“Familie for første gang”/Norwegian Nurse-Family Partnership (NFP) Pilot – Final Report on a Four-Year Real-Time Evaluation

Eirin Pedersen, Jannike Gottschalk Ballo & Wendy Nilsen

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"Familie for første gang"/Nurse-Family Partnership (NFP) Pilot.
Final Report on a Four-Year Real-Time Evaluation of the Nurse-Family Partnership in Norway

Eirin Pedersen, Jannike Gottschalk-Ballo & Wendy Nilsen

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Final Report on a Four-Year Real-Time Evaluation of the Nurse-Family Partnership programme in Norway

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Abstract:

The Work Research Institute (AFI) at Oslo Metropolitan University, Norway conducted a four-year real-time evaluation (2016-2019) of the implementation of the Nurse-Family Partnership (NFP) programme in Norway. In Norwegian, the programme is entitled “Familie for første gang” (Family for the First Time). NFP is a home visiting programme in which specially trained nurses visit at-risk first-time mothers-to-be from pregnancy until the child is two years old. The programme is being piloted in Norway from spring 2016 until mid-2021. The evaluation was commissioned by the Norwegian Directorate for Children, Youth and Family Affairs (Bufdir). The aim of the evaluation is to assess the feasibility of implementing NFP in a Norwegian context; the extent to which implementation can be accomplished in line with the original (international) programme’s criteria; and to assess any benefits from the programme.

The analyses are based on interviews with participants, nurses, partners and local authority representatives, as well as quantitative data collected by the nurses, including data on the participants ' education, work and age, involvement, mental health, sense of mastery, loneliness, partner status and violence.

The findings indicate that NFP has been largely implemented as planned in Norway, and that adaptations with respect to recruitment, target population and interaction resources appear to be successful. The programme reaches out to a vulnerable target population that is otherwise challenging to assist, and which may be difficult to reach by means of other interventions. NFP is suitable for adaptation to diverse needs and can embrace families with diverse and complex challenges. The number of included families indicates that the target population in Norway is larger than originally estimated. The programme is adaptable and can successfully interact with other services. NFP would not be as adaptable were it a locally devised service, and is solely a service to women pregnant with their first child.

The real-time evaluation concludes that there is a need for and high acceptance of a high-intensity programme such as NFP in Norway. The programme offers close and structured supervision for vulnerable families who need extra support in a challenging life phase. No corresponding service exists in local authority services in Norway for this target population. Although the data material does not permit effectiveness to be measured, the real-time evaluation finds that this intervention is probably capable of preventing child neglect and children being taken into care. In this way, an early intervention in the form of NFP can prevent problems for vulnerable families later in life.

Foreword

This is the final report from the real-time evaluation of the implementation of the Nurse-Family Partnership (NFP) programme in Norge; a home visiting programme for vulnerable first-time mothers-to-be. In Norwegian, the programme is entitled “Familie for første gang” (Family for the First Time).

The real-time evaluation was conducted by the Work Research Institute (AFI) at Oslo Metropolitan University by Eirin Pedersen, Wendy Nilsen og Jannike G. Ballo, with Knut Fossestøl as the quality assurer. The evaluation was commissioned by the Norwegian Directorate for Children, Youth and Family Affairs (Bufdir).

The real-time evaluation was carried out from spring 2016 to autumn 2019. Two interim reports were published earlier covering the start-up phase (Nilsen & Pedersen 2017) and the operational phase (Pedersen & Nilsen 2018). In the present final report, we summarise the outcomes of the pilot, based on qualitative and quantitative data.

We would like to thank all participants in the pilot who were interviewed for the purposes of this report, and extend our special thanks to the participants for generously sharing their time and their experiences.

Work Research Institute, Oslo Metropolitan University, 2019

Eirin Pedersen, project manager

Summary

Basis for the evaluation

NFP is a high-intensity, licensed home visiting programme addressing health and psychosocial challenges affecting vulnerable first-time mothers-to-be and their children. Specially trained nurses from a local NFP team visit mothers and their families from pregnancy and up to twenty-four months after childbirth with up to 64 home visits.

This report summarises the main findings from a four-year real-time evaluation of the implementation of Nurse-Family Partnership» (NFP) in Norway. The report relies on a total of 81 individual and focus group interviews. In addition, the nurses in the project collected quantitative data used in assessing implementation quality and 'stretch' goals (fidelity to the model), from 185 included participants.

The aim of the evaluation is to assess:

- the feasibility of implementing NFP in a Norwegian context;
- whether implementation in Norway can be accomplished in line with the programme criteria; and
- any benefit from the programme.

The evaluation finds that NFP:

1) **Is a well-implemented, high quality programme**
The findings indicate that NFP has been largely implemented as planned in Norway, and that adaptations with respect to recruitment, target population and interaction resources appear to be successful. Partners rate the programme as maintaining a high professional standard and that it has professional support from international research centres. The families show a high level of commitment to, and acceptance of, the programme, with the close relationship with the nurse being focal. The frequency of the home visits and the high quality of care delivery are also key factors in the families' acceptance of the programme.

2) **Addresses a vulnerable target population that is otherwise challenging to assist**
NFP addresses a target population that is difficult to reach by means of other interventions. The programme can help to identify vulnerable families at an early stage and facilitates early intervention in families that would not otherwise have been discovered. NFP is suitable for adaptation to diverse needs and can embrace families with diverse and complex challenges. The programme design of home visiting is conducive to programme flexibility. The number of included families indicates that the target population in Norway is larger than originally estimated.

3) **Improves the families' mental health predispositions, living conditions and parenting skills**
The benefits of NFP to families arise at several levels. NFP boosts the family's emotional environment and mental health. It boosts parental caregiving skills and attachment to the child. It helps the families with practical challenges involving housing, income security, job-seeking and educational plans. It also helps them to seek the help they need from other services. For parents with challenges, the programme provides great benefit in that it builds parenting skills. However, it remains to be seen whether NFP can provide greater benefit than the existing Norwegian health and welfare apparatus.

4) **Fits in with the Norwegian context and existing welfare services**
NFP is feasible to employ within the Norwegian local authority (municipal level) welfare and healthcare services. The programme is adaptable and has been able to cooperate with different services to find solutions to many practical challenges over the course of the pilot. Experiences and reactions in the urban districts and provincial municipalities running NFP indicate that it could be an important supplement to existing local authority services.

5) **Has certain limitations**
NFP will not be adaptable as a localised service because it is a licensed programme and requires compliance with criteria and guidelines. Equally, the fact that the programme is licensed prevents changes being made that might reduce its effectiveness. NFP is best delivered in built-up locations and cannot be diffused nationwide in a country like Norway with low population density and large geographical distances to cover in rural areas. NFP is a service offered to women pregnant with their first child and thus at present excludes vulnerable multiparous women.

The real-time evaluation concludes that there is a need for and high acceptance of a high-intensity programme such as NFP in Norway. The programme offers close and structured supervision for vulnerable families who need extra support in a challenging life phase. No corresponding service exists in local authority services in Norway for this target population. Although the data material does not permit effectiveness to be measured, the real-time evaluation finds that this intervention is probably capable of preventing child neglect and children being taken into care. In this way, an early intervention in the form of NFP can prevent problems for vulnerable families later in life.

Contents

1. Introduction

This report summarises the main findings from the real-time evaluation of the implementation of the Nurse-Family Partnership (NFP) programme in Norway. NFP is a home visiting programme in which specially trained nurses visit at-risk first-time mothers-to-be from pregnancy until the child is two years old. In Norwegian, the programme is entitled "Familie for første gang" (Family for the First Time). The evaluation was commissioned by the Norwegian Directorate for Children, Youth and Family Affairs (Bufdir), and was ongoing from project commencement in spring 2016 until autumn 2019.

The Work Research Institute (AFI) carried out an evaluation with the object of determining the feasibility of implementing NFP within a Norwegian context in line with the programme's criteria (fidelity 'stretch' goals) and any adaptations that might need to be made. As part of the evaluation, two interim reports have been published. The first interim report covered the start-up phase of the project in 2016 (Nilsen & Pedersen 2017). The second interim report follows the pilot through to the operational phase in 2017 and 2018 (Pedersen & Nilsen 2018). See tables 1 and 2 for an overview of the topics addressed in the two previous reports.

Table 1: Topics with page numbering in Interim Report 1 – on the start-up phase in 2016

Interim Report 1	
- Start-up of the programme and organisation of the pilot	pp. 17-22
- Recruitment of pilot testing sites	pp. 22, 31-36
- Recruitment and training of nurses	pp. 26-30
- Inventory of potentially overlapping schemes within healthcare and welfare services	pp. 36-39

Table 2: Topics with page numbering in Interim Report 2 - on the operational phase in 2017 and 2018

Interim Report 2	
- Assessment of NFP within provincial municipalities/urban districts; experiences of having NFP within existing services	pp. 19-20
- NFP teams' experiences of working within the NFP pilot	pp. 20-24
- Cooperation with other services	pp. 24-25
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- Participants' experiences and acceptance of the programme	pp. 57-64
- Partners' experiences of the programme.	pp. 65-67

The analyses in this final report are based partly on the findings of the previous reports and partly on new data collected in 2019.

