Chapter I. INTRODUCTION

1.1 Health Information and Communication in Indonesia

1.1.1 The New Field of Health Information & Communication (HIC)

In Indonesia, as in many other newly-developing countries, different forms of information and communication regarding health and disease co-exist, sharing the common goal of guiding and changing human behaviour to improve the general health status of the population. While traditional information has been accumulated and used for health and healing over many generations among different ethno-cultural groups throughout the country, the introduction from the West of modern, cosmopolitan medical information started to develop since the colonial period of time. The current various forms of information and communication are directly related to the pluralistic health sector of the country, as they influence not only health promotion and disease prevention, but also the treatment and care of patients. In their recent article in the *Bulletin of the World Health Organization*, Rimal & Lapinski (2009) underscore the fact that health communication has direct relevance for virtually every aspect of health and well-being of the entire population.

The related field of study of Health Information & Communication (HIC) has recently emerged from the discipline of communication science as a special subject area of different forms of health information and exchange among members of the society, including not only the general public, but also among clients and patients, and between patients, healers and doctors, and also within health centres and hospitals, with the aim to disseminate and operationalise information on health and disease for healthcare improvement. While taking into consideration that *information* basically refers to stimuli transferred with a meaning in a particular setting for its receiver, it is generally conceptualised as *data* when entered into and stored in a computer. Subsequently, when information is processed or used for the understanding of a particular situation, it is known as *knowledge* (*cf.* Rouse 2005). More specifically, *health information* is usually defined in conjunction with *health communication* among the members of the community to encompass a personal perspective on the *consumers' side*: *'information or an opinion about the health or a disability of an individual; or an individual's expressed wish about the future provision of health care to him or her'* (*cf*. ALRC 2008).

However, on the *providers' side* of both indigenous healers and modern medical personnel, the physicians, nurses and health auxiliaries have functionalised the recent digital revolution and developed a formal system of modern Health Information & Communication Technology (HICT) with the aim to build a consistent, sustainable and high-quality organisation of modern computer-based healthcare services.

By consequence, much effort has been made by the Government of Indonesia to establish a formal National Health Information System (SIKNAS) which links up with various district-level health information systems (SIKDA), all focused on the delivery of modern health care services. Recently, however, SIKNAS has been weakened by the process of decentralisation, where the multiple separate reporting systems have rendered vital registration incomplete (*cf.* Mahendradhata 2017). In the public domain, the new development of computerised Health Information & Communication Systems (HICS) includes a national effort to collect, process, report and utilise health information in order to guide the national process of policy and decision-making, based on a range of legislative, regulatory and planning frameworks. A major task, however, remains the study and understanding of the utilisation by the population of the various forms of Health Information & Communication throughout the country.

Recently, the various forms of information and communication related to health and disease have been studied in relation to different traditional and modern medical systems, where before the recent advent of the Internet, health information was largely collected as statistical data on paper forms and documented, analysed and functionalised for the improvement of health care of the population.

Since Health Information & Communication (HIC) are closely intertwined in the continuum of their accumulation of information and implementation in the dissemination and communication process, HIC can be conceptualised as a system in terms of an organised, purposeful structure which consists of interrelated and interdependent elements sharing the aim of achieving the goal of the system. In this way, the concept of the Health Information & Communication System (HICS) has been developed, as it is aimed at achieving the adoption of the health-enhancing behaviours, customs and rules of the society and as such is expected to contribute to the improvement of the health of the population. Also, HICS can be designed as a policy instrument to change the negative behaviour of community members into positive behaviour in order to improve their health by education, persuasion and internalisation. While health information basically refers to the health of individuals or the activities of organisations in the health sector, health communication refers to the study and practice of actively communicating promotional health information, such as in public health campaigns, health education, and between doctors and patients in health organisations, rendering both concepts inextricable (*cf.* O'Carrol *et al*. 2003).

In recent years, the field of Health Information & Communication (HIC) has developed rather rapidly as the result of the electronic revolution in Information & Communication Technology (ICT), particularly in the field of Health Information & Communication. An important applied-oriented aspect of the new discipline is that it enables the assessment and improvement of the coverage of the different health care services, where empirical and up-to-date health information at the community level is important to gain an insight into the local decision-making process of individuals and households in order to enhance the health of the community.

In Indonesia, apart from the above-mentioned problems of the National Health Information System (SIKNAS), there still exists a lack of information in the country on its utilisation by the local population as the consumers of the co-existing traditional and modern health information systems at the community level, particularly in the rural areas. In other words: the community perspective on the utilisation of the different Health Information & Communication Systems (HICS) in Indonesia – important because of their role in decision-making for health and illness behaviour – is still rather incomplete, in particular with regard to the important, but less computerised Traditional Health Information & Communication System (THICS).

The general aim of this research is to document, study and analyse the utilisation of the Plural Health Information & Communication System (PHICS) by the local population of Sukamiskin in the Sunda Region of West Java through the identification, documentation, and analysis of significant factors influencing the related utilisation patterns, differentiated within, on the one hand, the Traditional Health Information & Communication Systems (THICS) and, on the other hand, the Modern Health Information & Communication Systems (MHICS) at the community level.

In addition, the implications of the research findings are used as a basis for the development of an empirical model of integration of Traditional and Modern Health Information & Communication Systems (T&MHIC) as a planning tool for realising 'Information Society Indonesia' (2003) in the field of health and healing in the near future.

In order to study, understand and explain the local peoples' knowledge, beliefs and practices regarding health and disease information from their own perspective, this study is conducted within the context of the sub-discipline of ethno-communication, using the 'Leiden Ethnosystems Approach' as the appropriate ethnoscience research methodology (*cf.* Slikkerveer 1990; 1995).

1.1.2 Health Information Systems (HIS) for Improved Health Services

In general, a Health Information System (HIS) refers to any system which captures, stores, manages or transmits information related to the health of individuals or the activities of organisations working in the health sector of a country or region (PHIN 2012). The concept of Health Information Systems (HIS) has further been elaborated by the Pacific Health Information Network (PHIN) (2011), encompassing six components: (1) health information resources; (2) indicators; (3) data sources; (4) data management; (5) information products; and (6) dissemination and use (*cf.* O'Carrol *et al*. 2011). In the literature, the Health Information System (HIS) is usually defined for the modern medical system as a structured and integrated data management system and as modern health information at all levels of the government in order to support health management with a view to improving the health services of the society (*cf.* WHO 2008). Moreover, Health Information Systems (HIS) are required in all modern health programmes, ranging from the analysis of the situation, priorities, and alternative solutions through programme development, implementation and monitoring to the evaluation of health plans. According to the World Health Organisation (WHO 2007), such formal Health Information Systems (HIS) are one of the six major components or 'building blocks' of a health care system of a country which includes the following:

1 delivery of health services;
2 medical products, vaccines and medical technologies;
3 health workforce (medical personnel);
4 health financing;
5 health information systems; and
6 leadership and governance.

In the arrangement of the National Health Care System of Indonesia, the Health Information System (HIS) is one component of the sub-systems mentioned below, *i.e.* the management, information and health regulations which manage the implementation of health policies, health administration, health information and health regulations. Its objective is to be able to support the implementation of the National Health Care System effectively and efficiently, as well as to support the implementation of the sub-systems within the *Sistem Kesehatan Nasional* (SKN) ('National Health Care System'), as one unified entity. The sub-systems within the National Health Care System of Indonesia include the following:

- health efforts;
- health research and development;
- health financing;
- health human resources (HR);
- pharmaceuticals, medical devices and food;
- management, information and health regulations; and
- community empowerment.

(*cf. Sistem Kesehatan Nasional SKN* 2012).

In the development of the Health Information System (HIS), a commitment has to be built into each health care infrastructure unit in order to ensure the prolongation of the Health Information System (HIS). More importantly, however, is the use of computer technology in the implementation of the supporting Computer-Based Information Systems.

Useful information of modern medical systems has mostly been described on the basis of quantitative data in medical sociology and social and family medicine, using medical statistics with applications of quantitative methods and techniques to public health sciences, including epidemiology, public health, forensic medicine, and clinical research. Such information has lately become computerized as vital statistics, requiring a distinct data entry and storage process in various file formats and analysed by mainframe computers using standard data processing procedures. These activities have recently been developed into the field of *Public Health Informatics*, referred to as the systematic application of information, computer science and technology to public health practices, research, and learning [1].

