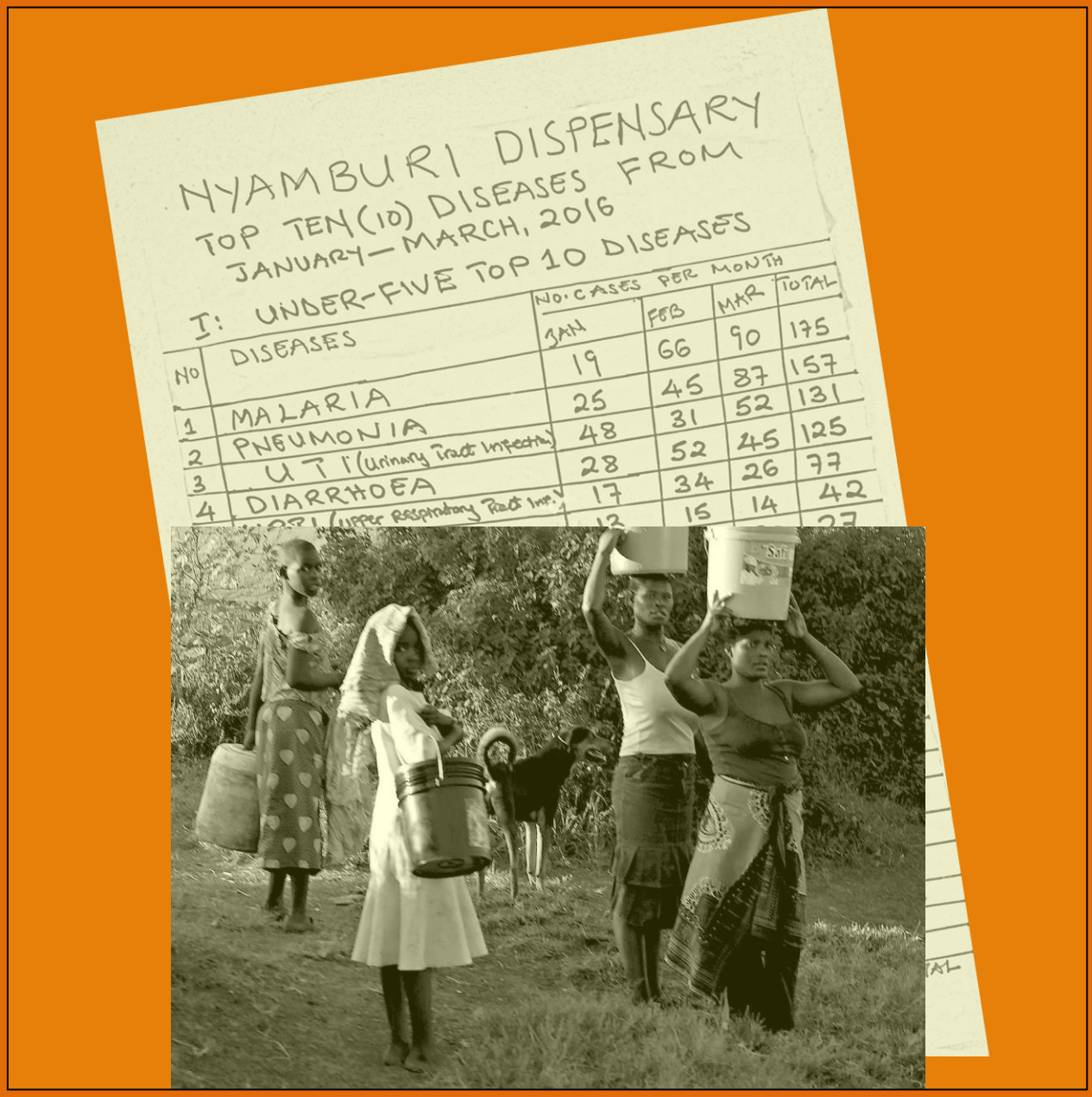
Transcultural Health Care Utilisation in Serengeti of Tanzania:

Towards Applied Ethnoscience in Public Health Management



J.C.M. de Bekker

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Cover: Women fetching water in Mara Region by dr. Jennifer C. Veilleux from Arch Creek Studios in Miami (copyright: used by permission) projected on a paper sheet of the handwritten morbidity rates as pinned on the wall by the C.O. in Nyamburi Dispensary, Ikorongo, Serengeti District.

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This book is dedicated to the women of Africa,
the true backbone of the continent,
and the people of Serengeti,
where
the middle of nowhere
becomes
now and here.

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List of Abbreviations

ACT Artemisinin-Based Combination Therapy
AFRO African Regional Office (WHO)
AIDS Acquired Immunodeficiency Syndrome
ALS Alternating Least Squares (Method)
AMR Antimicrobial Resistance
ARI Acute Respiratory Infection (URI)
CAM Complementary & Alternative Medicine
CARA Chronic Asthmatic Respiratory Affections
CDC Communicable Disease Control
CHC Community Health Committee
CHF Community Health Fund
CHW Community Health Worker
CSPD Child Survival Protection & Development Programme
DHMT District Health Management Team
DMOH District Medical Officer (of Health)
FES Field of Ethnographic Study
FGM Female Genital Mutilation
HD Historical Dimension
HIV Human Immunodeficiency Virus
HRM Human Resources Management
HSB Health Seeking Behaviour
HSSP Health Sector Strategic Plan
HSR Health Sector Reforms
ICCM Integrated Community Case Management
IMR Infant Mortality Rate
IKS Indigenous Knowledge System(s)
KMT Kanisa la Mennonite Tanzania
LEAD Leiden Ethnosystems and Development
LGA Local Government Authority
MAC Medicinal, Aromatic & Cosmetic plants
MCH Mother and Child Health
MDR-TB Multidrug-Resistant Tuberculosis
MDG Millennium Development Goals
MM Modern Medicine
MMR Maternal Mortality Rate
MOMALA Mobile Malaria Laboratory
NCD Non-Communicable Diseases
NDDH Nyerere District Designated Hospital
NHIF National Health Insurance Fund
NGO Non-Governmental Organisation
ORS Oral Rehydration Solution
PHC Primary Health Care
PHD Public Health Department
PMTCT Prevention of Mother to Child Transmission (HIV/AIDS)
PNO Principal Nursing Officer
PPP Public Private Partnership
PRC Pregnancy Related Complications
PV Participant's View
RDF Revolving Drug Fund
RED Reach Every District
SDG Sustainable Development Goals
SES Social Economic Status
SSA Sub Saharan Africa
TBA Traditional Birth Attendant
TB Tuberculosis
T&CM Traditional & Complementary Medicine
TM Traditional Medicine
TPHM Transcultural Public Health Management
TR Transitional Medicine
UHC Universal Health Coverage
UTI Urinary Tract Infection
VHC Village Health Committee
VHW Village Health Worker
WHO World Health Organisation
WIPO World Intellectual Property Organisation

CHAPTER I INTRODUCTION

1.1. Introduction

The *Leiden Ethnosystems and Development Programme* (LEAD), which is a multidisciplinary Research & Training Programme in applied ethnoscience, based in the Faculty of Science of Leiden University in The Netherlands has been providing the overall framework for the present study in Serengeti in the Mara Region of Tanzania. Its mission embodies the *leitmotif* of the research to*: 'develop and strengthen the newly-developing field of Applied Ethnoscience within the context of development in various sectors of the society through international co-operation in education, training and research with students, scientists and counterpart institutions. By studying local systems of knowledge and practice and using them as a steppingstone in the development process in interaction with global systems, improved participation can be achieved, and by consequence sustainable development. This important aspect not only increases the societal relevance of the novel field of study, but also offers new opportunities for innovative research in modern science, such as in medicine, pharmacology, economics, communication and ecology (cf.* Slikkerveer 2018). As the LEAD Programme has been engaged in various joint activities and networks with counterparts in South-East Asia, East Africa and the Mediterranean Region involved in the study, analysis and explanation of Indigenous Knowledge Systems and Development (IKS & D) in various sectors, this research seeks to strengthening the indigenous knowledge base in Tanzania in public health management with a view to integrate global and local medical knowledge and practice in order to contribute to the achievement of the Sustainable Development Goals of the United Nations (2015) in East Africa and beyond.

In the general orientation of the Programme to focus on the applied aspects of its rather dynamic neo-ethnoscience approach of IKS&D, various sub-fields are covered, including Traditional Medicine (TM), Indigenous Agricultural Knowledge Systems (INDAKS), Traditional Ecological Knowledge (TEK), Conservation of Medicinal, Aromatic and Cosmetic (MAC) plants, and Indigenous Community Institutions (ICI). The emphasis on the applied aspects seeks to reach the integration between the traditional and modern – or local and global– systems of knowledge and technology, as has been realised in the recent approaches of *Integrated Microfinance Management* (IMM) and *Integrated Community-Managed Development* (ICMD) (*cf.* Slikkerveer 2012; Slikkerveer, Baourakis & Saefullah 2018).

Recently, the shortage of well-trained public health manpower in Tanzania was brought to the attention of the LEAD Programme through a request by the health institutions of the Kanisa la Mennonite Tanzania (KMT) ('Mennonite Church of Tanzania'), namely the Nyerere District Designated Hospital (NDDH) and the Kisare College of Health Sciences (KCHS). The initiative eventually pertains to the future establishment of a University with a Public Health Management Faculty in order to respond to the current need of supporting capacity building at an advanced master level in public health, with an emphasis on the training of a new cadre of public health managers.

As a result, the focus expressed by the Kanisa la Mennonite Tanzania (KMT), which currently operates the educational facilities of a number of health manpower categories in the area, concerns the future development of a local curriculum at the master level. It is to be accessible to Tanzanian health workers on BSc level, who aspire to work in the area and thereby reduce both prevailing public health management problems and related manpower deficiencies.

The aim of this study is to acquire advanced knowledge on local peoples' illness behaviour, both in a rural and in a rural semi-urban area. It will focus on the motives and behaviour which clients and patients display in relying on any configuration of local health institutions, classified as either traditional, transitional or modern (*cf.* Slikkerveer 1989). It will examine the availability, accessibility and patterns of health care utilisation, particularly where they are embedded in the local cultural heritage. In addition, it seeks to document, describe, analyse and explain the various independent background, intervening and dependent categories of factors influencing the reported utilisation patterns reported by the participants, *i.e.* the inhabitants of the survey areas. In the course of this research an analytical model will be implemented, in which the utilisation of the co-existent medical systems is related to the historical, cultural and economic factors which guide the daily life of the inhabitants of Serengeti in the Mara Region.

The implications of the analysis of the research data will support the formulation of recommendations for education and training in order to contribute to the achievement of integrated transcultural public health policies, as requested by the District Health Management Team of the Serengeti District and the Kanisa la Mennonite Tanzania (KMT). Consequently, the findings will also be used as input for the establishment of a new master course on *Transcultural Public Health Management* (TPHM) in the area, and elsewhere in similar conditions (Luby 2013). Special attention will be given to the documentation of indigenous medical knowledge, belief and practices of the local population in the research area.

The joint initiative for the master course is currently being developed among six counterparts of the international consortium in Tanzania, The Netherlands, Denmark and Greece, taking the health facilities currently operated by the Kanisa la Mennonite Tanzania (KMT) as a point of embarkation, i.c. Kisare and Shirati Colleges of Health Sciences, as well as other institutes such as Nyerere University and the Clinical Assistants Training Centre in Musoma. The selection of the region, the recruitment of the research assistants, the processing of the data, and the installation of hardware at the Kisare College in Mugumu, as well as the above-mentioned International Consortium on TPHM provide the broader background of the present study in Serengeti in the Mara Region of Tanzania.

1.2 The Need for a New Approach to Public Health Management.

This research follows the Leiden Ethnosystems and Development (LEAD) method, designed for the assessment of the health care utilisation behaviour of the plural medical configuration in Serengeti with a view to improve the public health situation of the largely poor people living in the in rural and semi-urban areas. The approach supports the presumption that rural development can and will only take place if the people who are the subject of development are involved in the entire decision-making process (*cf.* Warren, Slikkerveer & Brokensha 1995, Posey 1995, Rist & Dahdouh 2006). In order to support the improvement of health care against the background of the Serengeti area in the Mara Region of Tanzania, as many socio-cultural factors related to health and well-being as possible are taken into account. In this case, the process of health care utilisation is documented and analysed within the setting of a complex society which is trying to find a balance between its pluralistic indigenous culture, its colonial heritage, as well as global economic influences. The research results seek to contribute to the development of public health management, by including and emphasising the role of indigenous medical knowledge, beliefs and practices in the training of new categories of health manpower, as well as in the design of locally appropriate health care policies.

The analysis is built up ranging from district, to community to individual level. As many scientists in the public health field will recognise, there is currently not one generally suitable model in dealing with public health problems on the African continent. There may rather be a growing consensus on the idea that various customised models have to be developed in order to suit as many local situations *(cf.* Hörbst *et al.* 2017). The *WHO Agenda for the African Region* (2015) already covers a range of themes for 2030, including (i) improving health security; (ii) strengthening national health systems; (iii) sustaining focus on the health-related MDGs / SDGs; (iv) addressing the social determinants of health; and (v) transforming the African Region into a responsive and results-driven organisation, but anticipates their feasibility simultaneously: *'While the goals and targets in the 2030 Agenda for Sustainable Development are global in nature and universally applicable, the declaration envisages a situation with each government setting its own national targets guided by the global level of ambition but taking into account national circumstances'* (*cf.* WHO 2015; p.2 nr. 7).

Historical and contemporary examples of strategic choices, policies, plans, and operational implications are presented consecutively in the next Paragraph. As has been defined by Leslie (1976), Fabrega (1982) Slikkerveer (1982), and Helman (1994), the availability of more than one medical system connoted as either traditional, transitional or modern, being utilised simultaneously, alternately or consecutively, irreversibly leads to the need of discovering the mutual relations of these medical systems. Such a configuration of medical systems which is termed '*Medical Pluralism*' has internal dynamics which may disclose the essence of why people make choices to undertake specific actions in the utilisation of these systems (*cf.* Slikkerveer 1982, Hsu 2007, WHO 2013, Olsen & Sargent 2017).

In Sub-Saharan Africa, the co-existence of traditional and modern medicine is now more than a hundred years old (*cf.* McPake 2009), and so far, the combination of both medical systems has not yet been implemented as a complementary system, while the World Health Organisation (1978) has been encouraging such a co-operation, and several African governments have already adopted legislation to that extent, as well as commissioning national institutes to engage in research into indigenous herbal medicine (*cf.* Slikkerveer 2006).

At most, it has developed a symbiotic tendency in specific countries *e.g.* China, Indonesia or India. One may argue that through communication and commercialisation, currently exponents of all systems, such as African Traditional Medicine (TM), Complementary & Alternative Medicine (CAM), Chinese Traditional Medicine (CTM), and Ayurvedic Medicine (AM), have become increasingly available and accessible.

The awareness that the current health status finds it root in colonial history to this day, has reached all levels of academic debate, but the inventivity of finding ways to bridge these systems into a form of true integration has been limited. Ethnoscience is trying to meet this challenge in applying methods to find significant relationships to improve health care delivery within its - plural medical - cultural context. The 'complementarity' should imply that it evolves into a truly integrated medical system (*cf.* Ambaretnani 2012), an umbrella which covers all variants, instead of one system being co-opted by another, or considered intrinsically superior, while encompassing as many locally relevant socio-economic and psycho-cultural factors as possible.

1.2.1 History and Development of Public Health in Sub-Saharan Africa.

In the relevant literature on public health development, the focus on the definitions used to explain the public health concept, is largely placed on the relationship between establishing well-being of the larger population in a given area, and the application of monitoring, control and preventive policies, as well as of measurements involving medical practice on an individual level. (*cf.* Hobson 1965; Koplan *et al.* 2009). According to Koplan *et al.* (2009), public health first appeared as a concept as a result of social reform developments in 19th century western society, i.c. continental Europe and the USA, and the advancement in bio-medical knowledge, especially with regard to communicable diseases. The four elements underlying the concept are a) decision making based on data and evidence; b) a focus on populations instead of individuals; c) the goal to achieve social justice and equity; d) emphasis on prevention rather than curative care.

Since its establishment in 1948, the World Health Organisation remains the agency which is assigned to maintain global governance in health care, through the endorsement and monitoring of international norms and standards, and the co-ordination of the efforts of all member states. Its definition of public health has been formulated as; *'the science and art of preventing disease, prolonging life and promoting human health through organized efforts and informed choices of society, organizations, public and private, communities and individuals'*. (*cf.* Acheson 1988: 1; WHO 2017). So defined, it implies the involvement of an endorsed (centralised) authority with an administrative body, which is capable of implementing these policies, apart from having human as well as material resources or the appropriate infrastructure. Once the combination of these attributes is dissected however, the need to tailor the concept in its application to rural Africa becomes more distinct.

In order to analyse the role of public health in rural areas in Africa, several parameters have to be considered, as argued by Azevedo (2017a). He points at the combination of specific geographic, socio-economic, cultural, historical, and infrastructural features, creating a setting which cannot be compared to other rural settings in the Southern Hemisphere, without making elaborate distinctions. The reference to Africa in this research concentrates on what is called Sub-Saharan Africa (SSA) and as such is distinct from what is called MENA (Middle East and North Africa), which from this viewpoint is peripheral, with its own characteristics (*cf.* Beaglehole & Bonita 2009).

For a tangible historical perspective on a uniformly organised or 'institutionalised' health care on a national scale, it is instrumental to look at the relatively short time span of nation building on the African Continent, which was set in motion around the late fifties and early sixties of the former century. Before and right after that period of time most facilities were either managed under a local (colonial-) government, or dependent on religious organisations (or their affiliated NGO's) which built, owned and operated almost all curative inpatient institutions [1]. Moreover, these facilities largely served the Europeans who were deployed in Africa during the colonial period of time, while religious orders used the provision of health care as a means to convert the local population to Christianity. In the beginning, the organisation of interconnected curative and preventive health care on a large scale had not yet been established, and the only generally available medical system included the centuries-old indigenous system of Traditional Medicine [2]. However, this system has for a long period of time not been officially recognised, because of the negative attitude of both the colonial powers as well as the missionary congregations (*cf.* Slikkerveer 1988; Chirangi 2013). The cumulative effect of the limited scale of local rural economies, lack of resources, moderate

infrastructure, as well as cultural differences between providers and recipients, seemed to render the implementation of an approach of modern public health rather incompatible with the characteristics of the local population in rural areas.

The expectation that the conditions which make the public health concept work in large parts of the western world would be equally available, or attainable, in the African rural areas, was most probably based on an historical and political bias, as summarised by Chigudu (2015) in his analysis of what evolved around the Ebola crisis of 2014. Although that instance may possibly be regarded as dealing with only one aspect, *i.e.* Communicable Disease Control, it was far more intricate in its implications. The outbreak could technically be contained through great effort, but the suspicion among the general audience regarding the explanations given by authorities and staff, and their initial unwillingness to adhere to an advised code of conduct, showed how vulnerable the communities involved were, and how unprepared the system itself was for the potential hazards of the situation.

The introduction of biomedicine during the transformation process of a colony into an independent nation state rendered its role in the appearance of an institutionalised health care framework not necessarily controversial. Modern medicine became an alternative next to existing medical systems, while being associated with 'progress', and used by the authorities as a showcase for development. There is an analogy in the provision of formal education, primarily to enable and support socio-economic development. An underlying motive was to acquire international resources in the process, despite the fact that they were fragmented or inefficiently implemented. According to Prince & Marsland (2014), such failures often resulted from an imbalance between urban and rural facilities as well as between the owners of facilities, being either local government authorities (LGA's) or NGO's.

Apart from the influence of the natural environment, and the perceptions of health care by the local population, the concept of public health in SSA is also connected to the classification of 'tropical medicine'. According to Azevedo (2017a), the reference to 'tropical medicine' is inappropriate, as it comprises diseases which did not originate in the tropics but are rather associated with the geographical zone, after they started to occur there. In his view, it covers area specific properties such as climate and socio-demographic features, which should be the case everywhere, and he suggests that the term is suspect as a classical perception which finds its root in colonial history. In this way tropical medicine treated morbidities in a specific climatic zone as a phenomenon first defined by western science and as inherent to that zone, irrespective of the underlying socio-economic conditions or the factual historical cause of a number of morbidities which were classified as characteristic. Even more so, as the definition is still widely used today in many African institutions of higher learning, it had deserved to be rephrased in an earlier stage. Therefore, the connection between the concepts of public health and tropical medicine becomes a construct which needs to be prudently applied.

In the meantime, the initial public health movement of the mid-nineteenth century with its focus on health improvement of large population groups through environmental change was replaced in the 1980's by the era of 'new public health', where in addition to the creation of health-supporting environments, the local population was assisted to reclaim power and control over their own lives, pertaining to community empowerment in health (*cf.* Ashton & Seymour 1988, Awofeso 2004). The relationship between the new public health initiative, community health and the strategy of 'Health for All' by the World Health Organization (WHO 1981) is further elaborated in Chapter II.

1.2.2. The Policy of Structural Adjustment

The economic situation in most countries leading up to the recession of the 1980's, and shortly thereafter, was such that the structural adjustment policies advocated by the World Bank (1981) and the International Monetary Fund (IMF) (1974) led to unprecedented shortages in resources to maintain basic health services, especially in Maternal & Child Health (MCH) and Community Health (CH). Important landmarks in post-colonial history are the Alma-Ata Declaration (1978), with the Primary Health Care (PHC) concept [3], one of the first all-encompassing and uniformly implemented public health policies, followed by the Bamako Initiative (1988).

In the current definition Primary Health Care, is described by the World Health Organisation as; '*…ensuring people's health problems are addressed through comprehensive promotive, protective, preventive, curative, rehabilitative, and palliative care throughout the life course, strategically prioritizing key system functions aimed at individuals and families, e.g. primary care, and the population, e.g. public health, as the central elements of integrated service delivery across all levels of care'* (WHO 2018; p.1).

At the conference in Alma-Ata (1978) the WHO recognised that an estimated 80% of the population in developing countries depends on various forms of Traditional Medicine (TM) for their primary health needs, and the new PHC-concept not only created the possibility of collaboration with traditional healers and birth attendants (TBA's), but introduced a new paradigm of integrating traditional and modern medical systems to support health care development (*cf.* Bannerman, Burton & Wen-Chieh 1983). The World Health Organization then launched its new strategy of promoting the role of Traditional Medicine (TM) in Health Systems which was later implemented with increasing success, particularly in rural areas of developing countries (*cf.* World Health Organization 1978; 1993; 2000; 2002a; 2002b; Twarog & Kapoor 2004);

The primary goals of Bamako (UNICEF, WHO 1987-1988) include the improvement of access to elementary services through community involvement, a focus on essential drug supplies, increase the scale of services through immunisation campaigns, and a combination of limited user fees, sponsored free services, proper financial management, and community mobilisation. Community involvement translates into the knowledge of the underlying causes of existing health conditions. It means that the management of health problems by the community members themselves, includes related aspects in terms of food, environment, education, infrastructure and social cohesion. The community's resources are applied with consensus among inhabitants, and volunteers support local initiatives. In that aspect Community Health (CH) has a direct relationship with Primary Health Care (PHC) and 'New' Public Health (WHO 1995), as it is the translation of self-determination in dealing with health care problems at the local level. It is also where the conditions for accessibility in terms of geographical, economic and cultural barriers come together (*cf.* Sofoluwe & Bennett 1985, WHO 1995).

With the introduction of the new Community Health (CH) approach, the role of donor funding, whether international, bi-lateral or NGO-based, remained essential in the execution of these programmes, in addition to whatever a national government was able to contribute from the available budget. Although widely supported politically, the initiative did not deliver the desired result on the intended scale everywhere. The predominantly economically oriented analyses by Kanji (1989) and Jarrett (1992), show that the economic decline hindered the recovery of cost through user fees in order to maintain the level of service in health care. In addition to user fees, the

community leaders and local government authorities (LGA's) were faced with much more problems. The Community (Village) Health Committee had to provide premises for the Village Health Workers (VHW) who were supposed to be volunteers but expected compensation. The Revolving Drug Fund (RDF) did not generate enough turnover to replace the original budget, and simultaneously there were to be provisions for free medicine for poor people who could not cope with even the most elementary fees, but there was no criterion as to how to identify them. Moreover, there were no reservations for expanding the projected coverage -either by need or demand- once the initial amount was budgeted. All these facets together create a situation in which there was no practical solution presented for recuperating the actual cost. As a result, the utilisation of the formal health care system dropped, and staff motivation diminished because of their private economic situation, which in turn led to affect quality levels. With regard to the policies concerning local government authorities (LGA's) the decentralisation of power played a role, because the budgeting was also decentralised, and therefore became influenced by other local priorities besides health care, compensated only through the capacity of local tax levying (*cf.* Kanji 1989; Jarrett 1992).

Because of the association of biomedicine with 'external' influences, implicit in a 'modern' health system, identified through the involvement of western NGO's and UN-sponsored activities (sometimes imposed by local authorities) in some cases initial Primary Health Care interventions were even met with suspicion by the indigenous population (*cf.* Prince 2014). These situations pertained to lack of response to health education campaigns, or lack of adherence to community mobilisation, *e.g.* during the introduction of the Extended Programme on Immunisation (EPI–treks) or MCH mobile under-five clinics (UFC). Sometimes these were due to insufficient explicative communication, for example with reactions of infants to inoculations, sometimes to the unpopularity of preventive measures which were not considered as a priority by the local population. Examples include communal construction of public latrines, a ban on using water from a nearby river, or the imposition using mosquito nets while sleeping. During the author's qualitative research in Ghana from 1988 to 1992, the motives expressed underlying this behaviour indicated that many people did not recognise a relationship between these preventive measures and their experience of certain diseases, or their convictions as to the cause of some of them (*cf.* De Bekker 1993). The preventive measures moreover demanded adaptations of their lifestyle, very different from the ways they were taught by their ancestors, who had abided by traditions for hundreds of years without these adaptations. The spending of resources on preventive services, experienced as superficial while not being ill, was generally perceived as a paradox, and the promotion of collective health insurance on community level, inspired by various missions in its initial form, often flawed for the same reasons. The metaphor used by a local District Medical Officer of Health in despair at the time was: *"When you acquire a watchdog to guard your estate and the burglars don't come, does it mean the dog has been useless?"* (*cf.* De Bekker 1993).

In other research such as Muhammed *et al.* (2013) the underutilisation of Primary Health Care is attributed to a relatively high fee for preventive services, inadequate infrastructure in healthcare facilities, and occasional lack of medicine supply. What is essential though is that Mohammed *et al*. establish that people do directly use secondary and tertiary facilities but tend to evade preventive services. In their analysis, the majority utilise the modern health system primarily for curative instead of preventive services, and that modern health care facilities in fact compete with commercial pharmacies for medicine, which the latter always seem to win. Preventive health care, whatever the quality of service, is apparently not recognised or appreciated as essential. The

criticism is mostly aimed at unreceptive staff attitude, the absence of a doctor, and levies for officially free services or physical remoteness (*cf.* Muhammed *et al.* 2013). What needs to be addressed at this point is the long history with self-medication, following a holistic approach with regard to health and well-being, which is common practice in large parts of the continent. As such, there is a direct connection with home remedies, or private consultation of knowledgeable community members who offer advice or treatment primarily as part of a traditional medical system. That behaviour affects the role of preventive services in terms of their proximity, as the latter are less visible, must be acquired purposely, or offered within the social framework of the community. An additional problem which is reported is that the attitude of staff in the modern system is frequently described as distant, disapproving, or dismissive of applying traditional alternatives (*cf.* Chirangi 2013), which is intriguing, as staff and potential patients predominantly share the same cultural frame of reference. Furthermore, those public health services which are supposedly to be delivered for free, *e.g.* Maternal and Child Health (MCH), elderly care, or specific HIV/AIDS treatment, are frequently charged in cash in advance by modern health workers and create animosity towards them among the local population.

As regards the institutional aspects in this historical overview, one of the key attributes in the assessment of public health as experienced in many rural areas is the fragmentation of services. Because of the involvement of a large number of private & public partnerships, it was (and is) not uncommon to observe that a local clinic –and its annex outreach operations in the vicinity- owned by a religious institution with external sponsorship is often better equipped than a local government's public health department, just because a congregation of a particular faith exists in the community. In the process, essential demographic features or morbidity rates were apparently not taken into account by the external funding agencies in awarding their support. Some NGO's chose to focus on one aspect, *e.g.* Maternal & Child Health (MCH), Polio, Guinea-worm, Onchocerciasis, Leprosy, or safe drinking water, because of the support available from abroad, not because of prioritisation by the local government authorities (LGA's) concerned. These LGA's were however simultaneously expected to endorse the local mission's projects, because of the influx of the connected funds. In a similar way, a private commercial laboratory in town is executing tests because the nearby (mission-) hospital is not equipped to perform the same analysis. The number of private hospitals is increasing, but they mainly serve the privileged members of society. In that way privatisation is technically successful, and complementary, but it does not answer to the requirements inherent in providing a public service on the intended scale as in a national health system. It is evident that private commercialisation of health care can hardly be centrally controlled towards a purposeful application of available resources to support health policies, unless the commitment of local authorities, NGO's, and the central government to co-ordinate efforts is established. The imbalance in development happened within a larger framework however, because of the adaptation of the WHO's norms and standards by national governments and NGO's, as health care development is considered inherent to rural development and adhering to the themes prioritised by the WHO's policies implies gaining access to external funding.

Complementary to his analysis, Mpambije (2015) points at another factor which is suggested to have played a part in the unsatisfactory delivery of health care services. He refers to the aftermath of 1980's economic crisis, namely the decentralisation of health services by the central government as a part of Health Sector Reforms (HSR) by the Ministry of Health of Tanzania (*cf.* Chirangi 2013). Following the limited central revenue resources, and the unfulfilled weight of community

involvement, the distribution of funds to local government authorities (LGA's) and the utilisation of these funds on district and facility level are difficult to manage. As Mpambije (2015) argues, the application of funds in the Primary Health Services Development Programme (PHSDP), to the dedicated targets *e.g.* facility maintenance, upgrading, staff training, recruitment, standardised equipment, drug supply, special disease programmes have been incomplete. Kamugisha (2008) notices that the response to Community Health Fund (CHF) which is directly related to service delivery has been low, 10% instead of the projected 85% participation, because of the lack of fulfilment of the facilities covered by the fund, and the invisibility of benefits to large sections of the population. Although the adagium of Primary Health Care (PHC) has been that successful curative services yield better response to preventive services, the ambivalence remains whether these developments should be regarded as a flaw in the concept of Primary Health Care (PHC), or as a result of economically determined logistics, human resources and management problems. The perception that a combination of a lack of qualified staff and frequent unavailability of essential drugs is the major influence for people's low response to the formal health system does not provide sufficient answer. The description of Health Seeking Behaviour (HSB) (*cf.* Rosenstock *et al.* 1988; Metta 2016) and the three basic barriers to health care accessibility, formulated as geographical, economic and cultural, as implicated by the 'New Public Health' paradigm (*cf.* Sofoluwe & Bennett 1985; Ashton & Seymour 1988) provide more insight in the underlying phenomena.

1.2.3 Public Health Policies: Ignoring the Role of Traditional Medicine

Alongside the foregoing developments, attempts to incorporate both modern and traditional medicine into one comprehensive medical system took shape in the late 1980's and early 1990's. The interest in predominantly herbal traditional medicine specifically, has been revived to the extent that research centres into indigenous plant medicine were established in several countries, usually placed under a ministry of health, or an eligible institute of higher education (*cf.* Owusu-Ansah 2014). According to World Health Organization (2002:7): *"Traditional Medicine refers to health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well-being."*

As mentioned above, the original idea, promoted by the World Health Organization following the 1978 Alma Ata Declaration, was that the incorporation would lead to a reduction of pressure on the already overburdened official health care system. An additional motive was that such integration could disclose alternatives for the provision of basic health care on a larger scale at a fraction of the cost, if more effective resources could be traced in locally available herbal medicines, inherently accessible to the general public, and implicitly embedded in local culture (WHO 2000).

According to Meincke (2012) there were 39 countries which were WHO-member states in the African Region, including Tanzania, which had to a certain extent developed a national policy for the promotion of traditional medicine in 2011. Meincke makes a connection between the development of an overall increase in the interest in herbal medicine worldwide, and the regional expectation of TM evolving into an additional health resource in the nations in question, with an apparent consensus, as the initiative has also been endorsed by the African Union (2005). Traditional practitioners, including Traditional Birth Attendants (TBA's) were considered important individuals in improving community health, and some communities even selected them as Village Health Workers (VHW) (WHO 1978). They were known to the inhabitants, knew the local customs,

were trusted by their community, occupied with maintaining health, and were the bearers of indigenous knowledge. Subsequently, there was a change in emphasis because of the focus on herbal knowledge of TM, instead of using the wide range of traditional professionals as a health manpower resource alternative (*cf.* WHO 2002; Marsland 2007). Why a structural co-operation between traditional practitioners and the modern medical system did not materialise until now is attributed to a large number of factors, but in Meincke's (2012) analysis, supported by Chirangi (2013), it was largely due to a lack of political commitment as well as financial support by local government authorities (LGA's).

Considering the health expenditure deficiencies involved in regular service delivery at local level in most countries during that period of time, it could be regarded as a result of economically driven short-term decisions. The focus became uniformly shifted towards communicable disease control (CDC), donors following the priorities set by the WHO. As an additional factor, Meincke (2012) also refers to scepticism from modern medicine when traditional practitioners were attributed to cure HIV/AIDS or cancer (*cf.* De Bekker 1993), or were associated with witchcraft's distorting influence on social cohesion, which stigmatised them as disruptive within their own communities (*cf.* TAMA 2002)[5]. That leaves aside the possible distinction between types of healers, many of whom practice their profession with appreciation from their communities, *e.g.* the prestigious status of some bonesetters, spiritual healers and herbalists. (*cf.* Warren 1975; Bannerman *et al.* 1983).

As documented in the recent literature such as Hausmann-Muela (2000), Millar (2004), Marsland (2007), Meincke (2012), Denisenko (2013) and Chirangi (2103), the discussion centres around the combination of 'natural' or 'supernatural' causation. The concept of combining medical systems assumes a symbiosis of biomedical and ethnomedical systems, whether or not the latter has a distinct therapeutic character, or a ritual character, which could simultaneously carry communal symbolism and/or social significance. That specific discussion usually evolves into a trade-off between local cultural context and western scientific axioms, but that need not be the unavoidable outcome of trying to bridge these different qualities. In recent years there has been ample demonstration of more attention being paid to the indigenous viewpoint, increasingly relevant once the historic legacy of colonial influence, or the emphasis on current shortcomings in economic, manpower or infrastructural resources are left out of the equation (*cf.* Azevedo 2017; Konadu 2008; Marsland 2007).

Moreover, such ambivalence is not only applicable to Africa, but to indigenous cultures in Asia and the Americas as well, as they had all developed indigenous medicine long before western scientific influence was felt. Yet, according to Konadu (2008) the current position is that even national policies by local governments "perpetuate" the dichotomy between modern health care and 'traditional' healing to such an extent that a possibly desirable integration, or re-appreciation of combining both systems, seems far off. The option of allowing a traditional system to complement insufficient coverage by a modern system as an alternate resource, is currently not being reconsidered (*cf.* Chirangi 2013). There were however TBA trainers working with traditional midwives in the late 1990's, focusing on how to recognise emergencies crossing their span of control timely, and refer their patients to a nearby clinic in case of suspected pregnancy related complications (PRC's). Another example is the rather successful Primary Health Training for Indigenous Healers (PRHETIH) programme, introduced by Warren *et al.* (1982) as a strategy to co-ordinate human resources with the Ministry of Health. It involved different categories of indigenous healers, mainly TBAs, herbalists and priest/priestess healers in the Techiman District of Ghana.

Similar promising strategies have also been implemented in Ethiopia; Zaire and Nigeria (*cf.* Slikkerveer 1982; Yoder 1982; Bibeau 1982 and Brink 1982). In the early 1990's at some instances co-operation (*e.g.* Vane, Volta Region, Ghana, 1989) between modern and traditional medical systems was displayed where traditional healers were invited purposely to establish their practice across the road from the clinic entrance, in order to be able to refer an individual who would not respond to a specific therapy, and vice versa (*cf.* De Bekker 1993).

In Konadu's argument, even early academic accounts, as well by ethnographers as medical anthropologists, of what a traditional system is built up from, often deviate from the day to day reality of its practitioners, and thereby undervalue its essence (*cf.* Konadu 2008). Konadu presents it as another demonstration of the dominance of a western scientific paradigm. If one wants to remove this dilemma, one could look at the way the application of modern medicine was necessitated by the introduction of western borne diseases in non-western societies, obviously in a historical timeframe. The traditional medical system as well could not anticipate the development of a cure for unknown morbidities (*e.g.* tuberculosis) before that period of time.

The aspect which should be removed from this polemic is whether the classification of diseases and their respective applied therapies in a specific cultural area, are a result of the need of scientists to construct a theoretical framework to support their assumptions about human behaviour, or whether it comes forth from the desire to improve upon local living conditions. Otherwise stated, it should not be driven by a scientific paradigm, but rather by humanitarian pragmatism. Irrespective of the actual motivation of individuals to apply a certain therapy on the basis of the experience of a particular illness, the ultimate goal is to get well. The assignment of public health policies is to provide an environment in which as many health problems of the population can be prevented as possible.

During the preparatory meetings towards this study in 2014, the Serengeti District Health Management Team in its capital Mugumu, expressed the eagerness to deal with those instances in which health problems cannot be managed. Whether this is on the basis of logistics, quality, service delivery, or traditional beliefs does in the end does not matter. The ethnoscience method as it is defined, is to present phenomena from the perspective of the participant. It implies that those cases experienced as either effective, ineffective, hazardous, or inappropriate by the local population become the object of study. The connections between a certain disease and the options considered for therapy can be dependent of many factors and they are readily recognised by many health workers of both traditional and modern medical systems. The emphasis put on a supernatural dimension attributed by western scientists to traditional healing as an unverifiable factor, takes away the focus from what could be achieved. The research into the efficacy of traditional medicinal plants does not deserve to be labelled as 'neo-colonialism'. The focus should be on embracing new insights, irrespective whether they meet microbiological criteria, but rather their contribution to intellectual property (*cf.* Sackey *et al.* 2010).

As Meincke (2012) argues, if the knowledge is taken away from the healer, it would simultaneously diminish his role as a social mediator, which is exactly the added value in the entire concept of co-optation as a health worker. It also ignores the relationship of his personal qualities with the healing process (*cf.* Ambaretnani 2012). It would unjustifiably establish scientific criteria as the universal standard which determines whether traditional knowledge is valid, until proven otherwise. In the present research however, the documentation of the decisions as to which system is utilised, because of what perception, is regarded as nothing less than a consensus among the people

whom it concerns, and not the desire to mould it into a theoretical framework. In this way there is no motivation to regard any type of medical system intrinsically superior to another, but rather address the need to analyse and understand disease prevention and control in the most optimum fashion. The involvement of local researchers and respondents in the research area using the local language investigating the local perceptions and practices, is practically applying ethnoscience, and the ultimate basis to support development; '*…frame my analysis in terms 'of' an anthropology of public health, as opposed to an anthropology 'in' public health. The 'of' requires that anthropologists should put public health itself under the ethnographic lens, whereas the 'in' compels us to offer a service, such as cultural broker, to public health'.* (Prince & Marsland 2014: p.75).

Another approach to the assessment of the role of traditional medicine (TM), especially in relation to the incidence of malaria, is found in recordings after rounds of Focus Group Discussions with health workers in Tanzania (Comoro *et al.* 2003). It shows that there is widespread knowledge of elementary symptoms, but simultaneously there may be a missing link to the actual underlying morbidities, as has been demonstrated when anaemia or convulsions, and other indirect long-term physical effects, were not directly associated with malaria when they should have been. Additionally, it has been found that traditional herbal treatment is often regarded as a suitable option because of the role which women play in advising treatment within the household, similar to what traditional healers do within a community, in some cases excluding other treatment options where they may equally be lifesaving.

As Towns *et al.* (2014) note, following their work in West African Benin, there is a preoccupation with knowledge which resides with professional traditional healers, and, perhaps, too little with the knowledge already available at the household level in the form of 'home remedies'. That leaves aside whether that knowledge transcended from other family members or was originally acquired from professional traditional healers. The recommendations from their research put a link between the role of mothers in the health care of children, and their knowledge of herbal treatment, in the sense that more knowledge of TM would incline them to take better care of children overall. They also tend to consult modern medicine (MM) in an earlier stage because through their experience, they have a better understanding of the relationships between different symptoms and the efficacy of various treatments. That understanding is exactly one of the points of embarkation of ethnomedicine in integrating indigenous knowledge with health education, as is prioritised in developing the concept of Transcultural Public Health Management (TPHM). The present research also takes the gender influence on health care into account, as shown in chapter VII, following Towns *et al.* (2014: p 8) who state: '*future studies can ask women if a positive experience with one form of treatment would influence future decisions. Infant and Child Health Care will be enriched if local knowledge, illness concepts, and medicinal plants fit into a larger framework, which studies healthcare from a community perspective, including researchers from outside the biomedical field'.*

As Slikkerveer (2000) argues, indigenous medical knowledge can play an instrumental role in the integration of local and global medical systems, and one aim of the present study is to contribute tangibly to that objective in Tanzania. The 'bottom-up' approach has been often presented, but very rarely consistently implemented (*cf.* Hahn 1999). Osei Owusu (2011) recognises this phenomenon where he refers to the shift from 'eradication' to 'control' and emphasises the increasing participation of local people, as a focal policy trend in malaria control over the last two decades. The aim here is not to imply that a 'science based' public health concept would in no way be applicable to the current health problems as described in this study, but rather to prevent possible pitfalls as a

result of not detecting or ignoring the underlying factors, which may be essential to a rural communal setting. In order to illustrate the foregoing argument, Slikkerveer (1982; 1990) in his research in the Horn of Africa, demonstrates that the interrelated social-cultural factors are relevant in the process of development, especially in addressing the complexities in health care delivery in rural Africa. The applicability of the approach finds adherence today among various scientist. As all preceding authors underwrite, the process of developing public health into an appropriate model is ongoing, no matter the lack of consensus on a definition which encompasses all aspects. The actual situation is such, that area-specific problems are consistently being identified, and do receive attention, although it has not led to short term solutions in a practical sense. It does, however, support an approach with more attention to local details, especially in the socio-cultural sense, away from mainstream ideas. As Kelly *et al.* (2017; p.1) notice: '*For many African governments forced to restructure health activities in tune with the priorities of the World Bank, a public health system has only ever been a notional concept, or one greatly compromised by multiple social, material and political constraints'*

Besides this proposition, it must be added that recent developments in the SSA region have shown intricacies without precedent, referred to by Sanders *et al.* (2009) as "the double burden of disease". They contend that, apart from the influence of armed conflict, resulting in the migration of large number of refugees, it is the persistence of communicable diseases such as cholera, malaria, yellow fever, considered to be under control to a certain extent, while an additional number of 'new' diseases such as HIV/AIDS, multi-drug resistant TB (MDR-TB) and Ebola, have entered the arena, which pose increasing threats to an already challenged medical system. Additionally, the frequencies of chronic non-communicable diseases (NCD's) such as diabetes, cancer, cardiovascular deficiencies, hypertension and CARA are increasing in the region. Simultaneously, elementary provisions covering children's nutrition, safe water, or environmental hazard prevention, *i.c.* waste and pollution, are not yet on the desired level, in connection with population growth ratios. There may have been a shift in emphasis during the past two decades, but the present research supports a revision of that move, as mentioned by Prince (2014: p 8):*'The past decade has witnessed a narrowing of public health to target biologically defined (for example, HIV-positive) populations rather than a national public and citizenry. As such interventions focus more on the containment of diseases defined as "health emergencies" than on public health as a developmental goal, visions of public health have retreated further from the "health for all" goals.....pursued by many African governments together with the WHO*'. The shift of emphasis has recently been recognised as the WHO, in its latest African Regional Agenda (2017), has reiterated the need of paying more attention to the 'social determinants of health' among others as a lesson learnt from the precarious efforts in the containment of the Ebola crisis in West Africa, as well as the consistent health manpower problem.

With regard to the definitions concerning regional health targets as maintained by the WHO (2016), it is possible to arrive at a consensus towards a public health approach which would seem universally applicable. For example: public health is aimed at 'collective' and not 'individual' health, at access by any level of the population, at standardised quality and treatment protocols, at feasibility of services on a large scale with available resources, at both physical and mental well-being, and it takes into account non-medical factors, including socio-economic or environmental factors *(cf.* WHO 2016). Considered in such a way, it could be a model framework which enables socio-culturally differentiated and area-specific operations to be compared by identical norms,

without implications of being western-based or opposed to cultural relativism. The definition of what public health entails as a concept should preferably be taken away from ethnocentric scientific parameters, simply because of the humanitarian purpose of achieving its goal of providing "Health for All', especially if it can be done through a variety of themes, methods, or means stemming from an indigenous cultural knowledge framework. In the words of Akala (2006), the effectivity of a public health system is also dependent on the extent to which the organisation, which is responsible for it, can be held accountable, not monetary, but in terms of operational integrity. She finds complementary functions, *e.g.* PR-communications including information, education, promotion, and feedback, quality control, and intersectoral policy development to be the aspects which need attention in the future, again all non-biomedical, but up-to-date management aspects. Therefore, the *Transcultural Public Health Management Theorem* of the future will emphasise on the aspects outside the purely medical realm (*cf.* Krieger 2012; Appendix Nr. II).

1.2.4 Communicable Diseases Control and Promotional Programmes

During fieldwork carried out in the Volta Region and Brong Ahafo of Ghana, for several years (1988-1992), the fellow staff members of the District Public Health Department consistently agreed upon the notion that public health in a rural setting was always concerned with acknowledging local traditions, personal views, physical environment, and, especially, social communications (*cf.* De Bekker 1993). There were many examples in the efforts to consolidate the Primary Health Care concept at the time. It was necessary for the District Medical Officer of Health and his Public Health Department, to maintain good liaisons with the local people, community leaders and opinion leaders, in order to be able to monitor and at the same time cope with the health problems. It was considered a separate challenge alongside the problems of health manpower and facilities.

At that time there was a large number of parallel projects, almost entirely externally funded, encompassing training programmes for Traditional Birth Attendants (TBA's), the Ghana Leprosy Control Programme from Italy, the Polio Eradication Programme form the United Nations, Mobile Outreach Clinics and Under Five Clinics (UFC), EPI treks, the Extended Programme on Immunisation (EPI-treks), Family Planning Campaigns form UNFDP, Anthropometric Malnutrition Surveys, the Onchocerciasis Control Programme (OCP) by the WHO, the Guinea Worm Eradication from World Vision, and the Primary Health Training for Indigenous Healers (PRHETIH) programme (*cf.* Warren 1982; Ventevogel 1996). All these cases provided ample proof of the necessity of integration with grass root perceptions and practices, as with most of these programmes; the local Public Health Department was directly involved in their implementation (*cf.* Hahn 1999).

Over the years the type of morbidities which are dealt with within the domain of public health have not changed significantly, albeit that the intensity of various types of morbidities show notable fluctuations. Examples such as HIV/AIDS, Malaria, anaemia and waterborne diseases have been consistent challenges over time (*cf.* Serengeti PHD 2015). More recently, a specific hazard as the re-emergence of Ebola in 2014, although known and recognised as a threat since 1976, has refocused the public health agenda with regard to community involvement for the WHO (2017). The Alma Ata Declaration (1978) has led to the adoption of the 'Global Strategy for Health for All by the Year 2000' in 1981, defined by the WHO (1998: 2) as: '*the attainment by all the people of the world of a level of health which will permit them to lead a socially and economically productive life'*. The 'Global Strategy for Health for All' represented a formal beginning of the social model of health

with Primary Health Care (PHC) as its epitome. Again, the Sustainable Development Goals for 2030 by the United Nations (2017), which were set for reaching basic health for all people in developing countries by 2030, may demand the same attention as the original PHC concept did in 1978.

According to McMichael *et al.* (2005) there has been insufficient assessment of large-scale communicable disease interventions directed towards improving health in low resource environments. They state in connection to malaria control that collaboration between the sectors, community partnership and improving the management of monitoring and treatment capabilities are essential. The value of such an approach is in the integration of these components besides effective treatment. When interventions which have been regularly carried out over a prolonged period of time do not deliver expected results, it becomes essential to discover alternative methods to make future ones more successful (*cf.* Osei-Owusu 2012). Such an assessment does not include the underreporting as a result of cases treated at home, through the application of purchased commercial drugs, and those cases not officially diagnosed by health facilities. On the other hand, one is to be cautious in interpreting data, as there may also be subjective over-reporting of malaria because of a lack of proper diagnosis when not facilitated or unavailable. A perceived morbidity can be assumed on the basis of experience, or because of social acceptance in relation to the observed symptoms (Kwesigabo *et al.* 2012). With regard to promotional programmes, the themes are not always determined by the urgency of the problem at local level, and they are to a large extent dependent of facilities or funding made available by national or supranational agencies, who deliver the content as well as the media to enable exposure. At times one specific theme, *e.g.* early detection of female breast-cancer, may receive abundant support because some international NGO has adopted that specific theme. It implies that immediate relevance to a local situation is not decisive when resources are not available on local level (*cf.* Osei-Owusu 2012). Managing this type of health education as well deserves a concerted effort whereby mobile Public Address System campaigns ideally coincide with repeated regular media coverage to assure impact and recognition. Preferably and more effectively, they should be integrated with role play on community level, involving young people as a prime medium of transmission, and linking to the oral tradition.

Another problem related to the efforts of integration is the relationship between advanced treatment development and official treatment guidelines, as demonstrated in *Artemisinin-Based Combination Therapy* [4], which introduces an alternative to monotherapies, and commercially advertised pharmaceuticals which are commonly used on a large scale, but may become outmoded, outdated, or even ineffective. Some of these pharmaceuticals may lose their efficacy on account of improper dosage leading to parasite resistance (*cf.* Cheeseman 2012; Phyo 2012). It is probably a challenge to subject commercial pharmacies to a more rigid regulation with regard to unprescribed medicine, without creating resistance among the owners, who are predominantly economically motivated entrepreneurs. There are cases among these commercial pharmacies, where insufficiently qualified staffs, without the required knowledge of treatment advice, are consulted by unsuspecting patients (*cf.* Kamat *et al.* 2010). Malaria control is taken here merely as an example of current public health challenges, but these types of problems are obviously not limited to a single morbidity.

In the case of Serengeti's morbidity rates, the third largest in ranking is Urinary Tract Infection (UTI) which is not in the official data because of the externally provided software. Serengeti PHD staff indicated they could not add a new morbidity at will in the data set because of the restrictions in end-user modification possibilities. Occasionally the rates show epidemic proportions, but there is no consistent reporting among patients regarding causes or a set of recognisable preventive

measures (*cf.* CCHP 2015). As is described in Chapter VI, many respondents were neither capable of reproducing the proper set of symptoms, nor was there mention of a consistent causation, yet the classification of UTI was regularly made. Simultaneously different types of medication appear to be applied for UTI treatment, as observed during the fieldwork survey in the area.

The current AIDS/HIV incidence is characterised by problems of specific awareness, prevention, treatment and control. To complicate matters the registration on the district level is separate from the regular morbidity rates reported from the dispensaries, on account of its funding as a separate programme. The problem emerges when traditional medicine is utilised without proper diagnosis or even registration, as a result of shame, denial or despair of the patient in an advanced stage. In those instances, a person can bring his entire social circle in jeopardy unintentionally. They are not identified as HIV-positive but maintain physical contact with their social network. As indicated in Chapter VI, in the research area primarily religious organisations are found to take up responsibility and promote this person to person 'buddy system' communication to prevent people from social isolation or hazardous behaviour.

1.2.5 Multiple Health Care Challenges & Health Manpower Shortage

In compliance with the *Sustainable Development Goals* (SDG's) of the United Nations (2015), also known as the *Sustainable Development Agenda 2030*, the Tanzanian development policies had focused on specific themes and targets for the 2015 deadline of the preceding Millennium Development Goals (MDG's) of the United Nations (2000), such as Maternal and Child Health, Infant and Maternal Mortality Rate, safe drinking water and sanitation, and control of the major communicable diseases.

In the current Tanzanian Development Vision 2025, access to Primary Health Care (PHC), and access to Maternal and Child Health (MCH) are integrated. The reduction of Infant (IMR) and Maternal Mortality Rates (MMR) are addressed separately (MDG No. 4 & No. 5), as well as a public health related problems such as safe drinking water and sanitation (MDG No. 7) (UN 2000). As these targets of the Tanzanian Development Vision 2015 were formulated in the late 1990's, the awareness of the themes which reoccur in both MDG's and SDG's of the United Nations is quite substantial, and in fact have been an integral part of national development policies since the year 2000, *e.g.* the Health Sector Strategic Plan IV 2015-2020 (HSSP IV)

According to the analysis by the Finland Futures Research Centre (2015), the country is on the verge of achieving MDG No. 2 (Primary Education) and MDG No. 6 (HIV/AIDS, malaria and similar major diseases), and is approaching MDG No. 4 (Infant Mortality) while it is still struggling with MDG No. 5 (Maternal Mortality). These themes are also in line with regard to the focus in policies on national health planning. The intentions towards future achievements in public health indicate that an emphasis may be placed on quantitative targets, taking away the attention from consolidating the quality of public health development. These authors conclude that the country's health sector has reached the Abuja Declaration norm of 15% of the national budget, largely because of substantial donor funding (Luukkanen *et al.* 2015).

It is difficult to establish to what extent quality control could be applied to the specific targets of health care development in Tanzania, but there is a strong motivation to become independent of structural aid, which could possibly be substituted by more Public Private Partnerships (PPP), while here is a focus on Health Manpower Planning. At the same time however, as suggested by

Luukkanen *et al.* (2015), Tanzanian government officials perceive too much prioritisation in the MDG's imposed by either donors or international organisations, often at the expense of domestic views on their own priorities of public health development. The criticism is directed foremost at the complexity of addressing all the MDG's at the same time, implying that choices have to be made, with the risk to restrict the number of donor agencies who are committed to achieve one specific goal, and thereby limit the degree to which donor support could be obtained. The situation is reminiscent of the era of 'New Public Health' which had exactly the opposite purpose, whereby the self-determination of the society would be the leading principle for implementing national policies (*cf.* Sofoluwe & Bennett 1985; Ashton & Seymour 1988).

Another implication is that the measurement of the output in only quantitative results does not justify the investments made in various supportive initiatives which may provide results in a longer term or contribute indirectly to public health improvement, such as promoting health manpower training initiatives or incorporating traditional practitioners in primary health care. The present approach of the Government of Tanzania can be regarded as an extension of achieving the original MDG's for health care development for the next decade, as they are currently considered relevant but not achieved as yet. The wider implications of adhering to the new SDG's, seen as a continuation of pursuing the preceding MDG's, lead to another dilemma: African nations need a different approach for their own economic development in order to attain the SDG's. If they do not, they will never be able to finance the investments needed to attain these goals under the current conditions, especially if they want to disengage themselves from external donor funding. The most recent policy formulation in the Health Sector Strategic Plan IV 2015-2020 of the ministry of health, shows the continuation of this approach; *The unfinished work on reaching some of the MDG 2015 targets is taken forward in the HSSP IV, driven by the call for sustainability under the MDG successor global theme, 'Sustainable Development Goals'* (HSSP IV 2015; p.2).

In an operational sense this implies an extended preoccupation with the existing Communicable Disease Control programmes and an emphasis on the MCH-related themata, called 'Reproductive, Maternal, Neo-natal, Child & Adolescent Health' (RMNCAH). The indications are that the response to these services does not reach the intended level. Here as well there is an increase in Non-Communicable Diseases (NCD's), primarily related to changing lifestyles, accompanied by the assessment of an insufficient current capacity to address them adequately. Considering Primary Health Care aspects, human resources and drug supply reoccur as quality of care deficiencies, as is the physical distance to facilities in rural areas, which is primarily affecting MCH.

The Strategic Objectives which are derived entail; 1*) quality improvement, 2) equitable access, 3) community partnership, 4) modern management methods & innovative partnerships, 5) the social determinants of health* (WHO 2018). The WHO's target remains the standard guideline for comparison: the African Regional Office (AFRO) of the WHO maintains a Transformation Agenda (2017) to determine its policies in the area as a whole for the immediate future. It consists of:
(i) improving health security; (ii) strengthening national health systems; (iii) sustaining focus on the health-related MDGs/SDGs; (iv) addressing the 'social determinants of health'; and transforming the African Region into a responsive and results-driven organization (WHO 2017).

Following this AFRO directorate there are currently multiple challenges [6] to deal with, deliberately leaving refugees, armed conflict and environmental disasters out of the definition. The first is trying to contain communicable diseases through the increase of immunisation coverage, as described in the Universal Health Coverage (UHC) policy, as the directorate maintains that one in

five children do not have access to the complete range of available vaccines. According to the AFRO's report, it is still related to a household's economic status and education level, apart from physical accessibility. The second challenge is capacity building on community level through the so-called Integrated Community Case Management (ICCM). The strategy links up with the ethnoscience approach, as it highlights community involvement through local monitoring, and anticipates the lack of referral possibilities, while reducing the timeframe of intervention with sick infants on the village level. Simultaneously it would improve access to quality care because of the investment in local facilities. The main morbidities are identified as HIV/AIDS, which has separate Anti-Retroviral Therapy (ART) campaigns, malaria, diarrhoea and pneumonia. The short-term target is to reduce maternal and neo-natal mortality within five years from 2017 onwards. Alongside these areas of concern, the entire system has to anticipate the phenomenon of Anti-Microbial Resistance (AMR). In relation to the example of Tuberculosis (TB) treatment, and the underlying adherence to effective treatment, it is expected that a reduction of the expensive and time-consuming interventions could be achieved, but it would require an increase in diagnostic capabilities at rural facility level.

The range of Non-Communicable Diseases (NCD), covering cancer, diabetes, cardiovascular diseases, (chronic-) respiratory infections, obesity, and mental illnesses is wide and indirectly related to urbanisation and a change in lifestyle. Such strategies will become a new focus in a future public health approach, but will require concerted regulatory efforts, as they involve many aspects of modern consumerist behaviour among young adults, a side effect of global communications.

The Ministry of Health has indicated that there is a shortage of rural health staff (Health Sector Reforms III, 2009-2015), further elaborated by Mujinja & Kida (2014), Sirili *et al.* (2014) as well as Sue *et al.* (2016). The human resources challenge in health care in Tanzania lies at the foundation of the above-mentioned academic initiative of establishing a university in the Mara Region. It was brought forward and underlined earlier by Kurowski *et al.* (2007), and calculations from Sue *et al.* (2016) show a health manpower shortage estimated at 90.000 people, implying that the number of health staff currently available may not be sufficient to achieve the desired standard, not merely through numbers, but also due to a lack of an appropriate level of education and training. The health manpower challenge does not even touch upon aspects such as suitability of staff in terms of interpersonal and communicative qualities, insufficient motivation as a result of unfavourable labour conditions, lack of incentives, or lack of professional recognition (*cf.* Rowe *et al.* 2005). Regarding the importance of personal liaisons with community-based institutions, as underlined earlier, it provides an opportunity to integrate all these qualities into a comprehensive public health staff training programme, in particular if the right conditions are created to extend the current number of personnel trained on bachelor level.

The parallel organisational developments, however, remain largely focused on managerial aspects, such as human resources management (HRM), *e.g.* staff alignment, needs matching criteria, accountability and financial management, operational efficiency, improving data gathering, applied statistics, research, and strategic partnerships. As IJsselmuiden *et al.* (2007) describe accurately in their historic perspective on the 'mapping' of health education in Africa, the focus before the Millennium had been placed on training medical staff and on curative aspects, mainly following western models in the available curricula. They mention a limited capacity for academic training, not only in infrastructure, funding, eligible candidates, or the number of facilitating countries, but a lack of attention as well for senior level scientists and public health fieldworkers at both ends of the

spectrum. Although the topic did receive attention regionally, it did not lead to a change in policies to achieve a common approach in the short term *e.g.* through the Network of African Public Health Institutions (NAPHI 1995) and New Partnership for Africa's Development (NEDAP 2003). One of the precedents limiting these training facility resources was the accessibility to already trained health professionals, mostly doctors. It ignored the potential of training staff with specific qualities on another level which could contribute to the improved management of a medical system in a particular area. More attention should be paid to comprehensive medical and non-medical aspects of public health care development. In other words, the multidisciplinary character in the approach with access to middle level staff who were not necessarily physicians was not recognised. Secondly, the point is not only to have the right staff trained at the right level, but also to create the capacity for training personnel locally, *i.c.* the number of training stations with higher education qualifications within a target area.

During their mapping research, IJsselmuiden *et al*. (2007) established that 55% of the target countries on the continent did not yet offer public health courses on post-graduate level. Already at that stage it was advocated that the combination between education and research should become standard, where it was limited to only the larger academic institutions. In the current state of development in mainly rural areas where the improvement of public health management is needed, the emphasis is put on the quality of human resources as a priority by the policy planners (*cf.* Yeboah-Antwi 2016). Apart from the intended integration with indigenous community-based development agents and initiatives, the introduction of advanced monitoring systems which have an ICT basis is the new focus. Working with mobile device diagnostic screening of morbidities, such as such as the method of *Mobile Malaria Lab* (*cf.* MOMALA 2017), software allowing a smartphone to detect parasites, are the desired skills for the new generation of field staff. The importance of this development is based on the community level involvement which is still essential in reaching the health care coverage targets (*cf.* UHC). As the WHO guidelines (2017) express clearly, the contact with local contact persons to implement A-level micro plans, organise community registration as well as defaulter tracking, and the reception of mobile teams is crucial.

Such a community-oriented approach implies the identification of the appropriate stakeholders and uses all available techniques to enhance participation of the local population. In medical planning jargon that would be referred to as '*community-based interventions at sub-district level'* from Reach Every District (RED) guidelines (WHO 2017). Current research programmes such as the Johns Hopkins Programme for International Education in Gynaecology and Obstetrics (JHPIEGO), or Boston University all have strong human resources management (HRM) components (*cf.* Biemso *et al.* 2016). The indications are that these 'Community Health Assistants', as distinguished from previous 'Village Health Workers', correlate with a higher response to preventive services, meaning an increased coverage of elementary diagnostics as well as treatment. The experience which these programmes demonstrate is that the viewpoint of either recruiting staff from the community and train them with medical-technical skills or bringing in newly-trained health staff equipped with applicable socio-cultural skills, is a feasible policy which may contribute to the reduction of health manpower shortage (*cf.* Byrne & Morgan, 2011)[7]. However, the practice during these experiments showed that manpower shortages as a result of delayed remuneration, lack of transport, accommodation, or ad hoc personal problems, either private or domestic, are still present. These aspects should however be differentiated from a lack of technical skills, trustworthy equipment, or a solid knowledge base, because they pertain to labour conditions and not to the

quality of health care standards. The effect of the brain drain of physicians abroad [8] is also addressed in Chapter V. The impact of the loss of these human resources is accentuated by the investments made in the education of these physicians, not benefitting the nation for which they were intended, irrespective of the legitimacy of their individual intentions to make a career for themselves.

In an attempt to give direction to future priorities, Azevedo in the second of his twin publications (Azevedo 2017b), pleads to refocus public health on strengthening Primary Health Care, by emphasising prevention and education instead of disease emergencies *i.e.* containing communicable diseases outbreaks, because of the implicit advantage above cure. He also identifies the relocation of the production of essentially non-advanced medicines to the target countries in order to improve attainability and achieve cost-reduction in drug supply. Another method to increase coverage is supplementing the extension of rural infrastructure with mobile services, as has been achieved with the mobile Under Five Clinic (UFC) units in West Africa in the 1990's. In the analysis of Human Resources for Health (HRH) the chosen assumption follows an interesting lead, by using the viewpoint that in the structure of rural communities, kinship networks seem more relevant than professional status, *i.e.* 'it is not what you are but whom you know'. Within the context of the relationships between patients and staff at local health facilities, there are several answers as to why people can expect good service at one place, and not at another. As a phenomenon this could be classified as an extension of social cohesion, similar to reciprocal conditions on community level. However, as every person should be entitled to the same quality of care, the effect of personal preferences becomes dysfunctional. It cannot be acceptable that a patient receives better care because one is favoured by someone employed within the health service. In that respect a health insurance takes away the interpersonal relationship aspect, and theoretically replaces it with a non-subjective standard: either the insurance covers a particular service, or it does not. The paradox is that the existence of such a personal relationship is exactly what takes the role of the traditional healer beyond the experience in a modern facility. In such a situation MM can learn from TM, and such service attitude should be an integral part of exchanging knowledge.

Especially with a view to a Universal Health Coverage (UHC) within the *Sustainable Development Goals* (SDG's) on the agenda for 2030, it will be difficult to attain the intended coverage without a generally implemented National Health Insurance Fund (NHIF) scheme, irrespective of how it is done. The added value of a fund in typical western societies is that it implicitly provides a levelling mechanism, where higher fees pay part of the poor people's bills. A necessary functional aspect is that health insurance should no longer be regarded as a voluntary engagement, as it is in Tanzania's Community Health Fund (CHF), although that may have implications for the level of the fees. It would also only be acceptable if it is implemented for the entire population. For that constellation to work out in an African context, whereby the volume of a middle class which can carry such a system must be substantial, may be a challenge.

