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Health promotion in pregnancy and early parenthood

The challenge of innovation, implementation and change within the Salut Programme

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ABSTRACT

Background: In 2005, the Västerbotten County Council launched a child health promotion programme, “the Salut Programme”, in response to an alarming prevalence of overweight and obesity, and trends of increased dental caries, among young county citizens. The programme, initially developed in four pilot areas, is built on multidisciplinary and cross-sectoral collaboration and aims to support and strengthen health promotion activities in health care, social services and school settings. It targets children and adolescents (0-18 years of age) and their parents, and starts during pregnancy. This thesis focuses on interventions provided by antenatal care, child health care, dental services, and open pre-schools, directed to expectant parents and families with children aged 0-1 ½ years. Within the programme context, the aim was to explore socio-demographic patterns of overweight and obesity in expectant parents (Paper I), first-time parents’ experiences of health promotion and lifestyle change during pregnancy and early parenthood (Paper II), professionals’ experiences of factors influencing programme implementation and sustainability (Paper III and IV), and early programme outcomes on professionals’ health promotion practices and collaboration following countywide dissemination and implementation (Paper IV).

Methods and results: A population based cross-sectional study among expectant parents showed overweight and obesity in 29% of women (pre-pregnancy) and in 53% of men ($n=4,352♀$, $3,949♂$). The likelihood for obesity was higher in expectant parents with lower levels of education, among those unemployed or on sick leave, and those living in rural areas. In 62% of couples, at least one of the partners was overweight or obese; a positive partner correlation was also found for BMI (I). An interview study with 24 first-time parents ($n=12♀$, $12♂$) revealed that they primarily undertook lifestyle changes to secure the health of the fetus in pregnancy, and to provide a healthy environment in childhood. Parents described themselves as highly receptive to information about how their lifestyle could influence fetal health, and they frequently discussed pregnancy risks related to tobacco and alcohol, as well as toxins and infectious agents in foods. However, parents did not seem inclined to make lifestyle changes primarily to promote their own health. The antenatal and child health care services were perceived as being mainly directed towards women, and parents described a lack of a holistic view of the family which included experiences of fathers being treated as less important (II). An interview study undertaken with professionals ($n=23$) in the Salut Programme pilot areas indicated programme sustainability at most sites, two years after implementation, although less adherence was described within child health care. Factors influencing programme sustainability,

as described by professionals, were identified at multiple organisational levels (III). A before-and-after survey among professionals (n=144) measured outcomes of the county-wide implementation of the Salut Programme in 13 out of 15 county municipalities. Results showed significant improvements in professionals' health promotion practices and collaboration across sectors. A number of important implementation facilitators and barriers, acting at different organisational levels, were also identified via a survey comprised of open-ended questions (IV).

Conclusion: The Salut Programme, developed with high involvement of professionals, and strongly integrated in existing organisational structures and practices, shows potential for improving health promotion practices and cross-sectoral collaboration. The findings can inform further development of the Salut Programme as well as new health promotion initiatives, and inform policy practice and future research. These aspects include approaches in health promotion and prevention, father involvement during pregnancy and early parenthood, and factors influencing implementation and sustainability of cross-sectoral health promotion programmes.

Key words: Antenatal care, Child health care, Counselling, Dental health services, Dissemination, Health Promotion, Implementation, Intervention, Parents, Pregnancy, Prevention, Obesity, Overweight, Pre-school, Primary Health Care, Sustainability

ABBREVIATIONS

ANC	Antenatal Care
BMI	Body Mass Index
CHC	Child Health Care
CI	Confidence Interval
NCDs	Non-communicable diseases
OR	Odds Ratio
VIP	Västerbotten Intervention Programme
WHO	World Health Organization

DEFINITIONS

Adoption	A decision to make full use of an innovation as the best course of action available. ¹
Body Mass Index (BMI)	Weight in kilograms divided by the square of height in meters (kg/m ²). ²
Diffusion	The passive, untargeted, unplanned, and uncontrolled spread of new interventions. ¹
Disadvantaged groups	Groups of people who, due to factors usually considered outside their control, do not have the same opportunity as other, more fortunate groups in society. ³
Dissemination	An active approach of spreading evidence-based interventions to the target audience via determined channels using planned strategies. ¹
Effectiveness	The extent to which a specific intervention, procedure, regimen, or service, when deployed in the field in routine circumstances, does what it is intended to do for a specified population. ⁴
Efficacy	The extent to which a specific intervention, procedure, regimen, or service produces a beneficial result under ideal conditions; the benefit or utility to the individual or the population of the service, treatment regimen or intervention. ⁴
Epidemiology	The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems. ⁴
Health	A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. ⁵
Health inequality	Differences in health status or in the distribution of health determinants between different population groups. ³
Health inequity	Differences in health which are not only unnecessary and avoidable but, in addition, are considered unfair and unjust. ⁶
Health promotion	The process of enabling people to increase control over and improve their health. It involves the population as a whole in the context of their everyday lives, rather than focusing on people at risk for specific diseases, and is directed toward action on the determinants or causes of health. ⁴

Implementation	The process of putting to use or integrating evidence-based interventions within a setting. ¹
Innovation	An idea, practice, or object that is perceived as new by an individual or other unit of adoption. ¹
Models	May draw on a number of theories to help understand a particular problem in a certain setting or context. ⁷
Obesity	Body Mass Index ≥ 30.00 . ²
Overweight	Body Mass Index 25.00-29.99. ²
Primary prevention	Directed towards preventing the initial occurrence of a disorder. ⁸
Process	A course of action or series of activities. ³
Public Health	One of the efforts organised by society to protect, promote, and restore the people's health. It is the combination of sciences, skills, and beliefs that is directed to the maintenance and improvement of the health of all the people through collective or social actions. ⁴
Sustainability	The degree to which an innovation continues to be used after initial efforts so secure adoption is completed. ⁹
Theory	Presents a systematic way of understanding events or situations. It is a set of concepts, definitions, and propositions that explain or predict these events or situations by illustrating the relationships between variables. ⁷

The definitions derive from:

1. Brownson RC, Colditz GA, Proctor EK: Dissemination and Implementation Research in Health: Translating Science to Practice. New York: Oxford University Press; 2012.
2. Global Database on Body Mass Index. Geneva: World Health Organization. (Accessed April 1, 2013, at http://apps.who.int/bmi/index.jsp?introPage=intro_3.html.)
3. Health Impact Assessment (HIA). Glossary of terms used. Geneva: World Health Organization. (Accessed April 1, 2013, at <http://www.who.int/hia/about/glos/en/index.html>.)
4. Last JM: Dictionary of Epidemiology. 4th edn. Oxford: Oxford University Press; 2001.
5. Constitution of the World Health Organisation. Basic Documents, 45th ed. supplement. Geneva: World Health Organization, 2006. (Accessed April 1, 2013, at http://www.who.int/governance/eb/who_constitution_en.pdf.)
6. Whitehead M: The concepts and principles of equity and health. Copenhagen: World Health Organization Regional Office for Europe; 1990.
7. U.S. Department of Health and Human Services. National Institutes of Health: Theory at a Glance: A Guide for Health Promotion Practices. 2nd edn. Bethesda; 2005.
8. World Health Organization: Health Promotion Glossary. Geneva; 1998.
9. Rogers EM: Diffusion of Innovations. 5th edn. New York: Free Press; 2003.

ORIGINAL PAPERS

This thesis is based on the following papers, which will be referred to in the text by their Roman numerals:

- I. Edvardsson K, Lindkvist M, Eurenus E, Mogren I, Small R, Ivarsson A. Overweight and obesity in expectant parents: socio-demographic patterns and within-couple associations. A population-based, cross-sectional study. Submitted.
- II. Edvardsson K, Ivarsson A, Eurenus E, Garvare R, Nyström ME, Small R, Mogren I. Giving offspring a healthy start: Parents' experiences of health promotion and lifestyle change during pregnancy and early parenthood. *BMC Public Health* 2011;11:936.
- III. Edvardsson K, Garvare R, Eurenus E, Ivarsson A, Mogren I, Nyström ME. Sustainable practice change: Professionals' experiences with a multi-sectoral child health promotion programme in Sweden. *BMC Health Serv Res* 2011;11:61.
- IV. Edvardsson K, Ivarsson A, Garvare R, Eurenus E, Lindkvist M, Mogren I, Small R, Nyström ME. Improving child health promotion practices in multiple sectors – outcomes of the Swedish Salut Programme. *BMC Public Health* 2012;12:920.

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TABLE OF CONTENTS

ABSTRACT	i
ABBREVIATIONS	iii
DEFINITIONS.....	v
ORIGINAL PAPERS	vii
INTRODUCTION	1
Public health concerns in a global and national perspective.....	1
<i>Non-communicable diseases - a global health challenge</i>	<i>1</i>
<i>Challenges for public health in Sweden</i>	<i>2</i>
<i>The global obesity epidemic and its consequences</i>	<i>3</i>
<i>Impact of obesity on maternal and offspring health.....</i>	<i>4</i>
Life course and multilevel influences on health.....	5
<i>Life course epidemiology</i>	<i>5</i>
<i>Multiple levels of influence on health</i>	<i>6</i>
Implementation and evaluation of health promotion	7
<i>The 'Know-Do' gap</i>	<i>7</i>
<i>A terminological jungle.....</i>	<i>8</i>
<i>The implementation process.....</i>	<i>9</i>
<i>Addressing multiple levels of influence on practice change.....</i>	<i>9</i>
<i>Theories, models and frameworks guiding implementation and research</i>	<i>10</i>
<i>Challenges in measuring effectiveness of health promotion.....</i>	<i>11</i>
PURPOSE AND AIMS	13
STUDY CONTEXT	15
The Swedish setting.....	15
<i>Characteristics.....</i>	<i>15</i>
<i>Health care in Sweden</i>	<i>15</i>
<i>The Swedish parental benefit system</i>	<i>16</i>
<i>Pre-schools and open pre-schools</i>	<i>16</i>
Västerbotten County and public health initiatives	17
The Salut Programme	17
<i>From pilot areas to county-wide implementation</i>	<i>19</i>
<i>Programme operation</i>	<i>21</i>
<i>Epidemiological surveillance of expectant parents</i>	<i>22</i>
<i>Health-promoting interventions during pregnancy and early parenthood</i>	<i>22</i>

SUBJECTS AND METHODS	25
Framing contributing papers in stages of development and evaluation	25
Overview of study aims, subjects and methods	27
Exploring overweight and obesity in expectant parents (I)	28
<i>Participants</i>	<i>28</i>
<i>Methods for data collection</i>	<i>29</i>
<i>Methods for data analyses</i>	<i>30</i>
Exploring parents' and professionals' experiences of health promotion (II, III)	31
<i>Participants</i>	<i>31</i>
<i>Methods for data collection</i>	<i>32</i>
<i>Methods for data analyses</i>	<i>33</i>
Exploring programme outcomes and factors influencing implementation (IV)	35
<i>Participants</i>	<i>35</i>
<i>Methods for data collection</i>	<i>35</i>
<i>Methods for data analyses</i>	<i>37</i>
Ethical considerations	38
MAIN FINDINGS	39
Overweight and obesity in expectant parents (I)	39
<i>Prevalence of overweight and obesity in expectant parents and in couples</i>	<i>39</i>
<i>Within-couple associations of BMI, overweight and obesity</i>	<i>40</i>
Experiencing health promotion and lifestyle change (II)	41
<i>Experiencing healthy lifestyle promotion without own lifestyle change</i>	<i>43</i>
<i>Offspring's health as primary incentive for lifestyle change</i>	<i>43</i>
Changing and sustaining health promotion practices (III and IV)	44
<i>Facilitators and barriers for programme implementation and sustainability</i>	<i>45</i>
<i>Effects on professionals' health promotion practices and cross-sectoral collaboration</i>	<i>48</i>
DISCUSSION	51
Summary of main findings	51
General discussion	51
<i>Public health consequences of overweight and obesity</i>	<i>51</i>
<i>Overweight and obesity in pregnancy – are people aware of risks?</i>	<i>52</i>
<i>Challenges when targeting the general population</i>	<i>53</i>
<i>A multifactorial and multilevel approach to health promotion</i>	<i>54</i>
<i>Fathers and health promotion in pregnancy and early parenthood</i>	<i>55</i>
<i>Influencing factors for programme implementation and sustainability</i>	<i>56</i>
<i>Aspects to consider in evaluation of programme outcomes</i>	<i>57</i>

Methodological considerations	58
<i>Limitations of cross-sectional studies</i>	<i>58</i>
<i>Definition of rural and urban areas</i>	<i>59</i>
<i>Response rates and representativeness in survey studies</i>	<i>59</i>
<i>Implications of convenience sampling</i>	<i>60</i>
<i>Risk for bias</i>	<i>60</i>
<i>Trustworthiness</i>	<i>61</i>
<i>Problems related to multiple comparisons</i>	<i>62</i>
 CONCLUSIONS AND RECOMMENDATIONS FOR POLICY, PRACTICE, AND FUTURE RESEARCH	 63
 SUMMARY IN SWEDISH – SVENSK SAMMANFATTNING	 67
 ACKNOWLEDGEMENTS	 69
 REFERENCES	 73
 APPENDIX	 87

INTRODUCTION

Well, it is certainly difficult to find motivation. It would be different if a doctor told me that "You've got a problem with your cholesterol" but, as long as I feel good....
(Father, Paper II)

Pregnancy and early parenthood are periods in life when people in general become more aware that lifestyle is important. However, change towards a healthier lifestyle is multidimensional and seldom easily achieved. This thesis explores a long-term and multifaceted initiative to improve population health by applying a life course approach, starting in the earliest phases of life; that is, during the fetal period.

The context is the county of Västerbotten in Sweden, where a child health promotion programme was initiated in 2005 by the County Council in response to some major public health concerns. This thesis explores the current situation in relation to overweight and obesity in expectant parents, and addresses aspects of lifestyle change from parents' perspectives. It further describes the *challenges of innovation* – in this thesis defined as developing new interventions and approaches in health promotion – and programme *implementation* on a large scale. *Change*, which is the penultimate goal of interventions prior to that of health improvements, is explored and discussed in relation to providers as well as receivers of interventions. Suggestions are made for policy, practice and future research.

Public health concerns in a global and national perspective

Non-communicable diseases - a global health challenge

The World Health Organization (WHO) sees non-communicable diseases (NCDs) as a major health challenge of the 21st century [1]. In 2008, 63% of the 57 million global deaths worldwide were attributed to NCDs including cardiovascular diseases, cancer, chronic respiratory diseases and diabetes [1]. The probability of premature death (between the ages of 30 and 70) from NCDs is higher in low-income and middle-income countries than in high-income countries, with the highest probability in sub-Saharan Africa, Eastern Europe and parts of Asia [1]. Behavioural risk factors, including an unhealthy diet, physical inactivity, tobacco use and harmful use of alcohol, are responsible for a major part of the NCDs [1]. WHO estimates that the global life expectancy would increase by up to five years if exposure to the following eight risk factors were reduced: tobacco use, alcohol use, low fruit and vegetable intake, physical inactivity, high blood

pressure, high cholesterol, high blood glucose and high body mass index (BMI) [2]. The ‘double burden of disease’ is currently affecting many low- and middle-income countries. This is due to ageing populations and changes in patterns of food intake, physical activity and tobacco consumption, with an associated increase in NCDs; at the same time communicable diseases are still prevalent [2]. Despite evidence of the importance of lifestyle for good health, studies indicate that few people meet such lifestyle recommendations [3-5]. In the United States, for example, 5% or less of the adult population adhere to an overall healthy lifestyle, including keeping a healthy weight, sufficient fruit and vegetable consumption, regular physical activity, and not smoking [3, 5].

Challenges for public health in Sweden

Public health in Sweden has continued to improve. This is mirrored in a steadily increased life expectancy over the last decades. Today, the life expectancy for women is 84 years, and for men 80 years [6], which is high from an international perspective [7]. The overarching aim of the Swedish national public health policy is *‘to create societal conditions that will ensure good health, on equal terms, for the entire population’* [8]. However, although this policy was adopted by the Swedish Parliament in 2003, social inequalities still persist, and there are signs that the gap between groups with different levels of education is widening [6, 9]. Physical and mental health problems are more common among women and men with low levels of education, and inequalities show a social pattern in relation to many health problems already in infancy and childhood [6, 9, 10]. Thus, it remains a challenging task, and increasingly so, to reach the overall objective of the public health policy with respect to *‘good health on equal terms’*.

The burden of disease in Sweden is dominated by cardiovascular diseases, neuropsychiatric diseases and cancer [11]. Burden of disease means the combined effect of years of life lost to death and the number of years a person lives with disability [12]. Although life expectancy is higher in women than in men, women report more physical and mental health problems [12]. From a global perspective, the health of Swedish children is very good, and the majority of children report feeling healthy. The proportion of children in grade five who report good health has been stable, or somewhat improved, over the last decades [10]. However, physical and mental health problems have been shown to increase with age, with girls reporting more health problems than boys. Several reports over the last decades also point to increasing trends of some of these problems [13]. Data for analyses of time trends of mental health in younger children in Sweden is lacking, particularly for children of pre-school age [14].

For a long time cardiovascular diseases have been the leading cause of death in Sweden, although a steady decline in morbidity and mortality has been seen over the last decades [12]. This can partly be explained by a change in major risk factors such as reduced smoking and decreasing cholesterol levels [9]. However, although some major lifestyle risk factors for ill health such as smoking and harmful use of alcohol have decreased in the population [6], adherence to recommendations on physical activity and a healthy diet remain low, as in many other countries. For example, less than 10% of adults and children adhere to the national recommendations on intake of fruits and vegetables [15], at the same time as the consumption of discretionary foods is high [15]. Furthermore, one-third of the adult population does not meet the recommendations on at least half an hour daily physical activity, and the situation among children is of even greater concern as only 10-20% meet the age-adapted recommendations on physical activity [15]. A majority of school-aged children also exceed recommendations on limiting television and ‘screen-time’ [16, 17].

The global obesity epidemic and its consequences

Overweight and obesity have become a major global health concern, as the prevalence has doubled globally over the last three decades. The highest prevalence is currently seen in the American region, and the lowest in South-East Asia [1]. More than half of the adult population (52%) are overweight or obese in the European Union [7], so also in Sweden (49%), with a higher prevalence in men (56%) than in women (42%) [4]. Studies from different parts of Sweden indicate that 15-20% of children are overweight, and 3-5% obese, but there are indications that the steady rise in prevalence over the last two decades has reached a plateau [10]. Public health efforts have so far largely been unsuccessful in reversing these trends, in that obesity still seems to be on the rise among adults, particularly among those under the age of 50 [6, 18]. This is of great concern, as obesity is a major risk factor for several NCDs, including diabetes, cardiovascular diseases, musculoskeletal diseases, and certain forms of cancer [19]. Thus, high rates of overweight and obesity pose a major threat to further improvements in population health [20].

These implications are also important to consider from a life course perspective. Overweight and obesity in mothers and fathers, from conception and onwards, increase the risk of such problems in their offspring. The likelihood of the child becoming overweight or obese increases gradually depending on whether one or both parents have excess weight, and also relative to the severity of the weight problems in parents [21-25]. Further, children who are overweight or obese tend to remain so into adulthood, and may develop NCDs at a younger age [26]. Overweight and obesity in childhood entail an increased risk of consequences such as

obstructive sleep apnoea, type 2 diabetes, orthopaedic problems, psychosocial and psychiatric problems, and lower health-related quality of life [26-29]. Thus, overweight and obesity are major concerns for public health and indicate that strengthened efforts are needed in health promotion and primary prevention, especially as once established, overweight and obesity often persist, and many interventions aimed at weight loss are ineffective in providing long-term results [30]. Obesity alone has been estimated to account for 0.7%-2.8% of a country's total health care expenditure, with an even higher percentage if overweight is also included [31]. Furthermore, medical costs for obese individuals have been found to be 30% higher than for those with normal weight [31]. In Sweden, the total costs for treatment of overweight and obesity has been estimated at 1.9% of the national health care expenditure [32]. Beside the health effects on individuals, therefore, the obesity epidemic also puts a financial burden on society.

Impact of obesity on maternal and offspring health

In 2011, 38% of women in Sweden presented a BMI that corresponded to overweight or obesity at the time of registration in antenatal care (ANC) [33]. The corresponding figure was 25% in 1992, which equates to a 52% rise in the last 20 years [33]. Being overweight or obese in pregnancy increases the risk of a number of adverse maternal and fetal outcomes. A summary of these outcomes is presented in Table 1.

Table 1: Overview of adverse outcomes due to overweight and obesity in pregnancy

Period	Adverse effects of overweight and obesity in pregnancy (BMI ≥ 25.0)
Conception	Infertility [34]
Pregnancy	Gestational hypertension, gestational diabetes mellitus, stillbirth [35], miscarriage [36], pre-eclampsia [37], thromboembolism [38]
Labour, delivery and postpartum period	Preterm delivery, induction of labour, caesarean section, postpartum haemorrhage, postpartum stay >5 days, adverse effects on breastfeeding [35], infections [38]
Fetus	Large for gestational age, macrosomia [39], congenital anomalies [40]
Child	Shoulder dystocia, brachial plexus lesion, fracture of the clavicle [41], child overweight and obesity [42], metabolic syndrome [43], and other health problems
Future health (woman)	Long-term obesity [44] and associated health problems

The pregnant woman's weight gain in pregnancy influences maternal and offspring health. A thorough review undertaken by the Institute of Medicine (IOM) led in 2009 to the release of an updated version of their widely used recommendations on weight gain in pregnancy, as presented in Table 2 [45]. A weight gain above recommendations has been shown to increase the risk of several adverse pregnancy, labour and delivery outcomes, and also increases the risk for long-term overweight and obesity in both mothers and their children [45].

Table 2: Recommended weight gain ranges for women during pregnancy (singleton pregnancy) [45]

Pre-pregnancy BMI	Recommended total weight gain (kilograms)
Underweight (<18.5)	12.5-18
Normal weight (18.5-24.9)	11.5-16
Overweight (25.0-29.9)	7-11.5
Obesity (≥30.0)	5-9

Life course and multilevel influences on health

Women and men in their child-bearing years may be among the most important target groups for health promotion because their health and lifestyle do not affect them alone; they also influence their offspring's health from pregnancy to adulthood [21, 46-48]. Doyle and colleagues (2009) suggested that the antenatal period is important for preventive interventions, as investments in this period have potential to yield high returns [49]. In relation to obesity, early-life prevention may have lifelong impact and also positively influence the health of generations to come. However, as with many other public health problems, overweight and obesity are results of adverse influence from multiple complex factors, in which the physical and social environments also play important roles [50]. An approach in health promotion that addresses the earliest stages of life, and also takes into consideration multiple levels of influence on health behaviour, has been suggested as a way forward to promote health in parents and their children [50, 51]. These two perspectives will be briefly described below.

