

Cover page

Official title:

New Families – Innovation and Development of the Child Health
Services in Oslo

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“New families”: Innovation and Development of the Child Health Services in Oslo.

PART 1: The planned innovation

1. Underlying idea

The local authorities at the municipal level organize and finance Primary Care Services (PHC), such as Child Health Services (CHS), according to local demand. The CHS is run with specialized Public Health Nurses (PHNs), midwives and General Practitioner (GP) doctors. It is utilized by 98 % of the eligible population (1) and established by law as part of the Primary Health Care (PHC) (2). The ideological underpinning of the service is to prevent diseases and continuing good health status of all children, and improve parents' autonomy and independence. However, each visit to the CHS is tightly controlled with specific time allocation and forms that mandatory have to be completed. The list of topics to be discussed is age specific and documentation labour intensive, providing limited room for individual attention and discussion. -How to improve quality of existing CHS providing personalised services in an innovative way?

Oslo is the capital in Europe with the largest degree of health disparity. Some districts with high socio-economic status and well-educated citizens have a life expectancy 8 years longer compared to districts with low socio-economic status and low education (3). The high degree of social disparity and poverty increases the need for comprehensive measures and expanded services for a larger number of families and individuals. The increase in immigration and the clustering of immigrants in certain counties enhance the disparity and enforce the need for holistic measures to tackle the social disparities and the additional challenges brought by the recent immigration. Over the last 10 years, there has been an increased use of Child Welfare Services (CWS) in Norway (4). The CWS have a statutory obligation to ensure that children and youth who live in condition that might be detrimental to their health and development receive the necessary assistance and care at the right time. But the CWS is secondary and action first comes into effect after identified concerning conditions or special needs in relation to the home environment. Prevention of disease and social problems should be launched at an early age to prevent harm and facilitate social development and healthy active lives. -How to update the service structure in the CHS to early identify the families in need?

In Stovner District do one in three children grow up in poor households, compared to every 10th child in 2000 (5). Every third student drops out of high school and 23% of those above age 20 have no education beyond primary school (5). Only 23 % of the Stovner population has a higher education, compared to the average of Oslo where 48 % has university or college education (5). In 2013, the Stovner District administration invited their leaders in health related positions and researchers from the University of Oslo (UiO) to discuss possible approaches on how to accommodate both incremental service demands and new political and national guidelines related to PCS and public health. By developing a CHS where greater focus is placed on early family contact and increasing the possibilities for the PHNs to assist the families based on their needs, the tasks may transfer from costly secondary and tertiary measures in the CWS to early preventive measures in the CHS. “New Mother” program developed with user participation in Stovner District. “New families” (NF), based on “New mothers”, will now be implemented in all of Oslo by the end of 2020 (6). NF is an early intervention program, implemented in the CHS, universally targeting all first-time parents regardless of socioeconomic status. **The next four years offers a unique, one time window of opportunity to do R&D of the implementation and the user effect of the NF program in Oslo, to explore the added values the NF gives to the current Norwegian CHS system and other public sectors.**

2. Level of innovation

Improved services as all first time mothers and families will be offered a personal PHN .The immigration to Norway the last 15 years is significant. In 2012, 23 % of new-borns in Norway, had an immigrant mother (7). Developing a program only for immigrants could be considered structural discrimination, given the Norwegian policies of free health care for all in the CHS system. For many of the new families, prior adverse experiences are prevalent and they would have a high score on “risk factors”. A salutogenetic perspective to health care provision offers an alternative philosophy to the traditional pathology and risk perspectives (8). The focus is on resilience, strengths, and sense of coherence, in stark contrast to the risk identifying strategy usually employed in early intervention programs (9). Implementing a salutogenetic model in NF could ensure the intention and tradition of the Norwegian universal approach at the CHS as being an equal and equitable service for all Health

New families

preventive initiatives are paramount in order to early identify and assure optimal use of the community's resources and to avoid short- and long term cost-expensive secondary and tertiary measures. Such initiatives have the highest effect when the approach is universal, with an opportunity to tailor based on needs (10). Offering all first time families, a "personal" PHN is acknowledging that low-risk families also have needs; families who cope still need support on how to adapt to a new family situation.