In order to evaluate the pilot, our attention was directed at four evaluation areas:

1) Target population clarification in the Norwegian context – as regards participant recruitment, inclusion and attrition.
2) Implementation and delivery – as regards adaptation of materials, recruitment/training, acceptance and attrition of nurses who will be delivering NFP.
3) Cooperation with other health and care services – as regards organisation, need and acceptance at system level.
4) Potential effect for families in Norway, and the programme's contribution relative to other services to the target population (overlap).

At a more overarching level, we examine success indicators and barriers to the implementation of NFP in Norway and challenges that have arisen over the course of the four-year pilot. The evaluation also offers recommendations for onward organisation and implementation of NFP in Norway together with recommendations for research on the programme in Norway going forward.

2. The Nurse-Family Partnership

NFP has been piloted in Norway for its national value in contributing to parenting skills, prevention of violence and sexual assault against children and adolescents, and supporting early interventions for families at risk. NFP has been presented as the only evidence-based programme offering support and prevention from as early as the pregnancy and infancy period (Official Norwegian Report, NOU 2012:5).

2.1 Content of the NFP programme

The Nurse-Family Partnership (NFP) programme is a high-intensity, licensed intervention programme addressing health and psychosocial challenges affecting vulnerable first-time mothers-to-be and their children (Olds, 2002; Olds et al. 2007a). The programme pursues a relational approach and an empowerment focus. Several systematic reviews of the literature have highlighted NFP as one of the few interventions that is effective in reducing a number of adverse outcomes right from pregnancy (Aos et al., 2004; Ghate, 2016; MacMillan et al., 2009; Williams et al., 2008). The NFP programme is founded on proven results/recognised evidence relating to child attachment, interaction and development in addition to healthcare recommendations for pregnant women and infants. The programme has a well-defined learning structure, in which evidence and experiences from different countries are processed and disseminated by the international NFP office.

NFP’s goals are to:

1) Improve adverse pregnancy outcomes by helping women improve their prenatal health.
2) Improve the child’s health and development by helping parents provide more sensitive and competent care of the child.
3) Improve parental life-course by helping parents plan future pregnancies, complete their educations, and stay in work.

A body of evidence establishes the positive impacts of NFP in the form of reduced incidence of partner violence, reduced tobacco use prenatally and in infancy, reduced parental stress and increased incidence of breastfeeding (Mejdoubi et al., 2013, Mejdoubi et al., 2014, Sawyer et al., 2013). Trials have also indicated improvements in multiple child outcomes such as physical abuse/neglect of the child, child development and problem conduct, and birth outcomes (Mejdoubi et al., 2015; Robling et al., 2016; Sawyer et al., 2013, Miller, 2015). In the US, the programme proved to have greatest effect on the most vulnerable families – among young low-income single mothers with cognitive deficits and lacking confidence in their self-mastery (Olds 2006, Ball et al. 2012).

The six programme areas

1. Personal health (maintaining general health, nutrition and exercise, substance misuse, mental health)
2. Social setting (home, work, school and neighbourhood)
3. Life course (family planning, education and disposable income)
4. Motherhood (physical, behavioural and emotional care of the child)
5. Friends and family (personal networks and relationships, child-minding)
6. Healthcare and social services (fostering contact between the family and needed health and social services.)

The programme is delivered as home visits by family nurses (midwives and public health nurses) organised in teams of four to eight under weekly supervision from a team supervisor. Vulnerable families receive up to 64 home visits starting from pregnancy and continuing until the child is two years old. The nurse and family establish a therapeutic relationship, which is assumed to be a key criterion for bringing about change in the family. The family nurses use ‘facilitators’ (thematic loose-leaf sheets) to facilitate discussion and counselling in the various programme areas. These also serve as

information handouts for the participants to retain after the home visit (Olds et al., 2006). The facilitator sheets must be sufficiently diversified so as to accommodate flexibility in responding to the families’ differing needs. This is why the programme is referred to as “Fixed but flexed” (Olds 2002, Olds et al., 2006).

The nurses’ three main tasks:

1) Help/support mothers and other family members to alter behaviours that may have adverse impacts on the pregnancy, infant development and parental life course;
2) Help the mothers to build relationships and networks with supportive family and friends; and
3) Foster contact between the family and needed health and social services.

2.2 Organisation of the Norwegian pilot

The Norwegian pilot started in 2016 with two pilot sites: one in the Norwegian capital, Oslo (2 districts: Gamle Oslo and Søndre Nordstrand) and one in Rogaland County (3 municipalities: Sandnes, Stavanger and Time). Each pilot site was assigned its own NFP team consisting of 4 nurses and one nurse team supervisor, with a total of 10 nurses employed by the pilot. Four nurses and one team supervisor left during the pilot and were replaced by new nurses (see also Interim Report 2, p. 25). The nurses attend to 15-18 participants each, except for the team supervisor who attends to 3 participants in addition to having leadership and supervisory responsibilities. For the pilot, the teams recruited 75 participants in each site, making a total of 150 participants. Recruitment to the pilot was ongoing from August 2016 until October 2018. From that time on, the teams continued to recruit pending a prospective continuation of the programme.

The Norwegian Directorate for Children, Youth and Family Affairs (Bufdir) is the licensee of NFP in Norway. The regional centre for child and adolescent mental health and child welfare (RBUP), represented by the national NFP office, is responsible for implementation and professional quality in line with the licensing obligations and the core model elements of the programme. The national NFP office is responsible for adaptation of the programme, training and supervision of the NFP teams, communication with the international NFP office, and data collection and data processing within the programme.

For the pilot, three NFP boards were appointed, in compliance with the licensing requirements. A national board of representatives from directorates, trade unions and experiential advisers ensured platforming of the programme with, and dissemination to, professional groups and official entities. Within each pilot site, a local NFP board was established, composed of representatives of local authority administration and agencies involved in attending to vulnerable families within the pilot site, including Maternity and Child Health Care Centres, the Child Welfare Service and the Labour and Welfare Service (NAV). The boards are instrumental in diffusing information about NFP at local authority level and assist the NFP team in recruitment and cooperation surrounding vulnerable families.

2.3 Adaptations to a Norwegian context

Adaptations of the programme to a Norwegian context were implemented before and during the pilot. Major adjustments were undertaken in consultation with advisers at the International NFP Office. RBUP describes the international NFP office as interested in new knowledge and development of the programme, and that adaptations made in Norway may serve to further enhance the NFP programme going forward.

Lesser changes were made by the national NFP office in consultation with the NFP teams. The health boards were amended and adapted for conformance with the Norwegian Directorate of Health’s recommendations for pregnancy and infancy, and the facilitator sheets were localised for Norwegian culture and applicability. This has been ongoing as the programme transitioned through the three phases (pregnancy, infancy and toddler) and familiarity has been gained with the tools and the facilitator sheets in each phase. In that this is a multi-year programme and has comprehensive content covering multiple domains and phases, adaptation has been a staged process. Larger-scale adaptations are discussed in separate sections of this report – see, for example, Part 4, on recruitment and inclusion of participants (pp. 7-8), and Part 5 concerning reduction in the number of participant families per nurse (page 10).

3. Evaluation methods and data

The real-time evaluation is based on qualitative (interviews) and quantitative (numerical) data. The data permit evaluation of the quality of the implementation, the recruitment process, how the programme works in practice and how it is received by families, nurses and health and welfare services. However, the evaluation has limited options for determining the effect of NFP in Norway. Nevertheless, if a positive development is identified in participants, this then offers an indication of probable effects. The review of the quantitative data from this pilot yields recommendations for any future randomised controlled trial (using a control group). A description and discussion of factors such as the strengths and weaknesses of the qualitative and quantitative data are presented in Interim Report 2 (Pedersen & Nilsen 2018, pp. 13-18).

3.1 Qualitative data

A total of 81 interviews were conducted from the start-up in 2016 to autumn 2019. See Table 3 for an overview. We used a semi-structured interview guide. The NFP teams were interviewed individually and as a group, and team supervisors were interviewed individually on several occasions. In addition, we interviewed partners and representatives of the local authorities on the respective NFP board. We interviewed 25 participants. Of these, 18 had a partner, and eight were interviewed together with their partner. Three participants were interviewed twice in order to pick up on any changes in their perceptions over the course of the pilot. Participants were recruited through the nurses, who were encouraged to recruit participants representing the diversity of the included families.

Table 3 Overview of the type of informants and the number of qualitative interviews conducted between 2016 and 2019

	2016	2017	2018	2019	Total
NFP team/Team supervisor	2	8	6	6	*20*
NFP council/Municipality/District	4	4	2	2	*12*
National NFP office	1	1	3	1	*6*
Child Welfare Service			2	2	*4*
Maternity and Child Health Care Centre			4	3	*7*
Labour and Welfare Service			1		*1*
Participants		4	9	16	*28*
Total					*81*

3.2 Quantitative data

Quantitative data were collected by the nurses at various points in time from a total of 185 included participants as of September 2019. A total of 35 participant families had completed the programme by autumn 2019, with only a small number reaching the toddler phase (13-24 months). Frequencies and analyses in this final report are thus based on data from participants who participated in the pregnancy and infancy phases (0-12 months). In addition, we looked at the number of participants who dropped out of the programme before time and reasons for participant attrition.