Life course epidemiology

Research in later years has increasingly directed attention to how events during different stages of the life span may impact on the development of health problems later in life, and the 'life course framework' is increasingly being addressed [52]. Ben-Shlomo and Kuh define this approach as "*the study of long-term effects on chronic disease risk of physical and social exposures during gestation, child-*

hood, adolescence, young adulthood and later adult life. It includes studies of the biological, behavioural and psychosocial pathways that operate across an individual's life course, as well as across generations, to influence the development of chronic disease" [53].

The life course perspective generally considers two broad models of pathways between exposure and disease later in life; the 'critical' period model and the 'accumulation' of exposures model. The first model refers to when a specific exposure during a particular time period leads to lasting or lifelong health outcomes, which largely are not modified by other exposures later in life [46]. The 'critical period model with later effect modifiers' also takes into account the role of exposures later in life that can interact with these early life exposures. This model, also called 'biological programming'[53], or for the pregnancy period 'fetal programming' [47] provides the basis for the 'fetal origins of adult disease hypothesis' [53], and includes examples such as the effect of poor fetal growth on adult risk for cardiovascular diseases [54], hypertension [55], and type II diabetes [56]. The second 'accumulation of risks model' simulates how risks accumulate over the life course and increase disease risk, with risk factors being either independent, or clustered in chains or 'pathways' of risks. An example of clustering are risk factors associated with being socially disadvantaged [46]. The life course framework has been emphasised by the WHO as important in identifying effective and appropriate health-promoting and preventive interventions targeting our major public health concerns [52].

Multiple levels of influence on health

Patterns of health disparities between groups with different resources provide evidence of social and environmental influences on health and disease, and thus indicates that factors at these levels also need to be addressed in efforts to reduce our major public health problems [57-59]. Thus, health promotion not only needs to include actions to support behaviour change in individuals, but also to include actions directed towards factors that are largely beyond the influence of individuals, such as social, environmental and economic factors [60].

Frieden (2010) conceptualises the potential impact of public health interventions using a 5-tier pyramid, as illustrated in Figure 1. The base, which addresses socio-economic determinants, is expected to have greatest public health impact. Context/environmental interventions, protective interventions with long-term benefits (e.g. immunisations), direct clinical care, and, last, counselling, imply less population impact, and an increased effort needed from the individual [61].

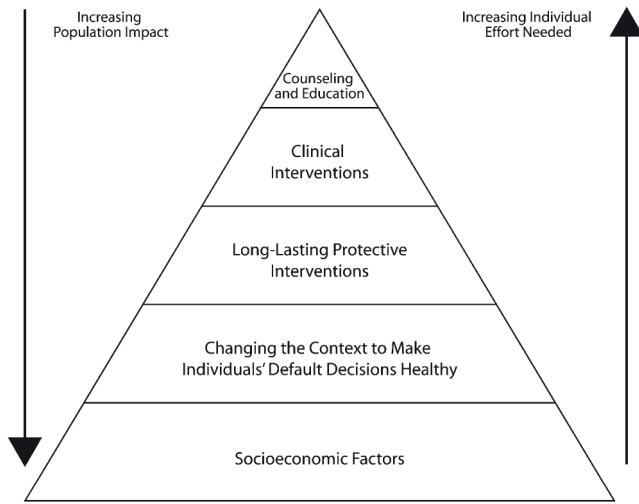


Figure 1: The health impact pyramid. Reprinted with permission [61]

Ecological models in health promotion can facilitate the understanding of multilevel influence on health behaviours by addressing factors at individual, interpersonal, organisational, community, environment, and policy levels [62, 63]. A systems approach not only considers influences from multiple levels, it also focuses on the interconnection between these different influences, and between individuals and the environment of these influences [50]. Thus, a systems approach has the ‘whole’ as a starting point rather than immediately narrowing down the focus to single influences [64], and this has been suggested as a way forward in addressing the complex origins of our major public health concerns [65].

Implementation and evaluation of health promotion

The ‘Know-Do’ gap

Knowledge translation has become an increasingly important area of research because of the growing awareness that, worldwide, still only a small proportion of new knowledge is adopted into policy and practice, and often at an unnecessarily slow pace [66-68]. The ‘Know-Do’ gap, which leads to a suboptimal delivery of care, loss of potential health benefits in the population, and a waste of already limited health care resources, is identified by the WHO as one of the main challenges for public health in the 21st century [69]. There is yet no common platform or comprehensive framework that can aid the understanding of how to

bridge this gap [69], and no singular strategy for knowledge translation has shown to be successful in all public health settings [70]. Wensing and colleagues (2009) describe selecting interventions as an ‘art’ because of the lack of evidence on which interventions are most effective for translating knowledge to action [71].

A terminological jungle

To date, the area of translating knowledge into practice is difficult to navigate in, particularly because of the lack of standardised terms and definitions [72-74]. Common terms used for describing the concept of translating knowledge into action include *diffusion*, *dissemination*, *implementation*, *knowledge translation*, *knowledge transfer*, *knowledge exchange*, *research utilisation*, *research use*, and *uptake* [73-75]. In addition, according to Straus and colleagues (2009) the terms are used somewhat differently in different parts of the world. *Implementation* and *research utilisation* are terms commonly used in the United Kingdom and Europe; *dissemination* and *diffusion*, *knowledge transfer*, *research use*, and *uptake* in the United States; while *knowledge transfer* and *exchange* are commonly used in Canada [75].

In a cross-sectional study of terms used to refer to knowledge translation conducted by McKibbin and colleagues (2010), 100 terms used to describe research on knowledge translation were identified [76]. This ‘terminological jungle’ poses a major barrier for access to and use of the literature in research and practice [76]. A commonly used definition of knowledge translation, developed by The Canadian Institutes for Health Research, reads: “*knowledge translation is a dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve health, provide more effective health services and products and strengthen the healthcare system.*” [77]. This definition is also the base for WHO’s definition of the concept [69]. As this thesis is based in the European context, the term ‘implementation’ will hereafter be used when appropriate. Eccles and Mittman (2006) define implementation research as “*the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services. It includes the study of influences on healthcare professional and organisational behaviour.*” [78].

The implementation process

The process of implementing new practices and programmes are in literature often described as consisting of several discernible stages, which must all be given attention in programme planning and implementation [72, 79]. Fixen and colleagues (2005) summarise these, as illustrated in Figure 2 [72].

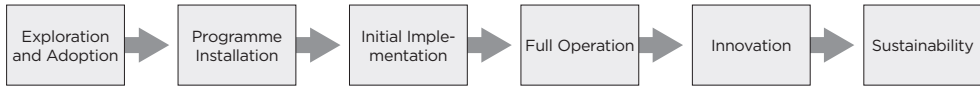


Figure 2: Stages of the implementation process as summarised by Fixen et al. [72]

During the *exploration phase*, different intervention/programme options are investigated and matched to the needs of the target population and to available resources, and an implementation plan, as much as possible accounting for potential barriers, will found the base for the decision to *adopt* the programme. The *installation stage* is when preparations are made to execute programme activities and when structural support is set up. This phase is often associated with ‘start-up’ costs, and activities can, for example, include staff training or acquisition of new tools or technology. The *initial implementation* is a challenging and complex phase, where change is required in the overall practice environment. This is described as a phase where many implementation efforts end. *Full operation*, on the other hand, is the phase when the programme is put into place and has become an integrated part of practice, where professionals can carry out programme interventions with sufficient skills and support, and the target population is made familiar with the programme interventions. The *innovation* stage involves modification and revision of programme interventions, before reaching *sustainability*; that is, when the programme continues to operate, despite contextual changes such as staff turnover, leadership, financial, or political changes. This stage may be reached a few years (2-4) after that the programme is fully implemented [72], although in reality many programmes fail to reach this stage. According to Fixen and colleagues (2005), most research has been made at the initial stages of the implementation process [72], while the body of research relating to programme sustainability, and impact of interventions once implemented, is still limited [71, 80, 81].

Addressing multiple levels of influence on practice change

Interventions in health promotion and prevention are often characterised as being complex as they commonly involve a large number of interacting components and different organisational levels, and require behaviour change among both the professionals involved and the intended receivers [82, 83]. Thus, there is a

long way to go, and many processes involved, before improved health may be observed as an outcome of public health interventions [75]. The importance of using a multilevel approach to practice change is often emphasised in the literature [84-86]. Thus, the levels of individuals, groups and teams, organisation and the larger system or environment all need to be considered to increase the likelihood of success, that is, sustainable improvements in delivery of services and health outcomes [85]. Barriers for change may exist at multiple levels of the health care organisation, and these need to be recognised and addressed when planning for complex changes [84, 85]. Grol and Wensing (2004) suggest that attention should be paid to six distinct levels: the innovation itself, the individual professional, the patient, the social context, the organisational context, and the economic and political context [84], and also that barriers and facilitators are examined. Results from an updated Cochrane review (2010) indicate that tailoring of interventions to prospectively identified barriers is favourable in efforts to improve professional practice [87].

Theories, models and frameworks guiding implementation and research

Many theories, models and frameworks can aid implementation and implementation research, both by explaining behaviours and how change occurs, as well as in programme planning, development, and evaluation [74, 88-91]. Effective implementation of interventions or programmes is often seen to involve a systematic approach with thorough planning and preparation [90-92]. One example of a common framework is RE-AIM [93, 94]. This framework is intended to assist program developers, researchers and decision-makers in public health programme planning and evaluation of public health impact. It focuses on five key areas considered necessary for programme success: Reach, Effectiveness, Adoption, Implementation, and Maintenance [94]. The framework has been widely used - recently in a Swedish setting where Carlford and colleagues found the framework to be relevant in the evaluation of two different implementation strategies of a new tool for lifestyle interventions in primary health care [95, 96]. However, although the use of planning models or frameworks can facilitate a systematic approach, the reference to theory often seems neglected in programme planning, implementation, and evaluation [89, 91]. One reason may be the 'smorgasbord' of theories, models and frameworks that exists which makes navigation among those challenging, especially considering they also span many different disciplines and scientific areas [92].

Challenges in measuring effectiveness of health promotion

Examining the effectiveness of health-promoting and preventive interventions involves many challenges, especially considering the many processes involved from the point in time when knowledge on what might improve population health exists, to the time when improved health can be seen as outcome [97]. For example, interventions to support healthy eating habits, physical activity for expectant parents and a healthy weight gain for women during pregnancy might yield a positive influence in offspring during the life course, up to adult life. The causal chain which links the specific interventions to changes in health status, in this case many years later, is thus difficult to identify [60].

Measuring the efficacy and effectiveness of health-promoting interventions (i.e. how well interventions work under optimal conditions versus how well they work in ‘real life’) [97] are also challenging due to the fact that the components that make an intervention successful in a ‘controlled’ setting rarely are the same as those that make an intervention successful in a wider population setting [97]. Thus, the experimental or linear process used in other areas, for example in randomised controlled trials such as drug trials, is not as applicable in health promotion and prevention [97, 98].

Interdisciplinary research, utilising both qualitative and quantitative research methods, is suggested to be a favourable approach in population and public health research, and is also described as one of the core principles for action in the Leeds Declaration [98]. The use of qualitative methods alongside a trial can, for example, provide process measures on the degree of implementation, or depict important implementation barriers and facilitators and thus provide a deeper understanding of why a specific intervention or programme is successful or not [99].

PURPOSE AND AIMS

The overall purpose of this thesis is to contribute towards a better understanding of how to improve health among expectant parents and children. This includes exploring the current health situation and health promotion strategies, and their implementation, utilising the Salut Programme in Sweden as a case of study. The ultimate goal is to contribute to policy and practice for improved health in the population.

Specific aims were:

- I. To explore the prevalence and socio-demographic patterns of overweight and obesity in expectant parents, and to assess within-couple associations.
- II. To explore first-time parents' experiences of health promotion and life-style change during pregnancy and early parenthood.
- III. To explore facilitators, barriers, and requirements for programme sustainability as experienced by professionals two years after finalising the development and implementation of a multisectoral child health promotion programme.
- IV. To examine outcomes of a child health promotion programme on professionals' self-reported health promotion practices, *and* to investigate perceived facilitators and barriers for programme implementation.

STUDY CONTEXT

The Swedish setting

Characteristics

Sweden has a population of 9.5 million people [100] and a size of 411 000 square kilometres. This results in a low population density — 23 inhabitants per square kilometre [100] — with 85% living in urban areas [101]. The country's Human Development Index was in 2011 ranked as the 10th highest in the world [102], and the Gender Inequality Index as the lowest [102]. Life expectancy in Sweden is 84 years for women and 80 years for men, with cardiovascular diseases and cancer as the leading causes of mortality [12]. The under-five mortality rate is three per 1000 live births, and the maternal mortality ratio is four per 100 000 live births [101], the 4th lowest in the world, respectively [103, 104]. In summary, the country has extremely strong indicators of health and welfare by global standards. This poses the challenge of demonstrating effectiveness of health-promoting interventions, as the distance between the 'starting point' and the target is narrower than in many other settings.

Health care in Sweden

Everyone living in Sweden is presumed to have equal access to health care. Swedish health care is highly decentralised and mainly financed by county and municipal taxes. Only a small proportion of the population, 4%, has voluntary (extra) health insurance [105]. In most county councils, health services are free of charge for children and adolescents [105]. Sweden also has a high-cost protection, which means that no individual will pay more than 1100 SEK (€128) for health care and not more than 2200 SEK (€255) for prescribed drugs within a 12-month period. Dental services are free of charge for children and adolescents up to the age of 20 years. Adults benefit from a fixed general annual subsidy for dental care, and a high cost-protection scheme for each 12-month period [105].

Antenatal care (ANC) and child health care (CHC) services in Sweden are along with other sectors important cornerstones of public health work. These services are free of charge for all pregnant women and parents living in Sweden, and attendance rates are high, close to 100%. ANC services normally provide the pregnant woman with seven to 10 visits to a midwife during pregnancy, including a follow-up visit postpartum, and additional visits to a family physician or obstetrician if required [106]. CHC provides parents and their children with health and development check-ups, immunisations, advice and support regarding the care of the child. Approximately 14 visits, including a home visit, are scheduled at

certain key ages from birth until the child is five years old, although the number of check-ups can vary depending on individual circumstances [107]. Services are generally organised and provided by a registered nurse with qualifications in child health (district nurse or paediatric nurse), and some health check-ups include an examination by a physician [107]. ANC and CHC services also provide parental support groups for expectant parents and parents. About 80% of first-time parents attend at least half of all parental support group sessions organised by ANC, and at least one of the parental support groups organised by CHC, with 60% of first-time parents attending at least five visits [108]. Men's participation in these groups are higher in ANC than CHC, where 46% of the attending participants are male compared to 20% in CHC (often only attending one visit) [108].

The Swedish parental benefit system

Sweden has a generous parental insurance system that gives parents the right to stay at home from work to take care of the child until the child is 18 months old, or as long as parental benefit is paid. Parental benefit is paid for 480 days per child. The compensation during the first 390 days is approximately 80% of the salary (up to a certain level), and thereafter a low set rate (180 SEK or € 21 per day). Parents are eligible for parental benefit until the child is eight years old. Fathers' involvement is encouraged as a minimum of 60 of the 480 days are reserved for each parent. Fathers are also entitled 10 days paid leave immediately after the child's birth [109]. In addition, a gender equality bonus that favours parents who share their parental leave equally was introduced in the parental benefit system in 2008 [110].

Parents also have the right to reduce their working hours by 25% until the child is eight years old. Further, if the child is sick, parents receive a temporary parental benefit up to 120 days per child per year if they need to be off work in order to take care of their child. All children in Sweden are entitled to a tax-free child allowance until 16 years of age (1050 SEK or €120, per month), and study allowance after the age of 16 if the child studies at upper secondary school. All families with two or more children also receive a large family supplement [109].

Pre-schools and open pre-schools

Children in Sweden are entitled to a place in pre-school from 12 months of age, which allows mothers and fathers to combine work life and parenthood. Municipalities are responsible to ensure that all children are offered a place, and a system of public subsidies/maximum fees makes the cost of a placement in pre-school comparably cheap for parents. Parents who are unemployed, or on leave of absence, are offered a place on a part-time basis [111]. *Open pre-schools* are

different from pre-schools, as they are free of charge and open for parents and their children to visit together on a ‘drop-in’ basis. The idea of open pre-schools is to provide children with group activities and at the same time give the parents the opportunity to meet with other adults [112].

Västerbotten County and public health initiatives

Västerbotten County, with its 15 municipalities, is located in the northern part of Sweden. It is Sweden’s second largest county in terms of size, but has less than 3% of the total population in Sweden (260 000 inhabitants) [100]; most living along the coast. Thus, the county is sparsely populated, with less than five (4.7) inhabitants per square kilometre [100], and it is in this context that service delivery must be considered. Västerbotten County has a long history of systematic public health work. In 1985, the Västerbotten Intervention Programme (VIP) was initiated to combat high rates of mortality and morbidity from cardiovascular diseases and diabetes mellitus in the county. The VIP takes a combined population and high-risk approach, as all county citizens aged 40, 50 and 60 years are invited to a risk factor screening and counselling about health and lifestyle. About 67% of those invited participate, and more than 146 000 examinations had been undertaken in 2012 (personal communication) [113, 114]. In 1993, a tobacco prevention programme, ‘Tobacco Free Duo’ was introduced in the county, aiming to prevent 12-15 year olds from starting to use tobacco [115]. The programme was initially a small-scale pilot project, but was later further developed, and from 1997 offered to all county municipalities. The programme has shown to contribute to a significant reduction in adolescent smoking in the county [115]. In 2000, Västerbotten County Council adopted the vision “By 2020 Västerbotten will have the world’s best health and the world’s healthiest citizens”. This vision also formed the basis for the county council’s next public health initiative for children and adolescents — the Salut Programme.

The Salut Programme

In mid-2000, local data in Västerbotten showed an alarming prevalence of overweight and obesity, and trends of increased dental caries among young county citizens [116-118]. Senior management in primary health care and dental services met to discuss opportunities for collaboration on these shared public health problems. Their deliberations resulted in the County Council launching the Salut Programme in 2005.

The programme is built on multidisciplinary and cross-sectoral collaboration between stakeholders who have the opportunity to influence the health of young

county citizens. It aims to promote healthy eating habits, physical activity, and good psychosocial health among children and adolescents 0-18 years of age and their parents, with start during pregnancy. The programme's intention is to support and strengthen initiated and ongoing health promotion and primary prevention activities in a variety of sectors, and also to develop a system for epidemiological surveillance of health and lifestyles of expectant parents, children and adolescents. The programme is built on age-specific modules and starts in the earliest phase in life where the pregnant woman and her partner are the targets for interventions (Figure 3). Sectors involved are ANC, CHC, dental services, open pre-schools and schools, with the social services sector also as collaborating partner.



Figure 3: Age specific modules in the Salut Programme

This thesis focuses on the first two age modules of the Salut Programme; that is, the pregnancy period and the child aged 0-1 1/2 years and his/her parents.

The name ‘Salut’ is originating from the word ‘Salutogenesis’, which is an approach in health promotion that emphasises a focus on the individual’s capacity and resources to generate health, rather than on risk factors and disease [119, 120]. The Public Health Policy of the Swedish Parliament, with the overarching aim to create societal conditions for good health on equal terms for the entire population [8], is directing the programme development. The Salut Programme puts an emphasis mainly on three out of 11 objective domains, but also includes aspects of other objective domains as presented in Figure 4:

Public health objectives	
1.	Participation and influence in society
2.	Economic and social prerequisites
3.	Conditions during childhood and adolescence
4.	Health in working life
5.	Environments and products
6.	<i>Health-promoting health services</i>
7.	Protection against communicable diseases
8.	<i>Sexuality and reproductive health</i>
9.	Physical activity
10.	Eating habits and food
11.	<i>Alcohol, illicit drugs, doping, tobacco and gambling</i>

Figure 4: The national public health objective domains with the Salut Programme’s primary objectives indicated in bold, and the secondary in italics

From pilot areas to county-wide implementation

The two first Salut Programme modules were developed and tested between 2005 and 2007 within four pilot areas in Västerbotten County prior to county-wide implementation. These areas were Byske (in Skellefteå municipality), Robertsfors, the city district Ersboda in Umeå and Lycksele, and they were originally selected to represent the demographic structure of Västerbotten County (Figure 5).



Figure 5: The Salut Programme pilot areas in Västerbotten, Sweden

The Salut Programme management also identified key persons in the pilot areas who were willing to collaborate and participate in programme development and implementation. Change process consultants from the county council supported the development process, guided by the Breakthrough Series model [121]. The professionals were highly involved as they attended learning seminars and conducted small-scale testing of interventions, guided by the Plan-Do-Study-Act (PDSA) cycle of learning [122]. The Salut Programme management and experts in maternal, child, and dental health decided on the final module interventions jointly, based on best available evidence and clinical experience (the programme development process is described in more detail in Paper III). The two programme modules were thereafter disseminated and implemented in the remaining parts of the county in three phases, as illustrated in Table 3. The implementation process consisted of four full-day partly interactive seminars; professionals were provided with work manuals tailored for each sector and encouraged to undertake small-scale testing of interventions between seminars. The second (coastal areas) and third (inland areas) phases, which involved 13 of the county's 15 municipi-

palities, were monitored for the purpose of this thesis. *Note: development of the programme modules III-VI was undertaken similarly in the four pilot areas. Thereafter, the plan is to disseminate the programme municipality by municipality, where it has so far been finalised for the municipality of Lycksele.*

Table 3: Timeline for implementation of the Salut Programme's first two age modules and start of epidemiological surveillance in different parts of Västerbotten County

	Phase	Area	Population (all ages)	Initiation	Completion	Start of epidemiological surveillance
Development/ implementation	Pilot phase	Byske (in Skellefteå municipality), Robertsfors municipality, the city district Ersboda in Umeå and Lycksele municipality	31 000	Module I April 2005 Module II February 2006	Module I First half of 2007 Module II Second half of 2007	January 2006
	Phase I	Skellefteå and Norsjö municipalities.	76 000		May 2009	May 2009
Dissemination/ implementation	Phase II	Bjurholm, Nor-dmaling, Umeå, Coastal areas Vindeln and Vännäs municipalities	141 000	February 2009	April 2010	April 2010
	Phase III	Dorotea, Malå, Sorsele, Storuman, Inland areas Vilhelmina, and Åsele municipalities	25 000	March 2010	November 2010	November 2010

Programme operation

A process management team, with a core of health promotion officers and researchers mainly employed by the County Council, coordinates and supports programme development and collaborates with experts in maternal, child, and dental health as well as with staff and managers in the sectors involved. A steering committee that includes members of the highest authority in the County Council and involved municipalities has overall responsibility for the Salut Programme. No additional resources for carrying out programme activities have been provided to the sectors.