Updated method and service structure as the PHNs will do several home visits during pregnancy and after delivery in addition to the regular check-ups and visits at the CHS. The first years of life are a critical time in a child's development, as the most rapid and significant developmental changes occur during the prenatal period and through the first few years of life (11). Early experiences lay the foundation for physical, cognitive, language, social and emotional developments that set the stage for future health and developmental progress (12). The socio-economic costs increases, when added the possible costs if the child does not develop a positive parent-child attachment within the first two years (13). By investing in early interventions, where the families are supported at an early stage, it is possible to prevent negative outcomes and promote a sustainable and positive development both in the short- and long-term (9). Earlier studies show that the PHN can prevent post-partum depression if the mother receives a personalized service focused on empathic communication in a trusting relationship. Universal depression screening is not recommended in Norway, but the post-partum depression prevalence is 10-15 % (14).

International literature demonstrates that more intensive home based interventions provided by nurses, during the first years of an infant's life show promise in promoting child health, family functioning and the subsequent use of welfare (15). As the PHN relinquishes some of the power and the role as an "expert" and approaches the mother and the family with attentive (active) listening (16), and focuses on resilience and strengths rather than the risk factors that might be glaring, unique resources of the family might emerge. Adverse childhood experiences (ACE) are strongly associated with adulthood high-risk health behaviours and correlated with ill-health and shortened lifespan (17). Adequate use of home visits can improve and update the CHS providing an opportunity to identify needs and provide low threshold services which the families and children need to prevent adverse short- and long-term problems.

3. Potential for value creation

Increase efficiency of the PHN work. The PHN is charged with monitoring both the children's current state of health and development, and the parents' capability of care giving (18, 19). While PHN's serve in an enabling role to improve parents' autonomy and independence, many parents look to them as professionals in the traditional sense, as 'experts' who can give them definitions of and solutions to their problems. Norwegian studies indicate that parents in Norway to a large extent trust the CHS as a source of knowledge on infant and child care because of the PHN who provides this service (20).

Improved quality and sense of usefulness of the CHS. Meeting regularly in somebody's home changes the power dynamic and opens up for other conversations that might be more challenging if taking place in an office. The overall experience with the services and the usefulness of advice might be improved as the PHN knows the home and the family context better.

Project partners. The proposed project will ensure increased competence and knowledge-building within the lead institution, and establish a strong and cross-sectional research team within applied and practice-based research focused at the CHS emphasising the knowledge triangle: Research – education – innovation.

Increased integration of immigrants. Especially immigrant women have limited interaction with the Norwegian society. Establishing a professional relationship with a PHN might open up for the women to be more likely and better informed to use other services. Lack of proficiency in Norwegian is a challenge for children when they start school. Participating mothers in the development of the NF program expressed great confidence in the CHS and a sense of increased inclusion (21).

4. Need for research

Internationally, few early intervention programs aimed at improving CHS are developed in a country where the existing service is free, voluntary and used by 98 % of the eligible population (1). The NF program was developed (New Mothers) using an iterative participatory formative research process, including users in all aspects of the development at Stovner District. In addition we; explored the

scientific literature, policy documents, qualitative methods, expert communication, community education and critical reflection, conducted focus groups and key informant interviews with users of the CHS, the PHNs, administrators of the CHS, and the administrators of the Stovner District. The elements of the intervention are briefly described in Part 2 Item 12. The work has been presented at several international meetings and NFR and the City of Oslo has financed a public sector PhD associated with the development of the NF program. However, we are left with several questions described under Part 2 Item 7. Despite the CHS system existing more than 100 years in Norway, there is a lack of research on service impact and effective measures. This first line service is rarely an object of research (22), which is reflected in the small number of published article over the last ten years. In PubMed we identified 19 relevant English articles addressing the Norwegian CHS. In addition, we identified 3 articles with results relevant for the CHS in terms of service recommendations. We could not identify any articles on service development or service innovation. New guidelines are often based upon practice, reflecting limited research (19, 23).

5. Project organisation and cooperation

Leadership: The project will be led by the Department for Primary Health and Social Affairs, City of Oslo by Chief Medical Advisor Johan Torper MD and VID Specialized University (VID) as administrative responsible main partner, Professor Kari Glavin at VID will be lead R&D partner. Core collaborators are UiO, Jeanette H. Magnus MD, PhD, and the Norwegian Institute of Public Health (FHI) Rigmor Berg PhD. Magnus is former Head of Institute of Health and Society at the UiO. Berg is Department Director at FHI and Professor at the University of Tromsø. Glavin, Magnus and Berg will be working on the R&D project on part-time basis and their CVs are attached. Glavin and Berg will be responsible for WP 1 and academic advisors for the proposed PhD. Magnus has been part of the development of the NF program at Stovner and is the academic advisor for the current NFR PhD candidate. She will be responsible for WP 2 in collaboration with the evaluator, the post doctor, Glavin and Berg.

