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**PUBLIC HEALTH NUTRITION IN EUROPE:
*WORKFORCE DEVELOPMENT AND POLICY CHANGE***

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ABSTRACT

Public health nutrition workforce development is an important prerequisite for developing a nation's capacity to achieve public health nutrition objectives.

Presently, there is a lack of knowledge about public health nutrition workforce development in Europe, in particular, about how governments have developed strategies for promoting a skilled and adaptable public health nutrition workforce and about the current workforce in terms of roles, competencies and functions. The aim of this thesis is to explore workforce development in order to identify current needs and to develop a better understanding of the policy processes that lead to public health nutrition policy changes.

Initially, a qualitative study comprising semi-structured face-to-face interviews was conducted to identify enabling and constraining factors of workforce development in seven European countries (Study I). In the following case-study, the agenda setting of a food and nutrition policy in Slovenia was scrutinised by applying Kingdon's streams model (Study II). In Study IV, the Swedish public health policy process from 1960-2006 was examined to distinguish policy learning patterns. Finally, we conducted a Delphi-study in order to develop a set of core functions to guide strategic workforce development (Study III).

This thesis shows that public health nutritionists as a workforce is largely missing in practice. In countries where public health nutritionists were recognised in policies and organisational aims and programmes, it was more likely that employers supported the roles and saw the value of employing public health nutritionists (Study I). Investigation of specific cases showed how a food and nutrition policy could be established in Slovenia despite weak initial interest from dominant coalitions in the government (Study II). It specifically points to the importance of particular individuals and their cognitive characteristics (i.e. analytical, strategic and entrepreneurial skills) in order to influence the policy process. Study IV points to the importance of the Swedish committee system as a decision-making arena where public health ideas can be debated and consensus agreed upon in order to enable public health policy learning across groups and influence policy change. Consensus on the core functions of the public health nutrition workforce emphasized the importance of analytical, advisory and interventionist functions in the context of preventing diet-related diseases in populations (Study III).

In order to secure public health nutrition processes and change, we need to learn about the context of policy subsystems (actors who have decision-making power in public health nutrition issues, expert networks, governmental agencies, intergovernmental organisations) and the relationships between actors and institutions, including their power and authority.

Potential implications based on the findings presented in this thesis are that it is necessary to stimulate relationships between governmental agencies, public health organisations at regional level, practitioners and private sector in order to improve public health nutrition agendas and workforce development strategies. Considering the current gap of knowledge about public health nutrition workforce development in Europe, there is a need to learn from countries that have been successful in increasing

the national and sub-national institutional capacity to lead, coordinate and implement public health nutrition objectives.

Keywords: Public health nutrition, workforce development, policy process, agenda setting, policy learning, core functions

LIST OF ABBREVIATIONS

ACF	Advocacy Coalition Framework
CAP	Common Agricultural Policy of the European Communities
CHD	Coronary Heart Disease
CINDI	Countrywide Integrated Non-communicable Diseases Intervention
EU	European Union
FNAP	Slovenian National Food and Nutrition policy
HIA	Health Impact Assessment
FAO	Food and Agricultural Organization of the United Nations
PH	Public health
PHN	Public health nutrition or public health nutritionist
WHO	World Health Organization of the United Nations
WFD	Workforce development

LIST OF PUBLICATIONS

- I. Susanna Kugelberg, Svandis Jonsdottir, Elisabeth Faxelid, Kristina Jönsson, Ann Fox, Inga Thorsdottir and Agneta Yngve (2012). Public health nutrition workforce development in seven European countries: Constraining and enabling factors. *Public Health Nutrition*, 15, pp 1989-1998.
- II. Susanna Kugelberg, Kristina Jönsson and Agneta Yngve (2012). Understanding the process of establishing a food and nutrition policy: The case of Slovenia. *Health Policy*, 107, pp 91-97.
- III. Svandis Jonsdottir, Inga Thorsdottir, Susanna Kugelberg, Agneta Yngve, Nicholas P Kennedy and Roger Hughes (2012). Core functions for the public health nutrition workforce in Europe: A consensus study. *Public Health Nutrition*, 15, pp 1999-2004.
- IV. Susanna Kugelberg, Kristina Jönsson and Agneta Yngve. Public health policy change in Sweden: A learning-based perspective. (*Manuscript*)

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1 INTRODUCTION

"The primary determinants of disease are mainly economic and social, and therefore its remedies must also be economic and social. Medicine and politics cannot and should not be kept apart."

Geoffrey Rose

Since the 1990s governments increasingly recognize that the burden of disease attributable to nutrition is substantial and that the evidence-base concerning the role of diet and nutrition in the development of disease and health related conditions, such as diabetes (1) and obesity (2), is generally well understood. Obesity increases the likelihood of diabetes, high blood pressure, heart disease, disease of the liver, kidney, gallbladder, nervous and musculoskeletal systems, and some common cancers. In addition, obese people are more often depressed (3, 4). These chronic diseases are not only on the rise in Western and developed countries but also holds true for developing countries (4).

Although still in its infancy, public health nutrition is an increasingly important research field. It emerged in the scientific literature as late as the early 1970s (5). While its initial focus was to tackle issues of malnutrition and food security (6), public health nutrition science became a growing academic discipline in the mid-1990s, most notably in Australia, Canada, the United Kingdom and the United States (7-10). Emerging out of a preoccupation with a very slow progress in improving the nutrition related health of large segments of the population, specifically those of low socio-economic status and poor living conditions, public health nutrition aims to address these issues at the population level rather than the individual level, and to do so via health promotion and workforce development rather than via a bio-medical approach. In its essence public health nutrition champions advocate changes – on both policy and practice levels.

Placing public health nutrition on the political agenda and increasing the capacity of the existing workforce to address public health nutrition issues are important prerequisites for developing a nation's capacity to promote and maintain the nutrition related health of populations (11-13). Scholars interested in public health nutrition development have long recognised that the workforce plays an important role in improving the nutrition related health in populations (14-16). Workforce planning (17, 18) and providing competency and capacity-building frameworks for public health organisations to build their public health nutrition workforce (19-21) are key strategies in attaining public health objectives.

In the European project JobNut that started with the aim of identifying the main competencies and functions needed to promote public health nutrition workforce development across Europe, questions such as why sudden public health nutrition concerns reach the political agenda and what roles individuals, external events, governments and international organisations play in policy change, came increasingly to the fore. It became evident that before we answer some key strategic questions about the workforce elements needed to attain public health nutrition goals, we need to learn from the experiences of different social actors and examine more closely the reasons for why public health policies change or do not change. This thesis constitutes one part of the JobNut project and explored challenges and barriers of workforce development of public health nutritionists and investigated occurrences of policy change.

The European perspective may refer to a number of dimensions, e.g. cultural, economic, historical and political context. The European perspective in this thesis builds on the JobNut project supported by the European Commission, and therefore identifies Europe as the 27 member states. The motivation for the European Commission to support this thesis was to gather knowledge about public health nutrition in Europe. This would facilitate joint research projects as well as development of best practice. Our aim is not to generalize to a European context or to present a full picture of the current situation in each country, but to understand strengths, weaknesses and opportunities related to public health nutrition workforce development. To this end, our sources have mainly consisted of interviews, a survey and grey literature.

To derive lessons in learning how to change, it is useful to have an explicit framework in order to focus on relevant aspects of reality. Political science makes important contributions towards explaining policy change, by offering theoretical tools for understanding and explaining how states and other political actors respond to and learn from external events, experiences and new information (22-27).

This thesis aims to contribute to the public health nutrition research field by exploring the factors that enable or constrain workforce development (Study I) and by giving strategic recommendations for public health nutrition workforce development based on consensus and agreement (Study III). We have also examined the factors that influence the public health nutrition policy-process and in particular how policy change may occur as a result of different actions taken by individuals or of opportunities provided by external events, which is highlighted in Study II. On other occasions, policy change may be the result of learning processes, which may occur through interactions in both informal and formal venues, where policy participants meet, influence and learn from each other as illustrated in Study IV.

In short, we hope to identify new directions for public health nutrition workforce development by studying the circumstances where public health nutrition policy change occurs and by strategic analysis of future directions.

2 BACKGROUND

To understand public health nutrition policy change and workforce development strategies, it is essential to know about the historical evolution of nutrition sciences. While public health nutrition has its roots in bio-medical and nutrition sciences, it emerged primarily as a response to the challenges that had arisen from changes in the social and political context. The next section provides a brief summary of the rise of nutrition science and the emergence of public health nutrition as a response to new challenges arising from the broader context. The last two sections provide a short introduction to workforce development strategies and the contribution policy sciences can offer in providing insight on how to understand public health nutrition policy processes.

2.1 NUTRITION SCIENCE

Since the early to mid-nineteenth century, nutrition science has taken a bio-medical approach resulting in the creation of dietetics as a separate paramedical profession (28). The first generation of nutritionists came from the ranks of physiologist, bio-chemical and physician backgrounds and were convinced that they could change the health paradigm with the help of nutrition science (29). When the food industry and governments endorsed nutrition science, nutrition became an important political instrument because of its ability to improve the health of populations. Nutrition science had its golden years from the end of the nineteenth century to the mid to late twentieth century and it is claimed that half of the economic growth in the UK and in certain Western European countries between 1790-1980 was related to improvements in population nutrition in conjunction with better hygiene and sanitary standards (30). In the early twentieth century, a number of diseases were identified as vitamin deficiencies. Prominent nutrition researchers, such as John Boyd Orr and Hugh Sinclair, were employed by the government to develop a more nutrition oriented national food system in the UK (30). Boyd Orr later became the first director of the Food and Agriculture Organization of the United Nations (FAO) and received a Nobel prize for his work on equity and world food supply (31).

2.2 MAIN CHALLENGES

In the 1970s, public health researchers became increasingly interested in the social determinants of health as a complementary approach to the bio-medical perspective of health. In the UK the Whitehall studies showed an association between social class and mortality from a wide range of diseases (32). There were also debates in Sweden about the nation's diet and the subsequent effects on health (33). International policy-making reinforced a new health equity approach with the release of reports such as the Canadian Lalonde report (34), the Alma Ata declaration (35) and the World Health Organization's Health for All strategy (36), which highlighted a need for policy change in order to address health equity and social determinant of health. Many scholars agree that national public health policies were influenced by diffusion from international policies on during the 1980s (37-39).

During the 1980s there was also a change in governance in many Western European countries, with an increase in decentralisation and allocation of public health responsibilities to the local level (40). Some important public health nutrition

programmes at the local level were initiated at this time. The North Karelia project in Finland (41) and the Norsjö project (42) in Sweden are two examples of comprehensive community-based interventions that tried to improve dietary habits, particularly population cholesterol levels, in order to reduce coronary heart disease (CHD) rates. The WHO Countrywide Integrated Non-Communicable Disease Intervention (CINDI) programme began in the early 1980s and was one of the main vehicles for implementing the regional policy for Health for All (43). CINDI focused on reducing levels of major non-communicable diseases (e.g. cardiovascular diseases, cancer, chronic respiratory diseases, diabetes) through primary care, intersectoral action and community participation (36).

Taking action at the local level provides an example of governments learning-by-doing rather than learning-by-studying and public health nutrition advocates soon recognised the need for developing a workforce for public health nutrition. The need for nutrition as a practical, community orientated discipline also grew from the discontent with current national policy-making, which was considered too *“individualistic, ‘bullet-style’, empirical and too technological to address complex societal matters”* (44) (p. 376).

In the mid-1990s, discussions about developing a workforce of public health nutritionists were initiated mainly in Australia (8), Canada (28), the UK (9) and the US (45).

A major challenge for the government and health practitioners was the increase in diet-related diseases, which started in the 1980s. Despite scientific advances in nutrition knowledge, the trend in the 1990s showed that obesity, diabetes and cardio-vascular diseases were increasing worldwide (4, 46). Today, it is recognised that the burden of disease attributable to nutrition is substantial. Diet and physical activity have been estimated to be associated with one third of cardiovascular diseases, in 30-40% of certain types of cancer and in the Europe-wide rise in overweight and obesity (47). The WHO estimates that the prevention of major risk factors for ill-health, such as poor nutrition, could translate into a gain of 5 years of disability-free life expectancy (46).

The latest challenges for governments relate to the multiplicity of actors that shape public health nutrition. It is recognised that individuals alone cannot make rational choices when it comes to healthy food and lifestyle, and decisions by policy-makers, farming organizations, food corporations, retailers, advertisers and educators also influence lifestyle choices (48). Policy change must address issues beyond traditional health interests and include other policy sectors such as agriculture and fisheries, the environment, rural development, food production and international trade (49-51). The main challenge is to change the belief systems of citizens and groups in the agriculture, industry and health sectors, as they may have conflicting beliefs (i.e. the primary goal of economic gain rather than population health).