Epidemiological surveillance of expectant parents

The Salut Programme not only aims to support health promotion activities in different organisations, but also to develop an epidemiological surveillance system. Surveillance of health, lifestyles and living conditions of expectant parents was initiated in ANC in the Salut Programme pilot areas in 2006 via the introduction of questionnaires directed to pregnant woman and their partners. The use of these questionnaires was then rolled out to the remaining parts of the county in a stepwise approach as described in Table 3, and the use of questionnaires is since November 2010 integrated in the normal routines in all ANC clinics in Västerbotten County. The Salut Programme management is responsible for development of questionnaires, coordination of data collection, and for data storage.

The woman's questionnaire is developed to be used both as a base for a dialogue on health and lifestyle, and as an epidemiological surveillance tool. It has been described as a helpful instrument by midwives and also as facilitating implementation and sustainability of the Salut Programme interventions (III, IV). The partner questionnaire has so far only been used for epidemiological surveillance; thus, it has not been a part of the routine in ANC to respond to any health and lifestyle issues of the partner. The partner questionnaire is directed to the pregnant women's partners independent of gender. The database that is built up within the Salut Programme will continue to grow as the programme develops (approximately 3 000 pregnant women are registered in ANC in Västerbotten each year).

The personal identity number that all Swedish residents have provides potential for linking data collected at different points in time for a certain individual. Links can also be made with national registers containing individual-based data via the Umeå SIMSAM Lab, following ethics approval. Umeå SIMSAM researchers operate a large research programme: *'Microdata research on childhood for lifelong health and welfare'* [123], in which the Salut Programme plays an important role.

Health-promoting interventions during pregnancy and early parenthood

The Salut Programme's health-promoting interventions are tailored for each profession, and are summarised in sector-specific work manuals. Some of the interventions are newly developed within the Salut Programme, and some are developed to strengthen pre-existing interventions. Health counselling in ANC, CHC and dental services is built on the aspects of Motivational Interviewing (MI) [124], which is an evidence-based client-centred counselling approach shown to be effective in treatment of a range of lifestyle-related health problems [125]. Apart from regular health check-ups within ANC and CHC, the counselling in-

cludes healthy lifestyles, such as the importance of physical activity, a healthy diet, a healthy weight and a normal weight gain during pregnancy, and counselling regarding the use of tobacco, alcohol and drugs. Aspects of social support, psychological well-being, parent-child attachment, parenting and parent relationships are also raised during visits. Professionals in ANC and CHC are encouraged to ask all women attending the clinics about men's violence against women and children, and the nurse within CHC performs a screening for postnatal depression (EPDS) [126]. CHC also offers a separate "fathers' visit", and a dental health screening when the child is 10 and 12 months old, respectively, with referral to a dental hygienist in the latter case if necessary. Midwives offer all expectant parents a free visit to dental care, where a dental hygienist provides counselling about dental-specific lifestyle and dental health for those who take up this offer.

The open pre-schools' role is to organise activities to encourage early parent-child attachment, to support parents to establish contacts with each other, linguistic development, to promote healthy eating – partly by providing healthy snacks and beverages at pre-schools – and physical activity in children. The involved professionals also collaborate across sectors; for example in parental support meetings where all four sectors, in different constellations, generally contribute to the agenda. The Salut Programme provides professionals with the opportunity to meet across sectors yearly via specific interactive 'Salut-days', with lectures and group discussions forming part of the agenda. Professionals also meet regularly across sectors in their respective localities, which allows opportunity for discussion of general issues as well as issues related to specific clients (under current rules of confidentiality). The Salut Programme furthermore provides regular input and feedback on performance at internal meetings within each profession. The programme's goal, with a set of sub-goals for each module that the involved sectors work collaboratively towards, is shared for all sectors. A detailed description of these is presented in Table 2, Paper IV. A summary of interventions in the Salut Programme module I – II are presented in Table I, Paper III.

SUBJECTS AND METHODS

Framing contributing papers in stages of development and evaluation

The mutual relationship between papers contributing to this thesis is presented in Figure 6.

This figure is inspired by Nutbeam's model (1998), which indicates six stages of research that are important in developing and evaluating health promotion interventions. These include *problem definition*, *solution generation*, *innovation testing*, *intervention demonstration*¹, *intervention dissemination*, and *programme management* – the last including questions on how the programme can be sustained [60].

The County Council via the Salut Programme has, by the initiating epidemiological surveillance of pregnant women and their partners, facilitated *problem definition*; that is, establishing the public health problems and some of the causes. For the purpose of this thesis, data from the Salut Programme's population-based database was used to explore the prevalence and socio-demographic patterns of overweight and obesity in expectant parents (I). Information was obtained on self-reported weight and height, socio-demographic characteristics as well as couple characteristics. Interviews with first-time parents (II) were undertaken to gain an increased understanding of the target population (*solution generation*), and to explore if the solution was successful (*innovation testing*) by exploring their experiences of health promotion and lifestyle change after being exposed to programme interventions. The first phase of the Salut Programme used pilot areas where interventions were developed jointly by the Salut management team, involved professionals and experts in maternal, child and dental health. Ideas that emerged underwent pilot-tests prior to implementation. Interviews with professionals (III) were undertaken two years following this implementation to explore factors influencing programme sustainability in pilot areas (*programme management*), considering influential factors from the time of *solution generation and innovation testing*; that is, early programme development and onwards. A pre–post survey on professionals' health promotion practices and collaboration was used to measure outcomes of the county-wide implementation that followed after the pilot period (IV) (*intervention dissemination*).

¹ *Intervention demonstration* (i.e. refinement of interventions and implementation approaches), was to some extent carried out in Skellefteå and Norsjö municipalities (Table 3, Phase I). This phase was not studied for the purpose of this thesis.

Information on implementation facilitators and barriers were also obtained on two occasions during programme implementation via a survey consisting of open-ended questions.

This thesis does not attempt to evaluate the whole Salut Programme or even the first two modules that are of focus. Instead, the thesis describes experiences and outcomes from several programme stages that according to Nutbeam (1998) are important to consider in relation to development and implementation of health promotion programmes [60].

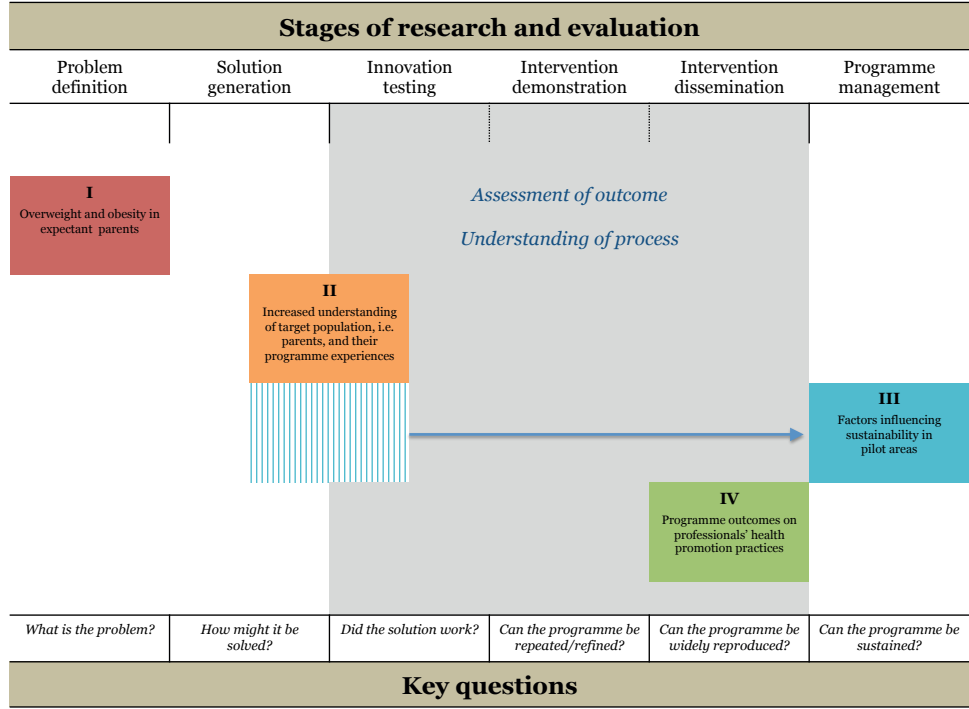


Figure 6: Mutual relationship between contributing papers (I-IV) nested in a model inspired by Nutbeam (1998) [60]

Overview of study aims, subjects and methods

An overview of study aims and the interlinked sub-studies are presented in Table 4.

Table 4: Overview of study aims, subjects and methods

Aim	Study design	Study population	Analysis	Years of data collection	Paper
To explore the prevalence and socio-demographic patterns of overweight and obesity in Swedish expectant parents, and to assess within-couple associations.	Cross-sectional population-based study with questionnaires.	Pregnant women (n=4352) Male partners (n=3949) Västerbotten County. <i>Overall 3356 couples.</i>	Descriptive, correlation and logistic regression analyses.	Jan 2008 – Dec 2011	I
To explore first-time parents' experiences of health promotion and lifestyle change during pregnancy and early parenthood.	Qualitative study based on semi-structured interviews.	First-time parents (n=24), Salut Programme pilot areas, Västerbotten County. <i>Female (n=12), male (n=12).</i>	Qualitative content analysis.	Jun–Dec 2010	II
To explore facilitators, barriers, and requirements for sustainability as experienced by professionals two years after finalising the development and implementation of a multisectoral child health promotion programme in Sweden.	Qualitative study based on semi-structured interviews.	Professionals (n=23), Salut Programme pilot areas, Västerbotten County. <i>Midwives (n=5), child health nurses (n=7), dental hygienists/dental nurses (n=7) and open pre-school teachers (n=4).</i>	Qualitative content analysis.	May – Sep 2009	III
To examine outcomes of a child health promotion programme on professionals' self-reported health promotion practices, and to investigate perceived facilitators and barriers for programme implementation.	Before-after study with questionnaires (quantitative and qualitative).	Professionals (n=144) (baseline) from 13 out of 15 municipalities in Västerbotten County. <i>Midwives (n=33), child health nurses (n=66), dental hygienists/dental nurses (n=21) and open pre-school teachers (n=24).</i>	Wilcoxon Signed Rank Test, McNemar Test, Qualitative content analysis.	Feb 2009 – Apr 2011	IV

Exploring overweight and obesity in expectant parents (I)

Participants

This epidemiological study took advantage of the Salut Programme's population-based database on self-reported health, lifestyle, and living conditions of pregnant women and their partners. Information was obtained on 4352 pregnant women and 3949 of their male partners, comprising 3356 identified couples. All female partners were excluded (n=16). These data were collected from January 2008 to December 2011. Socio-demographic characteristics of the study participants are given in Table 5.

Table 5: Participant characteristics (I) in comparison with selected variables from the general population in Västerbotten and Sweden, respectively

	Pregnant women n=4352	Women, 25-44 years ¹		Expectant fathers n=3949	Men, 25-44 years ¹	
		Västerbotten %	Sweden %		Västerbotten %	Sweden %
Mean age (SD)	29.1 (5.1)			31.6 (6.0)		
Range, years	15-46			14-64		
Education	%			%		
University degree	44.9	40.7	35.5	29.7	25.3	23.8
>12 years	13.6			14.5		
11-12 years (senior high school)	34.8			49.8		
≤9 years	6.8			6.1		
Occupation						
Employed	74.5	79.6	78.1	86.0	81.9	82.0
Studying	11.0			5.5		
Parental leave, unpaid domestic work	6.1			1.5		
Unemployed	7.1			5.8		
Sick leave, retirement	1.3			1.1		
Area of residence						
Urban	73.7			74.1		
Rural	26.3			25.9		
Country of birth						
Sweden	90.9			91.0		
Other	9.1	13.8	23.2	9.0	12.7	21.9
Cohabitation with expectant father	94.8			-		

¹Statistics Sweden [100]

The sample was largely representative of the general Swedish population with regards to mean age, mean BMI of pregnant women [127], and the prevalence of overweight in expectant fathers (compared to Swedish men aged 30-44 years) [4]. However, participants in this study had on average a higher level of education than the general population aged 25-44 in Västerbotten and Sweden, and were less likely to be born outside Sweden (Table 5).

This group of participants were largely unexposed to the Salut Programme interventions at the time of data collection, except for those who had previous pregnancies after the Salut Programme was implemented (see timeline, Table 3).

Methods for data collection

Data was collected via questionnaires that included self-reported data on socio-demographic variables including education, occupation, country of birth, cohabitation status (pregnant women only) and variables on physical activity, diet, weight (for women prior to pregnancy and current), height, use of alcohol, tobacco and drugs, satisfaction with the life situation, sleeping habits, perceived stress, social support, self-rated health and dental health, and intimate partner violence (pregnant women only). The questionnaires and their development have been described in more detail elsewhere [128]. English versions of the questions used in the study are presented in Appendix 1. Questionnaires were mailed out by midwives to pregnant women and their partners prior to their enrolment visit in ANC, and returned on the day of the appointment by the expectant parents, with a 55% response rate for pregnant women and 50% for partners.

Study variables

Dependent variable

BMI was calculated using self-reported weight and height, and the established classification of underweight (BMI <18.5), normal weight (BMI 18.5-24.99), overweight (BMI 25.0-29.99) and obesity (BMI ≥ 30.0) was used [129]. Information was obtained on pregnant women's current weight at enrolment as well as their weight just prior to pregnancy. However, the pre-pregnancy weight was used in this study, as this was expected this to give a more accurate picture of the current situation in relation to overweight prevalence in women.

Independent variables

Education, occupation, area of residence, country of birth, and cohabitation status (pregnant women only) were used as independent variables. Locations of the ANC clinics where the expectant parents were enrolled were used as a proxy for area of residence, and the variable was dichotomised in to 'rural' and 'urban'.

Expectant parents who were enrolled at ANC clinics located in the county's two largest cities, Umeå and Skellefteå, with a population density of 2 300 and 1 500 people respectively, per km² [100], were defined as living in urban areas. Those enrolled at ANC clinics located in all other areas were defined as living in rural areas.

Methods for data analyses

The analyses included descriptive statistics, parametric and non-parametric analyses to compare groups, and analyses to explore relationships between variables.

Analyses to compare groups

The independent samples t-test was used to compare mean age and BMI of pregnant women and expectant fathers. The Chi-square test was used to explore the relationship between gender and socio-demographic variables, but also to explore if the proportion of expectant women that were underweight, normal weight, overweight and obese were the same as the proportion of expectant fathers, and to explore the association between overweight/obesity and all independent study variables. Yates' Correction for Continuity was used in analyses where both variables were dichotomous to compensate for an overestimation of the chi-square value [130].

Analyses to explore relationships between variables

Correlation analysis, with different subsets of techniques, was used to explore the strength and direction of the relationship between variables. Spearman rank order correlation was used to explore within-couple associations of BMI as the data were not normally distributed [130].

Logistic regression analysis was used to estimate the impact of independent variables on the dependent variable (overweight/obesity) [130]. As this analysis provide Odds Ratios (OR), it was possible to compare the relative odds of the outcome (overweight/obesity), in relation to one or several independent (predictor) variables (educational status, area of residence, etc.) [131]. Multiple logistic regression was used to assess the relative contribution of the independent variables while adjusting for variables that could influence the dependent variable [131].

Odds Ratios (OR) and their confidence intervals (CI) were estimated for the following associations: within-couple associations of overweight and obesity (crude); associations between socio-demographic factors and overweight/obesity (crude

and adjusted for the influence of age, education, occupation, and area of residence); and associations between eight different combinations of dichotomised socio-demographic factors and overweight/obesity (age adjusted) (page 41, Table 11).

All variables in the last regression analysis were dichotomised, and data from pregnant women and expectant fathers were analysed together. This decision was based on extensive preliminary analyses that showed parallel patterns of associations between the independent and dependent variables for the pregnant women and expectant fathers. The reference population in all regression analyses was participants with BMI < 25. No interactions were found for independent variables in relation to BMI. Statistical significance was defined as $p < .05$ or a confidence interval (CI) excluding 1.0. SPSS statistics software (version 19) was used in all analyses.

Exploring parents' and professionals' experiences of health promotion (II, III)

Participants

Two different sampling strategies were used to recruit first-time parents and professionals. First-time parents were recruited using a convenience sampling strategy [132], using nurses at the CHC centres in the pilot areas to ask eligible parents for participation at their child's 18-months appointment at the CHC centre. Nurses provided parents with written information about the study, and those who agreed to participate were contacted by telephone. This generated a sample of 24 participants (12 couples), recruited between June and December 2010. Inclusion criterion was being a first-time parent to a child aged 18 months. Nine parents declined participation, and no demographic characteristics were obtained for them. Parents' ages ranged between 25 and 46 years. One-third of the couples resided in suburbs, one-third resided in small towns, and one-third in villages or rural areas. About half (11 of 24) of the parents had a university degree. Recruited parents were also diverse in relation to their lifestyles, including physical activity and use of tobacco and alcohol. Almost half of the mothers were pregnant with their second child. The mothers had attended most scheduled visits in ANC and CHC. All fathers had been visiting ANC and CHC at least once, with higher participation in ANC. A majority of both mothers and fathers had been visiting open pre-schools, while only a few mothers and fathers had been visiting a dental hygienist during pregnancy.

The recruitment of professionals differed to that of first-time parents in that all professionals in pilot areas were recruited to participate in the study. This generated a sample of 23 participants. The inclusion criterion was being on active service in ANC, CHC, dental services or open pre-schools in the Salut Programme pilot areas. Recruitment took place between May and September 2009 and the professionals were contacted via telephone. No-one declined participation. The sample consisted of females only, with mean ages in ANC, CHC and open pre-schools ranging between 53-57 years. Professionals in dental services were younger, with a mean age of 39 years. Most participants had extensive work experience.

Methods for data collection

Data were obtained via semi-structured interviews. This meant using an interview guide to allow for flexibility in the interview situation while ensuring that the same sets of topics were discussed with all participants [132]. The interviews took place in the home of parents, or at the professionals' workplaces, and they lasted between 23 and 58 minutes. All interviews were undertaken individually, except for one interview with two professionals who requested to be interviewed simultaneously. One parent interview was undertaken in English on request. Interview guides were developed by the research team, and all interviews were digitally recorded. An overview of key domains in the interview guides is presented in Table 6.

Table 6: Overview of key domains in interview guides (II, III)

Key domains in interview guides	
II	III
First-time parents were asked questions in relation to the following topics ¹ :	Professionals in the Salut Programme pilot areas were asked to describe and reflect on the following:
- Their experiences from ANC, CHC, dental services, and open pre-schools (including childbirth and parenthood classes within ANC and CHC)	- Their experiences of participating in the Salut Programme development process
- The involvement of mothers and fathers in each sector	- The current situation in their work place in relation to the Salut Programme activities
- Experiences of health promotion initiatives in each sector	- Facilitators and barriers for compliance to the Salut Programme
- Perceptions of own and families' health and lifestyles	- General views on important requirements for continuous development and sustainability of the Salut Programme
- Changes of lifestyle from start of pregnancy to current date	- Other thoughts and reflections in relation to the above topics
- Reasons behind and barriers for lifestyle change	
- Sources of health information	
- Experiences of the Salut Programme including involvement in programme specific interventions	
¹ All questions covered the time from start of pregnancy to the time for the interview. Additional probing questions were used to encourage parents to elaborate their responses and narratives.	

Demographic data were obtained from informants during the interviews, and the interviewer's reflections were captured in writing following the interviews. About 30 participants were aimed for in the planning stage of the study involving first-time parents (II). However, an assessment was made after the first 20 interviews, and although data was rich, a few more interviews were undertaken in order to ensure that no new topics emerged. Further informant recruitment was stopped after 24 interviews as no considerable new information arose during the last interviews.

Methods for data analyses

Data from both studies were analysed using qualitative content analysis, which is a commonly used method in qualitative research, used for analysis of data obtained from interviews, open-ended survey questions, documents, or observa-

tions [133]. Hsieh and Shannon define content analysis as “a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns”[133]. The analytical approaches within the method can vary, for example from the ‘conventional’ approach — an inductive approach generally used to describe phenomena for which the existing literature is limited or when existing theories are lacking — to a more directive approach when a knowledge base exists but needs to be validated or extended [133].

Qualitative content analysis with an inductive approach was used in analysis of all interview data (II, III) [133, 134]. Interviews were transcribed verbatim, and read several times to get a holistic understanding of the content. Ideas and concepts that emerged during this process were noted. The interviews were then coded; and codes with shared meaning were grouped into content areas, and subsequently abstracted into sub-categories and categories, or themes. Codes for males and females were separated (II). Content of the categories/themes was compared with the transcribed data as well as between researchers to secure trustworthiness of the analysis [134]. Uncertainties in coding and interpretation were discussed between the authors until consensus was achieved. The analysis process is illustrated in Table 7.