In contrast, the documentation and study of traditional medical systems in developing countries have for a long time been confined to the qualitative studies of medical anthropology and ethnomedicine. More recently, however, interesting quantitative studies have also been conducted on patterns of utilisation behaviour, by local population groups and communities, of traditional medical systems, providing a sound basis for sustainable community health planning and development (*cf.* Slikkerveer 1990; Warren, Slikkerveer & Brokensha 1995).

As regards the Health Information Systems (HIS) of local people concerning traditional medicine, it has been shown that their influence is crucial for the decision-making process of clients and patients at the community level for their health care utilisation behaviour in terms of their choice to seek help at either the traditional or the modern medical functionaries and services.

Several studies in ethnomedicine have documented and analysed the significant role of traditional health information systems, manifest in the oral tradition of indigenous healers, birth attendants, herbalists, and bone setters, and in written sources of medical books, recipes, formulas and indigenous classifications of Medicinal, Aromatic and Cosmetic (MAC) Plants. The importance of such traditional forms of health information has been demonstrated not only for local health improvement, but also for forest conservation *(*Bodeker *et al.* 1997; Slikkerveer 2006; Ibui 2007; Leurs 2010; Djen Amar 2010; Aiglsperger 2014).

Over the past three decades, the change from mechanical and analogue electronic technology to digital electronics which had started by the end of the former century has continued up until the present with the world-wide adoption and proliferation of digital computers and the collection and management of a variety of medical information covering both traditional and modern medical knowledge, beliefs and practices. Since the 1990s, the Internet and the World Wide Web have developed significantly in health care. As Helman (2007: 334) notes, the World Wide Web is described as: '*…a global collection of accessible information which can be accessed by computers linked to an enormous electronic network: the Internet.'* It could be called an information space, or a universe of information. People tend to use the Internet in order to find information about health and medical subjects, as well as about specific health problems including both physical and mental health, or to communicate with other people who are suffering from the same health problem and situation.

Tele-medicine refers to the transfer of health information between sites and between people. It has made a major impact on the culture of medical care, from traditional face-to-face consultation to consultation from a distance. The various forms of information include a voice, an image, and a document of medical records or commands to a surgical robot. Essentially,

information has changed from distant and remote communication of information to facilitated clinical care. The first form of tele-medicine was the telephone consultation between patient and doctor. Later, tele-medicine utilised more advanced technology with computers, satellite telecommunications, radio, the videophone, web-cam, video conferencing and mobile telephone networks.

There are two concepts of tele-medicine. The first is tele-care or tele-nursing*: 'the provision, at a distance of nursing community support to a patient'*; and the second is tele-health: *'public health service delivered from a distance, to people who are not necessarily unwell, but who want to remain well and independent.'* Within tele-medicine, six types of communication between these parties can be distinguished: (1) professional-machine-professional, (2) professional-machine-patient, (3) patient-machine-professional, (4) patient-machine-patient, (5) professional-machine-data base, and (6) patient-machine-data base (*cf.* Helman 2007). Tele-medicine is used for health communication and education, as well as for providing messages about the causes, prevention and management of illnesses to patients, groups or communities. Tele-medicine is also used in tele-care and tele-monitoring from a professional to a patient and for tele-surgery. Tele-pharmacy is used for ordering medicines via the Internet, while the web blog (personal diary) is largely used as a communication medium among patients to support each other.

1.1.3 Application of Information & Communication Technology (ICT) in Health

The electronic information revolution which has recently taken place in most societies is an indication of the rapid development of Information & Communication Systems (ICS) around the globe. As the dramatic increase in information is closely related to the infrastructure support provided by Information and Communication Technology (ICT), the development of a wide range of media has led to many innovations in communication systems in today's society. One of the causes of the recent development of information & communication systems is the expanding communication network. Indeed, the development of wireless networks has been transformed inciting many innovations in global communications systems, ranging from the telephone, telegraphy, fax, radio and television to electronic mail, which can now be delivered worldwide with the support of the Internet.

A major contribution to the understanding of the complicated development process of Information & Communication Systems (ICS) is provided by the study of factors associated with the peoples' utilisation behaviour of ICS within the context of their community or society. Recently, the United Nations Conference on Trade and Development(UNCTAD 2003) outlined several factors which determine the development of Information and Communication Technology (ICT), as follows: (1) *connectivity, including Internet hosts per capita, number of PC's per capita, telephone mainlines per capita, cellular subscribers per capita*; (2) *access, including several factors, such as Internet users per capita, literacy (% population), GDP per capita, cost of local calls*; (3) *policy, including a few indicators, such as presence of Internet exchange, competition in local loop telecoms, competition between domestic and long-distance, competition in the Internet Service Provider (ISP) market;* and (4) *usage: telecom traffic, including international incoming telecom traffic (minutes per capita) and international outgoing telecom traffic (minutes per capita).*

In the meantime, Information & Communication Technology (ICT) has also developed rapidly over the past decades and is nowadays utilised in almost all facets of life, including the health sector. The application of ICT in the health sector, also known as 'e-health', has advanced health care services both in the public sector and in the private sector, providing more qualified and efficient services. If the application of such advanced ICT in the health sector manages to

achieve its goals, the realisation of the *United Nations Sustainable Development Goals* (2015), as a follow-up to the previous *Millennium Development Goals* (2005) and the improvement of public health, could also be accelerated.

The application of Information & Communication Technology (ICT) in the primary health care sector can be divided into two groups, namely the application of ICT on health management and the application of ICT on health services. The utilisation of ICT combined with health management has developed into an integrated reporting system, so that decision-making and the allocation of health care resources can be made more accurately. Furthermore, the monitoring of ICT can also be used to assist the implementation of epidemiology surveillance and disease incidence from day to day, so that extraordinary events of diseases can be anticipated quickly. In addition, the utilisation of ICT renders it possible to detect at an earlier stage an increased incidence of malnutrition, as well as of malaria, diarrhoea and dengue fever, especially through the utilisation of mobile ICT devices, such as 'm-Health'. The utilisation of ICT for individual health care taking place in hospitals, health centres, laboratories, pharmacies and private practices should ideally be able to transfer relevant electronic data. Such utilisation may accelerate the provision and improve the efficiency of the health services. Currently, the government, in collaboration with various stakeholders, such as educational institutions, professional organisations and industrial enterprises, has developed the practice of 'telemedicine'. The progression of ICT can also help to overcome the problem of the scarcity of skilled labour in the sector by implementing various forms, such as tele-medicine, tele-consultation and tele-radiology.

In order to further accelerate the application of Information & Communication Technology (ICT) in the health sector, three strategies have to be implemented, such as the strengthening of the policy and planning related to the implementation of ICT; the integration of existing information systems; and the strengthening of Human Resources (HR), especially the management of skilled personnel. Hence, the e-health programme requires the support and commitment of both the public as well as the private sector.

The process of globalisation, defined as the process of unifying the world communities into one single world society, also known as the 'global society', tends to occur in various spheres of life, with different shapes and impacts, rendering the dimensions of globalisation rather important. As globalisation is no longer considered a novel and astonishing phenomenon, presently numerous nation-states tend to develop fewer strategies for their national economies, but design their strategies for operation in the global economic system (*cf.* Castells 1999). The rise of globalisation is also strongly affected by technological change, particularly in the development of Information & Communication Technology (ICT). The impact of globalisation on the development of Health Information & Communication Systems (HICS) shows an interesting process, where global medical knowledge systems interact with local medical knowledge systems often resulting in a useful integrated system of local-global knowledge and practices, also referred to as the process of glocalisation.

Globalisation has a dual impact on the health sector. As Diaz-Bonilla *et al.* (2002) indicate: *'Globalisation affects global health which in turn may improve or worsen the health of the poor in developing countries'*. In this context, globalisation is related to the current world health problem which has been characterised by what WHO (1999) identifies as 'the double burden of disease'. The increased life expectancy recorded in recent decades, together with changes in lifestyle stemming from global socio-economic development, has increased the importance of non-communicable diseases and injuries ('the new burden'). At the same time, however, as many as one billion people in the world still suffer from infectious diseases, under-nutrition and

complications in childbirth; care for such conditions not seen among the non-poor tends to lag behind as the unfinished health agenda ('the old burden').

Moreover, under the impact of globalisation, remarkable disparities continue to exist in health and healing between developed and developing nations, while there are also significant health inequalities within countries, where the burden of disease disproportionately affects the poorest and low-income families in the rural areas.