A related topic is the role of external funding of health care. In the current situation the estimate is over 36% dependence of donor money (Azevedo 2017b), which is substantial if the whole health service would have to be supported by its own income, *i.c.* NHIF reimbursement, over the counter payments, along with government subsidies. For some programmes the donor share is of such magnitude, that they would risk having to be abandoned all together (HIV / AIDS estimated over 90% donor funding (MoHSW 2013). In that respect as well integration of a traditional alternative is again attractive. The establishment of the Association of Schools of Public Health in Africa

(ASPHA) in Kenya in 2010, leading to the establishment of an office in Accra in 2014, can serve as an example of creating a platform to exchange the ideas connected to the Transcultural Public Health Management (TPHM) concept initiative (Appendix Nr. II).

Although the number of countries is currently limited, the impact of an institutionalised annual conference, and the snowball effect of having the educational staff involved from at least 26 institutions which offer a public health programme cannot be underestimated. The emphasis may be on streamlining epidemiological research as yet, but there is a direct opportunity to blend in with the development of training workshops and Information Technology, when introducing Ethnoscience, especially the research component, to be integrated into public health curricula. Because of the logistics involved in maintaining a local educational infrastructure, special attention could be given to distance learning opportunities, congruent with current ICT developments, the availability of mobile devices, and the introduction of e-Health applications as a new resource for information (Big Data-analysis) and individualised on-line promotional strategies.

Finally, as this research is focused on transcultural health care utilisation and health manpower, some aspects of public health in rural areas appear neglected or absent. It is however a deliberate selection, and the environmental challenges connected to safe drinking water, sanitation and hygiene are not overlooked. The management of environmental hazards with regard to air, soil and water deserve separate attention and will be addressed in the envisaged TPHM curriculum, *e.g.* subjects such as waste management, food safety, as well as occupational safety.

1.3 General Aim and Specific Objectives

1.3.1 General Aim

The general aim of this study is to document, study, analyse and explain the relationships between various categories of factors influencing the patterns of utilisation of the plural medical systems by the local population in Serengeti with a view to contribute to improved policy planning and implementation of public health management. The general research question is: *'what type of patient utilises what type of medical system for what kind of perceived morbidity'*. The sub-questions refer to the dimensions following the conceptual model of the research, as elaborated in Chapter III. These dimensions encompass socio-demographic, psycho-social, socio-economic, institutional and environmental factors, vis-à-vis the factors of utilisation of the medical systems, being the core of the quantitative research. The qualitative research with key–informants provides insight into the frame of reference of the respondents, their intrinsic motives, as well as their knowledge, belief and practice of the traditional medical system, including the utilisation of herbal medicine, and the role of the environment in their reported health and disease behaviour. In order to operationalise this general aim, a subdivision is made into a number of specific objectives to be achieved, which include the following:

1.3.2 Specific Objectives

Firstly: to document, analyse and explain the relationships between the independent, intervening and dependent factors of the conceptual model in the utilisation of the plural medical system by the local population.

Secondly: to study and explain the role of the local knowledge and belief of perceived illness causation in the utilisation process.

Thirdly: to present a sociographic description of the research area in Serengeti in general, and of the Kurya community in and around Nyamburi in particular.

Fourthly: to present an indigenous classification of local Medicinal, Aromatic and Cosmetic (MAC) plants, including their preparation and application, as well as their use for the treatment of specific illnesses.

Fifthly: to present the stepwise bivariate, mutual relations, and multiple regression analysis of the transcultural health care utilisation behaviour by the local population, in order to document and explain the interactions between the groups of factors operational in the research area.

Sixthly: to assess the perception of the local population of the current modern medical system in the area from the qualitative research, in order to improve the co-operation between the available medical systems.

Seventhly: to describe the theoretical implications of the research findings for the development of applied ethnoscience in the field of public health management, focussing on the influence of socio-cultural factors in attaining sustainable community development (*cf.* Slikkerveer *et al.* 2019)

Eighthly: to describe the methodological implications of the research findings for the further development of specific ethnoscience-based research methods and techniques as advocated by LEAD to contribute to sustainable community development. The implications substantiate the appropriate capacity of the 'Leiden Ethnosystems Approach' as an instrument to assess the emic factors in the process, and as such link up with the Impact Assessment Model as introduced in the concept of *Integrated Community Managed Development* (ICMD) by Slikkerveer (2018)

Ninthly: to describe the practical implications of the research findings for the improvement of the public health management policy planning and implementation process, with a focus on the development of comprehensive health plans by the Serengeti District Health Management Team, in providing a community-oriented contribution to the *Transcultural Public Health Management* (TPHM) Post-Graduate Course at Kisare College of Health Sciences in Serengeti.

1.3.3 Structure of the Study

Chapter I provides the context for the emergence of the research question, and its relationship with the role of the official counterpart in Tanzania (KMT), as it operates health care and training facilities in the area. It explains the need for health manpower training and the relationships with the defined medical systems, used complementary, instead of a focus limited to the official institutionalised service delivery. It shows where the approach to integrate Ethnoscience with public health management originated, and in what way knowledge of local culture and community involvement can enhance the efficacy of health care interventions.

Chapter II gives an overview of the theoretical framework by introducing the Ethnoscience approach as advocated by the LEAD programme. It gives descriptions of the underlying concepts. They are explained as terminology and definition, their internal coherence, and how they lead to the choice of methodology for the fieldwork. It furthermore provides examples of recently applied policies and the implications for this study.

Chapter III provides a description of the research methodology, starting from the conceptual model, through the definition of the chosen indicators for data collection, and the organisation of the fieldwork. It describes the methods used for analysing the data as performed in chapter seven.

Chapter IV describes the research area, covering Serengeti District, down to the area of Ikorongo and Nyamburi, the location for the household survey. It encompasses the socio-demographic and physical features as well as the historical development (*i.e.* Historic Dimension, HD). A section of the historical perspective is dedicated to the Kurya people who are predominantly indigenous to the household survey area (*cf.* Field of Ethnographic Study, FES).

Chapter V focuses on the health care situation in Tanzania in general, bringing it down to local area level, supported by data of the Public Health Department's District Profile. It provides a context for the analysis of the data pertaining to the prevalence of morbidities characteristic for the area, as well as the organisation of institutionalised health care Tanzania and in the district.

Chapter VI is a compilation of the qualitative research, as integral components of the Leiden Ethnosystems method (*i.e.* Participants' View, PV). It gives an historical perspective of Serengeti through the key informants' recollection. It reflects their opinion on current health problems and their experience with the plural medical system, as well as their personal assessment of the effectiveness. It serves as the elementary context for interpretation of the quantitative data. There is a classification of perceived morbidities, and a number of Medicinal, Aromatic and Cosmetic (MAC) plants reported in the household survey. They are presented in local and botanical terminology, their preparation and application for perceived morbidity.

Chapter VII presents the stepwise analysis of the quantitative data following the sequence of bivariate, mutual relations and multiple regression analysis (Non-Linear Canonical Correlation Analysis 'OVERALS'). It explains the interaction between the groups of independent and dependent factors following the conceptual model, in the utilisation of the plural medical system in the research area by the local population.

Chapter VIII addresses the conclusions and recommendations which result from the complementary qualitative and quantitative data analysis. It elaborates on the theoretical, methodological as well as the practical implications. It describes the intended spin-off, translated into recommendations contributing to public health management. It includes health manpower development, co-operation between the available medical systems, the contribution to sustainable community development, and the preservation of knowledge regarding indigenous MAC plants.

Notes Chapter I.

1. 'Hospital building seems to have started in Africa in the second half of the nineteenth century and intensified in the early part of the twentieth. The Sacred Health Hospital of Abeokuta (Nigeria) was built in 1865 and the first government hospital in Nigeria opened in 1871 in Lagos. Accra Hospital was built in 1882 with between 40 and 46 beds for Africans and a smaller number for Europeans. A new hospital was constructed for Europeans in Accra in 1916, the Korle Bu Hospital was built in Accra in 1923 and a maternity hospital was added in 1928. The first modern hospital was constructed in Somalia in 1925, in Berbera' (McPake 2009).
2. TM as well consists of preventive aspects, as besides curative methods, there is much attention to 'protection' by way of taboos, amulets, rituals, or specific deities which are connected to maintaining good health, foremost related to normative social behaviour (*cf.* Millar 2004).
3. PHC comprises eight elements: (i) education concerning prevailing health problems and the methods of preventing and controlling them, (ii) promotion of food supply and proper nutrition, (iii) adequate supply of safe water and basic sanitation, (iv) maternal and child health care, including family planning, (v) immunization against major infectious diseases, (vi) prevention and control of locally endemic diseases, (vii) appropriate treatment of common diseases and injuries, and (viii) provision of essential drugs (WHO 1978).
4. 'Currently Artemisinin-based Combination Therapy (ACT) is recommended for the treatment of P. Falciparum malaria. Fast acting Artemisinin-based compounds are combined with a drug from a different class. A co-formulated drug is one in which two different drugs are combined in one tablet; this is important to ensure both drugs are used' (malariaconsortium.org/pages/112.htm)
5. TAMA: Tanzanian Traditional and Alternative Medicine Act 2002 excluded certain spiritual healers from recognised traditional practice with the intention of trying to outlaw witchcraft, on account of its suspected impact on social cohesion.
6. They respectively include the 2030 Sustainable Development Goals (SDGs), the 2011-2020 Decade of Vaccines, the 2030 Universal Health Coverage (UHC) agenda, the 2011-2020 Global Vaccine Action Plan (GVAP), the Global Routine Immunization Strategy and Plan (GRISP), the Regional Strategic Plan for Immunization 2014-2020.
7. Tanzania Doctor to Population ratio = 1:23.000 (WHO standard = 1:5.000), and overall 5.2 clinical health workers per 10.000.
8. About 23,000 African health professionals (mostly physicians) migrate to developed countries every year costing $ 4 billion to replace (WHO 2017).

CHAPTER II THEORETICAL ORIENTATION

2.1 Applied Ethnoscience and the IKS-Based Development Paradigm.

The paradigm as developed by the Leiden Ethnosystems and Development Programme (LEAD) in the late 1980's forms the basis for this type of research and will be elaborated upon by indicating the connections between the programme and the related schools of thought. The overview presented by Yoder (1982) in '*African Health and Healing Systems*' shows that the previous "new ethnomedical method" is considered a school initiated in the early 1970's. At least one of these pioneers, the late Professor Dennis Michael Warren, closely collaborated with the Leiden LEAD Programme since its establishment in 1986, by its initiator, Professor L.J. Slikkerveer, himself an Ethnoscientist of the first order. They published what set a standard in a triumvirate with the late Professor David Brokensha, i.c. *The Cultural Dimension of Development* (1994), regarded as one of the main references for the 'Ethnosystems' school of thought (*a.k.a.* 'Indigenous Knowledge Systems', IKS).

From the definitions as they were formulated at that time, it is an explorative and descriptive method of trying to classify various types of perceived morbidity, treatments, medicine and traditional practices as applied by the people in a specific cultural area, but foremost a classification described in local terminology. The purpose of the method is to construct a framework by which the illness behaviour of a particular population and a cultural area, can be understood and explained. It does not imply, however, that the framework simultaneously functions as an explanatory model of the determinants of that behaviour, but at least it should provide terms of reference to illustrate the different illness episodes of the local people and support the operationalisation of public health policies on a local level. The earlier version of integrating the social and cultural context into organising public health was applied in the Primary Health Care (PHC) concept (ref. the Alma Ata Declaration, 1978), but the execution of the concept varied extensively locally (see 1.1).

In the case of this study, it must be emphasised that the descriptions encompass several dimensions. The presumed cause, the experience of symptoms, a set of symptoms leading to perceived morbidity, the accessibility of services, a choice of treatment, a way of administering of a certain treatment, the experience with the result, and the local (cultural-) connotations concerning all these phenomena. The complexity of all these dimensions of health and healing varies per area. The area pilot study (2015) showed that there exists a large degree of consensus among the members of the communities within their cultural area, enabling them to express all these dimensions in their local terminology (not only in local languages or dialects, but as well in Swahili and English respectively) and simultaneously recognised by the local research assistants.

The crucial distinction between the described ethnomedical method and a biomedical procedure - when limited to the collection of empirical data - is that there is no intended separation between social, cultural, psychological, or environmental influences in the forming of any classification. The essence is that an ethnomedically designed description provides one with a classification of phenomena in local terms which represent the emic view, as they are brought forward with consistency by the majority of the community members. It is instrumental at this point to explicate the terms 'etic' and 'emic' as they represent the viewpoint taken especially in social science research, 'emic' being the approach from the reference cadre of the group member as the object of investigation, whereas 'etic' refers to the viewpoint of the outsider. The terms are derived from linguistics, where the distinction in sounds is made between phonetics -in human language- and

phonemics -the speaker of a given language (*cf.* Pike, 1967). The ethnomedical method has been developed to study illness behaviour from a holistic vantage point per sé, and also includes bio-medical concepts or local definitions thereof on the same basis, namely that they are, or have become, exponents of the same culture once they are locally established, especially in a society which has an established indigenous (or 'traditional') medical system (*cf.* Press, Fabrega, in Yoder 1982; Posey 1995; Marsland 2007; Ambaretnani 2012).

One historical aspect regarding this method needs to be mentioned at this point, which deals with the initial formal undervaluation of traditional medicine coinciding with the introduction of modern medicine, in this case in an African setting (*cf.* Chirangi 2013). Following the experience during the pilot study (2015), such undervaluation is still present in the memory of the local population as well as traditional healers, and it was mentioned by a first meeting in Serengeti with the chairman of the local healers' association *(CHAWATIATA).* Asked why the eagerness from the formal health care authorities to co-operate with them came about only recently, he answered that both he and his colleagues had long been suffering from rejection (his words were translated as 'stigmatised' by the interpreter, the then acting KMT secretary) by the 'official' medical authorities. It has already been established that the use of traditional medicine is still very popular on a global scale, is found in all layers of society, and as such has been promoted worldwide (Bannerman *et al.* 1982; WHO 2008). Although there has not been sufficient registration, nor ample reviews of scientifically proven effectiveness of traditional practices, so far, the role of indigenous medical knowledge, especially based on herbal medicine has substantially contributed to the development of modern cosmopolitan medicine, particularly in pharmaceutical medicine. Exceptions are found in numerous medical anthropological and ethnomedical accounts and in studies of Ethnobotanical cases (Fennell *et al.* 2004). Others believe that the role of traditional, complementary or alternative health systems is as yet undervalued, underrated or underexposed, mainly through a suspected lack of political will, especially on account of post-colonial authorities, who publicly support the idea, but practically have not achieved to consolidate their status; '*although the ''cultural authority'' and hegemony of biomedicine over indigenous science and knowledge were initiated by the colonial state, they were extended by the mainstream national leaderships and national governments with far more extensive and profound implications and less resistance* (Khan 2006: p. 2).

With this consideration, the concept of 'Medical Pluralism' as described by Slikkerveer (1982), implies that an artificial dichotomy between a modern and a traditional medical system is in fact a shortcoming which does not do justice to the pluriformity of treatments applied by various health practitioners, who follow their own experience or local medical traditions, and possibly blend them with new discoveries; '*…aims to reassess…..the concept of medical pluralism for current debates in anthropology by exploring new theoretical horizons opened up by contemporary scholarship on plurality that focuses, for instance, topics such as globalisation and the transnational and national mobility of people, knowledge and technologies* (Hörbst *et al.* 2017: p. 8)

The reference which is often made with regard to the supernatural – or personalistic - causation of illness in an African context, needs to be handled with care, in the sense that attribution of illness to natural – or naturalistic - causes is just as commonly expressed in various reports (*cf.* Kutalek 2001; Lehmann 2001) as would be supernatural causes. Such type of distinction has already been dismissed by a number of researchers, such as Janzen (1978); Warren (1975); Slikkerveer (1994), Marsland (2007) as being too one-sided, but does not take away the specific role which spiritually designated diseases can play in contemporary African society (*cf.* Chirangi 2013). During fieldwork

in Ghana (*cf.* De Bekker 1993), the author often sat with traditional healers and in order to discuss the topic, asked them if they saw an analogy between psychosomatic disorders and supernaturally attributed disorders. The discussion often remained inconclusive because of the complexity of the definition of 'supernatural'. For example, the traditional healer Togbe Adzindzi, practicing both as a spiritual healer and a herbalist in Kpando Fesi in Ghana's Volta Region (1988) was convinced that both existed next to each other, and he believed that you can get an ulcer from stress, but if you get similar symptoms because you have insulted your ancestors, the treatment for an ulcer would not suffice without rituals. The representative of the local healers in Mugumu, when asked about the recognition of psychosomatic disorders, stated that if he would establish such a cause, he would stop his treatment and refer the patient to a psychiatrist. In the selected methodology, the way to deal with these causal distinctions has to be to remain as meticulous as possible in the description of the attributes. After all, the consensus among the respondents on a possible cause complies with the Ethnoscience approach, even if that may not lead to a consistent taxonomy based on semantic consensus. Identifying the causal distinction in itself is not an objective in this type of research. The aim is to provide an understanding of the relationship with the socio-cultural background of the respondent, and to contribute to the advancement of public health.

An appropriate way in which a local medical system can be described has been introduced earlier by Irwin Press (1980), which looks at four distinct functions of respectively 'identifying prevention', 'make diagnosis', 'provide therapy' and 'interpret meaning'. These four dimensions provided the basis for the operationalisation in the fieldwork. In the theoretical orientation, attention is also drawn to the 'process' approach towards utilisation, where, more specifically, the focus will be on the stages of health care seeking behaviour during the period of perceived morbidity. In this case, no reference is made to the 'illness-acceptance-patient-role', (Suchman 1965) but to the motivation for the actions taken, in particular when there is a combination of treatments: consecutive treatments, alternating treatment, or a 'tailor-made' approach (*cf.* Kleinman 1980) [10]. The sequence of events can also be perceived of as a form of 'interaction' between systems, given the pluralistic character of the medical services in the research area. This may have consequences for a disease classification, as it makes it seem a 'dynamic' system in which experience can modify convictions or illness behaviour, and therefore the 'utilisation process' of the respondents, instead of a 'static' system, *i.e.* implying a degree of rigidity in its application. In line with the 'Participants View' of the Leiden Ethnoscience School, the individual experience will be decisive in the analysis, not the qualities attributed to the treatment in the bio-medical sense.

In this context it is relevant to refer to the concept laid down in what is called "The Health Belief Model" *(*Rosenstock & Strecher 1988) quoted in Glanz, Lewis & Rimer (1997), also by Kohler, Grimley & Reynolds (1999), one of the first models where the social (behavioural) sciences were integrated with the description of health problems, or as put down by Clemen-Stone, *et al.* (2002) as '*the individual's perceived susceptibility, the perceived severity, and the perceived threat of a particular disease increases the likelihood of preventive action'*. This definition is in the direction of where the data recording is pointed, although the quoted remark was made because of low adherence to health education schemes embedded in public health practice. The Ethnoscience approach will not side-line the discussion on efficacy but will provide an insight in the actual pattern of utilisation. An important related topic deals with the 'ecological' relationship. As Alland (1970) suggests, when maintaining a strict focus on health and illness behaviour in ethnomedical terms, the role of the environment may be overlooked in the analysis. Then the adaptation to changing

conditions *('adjustive response'*) may not be considered in the dynamics of this behaviour. Here as well, the difference between knowledge and experience of the individual community member, who is familiar with home remedies, and of 'specialised' healers who claim to investigate the efficacy of their traditional medicine become important factors, but whatever intervention in environmental terms occurs, both will be affected and will react to it (*cf.* Posey 1999). As Böhmig notes:

'*The choices for treatment are based on experiences and combining traditional and western treatment is not perceived as a contradiction but rather as a useful mixture. The complex formal and informal health facilities and the problem of accessibility given the urban bias of health facilities together with cultural norms and post-colonial experiences, form a continuum to which the individual looks for an explanation and therapeutic options in case of illness* (*cf. Senah 1997, Ventevogel 1996, Takyi 2003)'* (Böhmig 2010 p.47).

The combination of trying to establish some sort of classification and attribute a type of causation in the same process, coupled to a related therapy of choice, is the mainstream fieldwork undertaken to measure health care utilisation. It involves documenting the subjective dimension of belief, which will probably add to the dimension of experience, where the latter may be based on prior use or the use by acquaintances and brings with it a criterion of efficacy. Additional to this dimension of belief there is the notion of 'normative behaviour', implying that unbecoming conduct in interpersonal relationships is seen as the ultimate cause for illness to appear, even though a biomedical agent has been determined to play a role (*cf.* Durie, 2004; in Owusu-Ansah, 2012). It illustrates the holistic principle of 'why' people fall ill instead of 'what' makes them fall ill. This implies that next to practical treatment, pacification of the distorted relationship simultaneously has to take place in order for any treatment to be successful.

With regard to the classification of diseases treated successfully by traditional healers, as reported by various researchers, there are similarities in the type of problems they are dealing with (*cf.* Gessler 1995; Ventevogel 1996; Towns 2015). These morbidities have often led to specialisations in treatment developed by traditional healers, *i.c.* applicable to more than one type. Especially symptoms with a spiritual connotation are often directed towards traditional medicine. For example, mental disturbances, stroke, epilepsy, (partial-)paralysis, upper respiratory infections, and infertility, all of which have symptoms which are at times attributed to a transcendental cause. As Gessler suggest from his analysis, his respondents did not associate tackling these symptoms with the option of modern health care and were apparently underreported in official morbidity registration. The phenomenon which is taken into account is the instance wherein the decision to have a morbidity treated traditionally, by self-medication, or in the official delivery system is made by either the patient himself, the traditional healer, or on the advice of family or friends. The pilot study showed in an earlier stage that there is a definite awareness among traditional healers which type of patients should better be referred to a hospital. The decision made by the household head, or individual members can only indirectly be established, since the narrated history through a post hoc interview in case of a referral may not disclose the actual sequence of steps that particular action patient took.

'*...Health problems mainly treated besides malaria by Traditional Medicine: Infertility 12 Headache 11 Abdominal problems 10 Mental confusion 9 Epilepsy 7 Paralysis 7 Fever (not malaria related) 6 Sexually transmitted diseases 6 Ulcers 6...* (Gessler 1995, p.153 Table.3).

Notably the type of morbidities which are primarily directed towards Traditional Medicine because of their 'spiritual' or 'social behaviour' connotations, are similarly distinguished and compared to those found in research such as Gessler's (see chapter VI). The African Health Monitor

shows a list usually treated by TM which is slightly deviant by comparison; *…effective remedies for treating the main diseases which afflict the populations of the African Region, such as malaria, stomach infections, respiratory problems, rheumatism, arthritis, sexual dysfunction, anaemia, parasitic infections, mental problems, bone fractures and conditions requiring midwifery services* (WHO 2010: p. 33, *cf.* Mahme 2010). This statement is remarkable because of the mix of communicable diseases, chronic diseases and those with a supernatural or mental connotation, as most recent utilisation studies do find a difference in utilisation results between these categories, while the type of healer which is consulted should also be distinguished, as specified in par. 2.3.

2.1.2 The Role of Cosmologies in Sustainable Development

Before selected terminology as used in this study is clarified, the first reference presented must be on African cosmology, as introduced by David Millar (1999, 2004) in his "Cosmovision". The nature of that vision could be described as pluralistic. African cosmology stands out in the way it is anchored in tradition but is simultaneously adaptive of new influences and experiences. In that sense it is dynamic, and pragmatic, and yet consistent in connection to its worldview. It regards components of the physical environment not as separate entities for an economic purpose (land, water, air, flora and fauna), but as a continuum, through time and space, which carries a sacred connotation (*cf.* Shetler 1998). The connotation is manifest in multileveled spiritual dimensions which are connected to almost every sphere of daily living activity. Historic and current interventions, either economic, cultural or political, have not deteriorated the inner consistency of that worldview but seem to have created a landscape of parallel thinking. The recognised inherent cyclical movement of life, as with all human endeavours, needs to stay balanced. To that extent, prominent people in society make sure that when decisions are taken, they are taken with consent of the connected spiritual dimension, irrespective of which level may be implicated. Some physical features, such as landmarks, animal species or deviant climatic conditions may become intrinsically linked to specific norms, values or functions, and become significant totems in a process of cleansing or transition. The medium in terms of a person stems from his role in the community, often ancestral, as they are regarded as custodians of these cultural institutions. The medium in connection to the spiritual realm may be in a ritual or an object. The architecture of such a cosmic vision is, according to Millar, generalisable to large extent, while thematic varieties may exist on the continent, from one cultural area to another. Although various degrees of acculturation have evolved, be it in the course of external religious denominations determining daily life, urbanisation, or external economic impact, the cosmology has to a large degree survived, even if in altered hybrid forms. While urbanisation continues, most African societies are still characterised as rural, agricultural and inherently vulnerable because of poverty. As a consequence, the modernisation which is associated with urbanisation has, until now, not diminished the importance of traditions. What this recapitulation shows is the lasting influence of these cosmological attributes in a society which has its own course into modernity. The application of indigenous knowledge will not immediately reduce population pressure, pollution, natural hazards or economic downfall. It is however important that local communities can be self-determinant in what course they will follow. Millar however simultaneously warns against undesirable traditionalism connected to superstition, (gender-) inequality, local misuse of power and ecological detrimental practices *e.g.* mining or monoculture, which are equally typical of areas on the continent.

2.1.3 Indigenous Knowledge and Sustainability

The term *Indigenous People* was defined by the Special Rapporteur of the UN Economic and Social Council Sub-Commission on Prevention of Discrimination and Protection of Minorities in the following manner: *'Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies which developed on their territories, consider themselves distinct from other sectors of the societies now prevailing in those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems'* (UN ECOSOC 1986)

On certain occasions in this study, as in other references in the course of the argument, the term 'indigenous' may be substituted for 'traditional', as will be acknowledged when necessary in the accompanying explanations. In a wider arching sense, the appropriate terminology for describing this type of knowledge and its transfer would be 'Indigenous Knowledge Systems' (IKS), as maintained by an international network of Centres for Indigenous Knowledge annex universities worldwide, *e.g.* CIKARD established in 1987 at Iowa State University, LEAD in Leiden, KENRIK in Nairobi, and INRIK in Bandung, Indonesia, and ELLRIK on Crete in Greece. For the purpose of this study, confined to East Africa, traditional knowledge as a 'system' is used and defined by the African Region Intellectual Property Organisation (ARIPO) as; *''the cumulative body of knowledge and beliefs handed down through generations by cultural transmission and the relationship of the local people with their environment''* (Sackey & Kasilo 2010: p. 93).

In their explanation, the essence of this system is that it comes forth from the relationship and the understanding which local people have developed of their environment, regarded as a survival mechanism. In their view, this is expressed in the biodiversity management as it was applied by communities over centuries, in essence what is now designated as 'sustainability'. The special characteristic of this system is that knowledge is maintained through oral transmission, encoded in language and embedded in culture. It is not static but improved with new experiences as they come along. It is informal, hereditary and collective. The distinct features are the interrelationship of daily living activities with natural elements, self-reliance and cost-effectiveness. The resilience of the current informal sector is posed as proof of the solidity of the system, not only in a material sense, but also in diachronically strongly composed traditions and lifestyle. Even though these features may not be visible in recent developmental challenges, they are an integral part of the heritage and should be regarded as a resource. Traditional knowledge applies to all spheres of society, and because of the ecological context an emphasis may rest on biological diversity management, agriculture, livestock or nutrition (*cf.* Millar 2004) [13], but traditional medical knowledge is equally important and customary. The only reason why traditional medicine (TM) seems challenged is because of the deviation from the biomedical paradigm, which is probably amplified by its connection with complex social and supernatural interactions. As Sackey & Kasilo put it; '*Unlike conventional medical practitioners who are expected to restore their patients' physical health only, Traditional Health Practitioners are also responsible for re-establishing a social and emotional equilibrium based on traditional community rules and relationships.'* (Sackey & Kasilo 2010, p.94).

The holistic capacity is what makes TM stand out, and makes it organic within its social environment, one of the motives why it should be included in local policies. While threatening to be

erased by technological advancement and globalisation, it could essentially contribute to -rural-sustainable development. Sackey & Kasilo therefore plead for a comprehensive legal framework to protect and position traditional knowledge for the future, as was done in the World Health Assembly adopted Global Strategy Plan of Action (GSPOA) on Public Health, Innovation and Intellectual Property in 2008. The practical implication of the holistic properties is explained by Mhame *et al.* (2010) in their description of the diagnosis. Following their analysis, it is a combination of the 'efficient' cause -the what- with the 'ultimate cause' -the why. In essence the symptoms experienced by the person, are extended with the place and time where symptoms became manifest, as well as the (optional-) impressions of family members or acquaintances with regard to the person's condition. In addition to these, contextual conditions such as material objects, memories or dreams of the patient may play a role in the process of interpretation. Regarding the methods involved in the traditional practices, there is a wide variety which ranges from oral ingestion, breathing of vapour (inhaling), sniffing, to more invasive ones, as the administration of medicine through cuts, or rectal infusion (enema), and piercing. Just as in modern medicine there are recommendations dealing with diets or abstentions, sometimes related to animals, which may carry a symbolism of some sort, as in taboos and totems, which vary strongly from one cultural area to another.

The cross over with Primary Health Care is most obvious in the area of ante-natal and post-natal care. In that respect the number of people depending on TBA's first line of contact is high in rural Tanzania (see also chapter V). There is however an ever-growing awareness among both mothers and TBA's of risk management during and after pregnancy. As most Pregnancy Related Complications (PRC's) are not associated with 'illness", they have to be addressed separately in utilisation studies. Given the nature of the patient-healer relationship as described, it shows the inherent suitability of traditional healing to answer to mental health problems. Because of the personalistic approach and the wider range of circumstances related to mental illness, there are many healers who concentrate on that field, often with consent, although unacknowledged, of their modern medicine (MM) colleagues. The ambivalence towards traditional medicine (TM), as referred to in chapter V, lies mainly with politically sensitive fields of practice, such as witchcraft or Female Genital Mutilation (FGM), which may also be performed by traditional healers, but are linked to subversive activities or gender emancipation. In most official guidelines published, these are demonstrably left out, or accordingly addressed as suspect.

2.1.4 Health, Disease, Illness and Perceived Morbidity

The terminology used in the references regarding 'illness' and 'disease' (as discriminated from the term 'sickness'), has a semantic discussion running parallel, which needs to be mentioned here for consistency. In our semantic use the term 'disease' is regarded as a clinical biomedical category, and therefore 'modern' or 'western' which is associated with the given perceived morbidity, whereas 'illness' is regarded as the experience by the human subject, and therefore culturally defined or constructed (*cf.* McElroy & Townsend, 1989). From an Ethnomedicine perspective, it implies that the cause of illness, or its connotations, as well as the actual treatment practice in a social or ritual context, is therewith also culturally defined: '*The UN describe a health system as a structure which includes 'all actors, organizations, institutions, and resources whose primary purpose is to improve health…Their primary goal is to promote, restore or maintain health, but they also aim to be responsive to people's legitimate expectations and (are) financially fair'* (AFRO Health Report

2013: 106). As elaborately addressed in Irwin Press' work on classifying medical systems (Press 1980), the distinction between 'traditional, 'indigenous', 'folk' or 'popular' medicine was exercised by various authors (Kleinman 1980; McElroy 1989) [11]. It is still applicable today, in publications whereby one term may be substituted by another or they may be used simultaneous or intermittently *e.g.* 'treating folk illnesses with traditional medicine', or 'domestic medicine', and 'biomedical illnesses and their treatment' respectively (*cf.* Towns 2014). The terminology used by the respondents in this study will be used as the reference to describe the local situation. The disease classification as registered by the research team, the subsequent consensus on the equivalent in biomedical terms, translated from Swahili terminology, is by no means exhaustive, but it will serve as a reference for this cultural area. When referring to Kleinman's question whether it was only in the heads of the people concerned; *"it may only be possible to discern a total system in the way that system is perceived as a cultural form and activity by members of a given culture". "Perceived" is the key word here. For the mere use by an individual (or hospital or physician) of elements of diverse systems need not imply that all are viewed as part of a single system* (Press 1980: p. 47).

An additional dimension is found in the way indigenous medical knowledge is transferred. In the experience in the field in this research, the knowledge exposed by traditional healers, or anything which is applied in home remedies by individuals, is usually not found in a book or otherwise officially registered. Moreover, traditional healers, or individual households, may find consensus in their common practices but may not therefore necessarily exchange procedures, let alone have those procedures monitored by a third party. Yet there is a whole system of classification behind it and the transfer of knowledge happens orally from generation to generation, which implies history, experience, a structure and an inherent logic, and therefore equals the principle of recording.

Related to this concept is the understanding of symptoms and long-term physical effects of a disease (*cf.* Winch 1999) or the character of chronic diseases *(cf.* Stanifer *et al.* 2015). Although the reproduction of a set of symptoms attributed to a recognised morbidity is often demonstrated, it may be more difficult to attribute consequences of a disease over a longer period of time *e.g.* anaemia or kidney failure as a long-term effect of frequent malaria. The discussion can be carried forward by claiming that the term 'professional' cannot be applied to individually administered home remedies, but it could be applied to traditional, transitional as well as modern health workers, thus implying a standard or a method in the operationalisation of their activities *(cf.* Kleinman 1980). It is followed by an economic motive, applicable to healers who do it for a living, which also implies repetition, and a certain level of quality of service. The overlapping area here may be where self-treatment and a traditional healer share the same frame of reference and material inputs, but it would not take away the distinction between a lay-person and a professional. In our case 'plural' in the definition of medical systems would imply that various types of treatment being applied within the same cultural area did not all originate there. In conclusion, referring to Irwin Press' struggle to arrive at a definition, it is not to achieve a complete integration per sé, but a co-existence of all these practices, *i.e.* traditional, transitional and modern, within one physical sphere. Another approach to this concept is to regard pluralism as a converging scheme whereby one way of dealing with a disease transforms into another by way of 'evolution', resulting from a mixed practice of modern and traditional remedies used by local groups, as noticed earlier in Northern Tanzania (*cf.* Bignante & Tecco, 2013). It is not the intention to extend this range of definitions with 'complementary', 'alternative', 'ecological' or any other contemporary term for the sole purpose of trying to be exhaustive (*cf.* Khan 2005).

A related phenomenon which is discovered during utilisation studies, is the role of side effects of certain modern medicines, for example appearance, taste or smell, where these qualities are substituted for their therapeutic efficacy (Etkin *et al.* in Hahn 1999), sometimes even used alongside traditional herbal medicine to enhance their respective attributed qualities. In that way the spectrum of transitional medicine becomes larger because of the number of possible combinations, which may be applied to a number of morbidities with similar symptoms (*cf.* Jangu 2012, Stanifer *et al.* 2015).

2.1.5 Ethnomedicine and Medical Anthropology

According to UNESCO's publication on *Science, Traditional Knowledge and Sustainable Development*, introduced by Prof. Thomas Rosswall, (ICSU 2002), the origin of Ethnoscience stems from the 1950's when Harold Conklin (1957) pioneered in The Philippines in a study which was centred around the knowledge of that community in relationship to its natural environment. In that case the quality which discriminated his work, was that it was preoccupied with the taxonomies of plant species and the semantics involved in their indigenous categorisation. Admittedly, as the diachronic analysis moves along, the original motives during the colonial era were not inspired by trying to discover an underlying knowledge system. They were to discover anything tangible which would add to the western scientific body of knowledge of the period. Such a pragmatic approach does not take away the meticulous dedication displayed in the effort, the irony is that in the course of the exercise, the logic and consistency of the indigenous ecological descriptions were adapted entirely. In that way contemporary science became based on traditional knowledge, although without proper acknowledgement. The only thing left for discussion at that time was in how far the characteristics of these findings could be considered universally applicable.

Although both disciplines cover mutual ground as far as the theme and methods are concerned there is need to explain the implications of the terms and their complementarity. According to Trumper (2013) the terms related to ethnology have been around since the late 1800's but started to evolve into a new jargon because of the growing interdisciplinary nature of research groups. They included biology, zoology, botany, and anthropology, involving scientists such as Boas (1940), Goodenough (1956), Conklin (1963), and Frake (1969). Eriksen & Nielsen (2001) see the emergence of Ethnoscience in the 1950's as a result of the application of quantitative analysis, starting with linguistics and semantics, and developing classifications of systems of knowledge, evolving into "componential analysis" to allow for 'precise definition of meaning'. The method of application was through induction, with large amounts of data processed digitally. According to Pollock (2014), Ethnoscience finds its roots in cognitive anthropology, and has been associated with it since the beginning of the 20th century. As he defines it, Ethnoscience represents a 'perspective on cultural knowledge' emerging in the 1950's, promoting 'analytical tools from linguistics and cognitive psychology', but it is narrowed down as a part of cognitive anthropology, as if Ethnoscience were a sub-discipline. That does not do justice to the wider definition it receives from many other scientists. Ethnoscience has also been labelled '*the integration of scientific and indigenous forms of knowledge'* by Rist & Dahdouh (2006), which at first sounds ambivalent as it may presume indigenous knowledge is not science. What it entails though, is that the compilation of various bodies of indigenous knowledge, in the process becomes science, especially where it is demonstrated which contributions this compilation can make to sustainable development and conservation of natural resources. Rist & Dahdouh also bring in an aspect which is preoccupied with

what could be called 'lost in translation'. That refers to the situation whereby the description of phenomena by both indigenous knowledge and western science remains free of a (biased-) intrinsic value, or comparison for the sake of establishing a hierarchical ranking. As Rist & Dahdouh put it; '*No relation between science and local knowledge can thus be 'value-free' making it impossible to define something like an 'objective' or 'science-based' relationship.'* (Rist & Dahdouh 2006: p.473).

However, that could exactly be the added value of the application of Ethnoscience, namely that it can categorise without such an ethical position. Rist & Dahdouh continue to warn of the necessity of intercultural dialogue, where the needs and desires of the people on either side of the argument have to be recognisable, should have common ground to reach consensus, and depend on an attitude of willingness. In practice there could be a situation in which an indigenous taxonomy of plants expressed in local language, would at all times have to be compared with botanical scientific designations, but that does not reduce the essence of the taxonomy in any way.

Although Ethnoscience is often related to -and associated with- Indigenous Knowledge (IK), it does not substitute for it, it is rather that IK is a topic within the scope of the discipline. As Atkinson (2015) will have it, it is viewed as a field of specialisation, occupied with studying the classification of knowledge which is put to use, and qualified by an emphasis on cognitive aspects and semantics. Here too, the definition is made wider by having Ethnoscience encompass all systems of knowledge, thereby preventing a limitation to a specific cultural area, presumed separate from a western cosmological framework. Atkinson finds that Ethnomethodology is thus assigned with discovering underlying structure and organisation, based on a logic or social order which is recognisable for the inhabitants. In such a way Ethnoscience is not an exponent of western science but encompasses all bodies of knowledge, some of which were hitherto not being systematically recorded or transferred but have been applied over generations by people to their own benefit and survival. The aspect which makes these reflections on applied Ethnoscience important for the near future is the implicit potential. It would mean that, because of the cross-disciplinary approach, a collaboration between sciences which is intended to avoid exclusion of otherwise unrecognised or undervalued phenomena, would enable true sustainable development. The essence of that approach is that it can identify essential differences with regard to needs and desires of any specific group of people, in more than one dimension, *i.e.* physically, spiritually, and environmentally.

The emergence of the term 'Ethnomedicine' is attributed to the anthropological work of W.H.R. Rivers (1924), following his *"Medicine, Magic and Religion"*, because it included the cosmological features which play a role outside the physical aspects, describing symptoms of illness or material components of medicine. In the period which followed, medical anthropologists started to expand their attention to modern health care systems and medical institutions, complementary to the original focus on traditional medicine. The first definition of Ethnomedicine is accredited to Charles C. Hughes (1968), although his description does not take it away from the dichotomy between indigenous cultural development, and a 'conceptual modern medicine' framework. The Erickson (2007) explanation of Ethnomedicine as 'relating the cross-cultural concepts of illness and healing to the biomedical understanding of disease, curing and efficacy', tries to cover more ground.
She sees it as the key to understanding 'the trend of using multiple medical systems and therapies'. Although the connection with western scientific principles is brought in, as she continuous; *'biomedicine has changed from excluding to incorporating alternative medicines. The argument that is upheld is that it is necessary to look with relativism at the dominance of biomedical successes. ...following the development of interdisciplinary interaction, it is now common for social scientist to*

look at alternatives for culturally appropriate health care in an increasingly diverse world (Erickson 2007, p.4). Much of the applied methodology is inclusive with regard to socio-cultural phenomena, meaning that aspects such as beliefs, traditions, norms and values, behaviour and language are all object of study, extended to the interactions with the environment, whether in relationship with physical subsistence or cultural symbolism. The method is comparative, cross-cultural, as well as diachronic, and looks to find connections between different dimensions. It is applied to identify the relationships with bio-cultural or cosmological spheres underlying behavioural patterns. In that respect it is understood that the frame of reference of Ethnoscience is wider than Anthropology or its sibling Ethnography per sé. As Slikkerveer (1999) indicates, the sub-discipline of Ethnomedicine also connects with Ethnobotany, where it regards the classification of –indigenous- medicine, as well as with Ethnopharmacology, in establishing active components and determining their effect. It could be extended to Ethnolinguistics, where it concerns the designations given to these phenomena across cultural areas. The possible combinations are an indication of their interdisciplinary character and potential, always with a scientific signature, and may be seen as an example which bridges the humanities with natural science in optima forma (*cf.* Ingold 2000).

2.2 Medical Pluralism: The Configuration of Co-Existing Medical Systems

With the earlier reference to the contributions of Slikkerveer (1982, 1995) to the concept of 'medical pluralism', introduced by Charles Leslie (1976) [9], it is necessary to go into detail of what the respective medical systems encompass. As explained by Hörbst *et al.* (2017), and Olsen & Sargent (2017), the reassessment of medical pluralism as a concept becomes relevant, as it shows from recent studies [15] that the increased mobility of people, inherently substantiating regional, transnational and international influences, is showing its impact through the various types of medical alternatives available all over the continent. This tendency is amplified by new technologies in means of communication which simultaneously make the associated knowledge accessible, and virtually disconnect it from time, place and original context. It is possible to make a distinction between the levels and type of parties which influence pluralism or 'pluralisation' as Olsen & Sargent (2017) prefer it, viewed as a dynamic process, meaning the difference between individuals, organisations, or institutions acting within political and economic spheres. They also draw attention towards emerging phenomena, resulting from new combinations *e.g.* '*hybridisation'* or '*bricolage*' (*cf.* Marsland 2007) taken from several origins. These origins may be separate medical systems, but their definition is dependent of the approach. Every new cross-over in theory could be the onset of a new system, just as the 'transitional' system as defined by Slikkerveer (1982) came into being, or the 'popular' system as recognised by Chirangi (2013) [11]. Presented as such, following the argument by Hsu (2007) and Hörbst *et al.* (2017) respectively, it becomes a challenge to demonstrate the coherence of parts into one system, without making deliberate demarcations.
In order to demonstrate their applicability, the parameters used in this research (see par. 2.1) are addressed in the paragraph below. The essence of a pluralistic situation is that more systems exist next to each other in the same physical sphere, even to the extent, as in Tanzania, that other cross-cultural systems such as Chinese TM, or Ayurvedic practices from abroad exist next to an indigenous or other locally available system. In that respect for example, the WHO (2008b) sets Complementary and Alternative Medicine (CAM) aside as a separate category, designated as not being part of the area's own tradition, and not integrated in the local medical system. They are often

of western, Asian or Latin American descent and may have commercialised to a certain degree. The movement can be between systems, within one system, or across several systems, depending on the specific qualities attributed to them. The understanding is that all these systems are somehow recognised, tolerated, accepted or endorsed by local authorities, and, in principle, accessible to the entire population of the physical sphere in which they exist. There may be a ban on specific practices identified as hazardous or undesirable *e.g.* occult versions associated with witchcraft or Female Genital Mutilation (FGM), but such qualities are never applicable to an entire medical system. On historical grounds, there may have evolved an artificial hierarchy, or a perception of difference in intrinsic value between systems, on account of political, normative, or legislative changes (*cf.* Prince & Marsland 2014). In this respect, accessibility is not equivalent to equality. As described in chapter I, the criticism of traditional medicine (TM) by proponents of modern medicine (MM) has led to a stigma until today. It has not alienated TM but has prevented it from attaining an equivalent position. Although political recognition has been established via the WHO (2018), and several countries have even officially laid the position of TM down in legislation, in practice however, very few nations embrace TM within their official health policies (*cf.* MoH HSSP IV 2015).

The mechanism which is behind interaction between systems could be called 'acculturation', as the experience of the inhabitants, either positive or negative, may lead them to explore new ways or leave existing ones. The primary identification is notably with the indigenous traditional system as it will be embedded in the cosmology of the local people. The evolution of the role of these systems can be directly linked to social economic parameters, as some services may be free through being funded or subsidised, others may have social proximity, and yet others may have preference because of technological advancement. According to Elisabeth Hsu (2007), medical pluralism should be carefully applied, as the notion of 'a system' in her view does not necessarily represent the patient's viewpoint but results from the need of health professionals to make such distinctions, referring to Janzen (1978). Hsu leaves the question whether the patient experiences a 'choice' between systems, since not all may be equally accessible in practice, because of socio-economic, psycho-cultural, political, or other limitations. In Hsu's reasoning the existence of medical pluralism can be viewed as a result of societal change, and the co-existence of systems is better explained through 'complementarity' then competition. She also recognises aspects of fragmentation as well as interdependency between systems, as described in current scientific dialogue (*cf.* Olsen & Sargent 2017) which may become a future signature of multiple medical systems, as globalisation moves forward at an unprecedented pace. The triplet applied in this research of a traditional, transitional and modern medical system, as operationalised in Slikkerveer's research in the Horn of Africa (1982), refers to the distinctions which can be made with regard to their respective origins and their position in the dimension of health and healing which these systems represent.

2.2.1. The Traditional Medical System

The Traditional System has been described as the total of beliefs, perceptions and practices which have developed over time in one cultural area and are typical as a socio-cultural attribute of the indigenous population. The characteristic, in most cases, is that the knowledge of the therapies is linked to specific persons within a community, and has been handed down over generations, built on experience and oral transmission. The latter does not hold for societies with a history of scripture, but in East Africa, in general, there was no tradition with documentation. The use of extracts from the natural botanical environment of that community is common, as is the link with behavioural aspects, *e.g.* code of conduct, ethics, rituals, and attribution to transcendent powers *i.c.* supernatural connotations. It is in its essence often called 'holistic' as many of the traditional therapies take circumstantial elements into account, referring to physical conditions as well as mental and emotional, while the complementary effect on a person's state of being is regarded as implicit.

The connection between social interactions in the community, the individual's behaviour, and physical well-being is interpreted by healers in coherence, to enable diagnosis and select a therapy. It may be accompanied by rituals to emphasise the importance of restoring the balance, either in social relationships, including ancestors, or with the person's environment (*cf.* Danquah 1944; Twumasi 1975; Warren 1975; Slikkerveer 1982; De Bekker 1993; Meincke 2012; Chirangi 2013).

These attributes lead to the distinction of various types of spiritual healers, as they have been placed in one category for a syntactic purpose, but in reality, every cultural area will have its own versions. The importance of this aspect is often underestimated, if there is a suspicion of an underlying cause outside the natural sphere, the urge to disclose it can be so strong it circumvents, or supersedes, any consultation of the modern medical system. In such a case it does not matter to which phase a modern therapy has progressed, sometimes to the surprise of health workers.

The professionalisation of traditional healers is usually not related to a generalised or formalised education, but is strongly connected to cultural heritage, personal relationships and personality. Knowledge transfer does not necessarily take place within family ties but can also take place if one is identified by a mentor as a suitable protégé. Distinctions are made between herbalists and spiritual healers, such as diviners, soothsayers, prophets, oracles, psychics, clairvoyance's, as well as bonesetters, birth attendants, and circumcisers. The healing practices however are always linked to a specific person who is recognised within that community as capable of exercising his specialty (*cf.* Mhame *et al.* 2010).

Another qualification is that, although the traditional healers earn money with their services, they were, until recently, not viewed as commercialised. There was no deliberate acquisition or profit optimisation through systematic replication connected to their practices. As Mhame *et al.* (2010) contend, following the underlying philosophy, a healer is not expected to provide services for material gain as is defined by '*Ubuntu'*. There is ambivalence with regard to the cost level, as traditional medicine (TM) is usually viewed as low cost, and payable in kind. Qualitative fieldwork has shown that payment in kind can exceed the actual value of the treatment, and in some instances, both are required. Hausmann-Muela *et al.* (2000) elaborate on this argument by showing that the financing of TM follows a different logic than MM services. The possibility of alternative paying schemes, involving either delayed payment, instalments, payments in kind, reciprocal activities, or financial support from family members increases when an illness has social context implications. This means if a treatment is qualified as "personalistic", the ability to pay a traditional healer is

higher in comparison to covering hospital bills. They distinguish between willingness to pay and ability to pay, and find that MM is subordinate compared to TM, when willingness is considered equivalent (Hausmann-Muela *et al.* 2000) [14]. The highest esteem is attributed to those healers who charge only when their treatment proves successful.

One specific property is the locality of this type of medical system. There are hardly any rural communities which do not have at least one of these practitioners among their inhabitants. Adversely, some of these practitioners may even develop a specialism which can carry their reputation across whole regions because the quality of their work, mainly spiritual healers associated with mental health cases are known in that category, but also specialists who focus on one particular morbidity do exist. The character of the relationship between healer and patient is also typical for this system, as opposed to the modern system, as the identification of the healer with the person behind the patient is a hallmark, as is the familiarity through shared cultural or cosmological reference cadres. As Mhame *et al.* (2010) describe, the patient healer relationship starts with the assessment of the person, usually in the form of a case history, before the type of treatment is decided upon, conform the '*Ubuntu'* philosophy.

Complicating factor in this system is the accepted logic that even though the aetiology may indicate a natural cause, a supernatural cause may as yet invoke any symptoms identical to a naturally caused illness, which has to be determined by a knowledgeable person. In this research, 'home remedies', referring to the preparations made on household level by individual knowledgeable respondents, mainly using material extracted from their own domestic environment, were also designated as belonging to the traditional system. The rationale behind this was, that the knowledge originated from either inheritance through family connections or was derived from experience with local traditional healers and is therefore part and parcel of the same body of cultural knowledge. Reminiscent of Kleinman's 'popular system', as well mentioned by Chirangi (2013), they are not categorised as 'popular' because of the descriptions of local herbal medicine shown in chapter 7.1, which clearly demonstrated their connection to local traditional sources of knowledge. Finally, as this system is characterised through the absence of recording and documentation of its practices, and knowledge is mostly orally transferred on an individual basis, it is often a subject of challenges with regard to intellectual property rights (*cf.* Sackey & Kasilo 2010, WIPO 2015). That is probably not applicable to a category such as Islamic diviners, as they use Koranic texts, and are subjected to prolonged scripture training.

2.2.2 The Transitional Medical System

The Transitional System can be described as the cross-over between modern and traditional systems as exponents of this system mingle materials and techniques of both. The mainstay is the use of pharmaceuticals, which are sold on a profit basis, not through certified health workers, but by traders, either in commercial pharmacies or in the open market, as an ambulant vendor. At the other end of the spectrum it is possible to see traditional healers who distribute labelled pills next to their regular therapy and take blood pressure to show their advancement. The essence of this system is that it is difficult to regulate, since the quality of production or dosage criteria are seldom recorded, and there is no reference to validated prescriptions. That makes the position of this system very fluid, as the impact of economic changes in society is first experienced here. It explicitly exists next to the modern system, even though it is heavily dependent of mass-produced pharmaceuticals, either

or not legal. The advice given by the traders may be correct, when they are inclined to inform themselves properly, but it is not based on formalised regulation. Advice could also originate from hearsay and prove unprofessional. A similar problem is also apparent in temporary staff manning commercial pharmacies who are asked for medical advice but not formally equipped to do so (*cf.* Jangu 2012; Denisenko 2013), as recorded in this fieldwork as well on numerous occasions (see chapter VI).

A related discriminatory challenge, in addition to the original triplet of 'traditional', 'transitional', and 'modern' medical systems by Slikkerveer (1982), stemmed from the varieties which were encountered during the fieldwork. In the briefing sessions with the research assistants and the chief linguist, reviewing the semantics of the household questionnaire, the following situations were brought forward. When a *'duka la dawa muhimu'* is selling products from pharmaceutical industries around the world, and so do the street and market sellers, why are they not designated as belonging to the 'modern system'? When a traditional healer opens a shop on the roadside in Mugumu, makes a storefront with pre-packed and processed herbs, makes a signboard with a mobile telephone number, offering his consultations for numerous problems, all clearly commercialised attributes, why is he not designated 'transitional'? There is a private laboratory downtown Mugumu which does analysis on blood and stool specimen to provide diagnosis which the hospital lab either cannot perform or proves too expensive. This operation in particular has a perfectly commercial starting point, in their view it could as well be termed 'modern' in using microscopes, reagents, fridges and computers- as 'transitional' being commercialised and not integrated into an official referral service delivery, applying acquired microbiological knowledge primarily for individual gain.

The consensus arrived at after several sessions was that the original intention was to be the demarcation. Having established that, the traditional healer receives his knowledge handed down from his forefathers or mentors, reproduces his treatments as before, retains the cultural or ritual context, and in that sense is "original". Where most of his knowledge is not written down or shared, he merely markets his services differently. The lab technicians completed their education in the modern system but decided to shift to private enterprise because of the reward, in which sense they 'left' the modern system and became 'transitional' through their commercialisation. In one village there is a former medical assistant, who left the health service and set up his own shop, combining the sale of traditional herbs and providing anamneses from his personal experience, pretending to do lab tests in the back -to which in fact he is not equipped. According to the local staff he should be designated 'transitional' because he no longer adhered to the original criteria of either of the other two systems.

In this way, the nuances in distinction are taken beyond a lingering dichotomy as described by Marsland (2007) in her description of 'hybrid' traditional practitioners. In respect to her description however, the semantic discussions among the research assistants never hinted of any traditional practice being associated with 'backwardness' or 'controversy'. They considered it as a niche rather, which was viewed upon as distinctive, primarily because it could deal with cultural values, with regard to 'old' diseases, and the environment, whereas a hospital doctor could not. The crossovers which are congruent with the descriptions of Marsland, deal mainly with traditional healers embracing a number of commercial attributes of modernity. They are concerned with aspects such as roadside advertisement, producing prepacked traditional herbs with attention to shelf life, offering package deals as well as polyvalence in their application. These aspects are described as well in the reflection on the 'transitional' role of traditional healers in paragraph 5.4.1. The relevance of this

system is that it is vulnerable for a number of reasons. Although it is associated with modern medicine, because to the large of scale self-medication resulting from it, and the frequent absence of diagnosis and regulated prescriptions, it is a riskful. The commercial earmark makes it prone to experimenting and creates a motive to avoid supervision or adherence to strong regulation.

2.2.3 The Modern Medical System

The Modern Medical System can be described as based on scientific knowledge of microbiology and human physics, organised through protocol and competence levels, strictly monitored, and subject to legal regulation. It is also established through structural financing either through local authorities or external donor funding. It is heavily dependent of infrastructural facilities and technological applications. It is hierarchical in competence levels, and there is an inherent referral system whereby the complexity of the disease determines the level of service. The endorsement by legal authority is the key, also for private facilities, as they will need to be licenced to be allowed to function publicly. Private hospitals and clinics tend to be concentrated in urban areas. Special mention must be made here of faith-based institutions, as they are formally private as NGO's, they have been totally incorporated in the referral system in most countries, often externally co-financed because of the international character of many religious organisations and their inherent access to charity funds. Some aspects of modern care may be made mandatory with the purpose of protecting the population from health hazards. Just as in the transitional system it also relies heavily on the pharmaceutical industry.

The preventive service and health education promotions are prototyping a healthy lifestyle, which is presented as a universal iconography, but seldom adhered to or physically realised. It finds an equivalent in the ethical or moral standards in many traditional systems, referring to exemplary behaviour. Officially, specific target groups encompassing pregnant women, infants and elderly persons are supposed to receive free care within the modern system, but in practice on many occasions, there are still fees levied for all kinds of reasons, ranging from 'administrative fees' to 'uncovered' materials. In that sense every service aspect can be individually charged, i.e. registration, admission, examination, laboratory tests, operations, and medicine distribution, often to the clients' frustration. What makes this extraordinary is that the modern system is also the only medical system with organised insurance schemes, which should cover these expenses, although this type of funding has not yet matured in most rural areas because of insufficient volume and discrepancies in cost levels (Stoermer *et al.* 2012).

What makes modern medicine progressive as a system, is a continuous engagement in scientific research to enhance existing therapies and discover new ones. The financing can be either national, international, through NGO's, or commercial funding. As opposed to the traditional system, the modern system is characterised as 'professional' but 'distant', as health workers are not usually inclined to become acquainted with the 'person behind the patient' but focus on the bio-medical causation of the symptoms, mostly on account of work load, timeframe and practical implications. There is a notion of being physician centred, instead of around paramedics, which has consequences for accessibility and cost. There is also a bias towards urban facilitation, leaving the bottom of the pyramid with elementary service in rural areas undervalued. The dominance of the modern system in comparison to other systems is partially due to the universal applicability of many of its standards, as demonstrated in WHO norms and guidelines. With regard to traditional system, which

is often locally consolidated, and may be officially endorsed, it lacks a local, national or internationally co-ordinating organisation. Finding the political will and support necessary to create similar standards to achieve recognition of TM is one of the current goals of the WHO (2019).

2.2.4 The Concept of Health Care Utilisation

Within the parameters of the existing medical systems as described in the foregoing paragraph, it should be explained what can be deducted from the concept of utilisation. As defined by Suchman (1965), Kleinman (1980), and Slikkerveer (1990) utilisation is indirectly determined by the sequence of stages in the behaviour of the respondent who becomes affected by a disease. The sequence is described as the acceptance of his role as a 'sick person' after experiencing an illness, and subsequently accepting the role as 'patient', in which condition the person takes action, and becomes dependent of the therapy(-ies) he engages in. That stage is crucial because the perceived morbidity is derived from an interpretation of a set of symptoms, which may lead to so-called 'health seeking behaviour' *(cf.* Rosenstock *et al.* 1988). The complexity is borne in the number of factors which may influence this behaviour. The first parameter are standard socio-demographic attributes as in gender, age, religion, education, profession and income. Although these are common in most utilisation studies *(cf.* Hjörtsberg *et al.* 2003), often showing a dominance of economic determinants and practical considerations, there is an expectation that they become less determinant once the number of subjective variables increases.

In the analysis of Stanifer *et al.* (2015) in Northern Tanzania, who discovered five factors as discriminative; biomedical service delivery, credibility of traditional practices, strong cultural identity, individual health status, and disease understanding, at least three of those are directly related to traditional culture, whereas more than half of the sample is able to identify with- or utilises traditional medicine (TM). In addition, they establish that TM use cuts across income segmentation, as well as rural/urban parameters. Poor quality of care is known to have a relationship with decreasing utilisation, but then the definition of quality should not be limited to cost (including non-registered) and availability of medication, but include attitude and competence of staff, and waiting time, which are subjective but quantifiable, have proven essential to the experience, and are coherent with qualitative data.

A more delicate aspect is related to the individual assessment of the efficacy of the cure itself, as Stanifer explains, where the expectations of a therapy may be too high or unrealistic, especially in connection with chronic diseases, or as a result of non-compliance. It could be inherent to a lack of understanding of diseases, when intended as 'biological understanding', as is apparently meant in Stanifer's research. Negative assessments however have also been attributed to TM therapies, as system crossovers work in any direction. In the final analysis, when considered as an individual perception, only if efficacy is consistently experienced with specific morbidities it may identify where they become systemic. The socio-demographic indicators in this survey are complemented by personal experience, designated as unaided knowledge of health-related aspects. This refers to knowledge of causes of illness, symptoms, cures, environmental hazards, the role of people in the domestic environment and the community, as well as convictions with regard to health, lifestyle and cosmology. Especially the differentiations which are made with regard to categorising a set of symptoms associated with a specific illness, and choosing an appropriate therapy respectively, are all assumed to be socio-culturally based. Buschkens & Slikkerveer (1980) have tried to capture the

decisive factors by making distinctions in the relative 'distance' between the individual and the optional potential therapy. In a practical sense there can be geographical distance, which poses a barrier in terms of physical ability to reach the proposed service, irrespective of the type of medical system. There can be an economic distance, implying that the cost involved in transport to- or the cost involved in accessing the service is beyond the means of the individual. Then there can be socio-cultural distance, which refers to the perception of the proposed therapy with regard to personal knowledge and experience or those of close relatives. This implies the aspects of social acceptability, individually or within the community as a whole, psychological preference *e.g.* non-invasive therapies, or practical effectivity, considered as duration of cure against level of cost, or exposure to public health education campaigns.

As such, the results which come forth from the categorisation, are ultimately also influenced by the design. A person who performs self-medication is utilising the Traditional System (TM), in case he is preparing a locally known herbal medicine at home. He will be utilising the Transitional System (TR) when deciding to purchase pharmaceuticals in the marketplace from a commercial vendor, without prior consultation. In that respect a 'popular system' as referred to earlier could not be applied here. The type of factors described above can be called 'determinants' of health care utilisation, and they are quantified as much as possible on micro level. Such measurements cannot be derived from medical statistics on macro-level, they have to be composed from individual actions, because of the number and nature of contextual aspects. In the model derived from Kohn & White (1976), and further developed by Slikkerveer (1982), all these aspects are measured in a household level survey and multiplied by the number of actions recorded from individual household members. It is done per type of perceived morbidity, and per type of medical system. In that way the influence of a number of aspects which are in essence subjective, can yet be quantified to determine their impact, as elaborated in Chapter III.

2.3 The Future of African Traditional Medicine

In this decade the role of Traditional & Complementary Medicine (T&CM), as it is currently designated, following the World Health Assembly initiative in the latest WHO Traditional Medicine Strategy 2014-2023, will have to be consolidated within political and legal frameworks. In the definition applied here, 'complementary' or 'alternative' medicine are those which do not originate from that country's own tradition and are not integrated in the dominant health care system. There is an inventory to the extent of which countries are in one way or another committed to adapt T&CM into their national development policies. In order to achieve tangible results, the WHO (2019) has designed regulation which can be applied in a universal mode. In short, there are three objectives:
1) building the knowledge base and formulating national policies; 2) strengthening safety, quality and effectiveness through regulation; and, 3) promoting universal health coverage by integrating T&CM services and self-health care into national health systems.

The challenge lies in establishing a mode of regulation which can function as an umbrella for a scala of products, practices and practitioners. The emphasis must be put on safety and quality, next to integration into national health policies. There is awareness that the mechanism is complex, as the possibility to investigate, monitor and control local materials and therapies, is dependent of accessibility and research capability. As delicately explained by Millar (2004) it again threatens to disguise the preoccupation with the technical aspects of traditional knowledge (what's in it?) while

leaving unmentioned the connection to elements of belief and social conduct, which represent the added value of traditional medicine (TM). The 2023 strategy foresees a decentralised approach, as member countries can develop their own framework as long as they adhere to the objectives set by the WHO. The main role of the agency is to facilitate in the development of these different approaches and to review the results, so progress monitoring is assured. The motivation for increased relevance is put against the background of recent popularity of alternative medicine, but also the economic consequences of rising health care investments (*cf.* Abdullahi 2010). The argument of a correlation with increasing non-communicable and chronic diseases is ambivalent, as recent utilisation studies indicate that TM finds it difficult to cope with these types of diseases effectively, which regularly leads to reversed cross-over and repetitive disappointment (*cf.* Stanifer *et al.* 2015). It would indicate that patients who are diagnosed with a chronic disease do consult TM more often, but they are not cured because such type of affections are not susceptible to single interventions, as with diabetes, cardiovascular deficiencies, hypertension, or kidney failure. In other words, patients may go for TM after repetitive MM consults without a conclusive treatment, interpreting this experience as MM not being capable of curing it, instead of the reoccurrence of a chronic symptom. As a measurement, such a correlation needs to be observed with caution.

The second dimension in the strategy deals with the relationship with the practitioners themselves. The intricacy of this part is that it refers to the practitioners' level of education, accreditation and regulation of their practices. It raises question marks regarding the position of indigenous knowledge in the shape of a traditional professional in these WHO (2018) guidelines. In a framework of exchanging biomedical norms it is understandable, but it will require extensive communication to create a level playing field. It may be acceptable to the extent that consistency with regard to safety and quality is considered a performance indicator. Such could be applicable to commercialised urban based traditional healers, but it should not cross the boundary with the person's cultural integrity. Abdullahi observes an inherent hierarchy in this situation, where TM will as yet have to adhere to western scientific standards to integrate; '*Again, if integrated, who provides training to medical doctors on the ontology, epistemology and the efficacies of African TM given the ethnocentric tendencies in modern medicine? That is, who determines the efficacy and effectiveness of TM given the inherent epistemological and ideological characteristic differences of both medicines?* (Abdullahi 2011: p. 119) [12] Simultaneously it is noticed that there are exponents of TM, as a result of commercialisation, who are not considered genuine in their professionalism, and hurt the integrity of the system. They would have to be identified through some form of regulation. The opposite may prove the case with introducing intellectual property rights, as regulation and accreditation of local practices will automatically provide a legal basis for recording the implicit knowledge heritage, hopefully to the benefit of the proper community (*cf.* Sackey *et al.* 2010). What is not brought forward in the foregoing arguments, as observed by Chirangi (2013), is that the first stage of making this integration feasible is substantial financial investments into facilitating a field of, until now, non-institution-based TM. It would not only enable longitudinal research, it would also enable the practitioners to develop justifiable quality standards or create biodiverse resources through the designation of herbal preservation areas, purposely for medical use. The budget allocations to investment in this area, set against the financial deficits in current health care, especially with regard to manpower (see Chapter V), may become a barrier towards implementation. National policies provide ample priorities which are preoccupied with consolidating and expanding existing service delivery and quality, striving to achieve independence from external sponsoring.