2.3 PUBLIC HEALTH NUTRITION

In the 1970s a new public health nutrition policy paradigm emerged in the US, which was intent on meeting the complexity and challenges of public health nutrition problems (5, 7, 52, 53). It was increasingly recognised that public health nutrition problems have sociological and political causes and that in order to address public health nutrition problems practitioners need to work with issues related to the

organisation of society and direct their efforts towards the most vulnerable groups. Various definitions of public health nutrition are discussed below to illustrate the connection between public health nutrition and society. Most definitions include descriptors that show a population focused, health promotion perspective, food and nutrition systems focus, wellness maintenance, primary prevention, application of public health principles, as well as ecological and political aspects (54). The Nutrition Society defines public health nutrition as *“the application of nutrition and physical activity to the promotion of good health, the primary prevention of diet-related illness of groups, communities, and populations (not individuals).”* (55). This definition of public health nutrition is quite narrow but clearly distinguishes it from clinical practices. The ‘new nutrition science’ (56, 57) defines the field as a conceptual framework showing the interactions between the food systems and biological, social, and environmental systems. The working definition in this thesis is derived from the First World Congress of Public Health Nutrition, in Barcelona 2006, where public health nutrition was defined as *“the promotion and maintenance of nutrition-related health and well-being of populations through the organised efforts and informed choices of society”* (58).

The point here is to show that the relationship between the organisation of public health nutrition services and the nutrition related well being of populations is a key aspect of public health nutrition.

Public health nutrition services can be defined as services that aim to address public health nutrition problems, including for example policy formulation, evaluation and lobbying, capacity-building, gathering of public health nutrition data (intake data and nutrition status data), research on effectiveness, planning, implementing and evaluating nutrition interventions as well as providing expert advice on different levels. These services can be placed in academic settings as well as in health care or public health settings – on local, regional or national levels. An important part of the work is to provide an update of the constantly evolving evidence base in public health nutrition, a task that needs to be coordinated on the national level and build on internationally derived information.

2.4 PUBLIC HEALTH NUTRITION POLICIES IN EUROPE

An analysis of policy experiences, suggests that factors needed for developing a policy for public health nutrition include: high-level political leadership, governmental monitoring of public health impacts, a structure for collaboration within and between the government and social actors, and support for policy development (18, 59). In addition to funds, authority and expertise, the development of new functions, roles and competencies within the public health workforce are needed (60). WHO member states recognize that the state has a responsibility to provide adequate health and social measures to fulfil public health goals (61). *The Global Strategy on Diet, Physical Activity and Health* (62) for example, states that in order *“to encourage the development, strengthening and implementation of global, regional, national and community policies and plans to improve diet and increase physical activity that are sustainable, comprehensive, and actively engage all sectors [governments need] to strengthen the human resources needed in this domain to enhance and sustain health.”* The Ottawa charter focuses on an intersectoral and participatory approach involving

many actors (63) and provides guiding principles for health promotion. Within the European Union (EU), public health nutrition strategies are also advocated. The Treaty of Amsterdam, that established the EU, states that “*a high level of human health protection shall be ensured in the definition and implementation of all Community policies and activities*” (64). Elements of food and nutrition policy are included in the European Commission’s *White Paper on Food Safety* (65) and the *White Paper on Nutrition, Overweight and Obesity Related Health Issues* (66). The long term EU strategy *Community Strategy on Diet, Physical activity and Health* highlights the need to mainstream nutrition and physical activity into all relevant policies at local, regional, national and European levels and to create supportive environments (67). The Council of Europe is also active in developing aspects of food and nutrition policy (68). “*Health and nutrition – elements for European action*” was a priority for the Commission and the French government during the French presidency (July–December 2000), which crystallized in the Eurodiet (69). The latest platforms to promote dialogue between social actors in the area of nutrition and physical activity is the EU Platform for Diet, Physical Activity and Health set up in 2005 (70) and the High Level Group on Nutrition and Physical activity (71). This group consists of European government representatives and is led by the European Commission. Of the 53 states in the WHO European Region, 46 have a final or draft policy document regarding nutrition. Most of the governments with nutrition plans acknowledged the importance of a intersectoral approach to public health nutrition development (72). In addition, governments assert a multidisciplinary and participatory approach, suggesting that public health nutrition development should involve all groups in society (73). Some of the member states, for example Denmark, emphasize the individual or the consumer as the final beneficiary (74). Nearly all governments recognize that social equity should be a guiding principle of national public health action plans. The Swedish draft action plan is very specific. It details 79 key measures organised by policy area, which are to be carried out by the government and national agencies as well as public health authorities and voluntary organisations at regional and local level (75).

2.5 WORKFORCE DEVELOPMENT

Despite this effort by public health nutrition advocates and the interest of government representatives, limited action has been taken towards developing the capacity of countries for implementing plans and programmes by developing public health nutrition training programmes and planning workforces (20). The scholarly interest in workforce development arose from a need to improve the implementation of policies and increase capacity-building in the public health nutrition infrastructure (5, 52, 53, 76, 77). Workforce development research is essentially strategic in nature and aims to direct and guide policy development (78-80). It often serves to draw attention to the need for joint efforts by practitioners, academic institutions and public health organisations to define what workforce functions and roles are necessary and to support competency development (79, 80). Most of the research in public health nutrition workforce development suggests that accredited academic institutions, a competent workforce and a wider public health infrastructure are necessary for improving the nutrition related health of populations. The definition of public health workforce development provided by Staron (81) shows its holistic nature:

Workforce development is a holistic concept that integrates workforce analysis and planning, human resource management and capability development to strengthen organization success by aligning the workforce to both current and future service demands. (81) (p. 33)

The JobNut project identifies workforce development thus:

The strategic investment of resources by organisations and communities in activities that reach and maintain a critical mass of human resources, develop organizational environments that enable and promote effective practices, and enhance the competency of the workforce for more effective public health nutrition effort that achieves public health outcomes. (82) (p. 9)

On a structural level, workforce development (WFD) aims to improve the functioning of the entire workforce by focusing on systems and structures that shape it, i.e. legislation, recruitment policies, resource allocation etc. On the individual level, WFD focuses on access to continuing competence development, on-the-job learning, mentoring etc. On yet a third level, it involves strategies for the coming generation of public health nutritionists, such as recruitment strategies and access to education and training. In line with Staron's definition, a large body of research has aimed at providing guidelines on how to operationalise workforce development (20, 21, 79, 83). A second branch of studies have focused on the current public health nutrition workforce and investigated workforce profile, career paths and developments (52, 84, 85). These studies provide insight into the characteristics of the workforce and are useful when comparing workforce compositions in different contexts, but provide few explanations of how actors have been instrumental in initiating, facilitating and promoting practice. There is also a body of studies focusing on competencies, functions and roles needed for effective practice (14, 15, 54, 86). Even if these studies give us a framework for evaluating the current practice and the range of competencies needed to fulfill core roles and functions, questions regarding the nature of support from public health directors, policy-makers and other professions as well as the structural barriers for public health nutrition workforce development, remain unanswered.

2.6 PUBLIC HEALTH NUTRITION TRAINING

In terms of workforce quality, some progress has been achieved in the area of workforce preparation, largely via the development of a European Master's Programme in Public Health Nutrition (EMPHN) (87, 88). This progress includes agreement about how to train public health nutritionists, how to integrate a European dimension into training programmes and how to collaborate in training on international level. However, research confirms that workforce development is more than just training, it also requires an infrastructure with supportive policies, structures, actors and processes (78, 83). Likewise, the actors in the system have limited possibilities for acting if they are not properly trained.

Nutrition training includes all types of nutrition education, from molecular to clinical to public health oriented training. Nutrition training takes place in all European countries to some extent, but to a varied degree of distinction when it comes to the scientific focus and level of training. Several new EU member countries have training in public health that includes food safety aspects only and where public health is taught on a

university college level, while clinical nutrition is included in the training of physicians or as specialized courses after medical training. Most countries have ongoing training in clinical nutrition (dietetics, dietary treatment of disease) and food safety (risks of food poisoning from microbial or chemical contamination), several countries provide training in molecular nutrition, which deals with nutrition from a molecular perspective (basic research, on cellular level concerning for example receptor research and genetics) and several countries have training programmes directly defined as public health nutrition training (89).

Since a specially trained workforce is only just emerging, literature mainly from Australia, Canada and the US has described the workforce a multi-disciplinary (84, 85, 90). There are various work settings identified for public health nutrition roles: government agencies, the food industry, voluntary organizations and NGOs, community and health-care services (52). Core functions reflect broader public health functions but have a nutrition concern (90).

2.7 POLICY PROCESSES AND POLICY CHANGE

How best to bring about sustainable public policies in accordance with public health principles has a long standing goal of public health nutrition science. In this respect, policy analysis can offer insights into conceptualising relationships between structures, actors, processes and change.

Policy change can occur in different phases of the policy process and may result in a fundamental change, affecting the beliefs and norms of past policies or it may result in small, incremental changes, with only minor revisions of existing policies. Policy change therefore involves influencing the policy process. The policy process can be influenced in a variety of ways that require different kinds of knowledge, roles and functions of the participating individuals. For instance, public health nutrition policy change may result from new ground-breaking epidemiological findings, by emulating policies from other countries or by learning from experiences of how to achieve public health nutrition goals. The theoretical perspectives and assumptions applied in this thesis are essentially drawn from the Advocacy-Coalition Framework (ACF) by Sabatier and Jenkins-Smith (26), Kingdon's streams model (22), policy diffusion and the literature on policy learning (25, 91, 92).

Policy learning recognises that learning can lead to change by altering the values, knowledge, and strategies of the policy participants in the subsystem or people outside the subsystem, such as individuals in authority or the general public (24-26, 92).

Most studies related to policy diffusion try to understand how policies and ideas are inspired by policies from other states and jurisdictions or from past policies (93). Even though the processes that have led to policy diffusion (e.g. learning, imitation and inspiration) (94-96) and the types of transfer (i.e. voluntary or coercive) are the main topics, there is a growing branch of study that uses the approach to analyze how ideas and practices are communicated between actors and become integrated in the domestic context (94, 97). These studies focus on the processes (i.e. the actors involved in diffusing, promoting and integrating the policy) and the conditions (i.e. cognitive aspects).

Kingdon's streams model and the Advocacy-Coalition Framework (ACF) (26) focusing explicitly on what contributes to policy change have shown that individuals and their characteristics, in combination with contextual factors, also play a major role in influencing the policy process.

3 AIM AND RESEARCH QUESTIONS

The general aim of this thesis is to explore workforce development in order to identify current needs and to develop a better understanding of the policy processes that lead to public health nutrition policy changes.

In the first study, the enabling and constraining factors of workforce development in seven European countries are described (Study I). In the next step, actors and processes that might explain agenda setting and policy change were traced and analysed (Studies II and IV). In the final step we developed a set of core functions for guiding strategic workforce development (Study III).

Key public health nutritionists from different sectors and levels were identified in the first study and were invited to participate in the Delphi study (Study III). Enabling and constraining factors identified in the Study I and informed the case studies in Studies II and IV.

The specific research questions that these studies attempt to answer are:

- *What is the nature of workforce development in the seven countries?* (Study I)
- *How do individuals (functions and roles) and policy learning influence the public health nutrition policy process?* (Studies II, IV)
- *What are the core functions needed for developing a public health nutrition workforce?* (Study III)

Studies I, II, III and IV were qualitatively categorised according to their research objectives. Study I is mainly *an explorative-evaluative* study, Studies II and IV have *descriptive-explanatory* objectives and Study III has a *strategic* objective.

The study designs and methodological approaches of the four studies are discussed in Chapter 5.

4 THEORETICAL FRAMEWORK

“Policy-making is a form of collective puzzlement on society’s behalf”

Hugh Hecló

In the last few decades, policy scholars and policy scientists have developed theories and conceptual frameworks to better understand policy processes. Highlighted below are some key assumptions from the policy literature about the role and function of individuals in influencing the governmental agenda setting as well as the political context within which they are embedded. Next, we explore theoretical insights from the policy learning literature and discuss the role of venues and forums in facilitating consensus and agreement between opponents. This chapter ends with some strategic insights from workforce development frameworks about functions necessary for informing workforce development. To begin with a short introduction on how to understand the policy process is provided.