In addition to new forms of treatment and medicines, scientific development in medicine has also been affected by the process of globalisation, as can be observed in the emergence of new medicines and instruments used in health care. Currently, operations even use robots and robotic surgery, while the technological examination of internal organs has been extended with the invention of endoscopy. Concerning modern scientific knowledge and the availability of new technologies, Hogstedt *et al.* (2007) note that: *'globalisation can make use of modern scientific knowledge and available technologies to improve quality of life for the billions of people living in poverty'* (Hogstedt *et al*. 2007: 155). In addition, Chalmers (2002) mentions a number of new useful health concepts which are also related to the process of globalisation, such as Technological Development, Evidence-based Medicine, Family-Centred Care, Psychosocial Health Care, Cultural Differences in Understanding Health and Illness, and Education and Efficiency of Care.

The impact of globalisation on the health of particular groups of the population, such as among women, is quite strong, as emphasised by Kawachi & Wamala (2007: 182): *'Globalisation is the engine of women's employment, the benefits of trade's trickle down to the poor are insufficient to characterize the complex ways in which women's health and wellbeing (and that of their family members) have been affected by the closer integration of economics around the globe'*. The impact of globalisation on Health Information Systems (HIS) is complex and difficult to predict since the factors which explain the effects are large in number and their interaction is very complex. According to Potter (1998: 260-26), the exposure to globalisation, especially in the field of information & communication, is in a way analogous to such subjects as 'the weather': '*Globalisation impacts (effects) are like the weather in many ways. Weather is always there and it can take many forms. It's very difficult to predict the weather with any precision, because the factors that explain the weather are large in number and their interaction is very complex.*' Potter (1998) notices that the effect of globalisation on the information & communication media can be either immediate or long-term. This distinction focuses on the time in which the effect occurs, but not on how long it lasts. Therefore, the different effects of globalisation are either immediate or long-term effects.

Potter (1998) also observes five levels of effects resulting from the globalisation of the information & communication media: cognitive, attitudinal, emotional, behavioural and physiological levels. At the cognitive level, the effect of globalisation on information & communication media can immediately transfer ideas and information to peoples' minds. Learning is the acquisition of facts, so that they can be recalled later. At the attitudinal level, the globalisation of information & communication media can create and shape peoples' opinions, beliefs and values. Attitudes can also be learned immediately. At the emotional level, the globalisation of information & communication media can make people feel the phenomena. They can trigger strong emotions, such as fear, rage and lust, but they can also evoke weaker emotions, such as sadness, peevishness and boredom. Besides, emotional reactions are generally related to physiological changes. At the physiological level, the globalisation of information & communication media can influence peoples' automatic physical systems which are usually beyond their conscious control. An example of this is irritation of the eyes when looking at dazzling objects. People cannot control the degree of glare of objects, but they can turn their eyes

to avoid irritation. At the behavioural level, globalisation of information & communication can trigger actions as well (*cf.* Potter 1998). Although the effect of globalisation on Health Information & Communication Systems (HICS) will have a less obvious effect on individuals in terms of cognitive, attitudinal, emotional, behavioural and physiological levels., these effects can vary from one individual to another, since the differences are strongly affected by the background of each individual, such as their level of knowledge and degree of experience.

1.2 Plural Health Information & Communication Systems (PHICS)

1.2.1 The Concept of a Health Information & Communication System (HICS)

The basis of Health Information & Communication (HIC) is found in the different information and exchange systems of the society which refer to: *'any system which captures, stores, manages or transmits information related to the health and disease concerning individuals, organisations and institutions which work within the health sector'* (*cf.* O'Carrol *et al*. 2011). As such, a system from the *providers' side* is mainly focused on modern health information and communication, processed in highly sophisticated computers and data sets with the aim of improving the organisation, and as such the health of its patients, while the systems on the *consumers' side* include information on both traditional and modern health information, often manifest in a pluralistic configuration of knowledge, beliefs and practices. Embarking on the multiple discourse approach to health communication in three spheres of influence, i.e. societal discourse, expert discourse, and lay discourse, introduced by Parrott (2004), this study focuses mainly on the domain of the lay discourse concerning the health information and communication among local participants in terms of the understanding and utilisation of indigenous knowledge sources and experiential information regarding health and disease at the community level, derived from cultural, social and individual experience which guides and adapts the community health and illness behaviour of the local people.

While much facility-based research has been conducted on the formal health information systems in modern health care organisations from the providers' perspective, this community-based study focuses on the different traditional and modern health information systems from the consumers' perspective being operational among the local people at the community level in the research area of Sukamiskin. By consequence, 'health information and communication' is conceptualised as encompassing a personal perspective of the community members: '*information or an opinion about the health or a disability of an individual; or an individual's expressed wishes about the future provision of health care to him or her'* (*cf.* ALRC 2008).

Since Health Information & Communication (HIC) is part of a continuum of accumulation of information and its implementation in the dissemination & communication process, the concept of *Health Information & Communication Systems* (HICS) has recently been developed to underscore the structured form of a system in which dynamics of information accumulation & communication among people for health improvement are operational. Particularly in the newly-developing countries, such HICS are found in the *Plural Health Information & Communication System* (PHICS), encompassing two major components of the Traditional Health Information & Communication Systems (THICS) and the Modern Health Information & Communication Systems (MHICS) (*cf.* Slikkerveer 2012).Indeed, the accumulation, collection, storage, exchange and dissemination of Health Information & Communication Systems (HICS) from the local population's point of view is not restricted to one medical system, but includes information derived from the related different traditional and modern medical systems. Since they are part of the plural medical configuration in the area, they provoke the advanced study of the related

factors influencing the utilisation of the co-existing and interacting Traditional and Modern Health Information & Communication Systems (T&MHICS).

As mentioned above, so far most Health Information & Communication Systems (HICS) have been studied from a health care provider's point of view, often at the national level, and as such have concentrated on the improvement of the delivery of modern health care, predominantly in health centres and hospitals. However, since the Traditional Health Information & Communication Systems (THICS) are widespread, culturally bound and crucial in local decision-making for the help-seeking process of clients and patients, the next Paragraph will focus on the position of the Traditional Health Information & Communication Systems (THICS) in Indonesia.

An additional aspect in the development of the Traditional Health Information & Communication Systems (THICS) is the digital documentation of sources of evidence-based medical cases, bibliographic references, and comparative databases, all relevant to evidence-based practices. According to Bakken (2001), the challenge for practitioners is to use these sources of evidence in combination with their experience and expertise to make clinical decisions. As the medical-evidence base continues to expand rapidly and more modern-trained physicians and nurses tend to accept the validity of traditional practices for diagnosis and treatment, there is a growing interest in integrating such expanding digital sources of evidence emerging from Traditional Health Information & Communication Systems (THICS) into an integrated health care system.

1.2.2 Traditional Health Information & Communication Systems (THICS)

In Indonesia, the practice of traditional medicine is widespread; this medical traditional knowledge and experience have been transmitted over many generations though both oral and written communication among the different population groups. The supporting Traditional Health Information & Communication System (THICS) refers to a structured form of indigenous medical knowledge, beliefs and practices which is openly shared not only among families and community members, but also communicated by *dukun* ('traditional healers') and *peraji* ('traditional birth attendants') throughout the rural communities. In addition to the exchange of information and knowledge of preparing *jamu* ('herbal home remedies') and the prevention of largely common illnesses, various forms of treatment of illnesses are also part of THICS.

The useful combination of health information and health communication in a Health Information & Communication System (HICS) encompasses a contribution from various disciplines, providing it with a multidisciplinary orientation. In this context, there are many interesting health-related aspects of the traditional knowledge society. While approximately 80% of modern medicine in Indonesia – as elsewhere around the globe – has originated from the indigenous knowledge and practices of Medicinal, Aromatic and Cosmetic (MAC) Plants of traditional healers over many generations, a large number of people continue to utilise some form of traditional medicine for their primary care needs which is often locally available and at a lower price. In Indonesia, a large segment of the population also still uses the services of traditional functionaries, including the *paraji* ('traditional birth attendant'), the *balian* ('midwife'), the *dukun* ('traditional healer'), and the *shaman* ('magician'). In recent years, indigenous medical knowledge systems have been documented, studied and analysed in many countries and regions, and have shown not only to be rather functional, but also successfully integrated into the sustainable development of plural medical systems throughout the world (*cf.* Slikkerveer& Slikkerveer 1995, 2012; Ambaretnani 2013).