At the referral interview conducted by nurses of candidate participants, the nurse records data such as gestation week, inclusion and exclusion criteria for participation, the referring entity and referral status. At both the referral interview and the first home visit, a record is made of demographic data, age, partner status, ethnicity, educational attainment, employment status, wage and welfare benefits. At each home visit, the nurses record data on the visit, visit duration, date, who participated, and referral to other agencies, in addition to topics raised during the visit, the participant’s involvement and acceptance of the topics discussed. Data is also obtained from validated scales on maternal mental health, sense of mastery and loneliness, together with partner status and violence on several occasions over the course of the programme.

From the interviews of the nurses, it emerged that over the course of the pilot, they had gained more experience of and familiarity with how the forms for data collection were to be used. This indicates that the quality of the data improved on a continuum over the course of the pilot.

4. Target population clarification – recruitment, inclusion and attrition

4.1 Recruitment process

Recruitment of participants employed a two-stage selection procedure, based on the Dutch NFP programme[1]. Adaptation means that recruitment is done in the frontline, based on individual vulnerability factors. This procedure was adopted instead of recruitment based on place of residence and age, which is standard in the US and Britain, where recruitment targets teenage mothers living in deprived neighbourhoods.

Stage 1
GPs, midwives and other healthcare professionals refer potential candidates to the pilot if they meet the following criteria:

1) Recruited by gestation week 28
2) Willingness (mother interested in NFP)
3) First (planned carried-to-term) pregnancy
4) Residing within an NFP pilot site catchment area
5) Professionally informed concern about the pregnancy or imminent parenthood, based on factors such as history of violence/abuse in childhood/youth or current relationship; history of welfare service intervention in own childhood/youth; lack of supportive network/family/relationship with child's biological father and/or partner

Stage 2
Family nurses include referred expectant mothers meeting at least one of the inclusion criteria below:

1) History of violence/abuse in childhood or current relationship
2) At-risk in own childhood/youth (neglect, prior history with child welfare service)
3) Limited social support/serious conflicts between parents-to-be
4) Mental health problems
5) Not in education, employment or training, and/or low level of educational attainment

Additional eligibility factors for inclusion:

- Long-term low income and challenging financial situation
- Lone provider reliant on welfare benefits
- Use of tobacco and alcohol/drugs

Exclusion criteria:

- Planning to move out of NFP pilot area for more than 3 months
- At risk of losing custody of child/intention to give child up for adoption

The NFP teams in the two pilot sites of Oslo and Rogaland describe that they gradually gained confidence with the screening interview and inclusion criteria. In the start-up phase they were uncertain about which women were appropriate to include, and there were a number of mis-recruitments where participants were included who were too resourceful. The nurses report that over

[1] NFP in the Netherlands, VoorZorg, was designed on the basis of and in consultation with NFP's licensors since the early 2000s. In 2018 VoorZorg decided to exit from the licensing cooperation with NFP to elaborate on its national model independently. All research in the programme and development of the principal innovations were completed while the Dutch programme was still operating under licence from the NFP licensor.

the course of the pilot they have developed a sound basis for assessment and more immediate sense of candidates who will benefit, and who merit inclusion.

Differing recruitment rate

Recruitment experiences differed between the two Norwegian pilot sites. From the start-up of the pilot, the Rogaland site received a steady stream of eligible referrals, including from midwives and from the District Psychiatric Outpatient Centre (see Interim Report 2, pp. 33-34). The participants who were referred had been well informed about the programme and were motivated to enrol. Many of those referred join the programme early in their pregnancy; from no more than gestation-week 5. This means that there is plenty of time to screen for suitability and hold a start-up meeting with the participant. The start-up phase in Oslo was far more sluggish, with very few referrals. For a certain period of time, the midwives were requested to refer all first-time mothers-to-be attending a Maternity and Child Health Care Centre before week 28. As time went on, the Oslo team began to receive more eligible referrals from different entities.

Twice as many births

It would seem likely that the differences in recruitment are largely attributable to the fact that in 2016 there were just over twice as many births in the three pilot municipalities of Rogaland County (n=3012) as in the two districts of the capital, Oslo (n=1477). Of these, we estimate that approx. 40% were first-time mothers-to-be. The fact that recruitment was more rapid in Rogaland might also be due to better midwife coverage at Maternity and Child Health Care Centres in Rogaland than in Oslo. Findings from Interim Report 2 (Pedersen & Nilsen 2018) indicate that recruitment of participants to NFP requires an effective front line. The team in Oslo included a higher proportion of the number of first-time mothers-to-be in the pilot site per annum (approx. 5%) than in Rogaland (approx. 2.5%). Recruitment is detailed in Interim Report 1 (pp. 29-35) and 2 (pp. 29-41).

4.2 Referrals and enrolments

In order to evaluate the implementation, we employed NFP's core model elements (CMEs) and 'stretch' goals (fidelity or adherence to the model), as employed previously in the Scottish evaluation of NFP (Ormston et al. 2014). The fidelity 'stretch' goals are based on US research and are believed to be optimum delivery goals for maximising the success of the programme. Seamless and effective referral and enrolment are decisive in the NFP model.

Table 4 Enrolees and non-enrolees who meet the criteria at the two sites of Oslo and Rogaland and in total within the Norwegian NFP

	Oslo		*Rogaland*		*Total*	
	n	*%*	*n*	*%*	*n*	*%*
Meet criteria	92	100%	137	100%	229	100%
Enrolled	84	91%	101	74%	185	81%
Not enrolled	8	9%	36	26%	44	19%

Table 5 Referral status of non-enrolled participants in Oslo, Rogaland and in total (numbers and percentages)

Status	*Oslo*		*Rogaland*		*Total*	
	n	*%*	*n*	*%*	*n*	*%*
Meet criteria	8	24%	36	63%	44	49%
Do not meet criteria	25	76%	16	28%	41	46%
Address unknown/contact not achieved/info lacking	0	0%	5	9%	5	5%
Total	33	100%	57	100%	90	100%

Table 6 Grounds for exclusion in Oslo, Rogaland and in total (numbers and percentages)

Grounds	*Oslo*		*Rogaland*		*Total*	
	n	*%*	*n*	*%*	*n*	*%*
Meet criteria - do not wish to participate	8	24%	18	32%	26	29%
Meet criteria – programme fully subscribed, other programme/waitlist	0	0%	18	32%	18	20%
Do not meet criteria	25	76%	16	28%	41	46%
Address unknown/contact not achieved/ No data	0	0%	5	9%	5	5%
Total	33	100%	57	100%	90	100%

Over the course of the pilot period, up until autumn 2019, 275 referral interviews were conducted. Of these, a total of 83% (n=229) met the inclusion criteria. Of these 81% (n=185) were enrolled. See Tables 4, 5 and 6. This meets the NFP's fidelity 'stretch' goals for enrolling 75% of eligible clients to whom the programme is offered. The lower rate in Rogaland is attributable to the fact that the programme did not have capacity to enrol more participants even if they met the criteria. The agencies/entities who refer participants generally remained unchanged from autumn 2018 (see Interim Report 2, p. 31), and the majority of referrals are still from the midwives (55%), client self-referrals (11%) and GP (9%). See supplementary table 11-a for a list of referrers.

4.3 Who are the included families?

In this section, we outline the main characteristics of the included families, and provide an assessment of the extent to which the included families meet the inclusion criteria and the target population that was envisaged for NFP in Norway. The figures referred to here are also available in the Appendix (supplementary tables 12-b and 14-d), while the target population is discussed more comprehensively in Interim Report 2 (pp. 41-50).

Vulnerable families with complex challenges

The participant families in the Norwegian pilot are vulnerable and have complex challenges. Both the interview data and the numerical data collected during the pilot period indicate that the mothers and the families have multiple vulnerabilities. These might include families in which the mother and/or father had a troubled childhood, mental health challenges and/or troubled relations with significant others. Several families are challenged in achieving interaction with the child, attachment to it, interpreting signals and understanding the child's needs. The families may also lack emotional, social and practical support (see also Interim Report 2, pp. 36-44). While the number of vulnerability factors remained the same in Rogaland over the period, there was an increase in the number of vulnerability factors among participants in Oslo. This might indicate that the front line is now referring more suitable candidates in Oslo, and that the nurses have gained more experience in determining who belongs to the target population.

Although the vulnerability factors may offer an indication as to whether the target population was achieved, they do not measure the severity or the implications of the challenges and difficulties disclosed by the participants. However, in the interviews, the nurses state that several families have complex problems and that several participant families use other services than NFP during the pilot period (psychiatric service, psychologist, hospital-based substance dependency in pregnancy service, addiction counselling and child welfare supervision service) (see Interim Report 2, pp. 40-44 for details). This indicates that NFP in Norway is succeeding in reaching families in need of close supervision.

Inclusion in NFP in Norway is not subject to any age limit

In Norway, the average age for participating mothers is higher than in the NFP trials in other countries. The age at enrolment of Norwegian mothers-to-be ranges from age 16-42 years, with an average of age 25 in Rogaland and age 29 in Oslo. The higher age may have several implications. On the one hand, higher maternal age means that the intervention happens later in her life course when she is

more established, and there is less scope for achieving change. On the other hand, previous NFP evaluations find an effect in the most vulnerable families (Olds et al. 2007b). In the British randomised controlled trial, which recruited participants on the basis of young age, no effect was found (Robling et al. 2016).