4.1 HOW TO INFLUENCE THE POLICY PROCESS AND POLICY CHANGE

There is agreement among scholars that study of the policy process needs to take into account the related actors, events, and contexts (27). There is, however, variation around what is considered most important. For instance, some scholars describe the policy-process as a staged process involving agenda setting, policy formulation, policy adoption, implementation, evaluation, and termination (98-100). This perspective focuses on the policy-process as a rational, formal decision-making process and assumes that the legislator’s decisions are implemented (top-down problem solving). This kind of rational policy-cycle approach is often used in public health policy studies (101). This description offers a simple way of understanding the policy-process however, critiques have shown that it has several flaws in explaining policy-making in today’s political realities, with several levels of governments and an increasing interdependence between domestic and international pressures (102). Alternative theories and frameworks, such as institutional analyses, suggest that human behaviour is influenced by different kinds of institutions. Institutions in this perspective refers to shared concepts that are learnt and normalised by repetitive situations, rules, norms, and strategies (103).

Other theories focus explicitly on what contributes to sudden policy change and have shown that individuals and their cognitive characteristics in combination with contextual factors play a major role in influencing the policy process. Among these theories, the Advocacy Coalition Framework (ACF), developed by Sabatier and Jenkins-Smith (26), and Kingdon’s streams model (22) have made vast contributions which are further discussed in the next section. It is important to note that the policy process cannot be reduced to a single interpretation or definition. Different theories highlight different aspects of reality and provide different insights into how the policy process is influenced. Our choice of theoretical framework highlights some aspects of the policy-making process at the expense of other perspectives. We have chosen perspectives that have been previously applied to health and social policy-making (22, 104) and which reflect the opinions and experiences of health policy-makers (105, 106). Below we will explore assumptions laid down by different theories that explain

policy change and how to influence the policy process via a) individuals and their role and functions, b) contextual factors and c) policy learning. d) Lastly we will discuss the concept of *core functions* as related to public health nutrition workforce development.

4.1.1 Individual level analysis

Roles and functions of individuals in combination with contextual environment are key factors in influencing the policy-making process (25). Not surprisingly, a combination of individual characteristics and contextual factors make up the core of many of today's policy frameworks and theories (22, 26, 107-110). It has been acknowledged that no policy innovation can be diffused into a stable policy subsystem without advocates that promote the benefits and who strategically motivate and exert influence on others to accept the innovation. In 1939, Schumpeter (111) called these champions of innovation *entrepreneurs*.

Initially, the term was applied to individuals in the private sector (111). However, over the last few decades, the concept of the entrepreneur has also been applied to individuals in the public sector (22). The notion of a *policy entrepreneur* is widely found in the literature of public administration and political science. The description of a policy entrepreneur is an individual who possesses a specific quality that enables him or her to be successful in influencing opponents and the public of the value of a new instrument, method or idea (110, 112). It has become increasingly recognized that there is a variety of individuals outside of government who may act as policy entrepreneurs, such as members of interest groups (113), professionals interested in particular social causes (106) and public administrators (114).

While the literature on policy entrepreneurs explicitly recognizes that individuals act within a context, it guides the reader towards an understanding of the strategies, roles and functions applied by individuals to win support for their ideas and policy proposals. Some of the most commonly described features of a policy entrepreneur include an innovative role (110, 115), networking role (114, 116) and leadership role (22). Kingdon (22) also suggests that a policy entrepreneur will exhibit risk-taking behaviour or a "[...] *willingness to invest their resources – time, energy, reputation, and sometimes money – in the hope of a future return*" (22) (p. 122).

The literature therefore describes a policy entrepreneur as an individual who seeks to initiate dynamic policy change (22, 110, 113) and will create strategies to grasp opportunities or *windows of opportunities* (22). Another key strategy is to manage timing, or as Kingdon notes, "*hook solutions to problems, proposals to political momentum and political events to policy problems*" (22) (p. 182).

In the field of policy diffusion, studies have shown that intergovernmental organizations (IGOs) are important channels for diffusion and dissemination of ideas (117), and so is the media (118). Actors who are involved in the communication of innovations may span over a large spectrum and involve professional organizations, civil servants, policy networks (transnational and domestic), and NGOs (94). These latter organizations and groups can be referred to as *opinion leaders* and *change agents*. According to Rogers, *opinion leadership* is characterized by the ability to influence the attitudes and behaviours of other individuals (93). Opinion leadership is earned and sustained by the subject's technical or scientific competence, status and conformity to the system's norm. The most significant characteristic is a unique and influential

position in the system's communication process. A *change agent* is defined as an individual who attempts to influence the decisions of target groups in a direction that they deem desirable (93). Change agents are often professionals groups. Their professional backgrounds may be a barrier to effective communication of the innovation they are promoting, due to their perceived low status, coming from a technical field. However, some professional groups may also enjoy high status (e.g. medical degree holders) and can influence the policy process and support innovations (119, 120)

4.1.2 Understanding the influence of contextual elements

Both the ACF framework and Kingdon's streams model put forward a second set of assumptions which are linked to knowledge and interactions in the context an individual finds himself in (22, 107). To succeed in influencing the policy process or achieving change in a specific policy subsystem it is essential to understand the contextual factors; for example, who is important, what are the boundaries of the issue, how is information shared, how are decisions made. These contextual factors are of great strategic importance because influencing the policy process requires a familiarity with policy issues, an existing government programme or policy (109). A broad knowledge of the policy subsystem helps individuals know how, why and when to come with proposals and initiate negotiation (108). It also helps remove policy issues and decisions that are irrelevant to the issue of concern. Understanding the policy subsystem is not enough; it is also crucial to take account of the macro-system. In Kingdon's streams model, a key factor to success is an understanding of the macro-setting such as basic constitutional rules, public opinion and opponents beliefs (22). These factors are referred to as '*relatively stable parameters*' in Sabatiers ACF (26). Policy change according to Kingdon necessitates a convergence of the *problem stream*, *policy solution stream* and the *political stream*. But we should not think of these streams as sequential stages because policy change according to Kingdon is also conditioned by external checks or with the strategic skills and persistence of a policy entrepreneur (22). External events can be in the form of crises, public opinion or socio-economic conditions (22).

4.1.3 Policy learning

Another contributing factor that will inform our understanding of how to influence the policy process is the assumption that governments and individuals within governments learn. Policy change can result from learning from previous experience. Sabatier (26) defines policy learning as "*a relatively enduring alteration of thought or behavioural intentions that are concerned with the attainment (or revision) of the precepts of a policy belief system*". (26) (p. 19)

Learning is about knowledge and is a cognitive process where we change or reinforce what we value, see, understand and how we behave (25, 92, 121). However, it is recognised that learning is developmental and change often requires a longer time perspective (122).

To make this more operational and precise, Glasbergen (123) distinguishes between 3 types of policy learning:

1. *Technical or Instrumental learning*: learning about instruments – how the instruments may be improved in order to achieve certain set goals. This type of learning is often based on scientific information, experience and evaluation.
2. *Conceptual learning or problem learning*: involves a process of redefining policy objectives and seeing things from a different viewpoint – called conceptual learning because it tends to be accompanied with the development or adoption of new concepts, principle and images.
3. *Social learning*: focuses on an intersectoral approach and communication between actors. It builds on scientific principles of technical learning and the rethinking of objectives resulted from conceptual learning, but stresses values and other ‘higher-order’ properties such as norms, responsibilities and goals.

These definitions come from Glasbergen (123) but share some similarities with other learning approaches. Hall (24) categorizes different types of policy learning into 1st order, 2nd order and 3rd order learning reflecting technical, conceptual and social learning. According to Argyris (124), who has studied organizational learning, the first type of learning is *single-loop learning*, a type learning that does not question the fundamental design, goals and activities of the organization; the last two types of learning (conceptual learning and social learning) are occurrences of *double-loop learning*. Glasbergen’s work on environmental policy learning encompasses a normative approach, in which he argues that social learning offers the greatest capacity for deal with complex social issues. Glasbergen’s approach has been used in a number of studies identifying required learning capacities for a sustainable development or evaluating governments’ approaches to environmental policy-making (125-127). Fiorinos (128) work on the evolution of US environmental policy-making is a good example of the latter.

Policy learning may occur when individuals of opposing belief systems meet in specific decision-making arenas or venues. Venues that facilitate policy learning include professional fora and consensus-based institutions (108). Sabatier (26) identifies professional fora as venues “*which admit participants on the basis of professional training and technical competence. Ideally, such a forum would be made up of analysts committed to scientific norms who shared common theoretical and empirical presuppositions and could thus resolve a wide range of analytic disputes*” (26) (p. 53). Sabatier and Jenkins-Smith (26) argue that successful policy learning depends on the amount and type of data available to inform the policy discussion. If a policy problem is supported with abundant quantitative data to support decision-making and analysis of potential policy alternatives, then the likelihood of learning across opponents and coalitions is increased. A successful forum, where consensus can be formed among previously opposing experts, is likely to occur when scientists from all coalitions, as well as neutral scientists, actively participate (129). Consensus-based institutions differ from professional fora as a type of decision-making arena. It includes both scientists and non-scientists in the decision-making process and focuses on communication, decision rules based on consensus and joint fact-finding procedures (129). Weible

argues that consensus-based institutions play a major role in building trust, goodwill, and mutual understanding of the different values (108). These consensus-based institutions need not always be formal organizations, but may include informal venues that bring coalitions together (108).

4.2 PUBLIC HEALTH NUTRITION CORE FUNCTIONS

The importance of having a workforce with the capacity to implement strategies for addressing public health nutrition issues at local, regional and national levels is obvious and logical. A framework of core functions provides a description of the work required of PHN practitioners. Absence of these core functions means that there are gaps in the workforce capacity. PHN workforce functions can be compared against current work practices and workforce characteristics to identify the workforce's strengths as well as shortfalls requiring further development. Thus an understanding of the work required for effective a public health nutrition effort is clearly needed to aid workforce development and ultimately improve population nutrition status. Research suggests that mapping out the workforce functions could aid public health development in numerous ways (90). It was noted that a consensus definition of public health core functions could provide a reference point for any activity where a standard definition of public health activity is needed (e.g. capacity-building, expenditure mapping, performance standards). Identified core functions could then be used to examine the skills of the current workforce and how these map against the functions identified as most important. Gaps appearing between the current workforce's skill base and the required core functions could point to additional education and training needs.

5 METHODOLOGY

This thesis applies different methodological approaches in an attempt to answer our research questions, articulated in the table below.

Study	Research question	Research objective	Study design and methodology
Study I	What is the nature of workforce development across seven countries? What are the barriers and enabling factors for workforce development?	<i>Explorative-Evaluative</i>	Comparative or cross-national study Text analysis based on workforce development concepts
Study II and IV	How do individuals (functions and roles) and policy learning influence the public health nutrition policy process?	<i>Descriptive-Explanatory</i>	Case-study design Text analysis based on policy frameworks
Study III	Which core functions are needed to develop a public health nutrition workforce?	<i>Strategic</i>	Delphi study

The research methods used in this thesis are mainly qualitative but consist also of a Delphi method. It was important that the research methods were appropriate for realising the specific research objectives. A qualitative research method was selected because it is a useful way of addressing explorative and contextual objectives (130). Qualitative methods can answer questions such as *What is the nature of people's experiences?* or *How are decisions made?* as well as examine the reasons for why actions are taken or not (131, 132). Both in Studies II and IV we ask *why* and *how* questions and in Study I we attempt to explore the *nature* of workforce development. The Delphi method provides useful strategic answers and policy implications, such as in our investigation into public health nutrition workforce development needs (133, 134). In Study III we attempt to identify the type of work and functions that are required to meet the current need for addressing public health nutrition policies and implementing programmes. Below we present the study designs and their analytical approaches.

5.1 STUDY DESIGNS

5.1.1 Comparative study

Study I is a comparative study. This design was used because a comparison of workforce development status across seven countries could provide an empirical basis for building and informing workforce development strategies. A cross-national or comparative study is defined in the literature as a comparison of a single concept between one or more units in two or more societies or countries, usually with the intention of generalising the findings (135, 136). This type of study involves a researcher gathering data about the phenomena (workforce development in different societies) and making comparisons in order to gain a deeper understanding of the phenomena (136). A comparative study is often used for exploring and understanding a diverse range of social and public policy issues. It has been broadly applied in research in the social policy fields to understand complex behaviours, needs and systems (137). In this field, comparative studies have played a key role in providing insights into the development of social policy. The use of comparative studies can be explorative/descriptive, evaluative and/or analytical. We used a comparative approach to explore workforce development in seven countries and to evaluate the degree of variability of workforce development across countries.