2.3.1 Recent WHO-Based Integration of Traditional and Modern Medicine

In the wake of the foregoing analysis, the WHO has established her 13th General Programme of Work (GPW 13) which is projected the cover the period from 2019 until 2023. In accordance with Sustainable Development Goal number 3 (SDG 3) which is focused on health and well-being, the report (WHO 2019), carrying the conclusions of the Octobre 2018 Global Conference on Primary Health Care, clearly indicates the importance of the future role of traditional and complementary medicine (T&CM). The report shows that the contribution which T&CM can make to the accessibility of health services to reach the Universal Health Coverage (UHC) goals is recognised and implemented.

Although a large number of countries, *i.e.* 88% UN-member states, had already developed national legislation to promote and include T&CM in their health care policies, they were until recently not operationalised on a large scale. For the African Region, Tanzania is one of the member states to adhere to this decision. Through this conclusion of the World Health Assembly, on the basis of the update survey between 2016 and 2018, assessing the improvements made by member states in relationship to the quality, safety, accessibility and integration of T&CM in their respective health services, its role has now been consolidated. The report summarises the most tangible achievements as follows:

- *It is the most comprehensive report on T&CM, with 179 of the 194 Member States officially contributing information; it addresses the challenge of lack of credible data and information.*
- *The three phases of progress made by Member States; before and after the first WHO Traditional Medicine Strategy (1999–2005), from the first to the second global survey (2005–2012) and from the second survey to the most recent update survey (2012–2018).*
- *It covers policy and regulation, as well as products, practices and practitioners of T&CM.*
- *It is the most current and up-to-date report, based on information from most Member States across the six WHO regions (WHO 2019).*

Apart from these conclusions the report emphasises the responsibility of the member states to address the challenge of increasing the available credible data in this field, from which future quality standards may evolve. Simultaneously it means that endorsed legislation will in the future encompass the products and practices of the practitioners involved to the extent that they are protected through formal recognition. In retrospect of the way exponents of T&CM have often been stigmatised, while their importance on community level has repeatedly been established, it may be an indication of an imminent factual integration of scientific and traditional knowledge.

Additionally, it means that the approach of a development paradigm from the community's perceived interest is reiterated, which is in line with the aim of the Transcultural Public Health Management (TPHM) concept. It maintains as a starting point that institutionalised health care delivery by itself will not be able to reach all rural perimeters. Moreover, because of the structural embeddedness of T&CM in local culture and environment it addresses the requirement of future sustainability (SDG's) in both a social-cultural as well as in a physical sense.

Notes Chapter II

9. *'Charles Leslie went forth building upon Robert Redfield's (1956) distinction between Great (scripture based) and Little (folk based) Traditions, trying to indicate that the Mediterranean, South Asian and Chinese medical traditions were independent to a large extent, while features of social organisation and theory seemed identical'* (Elisabeth Hsu, 2007: p.2).
10. Arthur Kleinman (1980) designated the application of home remedies as part of a 'popular sector', referring to it as a health system instead of a medical system.
11. Chirangi (2013) mentions the category of a 'popular medical system', entailing self-medication and non-professional advice in a private atmosphere, as well as spiritual healing in a faith-based context.
12. Ethnocentrism demonstrated in one reference: *"Unfortunately, the overwhelming thrust of this book is in the direction of research that will continue to legitimize inadequate health care delivery for the majority of the world's population. Despite all academic discussion of medical pluralism, and the reiteration in this book that there is not one medical truth, but many medical truths, the fact is that it is better to be rich and healthy in a Cosmopolitan medical system than sick and poor within an Asian traditional medical system"* (Philip Singer in American Ethnologist commenting on Charles Leslie's Asian Medical Systems, 1976)
13. Millar (2004) fine-tunes within the African livestock theme, between settled farmers who own cattle and pastoral systems, covering all aspects regarding the unique local relationship with animals, ranging from breeding, feeding, herding and husbandry, wealth risk-management, to hunting, attitude towards wild animals and female involvement.
14. Hausmann-Muela et al. (2000), mark a reservation here concerning the methodology, as it may be that willingness to pay is not appropriate when dealing with spiritual healing, as there is no perception of a suitable alternative. In that respect utilisation of TM becomes a necessity and not an option.
15. From a number of recent utilisation studies in Tanzania, crossovers between traditional, modern, transitional (commercialised), complementary & alternative medicine (CAM) have been established by Hausmann-Muela *et al.* 2000, Jangu 2012, Denisenko 2013, Stanifer *et al.* 2015.

CHAPTER III RESEARCH METHODOLOGY & ANALYTICAL MODEL

3.1 The Ethnoscience Methods

In line with the reference to 'Ethnoscience' as introduced in the theoretical orientation (see par. 2.2), the method is partly based on anthropological schools (*cf.* Eriksen & Nielsen 2001) and engages in a combination of ethnographic fieldwork with the analysis of the interaction between individuals as well as with their environment.

The approach was redefined and operationalised through the Leiden Ethnosystems and Development (LEAD) Programme of Leiden University (*cf.* Slikkerveer & Dechering 1995). In the methodology there are three distinctive components, which consist of The Participant's View (PV), The Field of Ethnological Study (FES) and the Historical Dimension (HD).

The FES concept is related to the definition of a 'culture area', which refers to the inhabitants sharing common ancestry (kinship), language, lifestyle, values, symbols, rituals and history. It enables them to identify with each other, possibly even with different ethnic groups within one geographical area which becomes regarded as an entity as a result of that (*cf.* Slikkerveer 1999).

The historical dimension (HD) is constructed on the descriptions delivered through oral transmission by the community members, combined with data from historic recordings; in as far as these are available in a society without a written tradition before the nation building era. In the Serengeti research area, there is a combination of retrospective recordings through clerical and colonial administration, pre-independence anthropological fieldwork, and current oral transmission by the elders of local communities. The complexity of this combination is in the absence of chronologically consistent and coherent documentation, as most was collected on individual initiative without structural co-operation or objective verification (*cf.* Shetler, 1998).

Although currently there is a large collection of manuscripts in academic repositories, there are inconsistencies with current local individual sources on the earlier history, especially pre-colonial periods. The method is a combination of qualitative and quantitative measures through semi-structured interviews with key-informants, daily interactions and participant observation regarding services at health facilities, complemented by a large-scale household survey. There are observations from daily participation in activities and interaction with members of the community. The underlying principles focus on 'Indigenous Knowledge Systems' (IKS) (*cf.* Slikkerveer 1993), *i.e.* the framework of reference handed down from generation to generation, supplemented by acquired knowledge through experience.

A second principle is the '*emic'* (inside view) versus the '*etic view'* (outside view), where the perception of the individual with regard to his daily life phenomena and the related knowledge systems becomes the starting point for analysis. These methods are applied simultaneously and complementary, and do not have pre-conceived emphasis or hierarchy. Its main contribution is in the use of a comprehensive and bottom up approach contributing to community and health care development, with the objective to use the beliefs, perceptions and practices of local people in local policy and decision making *(cf.* Ibui 2007; Leurs 2010; Ambaretnani 2012; Chirangi 2013; Aiglsperger 2014; Erwina 2019; Saefullah 2019).

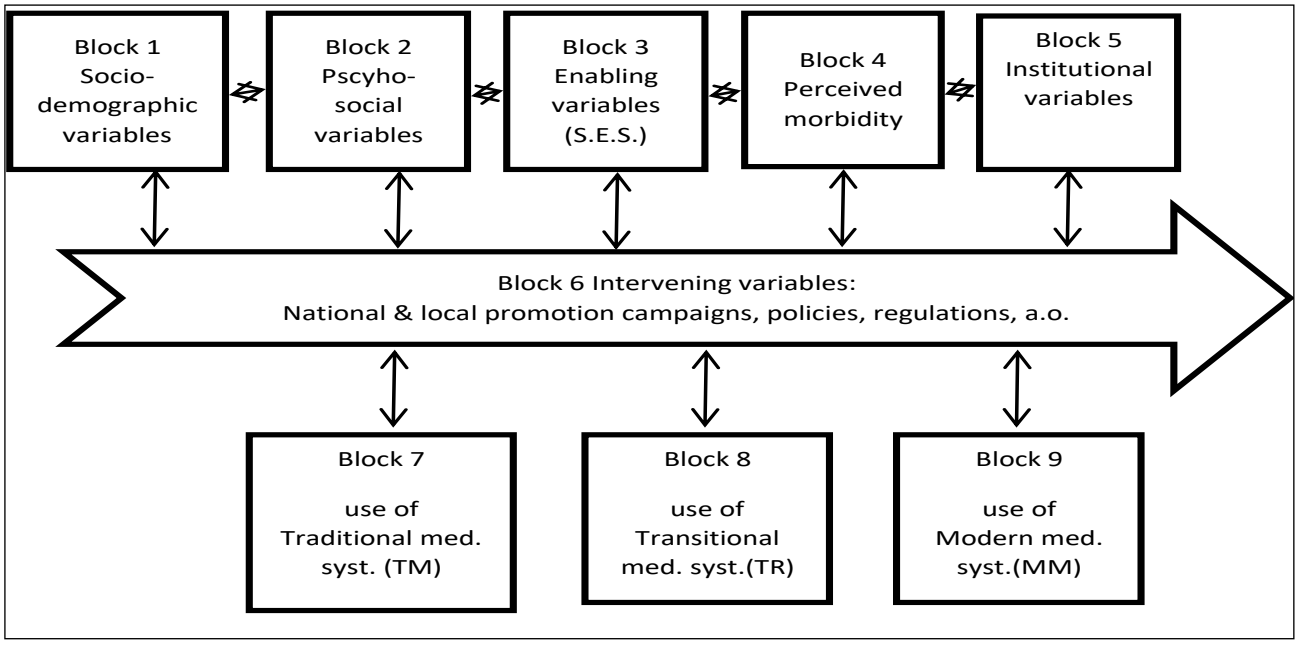
As is demonstrated in the next paragraphs this methodology is the basis for the design of the research tools, whereby all dimensions have one section attributed to them, to enable analysis of possible relationships between the dimensions afterwards. The Ethnosystems method is

interdisciplinary by nature, as it encompasses physical, demographic, psycho-social, socio-cultural and economic aspects in one movement. It is a mixed method as qualitative and quantitative methods are combined throughout.

3.2 Construction of the Conceptual Model.

Embarking on the model of health care utilisation of one dominant medical system, i.e. the modern medical system, studied in the U.S.A. and Europe by Kohn & White (1976), and later used in some developing countries, where the considerable utilisation of alternative systems of traditional medicine by the local population was largely ignored, Slikkerveer (1990) introduced a more realistic, ethnoscience-based model of transcultural health care utilisation in the Horn of Africa. This model proved rather successful in the analysis of utilisation behaviour of population groups in plural medical configurations, such as in the Mediterranean Region, South East Asia and Eastern Africa. As Slikkerveer (1990: p.63) concludes: *'In other words, patients consult several medical institutions concurrently or consecutively*.' In this model, the categories of independent, intermediate and dependent variables are located as 'blocks' of variables as to link up with the Ethnosystems Approach to identify different factors as variables in the model being significant determinants of the utilisation of different co-existent medical systems by the study population. In the design of the model for the study in Serengeti, the presumed relationships are shown between and among the nine blocks representing the independent (1 to 5), intervening (6) and dependent (7 to 9) variables with a view to allow the measurement of the level of significance (or non-significance) of the correlations among all variables. In the model, the plural medical systems in the research area are represented in the Blocks 7, 8, and 9, as reportedly utilised by the local population (*cf.* Figure 1).

Figure 1. Conceptual Model.



3.2.1 Multivariate Model of Transcultural Health Care Utilisation

Each of the blocks is translated into a section of the questionnaire used in the household survey. Each of the dimensions is operationalised into indicators which determine the value labels of variables. The indicators which are chosen for each variable are listed here below (table 1.). The actual values loading the indicators are not enumerated here for the purpose of compactness in the display, but they are structural to the questionnaire lay out, and represented as well in the cross tables of the bivariate analysis. Every section is described individually as well as its purpose in the multidimensional analysis.

3.2.2 Description of the Consecutive Variables:

The first section shows nominal and ordinal variables pertaining to the physical environment of the household and available assets, following socio-demographic and economic status definitions as they are used in regular social science research. They encompass housing, infrastructure, land area, livestock, as well as personal attributes such as gender, age, religion, marital status, education and the use of modern (communication-) media. The household members' relationships are also recorded in terms of genetic or extended family ties and co-existence within a physical household.

Table 1. Socio-Demographic Factors

Variables	Indicator categories	Measure
household size	number of members (up to 15)	ordinal
housing material	Stick and soil, cement brick, stones, other...	nominal
roofing material	Thatch roof, iron sheets, tiles, other…	nominal
land ownership	<1 acre up to 5> acres, 0.5-acre intervals	ordinal
poultry owned	1_3, 4_6, 7_9, 10>, three intervals	ordinal
cattle owned	<10, 11_20, 21_30, 30+, nine intervals	ordinal
type of toilet	Inside, outside annex, public facility, other…	nominal
water source	Well, piped, rainwater, dam, other…	nominal
media use	radio, television, mobile phone, internet, newspapers, other	ordinal
Gender	male, female	nominal
Age	0_5, up to 70+, 5-year intervals	ordinal
Group	ethnic affiliation, thirty local groups identified (listed)	nominal
religious affiliation	Christian, Islam, African traditional religion, other….	nominal
non-formal education	Private tutoring, Bible class, Koran lessons, cultural rites, other…	nominal
formal education	Primary, secondary, vocational, polytechnic, university, other…	ordinal
main occupation	Farming, herding, combined agric, trading, vocation, employment, non-skilled labour, other…	nominal

The second section displays the knowledge, opinions and beliefs with regard to the available medical systems, defined as 'traditional, transitional and modern', and the source of knowledge as in cultural origin, kinship and/or group influences. The subjective assessment of the medical systems can be related to the transfer of knowledge and experiences through interpersonal relationships within household, familial hierarchy, group or community. Top of mind awareness of types of symptoms, perceived morbidities, causes and prevention were recorded separately, on the basis of accumulated local terminology (*Swahili*).

Table 2. Psycho-Social Factors

Variables	Indicator categories	Measure
Knowl. of Traditional Medicine	none, little, average, much	ordinal
Opinion on Trad. Medicine	no opinion, low, average, high	ordinal
Belief in Traditional Medicine	none, little, average, much	ordinal
Knowl. of Trans. Medicine	none, little, average, much	ordinal
Opinion on Trans. Medicine	no opinion, low, average, high	ordinal
Belief in Transitional Medicine	none, little, average, much	ordinal
Knowl. of Modern Medicine	none, little, average, much	ordinal
Opinion on Modern Medicine	no opinion, low, average, high	ordinal
Belief in Modern Medicine	none, little, average, much	ordinal
Knowl. of Illness	listing of all current illnesses (TOM recollection)	nominal
Knowl. of prevention of illness	insects, poisoned food, contaminated water, hygiene, unsafe intercourse, weather conditions, anti-social behaviour, lack of rest, spells, micro-organisms, insulting ancestors, other…	nominal
Source of knowledge	Personal experience, parents, family, friends, traditional healer, health staff, education, other…	nominal
Advice for treatment consult	None, parents, family, friends, traditional healer, health staff, other…	nominal

Additionally, there is a qualitative indexation of which type of morbidity is directed towards which type of medical system on the basis of experience, reputation, or expected result through open ended questions listed in Table 2b. (Nr. 2.15 to 2.20 in that section of the questionnaire).

Table 2b. Indigenous Knowledge	Measure
What type of disease Traditional Medicine cures well?	Nominal
What type of disease Transitional Medicine cannot cure?	Nominal
What type of disease Modern Medicine cannot cure?	Nominal
What is your knowledge of home remedies (can you make yourself)?	Nominal
What is your knowledge of Transitional Medicine (commercial vendors)?	Nominal
What type of disease can be well cured in a hospital (or a clinic)?	Nominal

The answers to these questions will be processed as both quantitative (after being categorised post-hoc) for frequency, as well as qualitative, resulting in a syntax analysis for typology and prevalence. The outcome is cross-referenced with the results of interviews in chapter VI. The knowledge regarding home remedies is addressed separately in dedicated section in 6.4.

The third section provides the material context of access to the defined medical systems, both in terms of individual means available related to the socio-demographic attributes and social economic status, as well as the implications of utilisation, in this case the cost service delivery and cost of transport to a facility.

The status attribution by the research assistants is based on the presumption that income alone does not represent economic status per sé, (*cf.* De Bekker 2016) as personal preferences and additional material assets greatly influence the organisation of a household. The perception of Social Economic Status by the local research assistants is again qualified as ‘emic’.

Table 3. Enabling Factors

Variables	Indicator categories	Measure
Monthly income	<50.000 to 250.000 > intervals of 50.000	Ordinal
Additional income (non-occupation)	<50.000 to 250.000 > intervals of 50.000	Ordinal
Cost of Trad. Medicine	no opinion, expensive, average, cheap	Ordinal
Cost of transport to Trad. Medicine	no opinion, expensive, average, cheap	Ordinal
Cost of Trans. Medicine	no opinion, expensive, average, cheap	Ordinal
Cost of transport to Trans. Medicine	no opinion, expensive, average, cheap	Ordinal
Cost of Modern Medicine	no opinion, expensive, average, cheap	Ordinal
Cost of transp. to Modern Medicine	no opinion, expensive, average, cheap	Ordinal
Social Economic Status (*ascribed*)	very poor, poor, average, rich, very rich	Ordinal

The fourth section is based on the assessment of the health status by the individual household heads, the reported perceived morbidity by action patients within the last twelve months, and the experienced duration of the illness. The perceived morbidity is recorded in local terms. There is no distinction made between the reporting of symptoms and sets of symptoms attributed to specific morbidities, as they are maintained in the categorisation made by the respondents, irrespective of biomedical references or facility-based diagnosis.

Table 4. Perceived Morbidity

Variables	Indicator categories	Measure
Perceived health status	very bad, bad, average, good, very good	ordinal
Perceived morbidity	listing of all current illnesses (as quoted by respondent)	nominal
Illness duration	1_6 days, 1_3 weeks, 1_11 months, one year+	ordinal

The fifth section deals with the infrastructural and logistic implications of utilisation, referring to availability, proximity and the perception of the image and reputation of these systems. They are expressed in the type of facilities around, the distance to their location, and whether they are considered as socially acceptable, environmentally friendly, and economically efficient.

Table 5. Institutional Factors

Variables	Indicator categories	Measure
What type is environmentally friendly	Trad. Med., Trans. Med., Modern Med.	nominal
What type is socially acceptable	Trad. Med., Trans. Med., Modern Med.	nominal
What type is economically efficient	Trad. Med., Trans. Med., Modern Med.	nominal
What type of Trad. Med. is available	Home remedies, bonesetter, TBA, herbalist, spiritual healer, other…	nominal
What type of Transitional Med. is available	None, street drug vendor, market seller, pharmacy, other…	nominal
What type of Modern Med. is available	Medical doctor, nurse, midwife, VHW, clinical officer, dispensary, other…	nominal
What is the distance to Trad. Med.	1_4 km, 5_9 km, 10+ km, other….	Ordinal
What is the distance to Trans. Med.	1_4 km, 5_9 km, 10+ km, other….	Ordinal
What is the distance to Modern Med.	1_4 km, 5_9 km, 10+ km, other….	Ordinal

The sixth section, considered as intervening variables, intends to expose the impact of external information provided in two dimensions. The first one is the awareness of either local or national health education campaigns, the recollection of the topic and the type of media used. The second one is the distinction between commercially based promotional campaigns and health education campaigns from public health information by the local authorities. The recollection is recorded based on unassisted top of mind awareness, irrespective of time frames.

Table 6. Intervening Factors

Variables	Indicator categories	Measure
Local health education campaigns	Malaria, HIV, Pregnancy, (Top of Mind listing)	nominal
type of media used	Radio, TV, PA system, banners, newspapers, other…	nominal
available health insurance	National, local collective, private commercial, other…	nominal

Sections seven, eight and nine represent the dependent variables, expressed in either unique, repetitive, consecutive or simultaneous utilisation of one of the three defined medical systems. The categorisation of facilities within a medical system is done based on local consensus among research assistants and health professionals, explained in detail and presented in the bivariate analysis.

Table 7. Utilisation of Medical System (Block 7,8 & 9)

Variables	Indicator categories	Measure
use of Traditional Medical system	single, repetitive, or alternate use of facilities	Ordinal
use of Transitional Medical system	single, repetitive, or alternate use of facilities	Ordinal
use of Modern Medical system	single, repetitive, or alternate use of facilities	Ordinal

3.3 Organisation of Data Collection.

The data collection was done through two steps of combined qualitative and quantitative data gathering, using a household survey, and two separate series of key-informant interviews in the research area. Observations were made through repetitive visits to the health facilities in the area, as well as observations during health care delivery at certain stages during the facility surveying. A pilot survey was carried out in Mugumu as well as in Natta, both qualified as exemplary semi-urban and rural stations, regarded as representative for the Serengeti District by the Public Health Department in Mugumu. Data from both areas were compared for discovering a possible influence of peripheral health facilities, as compared to the availability of traditional medicine (TM) in rural, semi urban and urban settings.

The second stage household survey focusing on rural peripheral setting was chosen by the Public Health Department advisors to take place in Nyamburi, a settlement with a central section and satellite clusters of homesteads, encompassing several miles. On the directives of the Clinical Officer and the Ward Education Co-ordinator, the latter whom spent ample time in Nyamburi having been stationed there before, the research area was divided into four sections, assigned to each of the research assistants. They were teamed with a local assistant, assigned by the Village Executive Committee, to ensure that a proper introduction was done, and to provide proof of consent of the research by the VEO. Although two of the assistants were conversant with the Kurya language, the survey was officially conducted in Swahili, but transcriptions of Kurya were maintained whenever

local language expressions were used in relation to a symptom, an illness, or the description of local therapies or indigenous medicine. The four research assistants each delivered fifty questionnaires from their respective sections, of which twenty-five were later qualified invalid because of insufficient (missing) data, either as a result of lack of knowledge, insufficient detailed recollection by respondents, as well as incidental semantic differences leading to miscommunication qualified as such with consensus among the research assistants.

Table 8. Household Samples per Town Section

Town Section	N	%
Kiabakari (central)	47	26,8%
Saliganda	43	24,5%
Buchegera	42	24,0%
Mahembuhembu	43	24,5%
Nyamburi	175	100%

The sampling was done per town section by geographical distribution, trying to cover as much area as possible, guided by the principle of every third household. There was no stratification or segmentation apart from a reported morbidity by any one household member during the past twelve months. The questionnaire was directed at the household head, or the spouse, depending on who was identified as caretaker or main occupant of the residence at that particular time. Household size distribution within the survey is as follows:

Table 9. Number of Members per Household

Nr of Members	Nr. of HH	Total Members	%
1 member	1	1	0,6%
2 members	2	4	1,1%
3 members	9	27	5,1%
4 members	17	68	9,7%
5 members	20	100	11,4%
6 members	33	198	18,9%
7 members	27	189	15,4%
8 members	22	176	12,6%
9 members	19	171	10,9%
10 members	14	140	8,0%
11 members	4	44	2,3%
12 members	1	12	0,6%
13 members	2	26	1,1%
14 members	3	42	1,7%
15 members	1	15	0,6%
Nyamburi total	175	1.213	100%

The majority of the households consists of between 5 and 10 members (triple digit greyscale), representing a volume of 135 out of 175 (77%) and totalling 974 (80%) out of 1.213 members. The modus category is six members (18,9%) with a representation of 33 households (198 people).

While four academically trained research assistants were conducting the household survey, the principal investigator and the chief linguist, the Ward Education Co-ordinator, assisted by a female midwife-trainer from Kisare College of Health Sciences, conducted semi-structured interviews. The questions used were directly derived from the topics of the household survey questionnaire, without pre-defined categories, and reduced to questions pertaining to psycho-social factors, perceived morbidity, and institutional factors. Respondents were purposely identified key informants in the same area, partly through snowball sampling, partly through connections of the Public Health Department or the Ministry of Education, because every village had liaisons familiar with the WEC.

These key informants encompassed a number of societal sectors, including civil servants, health workers, schoolteachers, social workers, village executive committees, elders, religious congregation leaders, as well as local Traditional Birth Attendants and herbal healers. In some cases, civil servants were interviewed repeatedly, to enable a comment on topics raised during the interviews. This procedure provides an opportunity to explain operational procedures and logistic complexities, or express experiences from their individual viewpoint.

The interviews were done on site, and lasted between 1.5 to 2 hours, some were done repeatedly on separate occasions, while the linguists had complementary functions. In the case of TBA's the Kisare midwife trainer would conduct the interview in Swahili with the chief linguist assuring a proper translation into English. Transcriptions were made by the Principal Investigator and later reviewed together with the linguists, for completeness and semantics and edited before being compiled (see Chapter VI)

Listing of key informant interview questions (semi-structured sequence):

1) Do you use home remedies when you are ill? (free listing)
2) How did you acquire this knowledge? (type of relationship with consultant)
3) What do you consider the most important reason for their use? (categories: distance, treatment, cost, efficacy, access, belief)
4) What type of illness is regarded as not curable with modern medicine? (added to index)
5) How do you establish the difference between spiritual and psychosomatic diseases? (no pre-set parameter definitions)
6) Can you name a few of each category? (spiritual / psychosomatic)
7) What type of medicine do you prefer, and when? (categories: distance, treatment, cost, efficacy, service, attitude > type of morbidity)
8) Can you remember an unsuccessful treatment from your own experience? (respective next step)
9) What type of health care is for free?
10) What has changed most over time in terms of health care facilities in your personal experience?
11) Can you remember the most recent health promotion campaign? (12 months + medium)
12) What do you consider the most effective way of promoting health care in this area? (topic versus media, logistics)
13) What is currently the biggest health problem in your area? (free listing)
14) How do you perceive the difference between 'prevention' and 'protection' against illness?
15) Which type of illness can people not protect themselves from?
16) Which question do you have for the researchers?

In the process, the identification of home remedies listed by the key informants is added and compared with the same knowledge presented by the household heads in the household survey (questions 2.15 to 2.20). In the household questionnaire there is a similar open question based free listing where the local name is recorded, as well as the preparation and the mode of administering the concoction, followed by the symptoms it is applied for. There is a consistent syntax and semantic check over three languages, from the local language via Swahili to English, with the scientific botanical names ascribed post hoc through image material (see chapter VI).

3.4 Types of Analysis

3.4.1 Bivariate analysis

The first step consists of trying to establish the relationship between those variables which are considered to contribute towards utilisation. For that purpose, the utilisation of a particular medical system (as defined in block 7, 8 and 9) is transformed into one variable ('SYSTEM') and crossed with every other variable in the dataset. The level of measurement is set at 95% confidence level, and the significance is established by the strength of Pearson's Chi Square, combined with Cramer's V, or Pearson's R, dependent of the type of variable (nominal, ordinal, interval or ratio). The result leads to a ranking whereby the cross tabulation of the two variables reaches the set threshold, meaning that they combine a <0.05 significance with everything above 0.150 for Cramer's V, or Pearson's R above 0.30, and they are further examined in a multivariate staging. It is emphasised again that this correlation is not an indication of causality, but rather of co-variance. The results from the household survey are processed according to the format in the conceptual model. As such the multiple steps taken by a respondent are registered as individual records in the database. A respondent which takes three consecutive steps will have three records in the utilisation frequency data and is therefore represented three times in the calculations as it is the purpose to relate every step to the independent variables, regardless of which system was utilised. In that way the utilisation of a medical system can be directly related to all the other factors in the model, who receive their weighting accordingly.

3.4.2 Mutual Relations Analysis and Multiple Regression

The next step is to process the selected variables from each block and test the relationship between these sets of variables, based on the blocks as defined in the conceptual model. The procedure is known as Non-linear Canonical Correlation Analysis (*cf.* Meulman & Heiser, 2010) NLCCA, acronymed into OVERALS [17], because of the 'Alternating Least Squares' method. The underlying principles are similar to a standard deviation method, in calculating the average distance(s) between the objects in a multidimensional plot, where the distance is indicating the strength of the relationship. It is applied here for the quality of being able to perform an analysis regardless of the measurement level, which means that nominal and ordinal values can be calculated simultaneously (*cf.* Verdegaal 1986; v.d. Burg 1988; Dijksterhuis & van Trijp 1995; Vogelsang 2000). The essence of this method is that in this way all the actions of one single patient can be traced to the contextual attributes, as laid down in the independent, intervening and dependent variables. The outcome is to indicate which variables have the strongest impact on the

interrelationships which are suggested by the conceptual model. The indicator used in this type of analysis is called "Eigenvalue" (E_d) which is an equivalent of the percentage of variance being explained (*cf.* p.m. Burg, 1988). The formula to establish the ultimate impact of the correlation (ρ_d) between the sets is defined as $\rho_d = 2 \times E_d - 1$, i.e. the value of the coefficient is twice -over two dimensions- the Eigenvalue minus one. Chapter VII, dedicated to the data analysis, describes these steps extensively, whereby 175 households, containing 1.213 members, produced 564 action patients who collectively undertook 715 utilisation steps, across three medical systems.

3.4.3 Qualitative Data Analysis I: Interviews with Key-Informants

The semi-structured interviews conducted with the team of two linguists (one male, one female), were processed in two stages. Starting with condensed accounts of the interviews *(cf.* Spradley 1979; Luby 2013; Atkinson 2015) [16], these transcriptions were transformed into prose in consultation with the linguists, for post-hoc content verification and possible semantic differences. The interviews with local herbalist-TBA's were conducted with two linguists for a specific purpose: one to conduct the actual interview, the second to monitor the semantics involved in translating from Swahili to English or from local language speakers to Swahili. The transcriptions serve as a separate contextual reference to assist in interpreting the quantitative data, as well as an assessment of the perceived public health situation in the area complementing the Public Health Department's district profile. Transcripts of the individual interviews are presented in Chapter VI, deliberately not summarised, but left intact per respondent for the sake of providing additional background information. This procedure is in line with the principle of the Participant's View insights, following the LEAD ethnoscience methodology.

3.4.4 Qualitative Data Analysis II: Indigenous Knowledge and MAC plants

The therapies mentioned under the category of 'home remedies' in the questionnaire's open section -Block 2 psycho-social factors and indigenous knowledge- are listed, numbered, translated, and assigned the scientific name on the basis of images provided through the research assistants. These species, designated as Medicinal, Aromatic & Cosmetic (MAC) plants and therapies are verified by four traditional practitioners in the area for consensus on species identification and their ascribed *Igikuria* terminology. In two consecutive steps it is analysed whom the knowledge is acquired from by the respondent, the relationship to that person and the socio-demographic attributes of that person, to identify the source of knowledge. Then the species are matriculated for the type of preparation, the method of administering the prepared medicine, the perceived morbidities they are applied for, and where this is done in combination with other species. They are compared with available data from a similar cultural area to establish overlap, diversions or additions (*cf.* Gessler 1994; Owuor 2012). The botanic data are included as an indication of the current state of knowledge with regard to Traditional Medicine, to show the impact of the axiom of evidence-based medicine, as well as an object for future botanical or pharmacological investigation, which was repeatedly requested by both respondents and traditional healers. The research team were offered to take along prepared indigenous medicine to be subjected to investigation, which the team had to decline, as there was no facility to fulfil such task. Herbalists also indicated that preparation should preferably be done locally and ad hoc to ensure proper effectivity (see Chapter VI).

Notes chapter III

16. *'The anthropological method actively seeks to understand phenomena from the study subject's angle, to generate subjective knowledge. Using open-ended in-depth questions, they generate narrative which broadens the epidemiological understanding of what occurs in the community to a nuanced understanding of why it occurs. Such understanding is often crucial for developing interventions which are sufficiently relevant to the community to reduce disease risk'* (Luby, S., 2013, The Cultural Anthropology Contribution to Communicable Disease Epidemiology).
17. The Meulman & Heiser IMB SSPS Categories version 19 manual (2010) Chapter 4 explains the OVERALS procedure stepwise in prose, illustrated with the user interface images as produced on the screen in the software. It also presents the practical interpretation of the output through demonstration data tables. The reference is made here because manuals of later date do not provide software interface images with such level of detail.

CHAPTER IV RESEARCH AREA

4.1 Tanzania

Tanzania is an East African country which covers 945 thousand square kilometres, which makes it the largest in the region. It became independent in 1961 and has formed a union with neighbouring Zanzibar which brought about the current name, while the area was formerly externally referred to as “Tanganyika”. It currently has a reported 51.8 million people, of which approximately two thirds live in rural areas. The growth rate is projected at twice the global rate, asymmetric in composition as a result of 45% being under 14 years of age. According to national health statistics more than 80% of the people do not have access to structured sanitation units, and about 85% are not linked up to the official power supply. The distribution over the religious groups is balanced between one third Christians, one third Muslims, and one third adhering to traditional beliefs, although semi-autonomous Zanzibar is predominantly Muslim.

Map 1. Tanzania with Administrative Zones.

With more than 120 ethnic groups, the unity of the country was established during the Ujamaa era of ‘*Mwalimu*’ Julius K. Nyerere, the first president, who created a national identity, underlined by the use of Swahili as a lingua franca, which was introduced next to the formal but now mainly administratively and educationally used English. The indigenous languages comprise Bantu and

Nilotic, as well as Cushitic and Khoisan variants, mostly relative to respective population group sizes. Compared to other countries in the region it is one of the lowest ranking, measured to the national basic needs' poverty line, where, according to the Tanzania National Bureau of Statistics, 38% per cent of the people are currently situated. The role of rural agriculture is dominant, as an estimated 80% of all available labour is employed in local produce, while the sector in its entirety yields about half of the gross production. It implies that the dependence on this sector and the economic bias is large, but Tanzania is also equipped with many natural resources which have not yet been submitted to concessions, and their contribution to the development of the country is still subject of assessment. Regarding regional stability Tanzania stands out, and even the influx of refugees from regional neighbours Rwanda, Burundi, Uganda and Congo, has in the short term not led to tangible disruptions, although their impact on environment or local economic features may be felt in certain areas of the country. Overall, the consolidation of traditions and lifestyle is evident, as well as the adaptation to the wildlife conservation parameters which restricted the movement of local groups.

The National Bureau of Statistics reports that for a projection until 2035, the population growth of the country will decrease from 3.1 percent in 2013 (at 46,3 million) to 2.8 percent in 2035 (at 89,2 million). Tanzania's mainland population growth rate is expected to decrease from 3.1 in 2013 (at 45 million) to 2.8 percent in 2035 (at 86,8 million). As for Infant Mortality Rates (IMRs) for the mainland, they are expected to be reduced from 43 / 1,000 live births in 2013 to 13 / 1,000 live births in 2035, for both genders. Tanzania is currently still considered one of the lesser developed countries, while GDP growth revised in 2018 reached 6.8%. The country has recorded a relatively strong economic progress over the last years, ranking 22nd worldwide in 2014. A per capita income from ca. $ 950 and a Gini index around 37.8 are currently the standard references, while the poverty level is estimated at 33.6% (rural) 21.7% (urban), excluding the capital with a 4.2% rate. The nation's development index of 0.488 makes it rank 152nd out of 187 classified countries. After the discovery of natural gas coupled with a favourable GDP growth, the chance of reaching a middle-income status became feasible in a longer term. In spite of these movements, apparently 80% of all transactions are outside the formal sector, a substantial challenge in securing revenue for the government, including the budgeting for health services (ref. CCS III, WHO 2016-2020)

4.2. Serengeti District Profile.

Serengeti District Council is one of the eight local authorities which make up the Mara Region with its headquarters in Mugumu. It is one of the larger rural councils in Tanzania *(compiled from: Serengeti District Council Comprehensive Health Plan 2015, via Public Health Dept.)*

The district is features sloping areas from the south and west lowlands to the highlands in the north and eastern part scattered with hills and mountains series parallel to Mara River. The central and southern part of the district are covered with plains and hills intersected with seasonal streams towards Rubana and Grumeti rivers flowing to Lake Victoria. It has a total of 10,373 square kilometres of which Serengeti National Park occupies 7,265 square kilometres, Ikorongo Game Reserve 189,6 km², and Grumeti Game Reserve 68,3 km². The remaining open area is projected at 2,456 km². In total an estimated 659 km² thereof are in use for agriculture, livestock and as residential areas. Serengeti borders to Tarime in the North, Rorya in the North West, and the Republic of Kenya in the North East, Arusha region in the East, Shinyanga region in the South,

Bunda district in the South West and Musoma district in the West. Administratively the district is divided into one Parliamentary constituency, 4 divisions, 28 wards, 85 villages, 335 *vitongoji* or hamlets and 37,356 households.

The district is divided into three agro-ecological zones namely high, middle and lowlands. It has a rainy season from August to April, whereby the rainfall pattern differs with altitude where the highlands experience averages above 1,200 mm, the midlands between 600 – 1000 mm, but the lowlands may experience dry spells as low as 100 mm per annum. In favourable years, the average rainfall in the highlands can be as high as 1,235.4 mm while the midlands can show up to 1,023.7 mm. The district reaches average temperatures around 26º C during the rainy season running up to 30º C during the dry season.

According to the Mara Region projections, the district is currently estimated to have a population of 243,270 (women 124,067 and 119,203 men) in the year 2012. The population density is expressed as 45 per km² with the exclusion of the designated wildlife areas, and the groups are scattered over all arable land with extensive mingling and interaction. The ethnic groups are heterogeneous in culture and practice, although they share some customs, norms and values. They include Ikoma, Ngoreme, Issenye, Natta, Sukuma, Kurya, Luo, Zanaki and Jita, among others.

Regarding gender related topics which are currently on the Government's social and health agenda; though on a small scale, Female Genital Mutilation (FGM - *clitoridectomy*) is still being practiced in secrecy. Incidentally there are arranged marriages for under 18's, relative low education participation for young girls, polygamy, and female marriage (*a.k.a nyumba ntobu au nyumba mboke*) i.e. pragmatic unions as an alternative to protect single women from social exclusion or economic abuse.

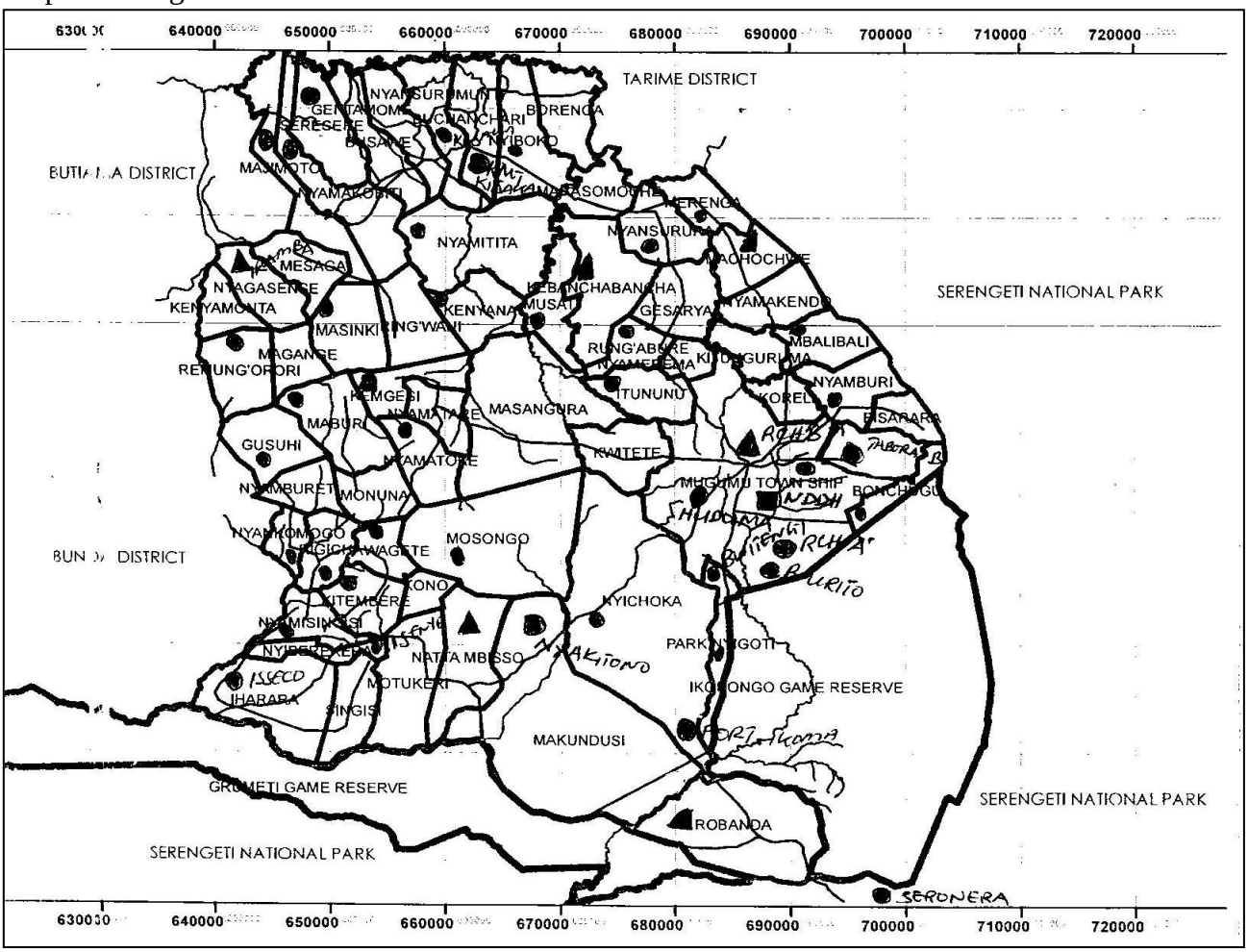
The road network of 1,189 km is largely unpaved, and only accessible for an estimated 70% during the rainy season. There is a connection to the National Electricity grid, while additionally a number of institutions rely on back-up power by generators, *e.g.* hospitals, schools and hotels. The main power sources for the rural communities however are based on biomass and kerosene. The district water supply is based on 457 boreholes, and 211 improved traditional wells, 29 gravity water schemes, 140 rainwater harvesting tanks. The council maintains 19 Diesel water pumps for community supply. Mugumu urban relies on the Manchira dam, which also provides for the hospital. There are several internet & communications providers, but the service is not stable, and disruptions occur frequently also related to the consistency of regular electricity supply. There are several airstrips (five) of which one is expected to be upgraded to an airport to increase benefits from local tourism.

The major economic activities in the district include farming, livestock keeping, small business enterprises, small scale industries and employment in various organisations. The majority of the people in the district (85%) are engaged in agricultural undertakings (farming) and livestock (cattle rearing). Food crops include maize, sorghum, finger millet, cassava, beans, peas, sweet potatoes, bananas, groundnuts. Although many of these are produced in excess there is no reliable market to distribute that surplus. The main cash crop is cotton. Coffee is being experimented with in high altitude areas, while crops such as tobacco and sunflower are introduced as alternatives. Livestock husbandry amounts to the second largest economic activity, closely related to social status and a wealth indicator, which is estimated to cover more than 300,000 heads of cattle. The ownership is also related to polygamy (through bride wealth) which is considered a status indicator. Poultry places second with an estimated areal of 250,000. The share of formal employment hardly reaches

31%, and is concentrated with local government functions, parastatal organisations, private institutions, including the tourist industry, and some minor trading activities. Most residents, between 80 to 85% live in rural areas and are engaged in multiple or complementary economic activities. All daily, weekly- and monthly markets are supervised and subjected to levy collection by the District Council, although some are contracted out to private operators. Since the market business operators travel all over the region, they are considered an epidemiologically relevant factor in transmitting infectious diseases, *e.g.* STI's or HIV/AIDS.

There are 106 primary schools (57,154 pupils) of which three are in private ownership. The 23 secondary schools are all run by the government, for two exceptions, run by religious organisations. Only two are designated as A-level secondary schools, Machochwe and Natta. The coverage is 11,260 students with a gender distribution of 64% male and 36% female, which indicates the low degree of participation of the latter. There are five higher education institutions, i.e. Kisare College of Health Sciences in Mugumu, Chipuka Polytechnic, Utalli College in Mugumu and both Mugumu and Natta Vocational Training Schools. The indicators are presented as 0,45% drop out-rate, a teacher to pupil ratio of 1:53, and a desk to pupil ratio of 1:3. Illiteracy is estimated at 0,04%.

Map 2. Serengeti District Health Facilities.



As referred to in the geographical description a total of 70% of the District has been allocated for wildlife preservation. Of the three national parks, Serengeti is the largest, and contains 35 species of plain animals among the other species contained in its ecosystem. The wildebeest (1,6 mln) zebra (500,000) are among the most populous. Other species, especially elephants, big cats, and giraffes, are already under threat although they are still around in numbers. In all the number of species contained in one area is what makes the Serengeti unique in the world. There are however still open areas where hunting is allowed, namely Ikoma, Sibora, Nyichoka and Issenye. The five large tourist hotels are integrated into the wildlife areas, extended with another 21 tourist camps which have non-fixed facilities. Although employment and amenities from supply to the Tourism industry do benefit local people, the numbers involved are disproportionately low to the actual branch turnover.

Map 2 provides an overview of health care infrastructures according to the comprehensive report of the Serengeti Public Health Department. The single square marking at three o'clock marked NDDH is the Nyerere District Designated Hospital in Mugumu, a C-level referral in the capital of Serengeti. It covers 2 Hospitals, 2 Health Centres and 48 Dispensaries (40 Government, 3 Private for Profit, 3 Parastatals and 2 FBO (Faith Based Organisations) and 1 Nursing & Midwifery Training Facility (converted into 'College of Health Sciences', extended to train Clinical Officers). The district key indicators are listed in the Council Comprehensive Health Plan as follows:

A. Health Services Coverage (source: District Council Comprehensive Health Plan 2015)

- Health services within 5 km radius 80%
- Doctor/population ratio 1: 28,163
- Health facility/population ratio 1: 4,866
- Nurse/population ratio 1: 2,233
- Latrine coverage: permanent 20%, temporary 62% without latrine 18%

B. Vital Health Indicators (source: District Council Comprehensive Health Plan 2015)

- Total population (2014 projection) 251,399
- Growth rate 3.3%
- Birth rate 6.4% at 16,090
- Children ≤1 year 5.25% at 13,437
- Children ≤5 years 22.5% at 56,565
- Women of childbearing age 21,5% at 54,050
- Maternal mortality rate 90 / 100,000
- Infant mortality rate 7 / 1,000
- Neo-natal death rate 2 / 1,000
- Under five mortality rate 2 / 1,000

The number of employees in the district is under level with a reported 273 (42,8%) of the required 639 (100%). The shortage of qualified health staff cadres is projected at 366, encompassing several disciplines, i.e. Clinical Officers, Nurses, ANO's, Dental Surgeon, Clinical Assistants, as well as Laboratory Technicians. It occurs that newly posted employees do not report, while others leave because of the remoteness of the area (according to the district profile out of 116 required and applied for staff, at the end of the 2015 recruitment year, only 28 were actually retained).

Image 1. Outpatient Department Morbidity Rates 2015

epublic of Tanzania

Council: Serengeti District Council

	Diagnosis	Above 5 years M	F	Total	% of total OPD Cases
1	Malaria	11547	11989	23536	43.0
2	Other diagnosis	5269	5485	10754	19.7
3	ARI	3938	4100	8038	14.7
4	Diarrhea disease	1155	1579	2734	5.0
5	Intestinal worms	1329	1385	2714	5.0
6	Clinical AIDS	700	1720	2420	4.4
7	Pneumonia	662	694	1356	2.5
8	PID	0	1250	1250	2.3
9	Skin diseases	513	516	1029	1.9
10	Oral conditions	405	452	857	1.6
	Totals	25518	29170	54688	

Comment: -High malaria prevalence rate of 27.8% for under fives and 40.3% for above fives.
-High cases of ARI 8.6% for underfives and 13.8% for above fives.
-High diarrhoea cases (4.1%) among underfives cases and(4.7%)to above five years.
-High intestinal worms infestation rate among above fives years by 4.6%
-High prevalence rate of HIV by 4.1%
-There is low detection of patients with cardiovascular diseases only 185 patient was seen and traeted amounting to 0.3%
-Increased prevalance rate of fracture case from various causes including accidents of 0.4%

N.B.: In the top morbidity rates the third largest - Urinary Tract Infection (UTI) is not represented because the Public Health Department could not add morbidities into the supplied software.

The district council supervises a total of 42 health facility governing committees, who are simultaneously responsible for the so-called Community Health Fund. The fund faces a number of challenges which are reported as follows; It is established there is a low enrolment and renewal rate (est. 10%). The matching grants from the government are frequently delayed in release which decreases the expectations among community members, as they are not visualised for their intended purpose. There is also a low awareness of the importance of the fund by the general audience. The council suspects a lack of social mobilisation skills in their approach to promote and maintain these facilities in the various communities. Moreover, the report talks of misconception of the idea of solidarity, meaning that contributors consider their fee a loss when they do not fall ill. Lack of community level social mobilisation is a contributing factor as well. The Ministry of Health distinguishes two particular areas on A-level which are considered of basic importance to delivery and collecting data on household level. The first is the village health post and the Traditional Birth Attendants (TBA). The second one, since recently, is the registration of traditional healers who apply mainly traditional herbal medicine. In this health post, the so-called Village Health Workers (VHW) are responsible for monitoring and delivering health services, including the satellite hamlets (*vitongoji*). In 2014 there were 85 VHW's across the district, i.e. two per village, while a number of

20 untrained volunteers were also operational. The challenge facing the VHW in his role is twofold, a lack of recognition by some villagers of their status, and a motivational problem from not receiving a full-fledged salary. Most community members start to appreciate the referral system only with the clinical officer at a dispensary. For overcoming both, the VHW must possess high intrinsic motivation to maintain his duties. Having established that, the utilisation data however show that the VHW are frequently consulted and the impact of their advice is measurable.

The Traditional Birth Attendants are the mainstay of managing deliveries at community level, and in all there are 182 TBA's registered. The entry level in the medical system is faced with insufficient equipment and infrequent supervision, monitoring and knowledge exchange. The availability of delivery kits for the trained TBA's was a problem, as well as a low Intersectoral collaboration between the local facilities and individual TBA's which results in a lack of proper data recording. It is stated that village committees report data without passing through health facilities. The acting in charge for public health stated that TBA's were no longer being trained or monitored as a result of finding insufficient suitable candidates who could attain the level the training was aiming at. Traditional healers are recognised in the community for accessible health service delivery. They are commonly the first people to be consulted according to the report on the basis of the remoteness of health facilities, but that is not supported by the data.

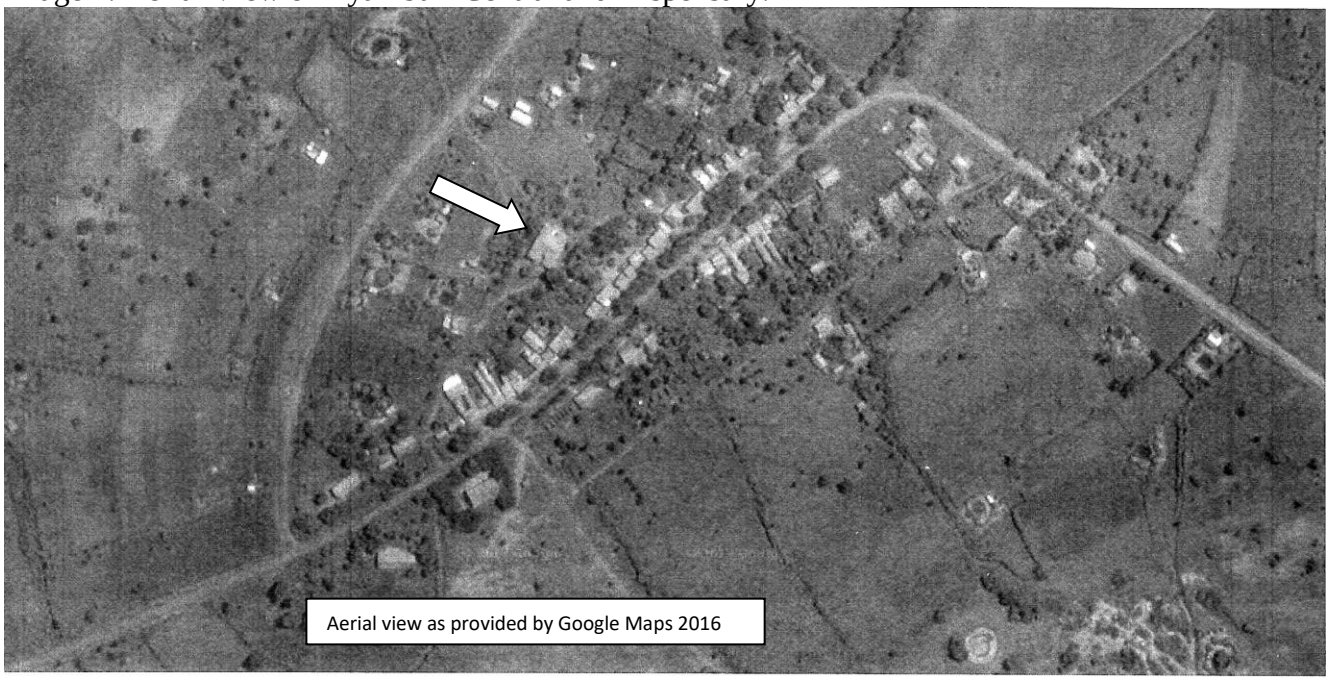
The adherence to traditional beliefs and practices is widespread, and the entry level of the traditional system includes herbalists, spiritual healers as well as soothsayers. The challenges facing this particular group are reported by the council as: inadequate knowledge of disease control and management, insufficient tools and equipment, poor working environment and structures, insufficient communications for those living in remote areas. There is a local association of traditional healers known as CHAWATIATA (*Chama cha Waganga na Wakunga wa Tiba Asilia Tanzania*) which has a local branch chairman in Mugumu. The district has registered 129 traditional healers in five different wards, of whom various herbs were also investigated by the Ministry of Health. Initiated in 1988 by the local branch of the Mennonite church (KMT) and known by its acronym IMARA, this NGO has a centre across from the hospital in Mugumu and strives to enhance the ability of Mara residents to identify and solve health problems as much as possible by using local resources. It promotes a holistic approach taking social economic, cultural and psychological aspects into consideration. It pays special attention to mental health care, people with disabilities, and identified HIV persons. The focus is on training auxiliary staff from villages and support them with knowledge or basic equipment. They are currently opting to be integrated in the JHPIEGO (annex Johns Hopkins University) initiative in Tanzania. Consecutively there is the Community-Based Rehabilitation Project (CBRP) which deals with the rehabilitation of physically disabled children under 18 years, by training them to be self-reliant and create awareness of their human rights, aiming to prevent social exclusion. The SEDIDEA project is aimed at identifying and developing a local cadre who become community health development facilitators. They are instructed to create awareness of local endemic preventable diseases, and their related health problems. Their second task is to identify traditional ways of maintaining a healthy lifestyle in collaboration with community members, and co-ordinate local efforts to manage their own health system. Thirdly, they are to act as intermediaries between organisations such as the CBRP (IMARA), the Public Health Department, local health facilities, the Council and community members. However, the Council report states that these community-based initiatives suffer from inadequate community involvement, but the report does not provide an analysis to that extent.

4.3. Household Survey Area

4.3.1. Nyamburi, Ikorongo, Serengeti District

The household survey in June 2016 was carried out in the settlement of Nyamburi central (Kiabakari) and its peripheral sections respectively known as Saliganda, Buchegera and Mahembuhembu, which together compose the larger community. Nyamburi, named after the crossing with the river of the same name, is a satellite of Mugumu, at approximately 6.5 miles distance. It is accessible only by motorbike via an accidented unpaved road which is cut by several rain induced eroded gullies. It becomes nearly inaccessible during heavy rains, and there is no regular organised public transport. Individual motorbike riders perform taxi service to Mugumu. The population consist of approximately 5.700 inhabitants within its periphery, predominantly of Kurya origin, with approximately 8.300 in the dispensary's larger catchment area (*Serengeti Public Health Dept. demographic data 2016*). Their main occupations are a combination of farming, herding, animal husbandry, poultry or petty trading. The food crops may be a combination of cassava, millet, sweet potatoes, with cash crops such as maize, tobacco, beans, sugar cane and groundnuts. Farmers can be both pastoralists and vice versa, the majority (72%) involved in some sort of farming activity, whereas about 16% is simultaneously herding cattle. An estimated 11% engages in petty trading or has official employment next to their individual subsistence farming (*household survey 2016*).

Image 2. Aerial View of Nyamburi Central and Dispensary.



N.B.: The large H-shape building just left of the middle is the local government dispensary (or A-level clinic), staffed by a Clinical Officer, a (male) Midwife, complemented by a Nurse and an Environmental Health Officer, and provides anti-natal services among others, see paragraph 6.3.7

Although it is a village with a main street and elementary facilities, most of the population are still scattered in homesteads around the central settlement (Kiabakari), intersected by large farming and grazing areas. The other three sections as they were identified (i.c. Saliganda, Buchegera and Mahembuhembu) in total encompass an area of approximately three miles in diameter. The town has its own Village Executive Committee, educational facilities, churches and a C-level dispensary, described in 6.3.7. Central is located on an elevation in the countryside, but not all peripheral settlements. Although many young people migrate, new houses are also being constructed around the central settlement, either for future residence or as new homestead for returning urban migrants.

4.3.2. Kurya Ethnographic Historical Perspective

From both Kenya and Tanzanian national census data (2011) it is estimated that at the moment this group consist of approximately 1.3 million people, who currently reside on both sides of the border between Kenya and Tanzania, whereby the Tanzanian share is estimated to be larger than the Kenyan (appr. 700,000 vs. 600,000). Their Bantu language is named Igikuria. There may be traces of Nilotic elements in their language because of historical mingling, as a result of earlier migration by smaller groups. They are said to have links with the Kisii people in Kenya, both in language as well as in cultural features. '*...between AD 1400 and 1800 when migration into Bukurya took place, the foundation was laid for the future Abakurya cultural and political developments. Early inhabitants of Bukurya came from both Bantu and Nilotic speakers who brought into Bukurya their peculiar cultures. Predominantly agricultural Bantu came into close contact with predominantly Nilotic pastoralists. Thus, a blend of cultures took place among the early inhabitants of Bukurya from the start by combining agricultural practice with pastoral pursuit as well as tendencies towards nomadic life. Today elements of Abakurya agriculture is much like that of the Abagusii and the Luo while in cattle keeping, they have borrowed practices of the Maasai, Zanaki and Nguruimi'* (source: Creative Commons 2013)

In other sources such as Fedders (1979) there is reference to the early Bantu communities stemming from the Victoria Lake area and as far away as Katanga (DRC) before that, as being primarily food producing agriculturalist, which fuels the discussion whether the Kurya were either sedentary or pastoralists originally. He places the origin of the group as an entity around AD 1600's, based on the calculation of the number of age-groups recognised at his time (thirty-four) multiplied by an interval of eight to ten years (*cf.* Shetler 1998). Recently Adada (2016) presented references pointing at the Mount Elgon area and a place called Misri, out of historical ethnographic data (colonial records ca.1910). The general impression is that Bantu members used to occupy lakeside areas to begin with, and adapted southern Nilotic features through absorption, thereby acquiring the cyclic age group system. In any case the descriptions show that they were always migrating in clans, not simultaneously, but consecutively, never settled in an area which was not already inhabited by others before their arrival, and always moving from north to south. The consensus now is that they adopted herding from the residents they met at their new destination. Consistent with the declarations of the elders interviewed in Nyamburi, the most original recordings in terms of early date according to Rwezaura (1982), are collected through oral transmission by Chacha (1963) a clan member himself. The migration took place from the Nile area in smaller groups, branching off at the lakeside, while intermarrying other groups on the way. They ended up in the current wider Mara area, including Tarimé, and recently Serengeti. They were apparently descendants from pastoralist groups,

as is currently disputed as well, as indicated by the residents. Simultaneously there is the notion that moving from Kenya to Tanzania was invoked by the advance of -and potential conflict with- neighbouring Maasai and Luo groups (*cf.* E.C. Baker, quoted by Rwezaura 1982) leaving the move from cattle herding to sedentary agriculture as yet undetailed. The suggestion made by Rwezaura, as his reasoning moves along, is that the impulse to get involved in farming was copied from the inhabitants of their newly acquired lands after migration, which, noticeably, is exactly the opposite from Fedders' chronology of earlier date. Although subject to debate among different sections of clans, the chronological sequence of subsistence activities according to the majority of current residents in Nyamburi has moved from hunting to herding to farming. Of course, having the emphasis in these economic activities alternate over time, during an extended pattern of migration is ultimately possible, especially when ecological conditions demanded such a move. The most distinctive feature however, in retrospect, is the forming of new subdivisions, creating new clans, and the intermarrying with other resident groups, as is currently manifest also in other areas of Mara, including Serengeti District. In the 2015 Natta pilot study sample, thirty different group origins were registered. As Fedders indicates, sovereignty resides with the clan, not with the group to which the clan belongs, that is why they were able to consolidate such a large number of diverse entities. The people in Nyamburi now recognise twelve clans, of which they themselves represent two.

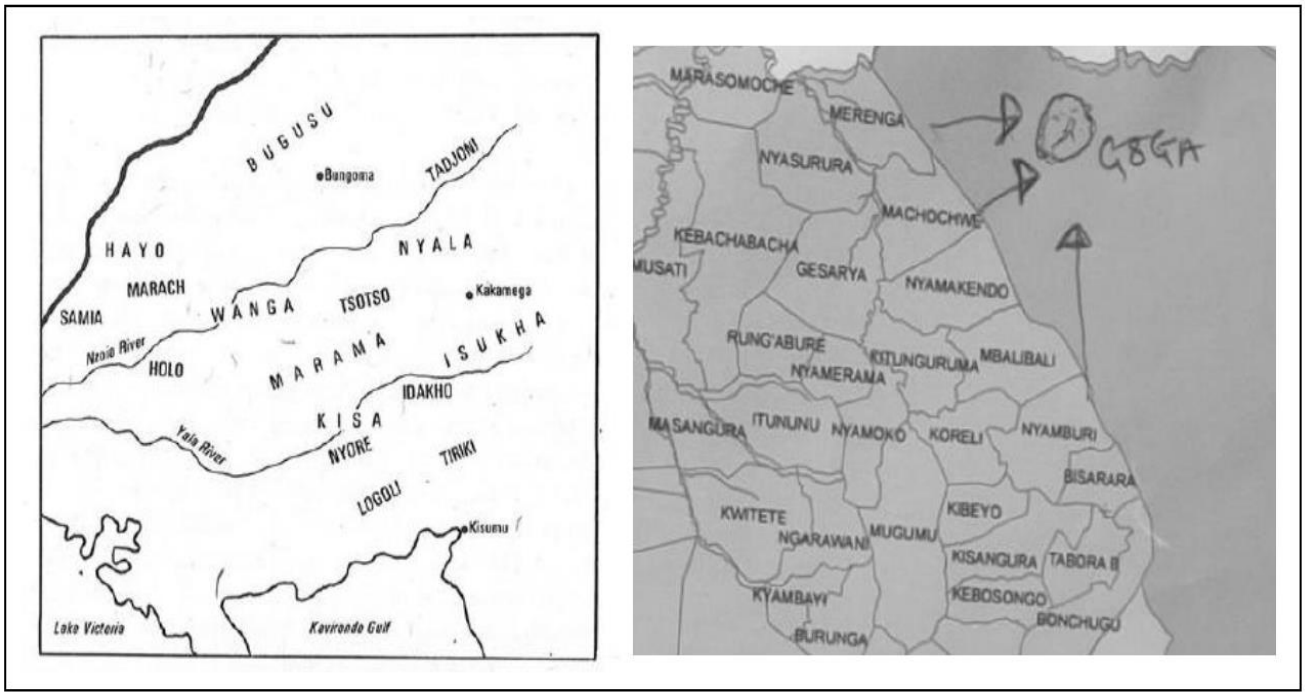
The history of the Nyamburi settlement is closely related to the village forming exercise (ca. 1974) introduced by former president Julius K. Nyerere after independence (1961), to create larger communities in answer to the dispersion of the local population which made it difficult to organise and facilitate social services or infrastructure, referring to the Arusha Declaration of 1965 made during the *Ujamaa* period (*cf.* Mandal 1989; Kwaako 2011). The elders indicate that at the time the original population in the area was limited to fifty families in all. As the Kurya people are resident in both Kenya and Tanzania (Abakurya) they furthermore place the migration of their original settlement at Tarimé to the south as a result of population pressure, but that was before independence. The current inhabitants of Nyamburi are designated to be members of the 'Wanyabasi' and the 'Watimbaru' clan, probably similar to 'Nyabasi' and 'Batimbaru' as transcribed in other sources, *e.g.* Fedders (1979). They are two branches of clans of one descent, signified by their Zebra totem, which hoofs symbolise the unity of the family, while the striped colours represent the two branches. Killing a zebra, either intentional or not, is heavily fined with up to thirty cows. The descendants of these clans have now moved to the settlements of Nyamburi, Mbalibali, Bisarara and Bonchugu. *'The Zebra totem started with Waighari the father of Mtimbaru and Mnyabasi. Waighari selected this animal to be the totem because it is a hoofed animal, this was regarded as a symbol of unity between his sons. It has two colours; each represented one of his sons, black for Mtimbaru and his descendants, white for Mnyabasi and his descendants. The Zebra totem is an identity to distinguish Watimbaru and Wanyabasi from other clans of Kurya people such as Abanchari, Abakira, Abanyamongo, Abairege and Abasweta'.* (Nyamburi elder, transcribed by Daniel Matinde, fieldwork 2016).

