# The implementation of intersectoral community approaches targeting childhood obesity

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# General introduction

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### *Childhood obesity*

Since the early seventies, the worldwide prevalence of childhood obesity has increased alarmingly (1,2). A child between the ages of 2-19 is said to be overweight if his Body Mass Index (BMI) is at or above the 85$^{th}$ percentile of the growth chart for children of the same age and gender, and from obesity if his BMI is at or above the 95$^{th}$ percentile (3). An estimated 14% of children in the Netherlands can be classified as overweight, whereas in the United States of America one in three children is overweight (4). Children who are overweight have an increased chance of developing physical problems such as diabetes type 2, high blood pressure, increased cholesterol levels and musculoskeletal disorders (5,6). Moreover, being an overweight child increases the likelihood of developing psychosocial problems such as a low self-esteem, feelings of depression, lower academic achievements and stigmatization by peers. If a child is overweight, the risk of becoming an overweight adult is high (7). Approximately 75% of obese adolescents will remain obese as an adult (8,9). Obesity in adulthood can have severe consequences such as cardiovascular diseases, metabolic syndrome, cancer and early mortality (10,11). The rising obesity trend has led to growing concerns about attributed health care costs; in the United States alone obesity accounts for an extra 315.8 billion US dollar in annual medical costs (12). The aetiology of child obesity is complex, involving dynamic interactions between nutritional intake, physical activity, genetic factors but also social and environmental factors (1, 13-18). For instance, the combination of living in an obesogenic environment or community and being exposed to a parenting style encouraging a sedentary lifestyle and high calorie diet could lead to childhood obesity in a specific child, whereas the obesogenic environment alone would not (17).

### *An adequate intervention to tackle childhood obesity*

As a result of the alarming childhood obesity prevalence and related burden of disease and costs, the quest to develop an adequate intervention to prevent and reduce childhood obesity has intensified in the last decade (19-22). It is argued that to successfully prevent childhood obesity over time, an intervention should be built upon existing community resources and take into account the multifactorial aetiology of childhood obesity (23). Based on this rationale, several Intersectoral Community Approaches to target Childhood Obesity (IACOs) were developed worldwide (24). An IACO aims to address a diverse pallet of childhood obesity determinants via (intersectoral) activities performed by community partners operating at different levels (such as policy officials, project managers, health professionals, teachers). The goal is to create a nonobesogenic environment in which a child is less likely to become obese (25,26). One of the most successful IACOs to date is The

French 'Ensemble Prevenons l'Obesité Des Enfants' (EPODE) program (27-29). EPODE started as a nutritional intervention program at schools in two small towns, Fleurbaix and Laventie. After the approach was found to be successful in the schools, community stakeholders and the local mayor became enthusiastic about the program. The program was then further developed into a community-based approach, targeting both physical activity and nutrition in multiple sectors (figure 1). The resulting EPODE community program is based on four central pillars; namely the presence of political and organizational commitment, collaboration between public and private organizations, use of social marketing, and support of scientific evaluation. Favourable results in the EPODE pilot towns (30) led to the development of several EPODE-derived IACOs in over 40 countries (27,28), and the establishment of an international network for the management of EPODE-derived IACOs (31). In the Netherlands, the EPODE-derived JOGG approach (an acronym for Youth On a Healthy Weight, in Dutch) was developed. JOGG follows the four EPODE pillars, but also adds a fifth pillar to meet the needs of the Dutch health care system; the reinforcement of linkages between preventive and curative health care (32).