Project team: NP Maria J. Leirbakk, currently NFR Public sector PhD candidate and part time NF Evaluation coordinator, staff from Agency for Health at the City of Oslo, will also participate. Stovner District has been allocated the responsibility to roll out the NF they developed, Program Coordinator Stina Dolvik will be a key collaborator. Their CVs are available.

PART 2: The R&D activities

6. Objectives

Primary objective: The New Families (NF) program will improve quality of existing services, secure personalised service and early intervention in CHS in Oslo. The proposed R&D will:

- Measure the effects of a primary prevention family-centered healthcare intervention in Norwegian CHS
- Create case studies from CHS praxis advancing PHN training and education in Oslo and Norway
- Establish a model for how to include users in service development in CHS
- Enhance the knowledge base of the PHN practice in CHS

Anticipated results: The project will bolster the knowledge base for education and professional practices within the service by strengthen the existing research within the field. The anticipated results of the project are that the intervention will increase maternal and parental self-efficacy, reduce the risk of postpartum depression among first-time mothers, reduce parental stress, increase social support, improve maternal attachment, improve generic health status, improve partner relationship and improve child development compared with usual care. The intervention research in this project can be a future model for service improvement in the CHS.

7. R&D challenges and scientific methods

The proposed R&D in the NF project will seek to answer the following research questions:

1. Is NF effective as a primary prevention family-centered healthcare intervention?
2. Does NF impact maternal parental self-efficacy, reduce the risk of; postpartum depression and parental stress among first-time mothers, increase social support, improve; maternal attachment, partner relationship and child development, compared with usual CHS care?
3. What is parents' satisfaction with the PHN intervention?
4. What are the barriers and facilitators to implementation of the PHN intervention?
5. How does the work strategy for the PHN change when participating in the NF?

New families

6. Can the NF model enhance the knowledge-base in public health nursing?
7. Can the process developed and undergone at Stovner District create a practice-based model on how to include users in improving existing health care services in Norway?

Central R&D challenges: Recruitment of study participants, especially control condition participants may pose a challenge. Our experience is that first-time mothers are busy and when they do not experience anything they perceive as unusual, they lack interest in providing information. All participants will be offered some recompense, in the form of a gift card at a baby shop.

Knowledge of the research front: We have conducted a search in scientific literature, communicated with experts and are very familiar with the intervention and the results it has achieved in other contexts. We undertook a scoping review, highlighting key elements of relevant programs, but also program elements not suitable for adaptation due to cultural or organizational differences, intended outcome, target groups or framing premises. We searched for existing and evaluated programs and focused on program theory, approach, outcomes and methods (24). The CHS is an under-researched area within the PHC. This practice-based R&D will bolster the knowledge base for education and professional practice within the service by strengthen the existing research within the field. One group for research on interaction within and between the services will be established at VID. The research group will contribute to dissemination and implementation of research results and innovations in the services, including in the educational programs.

Approach and methodology: “The effect of a primary prevention family-centred healthcare intervention” is evaluation research. The primary research question regarding the effect of the PHN intervention (NF) compared to usual care will be evaluated through a prospective controlled before-after study, whereby some first-time mothers receive the intervention, and others receive usual care (Part 8, WP 1). The secondary objectives, covering participants’ satisfaction with the PHN intervention and implementation, follow established guidelines for such evaluations. We selected this approach because it will provide the most trustworthy data. WP2 “Service development in CHS” is a qualitative study, with user and/or service provider involvement at all stages. This study will establish a cross-sectorial team to develop case studies to be implemented in PHNs CHS training and PHNs education in Oslo. We will develop two models; one on how to ensure program sustainability and fidelity in the districts, and one practice-based model on how to include users in CHS development. In addition we want to explore changes in the PHNs work strategy as a result of NF. We have assembled an experienced group of researchers and content experts who are confident in the merits of the proposed evaluation. The risks are mainly lack of funding, long term illness among central team members, and political decisions that could change the context of the involved areas.