More have a significant other

The majority of the mothers in the Norwegian pilot have a partner (80%) and 96% of them are cohabiting with the biological father. This is a divergence from the outcomes of trials in other countries, in which a higher proportion of participants are single mothers (Mejdoubi et al. 2015, Robling et al. 2016). This may be both a barrier and an enabler for the implementation of NFP. It may be enabling because the programme then has the potential to have a positive effect on both the mother and the father, which results in a more unified family focus and may be positive for the child. The fact of also attending to fathers may also increase the nurse caseload. This should be borne in mind in any further implementation of NFP in Norway. Of fathers not cohabiting with the mother, around 70% had regular contact with, and joint custody of, the child.

Education, employment and welfare benefits

Around half of the mothers are working, either full time (26%) or part time (18%). As described in Interim Report 2 (p. 48), there are differences in how the two pilot sites are grouped in terms of education, employment and welfare benefits. In Rogaland, a significantly higher proportion than in Oslo are unemployed, job-seeking and on benefits. In Oslo, a significantly higher proportion than in Rogaland are in part-time or full-time employment and have higher educational attainment. The educational and employment profile of the participants is virtually the same at the time of recruitment until autumn 2018 (see Interim Report 2, pp. 46-48). Because income variables are reported only for the mother and not for the entire household, it is difficult to tell whether the pilot is reaching low-income families. Low income may adversely impact childhood and reinforce negative social legacy, and preventing that is a key prevention goal in the Norwegian pilot.

Specifics of the goal during the pilot period

The core model elements of NFP require that: 1) Participation in the programme is voluntary; 2) Only first-time mothers are eligible; 3) Vulnerability criteria must be established; 4) 100% recruited no later than gestation-week 28; and 5) 60% to be recruited by the start of gestation-week 17. The pilot in Norway has met the first three criteria and is close to meeting the last two: of enrolled families, 45% were recruited before gestation-week 17, and a total of 96% were included before gestation-week 29. Although these rates do not meet the criterion exactly, they are an improvement on earlier phases in the pilot. This indicates that over the course of the process, goal-attainment improves (for further discussion of this, see Interim Report 2, pp. 45-46). The interview data also indicate that the improvements may also stem from the increasing maturity of the nurses’ clinical insight, increased knowledge of and acceptance of NFP among frontline services, and greater cooperation between the nurses and usual care (standard services).

4.4 Attrition

A total of 185 families were enrolled in the programme: 84 in Oslo and 101 in Rogaland (see supplementary table 13-c of the appendix for a full overview). For both sites in total, 52 of these families (28%) had dropped out of the programme by September 2019. So far, this meets the NFP stretch goals, which require an attrition rate of no more than 40%. The distribution of attrition in pregnancy (4%), in the infancy (16%) and toddler phases (8%) also meets NFP criteria (no more than 10% during pregnancy, 20% during infancy and 10% in the toddler phase). While it is positive that no more dropped out, the attrition rate may yet increase, as the pilot is still in progress. See Figure 1 for enrolment and attrition in the different phases (pregnancy, infancy and toddler phase).

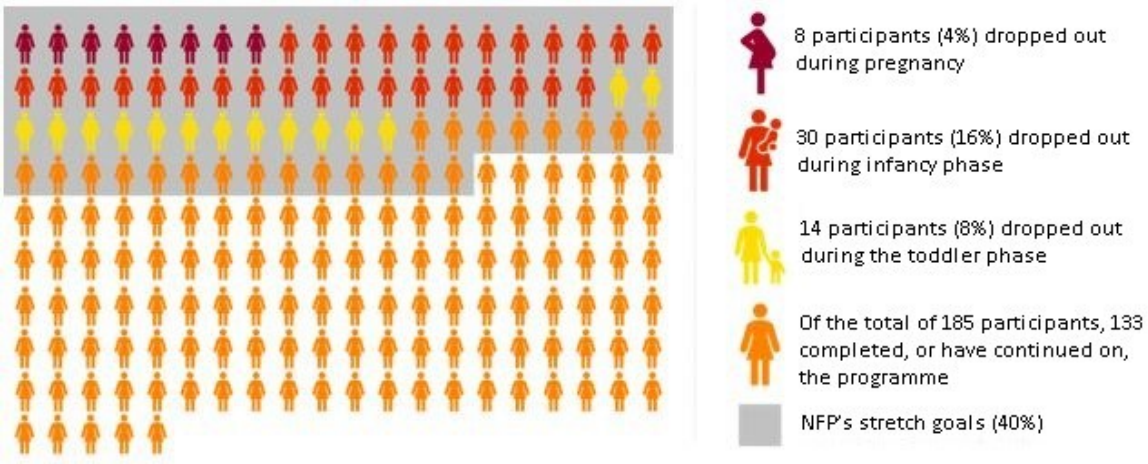

Figure 1 Attrition during pregnancy, infancy and toddler phases (n=185)

Few drop out of the programme because they are dissatisfied (1 participant during pregnancy, and 1 during infancy). During the infancy and toddler phase, a total of 8 participants dropped out of the programme due to transition to a new NFP purpose. A total of 6 participants left the programme after the nurse filed a notification of concern with the Child Welfare Service.

The inclusion criteria and the inclusion procedure employed in Norway permit recruitment of vulnerable participants, but require close cooperation between the NFP team and referring frontline**.** Over the course of the pilot, the number of referrals increased, the time of inclusion has become earlier in pregnancy and the number of vulnerability factors among participants has increased slightly. This suggests that some of the recruitment challenges described in Interim Reports 1 and 2 have been resolved.

The participant families in Norway are a more heterogeneous group in several respects (age, geography and vulnerabilities) than in other trial countries. The number of participants in the Norwegian pilot is too limited to permit their division into subgroups. If the participating families in any continuation are also heterogeneous, it would be well-advised to study any effects of the programme in such subgroups, as was done in other randomised controlled trials such as in the trial of NFP in England by Robling et al. (2016). Any continuation of NFP in Norway should focus on this from the planning phase in the interests of obtaining sufficient statistical strength for determining any effects of the programme if the decision is made to study subgroups.

5. Implementation and delivery

In this section, we describe implementation of the programme and the pilot's fidelity to the original model. We employ NFP's core model elements and stretch goals in evaluating whether implementation and delivery are compliant with the programme's requirements.

5.1 Adaptations

The number of participants per nurse has been reduced somewhat.
The number of participants attended by each nurse has been reduced, from 25 in the US to around 18 in Norway. In the Norwegian pilot, the plan was for each nurse to attend to 20 families. This number was reduced because the participants have more vulnerability factors than in other trials and because the nurses have to spend more time on travelling to and from home visits and more time on liaising with other agencies. The caseload should be taken into account in any continuation of NFP, as it is important that the number of families per nurse is sustainable.

Tools, guidelines and facilitator sheets have been adapted to the Norwegian participants and professional setting.
The interaction tools used in the US are Dance[2] and PIPE[3], of which Dance was devised specifically for NFP. The international NFP office, however, recommended that components of these tools be replaced by tools more widely used in Norway, and which, according to them, were also of a higher standard. Dance and components of PIPE were accordingly replaced by three interaction tools familiar to the national NFP office and the NFP community in Norway and which they are trained to use ((NBO[4], Marte Meo and EAS[5]). This adjustment is seen as conducive to implementation, since it allows NFP to be platformed on a known quantity, and the increased competence of the nurses in using these interaction tools is of benefit to them, and the competence-building in the interaction tools used in other parts of the Norwegian health service is to be seen as of value to both the nurses themselves and their future employers.

5.2 Home visit numbers and topics

The number of completed and cancelled sessions to date indicates that it is feasible to deliver the programme and that it appears to fit in with the participants' everyday lives. The family nurses register data on each home visit on a special form. In total, the Norwegian NFP pilot recorded 3678 scheduled home visits.[6]

[2] Dyadic Assessment of Naturalistic Caregiver-Child Experience
[3] Partners in Parenting Education
[4] Newborn Behavioral Observation
[5] Emotional Availability Scale
[6]The family nurses also register any contact occurring outside the participant's home (for example, contact over the phone), in an alternative to the home-visit form. This was outside of the mandate of the real-time evaluation.

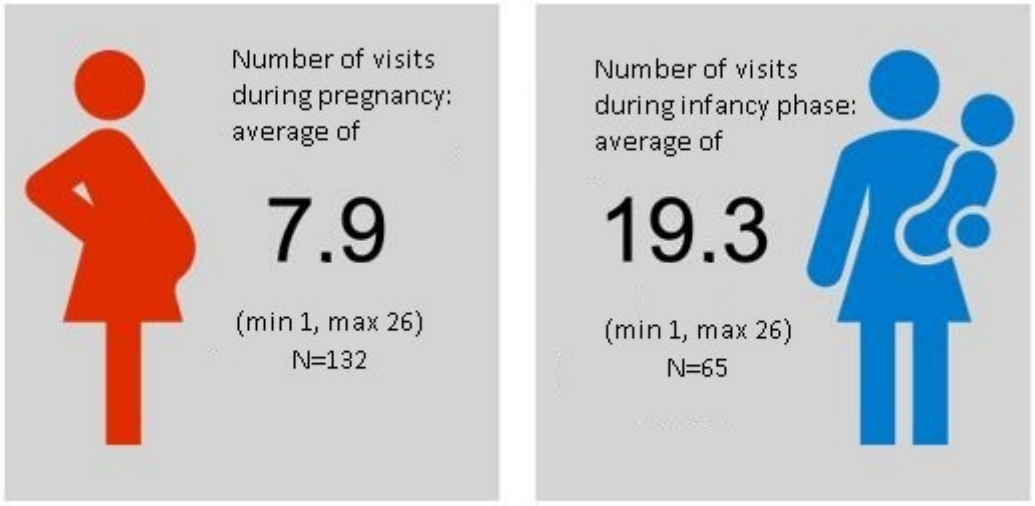

Figure 2 Number of home visits during the pregnancy and infancy phase calculated on the basis of participants who completed the entire phase.