5.1.2 Case-study

A more detailed analysis of how and why policy change occurs was undertaken in Studies II and IV. From Study I we noticed that individuals and their cognitions played a major role in facilitating policy change, and the particular case of the Slovenian policy-making process of a food and nutrition policy constituted a positive case to further investigate how individuals participate in and influence the policy process. The policy-making process is a complex process with multiple variables and blurred contextual boundaries (138). The study of people in complex situations with many variables over which the researcher has little or no control is often conducted as case-studies (138-140). Robert K. Yin (140) defines a case-study as *“an empirical inquiry that investigates a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident and benefits from the prior developments of theoretical propositions to guide data collection and data analysis.”* (140) (p. 18). In other words, a case-study with a theory-based approach can guide the researcher in exploring key concepts and help him towards finding new patterns and relationships. We used a case-study design to investigate i) the process of establishing a national food and nutrition policy in Slovenia (Study II) and ii) the development of public health policy in Sweden between 1960-2006 (Study IV). Sweden provided a case that may complement and modify the findings from Study II. It illustrates the difficulties in securing sustainable policy changes.

In both studies we applied key concepts from the policy literature and then sought verification from the individual cases. We also applied a historical perspective in evaluating alternative explanations for why policy change and learning occurred. According to Bennett (138, 139) case-studies should be conducted within a longer time perspective to detect patterns and evaluate the theoretical assumptions. Sabatier in his ACF-approach also argues that to study policy learning a timeframe of at least a decade

is necessary (26). Therefore, in both case-studies our chronological perspective stretched over more than a decade of time. We aimed at recreating the policy-making process in Slovenia that led to the adoption of the FNAP in 2005 in order to detect key roles and functions in the policy process (Study II). In Study IV we attempted to recreate the public health policy-making process in Sweden between 1960-2006 and identified policy learning as evidenced by changes in ideas and national policy.

5.1.3 Delphi study

Study III has the objectives to investigate and develop consensus among European key stakeholders as to the core functions and competency expectations required for effective public health nutrition practice in Europe and to test for differences in opinions about core functions and competency expectations between practitioners and academics. Academics can of course also be employers and the other way around, but in this context we define academics and employers by their working role, as researchers at universities and employers/practitioners in a public health organisation respectively.

The results of Study I showed that the workforce is quite heterogeneous in terms of the work they do and inconsistent in terms of competencies. Study III aims to provide recommendations to both PHN employers and academic institutions regarding PHN core functions. Consensus on the core competencies (i.e. the skills, knowledge and attitudes required to effectively perform in the workplace) of the public health nutrition workforce provide the basis for curriculum design and re-development, continuing education and workforce quality assurance systems. These are all important tools for systematic and strategic workforce development. In order to establish a list of necessary PHN functions, where limited agreement previously existed (c.f. (134)), we applied the Delphi method. The Delphi method is characterised by its ability to meet specific information needs and its potential for policy implications (141). It is named after the Greek oracle that reportedly had a large group of informants and was regarded as very accurate as a result of its being able to draw on so many sources. Linstone and Turoff (142) described the modern Delphi method as an instrument or technique for structuring group communication in order to bring together expert opinions to form an expert-based recommendation or set of priorities. It provides an opportunity for the panellists to anonymously express their opinions and share their knowledge about a complex problem, to compare their perspectives on the issue with others, and to change their opinions after evaluating the totality of the group's opinion (143). Delphi studies have been widely used across a range of issues in health and social policy. For instance, the Delphi method has often been used to develop consensus in healthcare settings, including competency requirements (142). The logic behind the Delphi method relies on statistics, whereby combined numerical estimates of participants views provide more reliable estimates than estimates from a single person (144). Compared to focus group interviews, the method allows input from a larger number of participants than could be included in group meetings and for the participation of geographically dispersed individuals at a relatively low cost (133). Another characteristic of the method is anonymity which can help avoiding peer pressure and prevent hostility, in particular personal and political conflicts that can affect the decision-making in interacting groups of experts (142). The inclusion of 2-3 rounds of the Delphi questionnaire and responses gives the panellists opportunity to change their views and opinions throughout the process (143). Additional information

can also be provided, such as opinions of panellists that fall outside a given set of options. After each round, responses are analysed and statistically summarised and then presented to the panellists for further consideration, and they are given the option to change their opinion. This iteration and feedback is continued until a certain amount of stability or consensus among panellists' responses is achieved. This consensus is the outcome of the Delphi method and regarded as an informed judgement.

5.2 ANALYTICAL APPROACHES

By choosing an analytical approach to analysing the data we have been guided by general qualitative criteria. Qualitative researchers have long held that the standard method of hypothesis testing through controlled experiments is not appropriate for conducting social science research (131, 145). Since the 1960-70s qualitative research methods have been increasingly applied in social sciences and in public health research (122). The literature points to the importance for qualitative research to be ethical, clearly defined and to use rigorous methods (146). Qualitative research is considered important when it can be applicable to society and theoretically useful by advancing the knowledge base (147). Qualitative comparative and case study research do not have a single defined method or standard set of procedures (139, 140). This can be appealing for very experienced researchers, but less so for a novice who seeks structure and organisation. Accordingly, our analytical approach is based on content analysis, which provides a structure and a framework for analysing the research questions. A review of qualitative analytical approaches applied in content analysis showed that they had some analytical stages in common. Although there might be disagreement on methodological order or terminology, most qualitative approaches would agree that planning, preparation, organising and reporting are important steps in text-analysis (135, 140, 145, 148, 149).

5.2.1 Stages in text analysis

Content analysis is one of numerous qualitative research methods used to analyse text data. Other methods include ethnography, grounded theory, phenomenology and historical research. Content analysis has a broad application and it is debated whether it is a method or a tool (148). It has been used both for quantitative applications, such as counting certain words or expressions in media research, and for qualitative interpretations, such as when an interpreter explores implicit or latent meanings. The use of content analysis in policy and social research has been widely recognised (150, 151). Walker states that it can provide insight to stakeholders *"grounded on the experiences – the world view – of those likely to be affected by a policy decision or thought to be part of the problem"* (152) (p. 19). Qualitative content analysis focuses on the characteristics of language as communication with attention to the content or contextual meaning of the text (148, 153, 154). According to Downe-Wamboldt, the goal of content analysis is *"to provide knowledge and understanding of the phenomenon under study"* (153) (p. 314). Furthermore, content analysis may be used in an inductive or deductive way (154). Inductive approaches move from the specific to the general, so particular instances are observed and then combined into a statement, or a larger whole, and deductive approaches are based on theory and therefore move from the general to the specific (155). Both inductive and deductive approaches in content

analysis have similar processes: the data-collection stage, preparation stage, organizing and reporting (154).

5.2.2 Data-collection stage

In study I data-collection was based on semi-structured interviews, a common tool in applied policy research (150). We needed to collect new data on the specific issue of PHN workforce development, specifically which events may have triggered or hindered development and factors that influenced the policy process. In Studies II and IV we collected information about specific cases, where the phenomena of interest were the processes that led to the establishment of FNAP in Slovenia and the Swedish public health policy development from 1960-2006, respectively. In Studies II and IV, data-collection involved both document retrieval and semi-structured interviews.

Semi-structured interviews are conducted within a framework that allows for focused yet conversational interviews (156). Unlike the questionnaire framework, where detailed questions are formulated ahead of time, our semi-structured interviews started with more general questions or topics. Not all questions were designed ahead of time. Many questions were created during the interview, allowing both the interviewer and the interviewee the flexibility to probe for further details or discuss further issues. Semi-structured interviews are advantageous in encouraging a two-way form of communication. They enable the interviewee to ask questions, and it can provide an opportunity for learning because it provides not only answers but the reasons for those answers. If the interviewer is inexperienced however, the semi-structured nature may inhibit the conversation or may result in leading questions being asked (131). In Study I, the questions covered contextual issues (training background, wider policy context and current work); issues related to workforce development and the roles and competencies of public health nutritionists (see Table 1). In Study II, we applied the streams model and created key questions to ask key actors in the policy process (see Table 2). The focus of Study II was on the role and functions of key individuals in the process of establishing FNAP. The interviews in Study IV aimed to gain insight into how public health policy learning in Sweden was influencing the policy process and the institutions central to this process (see Table 3).

Table 1: Sample of interview questions in Study I

Key theme	Focus	Example interview questions
Policy context	Negotiation and decision-making structure	Who are the leading actors in the process of formulating PHN policies?
	Problem definition and agenda setting	How does the government rank public health nutrition as an important area for action? (Probe: Within public health?)
	Workforce considered and rationale	What professionals do the government favour for implementing PHN policies? Why?

PHN Infrastructure	Infrastructure	How would you describe the structure and main organisations in your country that deliver public health nutrition services?
	Planned and current initiatives	What initiatives are planned or being implemented in your region to address PHN issues?
	Leaderships	If you think about colleagues who you would consider as public health nutrition experts, what attributes and skills do they have that contributes to their status?
Workforce composition	Professions considered	How would you describe the composition or structure of the nationwide public health nutrition workforce? (i.e. those who make contributions to PHN efforts) Who?
	Workforce development roles/functions	What would you consider being the core functions of the public health nutrition workforce?
	Competencies	What competencies (skills, knowledge and attitudes) would you identify as being necessary for effective public health nutrition practice?

Table 2: Example of interview questions to investigate key roles and functions in establishing FNAP

Key theme	Focus	Example interview questions
Problem definition	Visibility of policy area	What were the emerging public health nutrition problems?
	Change perception of problem	Who were the main experts in the field? What did they do? How was this information received?

Policy opportunity	Build up relationships with other experts Promote ideas Advocate Ideas	What were the main solutions to the problem? Who were the main actors? What ideas were considered by the government? (Probe: why and how)
Political opportunity	Understand political forces Build consensus Balance power	How did the government react to the problem? What was their level of concern? What kind of activities were organised?
Policy windows	Seizing opportunities to couple problem, policy and political windows	Why did the government react and adopt FNAP?

Table 3: Sample of interview questions in Study IV

Key theme	Focus	Example interview questions
Demographics	Role of interviewee	What was your role in the public health policy process? What kind of positions have you held?
Key institutions/actors	Ideas Professionalized fora/consensus based institutions Collaboration and consensus	What kind of ideas were developed and discussed? (Probe: by whom? Where?) Could you describe the members? (Probe: frequency of meetings, relationships, professional background of members) How would you describe the relationship between main actors/institutions and the government?
Effects on policy change	Main policy change Reasons for policy change	What were the main policy changes during this period? What influenced policy change? (Probe: external factors, international lesson-drawing)

5.2.3 Preparation stage

The second stage involved selecting the *unit of analysis*. In the literature, this refers to a great variety of objects of study: a person, a programme, or a state or nation (132). The key factor in choosing the unit of analysis is that it should be large enough to provide a context when identifying key themes (157). This was provided by the interviews in Study I and the combined data collection (interviews and documents) of Studies II and IV.

During the initial stage, we read through the material to get an overview of the depth and diversity of data, but this was also when the first process of identification of patterns began. It has been suggested that it may be appropriate to devise a first thematic framework to sort the material (153-155). This is not a mechanical process, it involves making judgements on the meaning and relevance of issues, making connections between ideas and, importantly, making sure that the original research questions are being fully addressed (155). In Study I our framework was based on workforce development elements, while in Studies II and IV our analytical strategy relied on Kingdon's streams model and policy learning assumptions, respectively. To identify the role and functions of individuals in the policy process leading to FNAP, the documents and interviews were coded according to key individuals and their function in the policy-making process. In Study IV the identification of different types of learning was completed by coding the interviews and documents according to what ideas regarding causal explanations of public health problems were expressed, who did the learning, the type of venues where groups and coalitions met and interacted, the type of participants in these meetings, the role of expert-based information used in policy-making, the preferred policy instruments for public health problems and the effect on policy change.

5.2.4 Organising stage

All data were organised into an index to provide a mechanism for labelling data for subsequent retrieval and exploration. Due to the large amount of material in Study I we coded using an application called NVivo 8, which helped retrieve text and compare codes. It was also useful for keeping track of the data, i.e. places, informants' names etc. (155).

5.2.5 Reporting stage

In a later stage of analysis, the search for patterns began. It was important to interpret the data as a whole when conducting the pattern analysis (157). The analysis involved abstraction by condensing the material (153, 154, 157). In the course of indexing and coding the interview material and documents we became aware of patterns of response that were formulated into broad themes. Table 4 summarizes the categories, sub-themes and themes derived from interview analysis in Study I. Table 5 summarizes the roles and functions in the policy streams model from Study II and summarizes the characteristics of the learning periods in Study IV (see under Results).