As indicated above, in most societies there exists a pluralistic configuration of co-existing Traditional and Modern Health Information & Communication Systems (HICS). Traditional Health Information & Communication Systems (THICS) are closely related to the traditional medical system and refer to a system of information and communication generally embedded in the local culture, where health-related information largely in the field of traditional medicine is disseminated among the local people over many generations by non-electronic devices, by traditional means of language, music and poetry, largely through the oral tradition. The oral transmission from generation to generation is identified by WHO (1999) as the typical characteristic of Traditional Medicine (TM) in various countries. It is linked to the fact that Traditional Medicine must be understood as a cultural manifestation of the local people which has been functioning over many generations.

According to the WHO (2000), Traditional Medicine is: '*the sum total of the knowledge, skills and practices constructed on 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.*' Other references to Traditional Medicine include 'indigenous medicine', 'ethnomedicine', 'folkmedicine' and 'native medicine' (*cf.* Good & Kimani 1980; Slikkerveer 1995). Different traditional medical systems are found in most societies worldwide, where they continue to be the primary source of health care of the larger part of the population. The relevance of Traditional Medicine for the development of Modern Medicine (MM) is that a large number of modern medicines have evolved from the traditional medical knowledge and practices used in many societies.

Human health and well-being are influenced worldwide by complex interactions between economic, socio-cultural and political factors as well as by behavioural patterns and the application of technology (*cf.* Wilkinson 1996). Traditional medical treatment has also contributed numerous benefits to raising the local economy. Initially, oral communication has been used in the spread of information about traditional medical treatment. Due to the development of the media and communications technology, however, traditional health information is now being documented rather well, rendering it possible to be disseminated through the mass media, while a wide range of books have been published which also document the benefits of traditional medical knowledge and practices. The purpose of these studies is to properly disseminate such important knowledge and information, which has existed in numerous societies for many centuries (*cf.* Warren 1982; Slikkerveer 1995; Slikkerveer & Slikkerveer 1996; Leslie 1976; WHO 1999; Slikkerveer & Quah 2003; Ambaretnani 2012; Chirangi 2013).

These traditional media are presently still in use in the local communities, spreading health information through local networks. There are several factors to be considered in the utilisation of Traditional Health Information & Communication Systems (THICS) through the local media for this purpose: (a) the background knowledge and experience of the information seekers;
b) the moral conveyance as one of the main aspects of traditional communication; (c) the myths and folklores which contain the important elements of the life of human beings, such as illness and death; and (d) the information about the local history of the community which documents how ancestors have been living and how they strengthened their solidarity *(cf.* Gräf 2007).

Furthermore, the dissemination of health information in traditional societies typically uses a two-step flow of communication channels, meaning that the first step involves communication with community elders, traditional healers, traditional midwives and religious leaders as important opinion leaders, who as a second step transfer the information to their fellow community members on whom they have a strong influence. This is then followed by the medical officers. For example, for the promotion of certain modern medicines or the introduction of government health programmes, such leading community members can be approached and

functionalised by the government, as most of the local people tend to trust these opinion leaders concerning the provision of particular information to the communities.

In general, health information is disseminated to local communities through personal communication and the oral tradition which have usually shown to be most effective and efficient. Moreover, the local cultures have played an important role in raising experienced community members who feel responsible for the many aspects of health and healing in the community. In this way, *pamali* ('taboos') are well-known in Indonesia as a form of local, setting-specific restrictions on the behaviour of community members as a form of preventive measure against certain diseases. It consists of various rules concerning the avoidance of risky behaviour, such as in digestion, where it is forbidden for someone to eat too fast because it can cause flatulence, or to take a shower for too long a period of time, which is regarded as the cause of catching a cold. The type of communication delivered from parents to children or young people is rather persuasive, encouraging them to act on the basis of accepted community norms and values in order to avoid a negative impact on health. The Sundanese language is used for the explanation of *pamali* ('taboos'), generally understood by all Sundanese people. In this way, disease prevention can be achieved and the health of the society can be maintained and enhanced through local communication on *pamali* ('taboos').

Similar forms of Traditional Health Information & Communication Systems (THICS) are observed in the spread of the knowledge concerning the effective utilisation of traditional medical treatment and medicines, particularly with regard to Medicinal, Aromatic and Cosmetic (MAC) plants, both in the form of *jamu* ('plant-based home remedies') and as medicines provided by *dukun* ('traditional healers') (*cf.* Djen Amar 2010).

1.2.3 Modern Health Information & Communication Systems (MHICS)

Modern Health Information & Communication Systems (MHICS) which were introduced as the pillars of Western cosmopolitan medicine towards the end of the colonial period of time, encompass a structured form of modern medical knowledge, beliefs and practices shared by both the general public as well as by medical experts, and as such communicated by Western-trained physicians, nurses and medical assistants working in public and private organisations of the health sector.

According to Sparks (2007), modernity is not essentially harboured in a set of techniques or knowledge, but in '*a state of mind, a psychological disposition and an inner readiness which made the modern human open-minded to innovation and change'*. In line with such perspectives, Modern Health Information & Communication Systems (MHICS) are closely related to the modern medical system and have penetrated into various forms of media because of the recent influx and development of MHICS. The networks of MHICS tend to change and promote modern medicine and health care in two ways: e-medicine using the Internet to improve and to modify conventional forms of diagnosis, therapy and quality control; and biomedical research using competent networks in medicine. Eysenbach introduced one of the MHICS using electronic channels, called 'e-health' (*cf.* Martin 2004). The WHO (2005: 121) defines e-health as: *'... The cost-effective and secure use of information & communication technologies in support of the health and health-related fields including healthcare, health surveillance and health education, knowledge and research'*. It goes without saying that the operation system of e-health is inseparable from the support of the information technology, namely the Internet and computers as well as a wide range of related technologies. The main characteristic is not only limited to the development of technology, but also involves the obligation to engage in information & communication networks, a way of thinking, an attitude and a commitment for

networking and global thinking, in order to improve health locally, regionally and worldwide by using the Health Information & Communication Systems (HICS). The three main criteria to provide an efficient e-health system are that it is: easy to use, entertaining and exciting. Through e-health which uses the Internet, it is very easy to provide information and advice on health to the community, largely because of the fact that the language used is made easy to understand. Supported by the process of globalisation, the objectives of e-health generally focus on enhancing its credibility, namely:

- to optimise the efficiency and efficacy of health care delivery: traditional health care should be integrated into modern health care, enhanced by information technology and focused on policy barriers to e-health;
- to ensure safety and efficacy of health care and to create systems which enhance adherence to treatment and reduce costs;
- to make care accessible, *i.e.* to enhance transparency and accountability, to implement appropriate business models for e-health and to develop appropriate indicators in order to assess process, maturity, productivity and outcomes; and
- to implement evidence-based e-health interventions by means of developing international collaboration in order to evaluate the impacts of such interventions and by generating indicators to guide investment.
  (*cf.* Gremert-Pijnen 2011)

The facility of communicating through the WEB 2.0-based Internet has also created a space for two-way communication in modern medicine between patients and doctors. Various web pages of consultation are now provided in websites, for example for the reproduction of health consultation on beauty matters. This rubric provides space for patients to make complaints and ask questions about modern health care. It is a new trend in the field of modern medicine, where doctors answer questions which often contain suggestions on preventive measures, so that the patient's illness will not continue or get worse.

However, in the case of serious indications, physicians usually refer patients to consult personally with a health centre or a doctor. Various information pages available on the website are certainly readable and provide new knowledge to the reader in relation to the individual condition which is experienced by the patient. It is also more effective, as in the case of similar problems, that doctors do not need to explain the problem of symptoms and prevention techniques repeatedly in more detail. In addition, the presence of a website which provides space for interactive communication on modern medicine between doctors and their patients can educate people in health matters and constitutes a new form of communication in the field of modern medicine.

In addition, recent new applications have also been developed on smartphones which can be used as Modern Health Information & Communication Systems (MHICS). A user of a smartphone can also use an application for health promotion to count for instance the number of calories burned during exercise, and there are now various health calculators which are able to count the calories needed by the body by adjusting the weight and activities that are being carried out.

As in the case of the Traditional Health Information & Communication Systems (THICS), this study is focused on the documentation and analysis of the factors influencing the utilisation of the Modern Health Information & Communication Systems (MHICS) from the consumers' perspective of local people, clients, patients and their families at the community level.