Each family received an average of 8 home visits during pregnancy, and 19 visits during the infancy phase (see Figure 2). The vast majority (88%) of scheduled sessions were completed. We find that the number of completed home visits meets the NFP stretch goal for at least 80% of visits scheduled during pregnancy to actually be conducted, and for 65% of visits scheduled for the infancy phase to be completed. The total of 444 cancelled home visits is compliant with the programme requirements. The majority (83%) were cancelled by the participating families, and the remainder (17%) by nurses.

What is discussed during home visits?

After each session, the nurses estimate how much time was spent on five of the six programme areas[7]: personal health, social setting, life course, motherhood, and family and friends (see page 2 for details of the programme areas). The information is used for feedback to each nurse on potential areas to devote more time to during the home visits with each participant. The nurses' average time per topic fulfils the goals set for NFP (see Tables 7 and 8). For the pregnancy phase, the time spent per topic is very close to target, but somewhat more time was spent on parenting and family/friends. The two pilot sites generally display similar patterns (see supplementary tables 15-e and 16-f), but in Rogaland, slightly less time was spent on personal health during the pregnancy phase. The variation in time spent on topics during visits could be interpreted as the nurses being flexible in response to participants' needs, and that the programme is adaptable to differing needs in the pregnancy and infancy phases.

Table 7 Percentage of time spent on different topics in the home visits during the pregnancy phase (average, N=131)

	Personal health	Social setting	Life course	Motherhood	Family and friends
NFP target	35-40%	7-10%	10-15%	23-25%	10-15%
Average	29%	12%	15%	28%	16%
Min-Max	(9-65%)	(0-31%)	(1-38%)	(7-66%)	(2-32%)

Table 8 Percentage of time spent on different topics during the home visits in the infancy phase (average, N=67)

	Personal health	Social setting	Life course	Motherhood	Family and friends
NFP target	14-20	7-10	10-15	45-50	10-15
Average	17%	10%	12%	46%	16%
Min-Max	(4-33%)	(3-20%)	(0-32%)	(21-74%)	(7-24%)

[7]In line with previous NFP evaluations, time-spent is only recorded for the first five programme areas. The sixth programme area – Foster contact between the family and needed health and social services – is not measured in terms of time spent.

5.4 Use of interpreting services

Approximately 19% of participating mothers' primary language is a language other than Scandinavian, with a slightly higher percentage in Oslo (25%) than in Rogaland (14%). By autumn 2019, interpreting services had been used in a total of 78 home visits to 24 families in the pregnancy and infancy phases. In qualitative interviews, both the mother and nurse in Norway report their positive experiences of using interpreting. Findings from the qualitative interviews suggest that the close relationship between nurse and mother also includes the interpreter. This may be because the same interpreter is used consistently in care delivery. The personal suitability of the interpreter may also be a factor. This is difficult to conclude, as the total number of interpreting sessions was limited and only one family that used an interpreter was interviewed. Future trials should evaluate this more closely and make every effort to use interpreters suited to the families and who are able to follow the family throughout NFP delivery.

5.5 Nurse experiences of the programme

We followed the NFP teams and team supervisors closely over the course of the pilot in order to gain insights into their experiences of the Norwegian implementation. We conducted individual and reference group interviews and gave the nurses the option of reporting any challenges to us directly along the way. The nurses in the NFP teams possess high professional competence and long-standing experience of care delivery to vulnerable families. They are also characterised by their dedication and personal aptitude for carrying out strengths and relational-based service delivery to vulnerable clients in a home setting (see also Interim Report 1, pp. 29-30 and Interim Report 2, p. 71).

A useful tool

The nurses rate the programme as being very good in its depth and breadth of content, which has been of value to them in care delivery. The programme is regarded as a tool to support them as opposed to a manual imposing rules on care delivery. The nurses received training in NFP in three training blocks to coincide with the three phases of the programme. They also received training in tools such as PIPE, NBO and Marte Meo (interaction guidances). They rate the training in NFP and the supplementary tools as good. While they see the training courses as maintaining a high standard, they feel that limited time was allocated for self-study after the course. Learning to use the programme is achieved through practice and experience, and has been a time-consuming process because the programme is rich in content and demanding in itself. For the new nurses who joined the programme during 2017 and 2018, the skills amassed by their colleagues have been helpful to draw on, while at the same time, the pilot became more established. The majority of the nurses report great benefit from peer support and weekly supervision form the team supervisor in terms of both competence-building and optimum care delivery. They also report that the monthly team supervision from a psychologist was helpful.

"I don't lose focus. We come into the picture at a vulnerable time in pregnancy, when they are vulnerable. And then we're with them all the way. So, regardless of whether this woman is under social services, a crisis centre or child welfare service or their GP, or wherever, then we're the ones who provide continuity of care. We're following them". NFP nurse

Cooperation counts

Cooperation and coordination are perceived by the nurses as an important task in relation to families with complex needs, and those needing help to find their way around the different services. Right from the recruitment process, the teams worked systematically to disseminate information about the programme among everyone in the frontline who is in contact with first-time mothers-to-be. This was a major task that took longer than scheduled, although recruitment is now happening at a suitable pace and the referrals are appropriate. The nurses have also established working relations with the Maternity and Child Health Care Centres and Child Welfare Service because the families often use multiple services. The nurses' flexibility and attentiveness to the participants' needs and resources mean that the cooperative relationships they establish function smoothly.

Challenges led to closer cooperation

Some challenges will inevitably arise, however. The fact that the health and welfare services/agencies do not share patient/client data makes it difficult to share information about care delivery to the families. However, this has been overcome by exchanging some information between the health and welfare workers delivering services, and clarification of division of responsibilities in serving the family. The nurses appear to have achieved better balance in their work life and report a greater sense of mastery over the course of the pilot.

Heavy workload

At start-up in 2016 and 2017, the workload in the programme was heavy. The team supervisors were working to disseminate knowledge of NFP and recruiting participants, in addition to which, the nurses were to undergo training, establish partnering relations with the Maternity and Child Health Care Centres and Child Welfare Service, and delivering the programme to enrolees. As the programme has become more widely known, the recruitment and liaison tasks have become simpler. Some nurses reported that in the first year, the frequency of home visiting was too high, so that they developed an overly close relationship with the clients. As they gained more experience and more participants, it became easier for them to find the right balance in the relationship, number of visits and more accurate assessment of the participants' needs.

"It helps a bit to have a have a car, because then I can eat in the car and sit there and do some office work in between. But it does mean I can only spend an hour with each [family]. But I've become quite good at getting that right, for some of them it's fine, and an hour is enough. Then all of sudden it'll be: 'could you just help me with this or that?', right at the end. Three sessions per day kind of don't work out, because then I have stay late in the afternoon writing up reports".
NFP nurse

The nurses still have a hectic work life. Much time is spent on travelling to and from home visits, and for each visit, there is preparation in advance and reports to be written up afterwards. Liaising with other agencies is also a major component of care delivery. Many of the participants have complex problems involving multiple agencies. The nurses may, for instance, have to spend time attending meetings with the Labour and Welfare Service and the local authority, which adds to the caseload in the Norwegian trial.

"I have one participant with severe mental health issues. So there are whole days to be spent on that because of the things to sort out in the way of psychiatrists, assessing the help needed, standing by her all the way until I know the situation is sorted. It gets very intense – meaning you have to sign off on all the other appointments you set up. There's an unpredictability to the work in that we have the possibility of being so flexible. But to succeed in this, you have to stay put when the house comes tumbling down".
NFP nurse

Some of the strengths of NFP appear to be that the programme is easy to adapt to different families' needs, and that it embraces the diversity of participants' needs. The nurses are, for example, flexible towards the participants when it comes to making and cancelling appointments, and can also be available to take calls or messages in the evenings or at weekends. This is a strength for the family and the nurse-mother relationship, and raises the quality of implementation in that the visiting sessions are more likely to be completed. Meanwhile this can pose a problem for the nurse caseload. However, the nurses emphasise that is not the *care delivery* to the participants that is challenging, but the paperwork and coordination of interagency cooperation surrounding the family.

The costs of nurses leaving the NFP programme

The nurses’ relationship with the families means that they are difficult to replace if they leave. The costs of nurses going on sick leave or leaving will be high owing to the time it takes to build up the needed competence, and in that it will also result in attrition among the families. The workload in the start-up phase has been high, even for highly competent and dedicated staff. The nurses describe a working day of many stress factors and great responsibility. Over the course of the pilot, half of the nurses opted to leave. It was beyond the remit of this final report to investigate the causes of this, but the number suggests that ensuring a sustainable workload will be essential for any continuation of NFP. Future research should also address the factors for nurse retention and attrition in the programme.

Why is NFP more time-consuming in Norway?

Certain elements in the pilot in Norway are contributory to a higher workload. One example of this is that all the participants have multiple vulnerabilities. This may cause the nurse caseload in Norway to be heavier than in countries where the cohort is delimited by an upper age limit for expectant mothers. A complex risk factor/vulnerability picture also entails time-consuming cooperation and coordination of inter-agency services around the participants which adds to the workload.