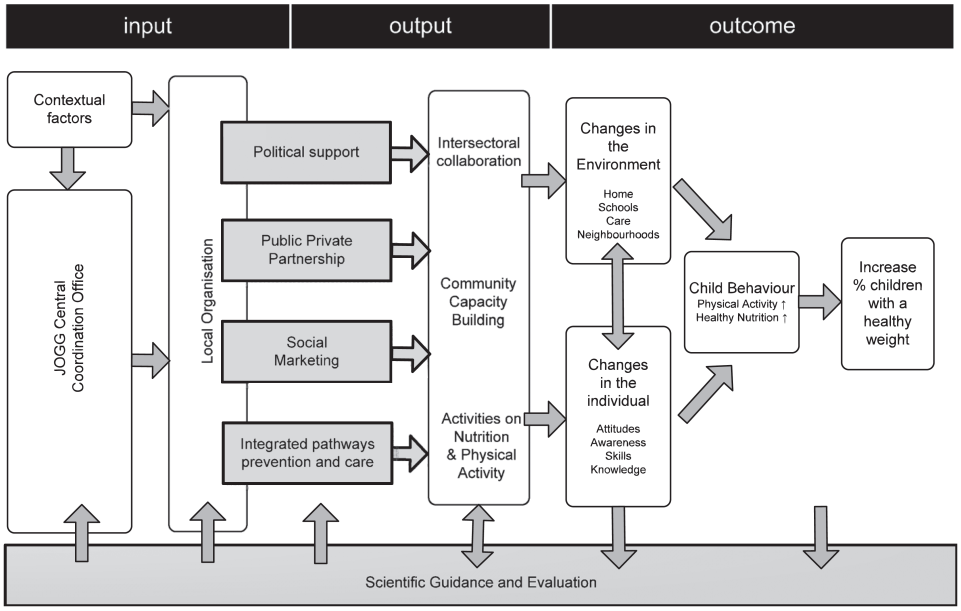


**Figure 1.** EPODE-derived JOGG program methodology

***The translation of an IACO into practice***

However, results of IACOs on behavioural and health outcomes in children vary greatly, and the intended outcomes have mostly been small and short term (33,34). One possible explanation for this lack of effectiveness is the translational gap often reported between the IACO as described by its developers and the IACO as executed in practice. Translation of a program into practice is a complex process, which was extensively described by Rogers (35) when he introduced his theory on the 'diffusion of innovations'. Rogers demarcated four essential stages; the process of innovation starts with the phase of dissemination (spreading knowledge and awareness about the innovation), followed by adoption (the formation of attitudes and intentions towards using the innovation), implementation (putting the innovation into practice) and continuation (continuing with using the innovation).

If somewhere along this process the translation of the program into practice fails, this can lead to a decreased exposure of the target population to (critical parts of) the program (36-38). This, in turn, can cause a decline in or even absence of intervention effect. If only intervention effect and not the diffusion process itself is evaluated, a failure in translation can even lead to the unjust conclusion that the intervention in itself is ineffective (type III error) (39).

***Evaluating the process of translation***

To prevent such errors and gain knowledge on the diffusion process, an evaluation of the process (further referred to as 'process evaluation') is necessary (36,37). IACOs are dynamic and their program plans are adjusted and amended in time following community developments. Hence, an IACO process evaluation should also by dynamic; the evaluation needs to be revised iteratively according to the cumulating changes in program planning (38,40). Saunders *et al.* (37) provide a framework to guide such a dynamic process evaluation, specifically for the phases of initial implementation and continued implementation (further referred to as 'implementation process'). An adapted version of this framework was used to guide this study and is displayed in figure 2. An IACO process evaluation can shed light on (a) if and to which extent an IACO is implemented as intended, but also on (b) which determinants impede or facilitate the implementation process (40,41). Considering the first, a variety of aspects have been proposed to indicate if a program is implemented as intended. No consensus, however, is reached in the literature on the operationalization or measurement of these aspects (42,43). In the widely cited 'Glossary for Dissemination and Implementation Research in Health', Rabin *et al.* (44) state that there are four main aspects that indicate the extent to which a program is translated as intended. These four aspects

are (a) adherence to the program plan, (b) dose or the amount of the program delivered, (c) quality of program delivery and (d) reaction and acceptance by the target population. Together, these aspects are referred to as implementation fidelity.