5.2.6 Delphi method

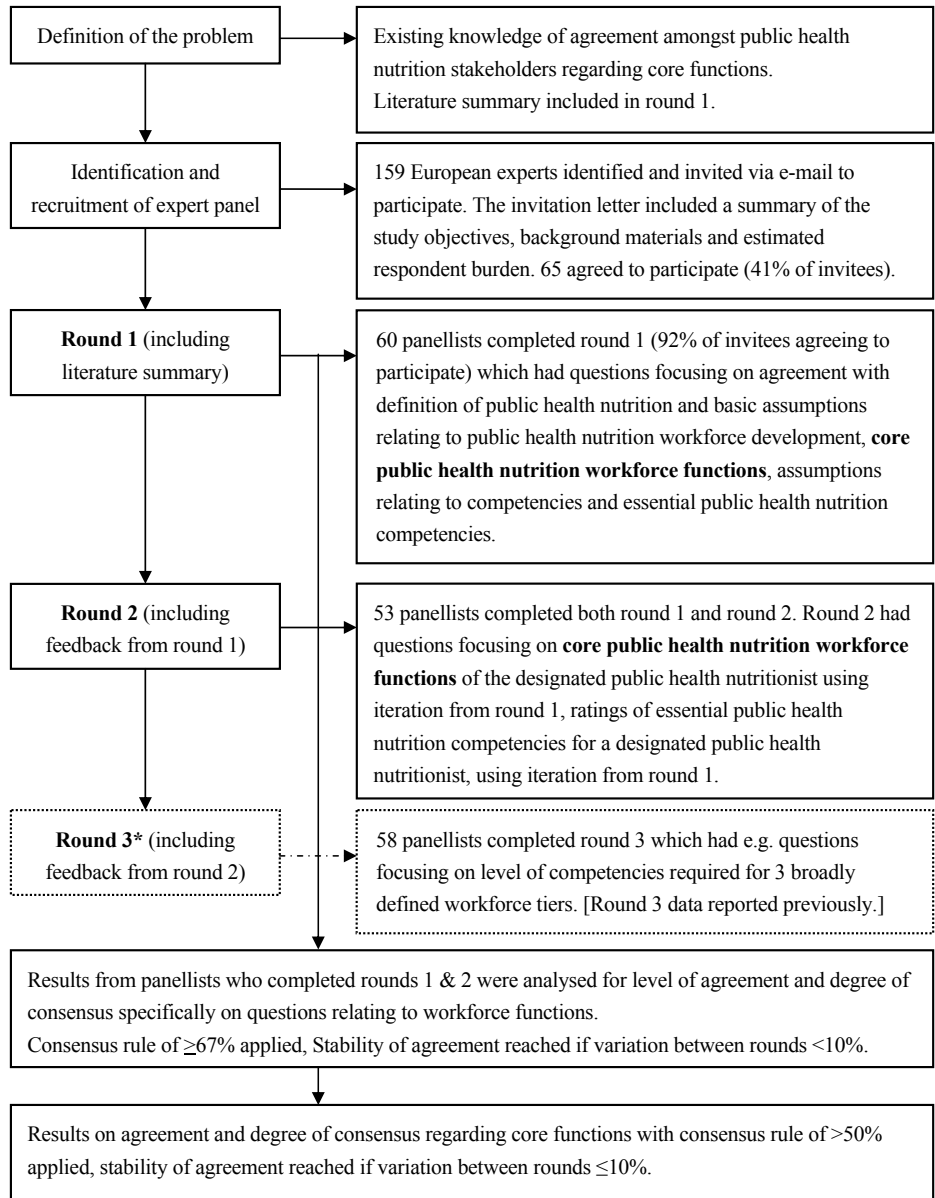
The Delphi method, which involved 2 rounds of questionnaires, was employed for answering the last research question: *What core functions are needed in order to*

develop a public health nutrition workforce? A cohort of 53 panellists completed both Delphi rounds. The results from the Delphi study were imported into SPSS Statistics 20 for Windows and statistically analysed for frequency of response distributions. A Chi-square test for differences in distribution between academic versus employer panellists was performed. The level of significance used was $p < 0.05$.

At the beginning of each interview we included some background discussion on the topic to provide a context and to ensure an understanding of the questions in the surveys (54). From a methodological point, it was important that the respondents understood the topic and procedure (144).

Our questions were structured, which is not always the case in Delphi studies, because we wanted to assess the relevance of functions previously identified (54) and to test if the different groups (academic versus employers) varied in their assessment. In the Round 1 survey, thirty-eight proposed public health nutrition functions were rated on a Likert scale (Always a PHN function, Often a PHN function, Sometimes a PHN function and Not a PHN function). These functions were further organised into six broad categories. A key issue was the percentage agreement that should be used to define the consensus cut-off point. Since there is no generally agreed-upon standard from the literature on how to determine when consensus has emerged, cut-off levels were chosen by the researchers and set to 50% (134). Consensus was considered to have reached stability if group ratings on suggested workforce functions varied by 10 percentage points or less between round, an approach that has been used in other studies (54).

Fig 1: Schematic overview of the Delphi process, adapted from Jonsdottir *et al.* (158)



*Results from Round 3 have been reported previously (158).

5.3 MATERIAL

Our analysis is based on material from three sources: semi-structured interviews, documents and a survey, as discussed in the previous section. To summarise, in Study I the analysis is based on semi-structured interviews with key informants. In Study II, we used semi-structured interviews, official and internal government documents and secondary sources. In Study IV, where we studied the Swedish public health policy-

making process, we used both interviews and documents to analyse learning patterns. The documents collected in this study were reports produced by the Swedish government, national legislation, commission reports produced by public health committees and secondary literature. For Study IV, retrieval of public records was relatively easy since these are generally characterized by great transparency. The Freedom of Information laws ('*Offentlighetsprincipen*') in Sweden ensure public access to a whole spectrum of government documents. In Study III, the analysis was based on a large survey.

5.4 SUBJECT RECRUITMENT

The subjects in Studies I-IV were chosen because of their experience in the field of public health nutrition. We wanted to find out about the existing workforce, specifically roles, functions and competencies, and about issues and events that may affect PHN development. Thus, to understand the wide range of issues that may have affected workforce development and influenced the policy process, we needed to interview individuals who had specific experience and knowledge about the way politicians had framed the issue and relevant events, as well as individuals who were working as nutritionists in different public health settings. The individuals identified were employed in communities, regional public health offices, the food industry, NGO's and officials in governmental positions. The countries chosen to compare PHN workforce development were the following: Sweden, Finland, Iceland, the United Kingdom, Ireland, Spain and Slovenia. The UK was chosen because of its progress in public health nutrition workforce development and professional organization (159). In Sweden, Iceland, Ireland, Slovenia, and Spain key experts in PHN networks that could assist in our search for information were known. Finland was chosen because of its successful implementation of public health nutrition programmes (41). Recruitment was achieved by consulting a European network of country experts in the field of public health nutrition. Emphasis was placed on PHN employers, professional bodies and academics, who were mainly identified through websites of European universities, official websites of PHN research projects, conferences, workshops related to PHN and through the Nutrition Society Website. The number of study participants was 60 in Study I and in Study III it was 53 panellists who completed both round I and 2 in the Delphi process..

The e-mail invitation in Study I and III included a background paper detailing the objectives of the study and the requirements of the panellists or informants in terms of responsibility and potential response burden. Panellists who accepted the invitation where forwarded the first Delphi questionnaire as an e-mail attachment for completion and return by e-mail.

5.5 VALIDITY AND RELIABILITY

In traditional quantitative research, the concept of validity and reliability are generally applied. However, these concepts are often not sufficient in qualitative research, where the concepts of *credibility*, *dependability* and *transferability* have been used to describe trustworthiness (131, 145). These qualitative concepts have relevance for Studies I, II and IV and are discussed in more detail. *Credibility* refers to the focus of the research and how well the data and analysis address this focus. Interpretation of a text involves

multiple meanings and any interpretation will be influenced by the researcher's own personal history and ontology. It is therefore not desirable that the collection and analysis of data is performed by only one researcher. However, in Studies I, II and IV data collection was collected by the first author, SK. Particularly for Study I, we believed it would be better if the same researcher conducted all the interviews to avoid inconsistency of questions asked. However, we had to consider the possibility that the personal history of the lead researcher had affected the results. To address this issue, the transcripts were discussed and coded together with senior researchers in the field and members of the JobNut project. According to Lincoln and Guba (1985) (p. 299) *dependability* means "taking into account factors of instability and factors of phenomenal or design induced changes", i.e. the degree to which data change over time and alterations are made in the researcher's decision during the data analysis. To avoid inconsistency during data collection, all the interviews were performed with a semi-structured interview guide. *Transferability* refers to the extent to which the findings can be transferred into another context. We have considered the context and characteristics of participants, in addition, we have inserted quotations in Studies I, II and IV to facilitate the reader's decision as to whether or not the findings are transferable to another context. We have also compared our interpretation with the literature in this field.

To ensure validity of the Delphi study, it was important that the panellist understood the topic of the survey (134), in this case what a core function in public health nutrition signifies. We provided the panellist with background information and also gave participants the option to withdraw from the study or suggest other individuals who might have a deeper knowledge of and interest in the issue. In our first round we used a structured survey (i.e. the functions the panellist should rate were pre-determined and derived from the literature). This could potentially mean that any consensus reached would only apply to that particular set of functions (134). However, because these functions had been assessed in a previous Delphi-study as core functions in PHN, we believed that they were relevant for forming the basis of an informed judgement. To ensure reliability and relevance of results, it is considered important to define, prior to the study, who is an expert and that the final panellist consists of these experts (160). We searched for individuals through known experts and websites that matched our criteria. In our case, the search for experts was facilitated by the members in the JobNut project, who together possess a vast network in this field. Another issue of concern is how to define consensus. As stated above, the reason for using the Delphi technique was to gain consensus or a judgement among a group of experts.

6 RESULTS

6.1 STUDY I

The study *Public health nutrition workforce development in seven European countries: Constraining and enabling factors* suggests that in practice, most public health work was undertaken at the local level by the local authorities, health centres and NGOs. Thus, practical public health activities took place in the child-care sector, in schools and in the workplace. Schoolteachers and nurses gave general health education. Preventive and population-oriented health care was integrated into primary health care and special health education programmes on tobacco, diet and alcohol. General practitioners and nurses mostly performed these functions. Respondents described how there was competition in this field from other professional groups, mainly doctors and nurses who take on public health nutrition roles, leaving little space for public health nutritionists to enter the health system. Nevertheless, respondents also recognised that other professional groups such as doctors and nurses were important for preventive nutrition practice, especially at the local level. The main barrier was if there was too heavy a reliance on the current workforce in hospitals and health centres for “solving” public health nutrition problems. (See Table 4)

Another barrier was that the work at the local level was carried out by a diversity of actors, making practice inefficient and asymmetrical between regions. This was especially emphasised in Finland and Spain. National level administrators confirmed that there was growing political interest in public health nutrition. Nevertheless, lack of financial and human resources were cited as reasons for limited implementation. There was confusion among employers at regional and local levels as to the roles and responsibilities for public health nutritionists.

Regarding the policy context the interviews showed that current policy-making in PHN, was open to many voices: media, doctors and nurses and international organisations. It was only in the UK where public health nutritionists were sufficiently organised to be able to provide advice to the government in terms of workforce development for public health nutritionists. A comprehensive public health agency at national level with competencies stretching from food safety to public health nutrition was only described in Finland. In other countries the fragmentation of responsibilities related to food and health between governmental agencies was described as a barrier. (see Table 4:1)

Study participants further responded that enabling factors for PHN workforce development were to a large extent found at the individual level. Study participants described how individuals by their skills and competencies played key roles in introducing public health nutrition ideas and principles in workplaces, but also by advocating PHN issues at the national level and influencing the policy processes. The study suggests that further research on the role of individuals and the dynamics between ideas, actors/institutions and the policy context is fruitful for gaining a deeper understanding of what enables public health nutrition and workforce development strategies.