The historical transit as relayed by the elders who were consulted [18] is that the Kurya people regard themselves as being on the way (from southern Egypt and Sudan) to their final destination. Heralded by a prophet whose name was not mentioned, succeeded by Binagi and Gesegwe, more recent prophets and guided by the time span of a generation called *Abhakihanga.* They were to arrive at their destination as they would reach old age. That particular age group is now encroaching their seventies, and therefore the prophecy would be about to unfold. For a more specific explanation of

the ‘age group’ phenomenon, reference is made to the comprehensive monography of Jan Bender Shetler (1998) who has elaborated on the use of attributing cultural events, metaphors, symbols, milestones or landmarks to an age group as a key to their position in an historical timeframe.

The said destination is a mountainous area generally referred to as ‘Goga’ -consisting of Gutura and Ng’ong’o mountains- which currently is encompassed by the boundaries of the national park and therewith inaccessible to the aspiring migrants, which is complicating the envisaged future. The prophecy itself could not be traced to a specific period or event by the respondents but is assumed to have a divine origin which transcended directly on the prophet as the chosen medium. Their migration does not hinder the members to become sedentary in their lifestyle as the journey can take a lifetime to complete and all phases during the transition are considered inherent to the process. The origin of the legacy, as the elders see it in hindsight, it was a result of a lack of general education so the spirits would select one person to lead the others, being the prophet and his disciples thereafter. It is maintained in oral transmission that the prophets themselves did not indicate what the location of Goga was at the time the prophecy was conceived.

Map 3. Original Area of Descent and Prophesised Destination of Kurya People.



Left: The original area of descent (migratory route) of the Kurya according to Fedders’ compilation of Kenyan historical cultures (map by Cynthia Salvadori) situated north of the Lake Victoria coast, resp. south of Mount Elgon. The suggested Egyptian root is disputed (Fedders 1979).

Right: The mountain destination of “Goga” as indicated by Nyamburi elders on a local Serengeti district map with a pencil, within the Serengeti National Park boundaries (fieldwork photo by D. Matinde).

4.3.3. Physical Environment, Lifestyle and Cosmology

The building of circular corral type residences (mainly stick and thatch, either or not with mudbrick, 'boma', is still widespread and their circumference is apparently correlated to the family unit's size, influenced by the polygamous nature of their social life. The number of wives can determine the number of separate elements in the circular structure, i.e. they have their own quarters integrated into the corral wall which constitutes the enclosure (*cf.* Mandal 1989). As is the case in Nyamburi, these elements are still scattered around the central settlement, which has facilities such as schools, churches, shops and a dispensary, but modern building styles are on the move for residency. Although cattle will be kept within the stockaded corral, the agricultural produce may be kept in storage outside the perimeter (granaries). This specific feature is according to Aberi (2015) a result of the focus on cattle by the Kurya's adversaries, as well as their lack of interest in agricultural produce, referring to the Maasai's nutrition preferences. Furthermore, it is indicated that the structure of the circular boma's is somehow discriminate between Kenya and Tanzania as the threat of being a target for raiding was higher in Kenya's context. Mention is made of ill-reputed cattle raiding on a substantial scale in the past, apparently in contest with the neighbouring Maasai, purposely documented by Fleisher (2000) which indirectly led to a diminished importance of animal herding; The phenomenon reoccurs in Chacha; '*Apparently just around world war one the raiding escalated (as result of the rinderpest and drought) and the introduction of cash crop was being promoted together with taxing cattle, the government incidentally seizing it, reducing bridewealth norms, in order to get the Kuria away from raiding, and to enable them to pay taxes*.' (Chacha 1999: p.66)

The combination of farming and herding activities is still widely practiced, although most sources agree that the emphasis is now on cash crops and is slowly changing society. One of the distinctions made here is that land cultivation was primarily a female occupancy, while men either cleared the land or herded cattle, but the introduction of cash crops has drawn more men into becoming farmers, sometimes having their cattle tended by someone else. The combination of land pressure through population increase and enhanced agricultural activity, combined with income generation through cash crops, may further reduce cattle ownership in the future, but because of the capital involved it may last as a status attribute beyond its economic importance. Not in the least because it is noted to be the financial basis for polygamous family extensions *i.c.* bridewealth, as well as for formal education of the young people of their owners.

Although committed to strong adherence to cultural traditions, the clans simultaneously present themselves as a largely Christian community, involved with both Seventh Day Adventist and Roman Catholic churches, but the critical community members estimate the number of active Christians to nearly half. In our survey 74% of the households claim to be Christian, the remainder adhere to what is labelled as 'African Traditional Religion' *(cf.* Veilleux 2013). The beforementioned subdivisions in turn consist of groups of families which form a sub-clan, and as such groups of groups build up a structure which shares the same totem or ancestors, and performs its rituals *e.g.* circumcision, within its own territory. At the same time though an "age set" (*irikora*) can transcend these segmentation lines because they belong to the same generation and are therefore bound by their 'circumcision' class (*cf.* Shetler 1998). They represent an historical period inherently, without conflicting with other family, lineage or clan ties. They may take a name derived from an event or milestone which is placed at the time of conception, with which they identify themselves. In physical appearance, Adada (2016) also notes that a number of objects still show the features from early colonial documented

illustrations, e.g. pots, baskets, knives, as well as clothing styles, regalia and decorative patterns, all indications of the important role of tradition. In contradiction to this, in his historic reflection, Rwezaura (1982) makes note of the changes within Kurya society with regard to this adherence to traditional norms, by stating that incorporation of their activities into a market economy (-as an extension of global capitalism) diminished the influence of the elders and made the younger generation less subordinate to their ruling. He mentions the legalisation of property rights, the changing emphasis from kinship and family relations to individualism, and the development of post-colonial national policies, among others. In the period's documented importance of cattle ownership and bridewealth, there may very well have been a decline in many of these cultural factors, which prove consistent with the increased role of agricultural activities beyond subsistence and tied into a market economy. The question whether this increased role was a consequence of enforced state policy and local jurisdiction, instead of internal dynamics, does not take away its impact on society. The parallel movement relevant to this duality of agriculture and herding, is that land allocation was no longer left to individual lineage heads, on account of availability and reciprocal mechanisms. It became subordinate to ruling as a result of colonial intervention, first with the chieftaincy, and subsequently with registered ownership by a local area government (*cf.* Rwezaura 1982).

In a later review by Mhando (2014), concerning Kurya marriage arrangements in particular, she refers to Rwezaura's analysis as well, but shows that despite the changes in society as a result of post-colonial ruling, religious institutions, economic development, urbanisation and modernisation, the Kurya as a group maintained their traditions. Aberi (2015) in his analysis points at the introduction of sedentary agriculture, formal education, Christianity, and population pressure, which eventually led to the abortion of activities such as cattle raiding. He suggests the raiding was mainly induced by the need for bride-wealth, tied to a code of conduct which displayed competitiveness, as the raiding was confined by 'rules of engagement'. As such it was an arena of masculine behaviour, but also sanctioned by the elders if certain lines were crossed. The loss of area for grazing due to agriculture is remarkably still mentioned today as a reason for a diminishing role of keeping cattle.

The jurisdiction over community matters in Nyamburi is organised through a council of senior men, called the *'Abhaghaka bha ikimira'* equivalent to *Abhanchina, Inchamaa, or Abhanchaama*, who perform arbitration in the majority of cases of controversy or conflict, as long as there is no -external- official legal action involved. There is an indigenous authority in place called '*Sungusungu*' a collective volunteer force which ensures adherence to the decisions made in the community analogous to a conventional police force. These are not members of the Village Executive Committee, but there is consensus over their mutual legitimacy. The informants expressed that people even prefer bringing criminals before the elders instead of taking them to court because of the stronger influence within the social code of conduct. Allegedly, if public denial was found to be unjust, the person and his family would be struck with bad luck, including mortality. During the trial the allegations are presented publically and countered in the presence of the totem, in this case the skull of a zebra (*Inchage*). In other parts of East Africa, the Sungusungu groups were criticised for operating outside an official legislative procedure and thereby becoming akin to vigilante type security, crossing the lines incidentally themselves (*cf.* Heald 2009; Jangu 2012).

With regard to social relationships and coherence, the community is described as patrilineal and polygamous, and traditional values are very much in place. Cultural events and rituals are performed with specific intervals intact, including circumcision for both men and women as a gateway to adulthood, which is considered mandatory before marriage. The candidates mark the transition by

'*Ritungu*' music and dance which is used to celebrate special social occasions, named after an 8-string musical instrument -not to be confused with 'Ritongo', which refers to a Kurya traditional court- comprising all adults both male and female in December, with an interval which is currently set at two years. The change in interval, it was four years originally, resulted from population increase, necessitating a higher frequency to accommodate all age groups. Circumcision is an important milestone, indicated by detailed elements. If one of the candidates dies before the circumcision event, or right after, it is perceived as a wrath to the community, and he would not be buried locally. Such incidents were originally associated with witchcraft from neighbouring communities. The person who is performing the circumcision surgically is identified and appointed by the elders. The story goes he will find knives at his doorstep to indicate that he is the chosen one. The function is also handed down as the newly appointed surgeon will have been taught by his predecessor, but in seclusion. He will not be announced as the new surgeon until after training.

'*A circumciser is chosen by ancestors ... he might be sleeping and wakes up to find out that there is blood all over his bed, or he may be walking and pick up circumcision knifes, or he may wake up with a knife on his hand. This is how he recognises that he has been chosen for the task'* (Mshana et al. 2011; p 113).

In respect of the division of labour there is the '*ogosagaria'* whereby cattle are herded by people other than the owner, in a delegated fashion, comparable to land lease, or 'outsourcing' as known in other economic activities, but the responsibility is inclusive (*cf.* Fleisher 2008). There is a gender related phenomenon of households consisting of two women who form an economic unit (*Nyambu ntobhu*), surrogate to a nuclear family, and so maintain access to resources they once shared with their either deceased, divorced, or absent husbands. They may result from remaining childless, or as a result of only female offspring. These situations may not be received well everywhere, they were not recognised as marriage by Christian churches, and at times could even be contested by the husband's relatives, as it is a patrilineal society (*cf.* Mhando 2014). It is often defended by the elders because it prevents the community of having to cater for single women without any domicile or livelihood, and keeps them on par with normal relationships and social economic status, comparable to "Boston Marriages" as known in New England (*cf.* Haworth 2016).

With regard to cosmological principles, there are references made to the existence of a supreme being, a God *(cf.* Aberi 2015: *Enokwi/Nyasae*) who supervises the universe and is responsible for nature and all living creatures, formerly apparently symbolised by the sun, although not as a personified entity (*cf.* Adada 2016). In Adada's accounts there are ancestral spirits who relay the wishes of the Supreme Being, and these ancestral spirits could be the focus of worship for any request from ordinary community members, accompanied by the ritual of pouring libation. According to the elders in Nyamburi, there are only a limited number of people who are capable of communication with this Supreme Being, similar to the early prophets. In this case there are spirits who express their concerns to the selected elders, the beforementioned *Abhanchamaa,* but alternately, the elders can also consult the spirits on their own account *(cf.* Aberi 2015). A prophet (*umuroti*) can be a member of the selected elders or any person chosen by the spirit as a suitable medium. The message is relayed to the prophet in a dream (*cf.* Aberi, 2015: *'Abaroti')*.

In the transcriptions made, the spirit will be tied to a specific event or milestone, for example planting, harvesting, circumcisions, or a natural hazard. It means that this specific spirit must be consulted when the event arrives. The whereabouts of the spirit's location might not be disclosed by the elder. When he decides to consult a spirit, he will visit the place, and by putting food there he

sends an indication of seeking contact. So, these intermediaries carry much weight, as their communications are ultimately the translation of the desire of a supreme being. The concrete communication is perceived by the respondents to be mostly unilateral, from spirit to people, not from people to spirit, although ancestors are worshipped. The elders can express a certain issue to a prophet who in turn receives directions from his spirit the following night, but it is not clear if he can communicate other than through dreaming. Aberi (2015) mentions the location of a 'shrine' for the Kurya community in Tanzania at Nyamieri, which was apparently visited by selected elders as late as 2010, following a conflict solving expedition. Such situations make the non-disclosure of the dwellings of spirits a relative concept [19]

Image 3: *'Ritungu' eight-string instrument accompanying social events*

Notes Chapter IV

18. i.c. Joseph M. Siriti, and Zakayo Enoch Mbota, among others, members of the 1940's age-set generation, residing in Nyamburi, interviewed with Nemes J. Sianga (WEC) in June 2016 – names are used with permission from the respondents.
19. *'Furthermore, as recently as September 1st 2010, the Kuria elders visited their holy shrine, Nyamieri, in Tanzania to plead to their gods for help to resolve a protracted community feud revolving around cattle and which had become a main source of conflicts between the Maasai and Kuria communities'* quoted from Muchiri (2010), in Aberi (2015; p.26)

CHAPTER V HEALTH CARE IN TANZANIA

5.1 General Characteristics

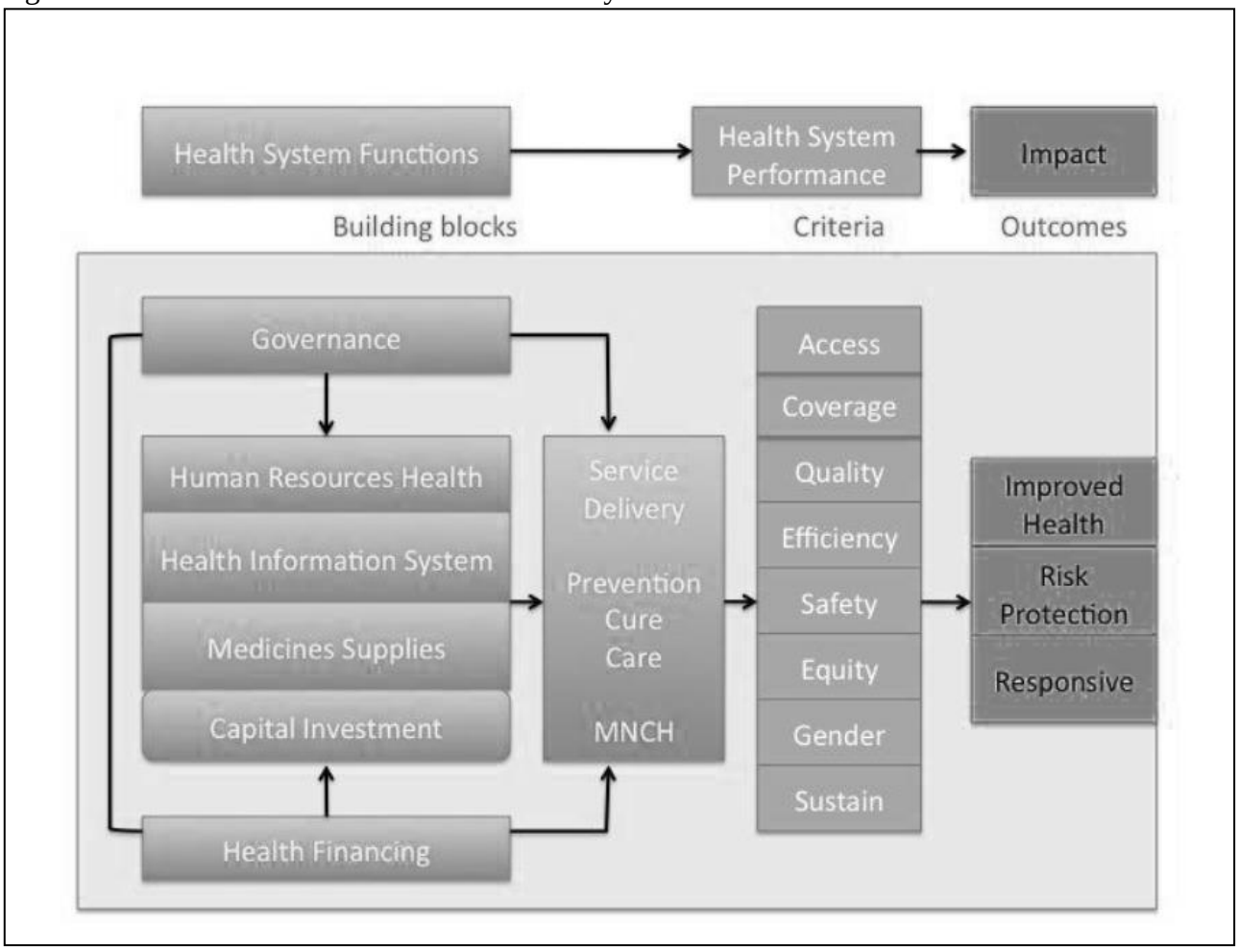
As with many countries which were former colonies at one time, located in this tropical zone, most of the early institutionalised medical facilities were based on the various missions, from as early as 1880. Tanzania has its share of mission hospitals and clinics, which were later complemented or sometimes substituted by government institutions. Prior to that, traditional medicine (TM) [20, 21] existed all around since almost every ethnic group has its own references to specific plants and therapies which have migrated along with its people. At the same time there was no original recording of most sources or methods, apart from the oral transmission among healers and their off spring, as the non-sharing of knowledge was still much in fashion (WIPO 2015), in contradiction to today's practices of commercialising, advertising, and even inviting authorities to scientifically determine active components (WHO Nr. 134, 2008). Simultaneously there was a mutual lack of understanding or even distrust, up to the level were the traditional system was being stigmatised by modern practitioners (*cf.* Chirangi 2013), mostly instigated by the representatives of the religion with which the mission facilities were affiliated. The modern system subsequently became officially recognised as the mainstream endorsed health service, although, according to the history narrated by most respondents, everyone used TM at least at one time during his life.

After independence health care was initially government funded and the service was considered free of charge. The consolidation of these services however demanded intervention after the recessions of the 70's and 80's, and around 1990 a first formal health policy was developed, while user fees were introduced (1993). After 1999 the introduction of health insurance schemes took off, initially directed at formally employed workers *e.g.* the National Health Insurance Fund purposely dedicated to civil servants, later extended with a Community Health Fund (CHF) in 2001, which is a voluntary scheme, and similar local initiatives on village level. There is a separate ministry of health on Zanzibar which co-operates parallel with the WHO Tanzania country office.

The infrastructural set up is analogous to many other -rural- areas as there is a complementary system of government and mission owned facilities which alternately function as steps in a referral system, depending on their distribution within a given area. There are basically five levels starting from village health posts, dispensaries, health centres, to district hospitals and regional hospitals. The prime distinction is the level of professional training of the personnel with which they are staffed. The Village Health Posts are staffed with a Community Health Worker, or 'Village' in VHW, who is trained in applying first aid, and is capable of recognising potential health hazards, but is primarily functional in early warning and detection and is supposed to refer to the first line dispensaries whenever possible. He is consulted often, though his status is not always appreciated by the average village inhabitant. The system makes a higher claim on his social communications abilities then the pure medical ones. From a dispensary and up a Clinical Officer and a Nurse will be the required minimum expertise, with an optional Midwife. From health centre and above, more elaborate reproductive services, laboratory analysis and auxiliary technical staff such as pharmacists come into view. The Clinical Officers can at Health Centre level be complemented by Assistant Medical Officers. At district level major surgery can take place although in some instances there will be yet another referral level in place for cases to specialised surgeons at regional level. A limited number of these regional hospitals are zonal consultancy centres as the highest level of

referral. The catchment area of a dispensary can cover as much as 10,000 inhabitants at times, as an indication of the demands on the system. The scale of the number of facilities put in a national comparison shows that out of the total of 7,335 facilities listed with the MOH & SW, 6,500 (88%) are dispensaries at elementary level. The co-operation between government and private institutions is illustrated by the division between them, which is now 65% vs 35% over all facility types, with the 'mission' Designated Council Hospitals (38) representing 40% of the total at district level. The supervision of all primary health care and rural emergency operations resides with local government public health departments integrated at council level (*cf.* Boex *et al.* 2015).

Figure 2. Tanzanian Health and Social Welfare System



Source: Health Sector Strategic Plan IV, Min. of Health & Soc. Welfare 2015-2020

In Mugumu the public health department's office is located on the district designated hospital compound, an indication of how interrelated they are. As an illustration of the specific type of operations within the system, reference is made to the Serengeti District elaborate profile in chapter IV, 4.1. National programmes run parallel to the institutionalised facilities, encompass Maternal & Child Health (MCH), Communicable Disease Control (CDC), Non-Communicable Disease Control (NCDC) - including Mental Health -, and Community Health Promotion & Disease Prevention

which includes environmental health and management information systems, and Health Professional Training within the formal higher education system. As far as the cost component of health care is concerned, the beforementioned Community Health Fund (CHF) established in 2001, coverage is below the desired impact with quoted margins of around 12 to 15%. Most of the patients are still confronted with transaction costs, even for those services which are advertised today as being free, as Maternal and Child Health (MCH) or care for the elderly. Most people indicate that even though there are no official bills, the staff will still demand an 'administrative fee'. Consequently, there was also a health service card system developed named TIKA (acronymed from *'Tiba kwa Kadi'*) which is aimed at the urban population but has not yet increased coverage extensively. The recent development is that these insurance schemes are regrouped under an umbrella organisation in the form of a National Health Insurance Fund (NHIF) [25] to extend their impact through central governance (*cf.* Mills *et al.*, 2012). The relevance of this enrolment is that apart from increasing the coverage and the quality of care, it was also intended as an incentive for the community members to become more involved in health-related challenges (*cf.* Boex *et al.* 2015)

An example of such a mechanism is provided by a liaison between a local agricultural growers' association, a private produce company and a CHF whereby the members as well as the company agree to pay contributions to the fund as a mutual benefit, to consolidate the scheme (*cf.* Stoermer *et al.* (2012). In this particular case it was preceded by sensitisation campaigns among informal groups sponsored by an outside NGO. In order to increase the attractiveness of such a fund, the classic balance between user fees and the type of service covered becomes pivotal. The coverage of hospital cost for example is not implicit everywhere, and will impose the biggest claim on the resources, yet it is a prime expectation for inexperienced new members. Just as with TIKA the extension to other non-governmental services is expected but not always feasible without intervention by the local authorities. In general, Stoermer *et al.* indicate that a successful CHF depends on a combination of factors, such as; a) the functioning of the District Health Management Team (DHMT), in its members' intrinsic motivation, b) appointing a dedicated person to co-ordinate communications between funds, facilities and authorities, c) ensuring the supply and availability of medicines, d) and the maintenance of quality of services. The suggestion is that promotion encouraged from within the system is not sufficient to increase membership; it will have to be achieved through 'social marketing', sensitisation campaigns, and control of membership premiums and benefits through good registration. Another improvement option is the facilitation of the spreading of payments of membership or user fees, which may produce similar results.

5.2. Current Public Health Challenges in Tanzania

According to Country Co-operation Strategy (WHO 2016) it is envisaged that because of the current economic progress, Tanzania will become less dependent on foreign assistance with regard to health care, and the government is aligned to increase its contributions to national health care over the next decade. As far as the Sustainable Development Goals (SDG's) are concerned, the agenda is determined by developing an emergency early warning and response system (*i.c.* EWAR), the general reduction and management of national health risks (*cf.* International Health Regulation standards 2005), emphasis on containment and decrease of non-communicable diseases (NCDC), and improve the co-ordination of the approach of the 'social determinants of health' with reference to community level reactions during the recent Cholera outbreak experiences. At the same time

some achievements were also recorded which deal with the reduction of the prevalence of malaria and HIV, a decrease in infant mortality, as well as higher coverage rate for immunisations. Remaining challenges are left with maternal morbidity, insufficient medicinal drug supply, and a shortage of budget allocations to health care tasks (<10%) referring to the Abuja target of 15%. One of the key areas identified in this policy document is the distribution of human resources for health to as many as eleven regions (*cf.* Health Sector Strategic Plan IV, 2015–2020). The CCS III agenda as it was formulated shows the operational details connected to the summary above;

a) Reducing the morbidity and mortality caused by communicable diseases through appropriate and effective interventions, including strengthening health systems and addressing environmental topics;
b) Reducing the burden of NCDs through health promotion and reduction, prevention, treatment and monitoring of their risk factors;
c) Contributing to reproductive, maternal, neo-natal, child and adolescent health (RMNCAH) and well-being and promotion of health through addressing the social determinants of health;
d) Strengthening health systems to improve the quality, equity in access and utilisation of health services;
e) Providing support for developing the minimum IHR (2005) core capacities and strengthening the capacity to implement disaster risk management.

Without wanting to recapitulate specific objectives from earlier plans, which ran from 2005 up to 2015, there is a coherence with other national five-year development programmes which focus on more infrastructural improvements, social services, as well as a focus on the quality of life and human well-being. In terms of targets which can be expressed in numbers, safe water sources are destined to reach 85% in rural areas and 90% in urban areas, a life expectancy of 66 years, striving for infant mortality to be reduced to 45/1,000 live births, with maternal mortality coming down to 250/100,000 live births. On an operational level, the HSSP IV mentions the mobilisation of Community Health Workers (CHW) to engage more intensively in front line of MCH services, complemented by e-Health applications, such as a dedicated CHW application, possibly through the assistance of PPP's, and the expansion of Emergency Obstetric & Neo-natal Care.

5.3. Health Manpower Shortage

One of the most important aspects recognised by the Ministry (MoHSW) is the Human Resources for Health shortage, estimated at 56% in 2014, based on population size and demand from the number of facilities in operation (*cf.* McFarlane & Kayaa 2012; Sirili 2014). Although health staff encompasses quite a number of professional levels, ranging from nurses, pharmacists, technicians, management and support staff, the physicians are in focus for this section. Apart from MD's (medical doctors / officers) at hospitals, there are assistant medical officers (AMO's) at Health Centres with three years extra clinical experience and two years of rotation, more than clinical officers (CO) with a minimum of three years of training stationed at Dispensary level. The AMO's can also perform surgery and midwifery with limited supervision. Many AMO's have had prior experience as detailed CO's so they grew accustomed to their working conditions. In the geographical distribution over the country there is a bias towards urban areas in numbers (including

private services), while minimum staffing requirements for rural facilities are not always met. Part of the problem is that a substantial number of candidates who graduate from professional training, disappear before entering an obligatory internship. Various reasons are listed as; low quality working environment, poor accommodation, low allowance, delayed salaries, and bureaucratic procedures, among others. It implies that completing a final internship is somehow postponed, or circumvented, but the consequence of not becoming a certified physician seemingly does not prevent a large number of the graduated pool to disappear (*cf.* Sirili et al 2014);

'Health professionals are being educated but not absorbed into the public health system. 'Many are not employed due to governmental financial hardship. There has been too little attention for human resources for health by big donors and the government. 'The most critical factor driving health system performance, the health worker, has been neglected and overlooked for too long'. There is more money for medicines, but human resources for health remain underfunded. Godfrey Philimon stresses the need for advocacy for more financial support from donors to enable countries to mobilize the human resources they need. (de Jong & Nedermeijer 2017: p.1).

The analysis provided seems to indicate that the system is not actually capable of absorbing all potential candidates regardless of the shortage. In any case graduates either leave the country to take up a position elsewhere, are employed at private facilities, while the remainder may be employed outside the health sector. Other graduates may be unavailable because of further studies for upgrading, or because of employment with health-related NGO's. The main reasons for the exodus of physicians from regular services, especially in a rural context are listed as a lack of employer benefits (retention scheme), low financial reward (remuneration), inadequate equipment or medical supplies, poor accommodation, an incidentally, physical remoteness. The Ministry reported that ca. 60% of the doctors finally showed up at their assigned stations, while 13% leave their station after a year because of dissatisfaction with their living conditions. The number of positions approved by the government, the number which are entering education and the number which are eventually installed, show large discrepancies.

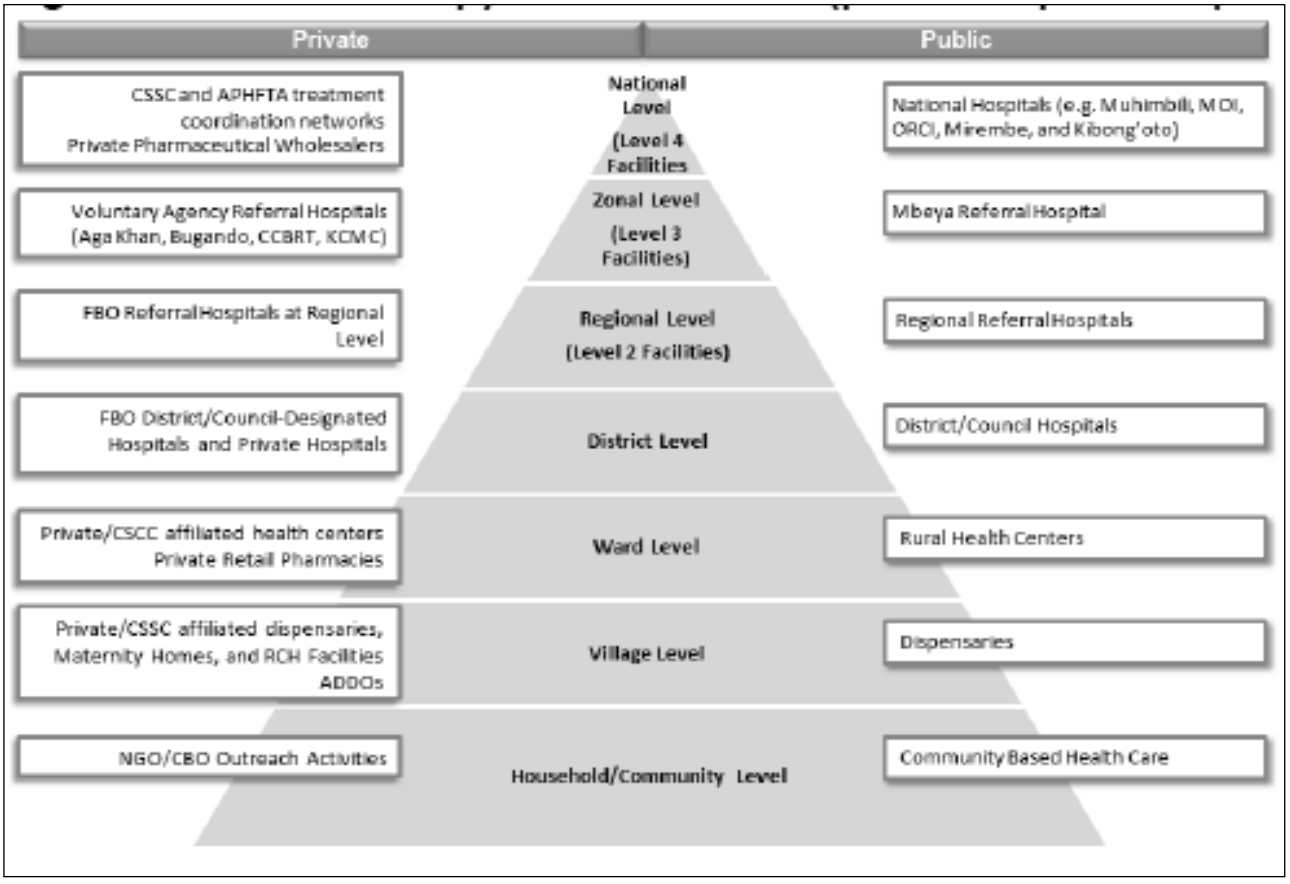
On the other side of the process the improvement of the volume of training facilities is now in focus, with 116 training institutions striving to maximise their influx. The limitations are identified as insufficient non-teaching infrastructure, lack of qualified students, lack of financial resources for teaching staff, exiting senior staff, no subsidies for on campus student housing, and no flexible curricula to shorten the academic training periods. Reducing the number of years of tutoring to expedite output, may have an impact on quality, as was applied for nurses training earlier. For the training institutions to attain increases in academic output, the type of measures in view are extending the training capacity with new technology (e-Learning, MOOCS, SPOCS, Augmented Reality, sharing on line academic repositories, etc.) increase training fees, or to integrate various professional training schemes within one institution [22]. E-Learning would also be suitable for continued medical education for the layers of CO's and AMO's, as a way of maintaining quality.

Another is to look for partnerships with alternative institutions (NGO's), either domestic or foreign, to invest in education as a collaborative effort, as in Public-Private Partnerships (PPP). With reference to the analysis of the Tanzanian Training Centre for International Health (TTCIH) [23] it explains the proportions in a 2014 estimate at 90,000 manpower deficit. With the recruitment of 500 health staff trainees annually, among whom at least 50 assistant medical officers, the situation is actual and urgent (*cf.* Sue *et al.* 2016). The government regards this as one of the main obstacles to reaching intended Sustainable Development Goals (SDG's) especially in the domain of Maternal

and Child Health (MCH). One of the ways for TTCIH to tackle this problem was considering these PPP's, as the intention was to have the said institute turn into an independent entity, already generating 80% of its own budget; '*An arrangement between the public and private sector entities whereby the private entity renovates, constructs, operates, maintains, and/or manages a facility in whole or in part, in accordance with specified output specifications. The private entity assumes the associated risks for a significant period of time and in return, receives benefits and financial remuneration according to agreed terms'* (PM Pinda quoted in Sue *et al.* 2016).

This approach will probably attract more potential if it can be demonstrated that external funding or subsidising these new private or NGO based institutions can assure a larger output of well qualified staff, because of their access to other interested philanthropic or relevant knowledge sources. Multi- or bilateral agreements can also enhance these capabilities as long as they are identified within larger regional co-operation funding schemes. The future demand in staff however may concentrate on the implications of the 'social determinants of health' (WHO 2018), which means that in the public health objectives the so called 'de-medicalisation of health care*'* is crucial for reaching SDG's. It will put the emphasis in staff training on coping with lifestyle and behavioural aspects, social communications, culture and traditions, especially for medical staff working in the first line of duty, as well on community level as in urban settings.

Figure 3. Health Care Pyramid & Referral Levels, Public & Private.



Source: Health Sector Strategic Plan IV 2015-2020 Min. of Health & Soc. Welfare

5.4. Options towards Integrating Traditional Medicine

As early as 1978, the WHO in Technical Report Series 622, already recognised and promoted the role of traditional medicine (TM) in the wider aim of universal health care development. From that moment on, the number of initiatives to examine possible integration with formally institutionalised forms of modern health care (MM) have been ample. The fields of interest which were identified by the WHO at that time were quite elaborate with regard to their applicability. The rallying of support for the promotion of traditional medicine was first addressed to get it on the agenda of national health policies. The steps to accompany this acceptance included the gathering of information on the available knowledge, means and therapies, as well as categorising the type of healers involved. It called for an inventory of the types of diseases which were successfully treated by traditional healers, as well as investigating the environmental factors the healers relied upon. The main policy goal, which was aimed at however, was in "the application of traditional medicine to primary health care" (Recommendation Nr. 7.5). The added value of this integration was to receive tangible proportions. For the following recommendations dealt with manpower development, *i.e.* the recognition of these categories of traditional healers as an HRM potential. They were regarded as professionals within an existing system, supported through multidisciplinary research programmes which not only covered efficacy, called '*validation*', but also 'studies in psychosocial and cultural aspect, and behavioural patterns' (Recommendation Nr. 7.7). Adapted by some scientist in period, the implications of that potential were put into a framework which was designated Indigenous Knowledge Systems & Rural Development; '..*Since it had become apparent…that the integration of traditional and transitional healers would constitute a cautious piecemeal procedure over a long period of time, it was considered essential to initiate this process by training new types of health workers for the practise of an integrated form of traditional, transitional and modern medicine, where new health cadres could function well within the expanding PHC services of the central government.'* (Slikkerveer 1982: p. 12)

The degree to which individual countries in Sub Saharan Africa (SSA) have been adaptive of such a policy is highly varied. It may be useful to make a distinction in the sense of purpose behind any type of integration when regarding traditional medicine against the background of an already institutionalised health care system. Firstly, there can be the approach of an all-encompassing integration, taking into account all aspects, meaning the original practice and its features as it exists, together with its holistic cultural context, without any restraint. Then there is an approach whereby there would be conditions, *i.c.* a relationship with specific morbidities, an established record regarding the efficacy of the medicine, non-medical aspects of the eligible therapy, or the degree of professionalism demonstrated by the practitioner. Another scenario may have the practitioner co-opted to help promote a mainstream health education aspect, as was demonstrated with the ORS training in Ghana (*cf.* Warren 1988; Ventevogel 1996). It was repeated at later stage with regard to HIV/AIDS counselling by traditional healers because of their special position in the community (*cf.* Homsy *et al.* 2004; Kaboru *et al.* 2006; Kayombo *et al.* 2007). There should be room for reciprocal actions, as is incidentally demonstrated where hospital doctors refer patients to well-known bonesetters because the quality of their work is unanimously recognised (*cf.* Oppong 1989). In the reasoning of Homsy *et al.* (2004), the human resources management (HRM) aspect returns. They indicate that traditional healers remain the first line of contact in more than two thirds of all cases, outnumbering biomedical physicians by far. It would make them more suitable to realise any change

in behaviour. Nuances between these types of collaboration are immediately recognised, in particular with respect to the transfer of knowledge. There might be an exchange of ideas on a voluntary basis, but also health education training standards and treatment protocol parameters which are stringent, and they have to be met on both sides in order to make it all functional. These aspects may not bridge the difference in attitude towards therapy, in other words, where TM applies holism and rituals, MM refers to 'scientific results' and protocol, but it should not take away the readiness to co-operate: *…key elements are; building mutual respect between biomedical and traditional health practitioners through dialogue on matters of interest, signing a memorandum of understanding; stressing complementarities of both systems by referral from one health system to another…showing humility and respect during workshop regardless of level of education; cultivating transparency through dialogue and negotiation, eagerness to learn from one another.'* (Kayombo *et al.* 2007: p.3/9).

Similar to the core competences of TM as they have been acknowledged by MM, such as bone setting, psychiatry, psychotherapy and obstetrics, there can be a core competence of community-based health communication in acquiring these professionals to play a role in preventive health education (*cf.* Elujoba 2005; Stanifer *et al.* 2015). As Marsland (2007) noted in her work on '*Hybrid Traditional Healers*' in Tanzania, there is an eagerness on the side of the traditional healers to incorporate many aspects from modern medicine which would contribute to making their work be received as professional, such as hygienic preparation, testing, conservation of products, consistent multiplication of therapies, quality control, and so forth. It may come down to willingness on behalf of the modern system primarily to find common ground and renew the initiative, preferably within a thematic framework *e.g.* HIV/AIDS, and a practically feasible co-operation. As Chirangi (2013) has explained the necessary policy context in Tanzania was established earlier; '*In 2002, Parliament passed the Traditional and Alternative Medicine Act, which became operational in 2005; the Act recognises the role of traditional medicine in the national healthcare system and supports co-operation between physicians and traditional healers.'* (Chirangi 2013: p.135)

Although at least since 2005, TM has seen a revival in terms of receiving attention, not only from the health care sector, but also from the Tanzanian government with purposely aimed new legislation (Stangeland *et al.* 2010). It has not resulted in a consolidated position within the wider official health establishment, although the spread of commercialised TM activities, increasing its visibility, is without contention. The main motive behind the legislation was apparently directed towards securing biodiversity and maintaining the heritage of traditional knowledge (*cf.* Msuya *et al.* 2009). Expectations may have been high that the collaboration would lead to a formal relationship within a referral system, but there are no signs of that as yet. Still, as Langwick (2010) clearly shows, the anchoring was already done by the Office of Traditional Medicine annex the Ministry of Health and Social Welfare. Langwick explains that under the set up all alternative practices were clustered under one umbrella, such as homeopathy, acupuncture, chiropraxy, among others, with a side note on the exclusion of the occult versions of *dawa za kienyeji*. Langwick's starting point is relevant here as she maintains that the role of traditional (herbal) medicine viewed as an economic driver for the nation. Especially early post-independence politicians played a large part in the current establishment of TM products as commodities for market use in Tanzania and abroad. In that sense TM could be viewed as institutionalised.

The benefit for public health in turning TM professionals into a human resource for health development in Tanzania, as the policy had first intended, does now not yet materialise. In

Langwick's analysis the tone is determined by the expectation of discovering hidden treasures which may yield large profits in the pharmaceutical field, instead of solving a human resources problem or insufficient drug supply in health care. Although that may have changed with the Act in 2002, up until today there has unfortunately not been a tangible contribution to curing AIDS, malaria or Ebola from indigenous herbal medicine bases through officially co-ordinated efforts.

The capturing of TM potential on account of economic motives is not controversial per se, but it is not the role envisaged by the WHO in its original form. What might evolve, as is noticed by more authors on the same topic (*cf.* Marsland 2007; Kamat 2010; Jangu 2012; Denisenko 2013), is that the commercialisation of large-scale manufactured products with a distinct indigenous herbal signature can emancipate the role of TM, away from biomedical stigma or scientific scepticism. As Langwick sheds light on the role of trading with China as a background to this commercialisation, it is not a result of emancipation from the roots, as in recognised common interest identified by consensus among organised exponents of TM in Tanzania. It does result however in an export of a database of indigenous knowledge to an invisible overseas partner. The ingredients are sent to China, produced there in numbers and sent back packaged and labelled. On another plane, the local research into plant medicine has produced insights which are complementary to the commercial movement, but of a different order (*cf.* Tilburt & Kaptchuk 2008). The problems encountered by traditional healers are mainly preoccupied with quality management. It refers to finding the right species, repeat the preparation of medicinal plants within a certain timeframe, and without deterioration to their efficacy; 'they have to be fresh and made on the spot to be useful' (see Chapter VI). It does however not imply that there are no herbal treatments which can be conserved. As is shown by Chirangi (2013) many of these products are now sold on the streets by commercialised traditional healers, also in urban areas such as Musoma and Mwanza.

Returning to a broader meaning of 'human resources for health', in the Tanzanian context there are various types of TM practitioners just as elsewhere on the continent which are categorised in professional groups. They range from herbalists, spiritual healers (diviners - *wafumu)*, practitioners who practice a combination of skills, circumcisers, soothsayers, bone setters, midwives, and crossovers, as many of the TBA's also have knowledge of herbs. Then a distinction can also be made as to their convictions, as in pagan, Christian or Islamic in as far as it has an impact on their practices (*cf.* Jangu 2012).

In identifying the most suitable partners for collaboration in a formal setting the TBA's were the first to be actively recruited, already in the early 1990's. The main reason initially was because of the emphasis on Maternal and Child Health (MCH) as a priority within the Primary Health Care concept. The number of TBA contacts which were then reported on district statistical level already showed that they represented the first line in obstetrics on community level. In the setup of the training the ultimate goal was to establish an early warning system in referral so that serious pregnancy related complications (PRC) would be handled in time at a properly equipped facility. In practice there are many variations which range from recognising symptoms and timely referral, to learning to deal with complexities themselves. There were many forms of trying to extend the system (*cf.* Byrne & Morgan 2011, Ambaretnani 2012).

Apart from training the TBA's they could also be connected to a specialised health worker on district level, who becomes a regular liaison and secures updates in knowledge and practice, preferably on the level of a senior Public Health Nurse Midwife. TBA's could as well be equipped with special delivery kits and visual quick reference aids with mobile back up.

Another method to involve the TBA is by having her attending the eventual delivery in a hospital, as an indirect way of familiarising with different techniques. The length and intensity of the training and supervision is definitely a criterion in the quality assessment. Over time the experiences have been mixed but the potential is still recognised (*cf.* Pfeiffer & Mwaipopo 2013). Because of the numbers involved it is a resource which is yet to be fully exploited. In Tanzania the TBA's which were approached, have mostly been trained and registered by the district public health department, and in practice, some actually accompany their patients to the hospital when they foresee complications. Some are functioning within the IMCI framework as community-based counsellors, but they are limited. The point made from the analysis by Pfeiffer *et al.* is that early experiences learned that the TBA extension could not become a substitute for the lack of MCH facilities within safe accessibility margins (WHO 2004).

Having established that the TBA's role is not necessarily in attending delivery, constituting the primary line of contact by advising pregnant women to seek professional assistance timely, their role is as ever essential. Because of their familiarity with the community inhabitants, analogous to the practitioners mentioned earlier, they are capable of influencing behaviour sustainably. The scenario to see them actively involved in preventive health education is currently contended by health workers who had ambivalent experiences during the training exercises.

In the case of Serengeti, the programme [24] to train TBA's as an extension of the first line in the Maternal and Child Health (MCH) referral system, was approached with scepticism, apparently because of a lack of "suitable" candidates. In this case it was explained by the Principal Nursing Officer that the midwives were not sufficiently receptive of medical biological knowledge transfer, to become safely operational, as noted at the MCU station in Mugumu. The district maternal services staff labelled them 'still a risk' notwithstanding the initial enthusiasm on both sides. It was not meant as a disqualification of the commitment or experience of these traditional midwives, it was presented as the assessment of the MoH trainers, that the candidates were not capable of fully acquiring the implications of certain pregnancy related complications or hygiene protocol, to satisfy the requirements of the standard of the training. Although other studies in Tanzania have reported dissatisfaction with TBA involvement (Mbaruku *et al.* 2009), it leaves unchallenged that their position in the community can be seen as comparable with a Community Health Worker, as capable of bridging the gap with a formal facility-based health care. The notion of a knowledge gap should not be generalised too soon. The midwife trainer from Kisare College noticed during the interviews with TBA's that their knowledge built from practical experience was beyond her expectations. Additionally, it was noticed that the awareness of complications is high, and the readiness to refer someone to the hospital is already demonstrated. Despite those instances where knowledge may be crucial, as in recognising symptoms of pre-eclampsia for example, the social communications and trust with inhabitants is as yet unrivalled and must be utilised. It must be possible to identify a set of tasks which a TBA can perform without risk and with sustained quality, preferably in coherence with Community Health Workers, instead of circumventing them on the basis of not meeting bio-medical knowledge standards, no matter how scientifically solid they may be. As suggested by Byrne & Morgan (2011) from their analysis, there was an overall correlation of TBA involvement with increased skilled birth attendance. The current Health Sector Strategic Plan IV does not make any mention of collaboration, or incorporation any specific type of TM professionals or facilities, in any case not regarding prevention, promotion, referral, or Human Resources for Health challenges, or in connection to the '*social determinants of health'* (WHO 2018).

5.4.1 Towards a Transitional Role of Traditional Medicine

Jangu (2012), based on his work in Mwanza in connection to HIV, remarks there is a new role of traditional medicine (TM) in an increasingly commercialising health care market, which is changing the stage. In the broader sense, the migration of professional healers (to urban areas), and the adaptation of some TM treatments into serial production modes, may remove the connection between healing and the spiritual or cultural dimensions in which it was formerly embedded. There is a risk of this separation becoming enhanced as well through the loss of biodiversity, and the lack of appropriate conservation techniques. But foremost it removes the ritual and its social function from the healing process. At the same time, Jangu maintains, the role of traditional healers is still essential as they are the gauge for changes in society, which makes them better capable of putting these changes in a proper context for developing health care in the frontline. Jangu's estimation of the share of the population consulting TM professionals at any one time is 80% which is coherent with other local utilisation studies (*cf.* Hausmann-Muela *et al.* 2000; Langwick 2011; Denisenko 2013; Stanifer *et al.* 2015).

To further support his notion, Marsland (2007) already described a tendency of TM professionals of wanting to adapt certain 'modern' features into their practice because of a number of reasons. Apart from losing their stigma of being 'backward' in the eyes of modern medicine, they want to demonstrate their eagerness to innovate, and learn new methods to prepare and conserve their natural resources-based medicine. The same was noticed during fieldwork, as mentioned in the qualitative analysis, many traditional healers were insisting on investigating the active components of their products in a scientific way to regain their rightful position in providing a well-received and established therapy. It would not only increase the efficacy of their labour-intensive production process, but as well increase the scale and flexibility in application, and eventual turnover. It would also enable them to compete with regular over the counter drugs and create an image of being progressive, without losing their knowledge input, or the connotations of the drugs in question. Marsland (2007) as well puts this into a wider historical perspective of the underlying struggle for recognition between 'traditional' and 'modern' medicine, resulting in an undesired dichotomy which is maintained by health institutions as well as local authorities over time.

Chapter V Notes:

20. Traditional Medicine is defined by the World Health Organisation (WHO, 1978a) as 'the sum total of knowledge or practices whether explicable or inexplicable, used in diagnosing, preventing or eliminating a physical, mental or social disease which may rely exclusively on past experience or observations handed down from generation to generation, verbally or in writing. It also comprises therapeutic practices which have been in existence for hundreds of years before the development of modern scientific medicine and are still in use today without any documented evidence of adverse effects'.
21. In 2013 it was defined as: It is the sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness (WHO 2013).
22. *'Academic institutions can work with health systems to provide health professionals with adequate pre-service and continuing education to prevent and reduce the disease burden of populations; and that collaboration between academic institutions can provide opportunities to develop and share best practices, for example, in curriculum development, teaching and assessment methods, and faculty development*' (MacFarlane & Kayaa 2012: p.S3)
23. The Tanzanian Training Centre for International Health (TTCIH), a public-private partnership between the Tanzanian Ministry of Health and Social Welfare (MoHSW), the Novartis Foundation, and the Swiss Tropical and Public Health Institute in Ifakara, a small town in rural Tanzania.
24. From 2008–2014, Johns Hopkins University led three USAID-funded programmes for Maternal and Child Health, HIV-counselling and testing, and the scale-up of Voluntary Medical Male Circumcision (VMMC): 1) the Mothers and Infants, Safe, Healthy and Alive Program; 2) the Universal HIV/AIDS Counselling and Testing Program; and 3) the Maternal and Child Health Integrated Programme (MCHIP).
25. In Tanzania the National Health Insurance Fund (NHIF) covers civil servants, who consist of 6% of the population, at a rate of 6% of their income. Such a change would be a drastic leap from the current single digit per capita health spending by the majority of the Sub-Saharan African countries. The informal sector may purchase insurance from the CHF, which is a voluntary insurance scheme which also insures those classified as "indigents" and others unable to afford one, as well as people which are "less likely to get treatment due to user fees" (*cf.* Wong 2013).

CHAPTER VI QUALITATIVE DATA: HEALTH PERSPECTIVES IN SERENGETI

6.1. Fieldwork Organisation

This chapter consist of the compiled transcriptions of the key-informant interviews which were conducted in the district complementary to the pilot survey and the household survey. The half-structured interview questionnaire is presented in chapter III on methodology. The qualitative survey was intended to provide background to the analysis of the quantitative data as presented in chapter VII. The choice for the locations was made in consultation with the Public Health Department's acting Chief Medical Officer. On account of the district characteristics it was determined that Mugumu as the capital would serve as one station, a larger rural satellite in the form of Natta, situated on the main road with public transport as semi urban, at a distance of approximately twenty miles from the capital, and Nyamburi, where the household survey took place, on the basis of its peripheral rural setting and remoteness in terms of accessibility, and its homogeneity (see Chapter IV). In line with the LEAD fieldwork protocol, the transcriptions start with an historic perspective, to generate an image of what constitutes Serengeti as a rural area. The informants were selected on the basis of their function in the community and recruited through the network of the Ward Educational Coordinator (W.E.C.), as every community has a liaison within the ministry of education, to a larger extent than the Public Health Department. The selection criteria ranged from health workers, civil servants, schoolteachers, religious leaders, Traditional Birth Attendants, NGO health projects staff, village executive committee members, and retired –local- government officials. Knowledgeable community elders were identified by the research assistants in all locations (see chapter IV), on the basis of their generation age set (*cf.* Shetler 1998), to reach the best possible early parameter in original information. All the names of the interviewees have been recorded, but withheld purposely for privacy reasons, although they all officially consented to being quoted. They are indicated by sequential alphabet capitals hereafter. The transcriptions, as explained in chapter III, were checked by the team of two translators post hoc for accuracy. In the case of the TBA's and elders there were two linguists present to control semantics in translation, when a local dialect designation was transferred to Swahili, and later to English. Wherever possible, historic details relayed through the key-informants were enriched with documented references, as acknowledged in the text. The names of non-interviewees and local organisations are left intact in order to add to the contextual information. Records are kept in the Kisare College of Health Sciences Library, as requested by the Ethical Review Committee and adhering to the ruling regarding research data.

6.2. Serengeti Historical Perspective

Respondents A and B (*retired local government official, religious congregation representative*)
A: The first note made regarding the history of the capital Mugumu is that it was not always there. The elders describe it as a forest area designated as Risaba before the emergence of the name. The reference the name carries is to a tree, identified by type as '*omosongo*' (there is no consensus) but one source insists that it's from Maragoli language spelled as '*Mogumu*'. It is the indigenous name for that species, according to an A-related elder, at a crossroads marketplace where the local groups met to do exchange trading, which location is nowadays marked by a roundabout (loc: '*Keep left'*). Respondent B, a retired member of the KMT local branch, is consulted on the same topic and adds

his knowledge. His reflection goes beyond Mugumu and starts to describe neighbouring groups interactions around the capital after 1900 as the starting point for recent history. For this area, the Ikoma people and their chieftaincy from nearby Morotonga are considered as the truly indigenous. Apparently, they were in the geographical proximity of neighbouring Ngoreme, Natta, Issenye, Kusini and Sukuma, and Maasai further east surrounding them from the onset. But here too, there are early movements of various groups, similar to the Natta situation. All refer to the influx of groups from Kenya, *e.g.* Maragoli, Nandi, Kisii, among others as a result of forced displacement following colonisation, the indication here is that British 'acquisition' of land for their plantations instigated the migration. The next movement is associated with Kurya moving from Tarimé to this particular area. With regard to economic activity it is emphasised that before the influx of the Kenyan groups the single crops were Millet and Sorghum, and, more importantly, the Ikoma were hunters primarily, because at that time there was abundant wildlife. The crops in time were extended with other ones such as cassava and the gradual shift in activities is identified as cattle keepers who started farming on the side, while the original farmers started to buy cattle for economic security. The sedentary character led to community development marked by the construction of the first primary schools in Mugumu central and Robanda. After independence the village development brought the organisation of farming activities, exemplified by the introduction of maize and beans and growing on larger plots in rows. It was enhanced through the establishment of the Mara Co-operative Union, to create a market for food crops, to depart from subsistence, and the introduction of a pure cash crop as cotton although not successful on a large scale. Trading intensified and the establishment of shops further created the semi urban atmosphere. It is described as a place of concentration for a large number of groups which also intermarried extensively and engaged in multiple economic activities. Referring to this large number of groups within several communities, the question is raised whether this would also implicate that each group maintains ties with their own traditional medicine keepers, in the sense that they are regarded as the preferred suppliers.

Respondent A claims that the daily practice shows rather the opposite for a number of reasons; first of all, the number of traditional healers is limited, not every settlement has one, and the existing ones usually have their own specialisation. That motivates people to find the one most revered for his or her specialty, which may involve quite extensive travelling. Another reason is that the obscurity of finding a healer outside one's own community contributes to a feeling of security, especially if a certain disease is thought to be shameful or otherwise controversial. Traveling extensively to find a specialist is supported by both, and they mention famous healers with patients around the entire region who are renowned for a successful treatment. The transfer of knowledge with regard to home remedies however does show that there is an original set and an acquired set, mostly because of the indigenous names which survive this knowledge transfer and are therefore traceable to specific origin. The underlying mechanism for this spread is indicated by the elders as the result of the extensive intermarrying, as many women have learned home remedies from their parents, and they take them along to their new in-law families.

Respondent C (*retired government official, farmers' union executive)*

The history of Natta as far as could locally be reproduced in August 2015 by oral transmission, starts around 1905. Respondent C has been an inhabitant since birth (1931). In his recollection, built around the information transcended through his father, the Natta community originally consisted of around six hundred people, who were mainly occupied with three activities, in order of importance

they were: farming, mainly millet and sorghum, cattle rearing, and hunting after local fauna. The community was rather remote and limited in size as most dispersed settlements were in that period (*cf.* Osafo Kwaako 2011). The influx from other migrating groups was initially twofold, the neighbouring Ikoma were drawn foremost by the fertility of the land, and the open spaces which invited unscheduled settlement. The area in that period is indicated to stretch all the way to the current plot of the Twiboki secondary school. The Ikoma movement was sporadic and did not have any specific impact, since the Ikoma maintained their own original settlement (Morotonga) and chieftaincy (Nyichoka) irrespective of their incidental migration. A different matter was the influx from a group called the 'Issenye'. This group did not arrive in the Natta area as a result of individual migration, but as a result of a conflict with the Maasai, which forced the Issenye to leave their area called Nyiberekera (*i.c.* Tabora B), entirely, making them in effect fugitives, leaving no one behind in the process. According to these elders the Natta people fought them off initially, because their number brought about an imbalance in local proportions, and they actually defeated them in a struggle. It was soon realised that a compromise had to be reached because these fugitives did not have many alternatives. Their leader reached an agreement with the Natta chief Rutiginga, which was underlined by a special ritual. The youngest member of their group would be breastfed by a woman from Natta, while the youngest member of Natta (*C's father in 1905*) by an Issenye woman. After this ritual the group were given an area near Natta called Nagusi. The degree of acceptance was illustrated by giving the newcomers the opportunity to establish a local chieftaincy (*Sarota*) though being resident in another area. After that event there was a return of focus on economic activity and eventually the resident groups started to intermarry.

Another notable event with tangible impact on the community was the first establishment of the Ikizu mission, started in 1918 by the Seventh Day Adventist (SDA) church, which presented Natta with its first formal educational infrastructure although at a distance (i.c. a boarding school at 60 km). The assimilation of the resident groups was furthermore enhanced by the abdication of chieftaincies with the arrival of independence (1961). The next influx from migrants on a large scale in the recollection of the elders is associated with the Developmental Villages (V*ijiji vya Ujamaa*) operation which ran between 1974 and 1982, of which Natta was part, and brought about economic changes. One of the motives was to realise larger communities and assist farmers in resettlement who were unable to harvest successfully as a result of long droughts in the early seventies.

'*...What we must do is to try and make it possible for groups of farmers to get together and share the cost and the use of a tractor between them. But we cannot even do this if our people are going to continue living scattered over a wide area, far apart from each other...The first and absolute essential thing to do, therefore, if we want to be able to start using tractors for cultivation, is to begin living in proper villages...unless we do so we shall not be able to provide ourselves with the things we need to develop our land and to raise our standard of living. We shall not be able to use tractors; we shall not be able to build hospitals, or have clean drinking water, it will be quite impossible to start village industries'* (Nyerere 1962: 183-4 quoted in Kwaako 2011).

The groups which now arrived in numbers did not only encompass Kurya (from Tarimé), Sukuma (from Nwanza), Zanaki (from Ikizu) but even people from Kenya. The fertility and the area of land available were of such proportion that the same pull factors of fifty years before were still in effect. It also stimulated the introduction of cassava, maize, rice, but there was a special stimulant from the government to engage in growing cotton as a cash crop, the first time that something next to subsistence food crops was introduced. That policy was however not consolidated through time,

but the mix of food crops remained. With reference to the last decade of economic activity the community now experiences the exodus of young people in stereotype urbanisation trek, but what pleases the elders is that they do see successful migrants return to establish themselves in Natta to reside, so their exodus is believed to be compensated. The historic perspective makes Natta an example of a mixture of many different groups and the joining of various economic activities with the signature of assimilated pluriformity, representative for a larger area [26]. *'When I asked elders to show me their territorial boundaries, they were quick to respond with both the 'traditional tribal' and the 'colonial' sets of ethnic boundaries. Natta elders said that their 'traditional tribal' boundaries were the (respective neighbouring) rivers'* (Shetler 1998: p.425)

6.3 Qualitative Data I: Interviews with Key Informants

6.3.1. Health Staff Members

Respondents D and E (*local health workers*)
Visiting the health centre in Natta, there were several sessions with the local Clinical Officer and the Village Health Worker on the topic of utilisation patterns and illness classification by the inhabitants, according to their own experience. When consulting the centre's annual monthly morbidity reports over 2014 it was noted that the top five morbidities remained rather consistent although there was an indication of seasonal trends. Furthermore, the registration of HIV came out to be absent from these figures as they were recorded separately on account of a special programme which required its own administration (see chapter IV). In the CO's assessment the people who came to the centre as their first consultation would not exceed 25%. In almost all other instances the sequence would be home remedies and traditional healers consecutively, depending on the severity of the disease. With malaria and anaemia in high incidence it was his opinion that however there had been recent local education campaigns on malaria, executed by mobile public address systems, the connection between the two was seldom made by the local inhabitants, and the prevalence of the morbidity had alas not diminished. Convulsions which may also be related to malaria, were initially almost exclusively treated by traditional healers before ending up at the centre, usually for a lack of result. He stated that these symptoms with children are primarily interpreted as having a spiritual cause. The fact that both symptoms were not consistently related to malaria should not deter from extensive health education.

A similar conclusion is arrived at with regard to HIV infections. Apart from the social implications of the infection being regarded as shameful, it happened often that HIV indicated people would consult traditional healers and be treated by them before finally consulting the centre. In this case there was a distinction made between traditional healers who are aware of not being able to cure HIV, and those who are not. In this respect both welcomed the idea as it would be a new approach to have these healers trained in recognising the symptoms in an early stage and make them an integral part of the referral system. The Village Health Worker did not operate from his own dispensary (*Zahanati*) but only made house calls. It enabled him to early detect situations which needed more advanced care and monitoring, but he feels he does not always carry enough authority to convince people to follow his advice. Some traditional healers would also be opportunistic so as to treat a person anyway as it is their livelihood. Other morbidities which were high in incidence were pneumonia and Urinary Tract Infections (UTI), both of which were also variably

underestimated and treated locally before searching aid in the centre. The referrals made to Mugumu mainly dealt with advanced stages of HIV or those requiring surgery, in particular pregnancy related complications (PRC) such as Sectio-Caesarea and Post-Partum Haemorrhage with an estimated frequency of two a week. In general, their assessment was that the role of traditional medicine (TM) in conjunction with local beliefs was strongly embedded and would need some new form of co-operation to have at least the risk of inappropriate treatment eliminated where possible or necessary in relation to HIV. It was concluded that in many instances the subjective experience of individual symptoms does often not bear a relationship with recognising a specific morbidity, as is especially the case with headache, diarrhoea, vomiting, or fever, because they need to be placed in a certain context before they can be interpreted [27].

Respondents P and Q (*health workers PHC, male and female*).
P: On utilisation motives and disease classifications, he lists a series of prevalent morbidities in the area, ranging from Malaria, diarrhoea related diseases, *i.c.* Amoebiasis, various worm infections (*minyoo*) and UTI. In his view a large number of cases are foremost due to improperly prepared food, whereby ingredients are not thoroughly cooked or untreated (‘*kichuri’*).
He is aware of a lack of hygienic discipline which is persistent, even if there is health education, according to his experience a behavioural aspect which is very difficult to change. There is a distinct lack of interest -and even suspicion- towards health workers, implying they would have an ulterior motive in wanting to make money instead of pursuing humanitarian goals. He feels that with regard to the choice motivation between traditional and modern medicine there is a very strong culturally embedded set of convictions which make people tend to interpret symptoms as having a suspected transcendental cause *(‘mapepo’, ‘majini’*) rather than a microbiological. In that sense it is very common to see people with symptoms attributable to either malaria or pneumonia, or exceptionally disfiguring effects *e.g.* Elephantiasis or Hookworm, to be taken to TM first. The strength of culturally motivated behaviour was displayed during a twelve-month research into the local practice of clitoridectomy (female genital mutilation - FGM), which provided him with much insight into the resistance to abandoning it, though it was already banned by the government. An additional aspect remains a purely economic one: it is commonly accepted that TM is cheaper than MM and is at any time considered an alternative. In terms of improving health education his strategy would be to improve the media-mix extensively, *e.g.* more visual aids, and he is convinced that individual education on household level is more effective than communal events.