8. Project plan

WP 1 The effect of a primary prevention family-centered healthcare intervention (experimental development)

Main activity 1: For the first and second research question, participants (mothers/partner/child) who consent to take part in the study will be followed (table 1). Not all data will be collected at each time point, to minimize participant reporting burden. The data will be collected via a self-report questionnaire and will consist of the following as outlined in **Table 1**:

1	Demographic questionnaire: Demographic data includes: parents' age, marital status, education level, occupation, income, living arrangement	At recruitment, 12 m pp
2	Type of delivery and infant feeding method	6 weeks pp
3	Perceived Maternal Parental Self-Efficacy PMP SE (25)	6 weeks, 3 m, 12 m pp
4	Perinatal Infant Care Social Support PICSS Scale (26)	6 weeks, 12 m pp
5	The Edinburgh Postnatal Depression Scale EPDS (27)	at recruitment, 6 weeks, 3 m, 9 m, 12 m pp
6	The Maternal-Infant Attachment Scale (MIAS) (28)	6 weeks, 3 m, 9 m, 12 m pp
7	The WHOQOL-BREF (29)	at recruitment, 3 m, 12 m pp
8	Parental Stress Scale (PSS) (30)	3 m pp, 12 m pp
9	Birth Postnatal Satisfaction Questionnaire (WOMBPNSQ) (31)	6 weeks, 9 m pp
10	Relationship Assessment Scale (RAS) (32)	at recruitment, 3 m pp, 12 m pp
11	Ages & Stages Questionnaires, Social-Emotional (33)	12 m pp
12	Gotland Male Depression Scale (GMDS) (38)	at recruitment, 6 weeks, 3 m, 9 m, 12 m pp
13	Sence of Coherence (SOC 13) (39)	at recruitment, 3 m, 12 m pp

New families

Power: We used the EPDS to calculate power because it is a primary outcome. We calculated that 64 participants were needed in each group (intervention and control), based on a power of 0.80, an alpha level of 0.05 and an effect size of 0.5. However, we will make concerted efforts to recruit as many first-time mothers from the CHS as possible from 01/07/18 to 30/06/19 to strengthen the study's power. Many new established families are moving within the child's first year so they can be lost to follow up.

Main activity 2: The third research question regarding parents' satisfaction with the intervention, will be explored by collecting data through one-on-one semi-structured interviews and focus group discussions (FGD) with a focus on the participants' satisfaction, experiences and opinions of the intervention's content, structure, delivery, as well as the participants' engagement in the intervention. Potential participants will be asked to participate in an individual or group interview. The interviews and FGDs will take place about 12 months postpartum and conducted in Norwegian or English, according to the participants' preference (other languages if qualified interviewers can be recruited). Interviews and FGDs will be led by PHNs with master's degrees with experience in qualitative research, knowledge of the intervention, and experience working with first-time mothers. We plan to recruit 15-20 mothers and fathers from the intervention group via requests for participation. A semi-structured interview guide, with prompts to facilitate discussion and participants' perspectives, will be used to structure the individual interviews and FGDs. Core questions asked of participants will not differ between the individual interview and focus-group formats

Main activity 3: The fourth research question will be explored by addressing the process of implementation. Data will be collected through a short survey and semi-structured interviews with PHNs and users (first-time mothers/fathers). The process evaluation will provide greater confidence in conclusions about effect, and unexpected effects, by assessing the quantity and quality of; deliverance, the generalizability of its effect by understanding the role of context, and will provide guidance about necessary modifications for the implementation of an expansion of the program in the event that the effect results are promising. The end of the program survey and interviews will focus on; program fidelity, how well the program plans and activities are working, reach (whether and the extent to which the first-time mothers comes into contact with the intervention), dose, and they will collect vital information about how to replicated the intervention, including aspects as training and support, communication and management structures. The survey and interviews will take place about 12 months postpartum. All interviews will follow the same procedure as described in main activity 2, but with different questions. We plan to recruit 8-10 mothers from the intervention group and 5-8 PHNs and other CHS staff via requests for participation.

Matching districts CHS for R&D study: Recruitment will take place from 1 July 2018 to 1 July 2019. Three districts have completed implementing the program and we will choose two of these as cohorts (intervention area). As control districts, we will select two districts among five possible. The Department of Health and Social Affairs (EHS) controls this.

Responsible: VID and the project leader Glavin are responsible for planning the main activities. Berg will also participate in the further planning and necessary activities. Both will serve as supervisors for the PhD. As the planned prospective controlled before-after study collects too much data for one PhD, the applied PhD student is responsible for carrying out some of the activities; collecting some data and disseminating the results of these (see table2). Another PhD will be applied for to collect data from 9 months and 12 months and disseminating the results of these (see table 3). The program coordinator and the evaluator will closely collaborate with the PhDs on conducting the necessary activities, and users of the CHS will be invited to participate on all relevant areas of WP 1. Together with the PhDs and master students at VID will be involved in the data collection and writing scientific papers.