Table 4: Constraining and enabling factors to workforce development

Constraining factors			Enabling factors	
	Category	Category content	Category	Category content
Policy environment	Lack of supportive policies	Lack of policies, laws, regulations that aim to develop the PHN workforce, policy ideas focus on a workforce with general public health skills and competencies	Windows of opportunities	Policy change and agenda setting relate to opportunities such as a sudden media interest, changes in the administration, WHO conferences and publications
	Lack of connectivity	Lack of financial support to finance the implementation of PHN projects at the regional level, lack of continuity between policy goals at national and implementing levels	Leadership role of national public health agencies and individuals	Leaders have an important role in advocating the PHN issue, to join others to build a knowledge network and communicate health behaviours to media and high ranking officials
Public Health organisations	Fragmented support for PHN initiatives	Difficult to get support for PHN services and projects, PHN practitioners need to push and promote PHN projects themselves	Institutional structure with public health nutrition goals at regional and local level	Regional and local authorities with public health nutrition goals and objectives
	Clinical health care perspective	Health authorities and decision-makers have a clinical and medical perspective, priorities are directed towards health care services	Voluntary sector	NGOs to carry out PHN interventions and programmes
Workforce composition	Novice character	Small workforce, unknown workforce, lack of professional organisation, lack of identity, lack of distinction to other professional groups	Agents of change	Competent individuals who can demonstrate change and contribute to workforce development, individual motivation the main push for competency development

Incoherent workforce composition	Health care staff dominated, multi disciplinary, lack of competencies within the current workforce,
Lack of workforce preparation	Lack of formal training, lack of practical orientation within nutrition programmes, Inconsistency in skills

Table 4:1. Differences and similarities between countries in terms of workforce development

Workforce development categories	Finland	Iceland	Ireland	Slovenia	Spain	Sweden	UK
Governmental recognition of the PHN workforce	-	-	-	-	-	-	+
Comprehensive PH agency at national level with expert and leadership role	++	+	+	+	+	+	+
Individuals as leaders in PHN	++	+	+	++	+	+	+
Institutionalized PHN goals and objectives at regional and local level	+	+	+	++	+	++	++
Voluntary sector makes an important contribution	++	+	+	++	+	+	+

Workforce preparation in terms of PHN training	-	+	+	-	-	+	+
Professional organization in PHN	-	-	-	-	-	-	++
Title of Public health nutritionist used by practitioners	-	-	-	-	-	-	+
<i>Workforce with consistent skill-base in PHN</i>	-	-	-	-	-	-	-

++: Existing, +: Fragmented, -: Missing.

6.2 STUDY II

The study *Understanding the process of establishing a food and nutrition policy: The case of Slovenia* builds on findings generated from Study I and aims to describe the development of a public health nutrition action plan in Slovenia with a focus on how agenda setting occurs. The analysis focused on the type of knowledge, skills and interactions used by individuals in a policy-making context. The investigation explored how individuals participated in and influenced the policy-process in the development of the Slovenian food and nutrition policy. The theoretical framework was based on Kingdon's streams model and the role of a policy entrepreneur.

Study II suggests that agenda setting and adoption of the national policy in food and nutrition was facilitated by key actors' knowledge of the PHN policy sub-system and macro-system. Specific individuals played major roles in taking advantage of the *window of opportunity* (i.e. the accession to the European Union (EU) and the Common Agricultural Policy (CAP)) for creating a win-win solution for the Ministry of Health and the Ministry of Agriculture, Food and Forestry to work together to create a food and nutrition plan. This study illustrates the distinct actions that influenced policy change and at what stage during the policy process they occurred (see Table 5).

During the 1990s, collecting data and conducting epidemiological surveys on non-communicable diseases increased in importance. Collecting and analysing epidemiological data related to nutrition is cited as a core function of public health nutritionists (5, 52, 77, 161). Our study explored important policy functions and found that not only was the collection of scientific data important, the presentation of scientific findings to policy-makers was crucial for influencing the policy process. Practitioners must consider the political context and select the right moment for communicating findings to key decision-makers in order to influence the policy process. This has not been fully explored in previous studies on PHN core functions

and provides an example of how this study is making an important contribution to this field.

Similarly, another important strategy identified in this study, which has not been fully explored before, is joining international, knowledge-based networks. When joining expert-based networks, individuals learn about the general discourse of the subject and issues of political relevance, such as institutional constraints or view of political opponents. Building contact networks with other experts increases credibility and can help forge persuasive arguments that may lead to policy changes.

Finally, a policy entrepreneur has a crucial and obvious role in policy change that has previously been explored in agenda setting and policy studies, and its main characteristic is to conjoin the streams of Kingdon’s model (i.e. *Problem*, *Policy solution* and *Political streams*) (162, 163). The streams flow independently from one another and together constitute the policy-making process, and when the three streams join they can result in a public policy being adopted. In our study we were able to show how policy entrepreneurs succeeded in mitigating political conflicts and forming a national food and nutrition policy.

Table 5: Key roles and functions in the agenda setting process

Role and functions	
Analytical role	
Problem identification	To conduct surveys based on epidemiological principles to highlight the problem To communicate the nutrition issue by repeatedly giving information to policy-makers
Strategic role	
Policy solution	To strategically search for policy solutions abroad To join international expert networks in food and nutrition To promote policy solutions from international expert organizations
Policy entrepreneurial role	
Political opportunity	To take advantage of political change To think beyond the nutrition issue To enlist the participation and support of opponents to create a win-win solution

6.3 STUDY III

This study, *Core functions for the public health nutrition workforce in Europe: A consensus study*, aimed to identify the core functions of the public health nutrition workforce and provide guidance for future workforce development. Study I and other research suggests that the current workforce is very small (60), incoherent (159, 164, 165) and lack necessary competencies (166-168). A claim derived from Study I and other scholars suggests that a major barrier for workforce development is the lack of defined work and functions required to address public health nutrition issues (20, 21,

83). This study was a first attempt to assess and develop consensus in a European panel of PHN experts regarding the core functions required for effective public health nutrition practice.

The study shows that there is consensus on 19 core functions of the PHN workforce. Out of these, seven were categorised under *Intervention management* (see Table 6). Intervention management and capacity building have been identified both as core functions and expected competencies of the public health nutrition workforce. This has been confirmed in the JobNut project (82). While many programmes included generic project management coursework in public health nutrition training programmes, few integrated capacity building practice and strategies as a systematic approach to developing public health nutrition interventions (82). This is a serious gap in workforce preparation.

Panellists put less importance on functions categorised under *Ensuring healthy and safe environments* and *Nutrition education and guidance*. The study also showed that there were no significant differences between academic and practitioner opinions on the core functions, except for one, *Monitoring determinants of nutrition and health*, which academics were more likely than practitioners to rate as a core function.

Table 6: Response distributions (valid %) for agreement on suggested workforce functions being core public health nutrition functions at Round 2

Suggested workforce functions	Shift between Rounds	Round 1 (%)	Round 2 (%)
RESEARCH, MONITORING & ASSESSMENT			
Evaluating the effect of policies on nutrition and health	+21.6	60.8	82.4
Assessing population needs to determine nutrition programme and service priorities	+13.7	64.7	78.4
Monitoring determinants of nutrition and health*	+17.6	47.1	64.7
Monitoring nutrition service and programme delivery	+15.6	47.1	62.7
Undertaking research on services and programmes (evaluations)†	-2.0	45.1	43.1
Monitoring nutrition-related mortality and morbidity†	+2.0	32.0	34.0
Identifying nutrition research priorities	-11.8	37.3	25.5
Undertaking research on nutrition issues in populations†	-5.9	27.5	21.6
Economically evaluating nutrition programmes or problems	-13.7	25.5	11.8
ENSURING HEALTHY & SAFE ENVIRONMENTS			
Addressing misinformation about nutrition	+19.1	54.9	74.0
Promoting equal access to healthy food†	+9.8	43.1	52.9
Addressing advertising and marketing practices to enable informed food choices†	+2.0	45.1	47.1
Promoting equal access to physical activity	-13.7	29.4	15.7
Ensuring food safety†	-7.9	21.6	13.7
Ensuring the sustainability of the food supply†	-3.7	13.7	10.0
The protection of safe water supplies†	-5.7	15.7	10.0
NUTRITION EDUCATION & GUIDANCE			
Using mass media for nutrition education†	+7.8	45.1	52.9
Providing food and nutrition information to individuals and groups†	-0.8	42.0	41.2
Developing individuals nutrition knowledge, attitudes and skills†	+0.7	37.3	38.0
Social marketing of nutrition issues	-12.4	34.0	21.6

BUILDING CAPACITY			
Developing community capacity to participate in nutrition issues	+15.7	52.9	68.6
Mobilising community action on nutrition issues†	+2.0	49.0	51.0
Providing education and training for other health workers†	-2.0	45.1	43.1
Building social networks and social support in communities†	-9.8	29.4	19.6
Providing education and training for consumers and community groups	-11.8	31.4	19.6
Providing education and training for professionals in sectors other than health	-17.7	37.3	19.6
POLICY PROCESSES			
Assess the impact of public policy on nutrition and health	+27.5	62.7	90.2
Advocate for food and nutrition related legislation to protect and promote health	+23.5	47.1	70.6
Advocate for sustainable and appropriate financing of nutrition services	+15.7	43.1	58.8
Review, formulate and promote health legislation†	+5.8	37.3	43.1
Enforce food and nutrition legislation†	-7.9	21.6	13.7
INTERVENTION MANAGEMENT			
Developing strategies to address nutrition issues	+11.8	78.4	90.2
Planning nutrition interventions	+17.6	66.7	84.3
Building organisational structures and processes with agencies to facilitate public health nutrition action	+17.7	62.7	80.4
Developing intersectoral partnerships to promote nutrition	+21.5	56.9	78.4
Evaluating nutrition interventions	+25.1	52.9	78.0
Accessing resources to support public health nutrition action	+11.7	47.1	58.8
Implementing nutrition interventions†	+8.9	47.1	56.0

Functions in bold letters reached the consensus standard, i.e. >50% agreement among panel members. *Significant differences (χ^2 , $P<0.05$) in response distributions between academics vs. employers in Round 2. †Response stability achieved, i.e. variation of ≤ 10 percentage points in ratings between Rounds 1 & 2.

6.4 STUDY IV

The study *Public health policy-making in Sweden: A learning-based perspective* attempts to distinguish learning patterns in the Swedish public health policy process (see Table 7). It shows that public health nutrition changes in Sweden have mainly occurred through technical capacity development. Professional fora and consensus-based institutions have had varying roles in facilitating learning. Sweden's approach to public health nutrition in the 1970s showed typical traits of technical learning. For example, symptoms rather than causes define the problem and solutions were structured around one particular policy sub-system of the government and poorly integrated in other policy sectors (126, 128). An important professionalised forum identified during this period was the Medical Expert Committee. This forum supported the *Diet and Exercise Campaign* from the 1970-80s with expert-based information (191). An internal factor that enabled consensus and agreement among the members in the Medical Expert Committee was probably related to the fact that many of these participants shared the same professional and scientific background (cf. (129)). The entire *Diet and Exercise Campaign* provided a learning venue and enabled state officials, experts and representatives from the food industry to meet on a regular basis,

facilitating trust-building, goodwill and gradually resulted in new knowledge. As a result, this period bears witness to a huge number of technological developments and information campaigns (169, 170). An external factor that facilitated policy learning across groups was a corporate tradition where the state actively supported the food industry with funding from agricultural import regulations. This funding was directed to the establishment of public-private food promotion organisations.

The second phase of conceptual learning was characterised by a change in the problem definition with new concepts entering the scene (123). Problems were defined less in scientific and bio-medical terms, but were increasingly seen as issues related to social determinants. New concepts, such as health inequalities and community diagnosis emerged. Conceptual learning partly evolved from learning-by-doing at the regional level and increased acceptance for the social-medicine perspective. The left-wing majority during the 1980s opened up *windows of opportunity* for a new direction in public health policy-making through a series of commissioned studies. The committees at the national level consisted of scientific and technical experts who shared an epistemological outlook and enabled the identification of new public health problems (cf. (108)). Conceptual learning is most evident in the large number of studies commissioned during this period. The HS-90 (171) report signifies a major break from its predecessor HS-80 (172), which reported exclusively on the disease orientation of health care systems. Although commission reports witness of a new learning, it had little effect on policy development. One identified barrier was the increasing politicisation of the issue, where the social democrats supported conceptual learning and the conservatives tended to adhere to a narrow, individual bio-medical approach.