1.3 Utilisation of Plural Health Information & Communication Systems (PHICS)

1.3.1 The Ethnoscience Perspective on Health Information Utilisation

Public Health is the general discipline encompassing all organised public and private activities to prevent disease, promote health, and treat disease of the population. The collection, documentation and utilisation of health- and disease-related information have been identified as rather important activities among the general public as the basis for the improvement of the health of the people. Since utilisation by the local people of health information in the form of different, albeit closely related Health Information & Communication Systems (HICS) is focused on the above-mentioned consumers' perspective, the utilisation of information within the context of health and disease has recently also emerged as an essential component of nursing practices and modern health care systems, in which the delivery of evidence-based care, policy development and advocacy by nurses can make a strong contribution to the health of the population (*cf.* Sigma Theta Tau 2004) [1].

Generally, the utilisation of health information systems is assessed in a facility-based approach, such as in a hospital, health centre or health station by measuring the use by the health personnel involved in modern health information for decision-making in order to take immediate action including feedback from supervisors, calculation of area coverage and preparation of maps, presentation of key indicators with charts or tables and the presentation of achievements of targets *(cf.* Abajebel *et al*. 2011).

In contrast, the community-based approach to utilisation implemented in this study describes and analyses the influence of interpersonal communication among patients and clients and their families through the utilisation of, on the one hand, the traditional, and on the other hand, the modern health information provided by family members, lay health advisors, traditional healers, as well as doctors, nurses and midwives, who are highly respected in their communities. Such influence is often reflected in the local decision-making process following the consultation of the illness management groups in the community. In view of the fact that according to two studies by WHO (2002a; 2002b) the utilisation of Traditional Medicine (TM) and Complementary and Alternative Medicine (CAM) is increasing throughout the world, and that in low- and middle-income countries, up to 80% of the population tend to rely on Traditional Medicine (TM) for their primary health care needs, the utilisation of related Traditional Health Information & Communication Systems (THICS) is likely to show a similarly high proportion among the local people. By consequence, the assessment of the utilisation behaviour of the Plural Traditional Health Information & Communication Systems (PHICS) by the community members should include a comparative approach towards the analysis of factors influencing the utilisation of THICS, and the utilisation of the Modern Health Information & Communication Systems (MHICS), together forming the main components of the overall Plural Health Information & Communication System (PHICS) at the community level.

Local community Health Information & Communication efforts include the encouragement and maintenance of social norms and cultural values and institutions, which have shown to reduce illness and enhance the health of the community over many generations. An important part of the Traditional Health Information & Communication Systems (THICS) at the community level is the provision of social support by the community members for the patients and clients' physical and mental well-being. It is clear that in these community-based THICS, social support and kinship relations are manifest in the related socio-cultural factors of group membership, ethnicity, age, language, way of life and life style.

In order to study and understand such complicated local systems, a special research methodology is needed. To this end, a specific *ethnoscience* methodology has been selected for the research in Sukamislin, known as the *Leiden Ethnosystems Approach*, specifically designed for community-based research of indigenous knowledge, beliefs and practices. The approach is grounded in the new field of study of ethnoscience, and encompasses three major principles, *i.e.* the Historical Dimension (HD), the Participants View (PV) and the Field of Ethnological Study (FES) (*cf.* Slikkerveer 1990). Both the selected research methodology and the analytical model elaborate on the specific ethnoscience-based research methods and techniques used for data collection and analysis in both the qualitative and quantitative parts of the study.

Meanwhile, a new concept has been developed at the community level representing the government-supported modern medical system, known as 'Effective Health Information & Communication'. The concept is mainly used by the government to influence modern community health development programmes and projects, aimed at engendering positive changes in the health and illness behaviour of the community members. In addition, the community-based Health Information & Communication Systems (HICS) also seek to change the socio-economic and natural environment and improve the delivery of formal health care services.

The elaboration of the related concept of 'Community-Based Health Information Systems' (CBHIS), however, is primarily focussed on the development of the modern health care system in terms of the improvement of the quality of the health manpower, capable to collect, analyse, and take decisions on the basis of collected data. The system generally consists of a computerised data set on statistical information on births, deaths, diseases, programmes and health care services provided in a particular region, often at the level of the Provincial and District Health Offices. So far, however, important data on traditional medical systems, functionaries and local treatment are often absent in these Health Information Systems (HIS).

An interesting example of a modern 'Community-Based Health Information System' (CBHIS) in Indonesia is provided by the Report on Community-based Health Information Systems by Tanoe *et al* (2003) in the region of the Landak Child Survival Project of West Kalimantan. While the related CBHIS Workshop largely follows the design and implementation of a modern health information system, promoted by Lippevel, Sauerborn & Bodart C (2000), it shows the lack of empirical data on the utilisation of Traditional Health Information & Communication Systems (THICS) by the majority of the population in the area. Following the objectives of the Workshop in raising the attention of the health staff of the District Health Office about the importance of the data collected, advocating for both the implementation of a better Health Information System (HIS) at the level of the District Health Office, and for the integration of Community Based Death and Diseases Surveillance (CBDDS) into the formal Health Information System (HIS) in West Kalimantan at the level of the Provincial and District Health Offices, as well as improving the District Health Officers' capability to summarize and present collected data at the district government levels, this all reflects strengthening the modern medical system without paying attention to the role and possible integration of traditional healers and birth attendants and their useful Traditional Health Information & Communication Systems (THICS) (*cf.* Tanoe *et al.* 2003).

As mentioned above, the study of the utilisation of Plural Health Information & communication Systems (PHICS) by the local population through the documentation, analysis and explanation of significant factors influencing the utilisation behaviour of both the Traditional and Modern Health Information & Communication Systems (T&MHICS) is important to health information problem-solving as it could identify and locate the inadequacy of appropriate information on how to prevent disease, promote health or treat illness, while it could at the same

time highlight the existence of functional Traditional and Modern Health Information & Communication Systems (T&MHICS) at the community level. In this context, the concept of 'meaningful use' of health information has been introduced to refer specifically to the utilisation of modern health information technology. The term refers to a broad concept which includes a range of technologies to store, share, and analyse formal health information with a view to providing additional health services to clients and patients. Especially in developed countries, health care providers are using Health Information Technology (HIT) to improve the quality of modern patient care in formal health institutions.

In the American modern health care system, the phrase 'meaningful utilisers' refers specifically to people who qualify to receive funds under the *Medicare and Medicaid Electronic Health Records Incentive Programmes* provided by the 'American Recovery and Reinvestment Act' of 2009. According to Daniel (2011), the funding is largely made available to health care providers who have adopted the system of electronic health records which they use to improve both the health of the patients and to increase the efficiency of the modern health care system. Although this particular form of Health Information Technology (HIT) is generally referring to primary health care providers, the utilisation of Health Information Technology (HIT) by individuals has recently also been operationalised for individuals – clients and patients – who have begun to better communicate with family members, nurses and doctors in order to learn and exchange not only modern, but also traditional information about health and disease, and undertake actions to improve their health and well-being.

The significance for individual clients and patients includes several health benefits, such as raising the awareness of health risks, providing the motivation to reduce those health risks, finding appropriate solutions and consulting with other patients who are experiencing similar health problems. In this context, Cline (2003) argues for shifting the focus of interpersonal communication about health and disease from formal to informal contexts: *'… everyday talk highlights a rich and untapped dimension of communication that could contribute to reducing disparities'*. The elimination of these health disparities in terms of inequalities between health outcomes of populations or groups as the result of the impact of different socio-demographic, economic and cultural determinants has become the strategy of several national public health programmes seeking the provision of health care for all members of the society. In such programmes, health communication strategies are implemented by experts to realise not only individual, but also community health care programmes and policies with a focus on equity in health care delivery services.

With the development of digital information technology, where computer-based media have extended the information and services of interest to the people, new interactive forms include the possibility to respond to information and exchange messages within the wider networks of the Internet. In this way, new opportunities have been created for health information & communication to extend beyond the inner circles of households and communities in order to engage into cross-boundary and cross-cultural communication on health and illness. Closely related to the emergence of the new interactive forms of Health Information & Communication (HIC) is the development of the interpersonal communication theory which seeks to further understand the interaction between providers and clients, also known as doctor-patient relations and interactions. Such a theory is particularly interested in the study and understanding of the way in which interpersonal relationships are influencing peoples' decision-making and their health and illness behaviour.

1.3.2 *Reformasi*: The Era of Extension of Public Information in Indonesia

Following Indonesia's accession to the information superhighway of the Internet in 1996, the new era of the *Reformasi* ('Reformation') had begun in 1998, with the fall of President Soeharto, with special attention for the freedom of the press [2].