Estimated costs: PhD, user involvement, Glavin (15 %), Berg (8%), (Magnus 2%), evaluator (2%), program coordinator (5%), work shops.

New families

Table 2: Sketch of data collection for the applied PhD student

At 28 weeks pregnancy to intervention and controls: information on study and invitation to study membership from the PHN to the parents. Parents receive information about the study and invitation to participate in the study on the basis of voluntary, informed consent. Parents give written consent to participation. Written consent form and completed questionnaire are submitted by parents to the PhD candidate.	
Time	Data
At recruitment 28 weeks pregnancy	Demographic questionnaire: parents' age, marital status, education level, occupation, income, living arrangements; The Edinburg Postnatal Depression Scale; Relationship Assessment Scale, SOC13, GMDS; WHOQOL_BRIEF
6 weeks pp	Type of delivery and infant feeding method; Perceived Maternal Parental Self-Efficacy PMP SE; Perinatal Infant Care Social Support PICSS Scale; The Edinburg Postnatal Depression Scale; The Maternal-Infant Attachment Scale; Birth Postnatal Satisfaction Questionnaire (WOMBPNSQ), GMDS
3 m pp	The Maternal-Infant Attachment Scale; Perceived Maternal Parental Self-Efficacy PMP SE; The Edinburg Postnatal Depression Scale; SOC13; RAS; PSS; WHOQOL_BRIEF; GMDS,

Table 3: Sketch of data collection for the Additional PhD student (to be funded)

Time	Data
9 m pp	The Edinburg Postnatal Depression Scale; The Maternal-Infant Attachment Scale; GMDS; Birth Postnatal Satisfaction Questionnaire (WOMBPNSQ)
12 m pp	Demographic questionnaire: parents', marital status, education level, income, living arrangements, number of children, The Maternal-Infant Attachment Scale; Perinatal Infant Care Social Support PICSS Scale; Perceived Maternal Parental Self-Efficacy PMP SE; The Edinburg Postnatal Depression Scale; Parental Stress Scale (PSS); Ages & Stages Questionnaires: Social-Emotional; WHOQOL_BRIEF; Relationship Assessment Scale (RAS); SOC13; GMDS

WP 2 -Service development in CHS (experimental development)

To promote a knowledge-based development of the CHS, it is essential that the project conducts high quality practice-based research on the service and service provider effects after implementing changes. All new initiatives in this work package will include user and/or service provider involvement and be piloted in the CHS in Stovner District. As described in Item 12 the PHNs in Stovner who participated in the development of the model for the NF, called New Mothers, will be the trainers of all new CHS clinics and PHNs. The feedback loops from the implementation of the NF will enrich and broaden the knowledge base. User participation, Focus groups and semi-structured interviews will be conducted using the same strategies as outlined in WP 1.

Table 4: Main activity, data collection, deliverables and results

Main activity (MA)	Data collection	Deliverables and results
1. Ensure knowledge sharing and documentation of how to identify CHS 'state of the art' through development and pilot case stories. The case stories will function as small mirrors of general cultural and social patterns, of societal dynamics and change. They present realistic, complex, and contextually rich situations and often involve a dilemma, conflict, or problem to be solved. The activity will be conducted through cooperation between professional practice, education and research.	-FGD and interviews with trained and new NF PHNs. -Participating in reflection meetings -Work-shops with PHN students (VID)	-Develop case stories to be used both in education program of the PHNs in the University (VID) and PHNs in the CHS in Oslo -Develop methods to teach by the case method
2. Enhance & document changes in the knowledge base within the CHS and the PHNs as a result of NF. Monthly reflection notes and group interviews with the PHNs (see Item12) will capture encounters and identify challenging key elements and service changes associated with implementing the program.	-Reflection notes from the PHNs -Participate in reflection notes meetings -Interviews with PHNs/CHS leader -CHS data on use of extra consultations	Document to what degree and how the PHNs knowledge base and practise change as a result of NF implementation -Identify barriers and facilitators
3. Using temporary results and experiences from the NF, and continue tailoring the program with focus on user and service provider participation.	-FDG and interviews with users of the CHS -Work-shops with PHNs and -Work-shops with users of the CHS	Develop a practice-based model on including users and service providers in continued development of the CHS

Responsible: A team of PHNs, VID, and Agency for Health (Ingjerd and Linda) is responsible for development and piloting the case stories. Evaluator, Magnus & the Post doc are responsible for developing the tools, collecting data and scientific publications.