Unique position to help families

All in all, the nurses report that they are put in a unique position to help families in that a strong bond and alliance is formed over the period of care delivery. The nurse forms a closer relationship with the families than other services, gaining solid insights into their strengths and challenges. This allows them to address root causes and strengths in dealing with various challenges in the families’ lives over time. The nurses rate the programme as being of a high standard, and state that they were well trained. The programme is comprehensive, and it has taken time to gain familiarity with, and practical experience of, all of its components.

6. Cooperation with other services – organisation, need and acceptance

Cooperation with other entities, nationally, locally and at the family level is an essential component of the NFP programme. In recognition of this, over the pilot period, we interviewed representatives of the municipalities and districts that served on the NFP boards, together with staff from the Child Welfare Service, the Maternity and Child Health Care Centres and the Labour and Welfare Service in order to include their impressions of interacting with NFP.

6.1 Parallel or overlapping service use

Both interview data with the nurses and participants together with quantitative data gathered from the home visits indicate that the participating families make extensive use of services that might have overlapped with NFP. In a total of 80 cases, either the mother or the infant received mental health services[8], and in 266 cases, they used other, possibly overlapping, services[9]. The fact that the programme is not seen as overlapping with other services is thus an indication that it works in the setting. Use of (other) services suggests that the target population of families have a need to avail themselves of multiple services concurrently.

6.2 Municipal and district experiences of NFP

A significant limitation of the Norwegian NFP pilot is that no testing has been undertaken concerning the challenges, benefits or drawbacks had the programme been organised at local authority level. Originally, the plan was for the nurses to be employed by the respective local authority. Local authority routines for advertising vacancies and recruitment were time-consuming and it was therefore necessary for the nurses to be employed at regional, rather than local level, under RBUP (regional centre for child and adolescent mental health and child welfare) in order to get the pilot launched within the designated timeframe. The teams were organised as an independent unit outside of the Maternity and Child Health Care Centres. Those municipalities and districts which applied to join the NFP pilot had an expectation that the NFP programme would boost their Maternity and Child Health Care Centre service with expertise and additional staffing. This expectation could not be fulfilled. The benefits and drawbacks of local authority organisation have been described and discussed at length in a SINTEF (independent research organisation) report on future organisation of NFP (Lippestad et al. 2018, pp. 35-38).

Discussions concerning use of licensed programmes

Perceptions differ concerning the use of manual and licence-based programmes in the participating local authorities. For the majority, the strict requirements and limitations on implementation of the programme license represent crucial quality assurance, and thereby also crucial competence building. For others, the licensing requirements make the programme overly strict and inflexible in that it is not permissible, for example, to include participants after gestation-week 28, or women expecting their second child. These differing perceptions of the programme tie in with extended discussions on whether a general boost to local authority service provision is desirable or whether needs-assessed, targeted interventions aimed at specific groups should be the aim.

The majority of municipalities/districts regard NFP as having been a valuable service with high professional quality, which they would like to continue. The local authorities find that NFP offers a type of service that complements that provided by the Maternity and Child Health Care Centre and Child Welfare Service. By using NFP, the local authorities are now identifying a vulnerable group of first-time mothers-to-be, and have a service to refer them to. Meanwhile, local authority financing of a continuation of NFP would be at the expense of other services such as appointments at the Maternity

[8]These include support groups, mental health services and crisis centres but not district psychiatric service, GP and the like.
[9]These include antenatal classes, infant development, family resource programmes, multicultural support services, parenting programmes, public services for children from the Child Welfare Service, counselling on smoking cessation, alcohol and drug addiction, problem gambling, sheltered housing, life-skills and breastfeeding assistance.

and Child Health Care Centre and staffing within the Child Welfare Service. The local authorities will require national budget appropriations to be able to continue NFP.

Should local NFP boards be continued?
In line with the programme requirements, NFP boards were appointed, composed of representatives of different services in the districts/municipalities. The boards helped to facilitate cooperation around NFP, across the municipality/district, services and professions. The NFP board setup was important in the beginning because it served to diffuse knowledge of NFP within the services, and was a resource in recruiting participants. Now that NFP has become more widely known and established, the function served by the NFP board is no longer evident. In a continuation of NFP within the local authority service, it might be expedient for NFP to be incorporated in the local authority's existing management, and for the board to be continued as a partnering forum for neighbouring local authorities sharing an NFP team.

6.3 Child Welfare Service experiences of NFP

Cooperation with the Child Welfare Service appears to have developed in a positive direction over the course of the pilot period. The NFP teams receive guidance from a Child Welfare Service adviser on a monthly basis where they confer on cases and address concerns and opinions. They estimate that they liaise with the Child Welfare Service concerning 30-40% of the families. Where the NFP team is involved in the families, this relieves the Child Welfare Service, and in some cases, the nurse can provide sufficient care delivery to a family. The cooperation might also mean that they undertake a joint visit to the family, or coordinate care delivery so that the NFP assumes some of the tasks that the Child Welfare Service might otherwise have undertaken. If the Child Welfare Service finds it necessary to undertake additional interventions, the nurse has extensive insight into the family's needs, and can facilitate targeted interventions more rapidly. The interviews with the participants indicate that a good relationship with the nurse is a key factor in the families' willingness to cooperate with the Child Welfare Service and in transfer of trust in the nurse to the Child Welfare Service. In this way the Child Welfare Service can gain a 'stepping stone' for engaging in more positive relations with the families they attend to.

Not without challenges
In spite of generally positive experiences and constructive interaction today, challenges have arisen along the way. The Child Welfare Service in Oslo and Rogaland, for example, report that it took time to gain an understanding of what NFP consists of: the contents of the programme, how the nurses work, how responsibilities are shared, and how best to liaise with NFP. This is presumably due to the breadth and depth of the content, and the fact that it took time for the NFP teams to gain sufficient oversight and expertise in the various components themselves in order to be able to share the information.

> As a system we manage to adapt and facilitate to ensure that it's not too much of the same thing. That does make demands on us, but I think that the coordinating meetings and case conferences allow us to achieve that. We have the same target population, so it's important to know how we complement each other, that as a system we think as a team.
> – *Child Welfare Service, Rogaland*

At the start of the project, the Child Welfare Service was concerned about whether the nurses would be exercising their duty to notify the Child Welfare Service. This concern proved groundless, as the Child Welfare Service reports that the nurses take their duty to notify seriously and duly notify the Child Welfare Service of families where there is a risk of neglect, even if means that the families no longer wish to continue in the programme.

The Child Welfare Service reports that the nurses offer practical and emotional support, with a clear focus on the participant's resources and a therapeutic relationship between the nurse and client. Their experience was also that the nurses gained more insight over the course of the pilot into how the Child

Welfare Service operates, and that this was important for the cooperation. The Child Welfare Service sees the NFP team as readily available and collaborative, and as having a good overview of the situation in the families.

Likely to be instrumental in preventing care proceedings
The NFP team in Oslo believe they may have been instrumental in preventing a child being taken into care in 6-12 families. Both of the NFP teams find it difficult to estimate the number of care proceedings that have been prevented, or to point to specific cases, both because prevention is difficult to measure and because the NFP teams work closely with other agencies. There will always be multiple factors enabling families to be capable of achieving the needed care-giving of their children. The NFP teams' part in facilitating continuity in attending to at-risk families by coordinating interventions, through flexibility about stepping up the number of visits, the frequency of care delivery, and the fact that they are involved from pregnancy are likely to be instrumental in preventing children being taken into care. Interim Report 2 (pp. 26-27) detailed two cases in which NFP was instrumental in preventing care proceedings. In these, early and concentrated intervention was decisive.

6.4 Maternity and Child Health Care Centres' experiences of NFP

The Maternity and Child Health Care Centres are generally positive about NFP and appreciate the fact that the service has no overlap with usual care delivery to families. The Centres regard NFP as maintaining a high professional standard. The Centres see NFP as a service which they themselves are unable to provide in terms of the scale of attendance, time to build up a therapeutic relationship, and the keen focus on client strengths. However, NFP is not seen as relieving the Maternity and Child Health Care Centres of their duties in that clients continue to receive care-as-usual from the local Centre.

A service aiding identification of vulnerable families
NFP may enable other services to identify families with additional needs. The Maternity and Child Health Care Centres see it as easier to identify vulnerable families now that they have a service for them in addition to a degree of extra attendance from the Centres. Having a service tailored to this group makes it more focal, and facilitates early intervention to ensure the mother's physical and mental health, caregiving to the infant and prevent future neglect.

Constantly improving cooperation
NFP team cooperation with the Maternity and Child Health Care Centres improved over the course of the pilot period. Over the course of the pilot, the Maternity and Child Health Care Centres have been an important arena for recruitment to the programme. In the Oslo pilot, there were challenges at the start because the midwives were short of capacity generally. This situation has gradually improved. The NFP team supervisors report that referrals from the Maternity and Child Health Care Centres are eligible, which is an indication that the midwives at the centres are well-informed about the inclusion criteria. At the start of the pilot, there were challenges in division of responsibilities surrounding families, but any further coordination problems of that nature were singled out and resolved over the course of the pilot. Another challenge concerned the fact that NFP and the local authority services do not have access to each other's summary care record records, which posed problems for exchange of information and coordination in care delivery. Although many of these challenges were resolved over the course of the pilot, any continuation should examine the scope for improving coordination and information sharing.