Table 7: The analysis process (II and III) illustrated by an example of moving from text to codes, subcategories, categories¹ and themes²

Text	Code	Sub-category	Category/ Context level	Theme
<i>I kept away from snuff³ as long as I was breast-feeding. But when I stopped breastfeeding, it didn't take long before I was hooked again.</i> (Mother)	Quitting snuff while breastfeed- ing Resuming snuff after breastfeed- ing	Relapse after pregnancy and breastfeeding	Feeling no urgency to prioritise own health	Experiencing healthy lifestyle promotion without own lifestyle change
<i>Well, it is certainly difficult to find motivation. It would be different if a doctor told me that 'You've got a problem with your cholesterol' but, as long as I feel good....</i> (Father)	Difficult to find motivation I feel good	Feeling strong and healthy		

¹ The main category is rather a context level than a category in Paper III

² Themes were only used in Paper II

³ Smokeless tobacco, placed between the cheek and gum

Following analyses of interviews with professionals (III), the proportion of participants contributing to each category was counted, and the categories were sorted into a theoretical scheme, inspired by Groh and Wensing [84]. This scheme

was based on the following contextual levels: 1) the innovation, 2) the individual professional, 3) the patient, 4) the social context, 5) the organisational context, and 6) the economic and political context. The software Open Code 3.4 was used in coding and categorising data for this study [135].

Exploring programme outcomes and factors influencing implementation (IV)

Participants

All professionals in 13 out of 15 municipalities in Västerbotten that were involved in the second and third phases of the Salut Programme implementation (Table 3) were invited to participate in the study (n=144 pre-implementation). The inclusion criterion was being on active service in ANC, CHC, dental services or open pre-schools in one of the 13 municipalities. The recruitment generated a sample of 134 participants. All data collection took place between February 2009 and April 2011. Participant characteristics are shown in Table 8.

Table 8: Participant characteristics (IV)

Professional group	Age		Work experience	
	Mean, years	Range	Mean, years	Range
Midwives (n=30)	52	32-63	15	2-37
Child health nurses (n=60)	52	36-65	14	0-33
Dental hygienists/dental nurses (n=20)	44	23-60	19	2-40
Open pre-school teachers (n=24)	49	24-60	8	1-25

Methods for data collection

Study participants were approached by two self-administered questionnaires. *Questionnaire No 1* was mailed out to participants and it aimed to measure changes in health promotion practices and collaboration from pre- to post- implementation as well as participant characteristics. *Questionnaire No 2* was administered at two of the four seminars during the Salut Programme implementation and it aimed to obtain information on implementation facilitators and barriers.

Questionnaire No 1 consisted of a set of close-ended questions [136] on current health promotion practices, knowledge and attitudes in relation to lifestyle counselling, and extent of collaboration between sectors. Questions were inspired by

the WHO Collaborative Study Questionnaire for GPs [137], but were adjusted to fit the study context and developed to allow for evaluation of change in health promotion practices following Salut Programme implementation by reflecting the intended programme goals. The questionnaire items are listed in Table 9.

Table 9: Questions and response alternatives, *Questionnaire No I* (IV)

Question	Response alternatives	Sector
- Consider your 10 latest clients at your clinic (target modified by professional group). With how many of these have you raised each of these topics? (See Table 3, Paper IV for sector-specific topics).	No client, less than half of the clients, half of the clients, more than half of the clients and all clients.	ANC, CHC, and dental services.
- To what extent do you use Motivational Interviewing [124] in lifestyle counselling? (Question modified to fit each professional group).	Never, seldom, sometimes, often and always.	ANC, CHC, and dental services.
- To what extent do you offer new mothers EPDS-screening [126] when the child is 6-12 weeks old?	Never, seldom, sometimes, often and always.	CHC
- To what extent do you offer a separate visit for fathers during the child's first 18 months?	Never, seldom, sometimes, often and always.	CHC
- How often are outdoor activities offered during families' visits at the open pre-school?	Never, seldom, sometimes, often and always.	Open pre-schools
- How often are children offered activities encouraging physical activity?	Never, seldom, sometimes, often and always.	Open pre-schools
- What kind of snacks and beverages are usually provided at the pre-school?	A tick box was provided for a variety of snacks and beverages.	Open pre-schools
- To what extent do you collaborate with persons in following sectors? (Each sector named)	Not at all, to a very small extent, to a relatively small extent, to a large extent and to a very large extent.	ANC, CHC, dental services and open pre-schools.

It was sent to participants prior to the first seminar well in time to allow for the reminder process (two mailed reminders and one phone call), and a second time approximately 4-6 months following programme implementation. Movie tickets were sent to participants as soon as they returned the questionnaires. Response rates were 93% pre-implementation and 81% post-implementation.

The main reason for loss to follow up (n=25) were change of employer, retirement or sick leave (Figure 7).

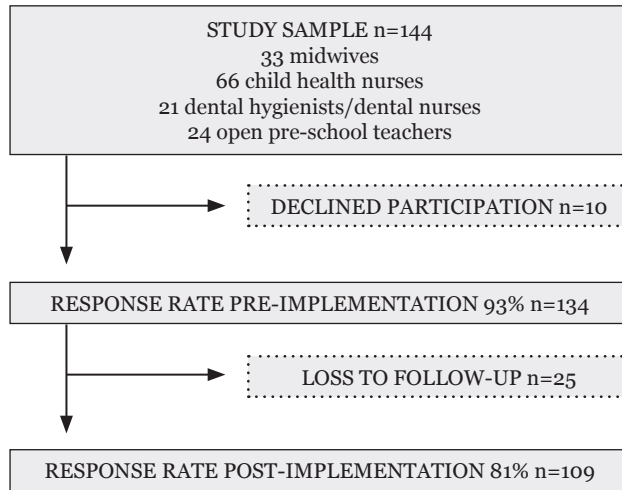


Figure 7: Recruitment and response rates (*Questionnaire No I*)

Questionnaire No II consisted of 16 open-ended questions [136] on implementation facilitators and barriers, inspired by the levels-framework of Grol and Wensing [84]. Professionals were asked to describe their workplace's precondition for programme implementation, and then about perceived implementation facilitators and barriers in relation to: the programme content and implementation process; situation, routine and practices of work; clients; immediate organisational environment (colleagues, managers/directors, working climate etc.); collaborating actors; organisational preconditions (structure, resources, administration etc.) and current activities in the society. In a final question, they were given the opportunity to add other information of importance. The anonymous questionnaire was administered to all professionals attending seminars no. 2 and 4 during the Salut Programme implementation. Professionals were given 20 minutes to write their responses. They were only asked to state their profession; no other identifying information was obtained. Response rates for *Questionnaire No II* were 96% (n=142) and 85% (n=98) at the two occasions respectively.

Methods for data analyses

The analyses included descriptive statistics, non-parametric techniques for analysis of repeated measures (pre-post implementation), and qualitative techniques for analysis of free-text answers from surveys.

Non-parametric techniques for analysis of repeated measures

The Wilcoxon Signed Rank Test was used to analyse changes in health promotion practices and changes in the extent of collaboration as all these outcome measures were based on ordinal data [130]. The McNemar Test was used to compare paired proportions in dependent samples [138], that is, to explore changes in open pre-schools' supply of snacks and beverages from pre- to post- implementation. Both tests used required exclusion of those who did not respond to the survey both pre- and post-implementation. Statistical significance was defined as $p \leq .01$ to minimise the risk of type I errors due to multiple comparisons. SPSS statistics software (version 19) was used in all analyses.

Analysis of free-text answers

Data from free-text answers were analysed using qualitative content analysis [133]. All answers were initially read through to facilitate a sense of the whole and also the diversity in responses. Concepts relating to facilitators and barriers were then identified and documented, subsequently sorted into broad topic areas, then abstracted into categories. Parallel coding of random sections of the free-text answers was undertaken by one of the co-authors, and compared. Deviating interpretations were discussed between the two authors, which resulted in slight revisions of categories and a re-examination of all free-text answers. The final categories were sorted according to the levels framework inspired by Grol and Wensing [84], including levels of the innovation, the individual professional, the client, and the social, organisational and the economic and political context. The number of professionals contributing to each category was counted.

Ethical considerations

All studies were carried out in compliance with the ethical principles presented in the Helsinki Declaration. Ethics approval was obtained from the Ethics Review Board of Umeå University, Sweden for all studies (Ref. Paper I and II: 2010-63-31M; Paper III and IV: 08-168Ö). All study participation was voluntary and based on informed consent. All personal information in the Salut initiative is processed in accordance with the Personal Data Act (SFS 1998:204). Study participants in Paper I were provided written information about the Salut initiative, the use of health forms for research purposes, and storage of data (Appendix 1). Study participants in Paper II, III and IV were provided written information about the study aims and procedures. Informed consent was obtained verbally prior to interviews (Paper II and III). Participant confidentiality has been prioritised in reporting of study findings.

MAIN FINDINGS

Overweight and obesity in expectant parents (I)

The main findings from Paper I were that the prevalence of overweight and obesity was high, and that the likelihood of being overweight or obese increased relative to partner's overweight and obesity. A socio-demographic gradient was also found, especially in relation to obesity.

Prevalence of overweight and obesity in expectant parents and in couples

Findings from Paper I indicated that 29% of the women (pre-pregnancy) and 53% of the expectant fathers reported weights and heights that implied overweight or obesity, that is, a BMI between 25.0-29.99 or ≥ 30.0 . Furthermore, overweight and obesity (BMI ≥ 25.0) was identified in the majority of couples, that is, in at least one of the two partners (Figure 8).

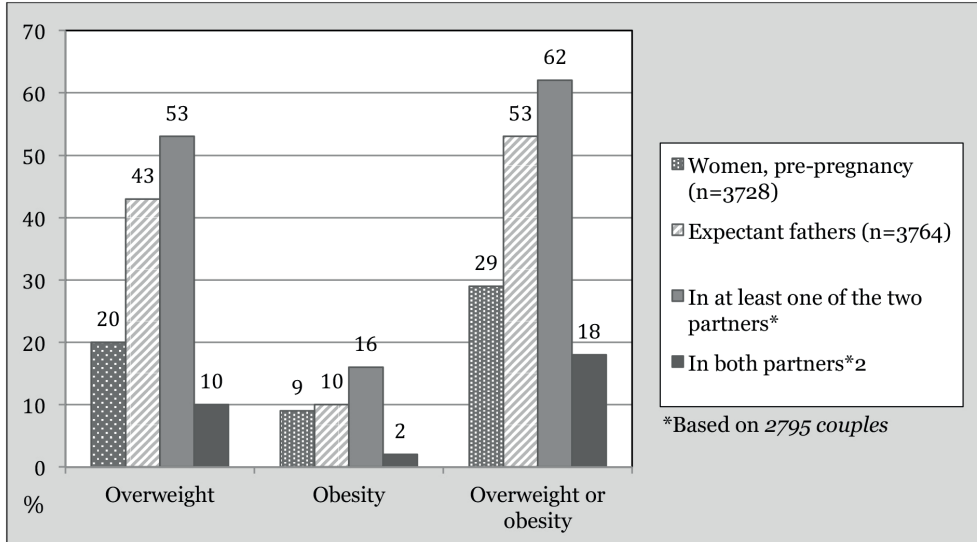


Figure 8: Prevalence of overweight and obesity in expectant parents and in couples in Västerbotten, Sweden

Within-couple associations of BMI, overweight and obesity

A positive partner correlation for BMI was found (Spearman's $\rho=0.21$, $p=.000$), and further analyses showed that pregnant women who had overweight or obese partners were more likely to be overweight or obese themselves (Table 10).

Table 10: Likelihood of overweight and obesity in pregnant women in relation to partner weight

	Pregnant women ¹	
	Odds ratio for overweight (95% CI) ²	Odds ratio for obesity (95% CI)
	n=2552	n= 2233
Expectant fathers		
Normal weight ³	1.0 -	1.0 -
Overweight ⁴	1.6 (1.3-2.0)	1.8 (1.3-2.5)
Obesity ⁵	2.8 (2.0-3.9)	6.2 (4.2-9.3)

¹Analyses based on women's pre-pregnancy BMI

²Statistical significance was defined as a confidence interval (CI) excluding 1.0

³BMI <25.0 (including underweight)

⁴BMI 25.0-29.99

⁵BMI ≥30.0

Socio-demographic patterns

When examining the socio-demographic patterns of overweight and obesity, it was found that level of education, occupation, and area of residence (both genders), were significantly associated with BMI, while country of birth (both genders) or the pregnant woman's cohabitation status did not show any significant association. The likelihood of obesity increased inversely with level of education; thus, pregnant women and expectant fathers with short education (≤ 9 years) were almost three times and two times as likely, respectively, to be obese compared to those with a university degree. Those unemployed, on sick leave or retired in both genders were also significantly more likely to be obese compared to those in employment. Furthermore, living in rural areas doubled the likelihood of obesity compared to living in urban areas. The socio-demographic patterns were not as consistent in the overweight category (see Table 5, Paper I for further details).

When analysing the cumulative influence of the socio-demographic variables education, occupation, and area of residence on overweight and obesity, a step-wise gradient in likelihood for obesity was found among those with less than university education (Table 11). The least advantaged group, that is, those with less than university education, unemployed, on sick leave or retired, and living in rural areas, were more than seven times as likely to report obesity compared to those with a university degree, in employment and living in urban areas.

Table 11: Likelihood of overweight and obesity in relation to different combinations of socio-demographic risk factors

Education	Occupation	Area of residence	OR ¹ Overweight ² (95% CI) ⁴	OR Obesity ³ (95% CI)
University degree	Employed, studying, parental leave, unpaid domestic work	Urban	1.0 -	1.0 -
		Rural	1.4 (1.1-1.8)	1.7 (1.1-2.8)
	Unemployed, sick leave, retirement	Urban	1.1 (0.6-2.0)	3.0 (1.5-6.2)
		Rural	0.8 (0.2-2.8)	1.2 (0.2-9.7)
Below university degree	Employed, studying, parental leave, unpaid domestic work	Urban	1.8 (1.5-2.1)	2.0 (1.5-2.6)
		Rural	2.2 (1.9-2.7)	4.0 (3.0-5.4)
	Unemployed, sick leave, retirement	Urban	2.3 (1.6-3.2)	4.8 (3.0-7.6)
		Rural	1.6 (0.9-2.6)	7.2 (4.1-12.4)

¹Age adjusted Odds Ratio. Data from pregnant women and expectant fathers were analysed together, and the analyses were based on women's pre-pregnancy BMI

²BMI 25.0-29.9

³BMI ≥30.0

⁴Statistical significance was defined as a confidence interval (CI) excluding 1.0

Experiencing health promotion and lifestyle change (II)

The main findings from analysis of interviews with first-time mothers and fathers were that parents primarily made lifestyle changes to secure the health of the fetus during pregnancy, and to create a healthy environment for the child when growing up. Their own health per se was not described as highly prioritised during pregnancy and early parenthood.

Most mothers reported that they recognised the Salut Programme and associated the programme with a range of health-promoting activities, whereas most fathers did not and few had participated in the specific programme component directed to them; a fathers' visit in CHC. Furthermore, mothers and fathers reported they did not receive any particular information on parental health and lifestyle from the involved sectors, except for the promotion of a healthy lifestyle in relation to pregnancy, and of child health in CHC, which were parts taken for granted by parents.

Two key themes emerged during analysis: ‘Experiencing healthy lifestyle promotion without own lifestyle change’, and ‘Offspring’s health as a primary incentive for lifestyle change’. The themes, with their categories and sub-categories, are presented in Table 12. The main findings are summarised below.

Table 12: Themes, categories and subcategories describing parents’ experiences of health promotion and lifestyle change during pregnancy and early parenthood

Themes	Categories	Sub-categories
Experiencing healthy lifestyle promotion without own lifestyle change	Encountering superficial health promotion	<p>Healthy lifestyle is common knowledge</p> <p>Experiencing lack of parental attention when entering CHC</p> <p>Experiencing health promotion advice as too directive</p> <p>Appearing healthy means no questions and advice</p>
	Facing prevailing traditional gender roles	<p>As partner being the third person of interest</p> <p>Perceiving ANC and CHC as ‘women’s business’</p>
	Feeling no urgency to prioritise own health	<p>Feeling strong and healthy</p> <p>Ranking risks and postponing lifestyle change</p> <p>Relapse after pregnancy and breast-feeding</p>
Offspring’s health as a primary incentive for lifestyle change	Securing the health of the fetus	<p>Avoiding fetal risk exposure</p> <p>Adhering to guidelines on healthy living</p> <p>Taking shared or single responsibility</p>
	Providing a health-promoting environment for the child	<p>Being a role model</p> <p>Changing daily routines and own lifestyle</p>
	Setting priorities for own health	<p>Maintaining a healthy lifestyle to avoid adverse outcomes</p> <p>Facing barriers to healthy living</p>

Experiencing healthy lifestyle promotion without own lifestyle change

The first theme portrayed aspects of parents' experiences of health promotion, in relation to interactions with health professionals/health care including gender aspects, views of own health risks, and reasoning about lifestyle change.

Discussing health and lifestyles in relation to the pregnancy in ANC, and in relation to the health of the child in CHC, were experienced as natural and important by parents. However, they did not experience obtaining any new information, and the concept of 'healthy living' was perceived as general knowledge. While parents experienced promotion of healthy lifestyles in relation to the pregnancy in ANC, they described a shift in focus when the child was born, and felt that their own health and wellbeing received very little attention in CHC. Many fathers, but also some mothers, described experiences that men were being treated as somewhat unimportant in the ANC and CHC settings, which resulted in some men feeling less involved. On the other hand, they described how their sense of participation increased when professionals in ANC and CHC directed their attention equally to both parents. Most parents perceived themselves as being healthy and having healthy lifestyles, even though many admitted they would probably benefit from changes. However, consequences of 'unhealthy living' did not seem to raise concern with regard to their own health, and some parents stated that adverse effects would be reversible if they took up a healthier lifestyle further on. Some mothers described that they relapsed to pre-pregnancy lifestyles after pregnancy and breastfeeding, which indicates that the health of the offspring was a much higher priority than their own health.

Offspring's health as primary incentive for lifestyle change

The second theme largely depicted parents' incentives for lifestyle change, and changes made, during pregnancy and the early parenthood period.

Women's incentives for lifestyle change during pregnancy were strongly linked to perception of risks to the fetus. Mothers described high adherence to dietary guidelines and recom-

“

I think it mirrors the way of thinking in antenatal care, that men are, we're not really part of the game....

(Father)

When it's only about yourself, then, I'm less concerned. But, our child has encouraged us to be more careful because we want her to have a healthy diet. And if she is to have a healthy diet, she must see that we do too. So that has helped us to become healthier as well.

(Mother)

Well, it's his child too. It's me who was pregnant but we were pregnant. That's how we looked at it, that WE were pregnant.

(Mother)

I don't know how to express myself, but I don't feel urgently in need of changing anything... [laughs].

(Father)

”

“

I kept away from snuff as long as I was breastfeeding. But when I stopped breastfeeding, it didn't take long before I was hooked again.

(Mother)

My partner wasn't allowed to eat just anything during pregnancy. She was told to be careful with freshwater fish and things like that. To keep a balanced diet, and to avoid alcohol and smoking.

(Father)

”

mentations, and saw avoidance of alcohol and snuff (tobacco) as obvious during pregnancy and breastfeeding. The importance of adherence to dietary guidelines was reinforced by fathers during the interviews. They also seemed up to date and could repeat specific dietary recommendations, in particular about toxins and infectious agents in specific foods, even though interviews were undertaken 18 months after the birth of the child. While a few women mentioned receiving recommendations on weight gain in pregnancy, in general parents did not reflect on maternal or fetal risks associated with overweight and obesity. Some parents saw the pregnancy as a shared responsibility, something perceived as facilitated by joint visits to ANC, and some men described making own dietary changes primarily to support the woman's adherence to dietary recommendations. Parents described that when becoming parents, they reflected on how their lifestyle could influence the health of the child when growing up, and they saw their own behaviours as strongly linked to the behaviours their children would adopt. Incentives for being a role model, and creating an overall health-promoting environment, were thus described to be strong. Putting more emphasis on regular meals, increasing the intake of vegetables, reducing the intake of junk food, and limiting 'screen time' were examples of changes made. Some parents described how they tried to maintain a healthy lifestyle also to promote their own health, but barriers such as time constraints, tiredness, distance to sports facilities, and the cold climate in northern Sweden were mentioned as limiting opportunities to make healthy choices.

Changing and sustaining health promotion practices (III and IV)

The analysis of qualitative interviews with professionals in pilot areas two years post-implementation indicated that the programme was sustainable at most pilot sites, with high adherence to programme activities, except in CHC where few professionals reported fully carrying out programme interventions (III). This latter finding was consistent with the parents' experiences from pilot areas, in particular in relation to the reporting that few fathers recognised the programme and had been invited to 'fathers' visits', an indication of low adherence to programme activities in CHC

(II). Results from the pre-post implementation survey undertaken during the county-wide dissemination and implementation of the programme showed improvements in health promotion practices across sectors, as well as improved cross-sectoral collaboration (IV). A number of facilitators, barriers and requirements for programme implementation and sustainability were described in relation to intervention, individual, and context characteristics (III, IV).

Facilitators and barriers for programme implementation and sustainability

The analysis of qualitative research interviews (III) and free-text answers to open-ended questions (IV) revealed a number of facilitators and barriers for programme implementation and sustainability in relation to intervention, individual, and context characteristics. The perception of factors influencing programme implementation and sustainability were to a large extent shared across sectors, and also to a large extent consistent between the two studies. However, they were also reflected in the two implementation approaches with high and low degrees of freedom to influence the programme content and adapt interventions to local circumstances.

While most facilitators related to the intervention and the social context, the analysis revealed some major barriers at the social, organisational, and economic and political levels (III and IV). The main facilitators and barriers for programme implementation and sustainability are given in Table 13, and the most important factors will be commented on below.