New families

Estimated costs: Post doc (100 %), Magnus (8 %), Glavin (5 %), Berg (2%), Staff City of Oslo (10 %), evaluator (8 %), program coordinator (2%), work-shops, user involvement. In addition, VID can use master students in order to help at any of the main activities. The students can write their thesis upon relevant activities.

Table 5: Milestones WP 1

Milestone	Quarter/year	Milestone	Quarter/year
Completed recruitment MA1	03/19	Completed main activity 2 and 3 and scientific paper submitted MA2 and MA3	02/20
Completed 6 weeks MA1	02/20	Second scientific paper submitted (recruitment and 6 w and 3 m data) MA1	03/20
Completed 3 months MA1	02/20	Third scientific paper submitted (recruitment and 6 w and 3 m data) MA1	04/20
First scientific paper submitted (recruitment and 6 w data) MA1	02/20	Completed thesis MA1	03/21

Table 6: Milestones WP 2

Milestone	Quarter/year	Milestone	Quarter/year
Develop case histories MA 1	01/19	Completed the development of a practice-based model	03/20
Completed data collection on MA 2	01/20	Second scientific paper submitted MA 2	03/20
Completed piloting case stories in VID and at CHSs	02/20	Completed piloting the practice-based model on user involvement	01/21
First scientific paper submitted MA 1	03/20	Third scientific paper submitted MA 3	02/21

Recruitment and participation are crucial for a successful project (both WP1 and WP2) and will be closely monitored by the project group every three months.

9. Responsibilities and roles in performing the R&D activities

Glavin (VID) has led several projects within the CHS and her expertise is both quantitative and qualitative research methods. Berg (FHI) has expertise in quantitative research methods and Magnus (UiO) has expertise in qualitative research methods and their roles are described in item 8. The relevance of the PhDs and the Post doc's work are also described in item 8. The international advisory committee have expertise within the field, with project development and implementation and both quantitative and qualitative research methods. The advisory committee is described in item 11. VID and City of Oslo are financing and research partners. FHI and UiO are research performing partners.

Table 7: The main activities and which partner who will be responsible for and participate in each activity

Partner	Name of partner	Responsible for main activity	Participating in following main
P1	City of Oslo		WP1, WP2
P2	VID, Kari Glavin	WP1	WP2
P3	FHI, Rigmor Berg		WP1, WP2
P4	UiO, Jeanette Magnus	WP2	WP1

10. Costs and funding for each research-performing and financing partner (NOK 1 000)

Table 8: The main activities and partner responsible for and participate in each activity

Partner	Total costs for R&D activities for the partner	Own financing
P1, City of Oslo	4120	1 797
P2, VID	7091	1 414
P3, FHI	0	0
P4, UiO	0	0
Total costs	11211	3 211

* UiO and FHI are not financing partners. Magnus (UiO) and Berg (FHI) have been contracted by the City of Oslo with 10% salary offset since 01.08.17. This will continue through the proposed period. Magnus and Berg have their main positions at UiO and FHI.

11. Other forms of collaboration on R&D activities

Advisory Committee: Paula Zeanah is a clinical psychologist, registered nurse and professor at Tulane University School of Medicine, with various early childhood research interests related to nurse home visiting. Professor Charles Zeanah is a child and adolescent psychiatrist and professor at Tulane University School of Medicine, has particular field of research is in child psychopathology focusing on infant-parent relationships, attachment and its development in high-risk environments.

New families

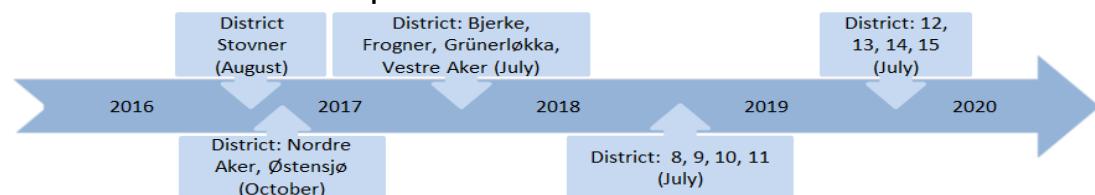
They have intimate knowledge to the NF program as discussants during the development. *Patricia Leahy-Warren* is a registered nurse, midwife, PhD, Senior lecturer, Director of Postgraduate Education and Chair of the Maternal and Infant Health Research Theme at Catherine McAuley School of Nursing and Midwifery at UCC, Ireland. She developed a theoretically based social support instrument, being used internationally to devise theoretically sound perinatal interventions to facilitate the transition to motherhood. She established and led the Maternal and Child Health Research Theme in the School of Nursing & Midwifery. Professor *Charlotte Delmar* is the Head of the department for Nursing Science, Aarhus University, Denmark and also a part of the leader team, Institute of Public Health; she has a 20 % professor II position at Diakonova/VID. She has a human caring science approach to the research areas and expert knowledge within qualitative designs, and 25 years of leadership experiences from clinical practice and from the University.