Then, the government changed its policy on publicity, rendering it easy to publish newspapers, journals and other forms of printed media. This change in government policy had a strong effect on the development of various media industries in the country, ranging from newspapers, magazines, tabloids and books. While under the former *Order Baru* ('New Order'), many media had their operational license revoked because they were considered critical to the regime in power at the time, under *Reformasi* ('Reformation'), they regained their freedom in extending unrestricted information to the public. The data of the printed media, released by the *Aliansi Jurnalis Independen* (*AJI*) ('Independent Journalists Alliance'), indicate that in 1997 the number of newspapers increased from 79 to 299, magazines from 144 to 491 and tabloids from 88 to 886 (*cf.* AJI 2001). Thus, the Indonesia *Reformasi* ('Reformation') of 1998 became a turning point in the development in various areas of broadcasting, printing and online media. The number of various media outlets continuously increased until it reached 12 media groups which are run by large private companies, *i.e. MNC group, Kompas Gramedia Group, Elang Mahkota Teknologi, Visi Media Asia, Jawa Pos Group, Mahaka Medika, CT Group, Beritasatu Media Holdings, Media Group, MRA Media, Femina Group and Tempo Inti Media* (*cf.* Nugroho & Syarief 2012).

With the further development of the printed media, a great variety of books were published in the field of politics, literature, defense, security and health. During the previous regime of the *Order Baru* ('New Order'), many books which were considered disruptive or threatening to the government administration had to be withdrawn from the society as 'banned books'. Presently, however, publishers are entitled to issue publications in book form, albeit under the provision that the content of the publication is free from ethnicity, religion, race and group interests (*suku, agama, ras dan antar golongan, SARA*). Furthermore, the development of the publishing industry is also significant as publishers are not only found in big cities, such as Jakarta, Bandung and Yogyakarta, but also in the small towns in and beyond the island of Java. The same process has evolved with the publishing of posters and billboards and the production of other forms of printed media. Hence, the advertising industry in Indonesia emerged and has been growing rapidly since the late 1990s, giving a new colour to the visual communication systems.

Meanwhile, the development of television as mass broadcast media has had quite a long history in Indonesia. In the 1950s, television started to replace the radio as a new medium in the world of mass communication which at that time was still using the 'Community Antenna Television' (CATV). Subsequently, in the 1960s, television broadcasting finally developed additional channels and from the 2000s onwards, digital television was introduced which changed the analogue system, rendering it possible to combine the Digital Video Player (DVD) and the Video Compact Disc (VCD). Later, from 2010 onwards, television programmes could be received with streaming technology via cell phones and tablet computers with Internet support (*cf.* Gross 2013).

Although according to Arifin (2011) television has been present in Indonesia since 1962, prior to 1998 there were only two television stations broadcasting in Indonesia: *Televisi Republik Indonesia* (*TVRI*) and *Televisi Pendidikan Indonesia* (*TPI*), although the television programmes were still limited to black and white [3 & 4]. According to the *Aliansi Jurnalis Independen* (2001), the broadcasting media increased and 200 new radio and 5 new television licences have been issued so far. However, the press has become increasingly commercial by becoming a

rather business-oriented than social institution, since the media owners are formed by conglomerates. A range of actual information is presented to the viewers through various programmes. The function of private television in Indonesia is not only to entertain like the mass media, but also to operate in accordance with the function of state television. In addition, the mass media are sometimes also used as a tool to incite revolution - stipulated in the Law of the Press of 1966 - with a national direction and as a tool for national development (*cf.* Law Press 1982).

Presently, the focus of communications systems in Indonesia is on freedom of information, while the freedom of receiving information in Indonesia is regulated by Law Number 14 of 2008. Both freedom of speech and freedom of the press in the society are the main pillars of the communications system in Indonesia.

The mass media in Indonesia also have an ideological function in the process of democratisation which combines politics with economic democracy. Besides, political communication in the country functions as a linkage between the provision of information, education and entertainment as well as pursuing social control overseeing incumbents (*cf.* Arifin 2011). As a convergence medium, the Internet has brought about several changes to the communication systems in Indonesia. Additionally, many people are attracted to the use of the Internet on a personal level since the 1990s. The rapid development of the Internet in Indonesia was documented by the *Asosiasi Penyelenggara Jasa Internet Indonesia* (APJII) ('Indonesian Internet Service Provider Association') in 2004 as follows: in 1996 there have been only 31.000 subscribers and 110.000 users after 8 years, while in 2007 there have been 2.000.000 subscribers and 25.000.000 users. Later in 2012, the number of Twitter users in Indonesia exceeded 19,5 million, while the number of blogs was more than 5,3 million, with as many as 42,5 million Facebook users. Presently, Indonesia is one of the largest users of social media in the world, such as Twitter and Facebook (*cf.* Nugroho & Syarief 2012). Consequently, the development which emerged from the presence of the Internet has also affected other media, *i.e* telephone, television, radio, as well as the press and journalism. Currently, the telephone can be used for communication by using the Internet, while the video call also uses applications, such as Skype, WeChat, Line and many other applications. Technology enables people to communicate easily face-to-face through the media. Besides, television and radio broadcasts can be obtained by streaming and playback technology via the Internet, so that people who do not have the time to listen to the actual broadcast are able to hear them at a later time. Newspapers have also been improved as a new media phenomenon called the 'e-paper'. Subsequently, newspapers and magazines have gone online by using cell phones and smartphones and can be accessed with Internet support.

Social media, such as Facebook, Twitter, Line, Blackberry Messenger, WeChat, Google+, Path, Instagram and other media, have connected people to each other in different parts of the world. In addition, the trend in communication using social media has provided a new dimension to the development of communication and sharing of information to a large number of people. Information concerning people can be tracked down easily through social media accounts, ranging from events to pictures of activities. Thus, social media can be considered as a medium which transforms the limitation of the personal space or area into the public area, although social media users have to be familiar with the rules concerning privacy in communication. According to the Internet Research Centre Indonesia (IIRC), Internet users can be divided into three categories:

1 existing users: active users of several services including email, web surfing and e-commerce;
2 perspective users: users who are not using the Internet but who have the potential to use it in the future (students, employees);
3 users who do not fit into the two categories mentioned above because of certain factors, such as their level of education, type of work or economic status.
(*cf.* Setyadi 2005)

Online games supported by information technology have transformed the appearance of traditional games, such as *Mahjong* and *Congklak,* and other forms can presently be found in digital form or online. Such transformations show that communication technology has brought about changes in many areas of life, such as in online stores, online medical consultations and with various guides which can be viewed online by the public.

In the meantime, the library as a source of information and a place which has become the estuary of information as part of the communications system has developed from human activities over a large distance. As Stuart (2004: 210) states: '*Libraries could not exist without people*'. At first, library activities were limited to the collection, storage, service and preservation of collections of printed and recorded information, such as monographs, magazines, newspapers and reference books. The tracking information system was limited to using the catalogue card [5]. Along with the development of the Information & Communication Technology (ICT), the library continues to evolve from a traditional library containing a collection of monographs and manually-tracked information to what is currently called a *Digital Library* with the concept of *'a library without walls'* [6].

Furthermore, digital libraries and library automation are innovations in the field of library science, since initially the concept of a library was limited to a physical building containing a collection. Later on, this concept shifted, so that current libraries and their information can be accessed anywhere. Users can also interact with the librarian through the support of the 'Web-based Media 2.0', also known as 'Library 2.0'. However, nowadays information retrieval can be easily executed through a search box on the Internet to retrieve any kind of information. The integrated database in the system of 'Library 3.0' shows quite a significant development of the library. It facilitates information retrieval by using the main catalogue ('union catalogue') integrated throughout the library system. Thus, if someone needs specific information, the user does not have to come personally to the library to look directly for the required information.

In other words, the library as an important source of information has become an integral part of the society. Moreover, a shift occurs in the role of Information & Communication Technology (ICT). At first, ICT was only a representation of information for decision makers, but currently, with the presence of the Internet, it has also become the deciding factor in business activities (*cf.* Applegate 2001). The proper use of ICT will certainly have a positive impact on the acquisition of quality information to drive innovation and improve performance in development from the Agriculture Society through the Industry Society and Information Society to the Knowledge Society (*cf.* Setyadi 2005). As each new era needs new literacy skills, the current entry into the era of information requires a sound preparation for the rapid advances in Information & Communication Technology (ICT).