Q: She lists a similar set of morbidities, i.c. malaria, UTI, diarrhoea and worm infections. She is convinced that most of these cases will consult MM first. She adds that UTI is treated successfully with TM in the sense that no re-infection occurs, which she says is associated with the treatment at the hospital. There is awareness of a lack of recognition of the treatment by TM, a reason why people will not express these practices to a doctor. As an example of the strong culturally determined behaviour, she presents the resistance to spraying against mosquitos at residential compounds because people believe it invokes infertility. Some people will receive a diagnosis at the hospital and move to TM to have it cured because they are convinced of its efficacy. She mentions the experimental treatment of HIV with TM at Bombo Hospital in Tanga in 2011 as a possible successful co-operation. The popular belief is that severe cerebral malaria cannot be treated at a hospital, a reason why so many children with convulsions (*degedege*) are taken to TM. She thinks

that health education should be increased, and because of this cultural embeddedness, a role play would be effective. It could present a person who has actually gone through his illness process and can relate to the efficacy of a specific treatment. She is aware of the risk in not completing a prescribed treatment but adds that some people are simply not capable of following the instructions given at a hospital, when they tend to get complicated or are extended over a long period of time. She feels that the price level of MM is not in line with a low-income population, and that the attitude of the nursing staff towards patients is often not very inviting or caring.

Respondents X and Y *(senior health staff*)
X: He specialises in dermatology and has sixteen years of experience, in which he acted as a physician in the hospital and as a District Medical Officer in Serengeti. On the motivation of choice in utilisation, he has seen a shift towards an increase in patronising modern medicine on account of more and better education. He is convinced that this trend will be consolidated in the near future. Such in spite of the initial motive of choice, which is still influenced by traditions and especially by result oriented expectations. New insights from education and the spread of knowledge in general through global media, have not influenced the adherence to traditional knowledge which is handed down through generations. *'These people do not like change'*, which he interprets more as traditionalism than as conservatism. There may however be a distinction in the type of diseases directed to one or the other, he mentions advanced obstetric or gynaecological problems which are directed towards MM, whereas mental problems are often suspected with having spiritual causes, and therefore presented to traditional healers.

Cases such as malnutrition, dehydration or anaemia, might be misinterpreted, and when presented to TM may involve a risk because they need to be treated properly to prevent them from growing into serious problems. In his experience, specialties such as Ear, Eye, Nose and Throat (EENT) symptoms are also primarily directed towards MM. He feels that it is foremost the 'acuteness' of the problem which makes patients want to opt for a hospital. Symptoms resulting from diarrhoea, headache or vomiting without a diagnosis, which initially seem moderate, will always be treated with home remedies, self-treatment via a pharmacy, or a traditional healer respectively, on account of accessibility, not necessarily because of the cost aspect. The cost aspect, in his view, is a relative one, because the economic value of livestock is not measured against the feasibility of paying a hospital bill on the same scale. When one sees a physician, either traditional or modern, people expect to be cured, regardless of the intricacy of the problem, and the result carries a long way in the future choices which are made. In his opinion it leads certain traditional healers to claim being able to cure diseases they actually cannot, because that claim is part of their credibility.

Another point he puts forward regards the recurrence of symptoms, with re-infections, or inherent to chronic diseases in particular. They may be interpreted as the result of ineffective earlier treatment, and invoke searching for alternative treatment, because of unawareness of the actual cause(s) of the reoccurrence (*cf.* Stanifer *et al.* 2015). On the topic of referral through TBA's, he cites the district health survey, where more than 60% of the deliveries take place at home and/or in the presence of a TBA anyway, so the question is not how to circumvent them in a referral system, but how to contain the problem of complications by higher awareness among the patients themselves. He feels it is impossible to leave TBA's out, as it would frustrate the system. They could go underground and would be embraced by the community members anyway for lack of alternatives in remote areas.

Moreover, in the light of the long-promoted initiative towards co-operation and integration of TM and MM, this would mean a breach with former insights. The only way this could be solved is by providing MCH services on the lowest community level.

There is no consensus on their level of expertise, but he presents an example whereby a TBA was correct in her analysis and was denied action and instructed to proceed with referral. He illustrates the functioning of the referral through TBA's being monitored by having them collect pebbles in different cups, so indicating the number of women they treated and how many they referred to a hospital or clinic. Ironically, the people who are now trying to contain the problem are the same who were involved in TBA training before. He has ample experience with referred cases of obstructed labour at the hospital. He brings forward the absence of an early detection system which was provided through the Community Health Nurses or Public Health Nurses as they were known, who made house calls, and operated annex the referral system on the lowest community level. He feels that they should be reinstated in the hierarchy of nursing staff, and thus supplement the community-based organisation of what is now being handled by the VHW and the district facilities.

Y: A prominent problem is the referral of pregnancy related complications (PRC) in the district, for which she, as a midwife, keeps records separate from the official district morbidity rates. They are classified in order of volume as a) Post-Partum Haemorrhage, b) Obstructed Labour (*various),* c) herbal infections, and d) incidental Eclampsia. The confidence of community members in TBA's is enormous, and because of their physical and cultural proximity it will be impossible to change the focus of young pregnant women towards MM. She feels that if the proliferation of local rural health facilities continues, more people will be able to reach qualified help in time.

Although some TBA's do refer complications to the hospital, and often even escort their patients, there are also cases where this does not happen timely. One of the underlying reasons in her view is that the majority of women prefer to deliver at home, as it is an act of good stature. On the topic of training TBA's and the co-operation with TM in general, she emphasis the risk implications. In her recollection, it was with the impact of HIV when this policy began to change. Although TBA's were trained and were originally destined to be incorporated into the referral system, it is the experience with the current generation that it is too difficult to get them on the level needed to be safe. Not only with regard to the recognition symptoms of complications, but also in consistency in adhering to minimum standards of hygiene. The insufficient qualifications are mostly related to illiteracy, and, secondly, there are large differences in competence among the TBA's. The risk factor of post hoc infections with the children, as well as with the mothers, in their immediate environment is considered too high. That is why, officially, their services have been suspended on local level.

Simultaneously, the upcoming three-year promotion programme* focused on referring pregnant women to modern health facilities will however make use of the TBA's, but the primary agents are set to be the envisaged new generation of Community Health Workers (**cf.* Johns Hopkins' JHPIEGO). She does understand that the government has set a policy goal of co-operating with TM, because it wants to prevent the traditional knowledge of getting lost, though that refers to herbal knowledge primarily. It will mean that improvements will have to be made in TM with regard to consistent and hygienic preparation of their medicine, maybe even to the extent that special places are created where this can be done (*her emphasis*).

She also refers to the history, as the current convictions have a travelled a long way past several generations of ancestors and this knowledge is not easily replaced by recent insights which have no

local cultural bearing. Simultaneously, although not as a prime motive, these TBA's make their living with these activities so there is hardly any alternative for them. It is noticed that there are very few young TBA's, and the implication here is that it is a problem which may eliminate itself through time, which would not resolve the fading of traditional knowledge. She delivers the annual report on all MCH statistics separately as a reference for our interview, since this level of data are not incorporated in the hospital or public health department's reports.

6.3.2 Education Staff

Respondents F and G (*schoolteachers male and female*)
In conversation with two teachers from Natta, the most pressing health problems were identified as Malaria, Typhoid Fever, 'Amoeba' (i.c. Amoebiasis), and UTI respectively. The female teacher indicated that most people would opt for TM first because they do not recognise certain symptoms as severe enough to go the hospital straight, and additionally there is a strong belief in cultural contextual causes, which are confirmed when the TM treatment is successful. Home remedies are often turned to with any initial headache, stomach-ache or fever. Because of the health education at schools she is seeing a reverse order in the transmission of preventive knowledge, whereby the children will be telling the parents what they learnt in school, instead of the parents teaching the children about health care. Nevertheless, she feels that it is often economically motivated as the people are so poor, they cannot afford a hospital bill, and in effect TM is cheaper. She claims that she is convinced that TM cannot cure the prevalent morbidities she mentioned. Subsequently, she indicates she has been taught a number of home remedies by her mother.

Both teachers give examples of 'medical shopping', where an unsuccessful treatment in either system automatically leads to venturing into another, and more often reversed to the expected sequence. The male teacher recalls a situation where he brought his 1,5-year-old daughter to the local health centre with stomach aches where she was given pills, but lack of result after two days inspired him to visit a healer, where an enema was applied with immediate result which satisfied him. He states that most diseases which were mentioned as prevalent in the area recently could not be cured by TM. When asked which diseases do belong in the sphere of TM, he points out that in his experience any orthopaedic diseases or muscle ache can be cured faster and more satisfactorily by the local bonesetters (*waganga wa mifupa*) than by modern medicine.

Focusing on the classification of the type of disease which determines whether to opt for TM or MM, he answers that the majority of the population is not capable of differentiating between a set of symptoms to make such a distinction ultimately. Most of the experience with recurring symptoms is primarily subject to belief. In his view it is the therapy's result which counts more than the classification of the disease. He refers to the cost of MM, stating that even the most elementary health insurance of 10,000 TZS is not feasible for a large number of people. Although it may finally not come down to an economic issue per sé, both respondents mention cost as a complimentary factor. Subsequently they both emphasise that free health care for children should be extended to primary school, whereas now it is limited to Under Five.

In his reflection on local health topics he puts forward a link with his daily practice at school, where out of the forty pupils he supervises daily, he weekly has a number of between two to five children who complain of severe stomach ache and ask to be dismissed. Although they would prefer to send these children straight to the health centre, they are not allowed to do so because the bills are

not settled by the parents afterwards. In those cases where the teachers advanced the payment, they were not reimbursed. On the issue of health campaigns awareness, the malaria campaign was not mentioned by these two respondents, but the female teachers remembered a campaign on family planning via mobile public address system which lasted for three days, a few months ago. One of the tangible results the female teacher acknowledged, resulting from health education, is that a local government survey, executed by the teachers themselves, proved that over the last five years the number of private toilets annex households had almost doubled.

Respondents J and K (*schoolteachers, male and female, secondary level*)
J: The male teacher sums up Amoebiasis, malaria and UTI as the prevalent health problems. Regarding the determining factors for the choice between TM and MM he answers that most people find it difficult to differentiate between the various symptoms, or possibly the lack of reference to a specific event. Because the incubation period can be variable in length, the sudden occurrence of symptoms may lead people to suspect another cause than an infection which they can relate to their own behaviour. These people may opt to see a traditional healer first for lack of indications. He is not able to provide an indication of how to distinguish between a spiritual cause and psychological disorders.

In his experience most people who are suffering from UTI of ARI do actually go to the clinic first. He is also aware of a situation where people treated for Malaria experienced allergic reactions to the treatment and therefore sought the help of a traditional healer alternatively. For most regular symptoms, referring to stomachache or diarrhoea, he feels that people will always seek treatment with TM first. His students are also known to suffer from these symptoms frequently and tend to relate it to the local water supply. He is convinced that TM is very well capable of treating specific diseases with local herbs. He refers to Typhoid fever, which he is also treating at home with a remedy of herbs and fruits which he was taught by his sister.

The choice is furthermore influenced by the cost factor, and he explains that modern medicine has a price tag on every single aspect, which costs thousands of Shillings. It ranges from a registration card, to a bed, to finally seeing the doctor and picking up your medicine. One can have all this for a single fee with a traditional healer for a fraction of the cost. In his recollection the last health education campaign dealt with malaria, equipped with banners and distributing free impregnated bed nets.

He makes note of a special phenomenon within school, whereby especially female students display unprecedented hyper extravert behaviour accompanied by prolonged outbursts of laughter, seemingly without any obvious cause. They cannot be corrected or contained since they do not react to any inquiry or reprimand. He asks for a hypothesis, since the local clinical officer could not define it and came up with the explanation of lack of personal attention, as it is a boarding school.

K: His female colleague puts UTI, malaria and STD's in the top health problems for the area. She is of the opinion that malaria can be well cured by traditional healers, but Typhoid fever, HIV and STD's should preferably be addressed by MM. In her view it is very difficult for people to differentiate between combinations of various known symptoms. The difference between spiritual and psychological disorders is primarily displayed in the behaviour towards one's direct social environment. She believes that spiritual disorders make a person primarily a threat to his next of kin, while people with psychological disorders could be a threat to anyone, not a specific group in

particular. With regard to the difference of efficacy of treatment between TM and MM, she emphasises that HIV cannot be cured by modern medicine. Malaria can be dealt with by home remedies; she herself applies Aloë Vera (*root*) with good result, a remedy she was taught by her grandmother. She states she can't think of an illness which could not be cured by TM.

To improve upon health education, she believes the best way is to incorporate it in the curriculum at secondary schools (*although according to the WEC this is already the case*). An additional factor in the choices made for treatment she mentions the cost aspect. Identical to her colleague she brings forward that every single aspect has to be paid for separately at a hospital visit, and TM is cheaper in comparison in most cases. Her latest recollection of a local health related campaign deals with a team visiting the secondary school on account of the National Health Insurance promotion. Reflecting at the end of the interview she makes note of the prevalence of STD symptoms with her female students and asks for advice on the matter. The answer provided is that it is the responsibility of the clinical officer to extend health education to the school's premises. The WEC adds that the school compound is not fenced, and no visible security measures seem to be applied.

Respondents R, S, T, and U (*schoolteachers male and female*)

R: As prevalent health problems she mentions UTI, skin infections and allergic eye reactions. According to her, the local population connects the incidence of UTI to contaminated water sources. The majority of the affected are girls who are advised to go the hospital consecutively. The skin troubles are suspected to be seasonal. In terms of choice between TM and MM she describes the sequence whereby the diagnosis of cancer established at the hospital was ignored, medicines remained unused and there was a subsequent visit to a local traditional healer to find relief. With reference to the skin diseases she is aware that TM is very effective and as an example gives a treatment for chicken pox *('Tete Kuanga'*), which is a home remedy as well. She is also familiar with a TM herbal malaria treatment which is known to have a preventive effect and is used by people who have been faced with repetitive infections after hospital treatment. This leads them to seek alternatives within TM. She mentions '*Roimit*' (*i.c. Aloë Vera root prepared as a concoction with a seemingly long-term effect*) which she learned from her father (*Maasai)* although she was not allowed to prepare it herself. In general, the strong cultural belief is predominant in the choice, while TM has the reputation of being cheaper than modern services. She feels that result orientation complemented with economic reasons contribute largely to the decisions made in the utilisation.

With regard to co-operation between TM and MM she is convinced that good communication and mutual respect could make a difference. Until now TM has often been criticised because of suspected dosage inconsistencies. Although the curriculum contains health education, she feels that putting students together in a Focus Group Discussion setting, so they can present their arguments from experience, would have a more lasting effect than traditional media exposure.

She is not aware which categories of patients are entitled to free health care. She emphasises that there will always be a fee to pay at a modern health facility, as every aspect of the visit is individually priced, from a recording card, to seeing a specialist, or medication. Top of Mind recollection of the last public health campaign in the area, she immediately lists breast cancer for women, and cancer of the uterus via a mobile public address system, in the beginning of the year.

S: This teaching colleague names UTI, malaria and skin infections as dominant in the area as well. The suspected causes for the epidemic proportions of UTI are no different from other colleagues. He

states that bathing with contaminated water could affect all persons, the reason why even children under five can contract the disease. For treatment primarily associated with TM he mentions yellow fever *('Manjano'*), followed by malaria and chicken pox. Additionally, he would associate all type of diarrhoea related diseases with modern treatment, as with cancer, Tuberculosis and sexually transmitted diseases (STD).

In his view most individuals regard the first step to use TM, especially home remedies, as a test to establish the actual impact of the disease before moving on to alternatives, making the severity of the symptoms a complementary factor. He is of the opinion that it is the efficacy of a specific treatment which ultimately determines the choice. That excludes the '*Mapepo*' suspected cases, which he, remarkably similar to his colleagues in Natta, experiences quite often among his - predominantly female- students. They display unprecedented outbursts of extremely erratic behaviour, which can hardly be contained. He cannot relate it to stress or their performance in class as they do pass their exams.

Health education at his school is incorporated in the Biology and Life Skills curriculum, and he suggests that having students confront each other with various experiences of treatment would be a feasible way of extending the health education. In his view the interest in TM is gradually diminishing with younger people, probably because of Internet. He can recollect the campaigns identical to his colleague, with regard to publicly organised events in the district.

T: Following her experience the female teacher lists malnutrition and diarrhoea accompanied by worm infections, alongside malaria and HIV as mainstay challenges. Incidentally TB and diabetes occur among the elderly. She sees the majority of the people applying the hospital and is not aware of specific diseases which would be primarily presented to traditional medicine. She is convinced that health education is covering the right topics. The students mainly ask questions referring to the transmission of HIV during her own classes. The knowledge regarding the transmission of UTI leaves something to be desired because it is considered a shameful topic by many residents. Overtly discussing the actual way of transmission is a challenge. Moreover, the role that the poverty aspect plays in this process can not be underestimated as the lack toilet facilities and hygienic routine are not easily brought up in larger gatherings of people. She would personally see a role play type of education as a possible medium of tackling these kinds of topics.

She believes that TM use is common practice, but she has no personal knowledge of this. She primarily associates spiritual diseases with TM, which in her opinion could just as well be addressed by religious functionaries, indirectly referring to the witchcraft aspect (*comparable to the 'diviners' in the 'popular medical system' cf.* Chirangi, 2013).

U: Her colleague is very elaborate on the morbidities of concern locally. From his personal knowledge the water and sanitation problem are extended by a nutritional aspect involving improperly prepared food (*intestines*) which may result in worm infections. It is his impression that UTI could easily be transmitted in boarding schools because of the concentration of people with unsupervised facilities.

He is carefully indicating the complexity between traditional beliefs, poverty, the distance to health facilities, and the severity of the disease respectively, as a constellation which determines where people will go. In his experience the majority of the people will not direct HIV, Cancer, Pneumonia or complications involving eye infections to TM but rather to a hospital. He indicates

that *e.g.* skin disorders, snake bite, palpitations, abscess, or even the so-called Pelvic Inflammatory Disorder are treated with TM. He is the first respondent to mention health risks related to female genital mutilation (FGM), which will be hidden for MM, because it is still practiced in resistance to official policy. He emphasises that there is not one determining factor but that accessibility and cost play in favour of TM. They inspire people to use home remedies, because they can relate to them more than modern medicine. He names a number of fruit-based home remedies which are widely applied.

To improve health education on a larger scale he believes that a platform gathering involving all community members *('masrar'*) would have an impact, because it makes a problem recognisable as universal, irrespective of social status or interpersonal relationships.

When the topic of free health care is brought up, an unexpected criticism extends the discussion. The female teacher is not aware of any official free care, and her colleague immediately emphasises the experience that every aspect of modern health care carries its own price tag, regardless of the official policy pertaining to Maternal and Child Health, elderly care, or HIV patients.

6.3.3. Local Authority Civil Servants

Respondents H and I (*civil servants, male and female*)
H: In the view of the female officer, HIV is the most pressing health problem, followed by Malaria, UTI and Amoebiasis. From her personal experience she expects almost every person to first consult a local traditional healer in any event. In her assessment the decisions are very much result oriented. Repetitive unsatisfactory treatment, or no cure, will lead to a clinic visit eventually, but in some instances she also noticed a reversed sequence.

The connotation of a 'spiritual' cause is often due to specific symptoms, *i.c.* erratic behaviour, but, as she puts it, primarily a result of 'local belief'. As an example of classifications in utilisation she mentions that traditional healers are very capable of treating convulsions (*degedege*), whereas HIV is typically a modern medicine disease. With regard to self-treatment and home remedies she reproduces concoctions she was taught by her mother to treat a sore throat or chest pains.

When consulted privately on health problems by other people it mainly concerns family planning, while all available alternatives could be a topic of discussion. Her recollection of the last major health education campaign in the area refers to family planning by way of a mobile public address system, just a month ago.

I: Her male colleague names Amoebiasis first, followed by UTI, malaria and skin infections. He relates the prevalence of these diseases firstly to the condition of the local water sources, in his view insufficient and mostly polluted, but there is no alternative. In the preference of treatment, he describes the result-oriented behaviour, in this case the reverse sequence from hospital to traditional healer, when the treatment in the hospital is experienced as 'superficial', *i.e.* there is no test, you get a diagnosis and a pill and that is it.

In his opinion traditional healers are well capable of treating Amoebiasis and STD's with a concoction. He is also convinced that ultimately TM is cheaper. He adds that most people would not be capable of differentiating between a set of symptoms to the extent that it could determine their choice, a reason why also HIV and malaria patients may consult a traditional healer. He is aware of a large number of home remedies being used in his surroundings, and he himself prepares ORS in

case of diarrhoea. The most recent health education campaign in his recollection dealt with malaria, whereby impregnated nets were distributed free, and a separate HIV-campaign on local level involving large banners and video projections.

Respondents N and O (*local government officials, both male*)
N: His experience with local health care is through his personal involvement in the Child Survival, Protection and Development Programme (CSPD), when the government decided to take interest in the co-operation and training of traditional midwives (TBA's) in the late 1990's, following alarming infant mortality rates.

His first remarks concern the infrastructural problem of the local dam in the river and the water supply not being up to standard, although the town is now moving towards a facility to clean local pipe borne water. The majority of the diarrhoeal related diseases are traceable to that cause, but he maintains that the priority health issue remains malaria. In his view the consecutive measures which were taken in malaria prevention were too intrusive to local inhabitants. He does not see that as a poverty problem (*he interjects that boiling water is cheaper than paying a hospital bill*) but as a mentality problem. There was resistance to using impregnated nets because they are too inconvenient, there was resistance towards spraying because it would invoke infertility, and the discipline needed to prevent mosquito breeding is just too intricate for the way of life of many inhabitants.

With regard to the choices people make when ill, he regards preference for TM as a matter of confidence, even if there is not always a proper diagnosis. He gives the example of his daughter, who is suffering from diabetes herself, and who turned to TM after long and unsuccessful treatment with MM. Although he was sceptical initially, after three months of consecutive TM treatment, she is now performing well, and he became confident enough to promote it himself.

He is sure that there is a specific role for TM in handling psychological disorders as the healers are much better equipped to deal with underlying social problems than MM. He suggests that co-operation between the two systems is very recommendable, and in his opinion, there should be an equal standard in terms of pre- and post hoc treatment testing of the patients. If this could be done at the same facility, the criticism of non-measurable treatment by TM can be invalidated. He emphasises that traditional cultural beliefs are very strong, and he mentions FGM at this point, which is still being practiced on an unknown scale, although during the CSPD programme there was ample attention to make the practice medically safe by introducing sterility. These remarks are immediately followed by the perception that an uncircumcised person was originally seen as an outcast, or at least not accepted as a mature person.

He feels that the current problems leave little alternatives than to sustain health education at all cost, but he does not present alternative types of message or media. He feels the lack of co-operation between traditional and modern systems is also due to the service level of modern medicine (MM), which leaves much to be desired, not only in terms of too many indirect costs, but also in the unwelcoming attitude of many local service personnel.

Respondent O. who has been in office since 1981, recognises the major local health problems as UTI, malaria, worms, Amoebiasis and Schistosomiasis. He sees unhealthy lifestyles as a result of strong traditions. In his opinion the majority of the local (*urban*) population does patronise the hospital, and he emphasises that the negative aspect of TM is that it is in practice often more

expensive than MM. The motivation of the choice for TM is primarily based on belief. Referring to possible co-operation between TM and MM for mutually referring cases he remains sceptical. He emphasises that most traditional healers are in it 'for the business', while health care should be 'a public service'.

As an illustration taken from his work, he describes the mobilisation of groups within the community's savings institutions as an alternative way of creating social security. They operate similar to rotating savings and credit associations (ROSCA's), and the weekly contributions, however small, are cumulated into provisions for education, health care and farming. That provision however is not limited to modern medicine, but he is not clear whether, as an equivalent to a regular health insurance, this is currently also applied to TM treatment.

He claims not to have personal experience with TM or specific home remedy applications, but he does suspect a risk in certain diseases being handled by TM which may preferably be addressed by MM. One striking feature of MM in his experience is the shortage of popular drugs, which leads people to acquire them from commercial pharmacies. He explains that the central budget allocation of resources is a factor to reckon with in that particular situation. He realises that the treatment in hospitals is based on tests and he perceives that as reliable, whereas the treatment by commercial or traditional services is mostly based on experience and individual assessment. He states that he does not believe any of the current health problems which he mentioned, referring to UTI, Malaria, worms, Amoebiasis, Schistosomiasis, can be cured by traditional medicine.

6.3.4 Religious Affiliations Focal Persons

Respondents L and M (*religious affiliation focal persons*)
L: In his view the most pressing current health problems deal with malaria, UTI, diarrhoea, airborne transmitted diseases, Amoebiasis, and a separate mention for HIV. As part of a bigger church, they have a mission health department annex the church province, which does its own health education programme in their congregations. They recently came to town do a campaign on HIV, connected with sexually transmitted diseases (STD), and the related item of safety in blood transfusions. He furthermore recollects Family Planning as a recent health education topic.

He is personally involved in counselling HIV-patients, and he notes that since his arrival, the notion of social isolation is diminished, and their consults are now more focussed on how to maintain personal motivation in daily life. He is also convinced that the cause of the high UTI and Amoebiasis frequencies are related to polluted water sources. He mentions that the concrete mounted water reservoir on top of the hill in central Natta was taken into use in 2014 and was initially expected provide safe borehole groundwater.

With regard to the choices made for traditional or modern treatment he suspects a strong role for economic reasons, referring to the range of costs involved in modern medicine, and the variable availability of drugs. He emphasises his religious background and upbringing but knows that TM can treat convulsions *('degedege'*), and that there are known effective concoctions to treat diarrhoea and Amoebiasis. He is aware of the fact that the treatment of convulsions by traditional healers has a risk in the way the dosage is unstandardised and he fears that there may have been instances where an overdose was applied. He makes a remark on the side that there is a tree in front of his house which he uses to prepare his home remedy when he has diarrhoea, which is very effective. He regards diarrhoea not as being really ill. He sees a specific role for traditional treatment with

reference to spiritually connoted diseases, *('Majini'*) which can be distinguished from psychological disorders through the communication with the patient. In his view you can have a conversation with a psychologically distressed person, but you can't reach a possessed person with reason. He makes mention of the local belief of the threat of 'being killed at a distance' *('Mana mana'*), for reasons of jealousy or any sort of 'revenge' for a social injustice incurred in the perception of the person.

In respect of efficacy he says TM cannot treat paralysis *('Kulemaa'*), or fever and headache the same way MM can, but with regard to musculo-skeletal diseases, such as joint pains or swellings, the herbalists are very capable of treating these with locally prepared treatment. He was personally curious as to the limitations of TM and recounts a visit made by himself to a traditional healer pretending to suffer from 'general body pains'. The treatment of the healer eventually proved unsuccessful and he was referred to the clinic.

With regard to extending or improving health education, he suggests the medium of role play ('*Maigizo'*) which, in his view, is the most effective way of reaching a wider audience, especially on socially delicate topics such as HIV/AIDS or STD's.

Respondent M. has been with his congregation for ten years. The church has a limited number of members in the community, and he resides in a neighbouring village a few miles away. His first remark on the local health status is the impact of malaria in the area which is often addressed by self-treatment *i.c.* 'Alu' from a pharmacy, and equally often by TM. Especially with regard to the convulsions with children (*degedege*). He makes a reference to the viewing of a bird during pregnancy which will lead to the assumption that the child may die when treated with an inoculation at the hospital (*cf.* Makemba 1996; Hahn 1999; Comoro 2003; Langwick 2011; Denisenko 2013). He subsequently mentions alternative treatments with a bird's feather, its ashes applied in an incision, or the inhaling of burnt elephant dung.

Current health concerns are Amoebiasis and UTI, both regarded as waterborne diseases, which appear endemic for the area, followed by HIV respectively. For diseases typically addressed by TM he mentions stroke -because of the paralysis symptoms- and diabetes, which carries the reputation that it cannot be cured by MM. He also names the spiritual disorders which are locally referred to as '*mana mana*' but he cannot explain these in detail.

Whether TM is preferred because of efficacy, cost or cultural belief, he is convinced that cultural belief is dominant, and a large number of people simply do not believe in the causality which is presented in official health education. He adds that TM -in his opinion- is not cheaper than MM, as it often occurs that a patient who receives successful treatment, is asked to add livestock to the initial payment which can make the total amount much higher than a hospital bill. The health centre has a regular shortage of drugs, whereby a patient after receiving a diagnosis can be advised to go to a pharmacy to buy the required medicine. A patient may be tempted to go to a pharmacy again straight the next time the symptoms reoccur, thus creating a shortcut without a proper diagnosis. He explains the facilities are subject to a procurement system in which there is no relationship between actual morbidity rates and perceived need, but central allocation based on financial turnover.

Regarding HIV-patients, especially if there is no test, people who experience the symptoms may not be able to admit to themselves that they are infected, because of the social implications. He illustrates this by the example of a man who lost his wife as a result of HIV. As he didn't carry the suspicion of being infected himself, he was left to marry another woman and continued to be a hazard for his social environment. He feels that HIV-patients who seek treatment with TM are

actually in a state of denial on many occasions. He emphasises that the decision where to seek treatment is very much dependent of the result and the personal relationship which is developed with the one who provides treatment. He compares the service at the hospital to treatment with a commercial pharmacist or a traditional healer where there is more personal attention, and no waiting room.

On the co-operation between TM and MM he feels that both have a history of mutual criticism, but both sides have created that situation themselves, and it will take time to rebuild confidence. Some alternative providers have been very creative in combining attributes of both medical services to suit their clients. He gives the example of a pharmacist who takes samples and pretends to do a lab test in the back of his shop without having any equipment for analysis. He comes back with the diagnose on a paper slip to support his advice for treatment, purely based on his interpretation of the symptoms. Then there is a clinically trained person in a neighbouring village, who combines both types of treatment, offering traditional herbs alongside modern medicine in his private practice, addressing the needs of his clients by providing the best of both worlds. He proceeds with a personal reflection to indicate his confidence in TM. His son developed convulsions as a child, but similar symptoms reoccurred when he was about 11 years old. It inspired him to take his son to several hospitals *e.g*. Kilimanjaro Christian Medical Centre (KCMC), but he asserts that eventually it was TM treatment which ceased the endless consultations. The diagnosis at KCMC is named cerebral artery problems, but the treatment is not recollected.

On the topic of health education, he as well proposes publicly set role plays as being the most effective way of educating the local people who display strong culturally rooted beliefs. He adds that continued health education is absolutely necessary and illustrates his standpoint by referring to an educational project of 2000 (SHIMWAJAWA). It was set up as a Sunday school for children of people who saw no use in sending their children to school, a group which produced university graduates after years of perseverance.

The free services advertised by government policies are not being implemented in his view, and he inserts a personal anecdote of his mother who is in her eighties, was referred to the hospital to receive an infusion and was yet charged with 20,000 TZS without any consideration.

6.3.5 Community Based Health Promotion Programme (NGO)

Respondents V and W (*NGO management health staff*)
V: In his view, the dominant motive in utilisation is not strictly cultural but economically driven. In his experience, especially poor people in rural areas will initially consult TM because of accessibility, both physically and financially. The fact that many communities are not equipped with modern facilities, or because they are too remote, will sustain such a practice.

He feels the role of poverty is underestimated, and he mentions the promotion of a national health insurance. Even the most elementary investment into that service is considered disproportionate in case one does not fall ill. The idea of being covered through different levels in a referral system is apparently not yet appealing enough, or tangible enough, for the majority of people. Overall, he sees there is a change though. Spending 10,000 TZS fee in a whole year instead of 100,000 TZS plus on a hospital visit is slowly gaining ground. In his view there is the widely felt need for a causal explanation for getting ill, which need is well addressed by TM and not by the MM health staff.

During consultation in MM facilities, a confrontation with initial self-treatment or using TM will lead to denial, or at least, non-sharing of information. He adds that the basic attitude of many health staff in modern facilities is not inviting enough (*'harsh'*) to be preferred over TM. The waiting lines and the impersonal treatment are fending off many people. It is amplified by the lack of recognition of TM by the modern health system, which will not encourage practical co-operation in case of perceived undesirable treatment. In order to establish which diseases are liable to be covered by TM, in his view, can only be determined by directly communicating with traditional healers.

W: Underwrites his colleague that a disease classification linked to either TM or MM would not be an appropriate approach. It is the locally rooted belief which determines most of the actions undertaken, whereby the question of 'why' that disease is occurring with a particular person is dominant. It is widely believed that an individual can invoke illness upon another person on account of any social relationship connected reason. He explains that this concept will be dominant over a microbiological cause at any time, and therefore renders it to a secondary level.

He suspects that this dominance is the most probable cause why there is a large number of morbidities seen crossing over between the two medical systems without a specific pattern. He asserts that it is the attitude of the traditional healers which enables them to sustain their position. They are receptive of personal motives and socio-cultural context, and they also take time for these aspects. It not only makes them more accessible, but also respected from the patient's viewpoint, besides a perceived lower cost level. He later adds that TM can be equally expensive at times.

In his reflection on the effectivity of TM, he assesses many practitioners to have very good psychological capabilities, and making use of such qualities, but without a deliberate advertisement. That leaves the determination of a biological cause of a disease untouched, however he feels this should still be done, in the light of suspected 'inappropriate' treatment. A patient may still be at risk after treatment by a traditional healer in the case of HIV. He gives the example of a misinterpreted symptom of CBP with a handicapped person, which was treated as a 'spiritually' caused illness had an adverse effect considered critical at that stage. At the same time, it is necessary to change the attitude of MM towards these situations, as health staff are not receptive of patients with ambivalent motives, having used TM in an earlier stage. He believes that there is an increase in self-treatment, also with commercial medicine, on account of the attitude of health staff.

A complementary aspect in the process of making choices is related to poverty in a very practical sense. In his opinion the inhibition of exposing one's poverty leads poor people to averting MM health institutions because one feels not representable, which is virtually absent in using TM. He does see possibilities in co-operation between the two systems but apart from giving TM their due respect, something should also be done towards a more receptive attitude with MM staff in order to regain confidence with the general audience.

Referring to the workshops in the recent past to train local healers and TBA's, he remarks that currently the priority of the district lies in reducing the relatively high infant mortality rate (IMR). It is organised through a special three-year promotion programme in co-operation with Johns Hopkins University, funded by the UN, involving his NGO as network in co-ordinating volunteers on village level. The underlying motive is that the IMR is suspected as a result of the large number of women who consult TBA's as a first level of service.

The *Mkunga wa Jadi* are regarded to insufficiently recognise or underestimate the pregnancy related complications (PRC) at hand, and may not refer these mothers to the MCH units, or too late. He brings the ambivalence once again to the attention, because even though co-operation with TM

was always on the agenda, reducing the IMR as a priority now renders these same partners (TBA's) as not reliable enough to contain this problem. The referred three-year programme (JHPIEGO) is set up accompanied by a wide public recruitment campaign.

6.3.6 Traditional Birth Attendants

Respondents X, X1 and X2 (*traditional midwifes, one urban, two rural*)
X: She shows her license for which she paid 60,000 TZS, although the ward executive office has interdicted them from operating currently without a refund of the fee she laments. She is a member of the healers association (CHAWATIATA), but it has been some time since there was a meeting. Besides that, she indicates there is no regular contact with either MCH or the community based health promotion programme (IMARA) [28].

With reference to the co-operation which took place in the framework of the CSPD [29] programme, she says that she was at that time not selected for training because of her illiteracy. She has now been inactive for about a year. She keeps a large file with photographs of her patients for which purpose she uses a photographer on a permanent basis. She has a large knowledge of various herbs and midwifery which she both obtained from her mother over the years. It is clear from the records she keeps that the majority of cases presented to her are people with some kind of mental disturbance, although some of them are also classified as being bewitched. She explains that she interviews people to the extent that she can establish the cause of their mental state. It is obvious from her reasoning that she applies a great deal of psychology and historical perspective. She is suspecting hereditary elements in mental diseases with one group of patients, three sons of the biological father, who display sudden erratic behaviour. She recollects that the grandfather was treated for similar symptoms by her mother before her.

In the field of Maternal and Child Health (MCH) she discusses several pregnancy related complications (PRC) with the Kisare midwife trainer [30]. It is established that she can recognise situations ranging from transverse and longitudinal positions, through cord prolapse and presentation complications, and her criteria for referring cases to the hospital. She can also recognise dehydration and malnourishment, which in turn provides the opportunity to exchange knowledge on the use of ORS, which she did not apply until now.

It is her wish to know more about psychology and she is very eager to know if there could be an opportunity to improve the co-operation between TM and MM, but she does not hear of any progress to that extent. With reference to the workshops of IMARA (CBHPP) in Mugumu, she is familiar with the NGO, but does not have a direct liaison. When asked about the relationship with MM staff she refuses to speak, although she was elaborately negative on their behaviour to our linguist on the occasion of making the appointment leading up to the interview.

X1: This TBA also practices as an herbalist. She too is a member of the association, but in this case she is still active, although she has paid a fee for only a temporary license. In contradiction to her colleague, she does have contact with the district co-ordinator for reproductive health (MCH), and she shows correspondence with the Public Health Department. She indicates that the last meeting of the association was in June, and she has been present at IMARA workshops, primarily dealing with hygienic methods and awareness of riskful procedures. She explains how she obtained her knowledge from both her father and her mother; by watching them perform consultations over the

years and learning how to make assessments of patients, carefully copying their modus operandi. She introduces a protégé, a young niece whom she teaches the collection and preparation of herbs. She is happy to witness that the young girl is showing interest, so her knowledge may be carried over the next generation. She treats cases which, among others, are dealing with female infertility, Amoebiasis, Typhoid fever, and malaria respectively. She presents a bottled concoction which has been composed of at least seven different herbs to serve as a treatment for malaria, with apparent success. In case of female infertility, when she suspects the cause to be mutual, she invites the woman to bring the husband and makes sure that both are given the same medication.

In exchanging knowledge on referral of cases she indicates that she is able to recognise cases which are too severe to treat whom she sends to the hospital. She demonstrates her techniques for establishing temperature levels and signs of dehydration, malnutrition and anaemia with great detail. With regard to making the distinction between spiritual diseases and mental illness, she applies a special session in which the patient is shrouded in an apron and is made to inhale a preparation in isolation. If there is no response to this application, she regards the patient to suffer from psychological problems, otherwise the patients will start responding through erratic speech and acting possessed. She provides no analysis in terms of a strictly behavioural assessment.

In line with the remarks made by her colleague earlier she also emphasises the need for more co-operation with MM. She particular interested in techniques to determine the right dosage as she is made aware that that has been a point of criticism in the past. She admits that their approach is purely from the angle of experience, and she wants to learn more. She asks why there has never been an initiative to test their medicine to prove their performance and eligibility, so that people may also be referred to TM when they are dissatisfied with MM treatment. There has been such a request by the chairman of the healers association in 2013, but the status of that request remains unknown. (*The linguist replies that such an initiative would have to be taken by the association, preferably in conjunction with the local government*). She explains there is a communication and organisation problem within the association. Since they are all individuals who work independently, scattered over a large area, some of her colleagues do not have any form of official registration, or even a mobile phone. Her personal request, on the topic of dosage, is to have modern equipment for cutting, grinding and mixing to prepare their medication more consistently, as it is now handwork which defers exact measurement (*cf.* Marsland 2007).

X2: Although she was originally a member of the association, says that she resigned on account of the lack of clear goals and direction. During one of the last meetings she attended there was a focus on spiritual healing and witchcraft, which she strictly denounces as a devout Christian. During the event, they were trying to force members to disclose the source of their medicine, which she does not agree to. After that she was never approached by any formal institution, nor took part in any of the IMARA workshops, while she does not have an official license anymore.

She explains that her knowledge was handed down from her grandparents in a dream, following her daughter's infertility, which she feels motivated her ancestors to provide her with this knowledge. She greatly cherishes this as a gift from God, although she will later lament that her offspring is not interested in carrying her knowledge forward, and she might take it with her forever.

Referring to the types of problems she is faced with in her practice she first mentions female infertility, followed by regular pregnancies which she will assess to her knowledge, on how to approach them. She explains in detail how she practices, and it comes out that she will more often

monitor a woman for months during her pregnancy until the time comes. That enables her to make a proper assessment. She will refer cases to the hospital when there is an advanced stage of complications, where she feels she is not capable of handling them. After being discussed in detail they are proper assessments according to our midwife trainer (R). She indicates to have knowledge of anaemia and dehydration and she will refer these cases to the hospital, as well as being aware of how to prepare oral rehydration solutions (ORS). She has adopted some techniques in using new blades to cut the umbilical cord and wear surgery gloves, properly boil and filter water, among others. She treats complications which she is familiar with external and manually in repositioning the foetus, just as she is massaging the abdomen after birth to relieve the new mother of post-partum pains.

She underwrites the desire to have co-operation between modern and traditional medicine, but at the same time there is an element of competition between the healers. She calls it 'jealousy' once there is an intimate relationship with MM, which is difficult to appease because there is infrequent contact among colleagues. In terms of willingness to co-operate she is ready to submit her herbal products for testing on efficacy, on the condition that it is done within a timespan which will prevent them from deteriorating. It should preferably be done immediately after she prepares them, and she is not required to disclose which herbs are used in advance.

When asked about the feedback of patients she referred to the hospital, she comes out with criticism towards the invasive type of assessment as is applied in the hospital, and the way they are treated in dealing with pain after giving birth. According to her own patients, the staff often treats mothers in a rude way, verbally as well as physically, which scares off many people because they don't understand what invokes the staff's patronising attitude.

6.3.7 Survey Area Health Facility at Nyamburi

(Y, Z: Dispensary Senior Health Staff-members)

In the triple level range of health infrastructure in the region, the facility at Nyamburi is elementary. The dispensary is equipped with basic medical tools but does not have a full-scale laboratory and is provided with insufficient malaria and HIV test kits. The staff consists of a Clinical Officer (CO), Midwife (male), Nurse, and a Technician. The Village Health Worker does not have an official base and only makes house calls, although he works in close co-operation with the other staff. The dispensary is located just off the main road, as indicated in image 2 in par. 4.3.1. There is an Environmental Health Inspector monitoring waste disposal and domestic hygiene, household annex latrines, although he has no official sanctions to have inhabitants adhere to the standards. He makes his rounds and invests ample time in health education, but he is sceptical about the impact.

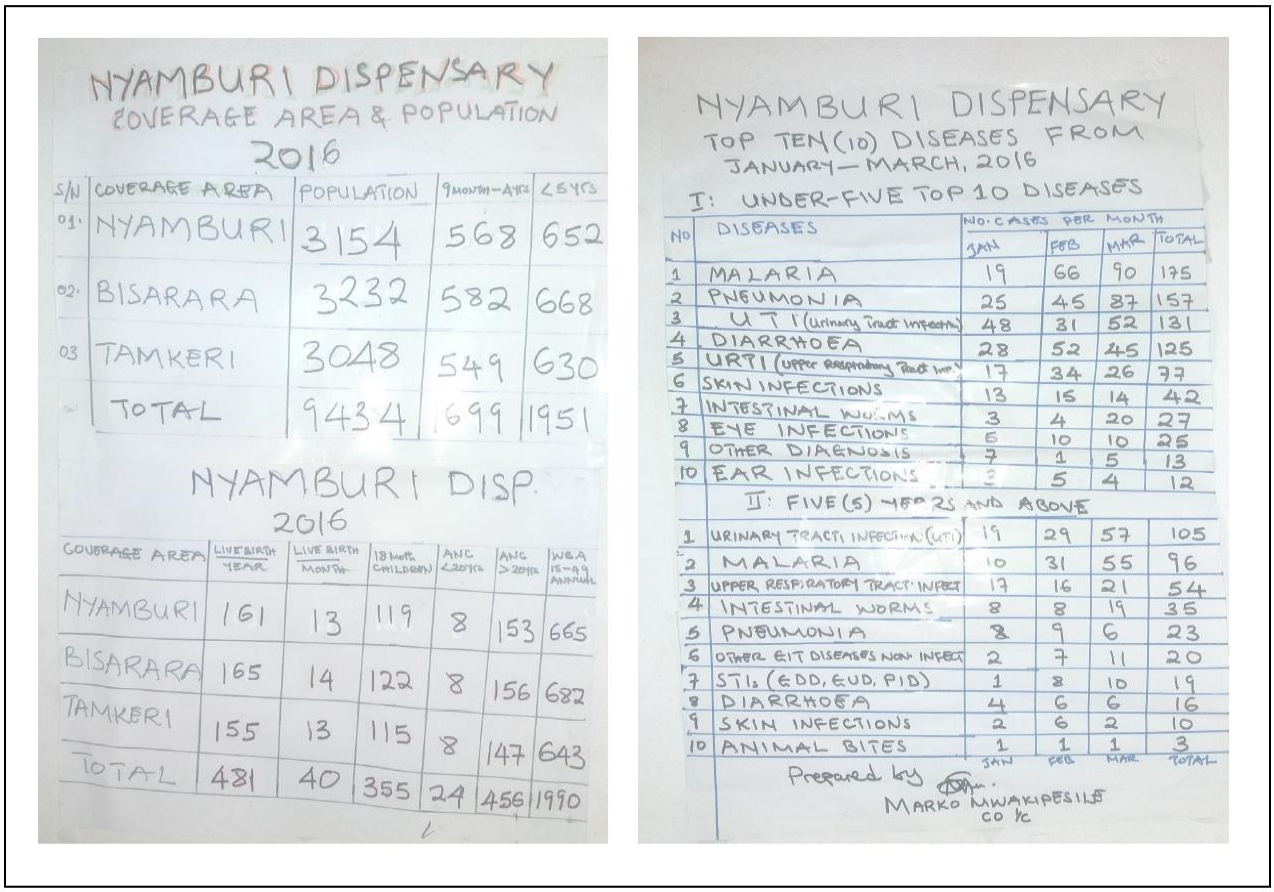
A limited number of over the counter drugs are sold commercially in town, and applied with- as well as without official diagnosis, more often so when the dispensary runs out of medical supplies. That happens as a result of stock being determined by budget allocation and availability, not by registered morbidity rates, according to the CO, as similarly reported during the qualitative pilot survey. Nyamburi's CO also is very keen on creating awareness with his staff and clientele, and he has put up handwritten morbidity rates and coverage area concerning his station on the wall of his OPD (Image 3). From his experience the CO makes mention of the fact that certain morbidities may be underreported because of insufficient clinical testing. On the other hand, the interpretation of symptoms by patients is always very challenging as they tend to popularise specific combinations.

He illustrates this by his treatment of a person who was experiencing a trauma after being involved in a traffic accident but requested the CO to provide him with malaria tablets because he was having a headache, bodily pains and perspiring heavily.

Another aspect which he mentions which intervenes with his protocol is that people who are diagnosed with a certain illness, do not take the prescribed treatment, but go to the pharmacy and buy pills themselves. They purchase insufficient quantities however, and stop the moment the symptoms subside, thereby not completing the required cure with all due consequences. It may as well happen as a result of unavailability of drugs in the system.

He welcomes the idea of a Health Information System in such a way that he could exchange medical statistics directly via internet with the Public Health Department in Mugumu and have the drug supply being linked to the actual data online. Now the information is mostly one way, from the dispensary to the department, without instant feedback or consecutive processing.

Image 4. Nyamburi Morbidity Rates on Dispensary Wall.



NYAMBURI DISPENSARY
COVERAGE AREA & POPULATION
2016

S/N	COVERAGE AREA	POPULATION	9 MONTH–4 YRS	<5 YRS
01.	NYAMBURI	3154	568	652
02.	BISARARA	3232	582	668
03	TAMKERI	3048	549	630
	TOTAL	9434	699	1951

NYAMBURI DISP.
2016

COVERAGE AREA	LIVE BIRTH YEAR	LIVE BIRTH MONTH	18 Month CHILDREN	ANC <20WK	ANC >20WK	W&A 15–49 ANNUAL
NYAMBURI	161	13	119	8	153	665
BISARARA	165	14	122	8	156	682
TAMKERI	155	13	115	8	147	643
TOTAL	481	40	355	24	456	1990

NYAMBURI DISPENSARY
TOP TEN (10) DISEASES FROM
JANUARY – MARCH, 2016

I: UNDER-FIVE TOP 10 DISEASES

NO	DISEASES	NO. CASES PER MONTH JAN	FEB	MAR	TOTAL
1	MALARIA	19	66	90	175
2	PNEUMONIA	25	45	87	157
3	UTI (Urinary Tract Infection)	48	31	52	131
4	DIARRHOEA	28	52	45	125
5	URTI (Upper Respiratory Tract Inf.)	17	34	26	77
6	SKIN INFECTIONS	13	15	14	42
7	INTESTINAL WORMS	3	4	20	27
8	EYE INFECTIONS	5	10	10	25
9	OTHER DIAGNOSIS	7	1	5	13
10	EAR INFECTIONS	2	5	4	12

II: FIVE (5) YEARS AND ABOVE

1	URINARY TRACT INFECTION (UTI)	19	29	57	105
2	MALARIA	10	31	55	96
3	UPPER RESPIRATORY TRACT INFECT	17	16	21	54
4	INTESTINAL WORMS	8	8	19	35
5	PNEUMONIA	8	9	6	23
6	OTHER EIT DISEASES NON INFECT	2	7	11	20
7	STIs (GDD, GUD, PID)	1	8	10	19
8	DIARRHOEA	4	6	6	16
9	SKIN INFECTIONS	2	6	2	10
10	ANIMAL BITES	1	1	1	3
		JAN	FEB	MAR	TOTAL

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Cover image: Morbidity Rates on Nyamburi Dispensary Wall. Notice that UTI ranks in the top three twice but is absent in the district morbidity rates from the Public Health Department in Image 1. (photo by Mr. Nemes Joseph Sianga, Fieldwork 2016)

6.4 Qualitative Data II: Kurya Health and Healing Concepts

In line with the aim of documenting indigenous knowledge attention was given to the connotations of various diseases recognised by the inhabitants as being specific for the area. Preceding the household survey local traditional healers were classified in four groups by key informants. The first group consists of people which can use divination, capable of foretelling the underlying cause of your problem, and suggest a solution, either or not through medication. The second group applies medicine only (as in herbalists). The third group does not use medicine but uses divination only and refers people to the first two types. The healers are said to receive their knowledge either through dreams, as one TBA in our survey explained in detail, or through the instruction of their parents (mainly applies to the herbalist). Finally, there is a (fourth) group which distributes herbs but acquires these from another herbalist, or they are instructed by them how to apply them. The first group are considered the most reliable, or "*honest*" -the word which was used. Many people consult more than one traditional healer and compare the outcome for accuracy. In that sense a 'second opinion' is in no way an aspect typical of modern medicine.

According to the elders the diseases which were primarily treated with traditional medicine, suspected of having a spiritual cause, were: epilepsy (*iririmo or indoli*), paralysis *Ilisusu*, (a.k.a. Kupooza(S)), female infertility (*ubhughumba*), impotence (*ughuchighala*), infants below seven days who cry for a long time (*Ichindoko - suggestion is that they have not been given a name, or not been given the right name*) persevering headaches (*migraine*), Elephantiasis (*Amatende)* and convulsions (*ukwibhabha,* a.k.a. *Ing'usa*). It is suggested that there is a causal relationship, whereas convulsions (*degedege*) are also perceived as an early stage of epilepsy. Suspected curses from ancestors (*iriraga),* which may be manifest through marital problems, infant mortality, or bad luck, are also presented to traditional healers. The categorisation between mental illness and being affected by witchcraft is made by the level of communication. As is referred to in the qualitative analysis, a mentally ill person can still make normal conversation, a spiritually cursed person cannot communicate in normal sentences. The display of erratic behaviour is not mentioned as a specific symptom for either category. On a different plane the ethical component became visible, as they explained that an extreme focus on material wealth ('*seeking riches*') is classified as a spiritually caused illness. Similarly, the manifestation of impotence is connected to displaying antisocial behaviour in terms of seeking a sexual relationships with family members. Fractures in particular are said to be the domain of the traditional bonesetters, who are generally preferred over MM, and who have such a good reputation that even hospitals occasionally refer their patients to these professionals. Some diseases have shed their original classification though, for example forms of malnourishment, which were formerly frequently associated with witchcraft, but nowadays mothers apparently take these children to the hospital. In most cases people who are regarded as being mentally ill are not taken to a hospital but preferably to a traditional healer.

As explained earlier in 5.4. a distinction is made by respondents between ' old' and ' new' diseases. Those classified as 'new' are usually not presented to traditional medicine, except when the results from a hospital treatment are unsatisfactory. The ones mentioned here as 'new' are HIV/AIDS, cancer, diabetes, cardiovascular diseases, typhoid fever, and high blood pressure. The most confidence with modern medicine is placed in the advanced techniques, such as inoculations, blood transfusions, laboratory analysis, X-rays, mass produced pills and surgery. On the other hand, there is suspicion among patients regarding inconsistencies in quality, where mention is made of fake

medicine, referring to commercially produced 'cheaper' version of the original, but mingled in the official system, to '*make money'*. Then there is a notion of 'fake' doctors, supposedly unqualified practitioners who make mistakes during operations and cause people to die in the hospital. It was impossible to establish the actual validity of these statements by respondents, or to present specific cases where this would apply, but even if it is hearsay, it is an example of where MM proves vulnerable. The fact remains that they were mentioned without being triggered purposely.

In the end however, MM retains the status of a 'final option' as people unanimously indicate that that is where one goes when seriously ill. These ways of dealing with emerging symptoms were familiar to the staff of Nyamburi dispensary. They indicated that there is no experience with taking tests in an early stage, so when the disease is already manifest in an advanced stage, is when decisive action is taken. One example provided was the case where a person had experienced lingering symptoms for several months, tried various remedies, homemade as well as from professional healers, until he is tested at the hospital and diagnosed with diabetes. The Clinical Officer stated that there is a tendency of trying multiple low-key therapies, often because of poverty, but many situations are approached by trial and error, depending on the severity of the symptoms.

6.4.1 Indigenous Knowledge & Medicinal Aromatic & Cosmetic (MAC) Plants

Table 11 shows types of cures and herbal medicine as mentioned by respondents during the household survey. Local people interviewed by the research assistants said they knew the plants and trees but could not always show species at that point because they couldn't trace them anymore. The species included here were photographed on site. The scientific indexation was partly done by Patrick Maundu, Ethnobotanist from National Museums of Kenya.

Most of the respondents knowledgeable on herbs (n=32) came out to be female 68,7% (22) and a total of 17 in the top two generation groups of which the highest single cell is 11 women above 55. The lower age groups also hold a majority of women, 5 out of 8 persons. That is in line with the qualitative research, where the transfer of knowledge is recorded within first grade family members, either or not parents or in-laws, with a strong emphasis on women. A selection of these people was capable of naming more than one or two types of preparations with the accompanying application, see Table 10. Of the selection of respondents (n=32), a majority of 62,5% (20) also utilised TM, but the cross-over to other systems is consistent with the other bivariate analysis, as 34,4% (11) also utilised MM at one point. Of the 20 respondents who used TM, 6 applied home remedies, and 12 consulted herbalists, also travelling outside their homestead in the process.

Table 10. Knowledge of Herbal Medicine over Plural Medical System Utilisation (n=32)

TM knowledge	TM	TR	MM	Total	Percentage
Little knowledge	11	1	8	20	62,5%
Some knowledge	9	0	3	12	37,5%
Total	20	1	11	32	100,0%
Column Percentage	62,5%	3,1%	34,4%	100,0%	

Cramer's V= 0,169, Chi Sq. = 0,05

Source: Fieldwork data 2016

As reported in the qualitative research the knowledge is transferred within groups and between groups, where the spouse is usually taught home remedies by either her own parents or by her in laws. If the spouse moves, the knowledge moves along to the next household. What is noticeable is the relative high age as 75% (24) of these people reside in age group four and five (45+), but there is transfer of knowledge to the younger generation, as 25% (8) people belong to lower age groups. The importance of the measurement is borne in the remarks made by teachers and TBA's in the qualitative research that the interest is diminishing among the younger generation. A sample of 18% (32) respondents out of the household head interviews (N=175), made specific remarks about the position of TM. One household head pleaded for herbal medicine to become over the counter drugs as in pharmacies, but most respondents indicated that it became increasingly difficult to find the right species. The morbidities they are preoccupied with concentrate on abdominal pains, diarrhoea, UTI, allergies, jaundice, anaemia and convulsions, among others. Malaria was mentioned only twice across this range of species. Twenty types were used in conjunction with others from the listing (*cf.* Table 14). The essence is that these respondents (n=26) named them as remedies while not being professional herbalists. The preparation and treatment mentioned are transcribed below;

Table 11. Medicinal, Aromatic & Cosmetic (MAC) Plants Reported in Household Survey.

Local name	Species name & part	Preparation & treatment
ilisibitali (*)(**)(***)	Lamiaceae sp. *(root & leaves)*	Pounded and boiled, used for Amoeba and abdominal pains
urung'uno (*)(**)(***)	*Harrisonia abyssinica Oliv. (root)*	Boiled to drink. Used for UTI, Amoeba, abdominal pains, menstruation
ubhoke bweitimo (*)(**)(***)	Lamiaceae sp. *(leaves)*	Pounded and boiled, drink for UTI, Amoeba and stomach-ache
ikiiri (*)(**)(***)	*Ocimum gratissimum (leaves)*	Pounded and mixed, drink for stomach-ache
iwawa (*)(**)(***)	*Momordica foetida* Schumach. *(leaves)*	Pounded into skin rub for joint pains, and with fractures
ikimusi (*)(**)(***)	*Euclea divinorum* Hiern *(root)*	Boiled, used for Allergies, boils and Jaundice
omosese (*)(**)(***)	*Rotheca myricoides (Hochst.) Steane & Mabb. (root)*	Pounded and mixed, drink for Amoeba and UTI
iririrebhana (*)(**)(***)	*Plectranthus barbatus* Andrews *(root & leaves)*	Pounded and mixed, drink for Amoeba
umuribha (*)(**)(***)	*Kigelia africana* (Lam.) Benth. *(fruits)*	Peeled, cut and boiled, used for Anaemia
irihirirya (*)(**)(***)	*Lantana ukambensis* (Vatke) Verdc. *(leaves)*	Pounded, chewed and sniffed, against fever
omotembe (*)(**)(***)	*Erythrina abyssinica* Lam. ex DC (*bark + leaf)*	Mixed and boiled. Used for Jaundice
kinyonyo (*)(**)(***)	*Oxalis corniculata* L. *(leaves)*	Pounded and mixed, drink for nausea
eghetalatula (*)(**)(***)	*Solanum incanum* L. *(root)*	Pounded, mixed and boiled, Diarrhoea, menstruation.

Local name	Species name & part	Preparation & treatment
mchele (*)(**)(***)	*Ozoroa insignis* Delile *(leaves)*	Pounded, mixed and filtered into drops, applied with eye sores
omupela (*)(**)(***)	*Psidium guajava* L. *(young leaves)*	Pounded, mixed and boiled, drink for Diarrhoea
bhurubhoikonde (*)(**)(***)	*(indet.) (root & leaves)*	Pounded, mixed and boiled for Amoeba
Umunyanduku #	*Zanthoxylum chalybeum* Engl. *(root & bark)*	Pounded and boiled, for ulcers
Umusisi #	*Tamarindus indica* L. *(bark & leaves)*	Pounded and boiled, for ulcers
ilityambwi (*)(**)(***)	*Sesamum calycinum* Welw. *(whole)*	Boiled, eaten for joint pains, specially knees
Omohenga/umunyente (*)(**)(***)	*Hoslundia opposita* Vahl *(leaves)*	Pounded, mixed drink for nausea
umwitanchoka (*)(**)(***)	*Senna occidentalis* L. *(root)*	Boiled and chewed, swallowed. UTI, Amoeba, Typhoid, Stomach
ekeghaghana (*)(**)(***)	*Gardenia volkensii* K. Schum. *(root)*	Pounded mixed with water. Nasal for convulsions (‘degedege’)
omosabhisabhi (*)(**)(***)	*Sesbania sesban* (L.) Merr. *(leaves)*	Boiled and eaten as porridge with body pains (trauma) skin bites
umuchahechahe (*)(**)(***)	*Cymbopogon citratus* (DC.) Stapf *(leaves)*	Boiled. Used to remove poison & Jaundice
ikitabhalali (*)(**)(***)	*Crassocephalum pidicrifolium* (DC.) S. Moore *(leaves)*	Pounded, boiled, applied as drops in sore eyes
omotaminyoo (*)(**)(***)	*Olea europaea ssp. cuspidata* (Wall ex G. Don) Cif. *(root)*	Boiled, drink for epileptic seizure
mwarobaini (S) (*)(**)(***)	*Azadirachta indica* A. Juss. *(root, bark, leaf)*	Boiled to drink for Amoeba, Diabetes, malaria and boils
mbulumatare (*)(**)(***)	*Melia volkensii* Gürke *(leaves)*	Boiled to drink for abdominal pains
inyimirya (*)(**)(***)	*Fuerstia africana* T.C.E. Fr. *(root & leaves)*	Pounded, mixed and boiled. Used for convulsions, Amoeba.
umunyingyi (*)(**)(***)	*Lannea schimperi (*Hochst. ex A. Rich.) Engl. *(bark)*	Boiled, drink for Cholera, menstruation, or stomach-ache
ilibhabhayo (*)(**)(***)	*Carica papaya* L. *(leaves)*	Mixed and boiled. for Jaundice
ilitoke (*)(**)(***)	*Musa* sp. *(root & leaves)*	Boiled, to drink for Jaundice (Manjano)
ubhinyankara (*)(**)(***)	*(Indet.) (fruits)*	Pounded and boiled, drink to induce vomiting to clean stomach
ikyulanse (*)(**)(***)	*Hydnora abyssinica* A. Br. *(root)*	Pounded, grinded, mixed to drink with pregnancy complications
egesamulya (A) (*)(**)(***)	*Kalanchoe* sp. *(leaves)*	Pounded, mixed. Applied nasal for convulsions (degedege)

Local name	Species name & part	Preparation & treatment
egesamulya (B) (*)(**)(***)	*Kalanchoe* sp. *(root)*	Dried, pounded, mixed. Nasal for allergies, and fever (homa)
ilitaghala (*)(**)(***)	*(indet.) (leaves)*	Pounded and boiled, drink to induce vomiting to remove poison
umulutunguli (*)(**)(***)	*Drimia altissima* (L.f.) Ker Gawl. *(leaves)*	Boiled, drink for malaria
nyabhisala (*)(**)(***)	*Adenia gummifera* (Harv.) Harms *(bark)*	Pounded mixed with water. Used to prevent miscarriage, and boils
weisebho (*)(**)(***)	*Ageratum conyzoides* L. *(leaves)*	Pounded and boiled, used for UTI, Amoeba or stomach-ache
iriraraura (*)(**)(***)	*(indet.) (root + leaves)*	Boiled to drink, for stomach-ache, and Amoeba

N.B.: Identification of species through visual recognition by Katalina Marwa, Nchagwa Surusi**, Gaita Chacha***, TBA's and herbalist, recorded and transcribed by Daniel Matinde. Source:* Fieldwork data 2016

Of the species mentioned here, pictures were collected and ranked according to the original numbering during the recording (*cf.* Table 14). They are presented by the transcription in the local language (*Igikurya)* followed by their scientific names. In the questionnaire there were two sets of open-ended question which were dedicated to top of mind knowledge on either of the medical systems and its practices. The first set inquired as to what type of illness would be preferably presented to a traditional healer, which would be suitable for self-medication, and which would involve a hospital visit. The second set inquired after the name of the treatment, the type of medicine or the type of therapy typically representative for a particular medical system. Regarding the type of illness best treated through traditional medicine (question 2.15) in multiple score (N+ ranging from 1 to 4 types) produced the following top ranking out of a total of 245 types mentioned, answered by 161 (92%) of the household head respondents (N=175).

Table 12. Perceived Morbidity Treated with Traditional Medicine (n=161)	N+	%
Urinary Tract Infection (UTI)	33	20,50%
Amoeba (ukaptula)	33	20,50%
Convulsions (degedege)	24	14,91%
Abdominal Pains (maumivu ya tumbo)	21	13,04%
Jaundice (manjano)	19	11,80%
Epilepsy (kifafa)	14	8,70%
Boils (jipu)	7	4,35%
Paralysis (kupooza)	6	3,73%
STD (kisonono – Gonorrhoea)	6	3,73%
Diarrhoea (kuharisha)	5	3,11%
others (miscellaneous)	77	47,83%
Number of respondents	161	100,00%

Source: Fieldwork data 2016

Apart from this listing which shows, with lower frequencies, diarrhoea (*kuharisha*), (partial-) paralysis (*kupooza + kulemaa*), sometimes attributed to epilepsy, gonorrhoea (*kisonono*), the rest category contains infertility, depression, nosebleed, mental illness, fractures, abcess, pneumonia, cholera, typhoid, worms, toothache, among others. These same respondents all indicated they would use other medicine, either through the dispensary or the pharmacy, complementary to herbal remedies if these proved insufficient. The mirrored question in the same set (question 2.17) inquired which type of illness a modern doctor cannot cure, and the listing was almost uniform across the sample, naming HIV/AIDS (*ukimwi*), diabetes (*kisukari)*, cancer *(saratani*), stroke (*kifafa*), Ebola and asthma (*pumu*), respectively. Incidentally, these morbidities would also show singularly in the listing treated with home remedies or by traditional practitioners.