Social learning was identified from the debates and dialogues and the government's effort to include a large number of social actors in the development of a public health strategy during the end of 1990s. The parliamentary led National Public Health Commission led the development of the public health strategy and thus largely enabled social learning (173). The National Public Health Commission was designed around face-to-face communication between the different groups and the rules were based on consensus; the Commission integrated politicians, public health administrators, scientists, non-scientists and the voluntary sector in this decision-making process. This process focused on dialogue and identification of the causes of ill health, such as social exclusion, unemployment and poor living conditions. Although this period shows some promising attempts at social learning the results were mixed and learning was not sustained. A key barrier identified in this study was that the Ministry of Health and Social Affairs was limited to mainly technical capacities and possessed limited ability to promote intersectoral action and secure policy change based on social learning. The Ministries in Sweden are rather small, with limited workforce capacity, they work independently and have poor collaboration with other Ministries (cf. (174)). These characteristics made it difficult for the Ministry of Social Health and Welfare to take on the necessary leadership role.

Table 7. Characteristics of learning periods in Sweden between 1960-2006

	1960-1980: Technical learning	1980-1994: Conceptual learning	1994-2006: Social learning
Problem definition	Problems are related to bio-medical processes	Problems are related to social structures	Problems are related to social and political structures
Defining characteristics	Focus on individual health and health impacts through diet and physical activity	Identification of key issues and groups whose health are worse-off are of concern, focus health equity	Attempts to have dialogues on the relative priority of public health objectives. Linking health to equity, state's responsibility and economic development
Scope	Specific to health policy sub-system	Recognition of other policy sub-systems	Attempts to involve all policy subsystems
Purpose of learning	Improving instrumental decision-making. To change individual behaviour is key driver	Ensuring that all aspects of health are addressed in policy-making and that health concerns of vulnerable groups are considered	Search for a strategy to unify issue fragmentation and priority-setting of public health goals
Key agents of learning	Medical doctors, food industry and state officials	Researchers, public health administrators and state officials	Researchers, public health administrators and state officials
How did the actors learn	Systematic study: learning-by- studying	Systematic study: learning-by- studying. Experience: Learning-by-doing	Interaction: learning-by-interacting
What is learnt	Instruments	Process-related, ideas	Norms and priorities
Type of information used	Scientific and technical	Scientific and technical	Scientific, technical and political
To what effect	Technological innovation, soft policy instruments (i.e. health information campaigns), voluntary agreements	Commission studies, soft policy instruments, minor organizational change	Weak structural change, symbolic policies

Internal factors to enable policy learning	Professional forums: committees of analysts with a shared scientific and technical competence	Professional forums: committees of analysts with a shared scientific and technical competence	Consensus based institutions: both scientists and non-scientists in decision-making, focus on dialogue and shared understanding
External factors to enable policy learning	The centralization of the system, social-corporate tradition	Left-wing majority, lesson-drawing	Left-wing majority
Degree of change	Significant within policy-subsystem	To some extent	Only short term

7 DISCUSSION

7.1 MAIN FINDINGS

This research reveals some important findings about PHN workforce development needs, processes and change. Key informants have described a number of major constraining and enabling factors for public health nutrition workforce development. Public health nutrition policy implementation suffers from the fragmentation of responsibilities related to food and health across governmental agencies and public health nutritionists as a workforce is largely missing in the practice.

Investigation of specific cases showed how a food and nutrition policy could be established despite weak initial interest from dominant coalitions in government (Study II). It specifically points to the relevance of individuals and their cognitive characteristics (i.e. analytical, strategic and entrepreneurial skills) in order to influence the policy process. Study IV points to the importance of the Swedish committee system as a decision-making arena where public health ideas can be debated and consensus agreed upon in order to enable public health policy learning across groups and influence policy change.

PHN is a multidisciplinary field and integrates knowledge from public health and nutrition and requires generic skills such as advocacy, intervention management skills and entrepreneurial skills (Study II and III), as well as specialized knowledge in public health such as theories and frameworks commonly used and proven to be effective in the public health perspective and in nutritional science such as nutritional contents of foods, nutrition recommendations and basic needs as well as the links between diet and health (Study III).

7.2 THEORETICAL LESSONS

7.2.1 Study I

The main body of public health workforce development studies has been developed in order to provide strategies for workforce planning, workforce capability development and workforce management and illustrates the processes in conceptual models. These models describe workforce development as a top-down process, where workforce development is initiated by legislation and policies, facilitated via universities and public health organizations and implemented by the workforce (79-81). Although these conceptual models show the logical steps for achieving workforce development, they leave questions unanswered concerning the characteristics of structural and contextual factors, which affects workforce development.

In the current embryonic stage of PHN workforce development research, it is argued that research aims should take two basic directions (18, 59). The first is to develop new indicators for workforce development that can inform current policies and workforce development strategies. Most studies to date have followed this route and have applied quantitative methods to operationalize and investigate workforce development (8, 90, 175, 176). The second direction is more process-oriented and requires further knowledge about structural and contextual elements that shape workforce demand,

infrastructure and composition in order to take appropriate action to prevent nutrition-related disease (17, 177).

It has been argued that the literature on public health nutrition workforce development in Europe has almost exclusively focused on training and the need for development of competencies, with no studies explicitly exploring the broader social and political context that affect practice (9, 14, 166, 168, 178, 179). Study I therefore addresses a gap in the workforce development research by conducting a qualitative assessment of key informants' experiences of the PHN policy environment, institutional and organizational arrangements, and the capacity of the current workforce.

Study I shows the importance of contributions by individuals and small groups, who have acted as leaders and agents of change and may play important roles in developing PHN practice and advocating policy change. The findings further indicated the need for theoretical concepts beyond the public health nutrition workforce development research field to understand how to influence PHN policy processes. Contrasting ideas of the policy-making process come from the socio-political field. Studies in this tradition highlight the role of actors other than traditional state centered ones, such as international organizations, epistemic communities, advocacy networks, opinion leaderships and professional groups, in the policy-making process. These latter insights informed the theoretical approach of Studies II and IV.

7.2.2 Study II

Study II investigated *how* to successfully influence policy processes and effect policy change. It showed that certain individuals and their roles and skills played an important role in developing the Slovenian National Food and Nutrition Policy. These individuals managed to use windows of opportunities created by political circumstances in order to negotiate and reach an agreement to establish a national food and nutrition policy. There are few studies on nutrition policy-making aiming to explain how actors and institutions influence the policy process. Previous policy research had used an institutional approach for explaining nutrition policy-making in Scandinavia (180-183). These studies highlight institutional aspects of policy-making, such as the influence of shared concepts that are learnt and normalised in institutions over time. Institutional analysis is complex and apt for explaining historical policy directions or incremental policy change, but faces difficulties in explaining sudden and radical policy change (110).

Study II may complement previous research on nutrition policy research by applying Kingdon's streams model, which offers a method for explaining innovative, rapid policy change (184, 185). It has been widely applied in studies examining agenda setting in the policy development literature (37, 116, 186). Previous studies applying Kingdon's model and concepts have focused on the key attributes of policy entrepreneurs in connecting the streams (162, 163), in particular the strategies applied by policy entrepreneurs in opening windows of opportunity (104, 106, 114). Mintrom (110) showed that policy entrepreneurs are often involved in policy innovation such as identifying new projects or missions for an organisation or recognizing areas of organisational weakness. The key function of policy entrepreneurs is to attract the attention of policy-makers and provide appropriate solutions (22). In our analysis, we examined the policy process in Slovenia over two decades and were able to trace

individuals who had had a role in forging the problem and policy streams. Our results highlighted that in the 1990s, collecting data and conducting epidemiological surveys were important strategies for monitoring non-communicable disease rates, but it was the actions of the analysts, who repeatedly presented the findings to policy-makers, that were important in instigating policy change. This function, to collect and analyse epidemiological data related to nutrition, has been noted as a PHN core function related to *Research, Monitoring and Assessment* (90), but is often not thought of as important in policy-making. The second role identified in our study, which influenced the policy process, was the *strategic* role. Our study showed that another key strategic function is to join international networks in order to create a knowledge-based network. We found that networking activities helped the policy entrepreneur to forge persuasive arguments and building contacts with others thus increasing their credibility (106). The third role identified was that of *policy entrepreneur*. We showed that several individuals were successful in taking advantage of the accession to the EU and CAP by creating an opportunity for the Ministry of Forestry and Agriculture to participate in a health impact assessment of CAP, which eventually resulted in a food and nutrition plan. Study II shows how individuals can influence the policy process and agenda setting and is relevant to workforce development research as it contributes to the understanding of PHN policy development and capacity building.

7.2.3 Study III

Study III has made a contribution to the workforce development literature by identifying the current gaps and PHN core function needs in a European context. The identification of core functions has been conducted in different parts of the world including the US (52, 60, 84), Canada (85), Australia (90) and in the EU (54, 166, 168). Most of these studies have identified the functions most important from a nutritionist practitioner perspective. In some cases the assessment has been based on actual job descriptions. There are only a few studies that have focused on combining the views from different perspectives (practitioners, academics and employers) (167, 168). Study III builds on the core functions identified in previous studies and shows strong agreement with basic core functions. The main contribution of this study was to identify necessary core functions in relation to those previously identified. The convergence of opinions of academics and employers on core public health nutrition functions indicated that there is indeed a core set transferable between countries that can be used as a benchmark to guide further development of the PHN workforce.

7.2.4 Study IV

While Study II reminds us of the importance of an actor and contextual approach to understand PHN agenda setting, Study IV takes another policy approach, investigating how policy changes may occur as a response to learning and why it is difficult to secure significant and sustainable policy changes.

It has been noted that policy learning focuses almost exclusively on describing the evolution of ideas and beliefs that have shaped policy outcomes, with few studies investigating the process where ideas are exchanged between actors and opposing coalitions (187, 188). In our case study, we addressed this gap in the literature by showing that professional fora and consensus-based institutions (e.g. medical expert

committees and public health groups and commissions) were important in the learning process. The role of institutional arrangements in enhancing trust between opposing groups and coalitions has also been the subject of a larger comparative EU project investigating Trust in Food. Kjærnes and others argue that trust, collaboration and consensus are strongly linked to the type of institutional arrangement (189). In countries where institutional responsibilities are comprehensive and clear-cut, there is a higher degree of trust, while in countries where responsibilities are fragmented across institutions the degree of trust is lower. Similarly, we show that the proximity between food industry, expert committees and a centralised authority (the *National Board of Health and Welfare*) within a narrow policy-sub system with clear responsibilities facilitated trust building and learning.

The Swedish committee system provided a venue where analytical knowledge, public health principles, deliberations of different views and interpretations of this knowledge were made and agreed upon. They played an important role in articulating the different learning perspectives in public health and influencing the policy process. The role of medical expertise in influencing policy learning was especially significant during the 1970's. For instance, some years after the Medical Expert Committee meeting, ideas and concepts significant for technical learning formed the Diet and Exercise Campaign (190). The role of science in modern food policy has been important. Torbjörn Bildtgård shows in his thesis (191) how legislators cooperated closely with scientific experts in forming food policy during the last century and argues that modern food policies derived much of their legitimacy from the fact that they were based on sound scientific knowledge.

Bildtgård also discusses how over the last three decades or so the role of expert-based information and analytical knowledge in establishing trust and legitimacy has been challenged by new norms put forward by new actors (192). In the food safety area the value of efficiency has been challenged by environmental and health concerns. A similar observation of the diminishing role of a pure scientific bio-medical approach to public health policy legitimacy during the last three decades is made in this thesis. The HS-90 delegation and the Public Health Group during the 1980s introduced a social medicine perspective and new concepts such as *social determinants* and *health equity* appeared in policy-making. The National Public Health Commission, which convened during the end of the 1990s changed the venues in which public health policies were made and moved the critical deliberation for a national public health strategy to a broader social arena and derived legitimacy based on values related to social equity and costs (cf (192)).

Study IV contributes to the discussion of the role of professional fora and consensus-based institutions in policy change. By applying a case-study approach we showed that the extent of influence of expert based committees in the early 1970s to the larger public health fora in the mid 1990s had on the Swedish public health policy process.

However, our findings also indicated that the capacities for learning and resulting policy change varied significantly between the different periods. According to Glasbergen, a policy learning approach provides us with an index of the extent of change (e.g. technical, conceptual and social) (123, 124). Thus, a learning approach is useful to public health nutrition workforce development in the sense that it recognises the difficulties in securing policy change and identification of possible sources of

needed changes. For instance, it shows the difficulties in applying an intersectoral approach and the importance of workforce development strategies, such as capacity building at the ministry level in order to attain public health objectives.

7.3 METHODOLOGICAL CONSIDERATIONS

There are many different approaches and methods available for studying public health nutrition workforce development. While most research in this area has focused on quantitative methods to study the workforce needs and gaps (52, 77, 84, 90, 161, 176, 193), our research used mainly qualitative methods which may lead to new research perspectives and theory development.