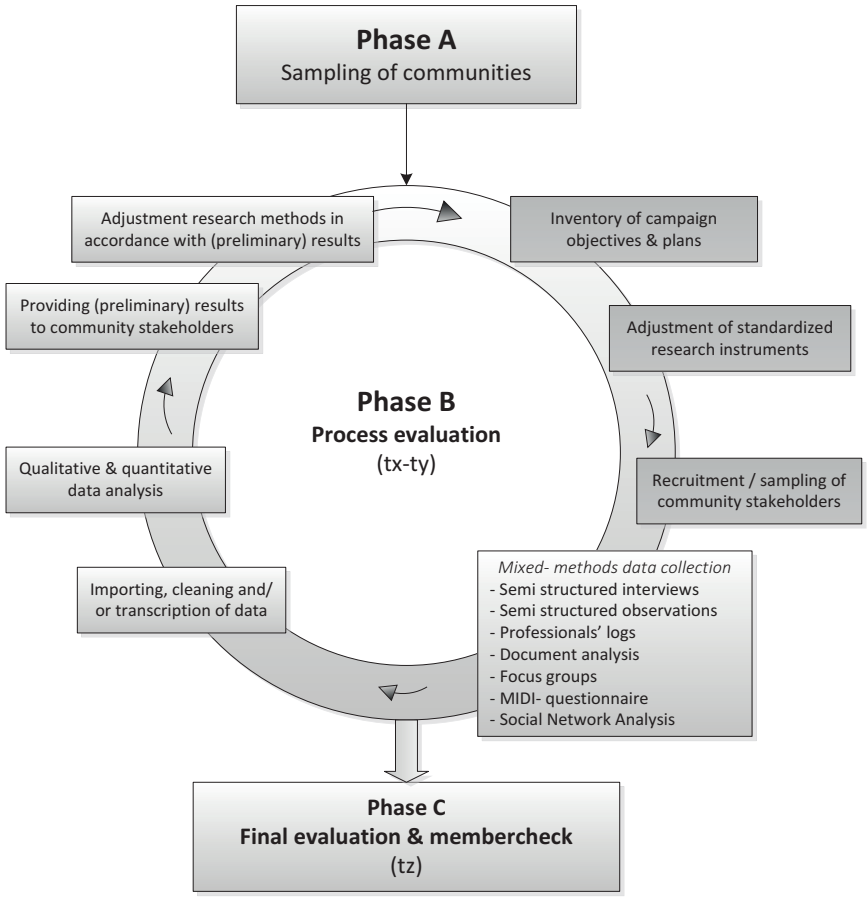


**Figure 2.** Adapted framework of Saunders *et al.*[37]

As for determinants, several models have been proposed to describe and categorize the determinants of the implementation of innovations (41,43,45-48). Fleuren *et al*. (49) constructed a model (figure 3) clustering determinants of the implementation of health care interventions mainly based on the Theory of Planned Behaviour (50), Social Cognitive Theory (51) and on data derived from a series of qualitative and quantitative implementation

studies. This model categorizes 50 determinants into (a) characteristics of the socio-political context, (b) characteristics of the organization, (c) characteristics of the intended user and (d) characteristics of the innovation. A recent review evaluating determinants of the innovation process underlines the use of this type of categorization (45). Based on this model, a Measurement Instrument for Determinants of Innovation (MIDI) was developed in 2014 to quantitatively assess determinants of the innovation process (52).

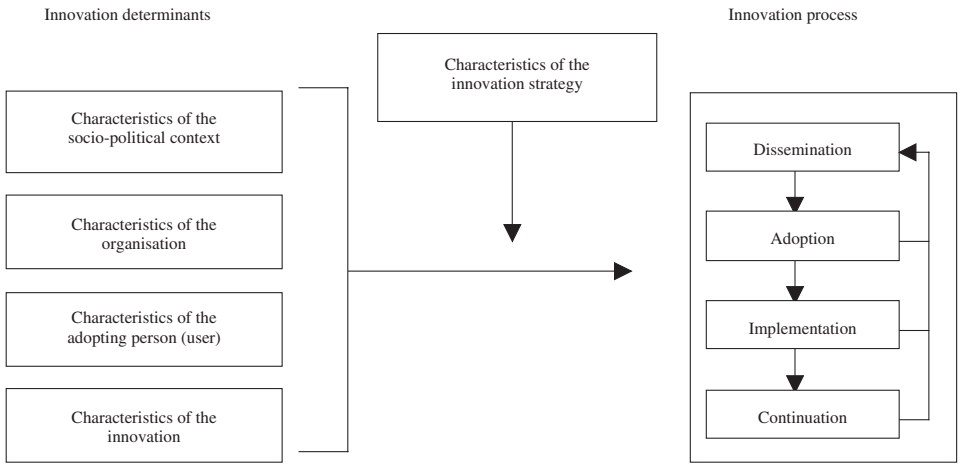


**Figure 3.** Fleuren framework

### *Research on the implementation process of IACOs*

The use of IACOs to counter the childhood obesity epidemic is relatively novel; widespread use of these complex interventions only started in the last decade. Hence, research on their implementation process is still in an early stage. No 'golden standard' for IACO process evaluation is yet available, and measures to evaluate possible impeding and facilitating determinants of implementation are scarce and often not statistically validated (53). Current research on the IACO implementation process has furthermore been limited and of varying quality (24,54); Most studies have been performed in one case or setting and do not apply a longitudinal perspective. A preliminary study performed by the Consortium Integrated Approach of Overweight (CIAO) revealed that for individual interventions targeting childhood obesity, high self-efficacy, sufficient knowledge and skills, possibilities for adaptation of the intervention to local needs, procedural clarity (for example of intervention manuals) and visibility of results of the intervention influenced implementation. Moreover, support from management and colleagues, the appointment of an implementation

coordinator and a task orientation compatible with implementation of the intervention were of importance for successful implementation of the intervention (55). If and to which extent these determinants also influence the implementation of IACOs remains to be elucidated.

In conclusion, more research is needed to disentangle the black box of IACO implementation. If the black box of IACO implementation is unravelled, evidence-based strategies for guiding and improving the implementation of IACOs in practice may be formulated. This could potentially optimize the implementation process and in turn, optimize IACO intervention effects.