1.3.3 The Development of Information & Communication in Indonesia

The *World Summit on the Information Society* (2003) declares the common desire and commitment to build a people-centred, inclusive and development-oriented information society,

where everyone can create, access, utilise and share information and knowledge, enabling individuals, communities and societies to achieve their full potential in promoting their sustainable development and improving their quality of life, premised on the purposes and principles of the *Charter of the United Nations* (1945), respecting fully and upholding the *Universal Declaration of Human Rights* (1948). Feather (1994: 154) states that: '*the information society is a product of the use of computers and other electronic and audiovisual media*'.

The *Declaration of Information Society* (2003) provides this opportunity to realise development on the basis of the U.N. Millennium Development Goals (2005), recently succeeded by the U.N. Sustainble Development Goals of the Post 2015 Agenda (2015). The new focus is put on the eradication of extreme poverty and hunger, the achievement of universal primary education, the reduction of child mortality, combating HIV/AIDS, malaria and other diseases and the improvement of maternal health.

An essential foundation of the 'Information Society' as outlined in Article 19 of the *Universal Declaration of Human Rights* (1948) is the statement that everyone has the right to freedom of opinion and expression, and that this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media, regardless of frontiers. This statement supports communication as a fundamental social process, a basic human need and the foundation of all forms of social organisation. Everyone everywhere should have the opportunity to participate and no one should be excluded from the benefits which the *Information Society* offers (*cf.* International Telecommunication Union ITU 2003). The provisions of Article 29 of the *Universal Declaration of Human Rights* (1948) state that everyone has his/her own duty in the community, and also the freedom to develop him/herself and to build his/her own character, which underscores that every human deserves to get the same opportunity in life. However, in the implementation of their rights, all individuals should obey the laws with which the regulations and rules are comprehended as the guarantee of recognition and respect for the rights and freedoms of others, to meet morality requirements, public order, and global welfare in a particular democratic society.

Education, knowledge, information & communication are at the core of human progress, endeavour and well-being. Furthermore, Information & Communication Technologies (ICTs) have an immense impact on virtually all aspects of peoples' lives. The rapid progress of these technologies opens up completely new opportunities to attain higher levels of development. The capacity of these technologies to reduce many traditional obstacles, especially those of time and distance, makes it for the first time in history possible to use the potential of these technologies for the benefit of millions of people in all corners of the world (*cf.* ITU 2003). However, the traditional aspects of the indigenous cultures which could disappear as a result of the rapid development of technology should be given special attention, as the general responsibility is felt worldwide of how to maintain significant traditional systems of knowledge, beliefs, practices and values in each state as part of the rich cultural heritage of each country. In this way, technology has to contribute to the establishment and maintenance of those traditional systems as technology should be a tool to build and not to destroy.

According to the *World Summit on the Information Society* (ITU 2003), the key-principle of the *Declaration of the Information Society* is an information society for all, with regard to several aspects, which are classified as follows:

- the role of governments and all stakeholders in the promotion of ICTs for development;
- information & communication infrastructure as an essential foundation for an inclusive information society;
- access to information and knowledge;

- capacity building;
- building confidence and security in the use of ICTs;
- an enabling environment;
- ICT applications: benefits in all aspects of life;
- cultural diversity and identity, linguistic diversity and local content;
- media;
- ethical dimensions of the *Information Society*; and
- international and regional cooperation.
  (*cf.* ITU 2003)

Since technology has nearly become a basic need of people's daily life, where people need telephones, mobile-phones, television, computers, the Internet, and many other devices to enter into communication with other people, the recent technological transformation of information & communication is able to close the gap because it renders the dissemination of information and extends communication more easily and quickly. The advantages include such factors as acceleration of time for management, limited broadcasting and telecommunicating, as long as the network and energy of the technology products are available.

In order to realise the information society, intensive cooperation is required from many related elements established on shared knowledge. It means that all individuals should understand and share the public vision of the inclusive information society which incorporates the main principles as mentioned above. With the arrival of the new electronic era, the potential to realise the information society has been further opened. In the emerging information society, information and knowledge can be produced, exchanged, shared and communicated through all the networks of the world. Thus, every individual can take fast action on the basis of acquired knowledge, rendering it a strategic step forwards for the future.

As regards the implementation of the Information Society, the research carried out by the Asia Pasific Communication (APC 2013) shows a number of conditions which have to be taken into consideration. These conditions include: poverty eradication, gender justice, importance of youth, access to information and communication, access to health information, basic literacy, development of sustainable and community-based ICT solutions and conflict situations. Also, some of the rights which need to be implemented within the context of human rights are: media freedom, security, privacy and protection, the right to participate in public affairs, workers' rights, the rights of displaced people, the rights of indigenous peoples, women's rights, the rights of the child and the rights of persons with disabilities (*cf. Declaration of the Information Society* 2003). Other issues include the regulation and rule of law, language and cultural diversity, the public domain of global knowledge, copyright patents and trademarks, software and research. The enabling environment includes ethical dimensions, democratic and accountable governance, infrastructure and global governance of Information & Communication Technology (ICT) (*cf.* APC 2013).

The commitment to realise an 'Information Society' in Indonesia is held jointly by several parties, such as the Ministry of Education, the Ministry of Health, the Ministry of Social Affairs, the Ministry of Religion, the Ministry of Labour, the Ministry of Women's Empowerment and Empowerment of Disadvantaged and Rural Communities (*cf.* Soeprijanto 2005).

1.3.4 *Indonesia Sehat 2015:* Towards a Health Care Strategy

The strategy of 'Healthy Indonesia' was initially developed from the concept of 'Healthy Indonesia 2010' which was followed by 'Healthy Indonesia 2012' and continued with the

strategic plan of the Health Department (presently: the Ministry of Health of Indonesia) 2010-2014, and advanced to become the *Strategic Plan of the Ministry of Health 2015-2019.*
In order to advance the development of health programmes, several efforts should be made, such as promotional, preventive, curative and rehabilitative efforts which are reflected in the implementation of the health programme concerned. In order to support these efforts, availability of various data on the target population of the health development programme are needed (*cf.* Ministry of Health 2012). The administration of the government of the former President Dr. Susilo Bambang Yudhoyono launched a programme named *Indonesia Sehat* 2015 ('Healthy Indonesia 2015') as the leading vision of national health. The essence of this programme emphasised the importance of health not only as a human right and the investment of the nation's health, but also as a central point of national development. The vision, mission and objectives of this policy can be achieved properly, if they are supported by highly-qualified medical personnel and well-equipped facilities, and in particular by both Information & Communication Technology (ICT) and Integrated Medical Databases.

While Indonesia had jointly signed the UN Millenium Development Goals (MDGs 2000) as its commitment to achieving these goals to improve the situation of the population aroung the globe by 2015 in areas of poverty and hunger, health, gender, education, clean water, and the environment, it recently also undersigned the U.N. Post-2015 Agenda for Sustainable Development in order to eradicate poverty by 2030.

The health strategy of the government's policy is managed by the Ministry of Health. The National Health Care System (*SKN*) is a health development system held by all integrated sectors of Indonesia and is mutually supported in order to ensure the achievement of a public health level as high as possible. The Presidential Regulation No.72/2012, Article 6 on the National Health Care System formulates the goal of the '*Healthy Indonesia 2012*' programme as follows: '*Implementation of the National Health System (SKN) which emphasizes the improvement of the behaviour and community self-reliance, professionalism of human resources for health, as well as the promotive and preventive efforts without prejudice to curative and rehabilitative services'*.

Similarly, the government has legislated a policy which provides local and provincial governments and municipalities with a kind of regional autonomy to govern the affairs of their administrative budget in their respective regions. Some authorities, however, are still retained by the Central Government and have not been entrusted to the local authorities to be administered by themselves in the field of defence, monetary and fiscal policies, foreign affairs, law and religion. The vision and mission of the Government of the Republic of Indonesia will be achieved through the programme of *Indonesia Sehat* 2015 ('Healthy Indonesia 2015') and the policy of decentralisation, which particularly refers to the following three pillars:

1 the health paradigm;
2 strengthening health services; and
3 health insurance.

The three above-mentioned pillars have subsequently been used as the main pillars of the programme of *Indonesia Sehat* 2015 ('Healthy Indonesia 2015') of the Ministry of Health, and turned into the main goal of Indonesia's national health care system. The *Rencana Pembangunan Jangka Menengah Nasional* (RPJMN) ('Medium-term National Development Plan') in the field of health is based on the following six objectives:

1 to increase the health and nutritional status of mother and child;
2 to increase disease control;

3 to increase access to and quality of basic health services and referrals, particularly in remote, disadvantaged and border areas;
4 to increase the universal health care coverage through the Healthy Indonesia Card (*Kartu Indonesia Sehat*) and quality health management;
5 to fulfil the requirements for health personnel, medicines and vaccines; and
6 to increase the responsiveness of the health care system.