Table 13: Main facilitators and barriers for programme implementation and sustainability summarised in a levels framework inspired by Grol and Wensing¹ [84]

Level	Facilitators	Paper III/IV	Barriers	Paper III/IV
Innovation/ Intervention	Clear programme branding	III	Not suiting the needs of disadvantaged groups	III
	Having time to develop strategies	III	Similar to approaches already present at the work place	III
	In line with existing work routines, easily integrated	II, IV	Time consuming	III, IV
	Involvement in programme development	III	Topics/questionnaires intrusive and extensive	III, IV
	Perceived as relevant	III, IV		
	Shared vision and goals	IV		
	Support from process consultants	III		
	Work manuals/questionnaires	III, IV		
Individual	Positive towards interventions (professionals/parents)	III, IV	Competing work tasks	IV
	Positive towards lifestyle change (parents)	IV	Content of parent meetings unpopular (parents)	III
			Lack of motivation (professionals)	III
			Lack of motivation or resources for change (parents)	III, IV
			Programme goals found unrealistic (CHC)	III
Social context	Cross-sectoral collaboration	IV	Collaborative partners missing	IV
	Managerial support	III, IV	Difficult to start or maintain collaborative relations	IV
	Positive colleagues/working climate	IV	Insufficient managerial support	III, IV
	Regular meetings	III	Insufficient support from physicians or other colleagues	IV
Organisational context	Geographical proximity for collaborators	III, IV	Geographical distance to collaborators	IV
			Insufficient work facilities or supplies	IV
			Workload/lack of time and resources	III, IV
			Conflicting incentives for performance	III, IV
Economic and political context			Threat of cutbacks	III

¹Presented in alphabetical order under each level

Facilitators

Professionals' involvement in programme development was described as important for programme sustainability in pilot areas (III). Learning seminars and small-scale testing of interventions were commonly described to facilitate operationalising visions and goals to feasible interventions. Also, being given power to influence programme development led to a sense of 'ownership', contributing to programme sustainability.

The brand 'Salut' emerged as a somewhat unexpected topic in discussions on facilitators and barriers in pilot areas (III). The name of the programme, and also its purposes, was, according to some professionals, often recognised by parents after an initial introduction in ANC. It was also described as facilitating discussions on sensitive topics, as professionals could refer to the standardised programme interventions. It also made the professionals identify themselves as part of a team and a larger initiative.

Besides collaboration between sectors, which was a frequently mentioned facilitator among all professional groups in the county-wide implementation of the programme (IV), the use of work manuals was depicted as a key facilitator in both studies (III, IV). The manuals were described to facilitate a standardised way of working, and to enable professionals to raise uncomfortable topics for discussion (III, IV).

Barriers

The most commonly described barriers were workload, shortage of time and resources, and insufficient involvement and support from managers and colleagues. The child health nurses in pilot areas described the comprehensive interventions designed for CHC difficult to adhere to, as the sector already was resource constrained (III). This was consistent with reports from CHC nurses in the county-wide implementation areas, as they described competing goals, demands and work tasks as among the main barriers to implementation (IV). The demographic information about study participants revealed that 93% of the child health nurses had work tasks other than CHC (IV). This barrier was also re-

“

We have built this on our own. It had empty spaces, lacked a basic programme, had nothing like this. It is ours, definitely ours.

(Open pre-school teacher, III)

Well-documented work manuals are important; it is essential that new employees, regardless of the place and profession, easily can get information on how we work.

(Dental hygienist, III)

'It is very difficult from the grass root level to tell [the managers] that this requires time'

(Child health nurse, III)

”

ported from ANC and dental services. The difficulties of starting and maintaining cross-sectoral collaboration, partly because of absence of collaborating partners, were frequently mentioned in free-text answers during the county-wide implementation of the programme (IV). Geographical distance between collaborators was also described as an important barrier (III, IV). Another main barrier in both studies was that topics discussed during counselling, and questionnaires for epidemiological surveillance, could be experienced as too extensive or sensitive/extensive by expectant parents and parents. The lack of motivation and interest among parents were also mentioned. Professionals in dental services reported lack of, or conflicting, financial incentives as they felt pressured to generate money by treating adults, while in the Salut Programme expectant parents were offered a free visit (III, IV). This conflicting incentive for performance posed a major barrier for long-term sustainability according to the professionals, even though high level of adherence to programme interventions was described at the time for the interviews in pilot areas (III). Despite this barrier, dental health care was also the sector that stood out in terms of significant improvements in health promotion practices and collaboration in the county-wide implementation of the programme (IV). Insufficient work facilities and supplies were a commonly reported barrier in open pre-schools (IV), as their work environments were not optimal for programme interventions to be carried out (e.g. no safe outdoor environments).

(For further details on facilitators and barriers to programme implementation and sustainability, see Table 3, Paper III, and Table 7-8, Paper IV).

Effects on professionals' health promotion practices and cross-sectoral collaboration

Health promotion practices and collaboration were improved to some extent in all sectors at follow-up of the county-wide implementation of the Salut Programme (IV).

Changes in professionals' health promotion practices

The following significant changes in self-reported health promotion practices were found: various lifestyle topics were to a larger extent raised with parents/clients in CHC and dental services; issues related to men's violence against women were to a larger extent raised with pregnant women in ANC; motivational Interviewing [124] was more frequently used as a counselling style in CHC; fathers were more often invited to separate fathers' visits in CHC; and the supply of healthy snacks and beverages were improved in open pre-schools.

Changes in cross-sectoral collaboration

Collaboration significantly increased in several cross-sectoral constellations. All professional groups reported significantly increased collaboration with dental services, consistent with the reports by dental hygienists/dental nurses. Most midwives and child health nurses reported a high degree of collaboration with each other at both measurement points.

DISCUSSION

Summary of main findings

The prevalence of overweight and obesity among expectant parents in Västerbotten County was found to be high, which may indicate that adherence to national recommendations on healthy lifestyle in this population is low. Interviews with first-time parents indicated that the parents' own health per se was not being of high priority during pregnancy and early parenthood. However, wanting to secure the health of the fetus in pregnancy and create a healthy environment for the child during upbringing emerged strongly from both mothers and fathers. Follow-up of implementation of the programme's first age-modules, targeting expectant parents (and the fetus) and children aged 0-1 ½ years, indicated sustainability in pilot areas two years post-implementation, although professionals in CHC described lower level of adherence to programme activities than other sectors involved. The dissemination of the programme, from pilot areas to county-wide implementation, showed improvements in health promotion practices and cross-sectoral collaboration in all sectors. A number of factors perceived by professionals as facilitating or hindering programme implementation and sustainability were described. In summary, these results show the challenges—and opportunities—of innovation, implementation and change within a multidisciplinary health promotion initiative aimed at improving the health of young county citizens and their parents.

General discussion

Public health consequences of overweight and obesity

The high prevalence of overweight and obesity found among expectant parents (I) implies that a considerable part of this population faces an increased risk of several adverse health outcomes. These include but are not limited to consequences on maternal outcomes during pregnancy, delivery and in the postpartum period [35-39, 41], and long-term consequences in both genders such as risk for cardiovascular disease, diabetes, musculoskeletal disorders and cancer [19]. The high prevalence of overweight and obesity also has intergenerational consequences, as offspring of overweight or obese mothers and fathers are at increased risks for adverse health outcomes from fetal life throughout the life course [21-24, 39-42, 139-142]. Thus, stronger action is needed in public health, and more innovative approaches are urgently needed as strategies used so far have shown to be unsuccessful in reversing the trend on a larger population level. It seems clear

that structural and environmental factors need considerably more attention in this effort [20]. Apart from individual level benefits, a reversal of the obesity epidemic would reduce the economic burden to society [31, 32, 143].

Overweight and obesity in pregnancy – are people aware of risks?

Despite the fact that overweight is a major public health concern globally and in Sweden, with high prevalence also in the pregnancy population, risks associated with overweight and obesity were scarcely mentioned in interviews with first-time parents (II). This was somewhat interesting considering that both mothers and fathers to a high extent brought up other risks during interviews, mainly those associated with tobacco, alcohol, and risks related to toxins and infectious agents in specific foods. Both mothers and fathers took action to avoid such risks in order to secure the health of the fetus, with the highest perceived risk promoting the easiest change. These findings may be interpreted in various ways. One possible explanation may be related to the health and lifestyle characteristics of the participants. Although they reported a variety of lifestyles, none of the participants was perceived as being obese by the interviewer. On the other hand, awareness of other risks as mentioned previously was seemingly high, even among those where it was evidently not part of their lifestyle (e.g. smoking). An alternative interpretation is that awareness of associated maternal and offspring risks may have been low among study participants, in comparison to that of other maternal and fetal health risks.

Low level of awareness of maternal and offspring risks associated with overweight and obesity have been found in recent studies, particularly in relation to adverse neonatal and offspring outcomes, with lower levels of awareness among women with low levels of education, although these are at highest risk [144-146]. The literature also indicates that few women are given accurate counselling about weight gain in pregnancy and maternal and offspring risks associated with inappropriate weight gain, even though health care providers may consider their counselling to be adequate [147-155]. Lack of, or inaccurate counselling is a concern since women's gestational weight gain has been shown to be influenced by the recommendations provided [149, 156-159]. Thus, inadequate counselling has implications for maternal and offspring outcomes, because not only is a normal BMI at the start of pregnancy important, so is a weight gain within the ranges recommended in the IOM guidelines [45]. The literature indicates that such inadequate counselling may be related to sensitivity of the topic, insufficient training, and providers' own view of the effectiveness of counselling [160-162]. As the parental incentives for giving offspring a healthy start in life

seem to be high, increased parental risk awareness of overweight and obesity on maternal and offspring health may also lead to increased adoption of healthy lifestyles in this particular population.

Challenges when targeting the general population

Findings from the interview study with first-time parents (II) indicated that the major drivers for lifestyle change in both genders were the incentives for securing the health of the fetus in pregnancy and creating a healthy environment for the child when growing up. Parents described particularly high adherence to recommendations to abstain from alcohol, tobacco and certain foods during pregnancy, and the importance of adhering to these guidelines as ways to secure fetal health was emphasised by mothers and fathers. At the same time parents' own health per se was not highly prioritised during pregnancy and early parenthood, and potential risks due to unhealthy lifestyles did not seem to raise concern. These latter findings seem to be consistent with the larger literature, because although many short- and long-term health benefits of adopting healthy lifestyles are widely known, the literature indicates that few people actually adopt such lifestyles [3-5]. A systematic review of randomised controlled trials on lifestyle counselling in primary care undertaken by Fleming and Godwin (2008) indicated that very little benefit was gained from lifestyle counselling that targeted low risk groups for primary prevention of cardiovascular disease [163]. It would be unfortunate to interpret such findings to dismiss lifestyle counselling as worthwhile in primary health care, because as previously pointed out, many health promotion and preventive interventions are not suited to be evaluated with experimental study designs. Thus, putting too much emphasis on randomised controlled trials may lead to accepting that a specific public health intervention is unsuccessful in improving health in the population, when in reality it might be. The success of public health and preventive interventions in broader population settings often depends on the synergy effect of several influential factors, of which the relative contribution of each factor may be difficult to disentangle and measure in a standardised way. The Västerbotten Intervention Programme (VIP), the flagship in the history of public health initiatives in Västerbotten County [113, 114], is one good example. This programme has, by adopting a combined population and high risk approach, shown success in reducing risk factors for cardiovascular diseases; a strategy that also has shown to benefit the least privileged groups the most [164]. However, the programme has not been designed as a 'controlled experiment', because already at programme initiation, it was realised that lifestyle changes on a broader population level not could be evaluated within such a standardised frame. This approach is chosen also in the Salut Programme, based on the experiences from VIP.

However, although success has been shown in previous initiatives in Västerbotten, the Salut Programme may face other challenges that are related to the characteristics of the specific target population. While VIP targets people at 40, 50 and 60 years of age, the Salut Programme focuses on the younger age groups. Findings from this thesis indicate that at the time of becoming a parent, people are not particularly worried about own future health risks, and thus may have low motivation to act on lifestyle counselling. It seems reasonable to suggest that future interventions could benefit from an increased focus on the offspring as a motivator for lifestyle change and not limiting health promotion to the individual's own health. This is particularly important also considering the growing knowledge on early risk factors for ill health later in life, as well as intergenerational influences of health and lifestyle on offspring health.

A multifactorial and multilevel approach to health promotion

Obesity, as with many other health problems, shows a strong socio-demographic pattern in both adults and children [4, 116, 165], as also shown in this thesis (I). Future socio-demographic patterns of overweight and obesity in children in Västerbotten can be expected to be reflected in these strong socio-demographic patterns of obesity (I) because children of parents who are overweight or obese at the start of the pregnancy are more likely to become overweight or obese themselves [21, 42, 166]. Thus, the vicious cycle of intergenerational transmission of overweight and obesity will likely continue if no comprehensive strategies, that address all ages, individuals as well as wider social and environmental factors, are implemented [59]. In Swedish children, risk factors for ill health and mental health problems have been shown to be 80% more common, and physical health problems 30% more common, among those who are socially disadvantaged compared to more advantaged children [167]. Such health differences between groups with different social, physical, and economic resources highlight the important role of contextual factors in our environments [57]. This indicates therefore, that our major public health problems and interlinked social differences in health are difficult to come to terms with by interventions targeting the individual level only. Although interventions directed to the individual level may be one important component in the palette of possible interventions, the literature seems to be largely in agreement that the overall conditions and social and physical environments in which the children and their families live need to be recognised and targeted [58, 59, 168, 169]. Such multi-factorial and multi-level approaches have in recent studies shown promising results in preventing overweight and obesity in children [170-175] also by reducing social gradients in weight gain among children [171].

Fathers and health promotion in pregnancy and early parenthood

Fathers' experiences of 'being the third person of interest' in the ANC and CHC settings emerged during interviews with first-time parents (II). Experiences of exclusion, not being seen or heard, facing insufficient attention to their needs, being in a 'women's world', and experiencing lack of a holistic view of the family from health care providers have been described in previous Swedish and international studies [176-183]. These findings may be interpreted in various ways. One interpretation is that the interventions introduced to increase father involvement are not sufficient, assuming that interventions were adopted in practice. Another interpretation is low adherence to programme interventions among professionals, which was also indicated in the interview study with CHC nurses in pilot areas (III). Although Salut Programme interventions include activities that aim to promote health of the whole family, increase parent-child attachment, and strengthen parent relationships, the most tangible intervention introduced directed to fathers is a separate 'fathers' visit' in CHC.

Increasing involvement of fathers has several potential benefits for health outcomes in both pregnant women and offspring. Recent research has shown that health behaviours of women can be positively influenced, and the likelihood of overweight and obesity be reduced, if their partners have health-promoting attitudes and behaviours [184]. Even though more research is needed in this area, these findings are highly important to consider in light of a high prevalence of unhealthy behaviours and overweight/obesity in expectant fathers (I) and Swedish men in general [4]. Additionally, both mother *and* fathers play important roles in influencing health behaviours and health outcomes in children, as the literature provides evidence for the important influence of the family environment, parenting styles, and parents' own health behaviours [185-191]. Furthermore, findings from a systematic review underscore the positive influence that father engagement has on social, behavioural, and psychological outcomes in children [192]. Thus, as a large body of literature provides evidence that such father involvement is beneficial, there seems to be potential for improvement in delivery of ANC and CHC services to increasingly include and involve fathers and to view the family as the unit of care. In addition, it seems that longitudinal studies to follow increased father involvement and its potential influence on maternal and offspring health would be valuable.

Influencing factors for programme implementation and sustainability

Professionals in pilot areas were given a high degree of freedom to influence programme content and to adapt interventions to the local context (III), while professionals in the county-wide implementation areas were given complete ‘intervention packages’ to be implemented (IV), and, consequently, less freedom to influence the content. There was thus a major difference between these two implementation approaches, which to some extent was reflected in the character of reported factors influencing programme implementation and sustainability.

In pilot areas, professionals’ involvement in programme development, with small-scale testing of interventions (III), was found to have played an important role in shaping interventions that were easy to use in practice and to integrate with existing work routines. They were also given ‘trialability space’ [193], which was reflected in the reported facilitators. These factors are all known to be important for implementation, adoption and adherence to guidelines [193-195]. This involvement also contributed to a sense of ‘ownership’ of the programme, which was claimed to have contributed to sustainability. What was common to the two studies was that a majority of facilitating factors were related to the innovation and the social context, in contrast to barriers that were more common at the levels of social, organisational, economic and political contexts. The latter may indicate that higher system levels were given insufficient attention in programme development and implementation. One explanation to lack of attention to these levels may be that programme development in pilot areas were built on a ‘participation model’ with high end-users’ involvement, as this model entails a risk of overlooking structural factors that are important for programme success and sustainability [193, 196].

In making a prognosis for long-term sustainability of the Salut Programme, it is interesting to compare some of its features with those of the earlier initiative, the Västerbotten Intervention Programme (VIP), which was introduced in Västerbotten almost three decades ago. VIP has shown good sustainability, also with increasing participation rates in health examinations over time [114]. Some of the key factors identified for the programme’s longevity include the integration of interventions in an established structure in primary health care, targeting of the entire middle-aged population, collaboration with local stakeholders—which in the start-up phase also involved the population—and strong support from political and decision-making structures. The latter is mirrored in a political decision of financial incentives for health care centres [113, 114].

Although some similarities exist between the Salut Programme and VIP, such as integration of interventions in established organisational structures, targeting of a whole population (pregnancy to 18 years), collaboration with local stakeholders, and strong support from politicians and policy-makers, there are also some important differences. The population has not been involved in developing the Salut Programme. This may be one important factor to consider for further programme development, especially considering indications that some aspects of the interventions were not appreciated by parents (III, IV). Another important difference is that while the County Council pays health care centres 650 SEK (€ 78) for each VIP health examination, no such financial incentives are applied to the Salut Programme. Financial incentives have shown to influence care, and performance levels have shown to fluctuate relative to introduction and removal of such incentives [197]. As shown in this thesis (IV), CHC nurses struggled with competing goals, demands and work tasks in daily practice, and the vast majority of nurses (93%) reported having other work tasks in addition to CHC (IV). Different incentives may influence priority setting at both individual and organisational levels, and may consequently influence long-term sustainability of the Salut Programme. Summing up, what is evident from findings (III, IV) is that factors that influence programme implementation and sustainability exist at multiple levels of the system; they are also setting- and context-sensitive — findings that are consistent with previous knowledge [84, 193]. Thus, those responsible for programme planning and implementation need to employ a systematic approach in identifying and addressing these [87].

Aspects to consider in evaluation of programme outcomes

The Salut Programme has been implemented in organisations that continuously undergo changes as a natural part of organisational development. It has also been a deliberate strategy of the Salut Programme management to integrate programme activities with ordinary work tasks. When evaluating health promotion outcomes, it is therefore difficult to disentangle exactly what changes are results of programme interventions, and what changes that are results of other improvement efforts in the organisations—efforts initiated separately from or in interaction with the Salut Programme.

For example, during the study period, and parallel to the Salut activities, a new action plan for overweight and obesity in pregnancy was introduced in ANC, and Motivational Interviewing (MI) [124] as counselling approach was introduced to health care professionals on a broad scale. Activities such as these most likely influenced professionals' practice. Even though the studies included in this thesis indicate improvements in health-promoting practices in ANC, CHC, dental services and open pre-schools, and increased cross-sectoral collaboration follow-

ing Salut Programme implementation, the extent to which the interventions have been effective in terms of health outcomes in expectant parents, parents and children still remains unknown. Thus, further studies are needed.

The literature indicates that there are risks associated with evaluating newly developed programmes before *full operation* is reached; that is, when programme interventions are integrated into professional and organisational practices, as such premature evaluation may result in not detecting actual outcomes [72]. A few issues must be considered in regard to timing of the follow-up study (IV) on programme effects on professionals' health promotion practices and collaboration. One possible scenario is that health promotion practices and collaboration continued to improve after study completion, if full operation had not been reached at the time for the follow-up survey (approximately six months post-implementation). An alternative scenario is that adherence to programme interventions dropped following implementation, and continued to decrease after the follow-up survey, as this has been described as a common phenomenon when support from the project organisations is withdrawn [92, 198]. However, although the implementation per se was completed, the Salut Programme provides ongoing support and follow-up activities for involved sectors. Thus, a follow-up study into sustainability of the county-wide implementation two to four years following programme implementation [72] could provide more information on outcomes and overall success. Additional objective measures into professionals' health promotion practices and collaboration would have strengthened the findings, as this thesis only reflects views from front line health professionals and parents. However, studies that include other organisational levels in relation to the Salut Programme have been carried out by others [199] and are also forthcoming.

Methodological considerations

There are some issues to consider when interpreting findings from this thesis, and some methodological considerations will be elaborated on below.

Limitations of cross-sectional studies

Even though the cross-sectional study (I) provides some important information on the current situation in relation to overweight and obesity, the study design does not provide a good ground for establishing a cause-effect relationship between socio-demographic factors and overweight/obesity in expectant parents [200]; this is because data on exposures and outcomes were collected at the same point in time. Even though it seems reasonable that socio-demographic factors (independent variables) influence overweight/obesity (dependent variable), it cannot be ruled out that the direction of influence to some extent also can be

reversed. Thus, a longitudinal study that measures exposures and outcomes at different points in time would provide stronger evidence for the influence of different exposures on health outcomes in expectant parents.

Definition of rural and urban areas

The definition of urban and rural areas varies widely, within Sweden as well as between countries, and different definitions are often used in various contexts and for different purposes [201]. In the epidemiological study (I), a decision was made to exclude Lycksele, the county's third largest city, from the 'urban' category because of its small population (8 500 inhabitants of all ages), compared to the largest and the second largest cities Umeå and Skellefteå (80 000 and 33 000 inhabitants respectively, of all ages) [100]. Another categorisation of rural/urban may have altered the association between area of residence and BMI/overweight/obesity.

Response rates and representativeness in survey studies

High response rates are important to reduce bias in epidemiological studies [202]. The estimated response rates — 55% and 50% for women and men respectively (I) — are similar to what is reported from Swedish [203] as well as international public health surveys [204], but lower than what is recommended for population estimates. Tolonen and colleagues (2005) support recommendations of at least 70% response rate if respondents and non-respondents do not differ considerably, and if they do, 90% or more are needed to ensure accurate population estimates [205]. Obtaining such high response rates is challenging, especially considering national and international trends of declining response rates during the past decades [203, 204]. Previous studies have shown that low socio-economic groups are overrepresented among non-respondents in population-based studies [205, 206], and these groups are also more likely to have poorer lifestyles and health than respondents [205]. This phenomenon is indicated also in this thesis (I) as the educational status was somewhat higher in our study population in comparison to that of the general population in Västerbotten, and even more so compared to the Swedish population aged 25-44 years [100]. The study population was also less likely to be born outside Sweden. It is thus possible that the health and health behaviours of the expectant parents (I) differed from those who did not respond to the survey. However, in a large pregnancy cohort in Norway, with a response rate of 44%, Nilsen and colleagues found that while prevalence estimates differed significantly between cohort participants and the total population, association measures (exposure-outcome) did not differ significantly [207].