Call for more knowledge sharing
While both the Maternity and Child Health Care Centres and the Child Welfare Service assert that they have established productive cooperation with NFP, their impression is that the NFP team has a great deal of insight that would be extremely useful to share with staff at the Maternity and Child Health Care Centre/Child Welfare Service. There is potential for diffusing knowledge from the programme so that it can also benefit families who will not be joining the programme.

7. Potential effect for families in Norway

7.1 Maternal sense of mastery and mental health

From pregnancy until 12 months postpartum, the nurses scored mothers on mental health issues, meaning symptoms of anxiety and depression, and sense of mastery.

Negligible change in sense of mastery

We find no substantial change in sense of mastery from pregnancy to 12 months postpartum in either Oslo, Rogaland or in total for the entire cohort. See Figure 2 for the mothers' average score for sense of mastery at home visits in early pregnancy (IP), 6 months (6M) and 12 months postpartum (12M). Few mothers were scored for each of these phases, and we find few participants in the group with very low sense of mastery, meaning that the findings must be interpreted with caution. It may be speculated whether it is difficult to measure changes in general sense of mastery, and that a very substantial improvement is required in order to detect such changes. It is possible, for example, that a score for mastery of parenting (or other specific life factors) would have been better able to detect positive change. It may also be the case that sense of mastery is not achieved until later, when the mothers will tend to have started working and the children are older.

Sense of mastery

Sense of mastery is measured by means of the seven-item Pearlin Self-Mastery Scale (Pearlin & Schoolers, 1978). The participants are asked how far they agree or disagree with statements such as "I can do just about anything I really set my mind to" on a scale of 1 "Strongly disagree" to 4 "Strongly agree". Higher scores indicate a higher level of self-mastery, while a score of less than 20 is regarded as low self-mastery.

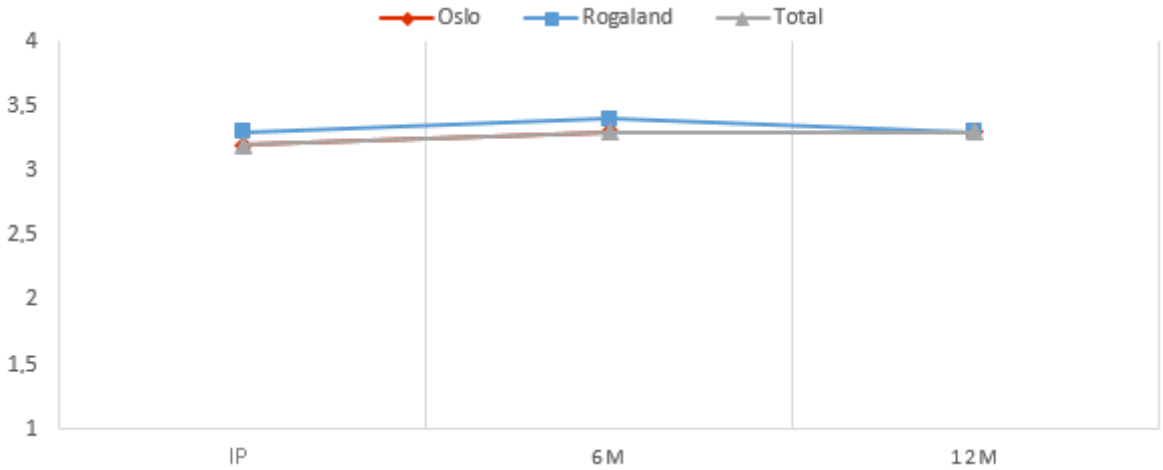

Figure 3 Maternal sense of mastery during pregnancy at 6 months and 12 months post-partum (n=24)

Decrease in symptoms of anxiety and depression

Both anxiety and depression symptoms decrease over this period, with the two pilot sites showing similar patterns. See Figure 3-4 for the mothers' average score for depression and anxiety symptoms at home visits in early pregnancy (IP), gestation-week 36 (G36), gestation-week 8 (8W) and 12 months postpartum (12M). Few of the mothers responded in all of these phases, and we find few participants in the group with severe anxiety or depression. However, this is a significant improvement[10]. If the programme is continued in Norway, it will be important to compare mothers in the programme with a control group in order to test whether the programme makes a significant contribution to reducing mental health problems compared with a standard service.

[10]The changes were tested for significance in simple regression models and were found to be statistically significant $p<0.5$). A statistically significant change means that we can say with great certainty that the change is not due to random factors in the cohorts. However, this does not necessarily mean that the changes are in any way substantial.

Anxiety symptoms

Symptoms of anxiety are scored using "The Generalized Anxiety Disorder 7-item scale" (GAD-7) (Kroenke et al., 2007). The participants were asked how often they had been bothered by seven different symptoms over the last two weeks, with four response categories from 0-3 ("Not at all sure", "Several days", "Over half the days" and "Nearly every day"). A high score indicates a high level of anxiety symptoms.

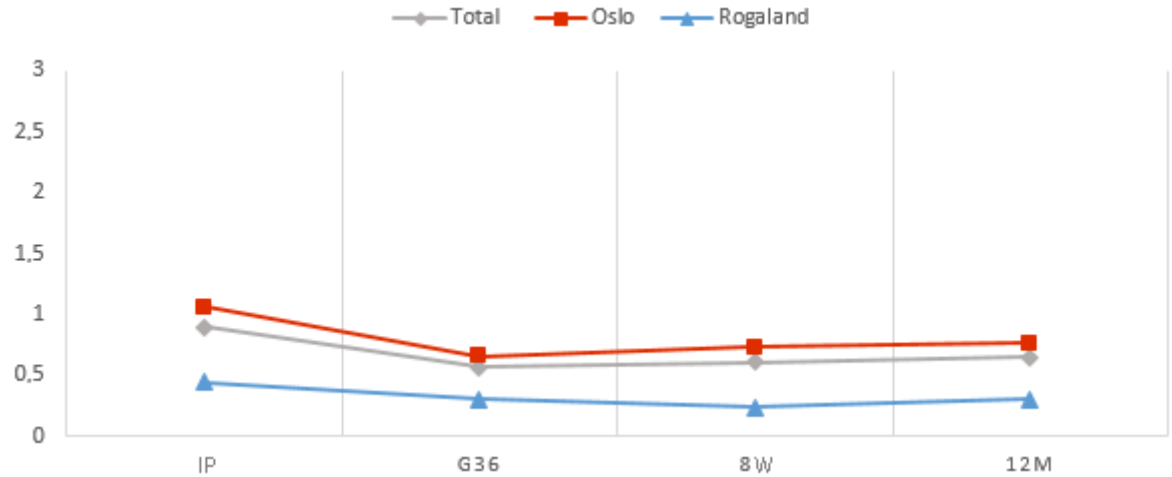

Figure 4 Maternal anxiety symptoms during pregnancy, at 6 months postpartum and at 12 months postpartum (n=24)

Depression symptoms

Depression symptoms are measured using "The Patient Health Questionnaire" (PHQ-9) (Kroenke et al., 2001). The participants are asked how many times they have been bothered by nine different symptoms in the past two weeks, with four response categories each scored with 0 to 3 points ("Not at all", "Several days", More than half of the days" and "Nearly every day"). A high score indicates a higher level of depression symptoms.

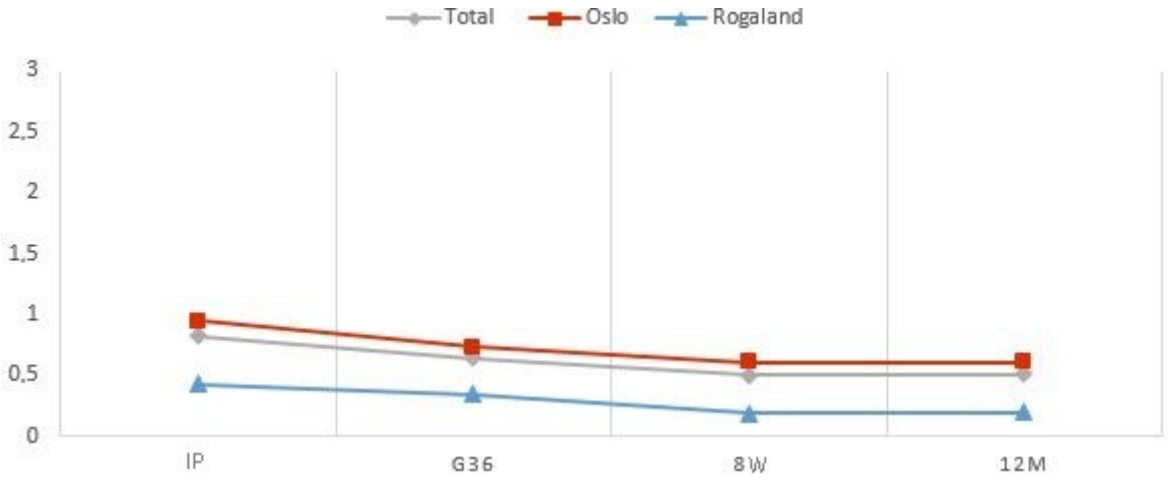

Figure 5 Maternal depression symptoms during pregnancy, at 6 months and at 12 months postpartum (n=24)

7.2 Pregnancy outcomes and prenatal health

The proportion (5%) born before the end of gestation week 37 (defined as premature) is at a slightly lower level than the national average (7.5%) (Norwegian Health Informatics, 2019). The proportion with low birthweight (<2500 g) is higher in the participant families (8%) than the national average (4%) (Norwegian Institute of Public Health, 2017). The total number of infants admitted to a neonatal unit or neonatal intensive care unit is 24 (of a total of 132 pregnancies carried to term), but owing to the lack of a control group, it is difficult to determine whether this is higher or lower than normal. Earlier studies on breastfeeding revealed that the proportion of exclusively breastfed infants in the maternity period averages 80-94% (Lande & Helleve, 2014). The proportion of exclusively breastfed infants within the NFP cohort is substantially lower than this. Approximately half (57%) exclusively breastfed their baby

for the first few weeks postpartum, and around one in seven (12%) mothers breastfeed exclusively when it is 6 months old. Many mothers indicate that they used infant formula to supplement breastmilk in the first few days in hospital or for a night-time bottle-feed. At 6 months, 94% had breastfed their baby or bottle-fed their baby breastmilk, and around half (46%) part-breastfeed their baby. To be able to assess whether NFP has a positive effect on breastfeeding, future trials should study the figures for exclusive and partial breastfeeding beyond the infancy phase compared with a control group.