PART 3: Realisation of the innovation and utilisation of results

12. Plan for realisation of the innovation

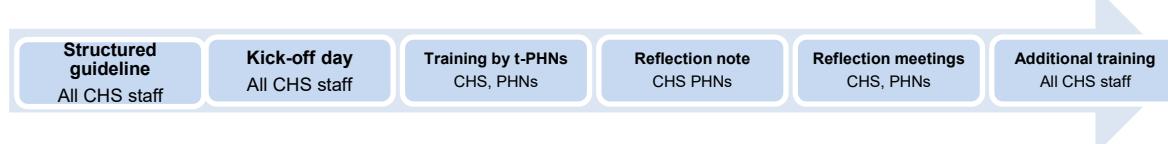
In 2016 Oslo city Government decided to implement the NF program in 7 districts in the period up to 2019. In addition, the city government has in the proposed budget for 2018, suggested full implementation in all 15 districts by 2019. The General Director of the Department of Health and Social Affairs (EHS) is responsible for the program and appoints the program board. The program board consists of representatives from EHS, participating district, users and representatives from employee organizations. The program board was established to secure cooperation during the implementation and has monthly meetings to discuss different strategies and challenges regarding the NF program. The districts commitment is ensured by a program document.

Model 1: Timeline for district implementation



To ensure fidelity to the program the leaders, the PHNs and CHS staff receive a structured guideline presenting the theoretical framework and methodology thoroughly discussed at the kick-off day, conducted by the NF coordinator and training PHNs (t-PHNs) who took part in developing and piloting the NF program in Stovner District. The t-PHNs are also responsible for the training of the PHNs in each new district, which involves a home visit. The aim of conducting the home visit in pair is that the PHN from the new district can observe and learn from the t-PHN, as well as being able to discuss work methods and applied knowledge before and after the home visit. The t-PHN will also have a supervisor role for the PHN from the new district, and will be available to discuss and answer questions by phone and e-mail. This ensures that the t-PHNs will both train and mentor the PHNs from the new districts, which is an important aspect of quality assurance and best practices of the program. The NF program intervention is providing extensive home visits from gestational week 28 until the child is two, in order to support and help families based on their needs. All the PHNs in the different districts are obligated to write monthly reflection notes, where they highlight their chosen work methods, as well as the ethical choices and considerations they are faced with. The reflection notes are subsequently discussed at regular meetings together with the NF coordinator, which facilitates exchange of knowledge between the PHNs.

Model 2: The different phases of the NF implementation in each district CHS



A Forum with leaders from CHSs in participating districts has been established, facilitating cooperation and dissemination of knowledge and experiences, and important when identifying needs for additional training.

13. Risk factors

Risk elements related to implementation: Ensuring appropriate training and fidelity to the NF guideline is imperative. Peer mentoring is critical as the PHNs are training the new PHNs in home visiting. Necessary that all CHS leaders and staff to read the guideline and participate in the kick off day at each new district. Lack of comprehension of and fidelity to the NF program's empirical and methodological foundation. CHS staff who for various reasons counteract the implementation of the NF program.

Financing risks: The city government on behalf of Oslo municipality has already approved implementation of the NF program in seven districts. The proposed budget for 2018 proposes full implementation in all 15 districts by 2019. This ensures that Oslo municipality already with the current budget decision has sufficient number of districts to conduct the proposed R&D in the NF program.

Organisational risks: The NF program must be adequately acknowledged or sufficiently politically anchored. A hypothetical risk if any new CHS is lacking resources and use NF funds to cover an already insufficient service. The Program owners, Department for Primary Health and Social Affairs, do request detailed reporting from the districts to counteract this. Opposition to changes in the district administration.