Response rates in the survey study (IV) ranged between 81%-96%, which is well above what can be expected in postal surveys of health care professionals [208]. In the mailed survey, factors known to enhance response rates such as financial incentives (movie ticket), first class mail, prepaid return envelopes, and multiple contacts — including a personal phone call from the first author to non-respondents — were all used as strategies to increase response rates [209]. Parts of the research group were in different ways involved in Salut Programme seminars, and this familiarisation may also have contributed to the overall high response rates. The sample can be considered as representative for the county of Västerbotten (IV), although the results are based almost exclusively on female respondents. The four sectors (ANC, CHC, dental services, open pre-schools) in Sweden are predominantly staffed by females; only 0.5% of midwives, 9% of nurses (2% of district nurses, personal communication, Distriktssköterskeföreningen), 3% of dental hygienists [210], and 1% of open pre-school teachers [211] are male. Therefore it is reasonable to interpret that the findings are largely representative.

Implications of convenience sampling

The interview study with first-time parents (II) employed a convenience sampling strategy [132], striving for a diversity in relation to gender, age, lifestyle, socio-economic, demographic and ethnic background. While the sample was diverse in relation to education and occupation, only one woman born outside Sweden was recruited. In addition, all mothers were living with the father of the child at the time for the interview, which meant that perspectives of single parents or same-sex parents were not obtained. Furthermore, the sample was well-educated, with 46% having a university degree, which is not representative of the larger population in Sweden. Thus, more studies are needed in diverse pregnancy and parent populations.

Risk for bias

All results in this thesis are based on self-reported data in form of questionnaires (I, IV) and interviews (II, III) with information obtained from professionals, expectant parents, and parents. Self-reported data entail a risk of bias, which has to be considered in relation to validity of findings from this thesis. First, an overestimation of height and underestimation of weight among women and men is well-known phenomenon in the literature [212, 213]. Research has also shown that self-report weight bias in some populations has increased over time [214, 215]; therefore, the true prevalence of overweight and obesity in this thesis may be higher than what was reported (I). However, although objective measures, for example from health examination, generally provide more reliable estimates, overweight and obesity rates are still most commonly derived from self-reported

data [7]. Second, people tend to report what is socially desirable (social-desirability bias) [216], which may also indicate underreporting of overweight and obesity. In relation to health professionals' reporting of adherence to guidelines, previous research has shown that an overestimation of adherence to guidelines is common in self-report studies [217], and it is possible that this kind of bias may be present also in this thesis. For example, professionals may have overestimated their adherence to live up to expectations from the Salut Programme management as well as collaborating professionals and their respective employers (IV). Bias may in the same way have occurred in the interviews with professionals in pilot areas (III), as they may have reported higher adherence to programme interventions if they thought this was desirable from the interviewer's perspective. The extent to which this is the case remains unknown.

Modification of questions used in existing instruments, and self-constructed questions, entails a potential source of bias due to measurement errors [218]. The questionnaires used in the Salut Programme were largely based on previously validated and published questionnaires to reduce the likelihood of such bias, although some questions were self-constructed or modified to fit the setting in which the epidemiological surveillance was undertaken (I) [128]. Thus, some questions remain regarding the psychometric properties of these questions. In the study of the county-wide implementation of the Salut Programme (IV), the aim was to use existing and validated instruments to measure programme outcomes as well as in obtaining information on implementation facilitators and barriers. However, after considering a large range of validated questionnaires, these did not seem sensitive enough to capture eventual programme-specific changes, or explore the full range of potential implementation facilitators and barriers within the four sectors. However, the questions and their response alternatives in the pre-post implementation questionnaire were in the development largely inspired by the Swedish version of the WHO Collaborative Study Questionnaire for GPs [137] to increase study validity.

Trustworthiness

There are also some particular issues to consider when interpreting findings from the qualitative components of this thesis (II, III), and to the extent these findings are trustworthy. Graneheim and Lundman suggest concepts related to the qualitative research tradition are to be used when reporting findings derived from qualitative content analysis, with aspects such as *credibility*, *dependability*, *transferability* contributing to the overarching concept of trustworthiness [134]. The aspects of *credibility* were addressed in this thesis by recruiting participants with various socio-demographic characteristics and experiences to get varied and rich descriptions of the topics under study (II, III). An inductive and systematic

approach to coding and categorisation was used to ensure that the developed categories and themes covered data. An attempt to increase credibility was also made by collaborating on coding and categorisation, and by frequently discussing the process of analysis and the emerging findings. *Dependability* was addressed by consistency in data collection. The approach used in the two studies was structured in such a way that the same topic areas were covered in all interviews. However, the questions were not necessarily asked in the same order in all interviews, which allowed for flexibility in the interview situation with follow-up questions and probing, and for the informants to talk more freely and to express their views at length. All interviews were performed by the first author, and within a few months' time period for each study (five and seven months, respectively), which secured consistency in the data collection process. *Transferability* was addressed by a clear description of context, participants, as well as the methods for sampling, data collection and analysis [134].

Problems related to multiple comparisons

Analyses of data from the pre-post implementation survey (IV) involved multiple statistical tests, which entailed the risk of making type I-errors since the chance of finding significant differences increases the more comparisons are made [219]. For example, a significance level cut-off set to $p \leq .05$ means that in the long run, one in 20 comparisons will appear as significant, although no real difference exists [220]. There are several approaches to address this risk, and the Bonferroni procedure is one commonly used method [219], although according to Feise (2002), some argue that this test to compensate for multiple comparisons is too stringent [220]. By using a method like Bonferroni in our study, we would have minimised the risk of making Type I-errors while increasing the risk of introducing Type II-errors instead [220]; that is, an incorrect conclusion that the programme failed to have significant impact on professionals health promotion practices and collaboration when in reality, it did have an impact. After thorough discussions within the research group, we decided to decrease the significance level to $p \leq .01$ to balance these two risks.

CONCLUSIONS AND RECOMMENDATIONS FOR POLICY, PRACTICE, AND FUTURE RESEARCH

Although this thesis summarises research related to several of those stages that are important to consider in the development and evaluation of health promotion programmes [60], it only touches on a few aspects that need to be considered in the planning, development and implementation of multidisciplinary programmes for health promotion. Some questions have been answered, and many other questions have been raised. Based on findings from this thesis in synthesis with the larger body of literature, some conclusions will be made, and some recommendations will be made in relation to policy, practice and future research.

The Västerbotten County Council has for decades put a large effort into promoting the health of the county citizens via large public health initiatives that have resulted in great success and sustainability [113-115]. This proactive approach should be well-recognised. Via the launch of the Salut Programme, the County Council has also put an emphasis on the health of the youngest county citizens and their parents, including expectant parents. The Salutogenic approach, with health promotion combined with primary prevention, starting at the earliest phases of life (i.e. during pregnancy) seem in the light of existing knowledge to be a wise strategy in efforts to reduce the effects of our major public health concerns. The programme, developed with high involvement of professionals, and strongly integrated in established organisational structures as well as in existing practices, shows potential for improving health promotion practices and interdisciplinary collaboration in sectors that have the opportunity to influence health of young citizens.

Sweden, like most other countries, faces severe health challenges in relation to high rates of overweight and obesity. As shown in this thesis, one-third of women, and more than half of expectant fathers, are overweight or obese at the start of pregnancy. This has implications for the health of these individuals, but also for offspring from fetal life to adulthood, which indicates that this is a particularly important target group for health promotion and prevention.

Findings from this thesis indicate that efforts to raise awareness of adverse effects of overweight and obesity on maternal and offspring health outcomes are needed. These efforts could include individual level interventions as well as interventions at other levels (e.g. societal, through media campaigns). Health care professionals have an important role in providing accurate and comprehensive information on the importance of a healthy weight to all women of reproductive age. Midwives have a particularly important role in this effort as they counsel women

during their whole reproductive period, and thus have an excellent opportunity of influencing women *prior to* conception through various interventions. Further research would be valuable in relation to the content of counselling and the extent to which risks associated with overweight are explicitly addressed. Could a variance be explained by health professionals' own characteristics, such as age, gender, lifestyle, and BMI status [221], in the extent to which this is addressed? And is there a need to develop further guidelines or tools to support such counselling? Interventions aimed at raising awareness need to be further tested and evaluated, and such evaluations could benefit from using both qualitative and quantitative measures, as outcomes in relation to lifestyle change and maternal and offspring outcomes have different dimensions and deserve to be thoroughly assessed.

Given the high rates of overweight and obesity in the childbearing population, opportunities for health promotion and prevention must be seized. Findings from this thesis indicate that more attention to parental health and lifestyle is also needed in CHC. One potential way forward could be providing health check-ups with individualised feedback and counselling for both parents, as an integrated part of the CHC programme. As the main focus of today's CHC programme is related to the health and development of the child, CHC nurses may feel uncomfortable in raising issues related to parental health and lifestyle; in particular, to issues related to overweight and obesity [161]. Clear guidelines and tools may be needed to assist nurses with such conversations. The effects of such interventions in terms of outcomes on parental and child health need to be closely monitored with intermediate as well as outcome measures, given the potential of reaching a large part of the population if interventions prove to be effective.

Contemporary knowledge indicates that the health and lifestyles of *both* mothers and fathers are important determinants for health outcomes in children. Therefore it seems imperative to direct health promotion to both genders. However, findings from this thesis, as well as several other national and international studies, indicate that fathers still feel excluded in the ANC and CHC contexts. Thus, ANC and CHC programmes that more actively include men are needed. Furthermore, findings from this thesis in conjunction with the broader literature indicate that simple things, such as turning to the couple instead of only the woman, keeping eye contact with both partners and directing questions also to the partner can make an important difference in how welcome men feel in the ANC and CHC settings. Thus, it seems that professionals could implement such interaction-based small interventions immediately without any additional resources. However, actions at policy level are also needed to mobilise resources for practice change to facilitate active involvement of men in ANC and CHC activities. Such actions would likely benefit from being developed with influence and involvement

from the receivers of interventions. Further studies on the role of increased father involvement on maternal and offspring health outcomes are needed. In the meantime, quantitative studies of how males rate their inclusion could allow for analysis of time-trends, and thus provide evidence that provision of services is moving from a female-oriented approach to a more holistic approach with inclusion of fathers.

At local level, there is a need to evaluate adherence to and sustainability of the Salut Programme interventions in organisations (organisational and individual levels), and programme effectiveness in terms of health promotion outcomes, intermediate health outcomes, and health and social outcomes [60] in children and their parents, including expectant parents. Applying an appropriate model for such evaluations may be beneficial; for example, the widely used RE-AIM framework, which provides a comprehensive approach in the evaluation of public health impact of health promotion interventions [94] has been applied in many contexts internationally [222-225], and in Swedish primary health care [95, 96]. Furthermore, future health promotion initiatives may benefit from increased theoretical use of frameworks for programme planning, development and evaluation as current literature indicates that this can enhance the likelihood of success [90, 91].

Finally, individual level health-promoting interventions are necessary but not sufficient in isolation to improve health in the population. New national and local policies are needed to support the creation of health-promoting environments, based on the principles of making the healthy choices the easy choices. Such examples include better availability of healthy options for food, snacks and beverages in environments where people spend most of their time, including schools, work places, sports facilities and restaurants. The importance of this is emphasised in the higher age-modules of the Salut Programme (III-VII), where interventions to a greater extent are directed to environments such as pre-schools and schools rather than to the individual level. These interventions may be of particularly high value in rural areas (per our definition) where the range of options is often limited (e.g. fast food), and the rates of obesity the highest. Active involvement of the target population in such intervention development may aid an understanding of how specific needs can be met. Policy-level action is likewise important in the creation of activity-friendly environments, as the built environment influences people's decisions on being physically active [58, 226, 227]. This can include safe walking and bike paths, or access to recreation facilities, playgrounds or parks. Everyone, independent of gender or socio-economic position, will enjoy the benefits of such environmental changes.

SUMMARY IN SWEDISH – SVENSK SAMMANFATTNING

Bakgrund: År 2005 lanserade Västerbottens läns landsting en hälsofrämjande satsning "Salut" som svar på en oroande förekomst av övervikt och fetma samt trender till ökad förekomst av karies hos barn i länet. Satsningen, som initialt utvecklades i fyra pilotområden, bygger på tvärprofessionellt och verksamhetsövergripande samarbete och syftar till att stödja och stärka hälsofrämjande insatser inom landstinget och länets kommuner. Satsningen riktar sig till barn och unga (0-18 år) och deras föräldrar, med start under graviditeten. Denna avhandling fokuserar på insatser som erbjuds via mödrahälsovård, barnhälsovård, tandvård och öppen förskola riktade till blivande föräldrar och familjer med barn i åldern 0-1 ½ år. Med utgångspunkt från Salut-satsningen syftar avhandlingen till att undersöka socio-demografiska mönster av övervikt och fetma hos blivande föräldrar (I), förstagångsföräldrars upplevelser av hälsofrämjande insatser och förändrade levnadsvanor under graviditet och tidigt föräldraskap (II), personalens upplevelser av underlättande och hindrande faktorer för satsningens införande och uthållighet (III, IV), samt förändringar i arbetssätt och samarbete mellan verksamheterna efter den länstäckande spridningen av satsningen (IV).

Metod och resultat: En populationsbaserad tvärsnittsstudie bland blivande föräldrar visade på övervikt och fetma hos 29% av kvinnorna (vikt före graviditet) och hos 53% av männen (n=4352♀, 3949♂). Lägre utbildningsnivå, arbetslöshet och sjuk-skrivning samt att bo utanför städerna visade sig öka sannolikheten för fetma. Hos en övervägande del av paren (62%) fanns minst en partner med övervikt eller fetma och samband kunde även påvisas mellan kvinnans och mannens BMI (I). En intervjustudie med 24 förstagångsföräldrar (n=12♀, 12♂) visade att föräldrarna främst förändrade sina levnadsvanor för att säkra hälsan hos fostret under graviditeten och för att skapa en hälsosam miljö för barnet under uppväxten. Föräldrarna beskrev sig själva som mycket mottagliga för information om hur deras levnadsvanor kunde påverka fostrets hälsa och de diskuterade ofta graviditetsrisker i relation till tobak och alkohol samt gifter och smittoämnen i livsmedel. Föräldrarna var dock mindre angelägna att förändra sina levnadsvanor med tanke på sin egen hälsa. De upplevde att mödrahälsovårdens och barnhälsovårdens insatser i huvudsak riktades till kvinnor och beskrev en avsaknad av helhetssyn på familjen, vilket även avspeglades i upplevelser av att papporna behandlades som mindre viktiga (II). En intervjustudie med personal (n=23) inom pilotområdena, två år efter utveckling och införandet av Saluts insatser, indikerade god uthållighet av satsningen, även om en lägre följsamhet till insatserna beskrevs inom barnhälsovården. Faktorer som av personalen beskrevs påverka uthålligheten identifierades på flera organisatoriska nivåer (III). En före- och efterstudie bland personal (n=144) mätte effekter av den länstäckande

spridningen av satsningen i 13 av länets 15 kommuner. Resultaten visade på flera signifikanta förbättringar av de hälsofrämjande arbetssätten och ett ökat samarbete mellan verksamheterna. En enkät med öppna frågor riktad till personalen belyste också faktorer på flera organisationsnivåer som ansågs underlätta respektive hindra införandeprocessen (IV).

Slutsats: Salut-satsningen, som är utvecklad i nära samarbete med verksamheter-
nas personal och väl integrerad i redan existerande organisatoriska strukturer och
arbetssätt, visar på potential att förbättra hälsofrämjande arbetssätt och samarbete
mellan verksamheter. Aspekter som beskrivits och diskuterats kan vägleda satsnin-
gens fortsatta utveckling såväl som framtida nya initiativ. Resultaten och slutsat-
serna kan även användas i syfte att påverka policy, praxis och framtida forskning.
Detta avser framförallt hälsofrämjande och sjukdomsförebyggande metoder, pappans
roll under graviditet och tidigt föräldraskap samt kunskaper om faktorer som kan ha
betydelse för genomförande och uthållighet av verksamhetsövergripande
hälsofrämjande insatser.

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REFERENCES

1. World Health Organization: *World Health Statistics 2012*. Geneva; 2012.
2. World Health Organization: *Global health risks: mortality and burden of disease attributable to selected major risks*. Geneva; 2009.
3. Reeves MJ, Rafferty AP: **Healthy lifestyle characteristics among adults in the United States, 2000**. *Arch Intern Med* 2005, **165**:854-857.
4. Swedish National Institute of Public Health: *Living habits. Progress report 2011. [Levnadsvanor. Lägesrapport 2011] [In Swedish]*. Östersund; 2011.
5. Troost JP, Rafferty AP, Luo Z, Reeves MJ: **Temporal and regional trends in the prevalence of healthy lifestyle characteristics: United States, 1994-2007**. *Am J Public Health* 2012, **102**:1392-1398.
6. The National Board of Health and Welfare and The Swedish National Institute of Public Health: *Public Health in Sweden: Annual Report 2013 [Folkhälsan i Sverige: Årsrapport 2013] [In Swedish]*. Östersund; 2013.
7. OECD: *Health at a Glance: Europe 2012*. Paris: OECD Publishing; 2012.
8. Linell A, Richardson MX, Wamala S: **The Swedish National Public Health Policy Report 2010**. *Scand J Public Health* 2013, **41**:3-56.
9. The National Board of Health and Welfare: *Public Health Report 2009 [Folkhälsorapport 2009] [In Swedish]*. Västerås; 2009.
10. Hjern A: **Children's health: Health in Sweden: The National Public Health Report 2012. Chapter 2**. *Scand J Public Health* 2012, **40**(Suppl 9):23-41.
11. Moradi T, Allebeck P, Jacobsson A, Mathers C: **[The burden of disease in Sweden measured with DALY. Neuropsychiatric diseases and cardiovascular diseases dominate]**. *Lakartidningen* 2006, **103**:137-141.
12. Danielsson M, Talback M: **Public health: an overview: Health in Sweden: The National Public Health Report 2012. Chapter 1**. *Scand J Public Health* 2012, **40**(Suppl 9):6-22.
13. Swedish National Institute of Public Health: *Health Behaviour in School-aged Children in 2009/2010. [Svenska skolbarns hälsovanor 2009/10. Grundrapport] [In Swedish]*. Östersund; 2011.
14. Petersen S, Bergström E, Cederblad M, Ivarsson A, Köhler L, A-M. R, Stenbeck M, Sundelin C, Häggglöf B: Child and adolescent mental health in Sweden. A systematic review with emphasis on changes over time. *[Barn och ungdomars psykiska hälsa i Sverige. En systematisk litteraturöversikt med tonvikt på förändringar över tid] [In Swedish]*. Stockholm: Kungl. Vetenskapsakademien, Hälsovetenskaperna; 2010.
15. Axelsen M, Danielsson M, Norberg M, Sjöberg A: **Eating habits and physical activity: Health in Sweden: The National Public Health Report 2012. Chapter 8**. *Scand J Public Health* 2012, **40**(Suppl 9):164-175.
16. World Health Organization: *Social determinants of health and well-being among young people. Health behaviour in school-aged children (HBSC) study: International report from the 2009/2010 survey*. Copenhagen; 2012.

17. Vaezghasemi M, Lindkvist M, Ivarsson A, Eurenus E: **Overweight and lifestyle among 13-15 year olds: a cross-sectional study in northern Sweden.** *Scand J Public Health* 2012, **40**:221-228.
18. Norberg M, Danielsson M: **Overweight, cardiovascular diseases and diabetes: Health in Sweden: The National Public Health Report 2012. Chapter 7.** *Scand J Public Health* 2012, **40**(Suppl 9):135-163.
19. World Health Organization: **Obesity and overweight. Fact sheet No 311.** [<http://www.who.int/mediacentre/factsheets/fs311/en/>]
20. Swinburn BA, Sacks G, Hall KD, McPherson K, Finegood DT, Moodie ML, Gortmaker SL: **The global obesity pandemic: shaped by global drivers and local environments.** *Lancet* 2011, **378**:804-814.
21. Jaaskelainen A, Pussinen J, Nuutinen O, Schwab U, Pirkola J, Kolehmainen M, Jarvelin MR, Laitinen J: **Intergenerational transmission of overweight among Finnish adolescents and their parents: a 16-year follow-up study.** *Int J Obes* 2011, **35**:1289-1294.
22. Freeman E, Fletcher R, Collins CE, Morgan PJ, Burrows T, Callister R: **Preventing and treating childhood obesity: time to target fathers.** *Int J Obes* 2012, **36**:12-15.
23. Whitaker KL, Jarvis MJ, Beeken RJ, Boniface D, Wardle J: **Comparing maternal and paternal intergenerational transmission of obesity risk in a large population-based sample.** *Am J Clin Nutr* 2010, **91**:1560-1567.
24. Power C, Poulou T, Li L, Cooper R, Hypponen E: **Parental and offspring adiposity associations: insights from the 1958 British birth cohort.** *Ann Hum Biol* 2011, **38**:390-399.
25. Danielzik S, Langnase K, Mast M, Spethmann C, Muller MJ: **Impact of parental BMI on the manifestation of overweight 5-7 year old children.** *Eur J Nutr* 2002, **41**:132-138.
26. Reilly JJ, Methven E, McDowell ZC, Hacking B, Alexander D, Stewart L, Kelnar CJ: **Health consequences of obesity.** *Arch Dis Child* 2003, **88**:748-752.
27. Freedman DS, Mei Z, Srinivasan SR, Berenson GS, Dietz WH: **Cardiovascular risk factors and excess adiposity among overweight children and adolescents: the Bogalusa Heart Study.** *J Pediatr* 2007, **150**:12-17 e12.
28. Schwimmer JB, Burwinkle TM, Varni JW: **Health-related quality of life of severely obese children and adolescents.** *JAMA* 2003, **289**:1813-1819.
29. Daniels SR: **Complications of obesity in children and adolescents.** *Int J Obes* 2009, **33**(Suppl 1):60-65.
30. Loveman E, Frampton GK, Shepherd J, Picot J, Cooper K, Bryant J, Welch K, Clegg A: **The clinical effectiveness and cost-effectiveness of long-term weight management schemes for adults: a systematic review.** *Health Technol Assess* 2011, **15**:1-182.
31. Withrow D, Alter DA: **The economic burden of obesity worldwide: a systematic review of the direct costs of obesity.** *Obes Rev* 2011, **12**:131-141.
32. Odegaard K, Borg S, Persson U, Svensson M: **The Swedish cost burden of overweight and obesity-evaluated with the PAR approach and a statistical modeling approach.** *Int J Pediatr Obes* 2008, **3**(Suppl 1):51-57.