## Aim of this study

To contribute to the disentanglement of the black box of IACO implementation, the overall aim of this study was to examine the implementation process of five EPODE-derived IACO's in the Netherlands. The framework of Saunders *et al*. (37) was used to guide our study design, and the framework of Fleuren (49) to elucidate critical determinants of IACO implementation. This research is a sub study of the research Consortium Integrated Approach of Overweight (CIAO); research aims, concepts and methods used in all sub studies are presented in **Chapter 2**. **Chapter 3** provides an overview of the literature to date on the outcome indicators and determinants of the implementation process of IACOs. **Chapter 4** presents the result of our longitudinal, mixed-method case study the implementation of the EPODE-derived Youth At a Healthy Weight (JOGG) approach in one community in the Netherlands. **Chapter 5** examines the quantitative association between implementation adherence and its determinants using the Measurement Instrument for Determinants of Innovations (MIDI). **Chapter 6** presents the results of our longitudinal, multiple-case study on the process of implementation of five EPODE-derived IACOs in the Netherlands. Finally, **Chapter 7** discusses the result of a longitudinal social network analysis of three communities implementing an EPODE-derived IACOs. Also, the relationship between network analysis parameters and implementation success at the community level is discussed.

### *Relevance for practice*

'Practice what you preach'; A dissertation addressing the implementation of innovations would not be complete without a section elaborating on the practical relevance of its results. To this end, to adoption decision of four professionals from four different sectors towards an IACO are represented below. These cases will reappear in several sections of this dissertation, and the relevance and applicability of our study findings to their day-to-day 'implementation' efforts will be addressed in the discussion.

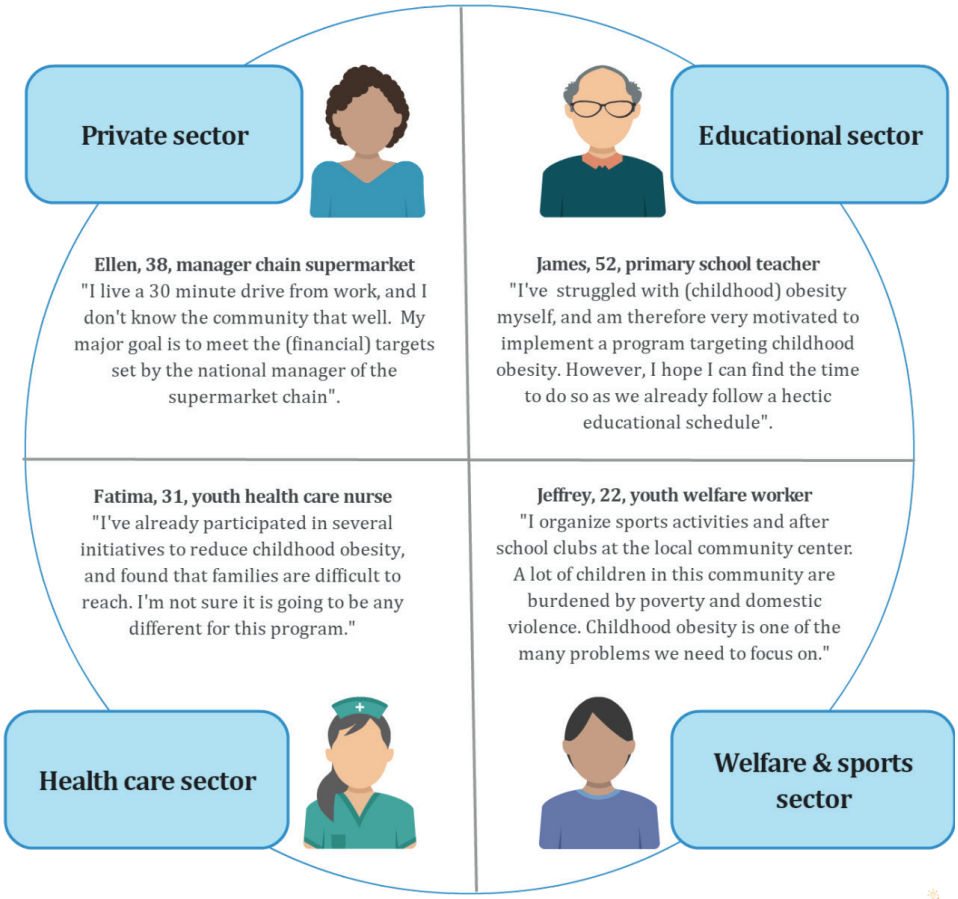


**Figure 4.** Cases of four professionals implementing an IACO

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