The Strategic Plan of the Ministry of Health 2015-2019 aims at increasing not only the health status of the community but also the responsiveness and the protection of the public against the risk of social and financial health problems, in which the different Health Information and Communication Systems (HICS) take a dominant position.

It is clear that in realising such ambitious objectives, the role of the Plural Health Information & Communication System (PHICS) in Indonesia is crucial, and as such deserves further documentation, analysis and understanding of its utilisation by the local people as a contribution to the health improvement of the population at the community level.

1.4 Aim and Objectives of the Study

1.4.1 General Aim and Specific Objectives

While the people of Indonesia have utilised Traditional Health Information & Communication Systems (THICS) over many generations, the Modern Health Information & Communication Systems (MHICS) were introduced during the colonial period of time, which lately experienced a major development as the result of the process of globalisation and the related advance of the Information & Communication Technology (ICT). Notwithstanding, Traditional Health Information & Communication Systems (THICS) have also benefitted from the globalisation process and the expansion of the media, where traditional medical knowedge and practices have found their way into the media through the process of 'development from the bottom'.

The resulting Plural Health Information & Communication System (PHICS) in the Sundanese region of West Java provides an interesting complex which needs further research in order to provide a basis for future health information & communication policies, focused on the improvement of the health of the population.

The general aim of this research is to document, study and analyse the utilisation of the Plural Health Information & Communication System (PHICS) by the local population of Sukamiskin in the Sunda Region of West Java through the identification, documentation, and analysis of significant factors influencing the related utilisation patterns, differentiated within, on the one hand, the Traditional Health Information & Communication Systems (THICS) and, on the other hand, the Modern Health Information & Communication Systems (MHICS) at the community level. In addition, the implications of the research findings are used as a basis for the development of an empirical model of integration of Traditional and Modern Health Information & Communication Systems (T&MHIC) as a planning tool for realising 'Information Society Indonesia' (2003) within the context of health in the near future.

In order to realise this general aim, a subdivision is made in a number of specific objectives to be achieved which are formulated as follows:

Firstly, to present the theoretical orientation of the new field of Health Information & Communication (HIC), placing special emphasis on Plural Health Information & Communication Systems (PHICS), including a description of the impact of globalisation on this system in Indonesia;

Secondly, to present the selected specific ethnoscience research methodology and the related appropriate analytical model and its components for the execution of the stepwise Bivariate, Mutual Relational, Multivariate and Multiple Regression Analysis of the collected quantitative data;

Thirdly, to present an overview of the research setting of the study encompassing the geography and historical background of the Republic of Indonesia, the Province of West Java, and the research area of Sukamiskin, located in Bandung, the Capital of the Province of West Java;

Fourthly, to describe the daily life in Sukamiskin: a presentation of data both available and collected among the people of the research population, *i.e.* the residents of the community of Sukamiskin, and the sample population, *i.e.* the selected household heads. In addition, a general description will be presented on the plural medical system, operational in Sukamiskin;

Fifthly, to describe the Traditional Health Information & Communication System (THICS) in the community of Sukamiskin;

Sixthly, to document the specific indigenous knowledge and classification of MAC plants used for *lalab* ('raw vegetables') and *ubar kampung* ('traditional Sundanese medicine') by the people of Sukamiskin as a major component of the Traditional Health Information & Communication System (THICS);

Seventhly, to describe the Modern Health Information & Communication System (MHICS) in the community of Sukamiskin;

Eighthly, to present the results of the stepwise bivariate, mutual relations, multivariate and multiple regression analyses of the quantitative data from the household surveys showing and explaining the differential relationship of significant factors in relation to the local peoples' utilisation of the Plural Health Information & Communications System (PHICS) in Sukamiskin, sub-divided in the Traditional and Modern Health Information & Communications System (THICS and MHICS) in Sukamiskin; and finally,

Ninthly, to present the conclusions and the theoretical and practical implications of the study, with special attention for the development of a strategic model of an Integrated Health Information & Communication System (IHICS) as a planning tool in order to provide a contribution to the improvement of the local people's level of health literacy, and as such to 'Information Society Indonesia' (2003) within the context of public health development in the near future.

1.4.2 Structure of the Study and Arrangement of the Dissertation

The structure and organisation of the chapters in this study is as follows:

Chapter 1 presents an introduction to the new field of Health Information & Communication (HIC), placing special emphasis on the Plural Health Information & Communication System (PHICS) in Sukamiskin, together with the recent policies on health information development in Indonesia;

Chapter 2 presents the theoretical orientation of the new field of Health Information & Communication (HIC), encompassing Plural Health Information & Communication Systems (PHICS), built on Traditional and Modern Health Information & Communication Systems (T&MHICS), and the need to document, study and analyse local peoples' utilisation behaviour of these distinct information systems from a community perspective;

Chapter 3 describes the selected research methodology and analytical model, and elaborates on the specific ethnoscience-based research methods and techniques used for data collection and analysis in both the qualitative and quantitative parts of the study;

Chapter 4 presents general information on the research area of Indonesia as a newly-developing country in South-East Asia, and the Sunda Region as a culture area in West Java, providing the background to the study;

Chapter 5 describes the profile of the daily life of the local people in Sukamiskin: the population, geography, the socio-demographic and economic structure and data on the plural medical system and the related Plural Health Information & Communication Systems (PHICS), documented from the household surveys;

Chapter 6 presents not only a description of the Traditional Health Information & Communication System (THICS) in Sukamiskin, but also the related indigenous knowledge and practice of Medicinal, Aromatic and Cosmetic (MAC) plants, used as a major expression of *lalab* ('raw vegetables') and *ubar kampung* ('traditional Sundanese medicine');

Chapter 7 provides a description of the Modern Health Information & Communication Systems (MHICS) in Sukamiskin;

Chapter 8 presents the results of the stepwise bivariate, mutual relations, multivariate and multiple regression analyses of the quantitative data from the household surveys showing and explaining the differential relationship of significant factors in relation to the local peoples' utilisation of the Plural Health Information & Communications System (PHICS) in Sukamiskin, sub-divided into the Traditional and Modern Health Information & Communications Systems (THICS and MHICS) in Sukamiskin; and finally,

Chapter 9 presents the conclusions and the theoretical and practical implications of the study, with special attention to the development of a strategic model of an Integrated Health Information & Communication System (IHICS) as a planning tool in order to provide a contribution to the improvement of the local people's level of health literacy, and as such to 'Information Society Indonesia' (2003) within the context of public health development in the near future.

Notes

[1] The study of Knowledge Utilisation (KU) refers to the use of various kinds of research knowledge, identified by Horsely, Crane & Bingle (1978) as an 'organisational process', particularly in nursing practices. The literature on nursing theory and practices documents several models describing the KU process, in which recently a need has emerged to increase evidence-based nursing practices to improve the quality of those practices (*cf.* Edgar *et al.* 2006).

[2] President Soeharto was the second president of the Republic of Indonesia. His administration is called the *Orde Baru* ('New Order').

[3] *TVRI* is the National Television of Indonesia which is managed and funded by the Government of Indonesia. *TVRI* was established on 24 August 1962 with the slogan '*Menjalin Persatuan dan Kesatuan, Saluran Pemersatu Bangsa*' meaning 'National Integrator Channel' or 'Establish Unity and Integration, National Unity Channel'. *TVRI* has stations in every province and region to broadcast programmes in the national range, therefore the area of information and news can be received by the entire nation.

[4] *TPI* stands for *Televisi Pendidikan Indonesia* ('Indonesian Education Television'). *TPI* was established on January 23rd 1991, but on October 20th, 2010 it was acquisitioned by *Media Nusantara Citra Televisi (MNCTV*).

[5] A catalogue card is a description of bibliographical material. There are three kinds of access points according to which the cards are recorded, namely the title of the collection, the author and the subject. The size of the catalogue card is 12 x 7.5 cm and is in accordance with the Anglo American Cataloguing Rules (AACR).

[6] The Digital Library is an online collection of digital objects of assured quality which are created or collected and managed according to internationally accepted principles for collection development and made accessible in a coherent and sustainable manner, supported by services necessary to allow users to retrieve and exploit the resources (*cf.* IFLA (2011).