Table 13. Aware of Traditional Remedies for Perceived Morbidities (n=151)	N+	%
Abdominal pains (maumivu ya tumbo)	50	33,1%
Urinary Tract Infection (UTI*)	22	14,6%
Jaundice (manjano)	15	9,9%
Malaria (*ilikengeti (K*)	13	8,6%
Amoeba (ukaptula)	18	11,9%
Diarrhoea (kuharisha)	9	6,0%
Boils (jipu)	9	6,0%
Convulsions (degedege)	7	4,6%
Tooth ache (maumivu ya jino)	6	4,0%
Fever (homa)	4	2,6%
Others (miscellaneous)	107	70,9%
Number of respondents	151	100,0%

Source: Fieldwork data 2016

Open question 2.18 *(For which type of illness do you know a herbal remedy?*) was answered by 151 (86%) respondents, producing a total of 260 types. That listing is compared with Table 12. Here the high volumes have a different ranking. The number of people knowing of herbal remedies is marginally smaller than the number presenting certain diseases to TM, but the type of diseases show an overlap. A remarkable position of malaria in this case, as it was absent in the former listing, yet there is apparent confidence in TM with individual respondents. Incidentally the root of Aloe Vera (*boiled*) was mentioned as the treatment for malaria. Again a wide range of other morbidities were mentioned in lower frequencies (107, 70,9%). Despite these numbers, the majority does not consider itself knowledgeable in TM. The C.O. in Nyamburi suspects that any fever of unknown origin is often labelled malaria (see 6.3.7).

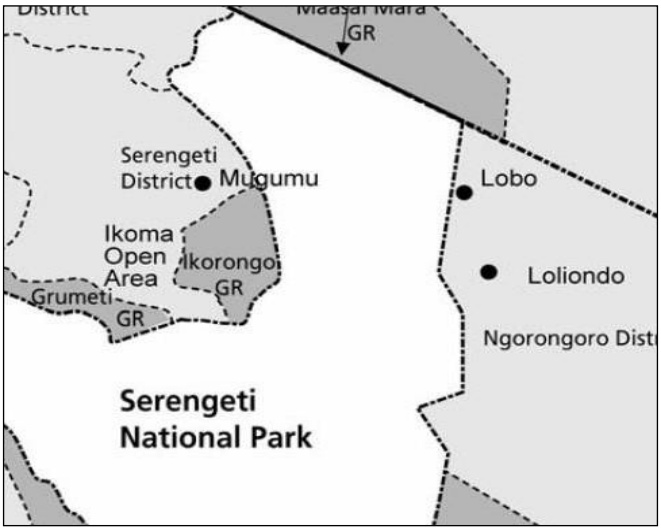
Considering that the source of this knowledge rests with the parents of these respondents, the historical perspective as to the origins of these species was only traceable via an herbalist who was from an early age group, now 66 years old [31]. Told by his grandfather (d.o.b. 1890), the non-indigenous species, said to be introduced by early missionaries, are nr. 26 *Umuchahechahe,* 29 *Mwarobaini*, 30 *Mbulu matare* (Mtishanga), 33 *Ilibhabayo,* and 34 *Ilitoke*. It is emphasised that these do not grow in the wild but are planted around homesteads and gardens or sold in a marketplace. In that respect it is essential to identify the specific age group of the respondents as that is the key to attribute the origin of this knowledge in diachronic analyses (*cf.* Shetler 1998). With regard to the species named in either *Igikurya* or *Swahili* by the knowledgeable respondents during

the household survey, several are mentioned in other research (*cf.* Gessler 1994; Owuor 2012; Chirangi 2013), although the diseases where the treatment is applied for may differ. It may be expected to the extent that the other remedies were provided by professional herbalists, but it does indicate that the applications of local treatments do not serve a single purpose. There may be a difference in local applicability on the basis of the effects as described by Gessler (1994), in the sense that similar species retrieved from different geographic locations also showed different levels of bioactive components. In the cases of *Zanthoxylum chalybeum* or *Harrisonia abyssinica*, for example, these are attributed anti-malarial properties by these respective authors but are not associated with that disease by the respondents in this sample. Considering language syntax errors or possible duplication because of regional differences, there are at least four species which are designated by another -or similar sounding- Igikuria name in the work of Bethwell Onyango Owuor (2012) in Kenya, although the botanical names are identical, as in the case of:

11 *Irihirirya*	*Lantana ukambensis*	noted as: *Irinyente / Irihiriria*
15 *Eghetalatula*	*Solanum incanum*	noted as: *Iritorotoro*
31 *Inyimirya*	*Fuersta africana,*	noted as: *Ekebunga baare,*
32 *Umunyingyi*	*Lannea schimperi*	noted as: *Umunyingei*

In Owuor's description of concoctions, species from this study's listing incidentally reoccur but not in the same constellation, *e.g.* nr. 44 *Weisebho – Ageratum conyzoides*, used to stop bleeding, rashes and constipation, in combination with two other species. Nr. 12 *Omotembe - Erythrina abyssinica*, as well is used in combination with three other species to address sexually transmitted diseases (STD). For these examples there are no similar combinations found in this study. The scheme in Table 14 shows the intricacy of the possible combinations of herbal treatment as described by the knowledgeable respondents. The numbering under the header 'combined' indicates which species are mixed to compose the intended concoction.

Map 4. Ikorongo Area: The Game Reserve & SENAPA.



The location of these species could be projected on the hyphen-circled area named Ikorongo Game Reserve, as the environment for Nyamburi community and its satellites (source: Hassan & Rija, 2011*).*

Table 14. Combinations Applied in Concoctions Indicated by Survey Respondents.

rec	local name	Scientific	parts	preparation	admin.	combined
2	*ilisibitali*	Lamiaceae sp.	root+leaves	pounded + boiled	drink	
3	*urung'uno*	*Harrisonia abyssinica* Oliv. (Simaroubaceae)	root	boiled	drink	3,4,5
4	*ubhoke bweitimo*	Lamiaceae sp.	leaves	pounded + boiled	drink	3,4,5
5	*ikiiri*	*Ocimum gratissimum* L. (Lamiaceae)	leaves	pounded + mixed	drink	3,4,5
6	*iwawa*	*Momordica foetida* Schumach. (Cucurbitaceae)	leaves	pound	skin rub	
7	*ikimusi*	*Euclea divinorum* Hiern (Ebenaceae)	root	boiled	drink	
8	*omosese*	*Rotheca myricoides* (Hochst.) Steane & Mabb. (Lamiaceae)	root	pounded + mix	drink	8,9,10 - 5,8
9	*iririrebhana*	*Plectranthus barbatus* Andrews (Lamiaceae)	root+leaves	pound + mixed	drink	8,9,10
10	*umuribha*	*Kigelia africana* (Lam.) Benth. (Bignoniaceae)	fruits	peel, cut , boil	drink	8,9,10
11	*irihirirya*	*Lantana ukambensis* (Vatke) Verdc. (Verbenaceae)	leaves	pound	chew/sniff	5
12	*omotembe*	*Erythrina abyssinica* Lam. ex DC. (Fabaceae)	bark+leaves	boiled, mixed	drink	
13	*omohenga/umunyente*	*Hoslundia opposita* Vahl (Lamiaceae)	leaves	pounded + mixed	drink	14,15
14	*kinyonyo*	*Oxalis corniculata* L. (Oxalidaceae)	leaves	pounded + mixed	drink	13,14,15
15	*eghetalatula*	*Solanum incanum* L. (Solanaceae)	root	pounded + mix, boil	drink	13,14,15
16	*mchele*	*Ozoroa insignis* Delile (Anacardiaceae)	leaves	pounded + mixed, filter	drops	5,16,17
17	*omupela*	*Psidium guajava* L. (Myrtaceae)	young leaves	pound, mix, boil	drink	5,16,17
18	*bhurubhoikonde*	indet.	root+leaves	boil, pounded + mixed	drink	5,18,31
19	*umunyanduku*	*Zanthoxylum chalybeum* Engl. (Rutaceae)	root+bark	pounded + boiled	drink	19,20
20	*umusisi*	*Tamarindus indica* L. (Caesalpiniaceae)	bark+leaves	pounded + boiled	drink	19,20
21	*ilityambwi*	*Sesamum calycinum* Welw. (Pedaliaceae)	vegetable	boiled	eat	
22	*nyaghasinda*	indet.	root	boiled	drink	43

Source: Fieldwork data 2016

Table 14. Combinations Applied in Concoctions Indicated by Survey Respondents (continued)

rec	local name	Scientific	parts	preparation	admin.	combined
23	*umwitanchoka*	*Senna occidentalis* L. (Fabaceae)	root	boil / chew	drink/swallow	
24	*ekeghaghana*	*Gardenia volkensii* K. Schum. (Rubiaceae)	root	pounded + mixed	nasal	
25	*omosabhisabhi*	*Sesbania sesban* (L.) Merr. (Fabaceae)	leaves	boil + porridge	drink	
26	*umuchahechahe*	*Cymbopogon citratus* (DC.) Stapf (Poaceae)	leaves	boiled	drink	
27	*ikitabhalali*	*Crassocephalum picridifolium* (DC.) S. Moore (Compositae)	leaves	pounded + boiled	eye drops	
28	*omotaminyoo*	Cif.(Oleaceae)	root	boiled	drink	
29	*mwarobaini (S)*	*Azadirachta indica* A. Juss. (Meliaceae)	root+bark+lea	boiled	drink	
30	*mbulumatare*	*Melia volkensii* Gürke (Meliaceae)	leaves	boiled	drink	
31	*inyimirya*	*Fuerstia africana* T.C.E. Fr. (Lamiaceae)	root+leaf	boil, pounded + mixed	nasal	5,18,31
32	*umunyingyi*	(Anacardiaceae)	bark	boiled	drink	
33	*ilibhabhayo*	*Carica papaya* L. (Caricaceae)	leaves	mixed + boiled	drink	12
34	*ilitoke*	*Musa* sp. (Musaceae)	root+leaf	boiled	drink	7,33,34
35	*Ibhinyankara*	indet.	fruits	pounded+boiled	drink	
36	*Iriraraura*	indet.	root+leaf	boiled	drink	5
37	*ikyulanse*	*Hydnora abyssinica* A. Br. (Hydnoraceae)	root	pound, grind, mix	drink	
38	*egesamulya*	*Kalanchoe* sp. (Crassulaceae)	leaves	pounded, mix	nasal	
38b	*egesamulya*	*Kalanchoe* sp. (Crassulaceae)	root	dry, pound, mix	nasal	
39	*ikilunguli kemuha*	indet.	porridge	boiled	eat	
40	*ilitaghala*	indet.	leaves	pound, mix or boil	drink	
42	*umulutunguli/nyaghitu*	*Drimia altissima* (L.f.) Ker Gawl. (Asperagaceae)	leaves	boiled	drink	
43	*nyabhisala*	*Adenia gummifera* (Harv.) Harms (Passifloraceae)	bark	pounded + water	drink	
44	*weisebho*	*Ageratum conyzoides* L. (Asteraceae)	leaves	pound, mix or boil	drink	5

Source: Fieldwork data 2016

5. Images of Table 14. Listed on Used in Conjunction with Others.

No. 3: Urung'uno (Harrisonia abyssinica)

*No. 4: Ubhoke Bweitimo (*Lamiaceae*)*

No.5: Ikiiri (Ocimum gratissimum)

No. 8: Omosese (Rotheca myricoides)

No. 9: *Iririrebhana (Plectranthus barbatus)*

No. 10: Umuribha (Kigelia africana)

Images of table 14. Listed on Use in Conjunction with Others (continued)

No. 13 Omohenga (Hoslundia opposita)

No. 14 Kinyonyo (Oxalis corniculata)

No. 15 Eghetalatula (Solanum incanum)

No. 16 Mchele (Ozoroa insignis)

No.17 Omupela (Psidium guajava)

No. 18 Bhurubhoikonde (Indet.)

Notes Chapter VI

26. Most of the people in this sample were not able to quote a figure on the number of inhabitants of Natta central, asked to create a context for the morbidity rates. The secondary school teachers estimate the number at 1,000+ and 3,000+ inhabitants respectively. According to the W.E.C. the Ward total is 12,495 from which 5,280 are in Natta Central. The Serengeti Public Health Department says there are 3,000 in the clinic's catchment area as defined in the district profile.
27. The registration of the morbidities over 2014 was presented as exemplary of the volume dealt with by the dispensary in Natta. The HIV rate in one quarter was given as 300+ for total established cases (i.c. under monitoring & treatment), with a three-monthly frequency of ca. 20 incidence (on an estimated population of 12.000+) over the same period.
28 The Community Based Health Promotion Programme (CBHPP) acronymed IMARA, located across from Nyerere Hospital, was founded as a Mennonite (KMT) related initiative and originally focused on identifying and supporting handicapped individuals on community level. External NGO funding makes it vulnerable, but it is locally recognised as an expert organisation, and capable of making community-based development work. It is an intermediary in the JHPIEGO project (Johns Hopkins Univ.).
29. The Child Survival, Protection and Development programme was launched in 1988 in the Mlimani ward with the objective of improving the welfare of women and children. By 2001, the programme was operational in all 19 wards of Morogoro municipality. In Mwembesongo and Mjimpya wards, the programme was initiated in 1992 and in 2001respectively (from: Maseta *et al.* 2008).
30. (R): Midwife trainer of Kisare College of Health Sciences, member of the research team and purposely assigned to conduct the interviews with all TBA's in order to create recognition, familiarity, and capable of medical knowledge assessments.

CHAPTER VII QUANTITATIVE DATA ANALYSIS

7.1. Sample Build Up, from Household Level to Action Patients

Table 15 shows the build-up of household member action patients (N=564) in steps in utilisation of the Plural Medical System (N=715), identical to the flow-diagramme in figure 4.

Table 15. Utilisation Rate of the Plural Medical System (N=715).

Step 1		Flo-thru		Step 2		Flo-thru		Step 3		System	Util. Rate	
N	%	N	%	N	%	N	%	N	%		N	%
214	37,9%	39	27,5%	78	54,9%	4	44,4%	6	66,7%	Trad.	298	41,7%
142	25,2%	24	16,9%	12	8,5%	1	11,1%	0	0,0%	Trans.	154	21,5%
208	36,9%	79	55,6%	52	36,6%	4	44,4%	3	33,3%	Modern	263	36,8%
564	100,0%	142	100,0%	142	100,0%	9	100,0%	9	100,0%		715	100,0%

Source: Fieldwork data 2016

When reversing the axes, it shows the total rates per system as used in the bivariate analysis:

Table 16. Stepwise Utilisation of the Plural Medical System (N=715).

Patient	Steps	Trad. Med. Syst.		Trans. Med. Syst.		Modern Med. Syst.		Rates	
N		N	%	N	%	N	%	N	%
422	1	17	41,5%	118	28,0%	129	30,6%	422	100
133	2	11	42,1%	31	11,7%	123	46,2%	266	100
9	3	11	40,7%	5	18,5%	11	40,7%	27	100
564		298	41,7%	154	21,5%	263	36,8%	715	100

Pearson χ^2 = 0,000 Cramer's V =0,148. Source: Fieldwork data 2016

Source: Fieldwork data 2016

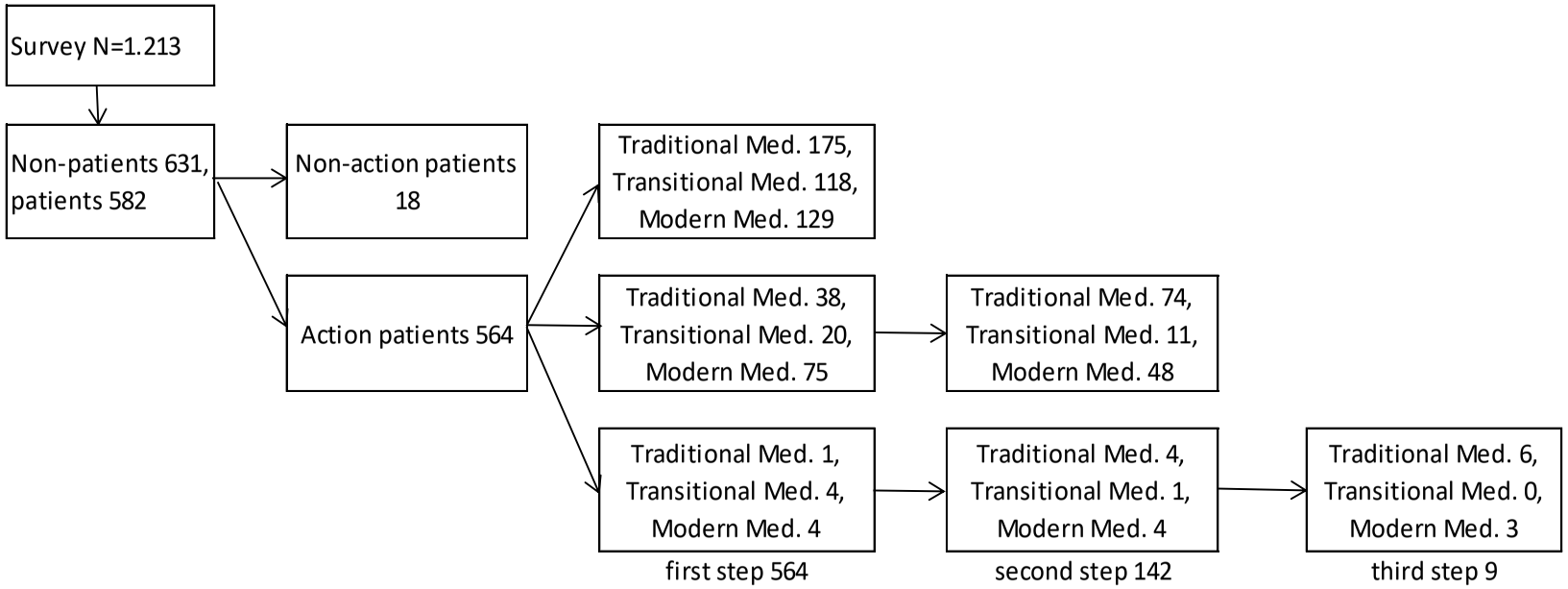
The overview shows how 133 patients who took two steps end up with 266 actions and 9 patients taking three steps make up 27, making up a total 715 actions for all 564 action patients. The primary reference was the general health status as perceived by the household head (*cf.* Table 17). Although 27,4% (48) said they were not able to make such assessment for lack of knowledge, a majority of 64% (112) fill the top three categories from average to very good.

Table 17. Assessment of Health Status by Household Heads (N=175).

General health status	**N**	**%**
Cannot assess	48	27,4%
Very bad	1	0,6%
Bad	14	8,0%
Average	61	34,9%
Good	50	28,6%
Very good	1	0,6%
Total	175	100,0%

Source: Fieldwork data 2016

Figure 4. Flow-scheme: number of steps per action patient.



Action patients	steps	Tradtional Medicine	Transitional Medicine	Modern Medicine	steps
422	1	175	118	129	422
133	2	112	31	123	266
9	3	11	5	11	27
564		298	154	263	715
		41,7%	21,5%	36,8%	100,0%

Source: Fieldwork data 2016

In addition to this status perception, the duration of the illness as reported by the action patients was taken into account, and put into an interval category of days, weeks and months. The majority of the diseases subsides within two weeks 64,8% (366), whereas 9,8% (55) linger for more than a year. In relating chronic diseases to age categories, only 21,8% (12) patients of the long duration illness category come out to be older than 55 years.

Table 18. Duration of Illness reported by Action Patients (N=564)

Period	N	%	cum
no recollection	8	1,4%	1,4%
1 to 3 days	68	12,1%	13,5%
4 to 6 days	124	22,0%	35,5%
1 to 2 weeks	166	29,4%	64,8%
2 to 4 weeks	51	9,0%	73,9%
1 to 12 months	93	16,5%	90,4%
more than 1 year	55	9,8%	100%
Total	564	100,0%	

Source: Fieldwork data 2016

Preceding the bivariate analysis, the relationship between the consecutive steps taken by the action patients and their use of the medical systems is examined. The data show that the number of times people switch from modern to traditional (n=58) is higher than the other way around (n=30). The volume of two steps (*cf.* Table 16) and the use of the modern system (MM) is due to people making a second step because of the referral system, which is more frequent than within the traditional system. The secondary use of traditional medicine (TM) is found with people indicating long and chronic illness duration, or as a lack of result with the prescribed medicine or preceding therapy.

7.2 Bivariate Analysis and Mutual Relations Analysis

This section shows the distribution of the variables which correlation proved to be significant in the bivariate analysis and the utilisation per medical system. They are listed in order of the questionnaire sequence, not by the significance levels. The applied criteria are listed as follows;

The values of Pearson Chi-Sq. are:	
> 0.15	non-significant
0.15 – 0.10	indication of significance
0.10 – 0.05	weakly significant
0.05 – 0.01	strongly significant
0.01 - 0.001	very strongly significant
< 0.001	most strongly significant

The values of Cramer's V are:	
0.00 - 0.15	very weak not generally acceptable
0.15 - 0.20	weak, minimally acceptable
0.20 - 0.25	moderate, acceptable
0.25 - 0.30	moderately strong, desirable
0.30 – 0.35	strong, very desirable
0.35 – 0.40	very strong, extremely desirable
0.40 – 0.50	extremely strong, suspect collinearity

On the basis of the combination of the highest values, variables are identified in the bivariate analysis and used in the multiple regression analysis in the second stage. The tables are presented with row percentages per variable value over the three columns representing the utilisation of the three medical systems.

Table 19. Distribution of Illness Duration over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Illness duration	N	%	N	%	N	%	total
1_3 days	30	37,5%	26	32,5%	24	30,0%	80
4_6 days	43	29,1%	41	27,7%	64	43,2%	148
1_2 weeks	76	37,8%	52	25,9%	73	36,3%	201
2_4 weeks	30	49,2%	7	11,5%	24	39,3%	61
1_12 months	69	53,1%	20	15,4%	41	31,5%	130
1 year >	44	50,6%	8	9,2%	35	40,2%	87
no recollection	6	75,0%	0	0,0%	2	25,0%	8
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,171
Source: Fieldwork data 2016

The first correlation to show significance from the questionnaire's household status sheet is the duration of the illness as reported by the action patients, leading up to seeking treatment. As established before, the majority subsides within two weeks, and both the traditional and the modern system show equally high cell counts in the two-week row. The highest proportion however is 53,1% (69) for people with chronic diseases up to twelve months and the use of TM. That is consistent with the statement made by several respondents that a lack of result leads to seek alternative treatment, *i.e.* to move from MM to TM (n=58) instead of vice versa (n=30).

Table 20. Distribution of Land Owned over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Land owned	N	%	N	%	N	%	total
<1 acre	23	53,5%	3	7,0%	17	39,5%	43
1_1.5 acres	36	48,0%	14	18,7%	25	33,3%	75
1.5_2 acres	25	31,3%	29	36,3%	26	32,5%	80
5 acres >	203	43,4%	86	18,4%	179	38,2%	468
None	11	26,2%	22	52,4%	9	21,4%	42
no reg.	0	0,0%	0	0,0%	7	100,0%	7
Total	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,198
Source: Fieldwork data 2016

The next variable from the socio-demographic factors (Block 1 in the model) is the area of land owned and worked on by the respondent's family. The difference between owning more than 5 acres and using TM 43,3% (203) or MM 38,2% (179) is narrow, whereas the highest proportional value is 53,5% (23) for people with less than 1 acre and using TM. The proportion of people with no ownership and using the Transitional Medical system is 52,4% (22), which is consistent with the reports of self-medication to avoid cost, followed by the argument of insufficient supplies at MM facilities.

Table 21. Distribution of Religion over Plural Medical System Utilisation (N=715).

	TM		TR		MM		Util. rate
Religion	N	%	N	%	N	%	Total
Christian	230	43,0%	117	21,9%	188	35,1%	535
None	47	50,0%	22	23,4%	25	26,6%	94
Afr. trad. rel.	18	22,2%	14	17,3%	49	60,5%	81
Muslim	3	60,0%	1	20,0%	1	20,0%	5
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,135
Source: Fieldwork data 2016

The highest proportional score is among African traditional religion with 60,5% (49) using MM. The majority of these action patients take a first step there but they are not morbidity related. This is unexpected, considering that 43% (230) of the Christians and 50% (47) of the pagans more often opt for the traditional system. The correlation does not reach the threshold for Cramer's V of 0,150.

Table 22. Distribution of Cattle Owned over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Cattle owned	N	%	N	%	N	%	total
< 10	188	45,3%	83	20,0%	144	34,7%	415
11_20	48	31,2%	37	24,0%	69	44,8%	154
21_30	12	42,9%	3	10,7%	13	46,4%	28
None	50	45,5%	24	21,8%	36	32,7%	110
no reg.	0	0,0%	7	87,5%	1	12,5%	8
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,153
Source: Fieldwork data 2016

In view of the importance of cattle, both economically and status wise, the relationship with using TM is expressed by the lower rows, no ownership and <10, which provide the highest score, 45,5% (50) and 45,3% (188) respectively. Having established that, the highest cell count for MM is also within the <10 row with 144. In that respect it does not prove socio-economic status influence through cattle ownership convincingly, as the 21> category is equally distributed.

Table 23. Distribution of Media Use over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Media use	N	%	N	%	N	%	Total
Radio	90	39,6%	49	21,6%	88	38,8%	227
two mod. media	65	42,2%	43	27,9%	46	29,9%	154
no media use	55	38,7%	42	29,6%	45	31,7%	142
mobile phone	58	49,2%	11	9,3%	49	41,5%	118
oral transmission	21	55,3%	7	18,4%	10	26,3%	38
multiple media	7	26,9%	1	3,8%	18	69,2%	26
TV	2	20,0%	1	10,0%	7	70,0%	10
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,171. Source: Fieldwork data 2016

The purpose of measuring media use (block 3) was for it to be linked to the intervening variables indicating health education campaign awareness and recollection (block 6). Consistent with expectations is mainly the aspect of 'oral transmission' and TM use with 55,3%, indicating no direct media influence. The top score of 69,2% (18) is for multiple modern media and MM use, although the cell count is low, as is TV with 70% (7). Contradicting may seem that the TM users show more modern media use *overall* than the MM users, but supportive of TM transcending all categories.

Table 24. Distribution of Profession over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Profession	N	%	N	%	N	%	Total
Farming	182	40,3%	107	23,7%	163	36,1%	452
Farm & herd	45	43,7%	14	13,6%	44	42,7%	103
Agric. & trade	15	39,5%	1	2,6%	22	57,9%	38
Farm & voc.	18	48,6%	13	35,1%	6	16,2%	37
Farm & trade	13	39,4%	11	33,3%	9	27,3%	33
Trade	11	68,8%	1	6,3%	4	25,0%	16
No profession	3	25,0%	2	16,7%	7	58,3%	12
Agric. & voc.	2	25,0%	1	12,5%	5	62,5%	8
vocation	5	83,3%	1	16,7%	0	0,0%	6
Agric + employed	1	25,0%	1	25,0%	2	50,0%	4
Employed	1	33,3%	2	66,7%	0	0,0%	3
Unqualified labour	2	66,7%	0	0,0%	1	33,3%	3
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,001 Cramer's V = 0,182. Source: Fieldwork data 2016

Almost all habitants of Nyamburi engage in some sort of agricultural activity, either or not in combination with trading, a vocation or employment. With the margins being narrow, the highest scores with MM appear with agric & trade 57,9% (22), as well as with TM 68,8% (11) for trade. A mirrored image comes with people who exercise a vocation, they show a majority for TM in two rows 48,6% (18) and 83,3% (5) and with MM 62,5% (5). The highest cell count is for people who farm with 182 and TM. Overall there is no specific relationship traceable of a specific category to system utilisation. The category 'Agric' indicates people who keep livestock, herd cattle and farm.

Table 25. Distribution of Knowledge of TM over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Knowl. of TM	N	%	N	%	N	%	total
Little	135	44,4%	67	22,0%	102	33,6%	304
Average	110	44,4%	51	20,6%	87	35,1%	248
Much	27	42,2%	12	18,8%	25	39,1%	64
None	26	33,3%	20	25,6%	32	41,0%	78
No reg.	0	0,0%	4	19,0%	17	81,0%	21
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,002 Cramer's V = 0,132.

Source: Fieldwork data 2016

Table 25 which does not reach the Chi 0,000 nor the V=>0,150 threshold, is presented because of the inherent relationship with indigenous knowledge variables. As in the pilot study, the rows which indicate little or average knowledge of TM have the highest proportion (44,4%) in utilisation, consistent with the people who claim no knowledge scoring 41% with the use of MM. Remarkably the respondents not wishing to answer this question turn to MM with 81% (17/21). As the majority of the respondents in the little or average knowledge rows which use TM are Christians (78%, 191/245) this affinity is well observed. Christian religion is often described as not endorsing traditional medicine, but appreciation is widely found among respondents within that category, as indicated by Chirangi (2013).

Table 26. Distribution of Opinion on TM over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Opinion on TM	N	%	N	%	N	%	total
low op.	37	31,1%	32	26,9%	50	42,0%	119
average op.	120	42,6%	69	24,5%	93	33,0%	282
high op.	140	50,4%	46	16,5%	92	33,1%	278
no opinion	1	7,7%	2	15,4%	10	76,9%	13
no reg.	0	0,0%	5	21,7%	18	78,3%	23
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,181
Source: Fieldwork data 2016

Expressing material confidence, the relationships become more extrapolated, as is shown in this distribution. Here the users of TM with 'average' and 'high opinion' score the highest proportion, 42,6% (120) and 50% (140) consecutively. Note that the respondents with a low opinion on TM are equally weighted at 42% (50) using MM. Again, the representation of Christians in the TM use selection with a positive opinion is 78% (203/260). The correlation is now V=0,181 compared to knowledge of TM, which was below the 0,150 threshold with V=0,132 (*cf.* Table 25)

Table 27. Distribution of Belief in TM over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Belief in TM	N	%	N	%	N	%	total
Little	39	32,8%	29	24,4%	51	42,9%	119
Average	104	39,5%	62	23,6%	97	36,9%	263
Much	154	51,3%	56	18,7%	90	30,0%	300
None	1	6,3%	4	25,0%	11	68,8%	16
no reg.	0	0,0%	3	17,6%	14	82,4%	17
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,172
Source: Fieldwork data 2016

In view of the score of the other related variables (knowledge, opinion and accessibility) 'Belief' was expected to reach a higher level, especially as the qualitative research indicates it to surpass almost all status attributes. In this case it is interesting that 30% (90) out of 300 cases with much belief in TM are found using MM. Connected to perceived morbidity, the majority of these cases

were malaria, whereas the majority among the TM users dealt with Urinary Tract Infection (UTI). Note that UTI symptoms are not always correctly reproduced and there may be unreliable reporting, according to the Clinical Officer in Nyamburi. The MM users show consistency with 42,9% (51) for the Little-believers, and 68,8% (11) respectively 82,4% (14) for non-knowledgeable respondents.

Table 28. Distribution of Knowledge of TR over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Knowl. of TR.	N	%	N	%	N	%	total
Little	122	41,6%	64	21,8%	107	36,5%	293
Average	56	29,3%	54	28,3%	81	42,4%	191
Much	5	33,3%	1	6,7%	9	60,0%	15
None	106	56,4%	30	16,0%	52	27,7%	188
no reg.	9	32,1%	5	17,9%	14	50,0%	28
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,158
Source: Fieldwork data 2016

With regard to knowledge of Transitional Medicine (TR), it is apparent that very few people make this claim, even among the TR users, the highest cell count is actually with the category 'little knowledge' 21,8% (64) with 'average knowledge' reaching 28,3% (54). Note however that 42,4% (81) cases claim 'average knowledge' among the MM users, which is consistent with the reports from qualitative research that many people go out and buy medicine commercially after being diagnosed at modern facilities. Not only because of lower cost, but also because the frequent unavailability of the prescribed medication at MM facilities. It indicates the use of TR as an acceptable alternative across all categories; with the possible exception of the highest cell count overall, 122 with 'little knowledge' and 106 with 'no knowledge' among TM users.

Table 29. Distribution of Source of Knowledge over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Source of Knowledge	N	%	N	%	N	%	total
Personal experience	84	40,2%	61	29,2%	64	30,6%	209
Mother	62	54,4%	21	18,4%	31	27,2%	114
VHW	32	28,8%	19	17,1%	60	54,1%	111
Grand parents	39	48,8%	17	21,3%	24	30,0%	80
Father	22	42,3%	9	17,3%	21	40,4%	52
Both parents	15	28,8%	8	15,4%	29	55,8%	52
School	12	42,9%	10	35,7%	6	21,4%	28
Traditional healer	13	59,1%	2	9,1%	7	31,8%	22
In-laws	7	43,8%	1	6,3%	8	50,0%	16
Spouse	8	53,3%	0	0,0%	7	46,7%	15
Family member	1	11,1%	3	33,3%	5	55,6%	9
Friends	3	42,9%	3	42,9%	1	14,3%	7
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,207
Source: Fieldwork data 2016

Source of knowledge (SOURCE) indicates who provided the knowledge with regard to the cause of the illness and the related cure, in the broadest sense of the word. It is related to who is consulted when seeking treatment (ADVICE). When cumulating all categories of family members, they are involved in 47,2% (338) of all cases (N=715). Consistency shows in the role of the Village Health Worker, who receives 54,1% (60) reference to using MM. Besides 'personal experience', within families the role of the mother is the highest cell with 54,4% (62) for TM users, followed by 'grand parents' 48,8% (39). The traditional healers' advice is solid with 59,1% (13) among TM users.

Table 30. Distribution of Treatment Advice over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Treatment Advice	N	%	N	%	N	%	total
Personal experience	123	41,6%	84	28,4%	89	30,1%	296
Village Health Worker	54	36,0%	30	20,0%	66	44,0%	150
Traditional healer	43	58,9%	8	11,0%	22	30,1%	73
Spouse	28	38,9%	10	13,9%	34	47,2%	72
Mother in-law	16	45,7%	3	8,6%	16	45,7%	35
Family member	9	36,0%	4	16,0%	12	48,0%	25
Mother	8	34,8%	1	4,3%	14	60,9%	23
Neighbours	11	64,7%	2	11,8%	4	23,5%	17
Grand parents	5	45,5%	4	36,4%	2	18,2%	11
Pharmacy	1	9,1%	8	72,7%	2	18,2%	11
Father	0	0,0%	0	0,0%	2	100,0%	2
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,215
Source: Fieldwork data 2016

The consultation (ADVICE) leads into another direction as the health professionals head the listing, with the Village Health Worker showing the highest cell count 44% (66) score using MM, followed by the traditional healer with 58,9% (43) among the TM users. The spouse now ranks highest followed by the mother in law, whose overall role in health problems is exemplified by scoring equally high on MM use. Neighbours hold the highest proportion 64,7% (11) for consultation on TM, but with a low cell count. The role of the family members was cumulated here as well for comparison with source of knowledge and turns out to be reduced to almost half to 23,4% (168).

Table 31. Distribution of Cost of TM over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Cost of TM	N	%	N	%	N	%	total
Expensive	43	36,8%	22	18,8%	52	44,4%	117
Average	108	39,9%	55	20,3%	108	39,9%	271
Cheap	146	50,0%	69	23,6%	77	26,4%	292
no reg.	1	2,9%	8	22,9%	26	74,3%	35
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,176
Source: Fieldwork data 2016

From the qualitative research it has become evident that there is wide ambivalence on the cost of TM (Block 3) as many believe that it is often more expensive than the modern system, although money does not always change hands. The donations made towards a traditional healer for treatment can reach a high intrinsic value when it involves livestock or food produce. However 'home remedies', are considered accessible and cheap and belong to the same category. The majority, 40,8% (292) indicate to consider TM 'cheap' of which half also appear as users, but within the 'average' category 37,9% (271) there is equal representation 39,9% (108) in both medical systems, which again illustrates the ambivalence.

Table 32. Distribution of Cost of Transport to TM over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Transp. to TM	N	%	N	%	N	%	total
Expensive	22	33,3%	13	19,7%	31	47,0%	66
Average	94	42,7%	45	20,5%	81	36,8%	220
Cheap	181	45,9%	88	22,3%	125	31,7%	394
no reg.	1	2,9%	8	22,9%	26	74,3%	35
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,154
Source: Fieldwork data 2016

The consensus on accessibility is slightly higher as 55,1% (394) considers getting to TM is cheap, and the group which considers it expensive reduces from 16% (117) to 9% (66). As mentioned before, home remedies are often collected individually around the domestic area, instead of being bought. On the other hand, people travel extensively if there is a traditional healer who carries a reputation for a specific treatment, even if it implies travelling to another region of the country.

Table 33. Distribution of Cost of TR over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Cost of TR	N	%	N	%	N	%	total
Expensive	161	44,7%	63	17,5%	136	37,8%	360
Average	129	41,6%	84	27,1%	97	31,3%	310
Cheap	7	41,2%	2	11,8%	8	47,1%	17
no reg.	1	3,6%	5	17,9%	22	78,6%	28
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,157
Source: Fieldwork data 2016

The cost of transitional medicine, although lower than MM is still considered expensive by the majority, 50% (360), and is used as an alternative to clinical treatment on many occasions, not only because of cost, also because of unavailability of medicine. The first step in TR, 19,8% (142) does not show a relationship with perceived morbidity. As indicated by the Clinical Officer, the acquired treatment is often an insufficient dosage or not completed because the symptoms subside, and occasionally applied undiagnosed. The other risk is that advice from commercial suppliers is not necessarily professional and may not be bio-medically indicated or motivated.

Table 34. Distribution of Social Econ. Status over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate	
Soc. Econ. Status	N	%	N	%	N	%	total	prop
very poor	26	55,3%	3	6,4%	18	38,3%	47	6,6%
Poor	133	48,9%	66	24,3%	73	26,8%	272	38,0%
Average	131	34,3%	84	22,0%	167	43,7%	382	53,4%
Rich	7	77,8%	0	0,0%	2	22,2%	9	1,3%
no reg.	1	20,0%	1	20,0%	3	60,0%	5	0,7%
	298	41,7%	154	21,5%	263	36,8%	715	100,0%

Pearson χ^2 = 0,000 Cramer's V = 0,157
Source: Fieldwork data 2016

The variable Social Economic Status (SES) is not compiled from the household attributes but evolves from the assessment of the research team members during the survey. Although there is some extrapolation visible, it does not show a distinct preference, while 55,3% (26) of very poor and 48,9% (133) of poor people use TM, there is no such counterbalance among MM use. The highest cell count there is 167 for TR, qualified as 'average' on SES. Notably 7 out of 9 rich people used TM. In perspective, the value of Cramer's V is above the threshold with 0,157.

Table 35. Distribution of Environmentally Friendly over Plural Medical System Utilisation (N=715).

	TM		TR		MM		util. rate
Environm. Friendly	N	%	N	%	N	%	total
Traditional med	199	46,7%	72	16,9%	155	36,4%	426
Modern med	76	34,4%	54	24,4%	91	41,2%	221
Transitional med	22	44,0%	15	30,0%	13	26,0%	50
no reg.	1	5,6%	13	72,2%	4	22,2%	18
	298	41,7%	154	21,5%	263	36,8%	715

Pearson χ^2 = 0,000 Cramer's V = 0,174
Source: Fieldwork data 2016

Environmentally Friendly (ENV) was to establish whether the users consider the defined medical system as environmentally friendly. It is noticeable that TM receives a high score 59,6% (426) among users of both traditional and modern systems, almost double of MM 30,9% (221). The qualitative research indicates that home remedies growing near the residence are considered a decisive factor for favouring TM as a first line of treatment. Although it are the TM professionals who actually search or nurse specific species, respondents indicate that the availability of some known species is diminishing because of agriculture, random use, and commercialisation. In Table 36 the initial step shows that the prime morbidity malaria is often addressed by self-treatment, next to being diagnosed in a facility. It also indicates that convulsions are primarily directed towards TM, although they do often end up with MM in a next phase. It is remarkable that Urinary Tract Infection (UTI) is also addressed with TM, because of its implications without proper diagnosis, ranking as the second highest morbidity in the district. Category 'Other' was designed to keep the number below fifteen as is advised in statistical manuals to avoid distortion in multiple regression analyses i.c. OVERALS (*cf.* Meulman & Heiser 2010).

Table 36. Distribution of Perceived Morbidity over Plural Medical System Utilisation (N=715).

	TM		TR		MM		cum.	Perc
Perc. Morbidity	N	%	N	%	N	%	N	%
Malaria	20	10,4%	74	38,5%	98	51,0%	192	26,9%
UTI	44	69,8%	6	9,5%	13	20,6%	63	8,8%
Abdominal pains	37	58,7%	10	15,9%	16	25,4%	63	8,8%
Amoeba	22	55,0%	0	0,0%	18	45,0%	40	5,6%
Headache	5	20,8%	13	54,2%	6	25,0%	24	3,4%
Eye problems	12	50,0%	6	25,0%	6	25,0%	24	3,4%
Cough	6	27,3%	8	36,4%	8	36,4%	22	3,1%
Chest pain	9	45,0%	4	20,0%	7	35,0%	20	2,8%
Convulsions	12	66,7%	0	0,0%	6	33,3%	18	2,5%
Diarrhoea	5	33,3%	4	26,7%	6	40,0%	15	2,1%
Leg problem	12	80,0%	0	0,0%	3	20,0%	15	2,1%
Skin problems	10	66,7%	1	6,7%	4	26,7%	15	2,1%
Fever	2	18,2%	7	63,6%	2	18,2%	11	1,5%
Pneumonia	5	50,0%	1	10,0%	4	40,0%	10	1,4%
Other	97	53,0%	20	10,9%	66	36,1%	183	25,6%
utilisation rate	298	41,7%	154	21,5%	263	36,8%	715	100,0%

Pearson χ^2 = 0,000 Cramer's V = 0,36
Source: Fieldwork data 2016

To show the utilisation steps broken down to the solicited facilities which were actually used within the description of that specific medical system. Table 37 is designed to show the frequency per facility, ranked by the most voluminous and leaving the non-applicable rows blank. The scores are based on the total of 715 steps and are not calculated for correlation because the table was constructed from the underlying frequency tables.

Table 37. Facilities Utilised Consecutively per Medical System (N=715)

	TM	TR	MM	Cum	Perc.
Home remedies	196	0	0	196	27,4%
Pharmacy / Market seller	0	135	0	135	18,9%
Doctor (Hosp.)	0	0	109	109	15,2%
Village Health Worker	0	0	102	102	14,3%
Herbalist / TBA	86	0	0	86	12,0%
Clinical Officer (Disp.)	0	0	52	52	7,3%
Street seller	0	19	0	19	2,7%
Spiritual healer	12	0	0	12	1,7%
Bone setter	3	0	0	3	0,4%
TBA	1	0	0	1	0,1%
Utilisation rate	298	154	263	715	100,0%

Source: Fieldwork data 2016

It was established already during the pilot study in Natta and Mugumu that most action patients try their own resources first by applying home remedies (TM); consequently, it scores high, followed by self-treatment with Transitional Medicine (TR). In the total utilisation pattern, the facilities of TM are utilised more frequently than MM overall, and related to the perceived morbidity ultimately.

Table 38. Consecutive Steps Across the Plural Medical System (N=715)

	TM		TR		MM	
Traditional Med. Syst.	181	60,7%.	22	14,3%	93	35,4%
Transitional Med. Syst.	22	7,4%	114	74,0%	19	7,2%
Modern Med. Syst.	95	31,9%	18	11,7%	151	57,4%.
Utilisation rates	298	100,0%	154	100,0%	263	100,0%

Source: Fieldwork data 2016

The cross-over between systems (*cf.* Table 15) appears balanced on both sides between TM and MM, as 35,4% (93) of MM users have also made use of a TM therapy as one of their consecutive steps, and 31,9% (95) vice versa. Repetitive steps *within* systems also occur, registered as 9 times within the TM users, and 16 times within MM, taking the multi-level referral system into account. These instances appear among longer running or chronic diseases, as patients were not satisfied with the result, indicating the re-occurrence of the symptoms as "weakness of the medicine", or "the doctors cannot cure this disease" applying new connotations following their individual experience.

Table 39. Independent Variables Included in the Mutual Relations Analysis (figure 5)

	Variable Label	Type	Chi Sq.	Cramer V	Block	Quest. nr	Categories
1	Clinical Diagnose	nominal	0,00	0,363	4	4.4	3
2	Perceived Morbidity	nominal	0,00	0,362	4	4.1	15
3	Socially Acceptable	nominal	0,00	0,216	5	5.1	6
4	Treatment Advice	nominal	0,00	0,215	2	2.14	11
5	Source of Knowledge	nominal	0,00	0,207	2	2.13	12
6	Land owned	ordinal	0,00	0,198	1	0.5	5
7	Availability of TM	ordinal	0,00	0,194	5	5.3	5
8	Availability of MM	ordinal	0,00	0,193	5	5.7	6
9	Opinion on TM	ordinal	0,00	0,181	2	2.2	4
10	Economic Efficient	nominal	0,00	0,176	5	5.2	4
11	Cost of TM	ordinal	0,00	0,176	3	3.3	4
12	Environm. Friendly	nominal	0,00	0,174	5	5.0	4
13	Belief in TM	ordinal	0,00	0,172	2	2.3	4
14	Duration of Illness	ordinal	0,00	0,171	4	4.2	7
15	Media use	ordinal	0,00	0,171	1	0.11	7
16	Cost of TR	ordinal	0,00	0,157	3	3.4	4
17	Cost of Transport TM	ordinal	0,00	0,154	3	3.2	4
18	Cattle owned	ordinal	0,00	0,153	1	0.8	4
19	Social Econ. Status	ordinal	0,00	0,152	3	3.8	4

Source: Fieldwork data 2016

The nine blocks representing the independent, intervening and dependent variables were reduced through the bivariate analysis as shown in the preceding paragraph in cross tables with the utilisation per medical system. The variables whose correlation proved significant using two thresholds, Pearson's Chi-Square (<0,001) and Cramer's V (0,150>) provide the parameters of which variables are included in the multiple regression procedure (*cf.* Table 39)

The indicator 'Cats' refers to the number of categories which determine the scale of the variable, whether nominal or ordinal. In the guidelines on the use of OVERALS the literature advises to limit the number of categories as much as possible (<15) as it may influence the outcome of the analysis (*cf.* Van der Burg *et al.* 1988; Meulman & Heiser 2010).

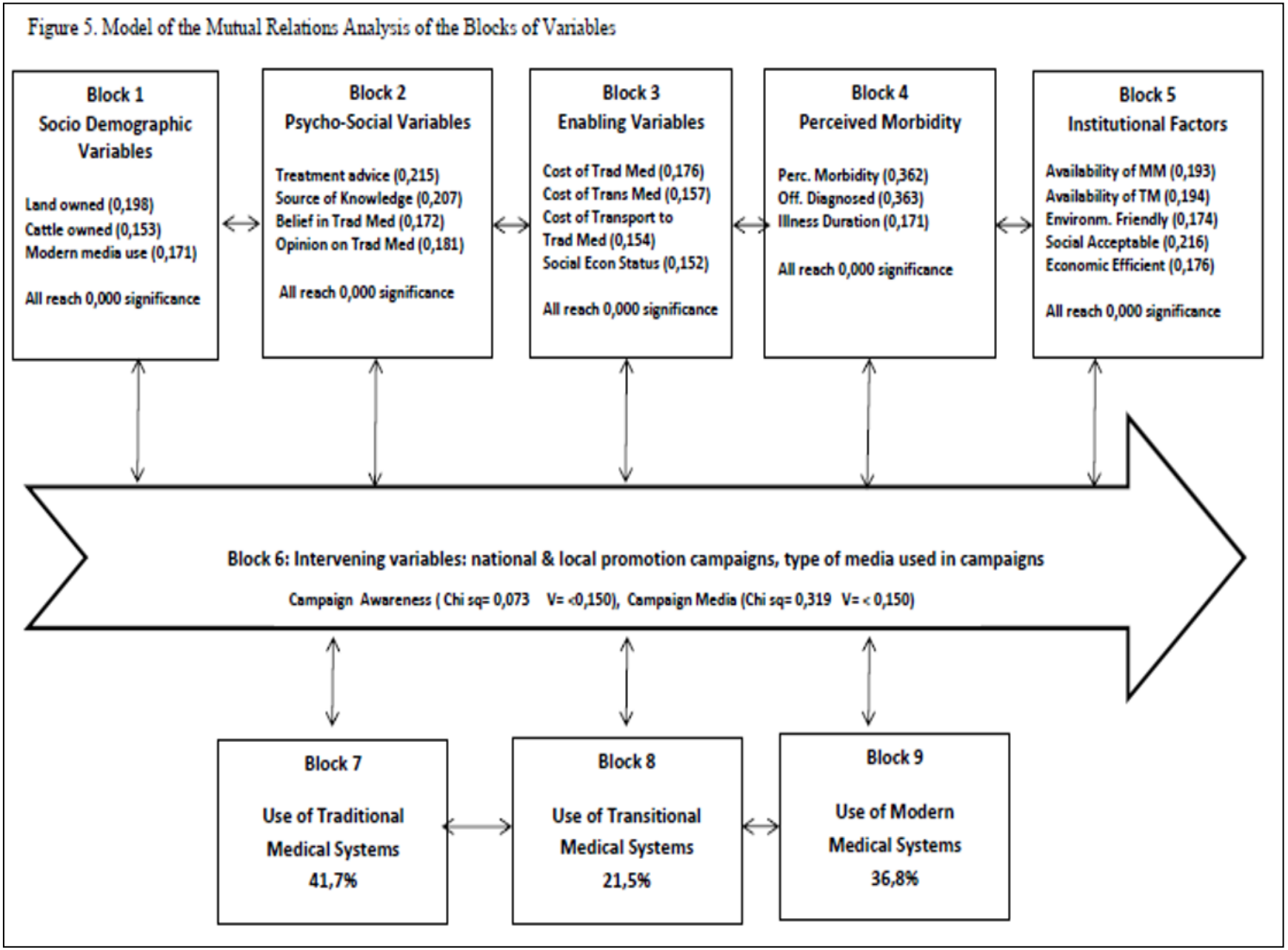
To achieve such reduction, the perceived morbidity variable for example received a 'rest category' for the morbidity frequencies below 10. All other variables were similarly reduced to the minimum number of categories possible, to enhance the discriminating capabilities of the analysis method. In Figure 5 the selection of variables and their respective values, are placed in the blocks of independent and dependent factors underlying the utilisation process. It also shows that from the original nine blocks of factors, block number six, the intervening variables, did not attain sufficient correlations to be included in the multivariate analysis.

The results in the five independent blocks and the utilisation represented by the three blocks of dependent variables come to together in the final multiple regression stage. From the socio-demographic factors, the area of land owned, the number of cattle owned, and the number of modern media in use are retained. From the Pyscho-Social factors, who is consulted for treatment advice, the source of knowledge, the belief in TM and the opinion on the efficacy of TM are retained. From the enabling factors the cost of TM and TR, as well as the cost of transport to TM, and Social Economic Status are retained. From the fourth block, perceived morbidity, duration of disease and the external diagnosis by a third party are retained. From the Institutional factors, the availability of modern and transitional medicine, along with the opinion on environmental effects, social acceptability and economic efficiency on all available medical systems are retained.

7.2.1 Preliminary Relationship Analysis: CHAID

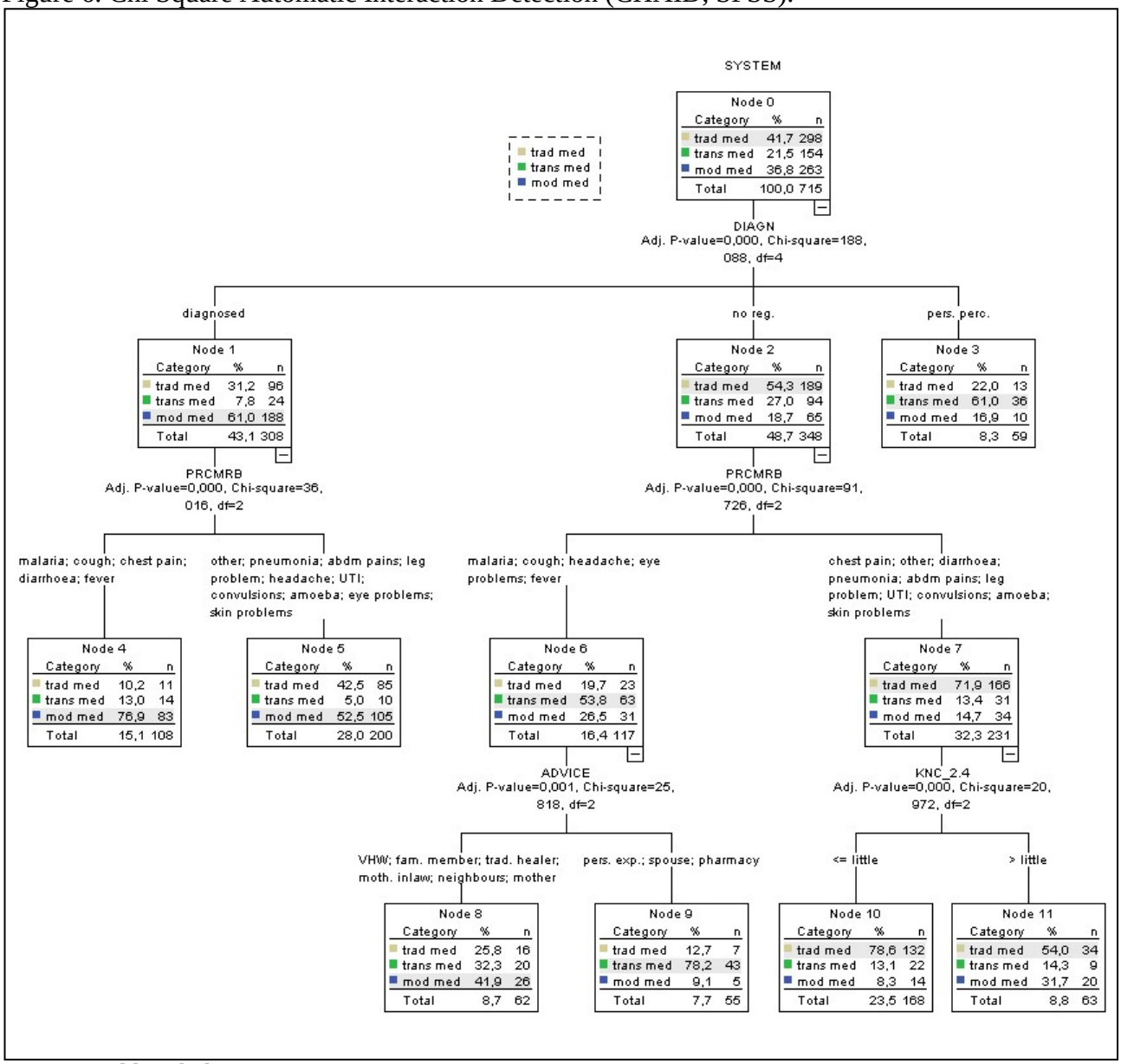
Chi-square Automatic Interaction Detection (CHAID) [33], (Kass 1980) is a decision tree technique, based on adjusted significance testing (Bonferroni testing). In practice, CHAID is used in to select groups of respondents and predict how their responses to some variables affect other variables; early applications were in the field of medical and psychiatric research. Similar to other decision trees, CHAID's advantages are that its output is highly visual and easy to interpret. Because it uses multiway splits by default, it needs rather large sample sizes to work effectively; in small sample sizes, the respondent groups can become too small for reliable analysis (*cf.* Schuurman 2014). The CHAID is run as a parallel analysis between these variables, purposely to compare with the outcome of bivariate as well as the Non-Linear Canonical Correlation Analysis, as is advised in the statistical literature consulted, by Van der Burg *et al.* (1988), Bijleveld (1993,1989), Dijksterhuis & Van Trijp (1995) Vogelesang (2000), to detect multicollinearity. In this case, the plural medical system utilisation (SYSTEM) is designated as the dependent variable (see Figure 6). The analysis shows the variables which are predicted to have the highest interaction, in this case respectively: whether the illness was clinically diagnosed (DIAGN), the perceived morbidity (PRCMRB), and the type of people who were consulted for treatment advice (ADVICE), and the knowledge regarding TR (var.

Figure 5. Model of the Mutual Relations Analysis of the Blocks of Variables



KNC_2.4) as are all mentioned under 'Independent Variables Included' in the SPSS output. Three variables mentioned here are consistent with and within the first five identified through bivariate analysis, except for Knowledge of Transitional Medicine. In this approach it shows that of those people who were officially diagnosed, the majority used MM with the morbidities which were involved. Those who were not officially diagnosed however used TM for the specified morbidities indicated and followed through with TR and MM depending on the advice from acquaintances. The influence of the Village Health Worker (VHW) tends towards MM, and both personal experience and advice from a spouse or other family members lead to use of TR. These findings are consistent with the results of the OVERALS procedure.

Figure 6. Chi Square Automatic Interaction Detection (CHAID, SPSS).



Source: Fieldwork data 2016

7.3 Non-Linear Canonical Correlation Analysis: OVERALS

The OVERALS (see also 3.5.2) procedure is part of the SPSS data reduction options called 'Optimal Scaling', and it allows for variables in the same analysis to have different measurement levels in terms of nominal, ordinal or interval. The essence of this approach is that it becomes possible to combine phenomena which cannot be measured on the same level, as in categories which reflect a ranking, or classifications with intrinsic or semantic differences, typical for ethnoscience research, within one and the same procedure (*cf.* Vogelesang 2000). There can be more than two sets of variables as in independent and dependent, and it is instrumental towards finding the ultimate correlations between the sets. The distinction between this method and ordinary multiple regression is in the character of the relationship, which is carried from 'many to one' over to 'many to many', showing various ways in which independent sets can be related to the dependent ones.

The term 'Optimal Scaling' refers to the quantifications of categories of a variable; reducing them either through recoding or conversion, to a minimum number, without loss of information, and then apply them as numerical variables, necessarily as integers (*no zero values*). The so-called non-linear transformations are capable of producing the best 'fit' for the model, which, reversely, is also indicated by the amount of 'loss' implied in the SPSS procedure's Summary of Analysis (*cf.* Table 40). It is emphasised that the method determines relationships between sets, not between variables unless one set would consist of only one variable. The technique is especially suitable to leave the role of ordinal variables intact because of the optimal scaling component (*cf.* Dijksterhuis *et al.* 1995). A score three is higher than two, but it does not imply that the difference in value needs to be larger than the difference between five and six on a seven scale. [32]. The '*Eigenvalue*' is calculated by one (1) minus the average loss, the sum over 2 dimensions is 1,213 (*cf.* Table 40) which indicates how much of the relationship is demonstrated in each dimension, or, alternately put, the proportion of variance accounted for by the weighted combination of variables in the set. The *Eigenvalues* add up to the total fit (0,787). Following this explanation from the abovementioned manual, it means that 0,412 / 0,787 = 52,4% of the actual fit is accounted for by the first dimension, verified by the loss (0,625) being higher in the second. A total fit would theoretically run up to 1 per dimension. Table 40 represents an SPSS output file, showing the following values:

Table 40. Summary of Analysis (SPSS output)

Sets	Dimension 1	Dimension 2	Sum
Socio-Demographic	0,582	0,653	1,235
Psycho-Social	0,273	0,431	0,705
Enabling variables	0,44	0,493	0,934
Perceived Morbidity	0,619	0,579	1.198
Institutional variables	0,24	0,292	0,531
Use of Trad. Med. System	0,651	1	1,650
Use of Trans. Med. System	0,9	0,852	1,752
Use of Modern Med. System	1	0,702	1,702
Average Loss	0,588	0,625	1,213
Eigenvalue	0,412	0,375	0,787
Accounts for Fit	52,4%	47,6%	100%

Source: Fieldwork data 2016

The component loadings of all 22 variables are listed in Table 41. Since the variables are listed here by their original survey order, the highest values per dimension have been put in a separate ranking to enable an overview of the values with the highest impact. As thresholds for the ranking of these listed loadings the norms are between 0,3 and 0,5 for 'moderate', and above 0,5 for 'strong'.

Table 41. Component Loadings of the Sets of Variables in Two Dimensions (OVERALS).

Independent	Variables	Var. label meaning			dimension 1	dimension 2
Socio-demogr.	OWN_0.5 a,b	*land ownership*			0,489	-0,260
variables	CAT_0.8 a,b	*livestock ownership*			0,067	0,132
	MEDIA c,d	*modern media use*	Dimension	1	0,204	-0,285
				2	-0,093	0,543
Psycho-social	ADVICE c,d	*treatment advice*	Dimension	1	0,372	-0,355
variables				2	0,216	0,562
	SOURCE c,d	*source of knowledge*	Dimension	1	0,411	-0,301
				2	0,271	0,469
	OPT_2.2 a,b	*opinion on TM*			0,735	0,119
	BET_2.3 a,b	*belief in TM*			0,750	0,252
Enabling	CTM_3.2 a,b	*cost of TM*			0,703	-0,344
variables	CSM_3.4 a,b	*cost of Trans Med*			-0,090	-0,462
	TTM_3.3 a,b	*cost of Trans TM*			0,644	-0,388
	SES_3.8 a,b	*soc. Econ. Status*			-0,120	0,473
Perceived	DIAGN c,d	*officially diagnosed*	Dimension	1	0,051	-0,251
morbidity				2	-0,165	0,520
	DUR a,b	*duration of Illness*			0,165	-0,289
	PRCMRB c,d	*perceived Morbidity*	Dimension	1	0,587	0,072
				2	0,347	0,214
Institutional	ENV_5.0 c,d	*environm. friendly*	Dimension	1	0,363	0,040
factors				2	0,282	0,168
	SOC_5.1 c,d	*socially Acceptable*	Dimension	1	0,311	-0,411
				2	-0,009	0,772
	ECE_5.2 c,d	*econ. Efficient*	Dimension	1	0,510	0,133
				2	0,332	0,336
	ATM a,b	*availability of TM*			-0,645	0,265
	AMM a,b	*availability of MM*			0,514	-0,285
Dependent						
Trad med	TM_USE b,e	*use of TM*			0,591	0,020
Trans med	TR_USE b,e	*use of TR*			-0,316	-0,385
Modern med	MM_USE b,e	*use of MM*			-0,015	-0,546

a: ordinal scaling level, b: single quantified, c: nominal scaling level, d: multiple quantified, e: single nominal (source: Version 17-3.spv)
Source: Fieldwork data 2016

From the table the strongest values in dimension 1 can be identified and put in a ranking. A total of fifteen variables are distilled, of which six are considered 'moderate' (0.3> <0.5) and nine are considered 'strong' (0.5>), one showing negative value, availability of TM. The ranking is shown below with the variable labels written out fully for a better understanding:

On dimension 1:	value	block	label
1. BET_2.3 a,b	0,750	2	Belief in Traditional Med.
2. OPT_2.2 a,b	0,735	2	Opinion on Traditional Med.
3. CTM_3.2 a,b	0,703	3	Cost of Traditional Med.
4. ATM a,b	-0,645	5	Availability of Traditional Med.
5. TTM_3.3 a,b	0,644	3	Cost of transport to Traditional Med.
6. TM_USE a,b	0,591	7	The use of Traditional Med.
7. PRCMRB c,d	0,587	4	Perceived Morbidity
8. AMM a,b	0,514	5	Availability of Modern Med.
9. ECE_5.2 c,d	0,510	5	Economically efficient
10. OWN_0.5A a,b	0,489	1	Land ownership
11. SOURCE c,d	0,411	2	Source of Knowledge
12. ADVICE c,d	0,372	2	Consult advice for treatment
13. ENV_5.0 c,d	0,363	5	Environmentally friendly
14. TR_USE a,b	0,316	7	Use of Transitional Med.
15. SOC_5.1 c,d	0,311	5	Socially acceptable

In the second dimension there are thirteen variables of which eight score 'moderate' (0.3 to 0.5) and five score 'strong' (0.5 and up). Three show negative values, the use of Modern Medicine and Social Economic Status, and cost of TM.