Risks relating to the need for amendment of the statutory framework: The NF program complies with existing statutory framework and guidelines.

14. Other socio-economic benefits

Reduced costs of CWS: The high budget to CWS was one of the reasons for the original call for new program at Stovner. Increased cost allocation by increasing the PHN visits can offset children served by (or under the care of) the CWS have an increased risk for school drop-out and later absence from work. For the society, the long-term consequences are costly (34). The City of Oslo will follow the outcome NP long-term.

Possible program effects benefitting the child, later children and society:

A long term goal is decreased ACEs, defined as psychological, physical, sexual exposure in addition to household dysfunction. If achieved we can in long term reduce risk for addictions, mental disorders, depression, self-harming and violent behaviours (17). If the NF program can prevent some ACEs from happening or decrease the load of ACEs on individual children the potential value for the society and the individual is extensive and almost impossible to measure. Increased school-readiness and early start in kindergarten can increase early reading and math scores, and lower the levels of conduct problems (35). Long term this can prevent dropout in school. In 2013 the rate of dropout was 29 % in Norwegian high schools. Each year the school dropout costs for society is estimated to 5 billion NOK (36).

Possible program effects benefitting the mother or father and society: Prevent paternal and maternal post-natal depression. This kind of depression is associated with adverse effects on children's emotional and behavioural development through a negative effect on caregiving by less attachment, sensitivity and more harsh or disrupted parenting behaviours, which may contribute to adverse child outcomes in children of depressed mothers, and in addition affects language development (37). Avoid separation and divorce through strengthening the parental relationship and preventing household dysfunction. There are no numbers available on the costs for broken families.

15. Dissemination and communication of results

Communication with users: Users will be informed through newsletters, brochures and posters at their local CHS and in the GP clinics. Involvement of users' at all relevant stages of the development and evaluation is an integral part of the project and the proposed R&D WPs.

Popular science: Local and national newspapers have already shown interest in the NF, and we will increase the value of the news by writing popular science articles the reach the general public. Since NF today has high political interest and affects all first-time families in the CHSs in Oslo, it is important that results are spread through other channels to reach a Norwegian audience.

Reports and evaluations: We expect to supply the City of Oslo with reports and evaluations of project progress, temporary results and policy briefs. The evaluator is responsible for delivery of the added reports and evaluations that are not in connection to the R&D activities.

Conferences, work-shops and seminars: We will arrange workshops, seminars and symposia linked to the project, with different purpose and target audience. We will invite stakeholders, users and staff at the CHS, district administration, politicians and external key researchers to share

New families

knowledge between different sectors and levels (academic/practice), CHS and CWS. Specially invited key speakers are relevant for seminars to ensure knowledge transfer from relevant issues to PHNs and CHS staff. We will conduct two symposia/conferences linked to the project, and invite several key researchers external to the project.

Dissemination of R&D results: Results will be disseminated through abstracts and articles in international peer-reviewed journals. The PhD (WP 2) and the Post doc (WP1) are responsible for writing the high impact scientific papers in cooperation with the participating researchers.

International dissemination: Throughout the project we will seek to present our findings at national and international conferences. As of today the NF program and the pilot "New mothers", have given 13 presentations at international conferences since 2014. The participating PHNs, the Stovner District administration and Oslo Health Department are co-authors.

PART 4: Other information

16. Environmental impact

Increased home visits by the PHNs will increase the need for transportation. We will strive to use public transportation where and when available and plan home visits based on geographical location and use non-polluting transportation. For example, electric bikes and electric cars are used at CHS in Stovner District.

17. Ethical perspectives

The ethical guidelines relevant to general, medical and health research will be followed. The NF implementation (issue 12 and 13) is service development and not strictly considered an R&D activity. NSD approval for extended evaluation will however be secured. All recruited families are informed about the intention of the NF. If they are to provide the program with any additional experiences beyond accepting home visits, for instance through FGD/interviews, they sign a declaration of consent. We will seek REC and NSD for all necessary approvals needed in order to conduct the R&D activities outlined in this proposal. The NFR PhD research in the process on documenting the pilot "New mothers" has approval both from REC (2015/1613/REK sør-øst C) and NSD (53379 / 3 / AH).

18. Recruitment of women, gender balance and gender perspectives

NF is universally directed at all new families, including same-sex couples and single parents. As of today no male PHN are working at the CHSs where NF is implemented. All the CHSs have female leaders. Only women are responsible for the planned R&D activities, and led by a female professor.

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New families

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