33. The National Board of Health and Welfare: *Pregnancies, Deliveries and Newborn Infants [Graviditeter, förlossningar och nyfödda barn] [In Swedish]*. Stockholm; 2013.
34. Pasquali R, Patton L, Gambineri A: **Obesity and infertility**. *Curr Opin Endocrinol Diabetes Obes* 2007, **14**:482-487.
35. Scott-Pillai R, Spence D, Cardwell C, Hunter A, Holmes V: **The impact of body mass index on maternal and neonatal outcomes: a retrospective study in a UK obstetric population, 2004-2011**. *BJOG*, in press.
36. Metwally M, Ong KJ, Ledger WL, Li TC: **Does high body mass index increase the risk of miscarriage after spontaneous and assisted conception? A meta-analysis of the evidence**. *Fertil Steril* 2008, **90**:714-726.
37. Bhattacharya S, Campbell DM, Liston WA: **Effect of Body Mass Index on pregnancy outcomes in nulliparous women delivering singleton babies**. *BMC Public Health* 2007, **7**:168.
38. Robinson HE, O'Connell CM, Joseph KS, McLeod NL: **Maternal outcomes in pregnancies complicated by obesity**. *Obstet Gynecol* 2005, **106**:1357-1364.
39. Athukorala C, Rumbold AR, Willson KJ, Crowther CA: **The risk of adverse pregnancy outcomes in women who are overweight or obese**. *BMC Pregnancy Childbirth* 2010, **10**:56.
40. Stothard KJ, Tennant PW, Bell R, Rankin J: **Maternal overweight and obesity and the risk of congenital anomalies: a systematic review and meta-analysis**. *JAMA* 2009, **301**:636-650.
41. Linne Y: **Effects of obesity on women's reproduction and complications during pregnancy**. *Obes Rev* 2004, **5**:137-143.
42. Whitaker RC: **Predicting preschooler obesity at birth: the role of maternal obesity in early pregnancy**. *Pediatrics* 2004, **114**:29-36.
43. Boney CM, Verma A, Tucker R, Vohr BR: **Metabolic syndrome in childhood: association with birth weight, maternal obesity, and gestational diabetes mellitus**. *Pediatrics* 2005, **115**:290-296.
44. Rooney BL, Schauburger CW: **Excess pregnancy weight gain and long-term obesity: one decade later**. *Obstet Gynecol* 2002, **100**:245-252.
45. Institute of Medicine of the National Academies. *Weight Gain During Pregnancy: Reexamining the Guidelines*. Washington, DC; 2009.
46. Kuh D, Ben-Shlomo Y: **Introduction**. In: *A Life Course Approach to Chronic Disease Epidemiology*. 2nd edn. Edited by Kuh D, Ben-Shlomo Y, Susser E. New York: Oxford University Press; 2004.
47. Fowden AL, Giussani DA, Forhead AJ: **Intrauterine programming of physiological systems: causes and consequences**. *Physiology* 2006, **21**:29-37.
48. Lau C, Rogers JM: **Embryonic and fetal programming of physiological disorders in adulthood**. *Birth Defects Res C Embryo Today* 2004, **72**:300-312.
49. Doyle O, Harmon CP, Heckman JJ, Tremblay RE: **Investing in early human development: timing and economic efficiency**. *Econ Hum Biol* 2009, **7**:1-6.
50. Nader PR, Huang TT, Gahagan S, Kumanyika S, Hammond RA, Christoffel KK: **Next steps in obesity prevention: altering early life systems to support healthy parents, infants, and toddlers**. *Child Obes* 2012, **8**:195-204.

51. Institute of Medicine of the National Academies: *Early Childhood Obesity Prevention Policies*. Washington, DC; 2011.
52. Aboderin I, Kalache A, Ben-Shlomo Y, Lynch JW, Yajnik CS, Kuh D, Yach D: *Life Course Perspectives on Coronary Heart Disease, Stroke and Diabetes: Key Issues and Implications for Policy and Research*. Geneva: World Health Organization; 2002.
53. Ben-Shlomo Y, Kuh D: **A life course approach to chronic disease epidemiology: conceptual models, empirical challenges and interdisciplinary perspectives**. *Int J Epidemiol* 2002, **31**:285-293.
54. Barker DJ, Winter PD, Osmond C, Margetts B, Simmonds SJ: **Weight in infancy and death from ischaemic heart disease**. *Lancet* 1989, **2**:577-580.
55. Huxley RR, Shiell AW, Law CM: **The role of size at birth and postnatal catch-up growth in determining systolic blood pressure: a systematic review of the literature**. *J Hypertens* 2000, **18**:815-831.
56. Whincup PH, Kaye SJ, Owen CG, Huxley R, Cook DG, Anazawa S, Barrett-Connor E, Bhargava SK, Birgisdottir BE, Carlsson S *et al*: **Birth weight and risk of type 2 diabetes: a systematic review**. *JAMA* 2008, **300**:2886-2897.
57. Woolf SH, Dekker MM, Byrne FR, Miller WD: **Citizen-centered health promotion: building collaborations to facilitate healthy living**. *Am J Prev Med* 2011, **40**(Suppl 1):38-47.
58. Sallis JF, Glanz K: **Physical activity and food environments: solutions to the obesity epidemic**. *Milbank Q* 2009, **87**:123-154.
59. de Silva-Sanigorski AM, Economos C: **Evidence of multi-setting approaches for obesity prevention: translation to best practice**. In: *Preventing Childhood Obesity: Evidence Policy and Practice*. Edited by Waters E, Swinburn BA, Seidell JC, Uauy R. Oxford: Blackwell Publishing Ltd; 2010: 57-63.
60. Nutbeam D: **Evaluating health promotion - progress, problems and solutions**. *Health Promot Int* 1998, **13**:27-44.
61. Frieden TR: **A framework for public health action: the health impact pyramid**. *Am J Public Health* 2010, **100**:590-595.
62. Sallis JF, Owen N, Fisher EB: **Ecological Models of Health Behavior**. In: *Health behavior and health education - Theory, Research, and Practice*. 4th edn. Edited by Glanz K, Rimer BK, Viswanath K. San Francisco, CA: Jossey-Bass; 2008: 465-482.
63. McLeroy KR, Bibeau D, Steckler A, Glanz K: **An ecological perspective on health promotion programs**. *Health Educ Q* 1988, **15**:351-377.
64. Huang TT, Drewnoski A, Kumanyika S, Glass TA: **A systems-oriented multilevel framework for addressing obesity in the 21st century**. *Prev Chronic Dis* 2009, **6**:82.
65. Mabry PL, Olster DH, Morgan GD, Abrams DB: **Interdisciplinarity and systems science to improve population health: a view from the NIH Office of Behavioral and Social Sciences Research**. *Am J Prev Med* 2008, **35**(Suppl 2):211-224.
66. Grol R, Berwick DM, Wensing M: **On the trail of quality and safety in health care**. *BMJ* 2008, **336**:74-76.
67. McGlynn EA, Asch SM, Adams J, Keesey J, Hicks J, DeCristofaro A, Kerr EA: **The quality of health care delivered to adults in the United States**. *N Engl J Med* 2003, **348**:2635-2645.

68. Haines A, Kuruville S, Borchert M: **Bridging the implementation gap between knowledge and action for health.** *Bull World Health Organ* 2004, **82**:724-731; discussion 732.
69. World Health Organization: *Bridging the “Know-Do” Gap. Meeting on Knowledge Translation in Global Health, 10-12 October 2005.* Geneva; 2006.
70. Larocca R, Yost J, Dobbins M, Ciliska D, Butt M: **The effectiveness of knowledge translation strategies used in public health: a systematic review.** *BMC Public Health* 2012, **12**:751.
71. Wensing M, Bosch M, Grol R: **Developing and selecting interventions for translating knowledge to action.** *CMAJ* 2009, **182**:85-88.
72. Fixen DL, Naoom SF, Blase KA, Friedman RM, Wallace F: *Implementation Research: A Synthesis of the Literature.* Tampa, FL: University of South Florida, Louis de la Parte Florida Mental Health Institute, The National Implementation Research Network; 2005.
73. Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W, Robinson N: **Lost in knowledge translation: time for a map?** *J Contin Educ Health Prof* 2006, **26**:13-24.
74. Rabin BA, Brownson RC: **Developing the Terminology for Dissemination and Implementation Research.** In: *Dissemination and Implementation Research in Health: Translating Science to Practice.* Edited by Brownson RC, Colditz GA, Proctor EK. New York: Oxford University Press; 2012: 23-51.
75. Straus SE, Tetroe J, Graham ID: **Knowledge to action: what it is and what it is isn't.** In: *Knowledge Translation in Health Care: Moving from Evidence to Practice.* Edited by Straus SE, Tetroe J, Graham ID. Oxford: Blackwell Publishing Ltd.; 2009:3-8.
76. McKibbon KA, Lokker C, Wilczynski NL, Ciliska D, Dobbins M, Davis DA, Haynes RB, Straus SE: **A cross-sectional study of the number and frequency of terms used to refer to knowledge translation in a body of health literature in 2006: a Tower of Babel?** *Implement Sci* 2010, **5**:16.
77. National Center for the Dissemination of Disability Research (NCDDR): *Knowledge Translation at the Canadian Institutes of Health Research: A Primer.* Austin, TX; 2007.
78. Eccles MP, Mittman BS: **Welcome to Implementation Science.** *Implement Sci* 2006, **1**(1).
79. Grol R, Wensing M: **Effective implementation: a model.** In: *Improving patient care. The implementation of change in clinical practice.* Oxford: Elsevier; 2005:41-57.
80. Wiltsey Stirman S, Kimberly J, Cook N, Calloway A, Castro F, Charns M: **The sustainability of new programs and innovations: a review of the empirical literature and recommendations for future research.** *Implement Sci* 2012, **7**:17.
81. Bowman CC, Sobo EJ, Asch SM, Gifford AL: **Measuring persistence of implementation: QUERI Series.** *Implement Sci* 2008, **3**:21.
82. Petticrew M: **When are complex interventions ‘complex’? When are simple interventions ‘simple’?** *Eur J Public Health* 2011, **21**:397-398.
83. Campbell NC, Murray E, Darbyshire J, Emery J, Farmer A, Griffiths F, Guthrie B, Lester H, Wilson P, Kinmonth AL: **Designing and evaluating complex interventions to improve health care.** *BMJ* 2007, **334**:455-459.
84. Grol R, Wensing M: **What drives change? Barriers to and incentives for achieving evidence-based practice.** *Med J Aust* 2004, **180**(Suppl 6):57-60.

85. Ferlie EB, Shortell SM: **Improving the quality of health care in the United Kingdom and the United States: a framework for change.** *Milbank Q* 2001, **79**:281-315.
86. Chaudoir SR, Dugan AG, Barr CH: **Measuring factors affecting implementation of health innovations: a systematic review of structural, organizational, provider, patient, and innovation level measures.** *Implement Sci* 2013, **8**:22.
87. Baker R, Camosso-Stefinovic J, Gillies C, Shaw EJ, Cheater F, Flottorp S, Robertson N: **Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes.** *Cochrane Database Syst Rev* 2010, **3**:CD005470.
88. Grol RP, Bosch MC, Hulscher ME, Eccles MP, Wensing M: **Planning and studying improvement in patient care: the use of theoretical perspectives.** *Milbank Q* 2007, **85**:93-138.
89. Davies P, Walker AE, Grimshaw JM: **A systematic review of the use of theory in the design of guideline dissemination and implementation strategies and interpretation of the results of rigorous evaluations.** *Implement Sci* 2010, **5**:14.
90. Gaglio B, Glasgow RE: **Evaluation Approaches for Dissemination and Implementation Research.** In: *Dissemination and Implementation Research in Health: Translating Science to Practice.* Edited by Brownson RC, Colditz GA, Proctor EK. New York: Oxford University Press; 2012: 327-356.
91. Green J, Tones K: **Health Promotion Planning - a Systematic Approach.** In: *Health Promotion: Planning and Strategies.* 2 nd edn. Edited by Green J, Tones K. London: SAGE Publications Ltd; 2010: 155-203.
92. Grol R, Wensing M, Eccles M: *Improving patient care. The implementation of change in clinical practice.* Oxford: Elsevier; 2005.
93. **Reach Effectiveness Adoption Implementation Maintenance (RE-AIM)** [<http://www.re-aim.org/>]
94. Glasgow RE, Vogt TM, Boles SM: **Evaluating the public health impact of health promotion interventions: the RE-AIM framework.** *Am J Public Health* 1999, **89**:1322-1327.
95. Carljford S, Andersson A, Bendtsen P, Nilsen P, Lindberg M: **Applying the RE-AIM framework to evaluate two implementation strategies used to introduce a tool for lifestyle intervention in Swedish primary health care.** *Health Promot Int* 2012, **27**:167-176.
96. Carljford S, Lindberg M, Andersson A: **Sustained use of a tool for lifestyle intervention implemented in primary health care: a 2-year follow-up.** *J Eval Clin Pract* 2013, **19**:327-334.
97. Glasgow RE, Lichtenstein E, Marcus AC: **Why don't we see more translation of health promotion research to practice? Rethinking the efficacy-to-effectiveness transition.** *Am J Public Health* 2003, **93**:1261-1267.
98. Nuffield Institute for Health: *Directions for Health: New Approaches to Population Health Research and Practice - The Leeds Declaration.* Leeds; 1993.
99. Bhattacharyya O, Zwarenstein M: **Evaluation of Knowledge to Action.** In: *Knowledge Translation in Health Care: Moving from Evidence to Practice.* Edited by Straus SE, Tetroe J, Graham ID. Oxford: Blackwell Publishing Ltd.; 2009: 249-266.

100. Statistics Sweden: **Population statistics** [http://www.scb.se/Pages/SSD/SSD_Tree-View.aspx?id=340506]
101. World Health Organization: **Sweden: Health Profile** [<http://www.who.int/gho/countries/swe.pdf>]
102. United Nations Development Programme (UNDP): *Human Development Report 2011*. New York; 2011.
103. United Nations Children's Fund (UNICEF): *The State of the World's Children 2012*. New York; 2012.
104. Central Intelligence Agency. **The World Factbook. Country comparison: Maternal Mortality Rate** [<https://www.cia.gov/library/publications/the-world-factbook/rankorder/2223rank.html>]
105. Anell A, Glenngård A, Merkur S: **Sweden: Health system review. Health Systems in Transition. Health Syst Transit** 2012, **14**:1-159.
106. Swedish Association of Obstetrics and Gynecology [Svensk Förening för Obstetrik och Gynekologi]: *Maternal health care, sexual and reproductive health [Mödrahälsovård, sexuell och reproduktiv hälsa] [In Swedish] Report No 59*. Stockholm; 2008.
107. Hagelin E, Magnusson M, Sundelin C: *Child health care [Barnhälsovård] [In Swedish]*. Stockholm: Liber AB; 2007.
108. Bremberg S: *New tools for parents - proposal for new forms of parental support [Nya verktyg för föräldrar - förslag till nya former av föräldrastöd] [In Swedish]*. Stockholm: Swedish National Institute of Public Health; 2004.
109. **The Swedish Social Insurance Agency (Försäkringskassan)**. [<http://www.forsakringskassan.se>]
110. Government Offices of Sweden: *The Swedish Government's gender equality policy. Fact sheet*. Stockholm; 2009.
111. The Swedish National Agency for Education: **What is preschool?** [http://www.skolverket.se/om-skolverket/in_english/the_swedish_education_system]
112. The Swedish National Agency for Education: **What is open pre-school?** [http://www.skolverket.se/om-skolverket/in_english/2.877/2.878/2.888/what-is-open-pre-school-1.72250]
113. Norberg M, Wall S, Boman K, Weinehall L: **The Vasterbotten Intervention Programme: background, design and implications. Glob Health Action** 2010, **3**.
114. Norberg M, Blomstedt Y, Lonnberg G, Nystrom L, Stenlund H, Wall S, Weinehall L: **Community participation and sustainability - evidence over 25 years in the Vasterbotten Intervention Programme. Glob Health Action** 2012, **5**:1-9.
115. Nilsson M, Stenlund H, Bergstrom E, Weinehall L, Janlert U: **It takes two: reducing adolescent smoking uptake through sustainable adolescent-adult partnership. J Adolesc Health** 2006, **39**:880-886.
116. Blomquist HK, Bergstrom E: **Obesity in 4-year-old children more prevalent in girls and in municipalities with a low socioeconomic level. Acta Paediatr** 2007, **96**:113-116.
117. Stecksen-Blicks C, Stenlund H, Twetman S: **Caries distribution in the dentition and significant caries index in Swedish 4-year-old children 1980-2002. Oral Health Prev Dent** 2006, **4**:209-214.

118. Stecksen-Blicks C, Holgerson PL, Twetman S: **Caries risk profiles in two-year-old children from northern Sweden.** *Oral Health Prev Dent* 2007, **5**:215-221.
119. Lindstrom B, Eriksson M: **Salutogenesis.** *J Epidemiol Community Health* 2005, **59**:440-442.
120. Antonovsky A: *Unraveling The Mystery of Health - How People Manage Stress and Stay Well.* San Francisco: Jossey-Bass Publishers; 1987.
121. Institute for Health Care Improvement: *The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement. IHI Innovation Series white paper.* Boston; 2003.
122. Deming WE: *The New Economics: For Industry, Government, Education.* 2nd edn. Cambridge, MA: MIT Press; 2000.
123. **The Umeå SIMSAM Network** [<http://www.org.umu.se/simsam/english/>]
124. Rollnick S, Miller WR, Butler CC: *Motivational interviewing in health care: helping patients change behavior.* New York: The Guilford Press; 2008.
125. Rubak S, Sandbaek A, Lauritzen T, Christensen B: **Motivational interviewing: a systematic review and meta-analysis.** *Br J Gen Pract* 2005, **55**:305-312.
126. Hewitt C, Gilbody S, Brealey S, Paulden M, Palmer S, Mann R, Green J, Morrell J, Barkham M, Light K *et al*: **Methods to identify postnatal depression in primary care: an integrated evidence synthesis and value of information analysis.** *Health Technol Assess* 2009, **13**:1-145, 147-230.
127. The National Board of Health and Welfare: *Pregnancies, Deliveries and Newborn Infants [Graviditeter, förlossningar och nyfödda barn] [In Swedish].* Stockholm; 2011.
128. Eurenus E, Lindkvist M, Sundkvist M, Ivarsson A, Mogren I: **Maternal and paternal self-rated health and BMI in relation to lifestyle in early pregnancy - the Salut Programme in Sweden.** *Scand J Public Health* 2011, **39**:730-741.
129. World Health Organization: **Global Database on Body Mass Index** [http://apps.who.int/bmi/index.jsp?introPage=intro_3.html]
130. Pallant J: *SPSS Survival Manual.* 3rd edn. Maidenhead: Open University Press; 2007.
131. Szumilas M: **Explaining odds ratios.** *J Can Acad Child Adolesc Psychiatry* 2010, **19**:227-229.
132. Lopez V, Whitehead D: **Sampling data and data collection i qualitative research.** In: *Nursing and Midwifery Research: Methods and Appraisal for Evidence-Based Practice.* 4th edn. Edited by Schneider Z, Whitehead D, LoBiondo-Wood G, Haber J. Sydney: Elsevier; 2013: 123-140.
133. Hsieh HF, Shannon SE: **Three approaches to qualitative content analysis.** *Qual Health Res* 2005, **15**:1277-1288.
134. Graneheim UH, Lundman B: **Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness.** *Nurse Educ Today* 2004, **24**:105-112.
135. **Open Code 3.6** [<http://www.phmed.umu.se/enheter/epidemiologi/forskning/open-code/>]
136. Osborne S, Schneider Z: **Quantitative data collection and study validity.** In: *Nursing and Midwifery Research: Methods and Appraisal for Evidence-Based Practice.* 4th edn. Edited by Schneider Z, Whitehead D, LoBiondo-Wood G, Haber J. Sydney: Elsevier; 2013: 200-217.

137. Geirsson M, Bendtsen P, Spak F: **Attitudes of Swedish general practitioners and nurses to working with lifestyle change, with special reference to alcohol consumption.** *Alcohol Alcohol* 2005, **40**:388-393.
138. Sheskin DJ: *Parametric and Nonparametric Statistical Procedures*. 3rd edn. London: Chapman & Hall/CRC; 2004.
139. Rodriguez A, Miettunen J, Henriksen TB, Olsen J, Obel C, Taanila A, Ebeling H, Linnet KM, Moilanen I, Jarvelin MR: **Maternal adiposity prior to pregnancy is associated with ADHD symptoms in offspring: evidence from three prospective pregnancy cohorts.** *Int J Obes* 2008, **32**:550-557.
140. Rodriguez A: **Maternal pre-pregnancy obesity and risk for inattention and negative emotionality in children.** *J Child Psychol Psychiatry* 2010, **51**:134-143.
141. Krakowiak P, Walker CK, Bremer AA, Baker AS, Ozonoff S, Hansen RL, Hertz-Picciotto I: **Maternal metabolic conditions and risk for autism and other neurodevelopmental disorders.** *Pediatrics* 2012, **129**:e1121-1128.
142. Oken E: **Maternal and child obesity: the causal link.** *Obstet Gynecol Clin North Am* 2009, **36**:361-377.
143. Muller-Riemenschneider F, Reinhold T, Berghofer A, Willich SN: **Health-economic burden of obesity in Europe.** *Eur J Epidemiol* 2008, **23**:499-509.
144. Keely A, Gunning M, Denison F: **Maternal obesity in pregnancy: Women's understanding of risks.** *Br J Midwifery* 2011, **19**:364-369.
145. Nitert MD, Foxcroft KF, Lust K, Fagermo N, Lawlor DA, O'Callaghan M, McIntyre HD, Callaway LK: **Overweight and obesity knowledge prior to pregnancy: a survey study.** *BMC Pregnancy Childbirth* 2011, **11**:96.
146. Kominiarek MA, Vonderheid S, Endres LK: **Maternal obesity: do patients understand the risks?** *J Perinatol* 2010, **30**:452-458.
147. McDonald SD, Pullenayegum E, Bracken K, Chen AM, McDonald H, Malott A, Hutchison R, Haley S, Lutsiv O, Taylor VH *et al*: **Comparison of midwifery, family medicine, and obstetric patients' understanding of weight gain during pregnancy: a minority of women report correct counselling.** *J Obstet Gynaecol Can* 2012, **34**:129-135.
148. McDonald SD, Pullenayegum E, Taylor VH, Lutsiv O, Bracken K, Good C, Hutton E, Sword W: **Despite 2009 guidelines, few women report being counseled correctly about weight gain during pregnancy.** *Am J Obstet Gynecol* 2011, **205**:333.e1-6.
149. Cogswell ME, Scanlon KS, Fein SB, Schieve LA: **Medically advised, mother's personal target, and actual weight gain during pregnancy.** *Obstet Gynecol* 1999, **94**:616-622.
150. Phelan S, Phipps MG, Abrams B, Darroch F, Schaffner A, Wing RR: **Practitioner advice and gestational weight gain.** *J Womens Health* 2011, **20**:585-591.
151. Stengel MR, Kraschnewski JL, Hwang SW, Kjerulff KH, Chuang CH: **"What my doctor didn't tell me": examining health care provider advice to overweight and obese pregnant women on gestational weight gain and physical activity.** *Womens Health Issues* 2012, **22**:535-540.