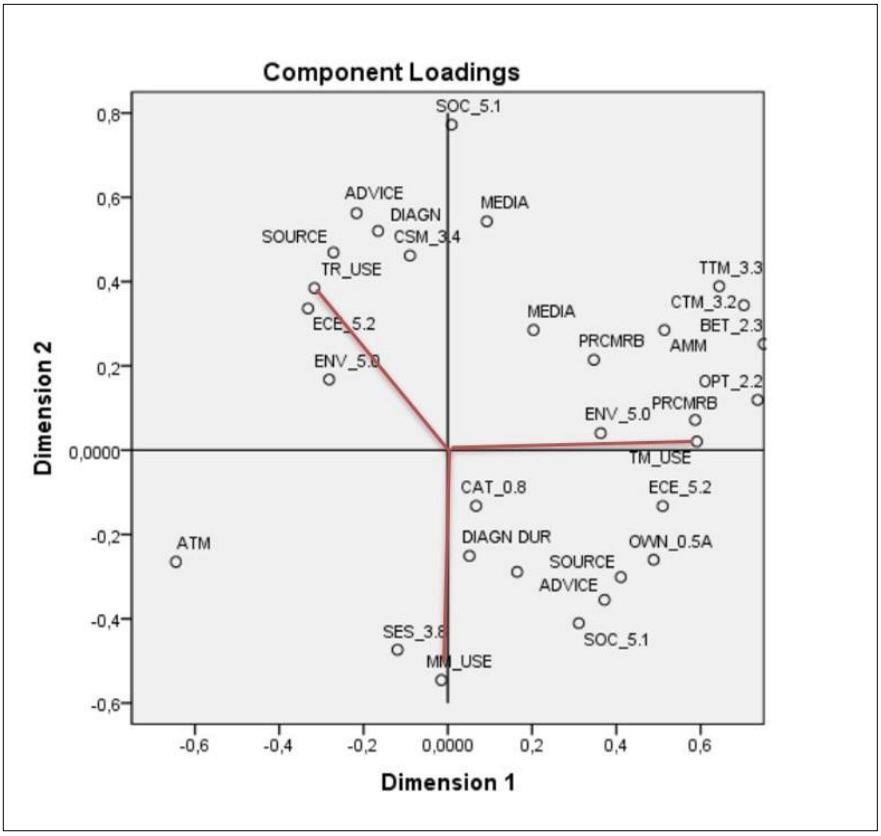
On dimension 2:	value	block	label
1. SOC_5.1 c,d	0,772	5	Socially acceptable
2. ADVICE c,d	0,562	2	Consult advice for treatment
3. MM_USE a,b	-0,546	9	Use of Modern Med.
4. MEDIA c,d	0,543	1	Use of modern media
5. DIAGN c,d	0,520	4	Externally diagnosed
6. SES_3.8 a,b	-0,474	3	Social Economic Status
7. SOURCE c,d	0,469	2	Source of knowledge
8. CSM_3.4 a,b	0,462	3	Cost of Transitional Med.
9. TTM_3.3 a,b	0,389	3	Cost of transport to Trad. Med.
10. TR_USE a,b	0,385	8	Use of Transitional Med.
11. PRCMRB c,d	0,347	4	Perceived Morbidity
12. CTM_3.2 a,b	-0,344	3	Cost of Traditional Med.
13. ECE_5.2 c,d	0,336	5	Economically efficient

Apart from PRCMRB – perceived morbidity, the variables which carry a sufficient values in both dimensions appear to be ADVICE - consult advice for treatment, SOC - socially acceptable, SOURCE - source of knowledge, CTM – cost of Traditional Medicine, TTM – cost of transport to

Traditional Medicine, and ECE - economically efficient. For the dependent variables it is the use of Transitional Medicine. It is apparent that from the dependent variables TM_USE is dominant in the first dimension, followed by TR_USE with a moderate value, whereas MM_USE is up in the second dimension, followed again by TR_USE, again with a moderate value. When referring to the bivariate analysis, it is apparent that the variables which are most discriminate are consistent with their appearance in the first and the second dimension, although incidentally in a reversed order. The variable DIAGN – the morbidity was clinically diagnosed, is highest in the bivariate analysis, and appears here in only the second dimension with a strong value, most probably for its relationship with MM_USE – use of Modern Medicine, ranking third with a strong negative value.

In Figure 7 [34] it is apparent that the combination of BET, CTM and TTM have the highest values in both dimensions, indicating that the belief, cost and cost of transport (*accessibility*) of Traditional Medicine form strong coherent motives, closely related to perceived morbidity (PRCMRB). The variables closest to the use of Modern Medicine are labelled SES - social economic status and SOC - social acceptability of the system utilisation. Opposite in dimension 2 TR_USE - use of Transitional Medicine, has the highest proximity to ECE - economic efficiency and ENV - environmentally friendly, but SOURCE, ADVICE and DIAGN are in the same cluster.

Figure 7. Component Loadings of Variables of Medical System Utilisation.



The use of transitional medicine (TR), in the qualitative analysis, appears to be influenced by subjective motives, as self-medication and buying over the counter drugs (OTC) is strongly related to the exchange of individual opinions on efficacy of widely available commercial products. This phenomenon is supported by the frequently reported drug shortages at modern facilities which is

said to lead people to purchase privately as a necessary alternative. Moreover, the sequence of undergoing a test at a private (commercial) laboratory and subsequently following the advice to purchase drugs privately is a common feature in Serengeti. It is perceived as more efficient, less costly and less time consuming, than visiting a clinic or hospital. Overall the correlations perceived in connection to the consecutive plural medical systems utilisation show a distinction with regard to the contextual motives. As established, Traditional Medicine (TM) appears to be carried by the combination of belief, opinion and cost. In the qualitative research, this is supported by accessibility *i.e.* proximity to domestic environment, and preparation of home remedies with no cost involved. Another aspect is that TM healers are incidentally considered expensive as well, because of additional requirements of donations in kind next to the actual bill, so it becomes more expensive than a hospital visit. If a healer is regarded an expert in a specific disease it may involve extensive travelling at extra cost. Next to these aspects, an emphasis on rural settings comes into view because here both land ownership and cattle ownership show up in the same cluster with TM use.

Having said that, it must be recollected that TM is simultaneously commercialising, appearing in urban settings as well, now offering a variety of treatments, complete with advertisement, media exposure and ready-made products in large quantities. The utilisation of the Modern Medical system provides associations with Social Economic Status and social acceptability. Secondly these appear to have an association with a clinical diagnosis, the duration of the illness, and the advice for treatment. These aspects are demonstrated in both the bivariate and the qualitative analysis, where it is established that the use of the Modern Medicine is associated with socially desirable behaviour, and there is a stigmatisation of TM use in religious circles. Secondly the duration of illness has an ambivalent effect, as unsatisfactory TM treatment leads to reverting to a hospital, but the opposite also happens with reoccurring symptoms from chronic diseases, be it with a lower frequency.

7.3.1 Multiple Regression Analysis

In this stage of the analysis the focus is not at the individual variables but on the relationships between the dominant variables within the various blocks of the model. The formula used to calculate the multiple correlation coefficient (*Pd)* for two blocks of variables is $Pd = 2 \times Ed-1$, meaning twice the '*Eigenvalue*' (*d*=dimension) minus one (*cf.* Van der Burg *et al.* 1988; Meulman & Heiser 2010). For this step the variables whose correlations are significant are each entered each into a block by block OVERALS analysis to establish the dominant factors in health care utilisation in the research model (*cf.* Figure 8).

The variables shown in Table 42 below are listed on their component loadings out of the block by block analysis, on the left for dimension 1 and on the right for dimension 2. Apart from MEDIA – media use, i.e. number of modern media in use by the household, the highest scores involving personal interaction are ADVICE – for treatment, and SOURCE – of knowledge. They indicate that the influence in both dimensions is dominated by whom is consulted for treatment, and who is the source of knowledge on the cause of a disease. In both spheres the family relationships appear dominant, with a bias towards the female family members and the elders. The exception here is the Village Health Worker who is the only one being consulted on a professional basis, although being a volunteer, but it is an indication that the social proximity of that person to the community is an important element. The strongest relationships in the overall ranking are between DIAGN – officially diagnosed, and MM_USE which is expected, as most formal test based diagnoses stem

from the modern system. The second highest is between PRCMRB – perceived morbidity, and TM_USE which indicates that the classification of the type of morbidity is related to the type of traditional treatment which is being opted. That is emphasised further when looking at the values of ATM - availability of TM and BET - belief in TM, as they are singled out in the relationship between block 2 and 5, both receiving a 0,9+ value. These indicators are complemented for the same blocks in the second dimension with ADVICE – treatment consult, and SOC – social acceptability of the utilised medical system, which together deliver a coherent outcome, indicating that socio-cultural context related variables are ultimately dominant.

Table 42. Strongest Correlating Variables Among Blocks in Two Dimensions (OVERALS).

Analysis	Two strongest correlations dimension 1				Two strongest correlations dimension 2			
Blocks	Name	Value	Name	Value	Name	Value	Name	Value
1 < > 2	MEDIA	0,702	ADVICE	0,643	MEDIA	0,760	SOURCE	0,505
1 < > 3	SES	-0,817	MEDIA	0,729	TTM	0,745	CTM	0,657
1 < > 4	OWN	-0,669	CAT	-0,586	MEDIA	0,710	PRCMRB	0,594
1 < > 5	SOC	0,648	OWN	-0,528	MEDIA	0,784	SOC	0,759
1 < > 7	TM_USE	0,789	OWN	0,498	n.a	0,000	n.a.	0,000
1 < > 8	TR_USE	-0,801	MEDIA	0,610	n.a	0,000	n.a.	0,000
1 < > 9	MM_USE	0,782	MEDIA	0,712	n.a	0,000	n.a.	0,000
2 < > 3	CTM	-0,819	BET	-0,804	ADVICE	0,659	CSM	0,589
2 < > 4	PRCMRB	0,606	ADVICE*	0,555	PRCMRB	0,683	ADVICE	0,564
2 < > 5	ATM	-0,938	BET	0,903	ADVICE	0,826	SOC	0,765
2 < > 7	TM_USE	0,838	OPT	0,676	n.a	0,000	n.a.	0,000
2 < > 8	TR_USE	-0,818	ADVICE	0,693	n.a	0,000	n.a.	0,000
2 < > 9	MM use	0,818	SOURCE#	0,496	n.a	0,000	n.a.	0,000
3 < > 4	TTM	0,689	PRCMRB	0,604	DIAGN	0,609	SES	-0,454
3 < > 5	TTM	0,887	CTM	0,859	SOC	0,801	CSM	0,561
3 < > 7	TM_USE	0,802	CTM	0,718	n.a	0,000	n.a.	0,000
3 < > 8	TR_USE	0,758	SES	0,541	n.a	0,000	n.a.	0,000
3 < > 9	MM_USE	-0,794	CTM	0,598	n.a	0,000	n.a.	0,000
4 < > 5	SOC	0,733	PRCMRB	0,582	PRCMRB	0,684	ATM	-0,491
4 < > 7	TM_USE	0,894	PRCMRB	0,877	n.a	0,000	n.a.	0,000
4 < > 8	TR_USE	0,856	PRCMRBˆ	0,641	n.a	0,000	n.a.	0,000
4 < > 9	MM_USE	0,912	DIAGN	0,871	n.a	0,000	n.a.	0,000
5 < > 7	TM_USE	0,827	SOC	0,601	n.a	0,000	n.a.	0,000
5 < > 8	TR_USE	-0,821	ECE”	0,460	n.a	0,000	n.a.	0,000
5 < > 9	MM_USE	-0,816	SOC	0,693	n.a	0,000	n.a.	0,000

N.B.: The table and ranking is composed from the SPSS analysis output per set of two blocks.
Source: Fieldwork data 2016

Referring to the bivariate analysis, the only variable deviant in this listing is MEDIA, a multiple nominal indicator, later recoded to an ordinal variable. It was found to relate to MM utilisation by the people with a SES above 'average', using multiple modern media.

The correlation coefficient formula introduced earlier leads to a ranking of the strength of their relationships as is demonstrated in Table 43 below and the subsequent Figure 8 which illustrates the relationships between the blocks in their entirety in one overview following the original conceptual research model.

As explained earlier in the SPSS methodological description, the sum of both '*Eigenvalues'* represents the total 'fit', which is the degree of variance accounted for by the outcome over two dimensions. The fit represents the maximum attained over the two dimensions, all values above 0,50 are sufficiently strong correlations.

Table 43. Multiple Correlation Coëfficients Between Blocks in the Model (Pd=2 x Ed – 1*).

Blocks	dimension 1	dimension 2	Fit
1 < > 2	2 x 0,817 – 1 = 0,628	2 x 0,804 – 1 = 0,608	1,621
1 < > 3	2 x 0,780 – 1 = 0,560	2 x 0,731 – 1 = 0,461	1,511
1 < > 4	2 x 0,677 – 1 = 0,353	2 x 0,656 – 1 = 0,312	1,333
1 < > 5	2 x 0,828 – 1 = 0,655	2 x 0,797 – 1 = 0,594	1,625
1 < > 7	2 x 0,636 – 1 = 0,272	_	0,636
1 < > 8	2 x 0,641 – 1 = 0,282	_	0,641
1 < > 9	2 x 0,612 – 1 = 0,233	_	0,612
2 < > 3	2 x 0,872 – 1 = 0,744	2 x 0,804 – 1 = 0,608	1,676
2 < > 4	2 x 0,753 – 1 = 0,506	2 x 0,690 – 1 = 0,380	1,443
2 < > 5	2 x 0,931 – 1 = 0,862	2 x 0,913 -1 = 0,826	1,844
2 < > 7	2 x 0,703 – 1 = 0,406	_	0,703
2 < > 8	2 x 0,668 -1 = 0,336	_	0,668
2 < > 9	2 x 0,669 -1 = 0,338	_	0,669
3 < > 4	2 x 0,692 – 1 = 0,383	2 x 0,656 – 1 = 0,311	1,348
3 < > 5	2 x 0,885 – 1 = 0,769	2 x 0,803 – 1 = 0,606	1,688
3 < > 7	2 x 0,643 – 1 = 0,285	_	0,643
3 < > 8	2 x 0,573 – 1 = 0,146	_	0,573
3 < > 9	2 x 0,630 – 1 = 0,259	_	0,630
4 < > 5	2 x 0,763 – 1 = 0,525	2 x 0,721 – 1 = 0,441	1,484
4 < > 7	2 x 0,800 – 1 = 0,599	_	0,800
4 < > 8	2 x 0,732 – 1 = 0,464	_	0,732
4 < > 9	2 x 0,832 – 1 = 0,663	_	0,832
5 < > 7	2 x 0,692 – 1 = 0,384	_	0,692
5 < > 8	2 x 0,674 – 1 = 0,347	_	0,674
5 < > 9	2 x 0,666 – 1 = 0,331	_	0,666

N.B. Blocks 7,8, and 9 received only values in one dimension.

Block 6 Intervening variables not included for not reaching significance threshold.

7.4 Results of the Analysis and Interpretation of the Findings

The multivariate analysis of the variables identified in the bivariate session, shows that the highest 'fit', which represents the proportion of variance accounted for, is found in the first dimension of the canonical space, with 52,4%. The outcome is consistent as the most discriminate variables in the bivariate analysis also rank high in both dimensions in the multiple regression analysis.

The highest in dimension 1 (*cf.* Table 41) among the independent variables are BET Belief in traditional medicine, OPT Opinion on traditional medicine, CTM Cost of traditional medicine, all scoring above 0,7 followed by ATM Availability of traditional medicine and TTM Cost of transport to traditional medicine, all above 0,6. The clustering in Figure 7 shows the coherence between the related aspects of TM utilisation.Apart from perceived morbidity (PRCMRB) the independent variables which receive sufficient values in both dimensions are ADVICE who was consulted for advice for treatment, SOURCE who was the source of knowledge, SOC the treatment is socially acceptable, CTM, and TTM the cost and transport to traditional medicine, and ECE the treatment is economically efficient. The variable DIAGN clinically diagnosed only associates with MM. The source of knowledge regarding illness (SOURCE) is dominated by family members, 46% (N=715), which appears gender biased as the majority is female. The Village Health Worker (VHW) rates second as source of knowledge in the MM system utilisation and third overall. Considering the low impact of formal health education the consultation for treatment (ADVICE) with the VHW and the traditional healers proves substantial while not family related. The highest correlations (*cf.* Table 43) between blocks on the first dimension are:

- 0,862 between block 2 psycho-social and block 5 institutional factors
- 0,769 between block 3 enabling variables and block 5 institutional factors
- 0,744 between block 2 psycho-social and block 3 enabling factors
- 0,663 between block 4 perceived morbidity and block 9 use of Modern Medicine
- 0,655 between block 1 socio-demographic and block 5 institutional factors
- 0,628 between block 1 socio-demographic and block 2 psycho-social factors
- 0,599 between block 4 perceived morbidity and block 7 use of Traditional Medicine
- 0,560 between block 1 socio-demographic and block 3 enabling factors
- 0,525 between block 4 perceived morbidity and block 5 institutional factors
- 0,506 between block 2 psycho-social and block 4 perceived morbidity

The highest correlations on the second dimension include:

- 0,826 between block 2 psycho-social and block 5 institutional factors
- 0,608 between block 2 psycho-social and block 3 enabling factors
- 0,608 between block 1 socio-demographic and block 2 psycho-social factors
- 0,606 between block 3 enabling and block 5 institutional factors
- 0,594 between block 1 socio-demographic and block 5 institutional factors

Presenting the effect on the dependent variables, block 7, 8 and 9, *i.e.* the utilisation of the respective medical systems; the values are taken from Table 42 (variables per block) and Table 43

(blocks). The strongest relationship is between Block 4 Perceived Morbidity (PRCMRB), and block 9 the use of Modern Medicine with 0,663. In block 4 the strongest variable in the first dimension was DIAGN (0,871) with the use of Modern Medicine (0,912). The second strongest relationship between block 4 PRCMRB and block 7 the use of TM with 0,599. The strongest variable values were PRCMRB (0,877) and the use of TM (0,894). The relationship between block 4 and block 8 use of TR, was the lowest, which is acceptable since the reputation of over the counter drug brands and oral advice resulting from customer experience have a strong influence on self-medication.

From the other independent factors correlating with the dependent factors there is a relationship between block 2 Psycho-Social factors (0,406) and block 7, use of TM. That appears consistent with the value of OPT – opinion on TM (0,676) in block 2, and the use of TM (0,838) block 7, in the first dimension.

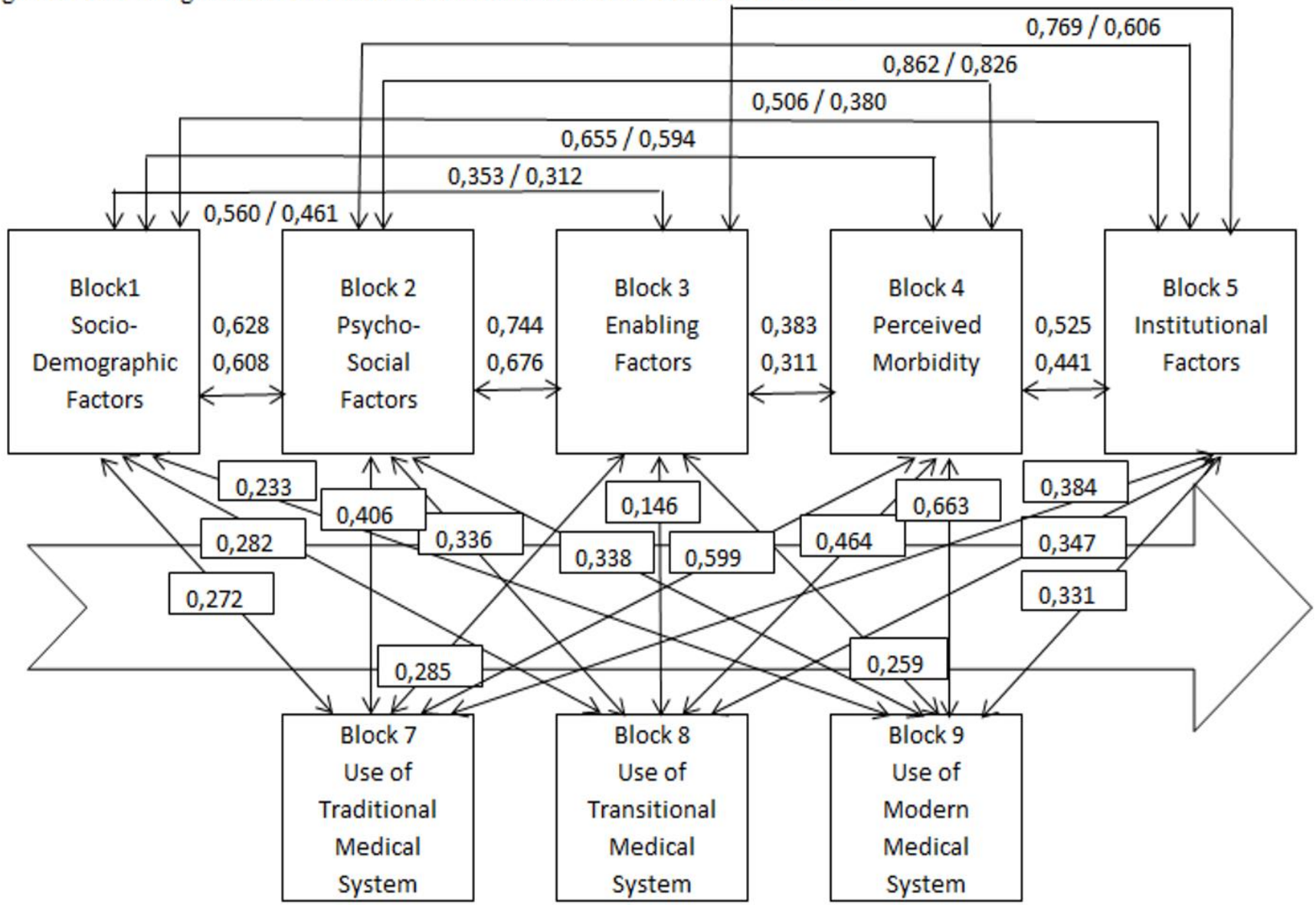
The other strong relationships are found horizontally between the blocks of independent factors. Block 2 Psycho-Social factors and Block 5 Institutional factors have the highest representation in the ranking (7x), followed by block 1 Socio-Demographic factors (5x), and block 3 Enabling factors and 4 Perceived Morbidity (4x) respectively. These frequencies to a large extent reflect the values of individual variables within the blocks.

The strongest relationship between blocks presented in Figure 8 is identified between block 2 Psycho-social factors and block 5 Institutional factors with 0,862 in dimension 1 and 0,826 in dimension 2. The next strongest relationship is between block 3 Enabling factors and block 5 Institutional factors with 0,769 in dimension 1 and 0,606 in dimension 2. That relationship is apparently determined by the combination of CTM - cost of TM, coupled with TTM – cost of transport to TM, and ATM – availability of TM. Referring to the qualitative data this underwrites the proximity in terms of TM in physical distance, the number of people who apply home remedies, acquired near their homestead, at a fraction of the cost.

In the individual variables between blocks (*cf.* Table 42) the availability of TM (ATM) receives the highest value with -0,938 connected to belief in TM (BET) with 0,903. Block 5 additionally shows social acceptability (SOC) of utilised system as strong, followed by the economically efficient (ECE) quality of the treatment. From block 2 the advice for treatment (ADVICE) and the source of knowledge (SOURCE) appear strong, as well as the belief (BET) and the opinion on TM (OPT). These relationships indicate that the influence of personal relationships within the community outrank pragmatic considerations. On the plane of socio-demographic factors, represented by block 1, there are three variables with sufficient values in the first dimension, being landownership, livestock ownership, and the use of modern media. The first one, landownership shows in a relationship with livestock and the use of TM in block 7, and with social acceptability in block 5.

It is established that the psycho-social factors are ultimately dominant in connection to the availability and accessibility of TM. The social acceptance in connection to the transfer of traditional knowledge through the consultation of family and community members appears to play a decisive role in the utilisation process. The majority of the sample in both quantitative and qualitative sections refers to the application of either domestic or professional herbal treatment as the first activity. There is a strong relationship with the classification of the illness and suspected causation. The dominance of pyscho-social factors is underscored by the low correlations regarding social economic status, education or modern media, as opposed to the prominence of family and community members' source of knowledge and advice for treatment.

Figure 8. The strength of the correlations between the blocks of factors in the model



Notes Chapter VII

31. With regard to the historical aspects of the species mentioned in the household survey, the informant who was capable of commenting on it, is professional herbalist Emanuel Kisiri (name used with permission) who was 66 years old when interviewed, who was told by his father (born in 1890) that to his knowledge at least theses five species are not considered indigenous. They were first observed planted around missionary residential settlements, and later dispersed in the area surrounding them. Such knowledge may not be current among the individual inhabitants, depending on their age group, as the indigenisation process started before independence (fieldwork by Daniel Matinde 2016).
32. 'The fit and loss values tell how well the nonlinear canonical correlation analysis solution fits the optimally quantified data with respect to the association between the sets. The Summary of Analysis table shows the fit and loss values, and eigenvalues for the survey example' (Meulman & Heiser 2010, p.134).
33. Chi-square Automatic Interaction Detection (CHAID) was created by Gordon V. Kass in 1980. CHAID is used to discover relationships between variables. Its analysis builds a predictive model, or tree, to help determine how variables best merge to explain the outcome in the given dependent variable. Nominal, ordinal, and continuous data can be used, where continuous predictors are split into categories with approximately equal number of observations. It creates cross-tabulations for each categorical predictor until the best outcome is achieved and no further splitting can be performed. In this technique, the relationships between the split variables and the associated related factor are visualised within the tree. The development of the decision, or classification tree, starts with identifying the target variable or dependent variable; which would be considered the root. The analysis splits the target into two or more categories which are called the initial, or parent nodes, and then the nodes are split using statistical algorithms into child nodes. Unlike regression analysis, this technique does not require data to be normally distributed. Source: https://www.statisticssolutions.com/non-parametric-analysis-chaid/
34. Figure 7: 'The figure shows the plot of component loadings for survey data. Without missing data, the component loadings are equivalent to the Pearson correlations between the quantified variables and the object scores. The distance from the origin to each projected variable approximates the importance of that variable. The canonical variables are not plotted but can be represented by horizontal and vertical lines drawn through the origin'. (Meulman & Heiser 2010; p.138).

CHAPTER VIII CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

8.1 Overview

Following the objectives set for this research, as enumerated in 1.3, this chapter will consecutively address the outcomes of the qualitative and quantitative data collection and analysis. They are complemented by the insights drawn from the field of ethnographic study (FES), the historical dimension (HD) and the participants' view (PV), as integral components of the Leiden ethnoscience method. The eight objectives addressed in paragraph 8.2 are translated into practical recommendations for the organisation of local public health policies in par. 8.4.

The vulnerability of current public health policies has been elaborated in the historical analysis in Chapter I. Given the complexity of the themes covered by regional and national health policies, and the political and social pressure to address them simultaneously, increases the risk of overstretching available resources without precedent (*cf.* Luukkanen *et al.* 2004). The themes consist of communicable diseases monitoring and control (CDC), an increasing incidence of non-communicable diseases (NCD), maintaining preventive services and health promotion, reacting to environmental hazards, health manpower shortages, as well as special programmes such as maternal and child health (MCH), HIV/AIDS, or PMTCT. In particular where handling these multiple tasks is dependent of infrastructural assets, logistic capabilities, financial resources and health manpower, the management may come under strain in the region.

Additionally, the analysis looks at the extent to which these policies match the resources of the community and communicate with the socio-cultural context in which they are applied. Where many current concepts become dysfunctional, is when the availability of any of these resources, considered inherent to a modern encompassing public health system, are below the expected margins to contribute in a functional way (*cf.* Ambaretnani 2012). It is suggested that successful development of public health in rural Africa is dependent of the inclusion of as many indigenous, social and cultural aspects as possible (*cf.* Slikkerveer 1982; 1995; Hsu 2007; Prince 2014; Marsland 2014; Azevedo 2017a, b).

In the original concept of Primary Health Care (PHC), as one of the first universally adapted public health polices, the role of the community was really an integral part, but the implementation leaves a number of aspects to be reconsidered. Initiated among others to achieve decentralisation, in retrospect, the necessary resource allocation to district level and the commitment demanded on community level may have been underestimated. The effect of these aspects was a lower response to Primary Health Care (PHC) than anticipated, consequently amplified by factors such as economic decline and population growth over two consecutive decennia (*cf.* WHO 2008a). The role of a community member as a local health staff extension was never controversial in itself. The functioning of a community health committee to perform as a liaison for local authorities may have been subject to a lack of political will in the past, but in concept it is to be re-appreciated and revived (*cf.* Azevedo 2017b). It is in this re-orientation that the assessment made by Maurice King in his compilation after the Makerere Symposium becomes a point of focus again. He remarked that too much emphasis is placed on the three aspects of 'money, manpower and materials' and too little on the influence of culture: '*The almost inevitable human tendency is to accept the visible parts of a strange culture, and unconsciously graft unto them invisible elements from the observer's own culture, albeit in a very incomplete and haphazard way'* (King 1966: 4.1).

The essence of the discussion on the role of the community becomes twofold: on the one hand it is imperative that community involvement becomes anchored in a local public health structure. On the other hand the demands made on those who become involved on behalf of the community have also increased over time. That applies to the village health committees (VHC) as well as the community health workers (CHW). It means that selection and training of these individuals deserves renewed attention, as well as the allocation of funds to maintain them, not only on community level but also on district level. Additionally, their role could be extended by not only becoming a liaison for the modern medical system, but simultaneously for the traditional medical system. By embracing the local traditional practitioners they become an equivalent of the detection, early warning and monitoring of health hazards already in place (see 1.4 and 5.4). It could serve to reduce health manpower shortage, provided there is mutual trust, exchange of knowledge, and respect for local culture (*cf.* Chirangi 2013). The collaboration would stimulate the sharing of resources and create awareness of community rooted problems. Such an approach can be considered as operationalising '*community-based interventions at sub-district level'* as an integral part of the 'Reach Every District' (RED) goal of the Universal Health Coverage (UHC) policy by the WHO (2013). Moreover, it would imply structural recognition and integration of TM in a way envisaged by the WHO (2019). It could start with the networking of individual TBA's who recognise the importance of pregnancy related complications (PRC's). It could involve bone-setters and herbal practitioners who express great interest in sophisticating their therapies, and who in personal communications prove to be aware of working in the periphery of an invisible yet essential referral system, especially from a community point of view.

8.2 Conclusions

The data from the household survey are processed in consecutive bivariate, mutual relations and multiple regression analyses, to provide insight into the strength of the relationships between the nine blocks of the conceptual model (Chapter III). The model is intended to disclose the nature of these relationships in the utilisation of the plural medical system, consisting of the traditional, transitional and modern medical system respectively, as described in 2.3. It shows these relationships as a point of reference for the local population, in terms of accessibility and cultural aspects. The blocks in the model consist of independent, intervening and dependent factors:

Table 44. Overview of the Sets of Variables Used in the Model.

Independent	pre-disposing variables	socio-demographic	block 1
	pre-disposing variables	psycho-social	block 2
	enabling variables	socio-economic status	block 3
	perceived morbidity	health status, illness, duration	block 4
	institutional variables	availability, quality, efficiency	block 5
Intervening	intervening variables	health education campaigns	block 6
Dependent	dependent variables	utilisation of traditional med. system	block 7
		utilisation of transitional med. system	block 8
		utilisation of modern med. system	block 9

N.B. see also 3.1.1. for the configuration of the conceptual model

The qualitative data were acquired by a set of open question sections in the household survey, complemented with in-depth interviews with selected key informants throughout the research area. They serve as a context for interpretation of the quantitative analysis, as well as identification of locally relevant themata. The eight research objectives are consecutively addressed as follows:

Objective 1: The qualitative analysis of the multidimensional model (Figure 1, table 44) of plural medical system utilisation provides the following results. In total 41.7% of the actors use TM, 21.5% use TR, and 36.8% use MM (N=715). The highest values among the independent variables are belief in traditional medicine, opinion on traditional medicine, and cost of traditional medicine, all scoring above 0,7. They are followed by availability of traditional medicine and cost of transport to traditional medicine, all above 0,6. The clustering in Figure 7 shows the coherence between the related aspects of TM utilisation. Apart from perceived morbidity, the highest values among the independent variables which receive sufficient values in both dimensions are: who was consulted for advice for treatment, who was the source of knowledge regarding illness, whether the treatment was socially acceptable, the cost and transport of traditional medicine, and whether the treatment is economically efficient. The clinical diagnosis only associates with MM. The source of knowledge with regard to illness and treatment is dominated by direct family members (46%). It appears to be gender biased as the majority is female among spouses, parents and grandparents. Especially with regard to the low impact of formal health education the VHW's role on community level remains essential. In the consultation for treatment both the VHW and the traditional healers (*waganga wa kienyeji*) prove substantial across the medical systems, as they are approached professionally and are not family related.

The dominant blocks in the model's relationships analysis presented in Figure 8, are block 2 psycho-social factors, block 3 enabling factors, block 4 perceived morbidity and block 5 institutional factors. The strongest relationship with the dependent variables is between block 4 perceived morbidity, and block 9 the use of Modern Medicine with 0,663. The second strongest relationship is found between block 4 perceived morbidity and block 7 the use of TM with 0,599. The highest correlation overall is between block 2 psycho-social factors and block 5 institutional factors in dimension one with 0,862, and in dimension two with 0,826. The intervening factors, block 6 in the model, which consist of the recollection of health education campaigns and their media of transmission, did not receive sufficient values in the bivariate analysis to substantiate their inclusion in the multiple regression analysis. Regarding the dependent variables the use of TM is dominant in the first dimension, while MM is dominant in the second dimension. From block 1 the social-demographic and economic factors, the only ones remaining significant in the analysis are land ownership in dimension 1, associated with TM, the number of modern media in household use, along with Social Economic Status (SES) in dimension 2, associated with MM.

The main cross-over in utilisation between medical systems appears to result from consecutive use of alternate treatments invoked by dissatisfaction with short term results. The movement can be multidirectional. A hospital treatment can be followed up by TM, and vice versa, but again, there is no correlation found with a specific morbidity, other than the ones mentioned in objective 2.

Other crossovers which are deviant from the expected process, are the options applied after official diagnosis by modern medicine (MM). There are the instances where instead of going to the hospital, a commercial laboratory downtown is consulted, which charges lesser fees, and is followed up by buying commercial medicine without a proper prescription. Equally unexpected is an official

diagnosis at a dispensary followed up by the same process, on account of non-available medicine. There is a subsequent non-adherence to the prescribed therapy as well because of cost level arguments. It is debatable whether these actions are purely a result of economic motives, or whether they can be attributed to scepticism or lack of knowledge. Non-compliance with therapy is a suspected cause for reoccurrence of symptoms. It is influential to the efficacy of selected prescribed medicines, possibly leading to insensitivity to certain therapies as feared by local clinicians.

Objective 2: Although there is an apparent classification of morbidities among respondents, as described in Chapter VI, par. 6.4, there is no single correlation with utilisation across systems, except for those associated with a mental illness, or the suspicion of a supernatural cause. They may occasionally be connected with symptoms resulting from stroke, partial paralysis, epilepsy or upper respiratory affections such as asthma. Another recorded distinction is the dichotomy between 'old' and 'new' diseases. That popular distinction stems from tradition and current experiences. Diseases such as cancer, diabetes, cardiovascular conditions, hypertension, obesity, HIV/AIDS and Ebola, are considered 'new', and therefore more difficult to treat with self-medication or TM. All other recorded diseases are treated with home remedies or by consulting a traditional healer.

Regarding the complementary outcomes of the quantitative and qualitative data concerning utilisation, there are two phenomena which stand out: the extent to which self-treatment is dominant within this sample by applying home remedies first. Secondly by the application of commercial medicine from the transitional system, notably when prior diagnosis by an external source is left out. These phenomena were observed with recurrent symptoms, but changed with increasing severity of specific symptoms over an extended period. In that case the next step was either to consult a specialised renowned traditional healer, involving extensive travelling, or proceeding to a hospital as the last option for treatment.

Objective 3: As described in both Chapter IV and VI consecutively, the sociographic background and the historical perspective show the strong adherence to traditions, especially the survival of normative behaviour over a prolonged period of time, to a large extent undented by modern societal developments. It is demonstrated by the awareness of the origin of migratory routes, customs and rituals, and explanations on the emergence of the combination of agricultural and pastoral practices.

With the Kurya people in particular, the role of transition rites and seasonal cultural festivals were indicated as essential, as well as the communal jurisdiction maintained and executed by both a council of elders and community members. This is emphasised by the widespread knowledge of oral history and the adherence of young people to the traditions, indicated by their collective participation. The remark made by the elders on the current situation is their recognition of an increasing urge to migrate to urban areas resulting from limited economic perspectives. Simultaneously however, people who have become successful in an urban setting create a 'pied a terre' in their hometown and spend their leisure time there, again showing identification with their original socio-cultural environment.

Objective 4: The qualitative research shows that general knowledge of traditional therapies is common, but specific knowledge pertaining to preparation of indigenous medicinal plants is more limited and transferred on personal relational level *i.c.* family members or acquaintances. There are indications of gender influence as most of the of the knowledge seems to reside with female

household members, as mentioned above (*cf.* Towns *et al.* 2014). Also, most TBA's combine their obstetric skills with herbalist practices, simultaneously complaining of a lack knowledge transfer to the next generation, as young people who show interest in the field are limited.

The intricate aspects of herbal medicine preparation are in the combination of species within certain concoctions, as well as their intended purpose. It may prove useful to investigate the varieties in the application of identified herbal treatments aimed at specific diseases across -sub- regional areas in the future (*cf.* Chirangi 2013), especially where they are consistent, and where they diverge, for example in malaria treatment. The household survey identified a number of specific TM treatment modes, which shows their current familiarity and confidence among the population, their effect on health care utilisation and impact on public health services. The type of morbidities to which they are applied, as described in Chapter VI, are mainly related to behaviour, hygiene, or nutrition, while indirectly indicating the limited impact of preventive health education.

The top frequencies in TM application are with urinary tract infection (UTI), amoeba, diarrhoea, abdominal pains, and jaundice. An exception is the role of malaria, where there are remarkable inconsistencies in health seeking behaviour, as well across the plural system utilisation as within one system. The lack of proper diagnosis and inconsistent treatment indicate the peril connected to the prevalence of this morbidity, it especially deserves attention when dealing with children. It is noted that convulsions (*degedege*) are usually self-treated, or by a traditional healer. Indirect effects resulting from malarial infections, *e.g.* anaemia, liver dysfunctions or cerebral injuries, are not widely recognised as possibly connected to the disease.

With regard to the maintenance of biodiversity, individual respondents knowledgeable on herbal treatment complained of decreasing availability of certain species. The species were identified through images by a number of professional botanists. There is an overlap with species identified in other area studies, although the combinations mentioned are yet to be matched with earlier recordings. There was no recording regarding the specific volume of the components mixed in concoctions, as the treatments were mentioned spontaneous during the household survey.

Objective 5: As described in Chapter VII the analysis of the data follows a specific sequence with the purpose of an overall data reduction in order to detect the underlying relationships between the dimensions of the conceptual model, as elaborated in *Objective 1*. The first step is the bivariate analysis which involves all variables in the model to be crossed with the system variable (SYSTEM) composed to represent the utilisation of the three designated medical systems in the area. The next step is to select the variables which attain a sufficient level of significance, and process these in a multiple regression method (OVERALS) to detect their mutual relations (table 43). The sets can consist of nominal as well as ordinal variables. The analysis is performed in two dimensions in a canonical space as presented in Figure 7. The multiple regression analysis of the variables identified in the bivariate session, shows that the highest 'fit', *i.e.* the proportion of variance accounted for, is found in the first dimension of the canonical space, with 52,4%. The outcome is consistent in as far as most discriminate bivariate variables also rank high in both dimensions in the multiple regression analysis. The final step in the process establishes the correlations between the sets of variables as indicators for the relationships among the separate blocks in the model as presented in Figure 8. They determine the level of influence of one specific block of independent variables on the dependent variables, *i.e.* the utilisation of a medical system.

Objective 6: The aspect of accessibility of health care services in a physical sense appears dependent of facility distribution. Whereas TM has been historically tied to the environment of the local population, and implicit in any social communal setting, the coverage of facility based curative and preventive services on A-level is stretched to its limits, given the current level of resources. Although this network is extended by the functioning of Community Health Workers, most of whom are operating without a fixed station, the distribution of facilities in rural areas will remain problematic in the middle long term, unless alternatives are found. One option would be to revive mobile services with outreach programmes [35] as were customary during the onset of Primary Health Care programmes in the early 1990's, or by upscaling the services on community level with local resources (*cf.* Azevedo 2017b).

The aspect of accessibility in socio-economic terms seems determined by complementary aspects. As most of the services are low key, while some are officially free of charge for the most vulnerable target groups, such as Maternal & Child Health (MCH), elderly care and HIV-suspects, there is competition for efficacy and cost level with alternate providers, whether transitional or traditional. One aspect which is explained by health workers is that the financial resources available on district level, cannot maintain the intended health care delivery, while preventive services do not generate the turnover to sustain themselves. Additionally, the present attraction of a Community Health Fund (CHF) or other types of collective insurance is not gathering enough momentum to function as a financial resource to sustain monitoring and preventive services, or their extension on community level. The strive by the government of Tanzania to become independent from NGO funding for the consolidation of health services demands a new approach towards identifying financial resources (*cf.* Health Sector Strategic Plan IV, 2015–2020). It may even prove to be more of social challenge than an economic one. To that extent several scenarios are reviewed in Chapter V, for example the integration with other professional organisations, such as having a farmers' union deduct reservations for health expenses from membership contributions, rescheduling local government subsidies, or allowing the spreading of payments for health services over extended periods. As noted from the references the major leverage mechanisms here are sensitisation and marketing campaigns, and, ultimately, the strength and trustworthiness of existing organisations (*cf.* Stoermer *et al.* 2012).

In line with earlier utilisation studies, *e.g.* Hausmann-Muela *et al.* 2000; Jangu 2012; Denisenko 2013; Stanifer *et al.* 2015, the qualitative research indicates that the confidence in the technical capabilities of Modern Medicine is high. It is expressed in the appreciation for aspects such as surgery, laboratory tests, X-rays, inoculations, infusions, blood transfusions, artificial respiration, resuscitation, and the compactness of modern medicine in mass produced tablets and sera.

However, as described in Chapter VI, the attitude of many modern health staff members is frequently criticised. There is a notion of insufficient feedback received during consultations, as the staff provide no explanations to the patient regarding the cause and effect of their morbidities or the proposed cure. Many respondents describe the attitude of staff towards patients as 'arrogant' or 'rude'. That being said, the underlying reasons, or even individual motivations as to where this behaviour stems from, are apparently a question mark to the patients. In as far as this may be affecting response to preventive services, it is an aspect for investigation at facility level. The same phenomenon was also reported by the TBA's from the feedback they in turn received from mothers returning from consultations, or delivery in hospitals and clinics. Additionally, the advertised free services, *i.e.* Maternal & Child Health (MCH), HIV/AIDS and elderly care, do not always prove

free. Many respondents remark that there is always some 'administrative' fee *e.g.* paying for registration cards, or extra payment for some medicine which is somehow not included in regular stock, which they believe ends up in the staff's pocket.

There is an apparent lack of top of mind awareness with preventive measures as established by the values for block 6 'intervening variables' (*cf.* Table 44). The popularity of preventive services is disputable, and while the awareness of health education campaigns is measurable (Chapter VII), the impact is low, as the correlations with system utilisation were below threshold level in the quantitative analysis. As respondents in the qualitative data expressed (Chapter VI), there is the option to improve the integration with regular primary and secondary education curricula. They have high expectations that children might prove the best medium to create awareness, while simultaneously reaching parents indirectly. The revival of staging public role plays on community level addressing the recognition of potential hazards is subscribed by several key informants. The impact is considered higher than campaigns based on mobile Public Address Systems or incidental informative invents with on-site bannering. The role of mobile communications is not yet investigated, but the proliferation of the digital communication is almost complete, as many inhabitants have more than one device because of the differences in cost level as well as quality in coverage range between local providers. Text messaging to herald health education campaigns, or to provide specific emergency information to a broader audience may prove promising, possibly involving social media.

As extensively described in Chapter I and V, the health manpower situation is urgent, clearly expressed in the number of staff shortage documented in the Serengeti district profile (see 4.1) (*cf.* Kwesigabo, *et al.* 2012). Against the background of health manpower problems in a broader sense, this shortage is twofold, as it not only concerns physicians, who might play a secondary role in consolidating preventive services, but paramedic staff on community level as well. The options discussed range from setting up PPP's in the formal training institutions, to incorporating local level traditional practitioners into the elementary preventive or curative services. As found during the qualitative research, the option of tackling a human resources challenge with local practitioners is still a feasible one, irrespective of to the renewed emphasis on increasing the role of a Community Health Worker (CHW). Notwithstanding the argument of certain individual practitioners not meeting qualifications to engage in formal training, as incidentally expressed by local staff members, there is also an opportunity in having them become instrumental as an early detection and referral system. Their position close to the community and their confidential relationship with individual patients, as demonstrated in the daily practice of TBA's, makes them a valuable resource. Moreover, as expressed by the traditional practitioners themselves, there is an eagerness to co-operate and exchange knowledge (*cf.* Marsland 2007). Individual TBA's have already shown to take responsibility, by referring delicate cases to the hospital, sometimes even accompanying them to make sure they went (Chapter VI). The very mechanism should preferably become reciprocal, by training traditional practitioners in return how to maintain quality control in the consistency and conservation of their traditional products, as that is exactly what they express to expect from their interaction with the modern system (Chapter V).

While the emphasis at this point is focused on a human resources alternative, the larger picture of co-operation with TM is somehow pushed to the background. As is shown from both the qualitative and quantitative data, the first line of care with specific morbidities is through self-treatment with home remedies. The majority of diseases which carry either mental or spiritual connotations are

directed towards TM, although sometimes erroneously [36]. The potential of this phenomenon should be recognised and used for improving health policies, rather than being dismissed as inferior, inappropriate or unmanageable (*cf.* King 1966).

There is a need to extend institutionalised interaction with what the WHO calls "*the social determinants of health*" (WHO 2018). The event which triggered this insight was the reaction of the people to the emergence of Ebola in West-Africa 2014-2016. The inhabitants could hardly be convinced of the risk involved in the transmission, because there was no opportunity for them to maintain contact with the patients or escort their deceased family members into their afterlife. In that example there was an analogy with the risk impact following HIV/AIDS when not discovered timely or intentionally ignored, an important aspect of the PMTCT [37] projects.

In a wider implication, this demands a change in the mind frame of many health workers. Their awareness of the impact of certain health measures on the daily routines of the local population, where they might conflict with traditional values, should accompany any operationalisation of local health policies. It is the point where the social sciences and the bio-medical dimension converge, which can prove their added value when they are combined. The fieldwork discovered the role of the community where dedicated volunteer members of religious affiliations took it upon themselves to guide HIV-patients. They encourage them to adhere to monitoring, and prevent them from becoming socially isolated, thereby indirectly contributing to the containment of a potential health hazard. The analogy with other indigenous institutions is not hard to envisage. There are expectations from an renewed Community Health Worker (CHW) in the future, who, as the eyes and ears on community level, could be the core of social communications. By anticipating health hazards, identifying potential pitfalls, co-operating with traditional practitioners, and using locally recognisable definitions, they serve the community as a whole. The conditions under which they will be identified, trained and maintained in the community will have to be reviewed however. Especially in retrospect of the experiences under the original Primary Health Care (PHC) set up, and analogous to the Johns Hopkins (JPHIEGO) project which is aimed at the improvement of Maternal and Child Health (MCH) and TBA training.

There is an opportunity to apply a health information system to enable digitalised early warning and detection of hazards on district level. During the qualitative research, the visits to the dispensaries on site proved the dedication with local health staff to collect and record relevant health statistics (see 4.2.4). Even as the facilities are equipped with desktop computers, they are not capable of using these assets to their advantage as there is no internet connection to process the data timely. Sharing them with the public health department's back office would be instrumental to managing monitoring and control. Yet the cost involved in setting up these connections are disproportionately low put against logistics and manpower involved in physical movement and alternative communications over large distances and unpaved roads. The interviews with staff members indicated that they would be eager to not only process the data digitally, but also analyse them on site and give feedback to the public health department in Mugumu [38].

With regard to a local population of which the majority operates two mobile phones and extensively uses digitally transferred money (M-Pesa) it is not an advanced prospect. It would imply that any health hazard data requiring short term response, would automatically be detected by a public health back office. The information could be analysed in a cloud, and shared simultaneously with their satellites in the district, the health centres and dispensaries. Objectives 7,8 and 9 are addressed separately in the next three paragraphs, *i.c.* 8.3.1 until 8.3.3.

8.3 Theoretical, Methodological and Practical Implications

8.3.1 Theoretical Implications

One contribution to the theoretical realm lies in the extent to which medical pluralism (*cf.* Slikkerveer 1982) has manifested itself in the research findings. As concluded in 8.1, the variation in steps and utilisation is multidirectional and moves across the defined medical systems regardless of their historical relationships. Although psycho-social and cultural aspects appear ultimately dominant, there are indications where perceived morbidity is linked to pragmatism with chronic or recurrent symptoms. Unsuccessful treatment or dissatisfaction with the explanations may lead the way to alternative treatment, even if that transcends the medical system a specific morbidity is associated with. Self-medication with commercial medicine because of economic motives, either or not officially prescribed, is sandwiched with clinical visits or indigenous medicine. Through all varieties there are however consistencies with regard to the classification of specific diseases as either naturally caused or suspected of a supernatural cause. In the qualitative data there are indications of TM becoming commercialised on the supply side, displaying tokens of modernity in the process, which can be seen as an example of the adaptive capabilities of an otherwise tradition oriented society (*cf.* Millar 2004; Marsland 2007; Chirangi 2013; Appiah 2018).

Under the influence of global changes, Tanzania is confronted with a range of feasible options which apparently do not contradict essential local values, as described in the T&CM proliferation by the WHO (2019). In that sense these adaptations are indicative of a true enculturation of T&CM, as they are instigated by local people, not by virtue of a remote influence. These trends are visible in modern (ex-) health staff putting up commercial services privately, traditional healers producing their medication in quantity introducing smart packaging with advertisement. A spiritual healer with a website scaling up his clientele on account of one outstanding specialty, or a commercial laboratory downtown offering tests at half the price and twice the speed of a hospital, but omitting official prescriptions. On an individual level, these varieties are so wide in range that the suggestion of an expanding continuum, constantly being reshaped by emerging opportunities, blurring the division of co-existing medical systems, becomes a plausible point of interest *(cf.* Hsu 2007; Marsland 2007; Chirangi 2013; Hörbst 2017; Olsen & Sargent 2017).

As the WHO has declared, the attention to the '*social determinants of health*' is crucial in the success of an encompassing public health system, leaving indigenous cultural values intact (WHO/AFRO 2018). The desired interaction with the community should be articulated in the proposed integration of social sciences with epidemiological and public health training curricula, thereby recognising the role of indigenous culture in rural development.

8.3.2 Methodological Implications

The application of the combined types of research as promoted by the Leiden school of ethno-science (Chapter III) provides outcomes which have to be viewed in their complementarity. The model (*cf.* Slikkerveer 1989) used in the analysis of the utilisation of plural medical systems enables combining multiple dimensions and delivers results with predictive capabilities. The contributions of qualitative fieldwork and the historical perspective are considered essential for the interpretation of quantitative data. The combined consecutive analyses show that a number of sets of variables are

strongly related, in particular the psycho-social and institutional factors, followed by enabling factors. The method is capable of identifying the combination of variables within the respective dimensions that support the dominant role of indigenous knowledge in the motives of the respondents. The clustering of belief, opinion, cost and availability of TM shows their coherence. The source of health knowledge is closely related to who is consulted for advice for treatment, as well as social acceptability, social economic status, and perceived morbidity. These connections show that communal and cultural aspects are ultimately dominant over practical and economic considerations in the short term and become complementary in the long term. In that way the ethnoscience method and its model can deliver contributions to policy planning and sustainable community development (*cf.* Agung 2005; Ibui 2007; Djen Amar 2010; Leurs 2011; Ambaretnani 2012; Chirangi 2013; Aiglsperger 2014; Erwina 2019; Saefullah 2019).

The application of the ethnoscience method is encouraged to contribute to what Nachega *et al*. (2012) identify as the need to extend national training curricula in the African region with as many epidemiology and public health aspects as possible (WHO/AFRO 2012). Their meta-analysis also indicates that historically there was a pre-occupation with communicable diseases (CDC), but this should be extended. It should include NCD's, incorporate MCH as well as climate change and environmental impact respectively, as they are notably on the rise in the region.

The main motive for applying comprehensive research tools lies in the identification of predictive indicators, as they state; '*the next decade must see increases in regional epidemiological expertise to identify and elucidate causes of illness rather than just control communicable disease and outbreaks'* (Nachega e*t al.* 2012: p.1841). It should involve promoting the collaboration with programmes outside the region, and the application of distant learning modules into existing curricula. There is an explicit reference to the demand for master courses in public health supported by internet-based resources to compensate for insufficient local infrastructural capacity.

8.3.3 Practical Implications

A tangible contribution can be found in the potential role of indigenous knowledge and practices in respect of the organisation of public health on a communal level. The prominence of the role of indigenous knowledge and practices leads to a reassessment of how to mobilise communities towards health-related topics. By recognising indigenous beliefs and motives underlying local behaviour, it is possible to exchange knowledge without loss of semantics and influence unhealthy lifestyle attitudes, which may contribute more than conventional health education campaigns.

It also enables newly trained health staff members to become fully integrated because of their acquired capability of communicating on par with community members. Especially when topics are regarded as controversial, *e.g.* the social isolation of HIV-positive individuals, or diseases attributed to witchcraft. The impact of institutionalised health care at local level is fragmented and not consolidated through preventive health education. The perception of quality is dependent of the perceived receptive attitude of health staff, identification with the patient, and to a lesser extent of the type of service or the available medicine. Despite the commitment of individual health workers, the first line of consultation by patients is with immediate acquaintances, traditional healers or midwives.

There is a substantial degree of self-medication, without professional diagnosis or prescribed treatment, which is perceived as accessible, economically efficient and socially acceptable (see 8.1).

It applies to both herbal treatment as well as mass produced commercial medication. Additionally, there are disease classifications which determine the type of health service which will be applied. That choice is subject to success, as dissatisfaction with the result of a cure will lead to seeking alternative treatment, irrespective of the source. In order to anticipate and monitor health hazards on a collective scale, these are all aspects which need to be addressed through increased co-ordination between the decentralised district level institutions and local community level.

The qualitative botanical data contribute to the indigenous classification of MAC plants in the utilisation of the traditional medical system. They intend to promote the pharmacological research into local plant medicine, and contribute to the cultural and intellectual property of indigenous peoples (*cf.* regulation 31, UNICEF 2014, WIPO).

Finally, the results of this study will be used as input for the development of a health manpower training scheme in the Serengeti, which is aimed at the full integration of the medical social sciences into a curriculum for medical professionals at bachelor level. It is called the Transcultural Public Health Management (TPHM) programme and is a joint venture of Tanzanian and European counterparts, implemented through the mediation of the Mennonite Church (KMT) health facilities in Mara Region, in particular the Kisare College of Health Sciences.

8.4 Recommendations

In order to arrive at tangible contributions to health care management on district and communal level, there are a number of feasible options which can be applied consecutively. They can be executed without ample resources as they are borne in the existing social and cultural structures and can be built upon existing infrastructure and the plural medical system.

1) There is the possibility to revive community-based institutions which improve the prerequisites for sustainable health conditions on local level. They entail the revitalisation of community health committees, community health workers, and the structural co-operation with traditional practitioners in the range in which they are available (*cf.* Ambaretnani 2012, Chirangi 2013). It could perform as an alternate health manpower resources pool, provided there is willingness on district level to co-operate. The mobile outreach routine of the early days of Primary Health Care could be reinstalled to perform as a liaison and training facility, complementary to its original function as monitoring and control of MCH activities.

2) There is a request for an enhanced curriculum (see 8.3.3) to train staff in applying indigenous knowledge in their daily activities. Integration of social sciences in public health management curricula will improve the communications on community level, instigate a change in attitude and better reflection on the motives of the local population. It will enable health staff at different levels to identify with the health utilisation behaviour of their target group, and improve both preventive and curative services. The relationship between the two proves to be dependent on the perception of quality and accessibility of service. It could lead to a structural co-operation with TM practitioners, resulting in mutual respect, exchange of knowledge, and a reduction of health hazards.

3) There is underestimated potential in the revitalisation of the Community Health Fund (CHF), by considering alternative ways of organising it. Integration with existing indigenous institutions on

communal level, *i.e.* farmers' co-operatives, religious affiliations, or voluntary associations involved in any other economic activity related to reciprocal credit, are eligible ways to consolidate a health insurance. Additionally, there could be proper re-evaluation as to which type of service should be covered, with consensus of all party's involved, and with long term commitment to build confidence. Finally, there are a large number of alternatives with regard to the payment of fees which have not been explored yet. The spreading in instalments, cost sharing, collective saving schemes, rechannelling through local associations, or digitalising via mobile communications, could all prevent potential patients from avoiding consultation because of the financial impact.

4) There is a desire to start a digitalised health information system between the referral stations in terms of exchanging and analysing morbidity rates, drug supplies, health hazard early warning, monitoring and control, by applying technology which is already available, but has until now not been operationalised. There is commitment at A-level to establish such form of communications, and they could be established at a fraction of the cost of traditional logistics and physical movement. The hardware and software is available, internet providers are available, electricity is available, and the knowledge is available.

5) There is an option to enhance the impact of health education campaigns by extending the sourcing in primary and secondary education, while increasing the frequency of role plays to appeal to the tradition of oral transmission in the transfer of indigenous knowledge. Additionally, because of the changing modalities of communications with mobile telecom, it is imperative to investigate the use of existing networks to introduce health hazard messaging on mobile devices. The next generation in particular will prove susceptible to these channels and they could create a platform for proliferation, possibly through eligible social media.

6) There is the possibility a to re-animate the research into the applications of indigenous traditional medicine. A number of traditional practitioners indicated they would be eager to have their material examined. They propose that the scientific analysis of the components would have a twofold effect. First of all, it would take away the stigma of not having any recorded qualifications, secondly it would enable them to further develop their medicine in terms of conservation or reproduction and receive recognition. The main objective, in their words, is to finally receive feedback on the offer which they have consistently made. It is simultaneously a solid basis for future co-operation, and the intended integration between medical systems. It should receive the deserved attention, more so because the same practitioners foresee a lack of interest by the younger generation to engage in the laborious task of collecting and preparing the needed species. They fear that the knowledge will not be maintained or transferred, while they simultaneously experience a diminished availability of some species, endangering their preservation (Chapter VI).

Notes chapter VIII

35. Mobile outreach clinics were a core activity of PHC in covering large rural areas with limited infrastructure. The activities combined ante-natal monitoring, detecting sources of communicable diseases, individual general counselling, dispensing elementary drugs and birth registration, making it a versatile exercise, but it involved a multidisciplinary crew and transportation on a regular basis. It requires extra input but may prove a feasible alternative to extending facility based preventive services in the short term (*cf.* Azevedo 2017b).
36. Various utilisation studies (*cf.* Marsland 2007; Jangu 2010; Towns 2014; Stanifer 2015;) have shown that the interpretation of recurring symptoms, on account of chronic diseases, or the display of convulsions with young children as a result of malaria related fever, may lead to a delayed or insufficient treatment, which may prove risk full. In the co-operation with TM professionals these delicate differences must remain on the agenda.
37. Prevention of Mother to Child Transmission (PMTCT) aims at making women aware of the impact of an HIV-infection in case of pregnancy, both as a health information campaign as well as leading them to subsequent participation in testing and counselling (*cf.* WHO 2015)
38. The dispensary at Natta is equipped with desktop computers in a separate room with elementary software and capable of processing and analysing health statistics. Yet the recording and reporting was done with pen and paper and kept on carbon copies. If there would be an internet connection the digitalised data could be sent to the Public Health Department in Mugumu directly and answered with relevant advice or directives via E-mail instantaneously.

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Summary

This research aims to identify to what extent the analysis of the utilisation of plural medical systems (*cf.* Slikkerveer 1989) can contribute to the organisation of public health, in particular in Serengeti, and in a broader sense in comparable situations in rural Africa. It wants to provide a foundation for the development of a new health manpower training initiative for public health staff, the 'Transcultural Public Health Management' curriculum. It includes a deliberate integration of ethnoscience methods during the training, in order to achieve a better understanding of the influence of socio-cultural and endogenous knowledge factors on the functioning of public health care. It also provides clues as to how organisational improvements can be achieved. The research follows the invitation of the Mennonite Church (KMT) in Tanzania to assist its educational institutions in the transformation to a university which can play a role in the training of personnel for public health management, to tackle the urgent manpower shortage. In 2014, the Serengeti District Health Management Team formulated the desire to gain insight into the actual impact of the utilisation of plural medical system on existing health policies. The research model as used in this study (see 3.1.1.), is developed by Slikkerveer (1989), and previously applied by Agung (2005), Ibui (2007), Djen Amar (2010), Leurs (2011), Ambaretnani (2012), Chirangi (2013), Aiglsperger (2014), Erwina (2019) and Saefullah (2019).

The background to this study is formed by developments in the field of public health (Chapter I) in the sub-Saharan region from the colonial period to the present, using earlier policy concepts such as Primary Health Care (PHC). It provides recent examples from local developments in Tanzania, while referring to the Sustainable Development Goals (SDGs) as formulated by the WHO for 2030. It gives an overview of the diversity of aspects which are addressed in public health strategies, and where some aspects are lost because of cultural, economic, infrastructural, personnel or organisational limitations (*cf.* Azevedo 2017a, b). These are assessed based on the situation in Serengeti and, where possible, set against comparable relevant situations elsewhere on the continent.

The research took place in three consecutive years in Serengeti, through an extensive pilot study in 2015, a household survey in 2016, followed by verification and updating of specific findings in 2017. The quantitative and qualitative research were always conducted simultaneously. The identification of the research locations was based on the experience and indications of the public health department in Mugumu. While two hundred households were surveyed in four locations according to the geographic distribution parameters, a second team undertook multiple in-depth interviews with thirty key-informants identified on the basis of their function in local government, formal education, healthcare, religious and social organisations. From a total of 1,213 people registered in the household survey, the cases of 564 active patients, selected for a reported morbidity during the last twelve months, were analysed to determine the utilisation patterns of 715 actions. During that process, an inventory was made of the classification of perceived morbidity, the knowledge of applied traditional and alternative therapies, arising from the open questions in the household survey, as well as the opinion about local health care. The research question was: *'What type of patient uses what kind of medical system for which perceived morbidity?'* For the nine underlying research objectives, the following questions were addressed:

Firstly: to document, analyse and explain the relationships between the independent, intervening and dependent factors of the conceptual model in the utilisation of the plural medical system by the

local population. The applied theoretical framework as presented in Chapter II serves to account for both the research methodology and for the policy-determining principle for a future development strategy (*cf.* Slikkerveer, Warren & Brokensha 1995). The underlying idea is an "emic" approach, which is based on perception by the local population at all times, and which must promote development "from the inside" and "bottom up." In this way, the concept of "Indigenous knowledge systems" (IKS) provides an interpretation of the conceptual model of behaviour in the utilisation of the plural medical system (*cf.* Slikkerveer 1989). In this model of so-called "medical pluralism" a distinction is made between traditional, transitional and modern medical systems, which are explained in their local context.

The research methodology as presented in Chapter III, is based on the Leiden School of Ethnoscience as promoted by the LEAD programme, in which a combination of qualitative and quantitative methods is applied. These are named as the field of ethnographic study (FES), the historical dimension (HD), the point of view of the participant (PV). The parameters for the quantitative analysis are formed by a model of nine blocks of variables (*cf.* Kohn & White 1976; Slikkerveer 1989). These are five blocks of independent or pre-disposing factors, one block of intervening variables, and three blocks of dependent variables. They are analysed in conjunction through bivariate, mutual relations, and multiple regression analysis. The strength of the correlations between the blocks in the model give direction to the interpretation of their mutual relations. The blocks in the model also served as components for the construction of the questionnaire in the household survey.

An overview of the most important findings is presented in Chapter VIII. The research objectives are answered sequentially: In total 41.7% of the actors use TM, 21.5% use TR, and 36.8% use MM (N=715). The highest values in the analysis of the independent variables is belief in TM, opinion on TM, costs of TM, all values above 0.7 followed by availability of TM and costs of transport to TM, all around 0.6. The clustering in Figure 7 shows the coherence between the related aspects of medical system utilisation. Figure 8 presents the relationships between the blocks of independent and dependent factors. It is established that block 2 the pyscho-social factors are ultimately dominant in coherence with block 4 perceived morbidity and block 5 the institutional factors (see 8.2). First in connection with block 7 TM in dimension one, and with block 9 MM in dimension two for the dependent variables respectively.

In addition to perceived morbidity, the independent variables which receive sufficient correlation values in both dimensions are; who was consulted for treatment, who was the source of knowledge, whether the treatment was socially acceptable, the costs and transport to TM, and whether the treatment was economically efficient. Whether the symptoms were clinically diagnosed is only associated with MM, as the intended control function with other medical systems was not achieved because of limited data. The source of knowledge regarding disease and treatment is dominated by immediate family members (46%), who appear gender-based, the majority being women among spouses, parents and grandparents. In respect of the low impact of health education (block 6), the Village Health Worker's (VHW) role at the community level remains intact. In the treatment consultation the VHW and traditional healers receive the second and third highest frequency respectively, while they are not family related.

The most important movement in utilisation between medical systems results from consecutive or alternative treatments due to dissatisfaction with an initial therapy in the short term. The movement can be multi-directional. A hospital visit can be followed by TM and vice versa, but no correlation

has been found with a specific morbidity, except for those with mental or spiritual connotations. Another movement which deviates from an expected process are the transitional medicine (TR) which are commercially purchased and applied after an official diagnosis at modern medicine facilities.

Secondly: to study and explain the role of the local knowledge and belief of perceived illness causation in the utilisation process, as presented in Chapter VI and VII. The interview themes include the perception of local health problems, the opinion about the available medical systems, as well as cosmological and cultural aspects which may play a role in utilisation. The transcripts of these multiple interviews are presented by sector, local government, education, healthcare, religious and social organisations, as well as representatives of the traditional medical system. They are instrumental for understanding and interpreting the qualitative data analysis.

Particular attention is paid to local cosmological statements regarding health and behaviour, and the classification of prevailing morbidities. A noticeable distinction in the classification of morbidities is the dichotomy between 'old' and 'new' diseases. It originates from an historical perspective and individual experiences. Diseases such as cancer, diabetes, cardiovascular deficiencies, hypertension, obesity, HIV and Ebola are considered 'new' and, according to respondents, are therefore more difficult to treat with self-medication or TM. Most other perceived morbidities are at one time treated with TM.