In the first study, we explored the nature of workforce development by identifying enabling and constraining factors for workforce development. A *purposeful sample* was gathered in order to construct a complete picture of expert experience relevant to workforce development. Perhaps it would have been more appropriate to select a *convenient sample* to gain knowledge about the differences in workforce development between the countries. However, convenient samples may fail to establish the knowledge needed for providing alternative explanations or suggesting new issues for research (130, 147, 150). The main reason why we used a purposeful sample was to provide rich descriptive evidence on the topic that could be further analysed in subsequent studies. The sample in our studies consists of individuals who have knowledge and experience of working or conducting research related to public health nutrition. Many of the informants had skills and competencies not only related to public health nutrition but also to the general field of public health and medicine. Therefore the perspectives taken on in these studies are not only from a strict nutrition perspective but also from a wider public health perspective. We consider that public health nutrition is part of the wider concept of public health and individuals with public health nutrition knowledge and skills also carry a public health perspective. However, the study might have been enriched by broadening the sample to include individuals who have not worked or conducted research related to public health nutrition. The study would then have gained an ‘outsider’s perspective’.

Qualitative research and especially case-studies are not generalizable to the larger population (194) and cannot be used to test theoretical assumptions. However, the aim of this thesis was not to evaluate the policy approaches presented. The research objectives of Study II and IV were rather to investigate if the policy development processes in these cases followed the concepts outlined by previous policy approaches. Consequently, the basis for generalizing the results of this analysis to other countries is limited.

We also wished to answer strategic questions, which could have potential policy implications. One strategic question related to workforce development was to identify the nature of the work and core functions. We applied the Delphi method to answer this question. A critique of the Delphi method is that it is merely a way of pooling opinions, which raises an important concern about the nature of knowledge derived from the Delphi method. In response to this critique, again we must consider the nature of the research problem. The state of knowledge regarding workforce development of public health nutritionists is incomplete – little is known about the workforce in Europe. However, it has been recognised that building a competent workforce is a key strategy

in workforce development. In order to obtain a consensus opinion regarding PHN core functions, to be used in informing workforce development strategies, we applied the Delphi method. This method provides a structured approach to pool the knowledge of the experts that take part in the process. We are however aware that it can be regarded as unrigorous, depending on the interpretation of what constitutes '*real knowledge*'.

7.4 FUTURE RESEARCH

Very little is still known about public health nutrition workforce development in Europe. Study I was a comparative study which explored workforce development in seven countries. We also explored the nature of national policy development, the organisational infrastructure regarding public health nutrition and the composition of the workforce. To gain further insight into the mechanism of workforce development and policy change, future research should focus on the policy context and its influence on workforce development.

From Studies I, II and IV, we may also conclude that workforce development research would benefit from applying theoretical perspectives of policy analysis. We know very little about the processes that lead to policy change and good practice. Further case studies are needed to explore the reasons why changes have occurred and to further investigate the role of individuals and the dynamics between ideas, institutional arrangements and external events and their influence on securing sustainable practices.

8 CONCLUSION

The aim of this thesis was to explore workforce development in order to identify current needs and to develop a better understanding of the policy processes that lead to public health nutrition policy changes.

In the present situation of the countries visited, a public health nutrition workforce was largely missing in practice and governmental agencies that could lead coordinated strategies in public health nutrition were fragmented. In countries where public health nutrition principles and strategies are part of governmental policies, integrated in public health organisations at regional level and where there is a professional organisation to support the workforce, it is more likely that employers and other professionals support the role and recognise the value of employing public health nutritionists (Study I).

Consensus on the core functions of the public health nutrition workforce emphasized the importance of analytical, advisory and interventionist functions in the context of preventing diet-related diseases in populations. This consensus enables the development of clear statements about public health nutrition work to inform workforce development such as for defining and developing the public health nutrition workforce in Europe and for developing public health nutrition training programmes in academic institutions. (Study III).

The policy context is an important variable for understanding how public health nutrition development occurs (Studies II and IV). In other words, a thorough understanding of the policy context is necessary for knowing how PHN policies that include workforce development strategies can be implemented and made sustainable. The question is not only whether workforce strategic elements (e.g. benchmark of public health nutrition core functions, public health nutrition skills and competency development frameworks, training strategies) are needed or not, because all elements are needed to improve public health nutrition outcome, the key puzzle relates to the nexus between the policy context and policy change. Thus, identifying workforce strategic elements is not enough for securing adequate public health nutrition processes and change. We also need to learn about the context of policy subsystem (actors who have decision-making power in public health nutrition issues, expert networks, governmental agencies, inter-governmental organisations) and the relationships between actors and institutions, including their power and authority.

8.1 POLICY IMPLICATIONS

Potential implications based on the findings presented in this thesis include that there is a need to stimulate relationships between governmental agencies, public health organisations at regional level, practitioners and private sector to develop the public health nutrition agenda and strategies. Public health nutrition competencies and functions need to be promoted and should include skills and functions related to how to best influence the policy process. Considering the current gap of knowledge about public health nutrition workforce development in Europe, it is important to learn from countries that have been successful in developing PHN policies and increasing the national and sub-national institutional capacity to lead and coordinate PHN issues. Integrating policy analysis and political science approaches to WFD research would be helpful in improving public health nutrition objectives.

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GLOSSARY

This glossary is mainly derived from *The concise Oxford dictionary of politics* (195), *A dictionary of public health* (196) and *Policy change and learning: An advocacy coalition approach* (26).

Advocacy coalition

Actors sharing similar policy core beliefs acting together in support of a particular issue, policy, programme etc. Advocacy coalitions are formed between actors, both public and non-public, on the basis of the congruency in their belief system and coordinated political strategy.

Bio-medical approach

Ideas and assumptions about the nature of illness, notably its natural scientific framework. The bio-medical model of illness and healing focuses on purely biological factors, and excludes psychological, environmental, and social influences.

Capacity-building

Activities directed at upgrading technical and professional skills and establishing and/or strengthening infrastructure in the health, education and social sectors, usually with financial as well as technical and professional development.

Consensus-based institution

Voluntary initiatives and advisory committees that use face-to-face rules for communication, open rules for entry, fair rules of negotiation, decision rules based on consensus, and joint fact-finding procedures that integrate scientists and non-scientists in decision making.

Core PHN competencies

Essential competencies without which the effectiveness of public health nutrition would be restricted.

Core PHN functions

Functions regarded as absolutely necessary; their absence would imply gaps in public health capacity.

Health equity

Focused societal efforts to address avoidable inequalities by equalizing the conditions for health for all groups.

Intersectoral action

Action that involves several sectors of society such as action by the health, education, housing and local government sectors to enhance community health.

Multi-disciplinary

Drawing on the experience and expertise of a wide range of individuals and including professionals with knowledge relevant to the issues being addressed.

Public health

An organized activity of society to promote, protect, improve, and, when necessary, restore the health of individuals, specified groups, or the entire population. It is a combination of sciences, skills, and values that function through collective societal activities and involve programs, services, and institutions aimed at protecting and improving the health of all the people.

Public health nutrition

The promotion and maintenance of nutrition-related health and well being of populations through the organised efforts and informed choices of society

PHN competencies

The knowledge, skills and attitudes required to effectively address PHN issues in practice.

PHN functions

Activities (processes, practices, services and programmes) undertaken in order to promote optimal nutrition, health and well being in populations.

Policy

A course or principle of action adopted or proposed by a government; the written aims, objectives, targets, strategies and plans that guide the actions of the government.

Policy belief system

Most fundamental of the beliefs are *deep core beliefs*. These are the most stable beliefs and are predominately normative. Examples include fundamental beliefs about the nature of society and man, liberal and conservative beliefs as well as relative concern for the welfare of present versus future generations.

In the middle of the belief system hierarchy is *policy core beliefs*. These are of moderate scope and span the substantive and geographic breadth of a policy sub-system. Examples include beliefs about structures and about processes towards policy goals. Policy core beliefs are resistant to change but are more likely to adjust in response to new experiences and information than deep core beliefs.

At the bottom of the belief system are *secondary beliefs*. Compared to policy core beliefs, secondary beliefs are more substantively and geographically narrow in scope, and more empirically based. Secondary beliefs, compared to deep core and policy core beliefs, are the most likely to change over time.

Policy learning

A relatively enduring alteration of thought or behavioural intentions that is concerned with the attainment (or revision) of the precepts of a policy belief system.

Policy sub-system

The political system is composed of several policy sub-systems or issue domains. Each policy sub-system has some degree of permanence, a particular mode of policy-making, and is surrounded by a specific set of political actors, policy-makers, stakeholders and target groups who seek to influence public policy-making and governmental decision-making in a specific policy area.

Professional fora

A venue where analysts committed to scientific norms and who share common theoretical and empirical presuppositions meet and debate. Analytical disputes are easily resolved in professional fora.

Social determinant

A definable entity that causes, is associated with, or induces a health outcome. It may be a factor or combination of social factors and includes the conditions in which people are born, grow, live, work and age, including the health system. The social

determinants of health are mostly responsible for health inequities – the unfair and avoidable differences in health status seen within and between countries.

Workforce development

The strategic investment of resources by organisations and communities in activities that reach and maintain a critical mass of human resources, develop organizational environments that enable and promote effective practices, and enhance the competency of the workforce for more effective public health nutrition effort that achieves public health outcomes

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SAMMANFATTNING

Strategier för att stärka folkhälsonutritionistens yrkesroll utgör viktiga utmaningar för att kunna förbättra folkhälsan. Idag råder en stor kunskapsbrist över hur länder i Europa har arbetat för att främja en kvalificerad, utbildad och anpassningsbar yrkeskår av folkhälsonutritionister. Syftet med denna avhandling är att undersöka arbetskraftsutveckling av folkhälsonutritionister i sju länder i Europa samt att uppnå en ökad kunskap om de policyprocesser som leder till policy- och praktikförändringar.

I det första delarbetet (Delarbete I) genomfördes en jämförande analys med semi-strukturerade intervjuer i sju europeiska länder, för att undersöka främjande och begränsande faktorer för utvecklandet och stärkandet av folkhälsonutrition som ett politikområde och för folkhälsonutritionistens yrkesroll. I nästa steg genomfördes fallstudier och i ett av fallen undersöktes den process som ledde fram till den slovenska mat- och nutritionshandlingsplanen (Delarbete II). Kingdons "*streams model*" applicerades för att förklara den politiska dagordningsprocessen. Den andra fallstudien (Delarbete IV) syftar till att beskriva utformningen av den svenska nationella folkhälsopolitiken mellan 1960-2006. Begrepp från policylärandeteorier användes för att identifiera hur förändringar inom folkhälsopolitiken har skett gentemot rådande folkhälsoprinciper och idéer. Slutligen genomfördes en Delphi-studie (Delarbete III) för att bestämma kärnverksamhetsområden för folkhälsonutritionister.

De mest relevanta resultaten från våra studier med hänsyn till arbetskraftsutvecklingsstrategier för folkhälsonutritionister är följande: a) att regeringar i de flesta fall inte satsat nämnvärt på arbetskraftsplanering eller en myndighetsstruktur för att hantera och leda en samordnad folkhälsonutritionsstrategi, b) att en väldefinierad yrkeskår av folkhälsonutritionister till största delen saknas i de flesta länder (Delarbete I), c) att fallstudierna visar att policyförändringar inom detta område har underlättats av nyckelaktörers medverkan i policyprocesser (Delarbete II), d) att tillgången till arenor där man tillsammans analyserat, debatterat och diskuterat olika ståndpunkter har varit viktig för att kunna uppnå konsensus och förändring (Delarbete IV) samt e) att kärnverksamhetsområden inom interventionsförvaltning och planering är av stor vikt för utvecklandet av folkhälsonutrition och dess professionalisering (Delarbete III).

God förståelse av policykontexten är en nödvändig förutsättning för att utveckla och realisera hållbara strategier för folkhälsonutrition (folkhälsointerventioner, utbildningsprogram, kompetensutveckling, identifierandet av kärnverksamhetsområden etc.). Det finns ett behov av att stimulera relationer mellan olika aktörer: myndigheter på nationell nivå, folkhälsonutritionister, folkhälsoorganisationer på regional nivå och den privata sektorn för att utveckla strategier för folkhälsonutritionisters yrkesutveckling. Policyanalyser och statsvetenskapliga perspektiv kan ge viktiga bidrag till folkhälsonutritionsforskningen i dess strävan att påverka såväl policy som praktik.

Nyckelord: Folkhälsonutrition, utvecklingsstrategier för folkhälsonutrition, policy-process, professionalisering, politisk dagordning, policylärande