152. Brown A, Avery A: **Healthy weight management during pregnancy: what advice and information is being provided.** *J Hum Nutr Diet* 2012, **25**:378-387.
153. Herring SJ, Platek DN, Elliott P, Riley LE, Stuebe AM, Oken E: **Addressing obesity in pregnancy: what do obstetric providers recommend?** *J Womens Health* 2010, **19**:65-70.
154. Ferrari RM, Siega-Riz AM: **Provider advice about pregnancy weight gain and adequacy of weight gain.** *Matern Child Health J* 2013, **17**:256-264.
155. Lutsiv O, Bracken K, Pullenayegum E, Sword W, Taylor VH, McDonald SD: **Little congruence between health care provider and patient perceptions of counselling on gestational weight gain.** *J Obstet Gynaecol Can* 2012, **34**:518-524.
156. Taffel SM, Keppel KG: **Advice about weight gain during pregnancy and actual weight gain.** *Am J Public Health* 1986, **76**:1396-1399.
157. Stotland NE, Haas JS, Brawarsky P, Jackson RA, Fuentes-Afflick E, Escobar GJ: **Body mass index, provider advice, and target gestational weight gain.** *Obstet Gynecol* 2005, **105**:633-638.
158. Brawarsky P, Stotland NE, Jackson RA, Fuentes-Afflick E, Escobar GJ, Rubashkin N, Haas JS: **Pre-pregnancy and pregnancy-related factors and the risk of excessive or inadequate gestational weight gain.** *Int J Gynaecol Obstet* 2005, **91**:125-131.
159. Strychar IM, Chabot C, Champagne F, Ghadirian P, Leduc L, Lemonnier MC, Raynauld P: **Psychosocial and lifestyle factors associated with insufficient and excessive maternal weight gain during pregnancy.** *J Am Diet Assoc* 2000, **100**:353-356.
160. Stotland NE, Gilbert P, Bogetz A, Harper CC, Abrams B, Gerbert B: **Preventing excessive weight gain in pregnancy: how do prenatal care providers approach counseling?** *J Womens Health* 2010, **19**:807-814.
161. Edvardsson K, Edvardsson D, Hornsten A: **Raising issues about children's overweight--maternal and child health nurses' experiences.** *J Adv Nurs* 2009, **65**:2542-2551.
162. Campbell F, Johnson M, Messina J, Guillaume L, Goyder E: **Behavioural interventions for weight management in pregnancy: A systematic review of quantitative and qualitative data.** *BMC Public Health* 2011, **11**:491.
163. Fleming P, Godwin M: **Lifestyle interventions in primary care: systematic review of randomized controlled trials.** *Can Fam Physician* 2008, **54**:1706-1713.
164. Weinehall L, Hellsten G, Boman K, Hallmans G, Asplund K, Wall S: **Can a sustainable community intervention reduce the health gap? - 10 year evaluation of a Swedish community intervention program for the prevention of cardiovascular disease.** *Scand J Public Health Suppl* 2001, **56**:59-68.
165. Norberg M, Lindvall K, Stenlund H, Lindahl B: **The obesity epidemic slows among the middle-aged population in Sweden while the socioeconomic gap widens.** *Glob Health Action* 2010, **3**.
166. Lawlor DA, Smith GD, O'Callaghan M, Alati R, Mamun AA, Williams GM, Najman JM: **Epidemiologic evidence for the fetal overnutrition hypothesis: findings from the mater-university study of pregnancy and its outcomes.** *Am J Epidemiol* 2007, **165**:418-424.

167. Bremberg S: *Social health inequalities in Swedish children and adolescents – a systematic review, second edition*. Östersund: Swedish National Institute of Public Health; 2011.
168. McNeill LH, Kreuter MW, Subramanian SV: **Social environment and physical activity: a review of concepts and evidence**. *Soc Sci Med* 2006, **63**:1011-1022.
169. Waters E, de Silva-Sanigorski A, Hall BJ, Brown T, Campbell KJ, Gao Y, Armstrong R, Prosser L, Summerbell CD: **Interventions for preventing obesity in children**. *Cochrane Database Syst Rev* 2011:CD001871.
170. Johnson BA, Kremer PJ, Swinburn BA, de Silva-Sanigorski AM: **Multilevel analysis of the Be Active Eat Well intervention: environmental and behavioural influences on reductions in child obesity risk**. *Int J Obes* 2012, **36**:901-907.
171. Sanigorski AM, Bell AC, Kremer PJ, Cuttler R, Swinburn BA: **Reducing unhealthy weight gain in children through community capacity-building: results of a quasi-experimental intervention program, Be Active Eat Well**. *Int J Obes* 2008, **32**:1060-1067.
172. Economos CD, Hyatt RR, Goldberg JP, Must A, Naumova EN, Collins JJ, Nelson ME: **A community intervention reduces BMI z-score in children: Shape Up Somerville first year results**. *Obesity* 2007, **15**:1325-1336.
173. Taylor RW, McAuley KA, Barbezat W, Strong A, Williams SM, Mann JI: **APPLE Project: 2-y findings of a community-based obesity prevention program in primary school age children**. *Am J Clin Nutr* 2007, **86**:735-742.
174. de Silva-Sanigorski AM, Bell AC, Kremer P, Nichols M, Crellin M, Smith M, Sharp S, de Groot F, Carpenter L, Boak R *et al*: **Reducing obesity in early childhood: results from Romp & Chomp, an Australian community-wide intervention program**. *Am J Clin Nutr* 2010, **91**:831-840.
175. Millar L, Kremer P, de Silva-Sanigorski A, McCabe MP, Mavoa H, Moodie M, Utter J, Bell C, Malakellis M, Mathews L *et al*: **Reduction in overweight and obesity from a 3-year community-based intervention in Australia: the 'It's Your Move!' project**. *Obes Rev* 2011, **2**(Suppl 12):20-28.
176. Premberg A, Hellstrom AL, Berg M: **Experiences of the first year as father**. *Scand J Caring Sci* 2008, **22**:56-63.
177. Ellberg L, Hogberg U, Lindh V: **'We feel like one, they see us as two': new parents' discontent with postnatal care**. *Midwifery* 2010, **26**:463-468.
178. Fagerskiöld A: **Support of fathers of infants by the child health nurse**. *Scand J Caring Sci* 2006, **20**:79-85.
179. Fagerskiöld A: **A change in life as experienced by first-time fathers**. *Scand J Caring Sci* 2008, **22**:64-71.
180. Finnbogadottir H, Crang Svalenius E, Persson EK: **Expectant first-time fathers' experiences of pregnancy**. *Midwifery* 2003, **19**:96-105.
181. Deave T, Johnson D, Ingram J: **Transition to parenthood: the needs of parents in pregnancy and early parenthood**. *BMC Pregnancy Childbirth* 2008, **8**:30.
182. Bayley J, Wallace LM, Choudhry K: **Fathers and parenting programmes: barriers and best practice**. *Community Pract* 2009, **82**:28-31.
183. Widarsson M, Kerstis B, Sundquist K, Engstrom G, Sarkadi A: **Support needs of expectant mothers and fathers: a qualitative study**. *J Perinat Educ* 2012, **21**:36-44.

184. Berge JM, MacLehose R, Eisenberg ME, Laska MN, Neumark-Sztainer D: **How significant is the ‘significant other’? Associations between significant others’ health behaviors and attitudes and young adults’ health outcomes.** *Int J Behav Nutr Phys Act* 2012, **9**:35.
185. Anzman SL, Rollins BY, Birch LL: **Parental influence on children’s early eating environments and obesity risk: implications for prevention.** *Int J Obes* 2010, **34**:1116-1124.
186. Fuemmeler BF, Anderson CB, Masse LC: **Parent-child relationship of directly measured physical activity.** *Int J Behav Nutr Phys Act* 2011, **8**:17.
187. Hinkley T, Crawford D, Salmon J, Okely AD, Hesketh K: **Preschool children and physical activity: a review of correlates.** *Am J Prev Med* 2008, **34**:435-441.
188. Savage JS, Fisher JO, Birch LL: **Parental influence on eating behavior: conception to adolescence.** *J Law Med Ethics* 2007, **35**:22-34.
189. Salmon J, Timperio A, Telford A, Carver A, Crawford D: **Association of family environment with children’s television viewing and with low level of physical activity.** *Obes Res* 2005, **13**:1939-1951.
190. Wake M, Nicholson JM, Hardy P, Smith K: **Preschooler obesity and parenting styles of mothers and fathers: Australian national population study.** *Pediatrics* 2007, **120**:1520-1527.
191. Hall L, Collins CE, Morgan PJ, Burrows TL, Lubans DR, Callister R: **Children’s intake of fruit and selected energy-dense nutrient-poor foods is associated with fathers’ intake.** *J Am Diet Assoc* 2011, **111**:1039-1044.
192. Sarkadi A, Kristiansson R, Oberklaid F, Bremberg S: **Fathers’ involvement and children’s developmental outcomes: a systematic review of longitudinal studies.** *Acta Paediatr* 2008, **97**:153-158.
193. Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O: **Diffusion of innovations in service organizations: systematic review and recommendations.** *Milbank Q* 2004, **82**:581-629.
194. Rogers EM: *Diffusion of Innovations*. 5th edn. New York: Free Press; 2003.
195. Francke AL, Smit MC, de Veer AJ, Mistiaen P: **Factors influencing the implementation of clinical guidelines for health care professionals: a systematic meta-review.** *BMC Med Inform Decis Mak* 2008, **8**:38.
196. Grol R: **Implementation of changes in practice.** In: *Improving patient care. The implementation of change in clinical practice*. Edited by Grol R, Wensing M, Eccles M. Oxford: Elsevier; 2005: 6-14.
197. Lester H, Schmittlidl J, Selby J, Fireman B, Campbell S, Lee J, Whippy A, Madvig P: **The impact of removing financial incentives from clinical quality indicators: longitudinal analysis of four Kaiser Permanente indicators.** *BMJ* 2010, **340**:c1898.
198. Bauer MS: **A review of quantitative studies of adherence to mental health clinical practice guidelines.** *Harv Rev Psychiatry* 2002, **10**:138-153.
199. Höög E, Garvare R, Ivarsson A, Weinehall L, Nyström ME: **Challenges of managing a multi-sectoral health promotion program.** *Leadersh Health Serv*, in press.
200. Shields L, Watson R: **Common quantitative methods.** In: *Nursing and Midwifery Research: Methods and Appraisal for Evidence-Based Practice*. 4th edn. Edited by Schneider Z, Whitehead D, LoBiondo-Wood G, Haber J. Sydney: Elsevier; 2013: 161-183.

201. Glesbygdverket: *Definitions of rural areas in Sweden and other countries [Landsbygddefinitioner i Sverige och andra länder] [In Swedish]*. Östersund; 2008.
202. Morton LM, Cahill J, Hartge P: **Reporting participation in epidemiologic studies: a survey of practice**. *Am J Epidemiol* 2006, **163**:197-203.
203. Boström G: *What does the nonresponse mean in public health surveys? [Vad betyder bortfallet för resultatet i folkhälsoenkäter?] [In Swedish]*. Östersund: Swedish National Institute of Public health; 2010
204. Galea S, Tracy M: **Participation rates in epidemiologic studies**. *Ann Epidemiol* 2007, **17**:643-653.
205. Tolonen H, Dobson A, Kulathinal S: **Effect on trend estimates of the difference between survey respondents and non-respondents: results from 27 populations in the WHO MONICA Project**. *Eur J Epidemiol* 2005, **20**:887-898.
206. Harald K, Salomaa V, Jousilahti P, Koskinen S, Vartiainen E: **Non-participation and mortality in different socioeconomic groups: the FINRISK population surveys in 1972-92**. *J Epidemiol Community Health* 2007, **61**:449-454.
207. Nilsen RM, Vollset SE, Gjessing HK, Skjaerven R, Melve KK, Schreuder P, Alsaker ER, Haug K, Daltveit AK, Magnus P: **Self-selection and bias in a large prospective pregnancy cohort in Norway**. *Paediatr Perinat Epidemiol* 2009, **23**:597-608.
208. Cook JV, Dickinson HO, Eccles MP: **Response rates in postal surveys of health-care professionals between 1996 and 2005: an observational study**. *BMC Health Serv Res* 2009, **9**:160.
209. Field TS, Cadoret CA, Brown ML, Ford M, Greene SM, Hill D, Hornbrook MC, Meenan RT, White MJ, Zapka JM: **Surveying physicians: do components of the "Total Design Approach" to optimizing survey response rates apply to physicians?** *Med Care* 2002, **40**:596-605.
210. The National Board of Health and Welfare: *Statistics on Health Care Personnel: Official Statistics on the Number of Licensed Practitioners (2011) and their Labour Market Situation (2010) [Statistik om hälso- och sjukvårdspersonal: Officiell statistik om antal legitimerade (2011) och arbetsmarknadsstatus (2010)] [In Swedish]*. Stockholm; 2012.
211. The Swedish National Agency for Education: **Staff in open pre-schools in 2011 [Personal i öppen förskola år 2011] [In Swedish]** [<http://www.skolverket.se/statistik-och-analys/statistik/2.5245/2.4322/2.4323>]
212. Gorber SC, Tremblay M, Moher D, Gorber B: **A comparison of direct vs. self-report measures for assessing height, weight and body mass index: a systematic review**. *Obes Rev* 2007, **8**:307-326.
213. Fattah C, Farah N, O'Toole F, Barry S, Stuart B, Turner MJ: **Body Mass Index (BMI) in women booking for antenatal care: comparison between self-reported and digital measurements**. *Eur J Obstet Gynecol Reprod Biol* 2009, **144**:32-34.
214. Shiely F, Hayes K, Perry IJ, Kelleher CC: **Height and weight bias: the influence of time**. *PLoS One* 2013, **8**:e54386.
215. Connor Gorber S, Tremblay MS: **The bias in self-reported obesity from 1976 to 2005: a Canada-US comparison**. *Obesity* 2010, **18**:354-361.
216. Fisher RJ, Katz JE: **Social-desirability bias and the validity of self-reported values**. *Psychology & Marketing* 2000, **17**:105-120.
217. Adams AS, Soumerai SB, Lomas J, Ross-Degnan D: **Evidence of self-report bias in**

- assessing adherence to guidelines.** *Int J Qual Health Care* 1999, **11**:187-192.
218. Gillespie B, Chaboyer W: **Assessing measuring instruments.** In: *Nursing and Midwifery Research: Methods and Appraisal for Evidence-Based Practice*. 4th edn. Edited by Schneider Z, Whitehead D, LoBiondo-Wood G, Haber J. Sydney: Elsevier; 2013: 218-236.
219. Dawson B, Trapp RG: **Research Questions About Means in Three or More Groups.** In: *Basic & Clinical Biostatistics*. 4th edn. Edited by Dawson B, Trapp RG. New York: Lange Medical Books/McGraw-Hill; 2004: 162-189.
220. Feise RJ: **Do multiple outcome measures require p-value adjustment?** *BMC Med Res Methodol* 2002, **2**:8.
221. Perrin EM, Flower KB, Ammerman AS: **Pediatricians' own weight: self-perception, misclassification, and ease of counseling.** *Obes Res* 2005, **13**:326-332.
222. Van Acker R, De Bourdeaudhuij I, De Cocker K, Klesges LM, Cardon G: **The impact of disseminating the whole-community project '10,000 Steps': a RE-AIM analysis.** *BMC Public Health* 2011, **11**:3.
223. Jenkinson KA, Naughton G, Benson AC: **The GLAMA (Girls! Lead! Achieve! Mentor! Activate!) physical activity and peer leadership intervention pilot project: a process evaluation using the RE-AIM framework.** *BMC Public Health* 2012, **12**:55.
224. Dunton GF, Liao Y, Grana R, Lagloire R, Riggs N, Chou CP, Robertson T: **State-wide dissemination of a school-based nutrition education programme: a RE-AIM (Reach, Efficacy, Adoption, Implementation, Maintenance) analysis.** *Public Health Nutr* 2012:1-9.
225. Estabrook B, Zapka J, Lemon SC: **Evaluating the implementation of a hospital work-site obesity prevention intervention: applying the RE-AIM framework.** *Health Promot Pract* 2012, **13**:190-197.
226. Frank LD, Andresen MA, Schmid TL: **Obesity relationships with community design, physical activity, and time spent in cars.** *Am J Prev Med* 2004, **27**:87-96.
227. Institute of Medicine of the National Academies: *Local Government Actions to prevent Childhood Obesity*. Washington, DC; 2009.

Mödrahälsovården & Salut-satsningen i Västerbotten

ENGELSKA



VÄSTERBOTTENS
LÄNS LANDSTING

Health Form

for expectant parents

mother

To be filled in by midwife

Estimated date of birth:

Public dental care:

Welcome to Maternity Health Care and Salut

We wish you very welcome to Maternity Health Care. We would like you to tell us a little about your habits and how you feel about your health. *So please fill in this form and bring it with you when you come to see us.*

The purpose of maternity health care is to promote and strengthen your coming parenthood and prevent or detect illness in a mother or her baby at an early stage. We therefore offer medical, psychological and social support during pregnancy.

Salut is a health initiative in the county of Västerbotten, the aim of which is to support the child while he or she is growing up, and beginning already during the mother's pregnancy. We know today that a favourable environment during the foetal period and while growing up is important for lifelong health. You will therefore encounter the Salut initiative's health-promoting activities in maternal health care and public dental care and later on in paediatric healthcare, open preschool, preschool and school.

The Health Form is sent to all parents-to-be in the county. It is used in your talk with the midwife and in the health interview that the dental hygienist offers you and your partner. Details marked "information for your maternity health care record" will be entered in your healthcare record. With the exception of the separate sheet used by the midwife, your answers are compiled and used in the Salut initiative to tell us more about the habits and health of the county's parents-to-be. *We hope that you will want to take part!*

THANK YOU FOR YOUR ASSISTANCE.

Maternity Health Care and the RD&E unit

Västerbotten County Council

Participation is voluntary. If you do not want the Health Form to be forwarded to Västerbotten County Council's Research, Development and Education unit (RD&E) please tell the midwife. The Health Form will then only be used as a basis for your interviews with the midwife and the dental hygienist.

The people who see your answers and the results of any examinations are legally bound to confidentiality. Your details are processed by the RD&E unit in collaboration with Umeå University. The information will be used in research projects approved by an ethics committee. No individual person can be identified in any analysis or report.

All personal information in the Salut initiative is processed in accordance with the Personal Data Act (SFS 1998:204) and your details are stored in a database. You are entitled to request a so-called extract from register and to have incorrect information corrected. You are also entitled to have your details deleted from the database. In such cases, please contact Personuppgiftsansvarig för Salut-satsningen, Landstingsstyrelsen i Västerbottens läns landsting.

Mödrahälsovården & Salut-satsningen i Västerbotten

ENGELSKA



VÄSTERBOTTENS
LÄNS LANDSTING

Health Form

for expectant parents

father/partner

To be filled in by midwife

Estimated date of birth:

Public dental care:

Welcome to Maternity Health Care and Salut

We wish you and your partner very welcome to Maternity Health Care. We would like you to tell us a little about your habits and how you feel about your health. *So please fill in this form and bring it with you when you come to see us.* It is not possible to go through your Health Form when you visit maternity health care but the midwife will gladly answer your questions or tell you who to ask.

The purpose of maternity health care is to promote and strengthen your coming parenthood and prevent or detect illness in a mother or her baby at an early stage. We therefore offer medical, psychological and social support during pregnancy.

Salut is a health initiative in the county of Västerbotten, the aim of which is to support the child while he or she is growing up, and beginning already during the mother's pregnancy. We know today that a favourable environment during the foetal period and while growing up is important for lifelong health. You will therefore encounter the Salut initiative's health-promoting activities in maternal health care and public dental care and later on in paediatric healthcare, open preschool, preschool and school.

The Health Form is sent to all parents-to-be in the county. It is used in the health interview that the dental hygienist offers you and your partner. Your answers are compiled and used in the Salut initiative to tell us more about the habits and health of the county's parents-to-be. *We hope that you will want to take part!*

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Excerpts from the questionnaire (I).

Today's date: / / Health centre:

Year Month Day

Midwife:

Name:

Personal identification number:

X1. What is your present type of occupation?

- | | |
|---|--|
| <input type="checkbox"/> Employed
<input type="checkbox"/> Self-employed
<input type="checkbox"/> Jobseeker for <u>more than</u> 6 months
<input type="checkbox"/> Jobseeker for <u>less than</u> 6 months | <input type="checkbox"/> Student, apprentice
<input type="checkbox"/> Doing household work at home (no personal income)
<input type="checkbox"/> On parental or other leave
<input type="checkbox"/> On sickness, old age or disability benefit |
|---|--|

X3. What is the highest level of education you have completed?

- ☐ Less than 9 years of school
☐ Completed compulsory school, or the equivalent of 9 years of school
☐ Completed secondary school, or the equivalent of 12 years of school
☐ At least 1 year of school beyond secondary school
☐ **A university degree**

The mother to be:

Name:

Personal identification number:

What is your weight at present? appr. ____ kg

How tall are you? appr. ____ cm