The qualitative research in Chapter VI shows that general knowledge of TM is common, but specific knowledge regarding the preparation of indigenous traditional medicine is limited and is transferred on a personal relational level *i.c.* family members or acquaintances. There are indications of gender influence as the knowledge seemed to reside with a majority of female respondents. Most traditional midwives (TBA's) combine their practice with herbal medicine. They perceive the transfer of knowledge problematic due to a lack of interest among the younger generation. The complexity in the preparation of TM lies in the combination of the various species and their application. Regarding the complementary outcome of quantitative and qualitative data, there are two phenomena which stand out: the extent to which self-treatment is dominant, firstly by applying home remedies (TM), secondly in applying commercial medicine from the transitional system (TR), as well after- as without official diagnosis or prescription.

Thirdly: to present a sociographic description of the research area in Serengeti in general, and of the Kurya community in and around Nyamburi in particular. The research area in Serengeti is described in both geographical, historical and socio-cultural terms in Chapter IV, including the district profile of the local government. Next to that it presents the specific conditions applying to the population in Ikorongo in the household survey.

The qualitative research which took place among selected key informants is described in Chapter VI, which produces an historical perspective as expressed by the prominent elderly people identified by the community.

The broader background with regard to the health care situation in Tanzania is elaborated in Chapter V, which describes recent developments in policies, health manpower and infrastructural challenges for the government, as well as the role of traditional medicine and the commercial (transitional) sector. It enumerates the policy priorities in the medium and long term, and their relationship with the Sustainable Development Goals (SDGs). It explores the possibilities of

addressing the current health manpower shortage by assessing alternative forms of co-operation. It also refers to recent policy intentions which strive for more independence from external support from national and international NGOs in existing first-line services and embedding them better in society.

Fourthly: to present an indigenous classification of local Medicinal, Aromatic and Cosmetic (MAC) plants, including their preparation and application, as well as their use for the treatment of specific illnesses as presented in Chapter VII. It specifies the indigenous knowledge collected from the open questions during the household survey, with regard to the perceived morbidities and the known traditional therapies. These are described with the identification of specific indigenous species and their application as indicated by the individual respondents. The classification is expressed in local terminology only (*Igikuria)* and verified by local traditional herbalists, for the sake of consistency to the emic principle. The scientific categorisation of botanical data took place post-hoc on the basis of the collected images. Their use is also assessed for spontaneous knowledge and individual application, as well as indirectly acquired knowledge via acquaintances, and the observed overlap and frequency. It serves to encourage examination of the diversity in the use of identified species aimed at specific disorders in other (sub-)regional areas, especially where they are consistent and where they deviate from existing botanical data.

Fifthly: to present the stepwise bivariate, mutual relations, and multiple regression analysis of the transcultural health care utilisation behaviour by the local population, in order to document and explain the interactions between the groups of factors, as described in Chapter VII. The bivariate analysis shows the selection of variables which play a role in the utilisation per medical system, and which are included in the multivariate analysis. It is followed by the interactions between the sets of variables per block. These interactions provide the opportunity to visualise the applicability of the conceptual utilisation model, also as a predictive operational tool for sustainable community development. The processing of the data is executed by the module "Data Reduction - Optimal Scaling" (OVERALLS) of SPSS (version 21).

The results of the bivariate analysis with system utilisation shows a residue of 19 variables over the five blocks of independent –predisposing- factors, all of which reach Pearson $\chi 2 = 0.000$ level and score on Cramer's V (for nominal variables) from 0.151 to 0.363. In total, 41.7% of the actors use TM, 21.5% use TR, and 36.8% use MM (N=715). It also shows that block six, with intervening variables such as media and information campaigns, does not score sufficiently to be included in the multivariate analysis. Of the socio-demographic factors, the land in possession, the amount of livestock owned and the number of modern media in use remain relevant. From the pyscho-social factors, who is consulted for advice, who is the source of knowledge, the belief in TM and the opinion about TM's efficacy are distinctive. Among the enabling factors, the costs of TM and TR, as well as the costs of transport to TM, and finally Social Economic Status appear to be important. Of the fourth block, the perceived morbidity, the duration of illness and the external diagnosis by a third party are distinctive. Among the institutional factors, the availability of modern (MM) and transitional means (TR), together with environmental friendliness, social acceptance and economic efficiency, are distinctive.

In the multiple regression analysis, the variables which show a substantial correlation in both dimensions are who is consulted for advice, whether the therapy is socially acceptable, who is the

source of knowledge, the costs of TM, and whether TM is economically efficient. For the dependent variables, that is the use of TR. It is evident that with the dependent variables, TM is dominant in the first dimension, followed by TR with a moderate score, while MM is in the second dimension, followed by TR, with a moderate score. In the bivariate analysis, it is clear that the variables which were most discriminating appear to be consistent with their position in the first dimension and the second dimension, although occasionally in a reverse order. The variable "clinically diagnosed", highest in the bivariate analysis, appears here only in the second dimension with a high value, probably due to the relationship with the utilisation of MM. In Figure 7 it is clear that the combination of belief in TM, costs and distance to TM have a small mutual distance in both dimensions, which indicates that the conviction and accessibility of TM form coherent motives, closely related to perceived morbidity. The variables which are closest to the use of MM can be referred to as socio-economic status and the social acceptance of utilisation of the system. Conversely, in the second dimension the distance between TR, economic efficiency and environmental friendliness is very small, while who is consulted, who is the source of knowledge and who made the diagnosis, are in the same cluster. It shows that in addition to the influence of social relationships and indigenous knowledge on the use of TM, there is an identical influence with regard to the use of commercial resources.

The analysis of the relationships between the blocks of the utilisation model also shows that blocks 2 and 5 are most discriminate (7x), followed by block 1 (5x) and 3 and 4 (4x) respectively. These frequencies reflect the values of individual variables within the blocks. Between block 2 and the others, the consultation for advice from acquaintances and the source of knowledge are distinctive, as well as the belief in and opinion about TM. In block 5, the social acceptance of the chosen therapy, followed by the economically efficient quality of the therapy, and the availability of TM are distinctive. It indicates that the influences of personal relationships within the community are dominant over pragmatic considerations. The availability of TM receives a value of 0.938 in connection with belief in TM with a value of 0,903. Regarding socio-demographic factors from block 1, there are three variables which play a role in dimension 1, namely land ownership, livestock ownership and the use of modern media. The first, land ownership shows a relationship with livestock farming, but more importantly, with the use of TM in block 7, and with social acceptance in block 5.

Overall, the strongest relationship is between block 2 (psychosocial factors) and block 5 (institutional factors) with 0.802 in dimension 1 and 0.826 in dimension 2. The highest correlation between independent and dependent is between block 4 and block 9 utilisation of MM, 0.663 on external diagnosis, and between block 4 and block 7 utilisation of TM, 0.599 on perceived morbidity. The next strong relationship is between block 3 (enabling factors) and block 5 (institutional factors) with 0.769 in dimension 1 and 0.666 in dimension 2. That relationship is determined by the combination of the costs of TM, linked to the costs of transport to TM and the availability of TM. Referring to the qualitative data, this supports the proximity of TM in terms of psychological and physical distance, the number of people applying home remedies, available in their environment, and at negligible costs.

Sixthly: to assess the perception of the local population of the current modern medical system in the area from the qualitative research, in order to improve the co-operation between the available medical systems, as described in Chapter VI and VIII. In current health care, there primarily is the

aspect of physical accessibility: while TM is historically linked to the physical environment and therefore implicitly present in every local community, the facilities-based services at A level are limited by the resources available. Although this network has been expanded by village health workers (VHWs), most of whom work without a physical station, the distribution of facilities in rural areas will remain problematic in the medium term unless alternatives are found.
In addition, accessibility plays a role in socio-economic terms. While most services are accessible, and some are free of charge for the most vulnerable groups, such as Maternal and Child Health (MCH), HIV-positive people and elderly care, there is competition with alternative providers, both transitional and traditional. The health workers explain that the financial resources at district level are not sufficient for the intended services, while preventive services do not generate enough turnover to sustain themselves. The Community Health Fund (CHF) and other types of collective insurance do not yet have a volume to function as a financial basis to support monitoring and prevention services, or their expansion on community level.

The qualitative research shows that confidence in the technical capacities of MM is high, there is appreciation for surgery, laboratory test, vaccinations -immunisation, X-rays, life support systems e.g. infusion, blood transfusions, artificial respiration and compactness of modern medicines such as mass produced pills, sera, implants. At the same time, the attitude of many modern health professionals is often criticised. There is a notion of lack of feedback during consultations. The staff do not adequately explain to the patient the cause and effect of their morbidity or the proposed cure, while the attitude of many towards patients has been labelled as "arrogant" or 'rude'. The respondents indicate they have no idea as to what invokes this attitude. It raises a barrier for spontaneous consultation, especially among women.

There is a lack of top of mind knowledge concerning preventive measures. The popularity of preventive services is debatable. Although the health education campaigns are measurable, the impact is low. As stated in the qualitative analysis, integration with mainstream primary and secondary education should be increased, because children bare the promise of creating more awareness and at the same time indirectly reaching parents. A revival of the role play at village level for the recognition of potential dangers is endorsed by various key informants. The role of mobile communication has not yet been investigated, but the private ownership of multiple mobile devices is such that they are promising as a platform for health education or health emergency warnings to a wider audience, as is already practiced in Asia, the America’s, and parts of Europe.

As emphasised in Chapter IV and V, the health manpower situation is urgent. In a broader sense, this shortage is twofold, because it not only concerns doctors, but also paramedics at the community level. The options range from Public Private Partnerships (PPP) connected to formal training institutions, to the integration of traditional professionals in health care at the local level. Regardless of the renewed interest in the role of Community Health Workers (CHW), collaboration with TM is still an option. The argument expressed by staff members that certain traditional practitioners do not meet training qualifications does not invalidate the option to make them instrumental in early detection, primary health care or timely referral. Their confidential relationship with the community, demonstrated as well by traditional midwives, makes them a valuable manpower resource. There is a willingness among that group to co-operate and exchange knowledge, while individual traditional midwives (TBAs) have shown that they take responsibility by referring delicate cases to the hospital, sometimes even by accompanying patients. The phenomenon should preferably be reciprocal, sharing with traditional practitioners in return how they could achieve consistency in

quality while maintaining their traditional resources, which is what they expect from their interaction with the modern system. Because of the emphasis on manpower, the larger picture of collaboration with TM is pushed into the background. Qualitative and quantitative data show that the majority of perceived morbidities are first self-treated, while disorders with either mental or spiritual connotations usually focus on TM, as with convulsions with infants. It deserves to be investigated and used to improve health policies, rather than TM being dismissed as inferior, inappropriate or unmanageable.

There is a need for institutionalised interaction with what the WHO calls the "social determinants of health" (WHO, 2018) following the reaction of the local population after the Ebola outbreak in West Africa. There is an analogy with HIV/Aids when infection is not detected in time or intentionally ignored, recognisable as an aspect of PMTCT [37] projects. It also requires a change in behaviour of health professionals. Their awareness of the impact of health measures on the daily routine of the population *i.e.* their cultural traditions, must be reflected in local health policies. Just as volunteers from religious congregations who guide HIV-patients to prevent them from becoming a health hazard to the community, the similarity with other indigenous institutions is evident. There are high expectations of a renewed Community Health Worker (CHW) who must be able to anticipate health risks, collaborate with traditional healers, and use locally recognisable definitions where the community can identify with. Their training and status in the community will, however, have to be revised, given the experiences in primary health care (PHC) and those with the training of traditional midwives (TBAs).

There is a need to digitise medical information. It can enable early detection of hazards at district level. The proliferation of mobile phones and the coverage of internet providers imply that such an application is feasible. The staff members at the dispensaries are committed to collecting and registering relevant information. There is software but no internet connection to share data in time with the staff department in the capital. However, the costs of setting up these connections are disproportionately low compared to the logistics and manpower involved in physical relocation and alternative communication over large distances and unpaved roads. The staff members also want to be able to analyse information on location and provide feedback to Mugumu [38]. It means that any fluctuation in morbidity rates, lack of essential medicine, or epidemiological health hazards which require rapid intervention, are automatically detected by a headquarters which can analyse data in a network and simultaneously share it with its health centres and dispensaries.

Seventhly: to describe the theoretical implications of the research findings for the development of applied ethnoscience in the field of public health management, focussing on the influence of socio-cultural factors in attaining sustainable community development (cf. Slikkerveer et al. 2019) Chapter VIII shows the implications of applied ethnoscience: demonstrating the role of indigenous knowledge and practices leads to a reconsideration of how communities should be approached in mobilising their potential to handle health care related problems. By recognising indigenous beliefs and motives which underlie social behaviour, it is possible to exchange knowledge without losing semantic values. It can provide better identification, and influence unhealthy lifestyles, which may contribute more than large-scale conventional media-based health education campaigns.

Eighthly: to describe the methodological implications of the research findings for the further development of specific ethnoscience-based research methods and techniques as advocated by

LEAD to contribute to sustainable community development. The implications substantiate the appropriate capacity of the 'Leiden Ethnosystems Approach' as an instrument to assess the emic factors in the process, and as such link up with the Impact Assessment Model as introduced in the concept of *Integrated Community Managed Development* (ICMD) by Slikkerveer (2018). The method also enables the next generation of health professionals to work fully integrated because of their ability to communicate with the local population on an equal footing, especially when certain topics are considered controversial *e.g.* anonymous HIV/IDS carrying individuals or witchcraft attributed phenomena. The application of an ethnoscience customisation method is encouraged to contribute to what Nachega *et al.* (2012) indicate as the need to expand national training programs in the African region (WHO / AFRO 2012) with as many epidemiological and public health aspects as possible. Their analysis indicates that the emphasis on communicable diseases (CDC) and MCH should include non-communicable diseases (NCDs), and climate change with its environmental impact, as they will increase in the region. The main motive for applying these research methods lies in the identification of predictive indicators (Nachega *et al.* 2012). It also promotes the collaboration with programmes outside the region, or the application of digital distance learning in the current curricula. It refers to the lack of master level management cadre in health care, and the need for more training capacity to compensate for the lack of local resources.

Ninthly: to describe the practical implications of the research findings for the improvement of the public health management policy planning and implementation process. It contributes to the development of comprehensive health plans by the Serengeti District Health Management Team. It provides a community-oriented contribution to the Transcultural Public Health Management (TPHM) master course at Kisare College of Health Sciences in Serengeti. The policy recommendations concluding Chapter VIII were formulated as follows:

1) There is the possibility to revive community-based institutions which improve the prerequisites for sustainable health conditions on local level. They entail the revitalisation of community health committees, community health workers, and the structural co-operation with traditional practitioners in the disciplines in which they are available (*cf.* Ambaretnani 2012; Chirangi 2013). It could perform as an alternate human resources pool, provided there is dedication on district level to facilitate communications. The mobile outreach clinics of the early PHC could be revived to perform as a communications and training device, complementary to its original function as monitoring and control of MCH activities.

2) There is a request for an enhanced curriculum (see 8.3.3) to train staff in applying indigenous knowledge in their daily activities. Integration of social sciences in public health management curricula will improve the communications on community level; instigate a change in attitude and better reflection on the motives of the local population. It will enable health staff at different levels to identify with the health utilisation behaviour of their target group, and improve both preventive and curative services, as the correlation between the two has proven to be dependent on the perception of quality and accessibility of service. It could lead to a structural co-operation with TM practitioners, arriving at mutual respect, exchange of knowledge, and reducing health hazards.

3) There is an underestimated potential in the revitalisation of the Community Health Fund (CHF), by considering alternative ways of organising it. As shown in the qualitative analysis, integrating it with existing institutions on communal level, i.e. farmers' co-operatives, religious affiliations, or voluntary associations involved in any other economic activity related to reciprocal credit, are eligible as a vehicle to carry health insurance. Additionally, there could be proper re-evaluation as to which type of service should be covered, with consensus of all party's involved, and with long term commitment to build confidence. Finally, there are a large number of alternatives with regard to payment of fees which have not been explored yet, *e.g.* spreading in instalments, sharing, collective saving schemes, rechannelling through local associations, or digitised via mobile communications, so as to prevent the potential patients of avoiding consultation because of the financial impact.

4) There is a desire to start a digitalised health information system between the referral stations in terms of exchanging and analysing morbidity rates, drug supplies, health hazard early warning, monitoring and control, by applying technology which is already available, but has until now not been operationalised. There is commitment at A-level to establish such form of communications, and they could be established at a fraction of the cost of traditional logistics and physical movement. The hardware and software are available, internet providers are available, electricity is available, and the knowledge is available.

5) There is an option to enhance the impact of health education campaigns by extending the sourcing in primary and secondary education, while increasing the frequency of role plays, to appeal to the tradition of oral transmission in the transfer of indigenous knowledge. Because of the changing modalities of communications with mobile telecom, it is imperative to investigate the use of existing networks to introduce health hazard messaging on mobile devices. The next generation is susceptible to these channels and it could create a platform for proliferation through social media.

6) There is the possibility to re-animate the research into the application of indigenous traditional medicine, as a number of traditional practitioners indicated they would be eager to have their material examined. They propose that the scientific analysis of the components would have a twofold effect. First of all, it would take away the stigma of not having any recorded qualifications, secondly it would enable them to further develop their medicine in terms of conservation or reproduction and receive recognition. The main objective, in their words, is to finally receive feedback on the offerings they have consistently made. It is simultaneously a solid basis for future co-operation, and the intended integration between medical systems. It should receive the deserved attention, more so because the same practitioners foresee a lack of interest by the younger generation to engage in the laborious task of collecting and preparing the needed species. They fear that the knowledge will not be maintained or transferred, while they simultaneously experience a diminished availability of some species, endangering their preservation (see chapter VI).

Samenvatting.

Dit onderzoek heeft tot doel aan te tonen in hoeverre de analyse van het gebruik van meerdere medische systemen (zie Slikkerveer 1989) kan bijdragen aan de organisatie van de volksgezondheid, met name in Serengeti, en in bredere zin in vergelijkbare situaties in ruraal Afrika. Het wil een basis leggen voor de ontwikkeling van een nieuw gezondheidsinitiatief voor training van gezondheidswerkers voor personeel in de volksgezondheid, het curriculum 'Transcultural Public Health Management'. Het omvat een doelbewuste integratie van ethnoscience methoden tijdens de training, om een beter inzicht te krijgen in de invloed van sociaal-culturele en endogene kennisfactoren op het functioneren van de openbare gezondheidszorg. Het geeft ook aanwijzingen over hoe organisatorische verbeteringen kunnen worden bereikt. Het onderzoek volgt op de uitnodiging van de Mennonietenkerk (KMT) in Tanzania om haar onderwijsinstellingen te helpen bij de transformatie naar een universiteit die een rol kan spelen in de opleiding van personeel voor het beheer van de volksgezondheid, om het dringende personeelstekort aan te pakken. In 2014 formuleerde het Serengeti District Health Management Team de wens om inzicht te krijgen in de daadwerkelijke impact van het gebruik van een meervoudig medisch systeem op bestaand gezondheidsbeleid, gedefinieerd in het gebruiksmodel zoals gebruikt in deze studie (zie 3.1.1.), Ontwikkeld door Slikkerveer (1989), en eerder toegepast door Agung (2005), Ibui (2007), Djen Amar (2010), Leurs (2011), Ambaretnani (2012), Chirangi (2013), Aiglsperger (2014), Erwina (2019) en Saefullah (2019).
De achtergrond van deze studie wordt gevormd door ontwikkelingen op het gebied van de volksgezondheid (hoofdstuk I) in de sub-Sahara-regio vanaf de koloniale periode tot heden, met behulp van eerdere beleidsconcepten zoals primaire gezondheidszorg (PHC), recente voorbeelden van lokale ontwikkelingen in Tanzania, onder verwijzing naar de Sustainable Development Goals (SDG's) zoals geformuleerd door de WHO voor 2030. Het geeft een beeld van de diversiteit van aspecten die aan bod komen in volksgezondheidsstrategieën, en waar sommige aspecten verloren gaan vanwege culturele, economische , infrastructurele, personele of organisatorische beperkingen (zie Azevedo 2017a, b). Deze worden beoordeeld op basis van de situatie in Serengeti en, waar mogelijk, afgezet tegen vergelijkbare relevante situaties elders op het continent.

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Het onderzoek vond plaats in drie opeenvolgende jaren in Serengeti, via een uitgebreide pilotstudie in 2015, een enquête onder huishoudens in 2016, gevolgd door verificatie en actualisering van specifieke bevindingen in 2017. Het kwantitatieve en kwalitatieve onderzoek werd steeds gelijktijdig uitgevoerd. De identificatie van de onderzoekslocaties is gebaseerd op de ervaringen en indicaties van de GGD in Mugumu. Terwijl tweehonderd huishoudens op vier locaties werden ondervraagd volgens de geografische distributieparameters, heeft een tweede team meerdere

diepte-interviews afgenomen met dertig belangrijke informanten die zijn geïdentificeerd op basis van hun functie in de lokale overheid, formeel onderwijs, gezondheidszorg, en religieuze of sociaal maatschappelijke organisaties. Van de in totaal 1.213 geregistreerde personen in de huishoud enquête werden de acties van 564 patiënten, geselecteerd op gepercipieerde morbiditeit gedurende de laatste twaalf maanden, gebruikt in de analyse om het utilisatiepatroon te bepalen. Tijdens dat proces werd een inventarisatie gemaakt van de classificatie van gepercipieerde morbiditeit, de kennis van toegepaste traditionele en alternatieve therapieën, voortkomend uit de open vragen in het huishoudenquête, evenals de mening over lokale gezondheidszorg. De onderzoeksvraag was: *'Welk type patiënt gebruikt welk medisch systeem voor welke gepercipieerde morbiditeit?*' Voor de onderliggende onderzoeksdoelstellingen werden de volgende vragen beantwoordt:

Ten eerste: het documenteren, analyseren en verklaren van de relaties tussen de onafhankelijke, tussenliggende en afhankelijke factoren van het conceptuele model bij het gebruik van het meervoudig medisch systeem door de lokale bevolking. Het toegepaste theoretische kader zoals gepresenteerd in hoofdstuk II dient om zowel de onderzoeksmethodologie als het beleidsbepalende principe voor een toekomstige ontwikkelingsstrategie te verklaren (vgl. Slikkerveer, Warren & Brokensha 1995). Het onderliggende idee is een "emic" -benadering, die te allen tijde gebaseerd is op perceptie door de lokale bevolking en die ontwikkeling "van binnenuit" en "bottom-up" moet bevorderen. Op deze manier wordt het concept van "inheemse kennissystemen" (IKS) en de interpretatie van het conceptuele model van gedrag bij het gebruik van lokale gezondheidszorg (vgl. Slikkerveer 1989), vormgegeven. In dit model van zogenaamd 'medisch pluralisme' wordt een onderscheid gemaakt tussen traditionele, transitionele- en moderne medische systemen, die in hun lokale betekenis worden uitgelegd, en waartussen de respondenten heen en weer bewegen in hun gedrag. De onderzoeksmethodologie zoals gepresenteerd in hoofdstuk III is gebaseerd op de Leiden School of Ethnoscience zoals gepromoot door het LEAD-programma, waarin een combinatie van kwalitatieve en kwantitatieve methoden wordt toegepast. Deze worden genoemd als het veld van etnografisch onderzoek (FES), de historische dimensie (HD), het gezichtspunt van de deelnemer (PV). De parameters voor de kwantitatieve analyse worden gevormd door een model van negen blokken variabelen (zie Kohn & White 1976; Slikkerveer 1989). Dit zijn vijf blokken van onafhankelijke of pre-disponerende factoren, één blok van interveniërende, en drie blokken van afhankelijke variabelen. Ze worden geanalyseerd in samenhang door bivariate, multivariate, multiple regressie en wederzijdse relatieanalyse. De sterkte van de correlaties tussen de blokken in het model geeft richting aan de interpretatie van hun onderlinge relaties. De blokken in het model dienden ook als componenten voor de constructie van de vragenlijst in het huishoudensenquête.

Een overzicht van de belangrijkste bevindingen wordt gepresenteerd in hoofdstuk VIII. De eerste onderzoeksvraag wordt als volgt beantwoordt: in totaal gebruikt 41,7% van de actoren TM, 21,5% gebruikt TR en 36,8% gebruikt MM (N=715). De hoogste correlaties in de analyse van de onafhankelijke variabelen is geloof in TM, mening over TM, kosten van TM, alle scores boven 0,7 gevolgd door beschikbaarheid van TM en kosten van transport naar TM, allemaal rond 0,6. De clustering in figuur 7 toont de samenhang tussen de gerelateerde aspecten van TM-gebruik. Figuur 8 presenteert de relaties tussen de blokken van onafhankelijke en afhankelijke factoren. Vast staat dat blok 2 de pyscho-sociale factoren uiteindelijk dominant zijn in samenhang met blok 4 gepercipieerde morbiditeit en blok 5 de institutionele factoren (zie par. 8.2). Eerst in verband met blok 7 TM in dimensie één, en vervolgens met blok 9 MM in dimensie twee, voor de

respectievelijke afhankelijke variabelen. Naast gepercipieerde morbiditeit, zijn de onafhankelijke variabelen die voldoende correlerende scores ontvangen in beide dimensies: wie werd geraadpleegd voor behandeling, wie was de bron van kennis, of de behandeling sociaal aanvaardbaar was, de kosten en het transport naar TM, en of de behandeling was economisch efficiënt. Of de symptomen klinisch werden gediagnosticeerd, is alleen geassocieerd met MM, omdat de beoogde controlefunctie met andere medische systemen niet werd bereikt door onvoldoende data. De kennisbron met betrekking tot ziekte en behandeling wordt gedomineerd door directe familieleden (46%), die tegelijkertijd op geslacht zijn gebaseerd, met overwegend vrouwen onder echtgenoten, ouders en grootouders. De uitzondering is de gezondheidswerker in het dorp (VHW), hij komt op de tweede plaats (22,8%) binnen het MM-systeem en als derde algemeen. Vooral in vergelijking met de lage impact van gezondheidsvoorlichting (blok 6), blijft de rol van de VHW op dorpsniveau blijkbaar intact. In wie geraadpleegd wordt voor advies is er een rol weggelegd voor de VHW en de traditionele genezers, waarbij zij respectievelijk de tweede en de derde hoogste frequentie innemen, de andere geraadpleegde personen zijn allemaal familie of vrienden. De belangrijkste beweging in het gebruik tussen systemen komt voort uit het opeenvolgend gebruik van alternatieve behandelingen vanwege ontevredenheid met de resultaten op de korte termijn. De beweging kan multi-directioneel zijn. Een ziekenhuisbezoek kan worden gevolgd door TM en vice-versa, maar er is geen verband gevonden met een specifieke morbiditeit, behalve voor diegenen met mentale of spirituele connotaties. Een andere beweging die afwijkt van een verwacht proces zijn de commerciële geneesmiddelen (TR) die na officiële diagnose worden gekocht en toegepast door gefaciliteerde moderne geneeskunde.

Ten tweede: het bestuderen en verklaren van de rol van lokale kennis en overtuigingen ten aanzien van de oorzaken van gepercipieerde morbiditeiten in het utilisatieproces, zoals gepresenteerd in hoofdstuk VI en VII. De interview themata omvatten de perceptie van lokale gezondheids-problemen, de mening over de beschikbare medische systemen, evenals kosmologische en culturele aspecten die een rol kunnen spelen bij het gebruik. De transcripties van deze meerdere interviews worden gepresenteerd door de sector, de lokale overheid, het onderwijs, de gezondheidszorg, religieuze en sociale organisaties, evenals vertegenwoordigers van het traditionele medische systeem. Ze zijn instrumenteel voor het begrijpen en interpreteren van de kwalitatieve data-analyse. Bijzondere aandacht wordt besteed aan lokale cosmologische uitspraken over gezondheid en gedrag, en de classificatie van heersende morbiditeiten. Een opvallend onderscheid in de classificatie van morbiditeiten is de dichotomie tussen 'oude' en 'nieuwe' ziekten. Het onderscheid komt voort uit een historisch perspectief en ervaringen waarbij morbiditeiten zoals kanker, diabetes, cardiovasculaire deficiënties, hypertensie, obesitas, HIV en Ebola als 'nieuw' worden beschouwd en daarom volgens de respondenten moeilijker te behandelen zijn met zelfmedicatie of professionele TM. De meeste andere geregistreerde morbiditeiten zijn ooit eerder behandeld met TM.

Het kwalitatieve onderzoek in hoofdstuk VI laat zien dat algemene kennis van TM wijd verbreid is, maar specifieke kennis met betrekking tot de bereiding van inheemse traditionele geneeskunde is beperkt en wordt overgedragen op een persoonlijk relationeel niveau d.w.z. familieleden of kennissen. Er zijn aanwijzingen voor genderinvloed, omdat de meeste kennis bij vrouwelijke respondenten leek te berusten. De meeste traditionele verloskundigen combineren hun praktijk ook met kruidengeneeskunde. Ze ervaren de overdracht van kennis als problematisch vanwege een gebrek aan interesse bij de jongere generatie. De complexiteit bij de voorbereiding van TM ligt in de

combinatie van de verschillende typen en hun toepassing. Wat betreft de complementaire uitkomst van kwantitatieve en kwalitatieve gegevens, zijn er twee fenomenen die opvallen: de mate waarin zelfbehandeling dominant is, eerst door TM toe te passen, ten tweede door commerciële middelen uit het transitionele medische systeem (TR) toe te passen, met name wanneer er geen externe diagnose was gedaan. In het geval van een tekort aan medicijnen in apotheken, of na een commerciële laboratoriumanalyse, worden medicijnen commercieel gekocht, met het risico van een onjuiste dosering of niet-naleving van de voorgeschreven therapie, wat de effectiviteit van selectieve medicatie in gevaar brengt.

Ten derde: het geven van een sociografische beschrijving van het onderzoeksgebied in Serengeti in het algemeen en van de Kurya-gemeenschap in en rond Nyamburi in het bijzonder. Het onderzoeksgebied in Serengeti wordt in zowel geografische, historische als sociaal-culturele termen beschreven in hoofdstuk IV, inclusief het districtsprofiel van de lokale overheid, evenals de eigenschappen die van toepassing zijn op de bevolking in Ikorongo in de huishoudenquête. Het kwalitatieve onderzoek dat plaatsvond onder geselecteerde belangrijke informanten wordt beschreven in hoofdstuk VI, dat een historisch perspectief oplevert zoals verwoord door prominente ouderen zoals geïdentificeerd door de gemeenschap. De bredere achtergrond met betrekking tot de zorgsituatie in Tanzania is uitgewerkt in hoofdstuk V, dat recente ontwikkelingen beschrijft in beleid, gezondheidswerkers en infrastructurele uitdagingen voor de overheid, evenals de rol van de traditionele gezondheidszorg en de commerciële sector. Het toont de beleidsprioriteiten op de middellange en lange termijn en hun relatie met de duurzame ontwikkelingsdoelen (SDG's). Het onderzoekt verder de mogelijkheden om het huidige personeelstekort te bestrijden door alternatieve vormen van samenwerking te beoordelen. Het verwijst ook naar recente beleidsintenties die streven naar meer onafhankelijkheid van externe steun van nationale en internationale NGO's in bestaande eerstelijnszorg en hoe deze beter in de samenleving te verankeren is.

Ten vierde: het beschrijven van een inheemse classificatie van lokale medicinale, aromatische en cosmetische (MAC) planten, inclusief hun voorbereiding en toepassing, evenals hun gebruik voor de behandeling van specifieke ziekten zoals gepresenteerd in hoofdstuk VII. Het specificeert de inheemse kennis verzameld uit de open vragen tijdens de huishoud enquête, met betrekking tot de gepercipieerde morbiditeiten en de bekende traditionele therapieën. Deze worden beschreven met de identificatie van specifieke inheemse soorten en hun toepassing zoals aangegeven door de individuele respondenten. De classificatie wordt uitgedrukt in lokale terminologie (*Igikuria*) en geverifieerd door lokale traditionele genezers, omwille van de consistentie met het emic-principe. De wetenschappelijke beschrijving van de botanische data vond post-hoc plaats op basis van de verzamelde afbeeldingen. Het gebruik ervan wordt ook beoordeeld op spontane kennis en individuele toepassing, evenals indirect verworven kennis via kennissen, en de vastgestelde overlap en frequentie. Het dient om onderzoek naar de diversiteit in het gebruik van geïdentificeerde soorten gericht op specifieke aandoeningen in andere (sub-)regionale gebieden aan te moedigen, vooral waar ze consistent zijn en waar ze afwijken van bestaande lokale botanische gegevens.

Ten vijfde: de stapsgewijze bivariate, wederzijdse relatie en meervoudige regressieanalyse van de utilisatie van het plurale medische systeem door de lokale bevolking presenteren, om de interacties tussen de groepen factoren te verklaren, zoals beschreven in hoofdstuk VII. De bivariate analyse

toont de selectie van variabelen die een rol spelen bij het gebruik per medisch systeem, en die zijn opgenomen in de multivariate analyse. Het wordt gevolgd door de interacties tussen de sets variabelen per blok. Deze interacties bieden de mogelijkheid om de toepasbaarheid van het conceptuele gebruiksmodel te visualiseren, ook als een voorspellend operationeel hulpmiddel voor duurzame gemeenschapsontwikkeling. De verwerking van de gegevens wordt uitgevoerd door de module "Data Reduction - Optimal Scaling" (OVERALS) van SPSS (versie 21).
De resultaten van de bivariate analyse met systeemgebruik tonen een residu van 19 variabelen over de vijf blokken van onafhankelijke - predisponerende - factoren, die allemaal Pearson $\chi 2 = 0.000$ niveau bereiken en scoren op Cramer's V (voor nominale variabelen) van 0.151 tot 0.363. In totaal gebruikt 41,7% van de respondenten TM, 21,5% gebruikt TR en 36,8% gebruikt MM (N=715). Het laat ook zien dat blok zes, met tussenliggende variabelen zoals media- en informatiecampagnes, niet voldoende scoort om in de multivariate analyse te worden opgenomen. Van de sociaal demografische factoren blijven het land in bezit, de hoeveelheid vee in bezit en het aantal moderne media in gebruik relevant. Van de pyscho-sociale factoren zijn wie om advies worden gevraagd, wie de bron van kennis is, het geloof in TM en de mening over de effectiviteit van TM onderscheidend. Onder de pre-disponerende factoren zijn de kosten van TM en TR, evenals de kosten van transport naar TM, en tenslotte de sociale economische status belangrijk. Van het vierde blok zijn de gepercipieerde morbiditeit, de duur van de ziekte en de externe diagnose door een derde partij onderscheidend. Onder de institutionele factoren zijn de beschikbaarheid van moderne (MM) en transitionele (TR) middelen, samen met milieuvriendelijkheid, sociale acceptatie en economische efficiëntie, onderscheidend.

In de multipele regressieanalyse zijn de variabelen die een substantiële correlatie vertonen in beide dimensies: wie om advies wordt gevraagd, of de therapie sociaal aanvaardbaar is, wie de bron van kennis is, de kosten van TM en of TM economisch efficiënt is. Voor de afhankelijke variabelen is dat het gebruik van TR. Het is duidelijk dat met de afhankelijke variabelen TM dominant is in de eerste dimensie, gevolgd door TR met een gematigde score, terwijl MM in de tweede dimensie is, gevolgd door TR, met een matigde score. In de bivariate analyse is het duidelijk dat de meest discriminerende variabelen consistent lijken te zijn met hun positie in de eerste dimensie en de tweede dimensie, hoewel soms in omgekeerde volgorde. De variabele "klinisch gediagnosticeerd", de hoogste in de bivariate analyse, verschijnt hier alleen in de tweede dimensie met een hoge waarde, waarschijnlijk vanwege de relatie met het gebruik van MM. In figuur 7 is het duidelijk dat de combinatie van geloof in TM, kosten en afstand tot TM een kleine onderlinge afstand hebben in beide dimensies, wat aangeeft dat de overtuiging en toegankelijkheid van TM coherente motieven vormen, nauw verwant aan gepercipieerde morbiditeit. De variabelen die het dichtst bij het gebruik van MM liggen, kunnen worden aangeduid als sociaal-economische status en de sociale acceptatie van het gebruik van het systeem. Omgekeerd is in de tweede dimensie de afstand tussen TR, economische efficiëntie en milieuvriendelijkheid erg klein, terwijl wie wordt geraadpleegd, wie de bron van kennis is en wie de diagnose heeft gesteld, zich in hetzelfde cluster bevindt. Het laat zien dat, naast de invloed van sociale relaties en inheemse kennis op het gebruik van TM, er een identiek mechanisme is met betrekking tot het gebruik van commerciële middelen.

Uit de analyse van de relaties tussen de blokken van het onderzoeksmodel blijkt ook dat blok 2 en 5 het meest onderscheidend zijn (7x significante scores), gevolgd door respectievelijk blok 1 (5x) en 3 en 4 (4x). Deze frequenties weerspiegelen de scores van individuele variabelen binnen de blokken. Tussen blok 2 en de anderen is het advies van bekenden en de bron van kennis

onderscheidend, evenals het geloof in- en de mening over TM. In blok 5 zijn de sociale acceptatie van de gekozen therapie, gevolgd door de economisch efficiënte kwaliteit van de therapie en de beschikbaarheid van TM onderscheidend. Het geeft aan dat de invloeden van persoonlijke relaties binnen de gemeenschap dominant zijn boven pragmatische overwegingen. De beschikbaarheid van TM behaalt echter de hoogste score in alle richtingen met 0,938. Wat betreft sociaal demografische factoren uit blok 1, zijn er drie variabelen die een rol spelen in dimensie 1, namelijk grondbezit, veehouderij en het gebruik van moderne media. De eerste, landeigendom vertoont een relatie met de veehouderij, maar nog belangrijker, met het gebruik van TM in blok 7 en met sociale acceptatie in blok 5. Over het algemeen is de sterkste relatie tussen blok 2 (psychosociale factoren) en blok 5 (institutionele factoren) met 0.802 in dimensie 1 en 0.826 in dimensie 2. De hoogste correlatie tussen onafhankelijk en afhankelijk is tussen blok 4 en blok 9 gebruik van MM, 0.663 (bij externe diagnose) en tussen blok 4 en blok 7 gebruik van TM, 0.599 (over gepercipieerde morbiditeit). De volgende sterke relatie is tussen blok 3 (pre-disponerende factoren) en blok 5 (institutionele factoren) met 0.769 in dimensie 1 en 0.666 in dimensie 2. Die relatie wordt blijkbaar bepaald door de combinatie van de kosten van TM, gekoppeld aan de transportkosten naar TM en de beschikbaarheid van TM. Verwijzend naar de kwalitatieve gegevens, ondersteunt dit de nabijheid in termen van psychologische en fysieke afstand, het aantal mensen dat huismiddeltjes toepast, beschikbaar in hun omgeving, en tegen verwaarloosbare kosten.

Ten zesde: om de perceptie van de lokale bevolking van het huidige moderne medische systeem in het gebied te beoordelen op basis van kwalitatief onderzoek, om de samenwerking tussen de beschikbare medische systemen te verbeteren, zoals beschreven in hoofdstuk VI en VIII. In de huidige gezondheidszorg is er vooral het aspect van fysieke toegankelijkheid: hoewel TM historisch is gekoppeld aan de fysieke omgeving en daarom impliciet aanwezig is in elke lokale gemeenschap, worden de op voorzieningen gebaseerde diensten op A-niveau beperkt door de beschikbare middelen. Hoewel dit netwerk is uitgebreid door gezondheidswerkers op dorpsniveau, van wie de meesten zonder fysiek station werken, blijft de distributie van voorzieningen op het platteland op middellange termijn problematisch, tenzij er alternatieven worden gevonden.

Bovendien speelt toegankelijkheid een rol in sociaaleconomische termen. Hoewel de meeste diensten toegankelijk zijn en sommige gratis zijn voor de meest kwetsbare groepen, zoals moeder en kindzorg (MCH), HIV-positieve personen en ouderenzorg, is er concurrentie met alternatieve aanbieders, zowel traditionele als commerciële. De gezondheidswerkers leggen uit dat de financiële middelen op districtsniveau niet voldoende zijn voor de beoogde diensten, terwijl preventieve diensten niet voldoende omzet genereren om zichzelf te onderhouden. Het Community Health Fund (CHF) en andere soorten collectieve verzekeringen hebben nog geen omvang om te fungeren als financiële basis om monitoring- en preventie te ondersteunen, of hun uitbreiding op dorpsniveau.

Het kwalitatieve onderzoek toont aan dat het vertrouwen in de technische capaciteiten van MM hoog is, er is waardering voor chirurgie, microbiologische analyse door laboratoriumtesten, vaccinaties, röntgenfoto's, levensreddende systemen, bijv. infusie, bloedtransfusies, kunstmatige ademhaling en de compactheid van moderne geneesmiddelen zoals in massa geproduceerde pillen, sera, of implantaten. Tegelijkertijd wordt de werkhouding van veel moderne gezondheidswerkers vaak bekritiseerd. Er is een idee van gebrek aan terugkoppeling tijdens consultaties, wat betekent dat personeel de oorzaak en het effect van hun morbiditeit of de voorgestelde remedie niet adequaat aan de patiënt uitlegt, terwijl de houding van velen tegenover patiënten is bestempeld als 'arrogant' of

‘onbeleefd'. De respondenten geven aan geen idee te hebben wat deze houding oproept. Het werpt een barrière op voor spontaan contact, vooral bij vrouwen.
Er is een gebrek aan spontane kennis over preventieve maatregelen. De populariteit van preventieve diensten is omstreden. Hoewel de campagnes voor gezondheidsvoorlichting meetbaar zijn, is de impact gering. Zoals vermeld in de kwalitatieve analyse, moet de integratie met het reguliere basis- en voortgezet onderwijs worden verbeterd, omdat kinderen de belofte in zich dragen om meer bewustzijn te creëren en tegelijkertijd indirect de ouders kunnen bereiken. Een heropleving van het rollenspel op dorpsniveau voor de onderkenning van potentiële gevaren wordt door verschillende sleutel informanten onderschreven. De rol van mobiele communicatie is nog niet onderzocht, maar het privébezit van meerdere apparaten is zodanig verspreid dat ze veelbelovend zijn als een platform voor gezondheidseducatie of noodwaarschuwingen via sms of apps voor een breder publiek, zoals al wordt gedaan in Azië, de Amerika's en delen van Europa.

Zoals in hoofdstuk IV en V wordt benadrukt, is de situatie op het gebied van gezondheids personeel urgent. In bredere zin is dit tekort tweeledig, omdat het niet alleen artsen betreft, maar ook paramedici op gemeenschapsniveau. De opties variëren van Publieke Private Partnerships (PPP) verbonden aan formele opleidingsinstellingen, tot de integratie van traditionele professionals in de gezondheidszorg op lokaal niveau. Ongeacht de hernieuwde belangstelling voor de rol van Community Health Workers (CHW) is samenwerking met TM nog steeds een optie. Het argument van personeelsleden dat bepaalde traditionele artsen niet voldoen aan opleidingskwalificaties, maakt de optie om hen instrumenteel te maken bij vroege opsporing, eerstelijnsgezondheidszorg of tijdige verwijzing niet ongeldig. Hun vertrouwelijke relatie met de gemeenschap, hetgeen ook wordt aangetoond door traditionele verloskundigen (TBA’s), maakt hen tot een waardevolle menskracht. Er is een bereidheid bij die groep om samen te werken en kennis uit te wisselen, terwijl individuele traditionele verloskundigen (TBA's) hebben aangetoond dat ze verantwoordelijkheid nemen door delicate gevallen naar het ziekenhuis te verwijzen, soms zelfs door patiënten te begeleiden. Het mechanisme moet bij voorkeur wederkerig zijn en delen met traditionele artsen in ruil voor hoe ze consistentie in kwaliteit kunnen bereiken met behoud van hun traditionele middelen, wat ze verwachten van hun interactie met het moderne systeem. Door hier alleen over personeelstekorten te praten, wordt het grotere beeld van samenwerking met TM naar de achtergrond geschoven. Kwalitatieve en kwantitatieve gegevens tonen aan dat de meeste gepercipieerde morbiditeiten eerst zelf worden behandeld, terwijl aandoeningen met een mentale of spirituele connotatie zich meestal richten op TM, hoewel soms onterecht, zoals bij convulsies met zuigelingen. Het verdient het om te worden onderzocht en gebruikt om het gezondheidsbeleid te verbeteren, in plaats van dat TM wordt afgedaan als inferieur, ongepast of onbestuurbaar.

Er is behoefte aan geïnstitutionaliseerde interactie met wat de WHO de "sociale determinanten van gezondheid" (WHO, 2018) noemt, afgeleid van de reacties onder de lokale bevolking na de uitbraak van ebola in West-Afrika. Er is een analogie met HIV/AIDS wanneer een infectie niet op tijd wordt gedetecteerd of (on-)opzettelijk wordt genegeerd, herkenbaar als een aspect van PMTCT [37] projecten. Het vereist ook een gedragsverandering van gezondheidswerkers. Hun bewustzijn van de impact van gezondheidsmaatregelen op de dagelijkse routine van de bevolking, d.w.z. hun culturele tradities, moet worden weerspiegeld in het lokale gezondheidsbeleid. Net zoals vrijwilligers van religieuze congregaties die HIV-patiënten individueel begeleiden om te voorkomen dat ze een gezondheidsrisico voor de gemeenschap worden, is de gelijkenis met andere inheemse instellingen duidelijk. Er zijn hoge verwachtingen van een vernieuwde gezondheidswerker in de

gemeenschap (CHW) die meer dan voorheen moet kunnen anticiperen op gezondheidsrisico's, moet samenwerken met traditionele genezers en lokaal herkenbare definities moet gebruiken om het beoogde publiek te bereiken. Hun opleiding en status in de gemeenschap zullen echter moeten worden herzien, gezien de ervaringen in de eerstelijnszorg (PHC) en die met de opleiding van traditionele verloskundigen (TBA's).

Medische informatie moet worden gedigitaliseerd. Het kan vroegtijdige detectie van gevaren op districtsniveau mogelijk maken. De verspreiding van mobiele telefoons en de dekking van internetproviders impliceren dat een dergelijke toepassing mogelijk is. De medewerkers van de klinieken zetten zich in voor het verzamelen en registreren van relevante informatie. Er is software maar geen internetverbinding om gegevens op tijd te delen met de stafafdeling in de hoofdstad. De kosten voor het opzetten van deze verbindingen zijn echter onevenredig laag in vergelijking met de logistiek en mankracht die betrokken zijn bij fysieke verplaatsing en alternatieve communicatie over grote afstanden en onverharde wegen. De medewerkers willen ook informatie op locatie kunnen analyseren en terugkoppeling kunnen geven aan het hoofdkantoor. Het betekent dat elke fluctuatie in morbiditeiten, een tekort aan essentiële medicatie of epidemiologische gezondheidsrisico's die een snelle interventie vereisen, automatisch worden gedetecteerd door een hoofdkwartier dat vervolgens gegevens in een netwerk kan analyseren en deze tegelijkertijd kan delen met districtsklinieken.

Ten zevende: de theoretische implicaties beschrijven van de onderzoeksresultaten voor de ontwikkeling van toegepaste ethnoscience op het gebied van management van de volksgezondheid, gericht op de invloed van sociaal-culturele factoren bij het bereiken van duurzame gemeenschapsontwikkeling (zie Slikkerveer et al. 2019) Hoofdstuk VIII toont de implicaties van toegepaste ethnoscience: het aantonen van de rol van inheemse kennis en praktijken leidt tot een heroverweging van hoe gemeenschappen moeten worden benaderd bij het mobiliseren van hun potentieel om problemen in de gezondheidszorg aan te pakken. Door inheemse overtuigingen en motieven te herkennen die ten grondslag liggen aan sociaal gedrag, is het mogelijk om kennis uit te wisselen zonder semantische waarden te verliezen. Het kan een betere identificatie bieden en invloed hebben op ongezonde levensstijlen. Het zal evenveel kunnen bijdragen als grootschalige op conventionele media gebaseerde campagnes voor gezondheidseducatie.

Ten Achtste: de methodologische implicaties beschrijven van de onderzoeksresultaten voor de verdere ontwikkeling van specifieke op ethnoscience gebaseerde onderzoeksmethoden en -technieken zoals bepleit door LEAD om bij te dragen aan duurzame gemeenschapsontwikkeling. De implicaties onderbouwen de juiste capaciteit van de 'Leiden Ethnosystems Approach' als een instrument om de emic-factoren in het proces te beoordelen, en als zodanig aansluiten bij het Impact Assessment Model zoals geïntroduceerd in het concept van Integrated Community Managed Development (ICMD) door Slikkerveer (2018). Deze methode maakt het ook mogelijk om de volgende generatie gezondheidswerkers volledig geïntegreerd te laten werken vanwege hun vermogen om op gelijke voet met de lokale bevolking te communiceren, vooral wanneer bepaalde onderwerpen als controversieel worden beschouwd, bijv. anonieme HIV-dragers of aan hekserij toegeschreven verschijnselen. De toepassing van een methode voor het aanpassen van ethnoscience wordt aangemoedigd bij te dragen aan wat Nachega *et al.* (2012) aangeven als de noodzaak om nationale trainingsprogramma's in de Afrikaanse regio (WHO / AFRO 2012) uit te breiden met zoveel mogelijk epidemiologische en volksgezondheidsaspecten. Hun analyse geeft aan dat de

nadruk op overdraagbare ziekten (CDC's) en moeder en kindzorg (MCH) moet worden uitgebreid met niet-besmettelijke ziekten (NCD's), en klimaatverandering en haar gevolgen voor het milieu, aangezien deze in de regio verder zullen toenemen. Het belangrijkste motief voor het toepassen van deze onderzoeksmethoden ligt in de identificatie van voorspellende indicatoren (Nachega *et al.* 2012) die tegelijkertijd de samenwerking met programma's buiten de regio bevorderen, of de toepassing van digitaal afstandsonderwijs in de huidige curricula. Het verwijst naar het gebrek aan managementkader op masterniveau in de huidige gezondheidszorg en de behoefte aan meer opleidingscapaciteit om het gebrek aan lokale middelen te compenseren.

Ten negende: de praktische implicaties beschrijven van de onderzoeksresultaten voor de verbetering van het beleidsplanning en implementatieproces voor het volksgezondheidsbeleid, met een focus op de ontwikkeling van uitgebreide beleidsplannen door het Serengeti District Health Management Team. Het leveren van een gemeenschapsgerichte bijdrage aan de Transcultural Public Health Management (TPHM) Post-Graduate Course aan het Kisare College of Health Sciences in Serengeti. De beleidsaanbevelingen ter afsluiting van hoofdstuk VIII zijn als volgt geformuleerd:

1) De mogelijkheid bestaat om op de gemeenschap gebaseerde instellingen nieuw leven in te blazen die de voorwaarden voor duurzame gezondheid op lokaal niveau verbeteren. Ze omvatten de revitalisering van gemeenschapsgezondheidscomités, gezondheidswerkers in de gemeenschap en de structurele samenwerking met traditionele genezers in de discipline waarin ze beschikbaar zijn (zie Ambaretnani 2012; Chirangi 2013). Het zou kunnen fungeren als een alternatieve pool van human resources, mits er toewijding is op districtsniveau om de communicatie te vergemakkelijken. De mobiele klinieken van het oorspronkelijke Primary Health Care concept zouden nieuw leven kunnen worden ingeblazen als een communicatie- en trainingsapparaat, als aanvulling op de oorspronkelijke functie als monitoring en controle van MCH-activiteiten.

2) Er is een verzoek om een verbeterd curriculum (zie 8.3.3) om personeel op te leiden in het toepassen van endogene kennis bij hun dagelijkse activiteiten. Integratie van sociale wetenschappen in curricula voor het beheer van de volksgezondheid zal de communicatie op gemeenschapsniveau verbeteren; aanzetten tot een verandering in houding en een betere reflectie op de motieven van de lokale bevolking. Het zal gezondheidswerkers op verschillende niveaus in staat stellen zich te identificeren met de motieven in het gezondheidsgedrag van hun doelgroep, en zowel preventieve als curatieve zorg te verbeteren, aangezien de correlatie tussen de twee afhankelijk is gebleken van de perceptie van kwaliteit en toegankelijkheid van de dienstverlening. Het zou kunnen leiden tot een structurele samenwerking met traditionele genezers, waarbij wederzijds respect wordt bereikt, kennis wordt uitgewisseld en gezondheidsrisico's worden beperkt.

3) Er is een onderschat potentieel in de revitalisering van het Community Health Fund (CHF), door te overwegen het op alternatieve manieren te organiseren. Zoals aangetoond in de kwalitatieve analyse, komt integratie met bestaande instellingen op dorpsniveau, d.w.z. boerencoöperaties, religieuze congregaties of vrijwillige verenigingen die betrokken zijn bij een economische activiteit in verband met wederzijds krediet, in aanmerking als voertuig voor het afsluiten van een ziektekostenverzekering. Bovendien kan er een goede her-evaluatie zijn van welk type zorg gedekt moet worden, met consensus van alle betrokken partijen en met een lange termijn inzet om

vertrouwen op te bouwen. Tenslotte zijn er een groot aantal alternatieven met betrekking tot de betaling van vergoedingen die nog niet zijn onderzocht, b.v. verspreiding in termijnen, delen, collectieve spaarregelingen, kanalisering via lokale verenigingen of gedigitaliseerd via mobiele communicatie, om te voorkomen dat potentiële patiënten consultatie gaan vermijden vanwege de financiële implicaties.

4) Er is een wens om een gedigitaliseerd gezondheidsinformatiesysteem te starten tussen de doorverwijzingsstations wat betreft het uitwisselen en analyseren van morbiditeitscijfers, medicijnvoorraden, vroegtijdige waarschuwing voor gezondheidsproblemen, monitoring en controle, door toepassing van technologie die al beschikbaar is, maar die tot nu toe beschikbaar is niet geoperationaliseerd. Op A-niveau bestaat er een verplichting om een dergelijke vorm van communicatie tot stand te brengen, en deze kunnen worden vastgesteld tegen een fractie van de kosten van traditionele logistiek en fysieke verplaatsing. De hardware en software is beschikbaar, internetproviders zijn beschikbaar, elektriciteit is beschikbaar en de kennis is beschikbaar.

5) Er is een optie om het effect van campagnes op het gebied van gezondheidseducatie te vergroten door de integratie in het basis- en voortgezet onderwijs uit te breiden. De inzet van rollenspellen kan worden verhoogd om een beroep te doen op die traditie van inheemse kennisoverdracht. Vanwege de veranderende modaliteiten door mobiele telecommunicatie is het echter noodzakelijk om het gebruik van bestaande netwerken te onderzoeken om informatie over gezondheidsrisico's op mobiele apparaten te introduceren, omdat vooral de volgende generatie vatbaar is voor deze kanalen en men een platform zou kunnen creëren via de sociale media.

6) Er is de mogelijkheid om het onderzoek naar de toepassing van inheemse traditionele geneeskunde nieuw leven in te blazen, aangezien een aantal traditionele beoefenaars aangeven dat ze graag hun materiaal willen laten onderzoeken. Zij stellen voor dat een wetenschappelijke analyse van de componenten een tweeledig effect zou hebben. Ten eerste zou dit het stigma van ontbrekende geregistreerde kwalificaties wegenemen, ten tweede zou het hen in staat stellen hun medicijnen verder te ontwikkelen op het gebied van conservering of reproductie, en tenslotte zou het hen erkenning geven. Het belangrijkste doel, in hun woorden, is om eindelijk een reactie te ontvangen over het aanbod tot samenwerking hetgeen ze consequent hebben gedaan. Het vormt tegelijkertijd een solide basis voor toekomstige samenwerking en de beoogde integratie tussen medische systemen. Het zou de verdiende aandacht moeten krijgen, temeer omdat dezelfde beoefenaars een gebrek aan interesse van de jongere generatie voorzien om de moeizame taak van het verzamelen en bereiden van de benodigde soorten te ondernemen. Ze vrezen dat de kennis niet zal worden behouden of overgedragen, terwijl ze tegelijkertijd een verminderde beschikbaarheid van sommige soorten ervaren, wat hun behoud in gevaar brengt (zie hoofdstuk VI).

Appendix 1: Approval by Ethical Review Committee (National Institute for Medical Research)

THE UNITED REPUBLIC OF TANZANIA

National Institute for Medical Research
3 Barack Obama Drive
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NIMR/HQ/R.8c/Vol. II /594

Ministry of Health, Community Development Gender, Elderly & Children
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04th May, 2016

Dr J. C.M Bekker
LEAD Program Faculty of Science
Einsteinweg 2 , 2333 CC Leiden, The Netherlands
C/O Dr Musuto Mutaragara Chirangi
Kisare College of Health Sciences
P O Box 139 Serengeti, MARA

APPROVAL FOR EXTENSION OF ETHICAL CLEARANCE

This letter is to confirm that your application for extension on the already approved proposal: Transcultural health care utilization in Mara region of Tanzania (Bekker J C M et *al*), has been granted approval to be conducted in Tanzania.

The extension approval is based on the progress report dated 27th October 2015 on the project, Ref. NIMR/HQ/R.8a/Vol. IX/1853, dated 20th November, 2014. Extension approval is valid until 19th November 2016.

The Principal Investigator must ensure that other conditions of approval remain as per ethical clearance letter. The PI should ensure that progress and final reports are submitted in a timely manner.

Name: Dr Mwelecele N Malecela

Signature
CHAIRPERSON
MEDICAL RESEARCH
COORDINATING COMMITTEE

Name: Prof. Muhammad Bakari Kambi

Signature
CHIEF MEDICAL OFFICER
MINISTRY OF HEALTH, CO MMUNITY DEVELOPMENT, GENDER, ELDERLY &CHILDREN

CC: **RMO**
DED
DMO

Appendix II: **Factsheet Transcultural Public Health Management Course (Model)**

Theme: Capacity Building
Programme: Strategic Partnerships (Erasmus+)
Programme countries: The Netherlands, Denmark (Associated: MAICH, Crete)
Partner country: Tanzania (three institutions, 2 under KMT (NGO), 1 Public)

AIM: Development of Transcultural Public Health Management Master Course

Higher Education Partner Institutions:

1. Leiden Ethnosystems and Development Programme, Faculty of Science, Leiden University, The Netherlands (Ethnomedical / Management aspects)

2. University College of Nordjylland, Aalborg / Hjørring, Denmark (Public Health & ICT aspects)

3. Mediterranean Agronomic Institute of Chania, Crete (Environmental & Management)

4. Kisare College of Health Sciences, Mugumu, Tanzania (Community Health aspects)

5. Shirati College of Health Sciences, Rorya, Tanzania (Epidemiological aspects)

6. Musoma Clinical Assistant Training Centre, Tanzania (Medical Biological aspects)

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1 Module is two days a week / one day is 4 contact hours / 8 hours a week

12 Modules is 96 contact hours. Total study-load 1.680 hours. 1 Credit = 28 hours (60 ECTS).

Allocation of all the 12 modules into the 3 main pillars of the proposed curriculum build up (model)

Social Sciences & Health	Strategic Planning & HRM Management	Research Methodology, ICT applications and Fieldwork
Module 1	Module 5	Module 9
Module 2	Module 6	Module 10
Module 3	Module 7	Module 11
Module 4	Module 8	Module 12

Module 1: Introduction to Transcultural Public Health Management (TPHM)

Module 2: Development of the Medical Social Sciences

Module 3: Socio-cultural Context of Health & Disease: Evidence–based Medicine

Module 4: Medical Pluralism: Traditional Medicine, Complementary & Alternative Medicine

Module 5: Community Health Promotion for Integrated Public Health (IPH)

Module 6: Project Management & Resource Planning

Module 7: Strategic Health Planning & Monitoring

Module 8: Health Manpower Planning (HMP)

Module 9 Research Methods & Techniques, Public Health Statistics

Module 10 IT applications for Data Monitoring and Analysis (theory & practice)

Module 11 Training in Social Science Field research (theory)

Module 12 Fieldwork (practice) / Thesis write up

The T.O.T. programme involves two lectors from each partnering institution, ten staff members in all. They will be the pivotal staff to lecture the course initially at Kisare in Mugumu (Serengeti) and eventually in all Tanzanian partnering institutions to Health Professionals on Bachelor Level (prime target group), with the aim of expanding Public Health Management staff to address the local manpower shortage.

Appendix III: Letter of Intent 2014, Kanisa la Mennonite Tanzania (KMT) & LEAD Programme Leiden

Letter of Intent

This is to certify, that the undersigned:

- Prof.Dr. L. Jan Slikkerveer, Director of LEAD, Leiden University, Leiden, The Netherlands, and
- Mr. Jumanne Magiri Mafwiri Dip CM, MA of Kanisa La Mennonite Tanzania (KMT) in Musoma, Mara Tanzania,

have agreed to further extend their scientific cooperation programme in Training and Research in the field of the Medical Social Sciences, particularly in Public Health Management and Community Health Development in Tanzania.

It has been agreed upon, that the First Joint Project under the framework of this scientific cooperation programme will encompass the PhD Research on *'Transcultural Health Care Utilisation in Mara Region of Tanzania'* to be conducted in 2014 in Tanzania by Drs. J.C.M. de Bekker of the LEAD Programme under the supervision of Prof.Dr. L.J. Slikkerveer of Leiden University, where Kanisa La Mennonite Tanzania (KMT) in Musoma, Mara Tanzania will act as the counterpart in the field.

Furthermore, it has been agreed upon, that the Second Joint Project under the framework of this scientific cooperation programme will encompass the *'Development of Kisare College of Health Sciences'* in terms of advanced human resources development in public health management and community health. It is the objective that this Second Joint Project will eventually pertain to the local capacity building programme, which is initiated by the Tanzanian counterpart Kanisa La Mennonite Tanzania (KMT) to train more health staff at an academic level.

It has also been understood, that the parties either on their own behalf or in common effort intend to support, contribute and seek further funding from internal and external private and public financial resources for the execution of the above mentioned joint project activities.

Since the initiative to such joint venture has developed from personal contacts and cooperation which evolved during the mid-2010s between the representatives from the institutions, it has been emphasised that these personal relationships will form the basis for the envisaged linkage relationship between the counterpart institutions in The Netherlands and Tanzania.

Finally, it has been agreed upon, that the joint project activities under the framework of this scientific cooperation programme are directly related with each other, and as such will together further strengthen the long-term linkage relationship between the counterparts in The Netherlands and Tanzania.

As agreed upon,

Leiden, 15 April 2014

Prof.Dr.Dr.(h.c.) L.J. Slikkerveer,
Director of LEAD,
Faculty of Science,
Leiden University
The Netherlands

Musoma, 16th April 2014

Mr. Jumanne Magiri Mafwiri Dip CM, MA,
Kanisa La Mennonite Tanzania (KMT),
Musoma,
Mara Region,
Tanzania

GENERAL SECRETARY
KANISA LA MENNONITE TANZANIA
P. O. BOX 1040 MUSOMA
TANZANIA

Curriculum Vitae J.C.M. (Hans) de Bekker

Hans de Bekker was born on May 16th, 1956 in Eindhoven, the Netherlands. After completing his secondary education at the Odulphus Lyceum in Tilburg, he moved to Leiden to study at the Faculty of Anthropology and Non-Western Sociology. He completed his master in 1987 in Medical Anthropology, supplemented with Development Economics (thesis), Political Science and Public Administration.

Simultaneously, through volunteer work for NGO's in the Netherlands during his student days, he became acquainted with the health situation in West-Africa, which motivated him to apply with the Horizon Holland Foundation in The Hague after graduation. That NGO awarded his application by detailing him to the Volta Region of Ghana in 1988, where the local beneficiary Keta–Ho Diocese had reported underutilisation of their Primary Health Care activities. It was the starting point for consecutive assignments, among others supported by sponsors such as the REMEDI workgroup, alumni associated with Leiden's academic hospital and Delft University.

The second detail was to Wenchi District in the Brong Ahafo region in Ghana, where his assignment with the Methodist hospital's outreach clinic, annex the Public Health Department's activities, until 1992 laid the groundwork for his current interest and involvement. Co-opted as board member of the Horizon Foundation upon return, he extended his volunteer work for the next decades in service of fundraising for development projects in the area, also as chairman of the Help Ghana Foundation at the founder's request.

His consecutive employment with Inholland University predecessor's branch at Diemen in 1993 as a researcher, continued his liaison with Africa as the Horizon Foundation started placing both Inholland and Leiden university students in Ghana, Tanzania and Zambia as part of their health care and science curricula, while he was co-ordinating the placement programme.

The alma-mater was always in the background, and eventually his former tutor Prof. L.J. Slikkerveer extended an invitation to become a guest-lecturer for the TWINMAP double degree programme in Medical Anthropology in 2002, on the basis of his African fieldwork experience. Consequently, the Integrated Microfinance Management programme developed by LEAD for Indonesia in 2011 brought forth additional tutoring assignments.

Through LEAD he became acquainted with the work of the Mennonite Church (KMT) health institutions in Tanzania, who in turn invited him to become involved at Kisare College of Health Sciences and Nyerere Designated District Hospital, through the mediation of their Executive Director dr. Musuto M. Chirangi (*PhD Leiden University*) - a LEAD member. Hans de Bekker is currently employed as a researcher at Inholland University of Applied Science in The Hague, and continuous as a guest-lecturer and researcher for the LEAD programme at Leiden University.