See supplementary table 18-h for pregnancy outcomes at the two pilot sites and in total. It is difficult to draw conclusions, since we only have quantitative data from 64 families and no control group. The incidence shown in this table may change therefore once more enrolees have completed the programme.

7.3 Commitment, understanding and acceptance among the participants

The nurses score maternal and paternal commitment, understanding and acceptance on a scale of 1 to 5 at each home visit. We looked at average values over the course of the pregnancy and infancy phases (see Tables 9-10). Overall, both mothers and fathers score above middling (4) to high (5) in commitment, understanding and acceptance. Only a very small number score less than middling in these estimates. The two pilot sites show similar trends (see supplementary table 17-g). This indicates generally positive perception of the home visiting sessions, and that the programme is well received by families in Norway.

This also indicates that fathers who opt to participate are committed to, accept and understand NFP. Beyond the pregnancy and infancy phases, increasingly few fathers participate in home visit sessions. They participate at the start, but not after session 11. This indicates that the fathers, although positive towards the programme do not see the programme as aimed at them (Ferguson & Gates 2015), or that they are prevented from participating in home visits due to work. These figures are based on those who participated in the home visit so far, and any continuation should also attend to the fathers who opt out of the participation in home visits.

*Table 9 mothers' commitment, understanding and acceptance at the sessions in pregnancy and infancy phases**

	N	Commitment Avg (max-min)	Understanding Avg (max-min)	Acceptance Avg (max-min)
Pregnancy				
Sessions 1-10	132	4.5 (2.33-5)	4.4 (2.5-5)	4.6 (2.5-5)
Sessions 11-28	36	4.5 (2-5)	4.3 (2-5)	4.4 (2-5)
Infancy phase				
Sessions 1-10	65	4.6 (3.1-5)	4.4 (2.9-5)	4.5 (3.4-5)
Sessions 11-20	65	4.6 (3.4-5)	4.4 (3.4-5)	4.6 (3.4-5)
Sessions 20-32	39	4.6 (3.3-5)	4.4 (3.3-5)	4.6 (3.4-5)

** Scored as 1 "Low", 2 "Below middling", 3 "Middling", 4 "Above middling", and 5 "High".*

*Table 10 fathers' commitment, understanding and acceptance at the sessions in pregnancy and infancy phases**

	N	Commitment Avg (max-min)	Understanding Avg (max-min)	Acceptance Avg (max-min)
Pregnancy				
Sessions 1-10	74	4.3 (1-5)	4.3 (1-5)	4.5 (1-5)
Sessions 11-28	12	4.3 (3-5)	4 (3-5)	4.5 (3.7-5)
Infancy phase				
Sessions 1-10	46	4.3 (2-5)	4.3 (2-5)	4.3 (2-5)
Sessions 11-20	41	4.3 (2-5)	4.2 (2-5)	4.3 (2-5)
Sessions 20-32	16	4.3 (2-5)	4.4 (1.7-5)	4.4 (2.7-5)

** Scored as 1 "Low", 2 "Below middling", 3 "Middling", 4 "Above middling", and 5 "High".*

7.4 Participants' experiences of the programme

We interviewed 25 families with differing parental age, background and challenges. In this report, we highlight aspects that were consistent in the families we interviewed. We find that the participants report their experience of participating in the programme as positive, but that there is some variation in the value of NFP care delivery among the participants. For some, it has provided support in a challenging period in that they have gained helpful knowledge about children and interaction, enjoyable visits and effective support. For others, it was crucial assistance in a difficult phase of life, where the relationship with the nurse was significant for their mental health and well-being and care-giving to their child.

The home visiting model gives the participants the sense that the programme is adjusted to their schedule. The content of the programme matches their needs and wishes. These positives have caused few to consider leaving the programme because it is aligned with their needs and is easy to fit into their lives. Some have been unsure about how to make time for visits when they return to work after parental leave and are no longer at home during daytime hours. The majority reckon that they will want to make time for the visits regardless of work commitments.

"I was really scared of making the same mistakes as my family... I really wanted to break that vicious circle. The thing I appreciated was the sense that I was being taken good care of, that it's an extension of the health service, which has just been preventive and supportive. And I wouldn't have been as good a mum or as healthy if it hadn't for the Nurse-Family Partnership.
Participant, NFP

All of the participants highlight the relationship with the nurse as being important in giving them peace of mind in a vulnerable phase of life. The participants tend to describe "their" nurse as being unique, with a special ability to see them and their baby. The nurse is patient, reassuring and shows understanding of their situation in life. The nurses are an important source of knowledge about childhood development and the child's needs, and give the participants sound care-giving strategies. Although the nurse is knowledgeable, she is not patronising, and her advice can be trusted. Participants who had to switch to another nurse during the programme felt that they were well attended to by the new nurse, but that the unique relationship they had with the first nurse was irreplaceable.

Lack of supportive networks

The families we interviewed have different degrees of vulnerability, but a number of them lack personal networks and social support. This makes the relationship with the nurse particularly valuable. Many of them have had a difficult childhood with a lack of parental modelling, and see the nurse as filling the role that a parent or friend would have had in supporting, advising and assisting them in parenthood and daily life.

The support from the nurse covers the majority of areas in the participants’ lives. She helps them to gain parenting skills, spots and understands their child’s needs and teaches them ways of ensuring their child’s healthy development. She helps the participants with their relationship as a couple and mediates conflicts in the relationship that may be harmful to the parents and child. She counsels the participants in their relationships with family and friends and in availing herself of the support in these relationships in her caregiving. The nurse helps the participant to focus and plan on personal finances, income and housing. This is both in the short term, such as securing a sound home for when the baby comes and more long term as regards work and education. The nurse also helps the participants with physical and mental health challenges, by being someone who cares, listens and counsels the family on how to receive needed healthcare.

“The way we have this contact with [nurse]...She’s amazing. She’s more like a kindly nurse than a municipal employee. [Nurse] has reassured me so much about the Child Welfare Service too, so in that too, she’s helped me along. It’s the first time I’ve had anything positive to say about the Child Welfare Service. And that’s mostly thanks to NFP, who actually showed the way, that they can help us through this”. Participant, NFP

Trust builds trust

Trust in the nurse is important in other services such as in the Child Welfare Service, the Labour and Welfare Service and the Maternity and Child Health Care Centre. Several participants say that by having a trusting relationship with the nurse, it has been easier to consult and receive help from the Child Welfare Service, Maternity and Child Health Care Centre, a psychologist or the Labour and Welfare Service. The participants do not feel that NFP overlaps with other services. Although they learn about infant development at the Maternity and Child Health Care Centre, the families see the knowledge they gain from the NFP nurse as being far more detailed and comprehensive, and tailored to them as a family. Those families who also receive support from the Child Welfare Service, see NFP as supportive and reassuring, while the Child Welfare Service is seen more as having a monitoring function. The close relationship with the nurse and the high level of trust also means that NFP is unlike any other service the families receive. The families participate both as individuals and as couples. While the mothers are the ones formally enrolled in the programme, the service can also include the fathers. Some women who have a partner receive home visits without their partner being present. This may be because the partner is at work or is disinterested in the nurse’s visits. The mother may also feel that it is “her” nurse, and prefer the father to be absent. In other families, the couple participate, and the visits are scheduled to allow the father to be present. In some families, the father is the most vulnerable parent, and the couple have been included on the basis of both the mother’s and the father’s challenges. In those cases, the father duly receives the most support and help from the nurse. Some fathers find it strange that they are not included in the data collection and the “scoring” in the programme in line with the mother, for example, videoing and scoring interaction with baby, even though the mother and father are equal caregivers. At the same time, the fathers see the nurse as including them in a good way in other parts of care delivery.

Only a few participants were approaching the end of the programme at the time of the interview. Some of those who lack social support and personal networks say that they would have difficulty coping without the nurse. The majority feel it will be nice to sign off and that they will be over the most challenging phase once their child is older than two. They also say that they have learned a lot from taking part in the programme, which will help them going forward. This suggests that the gradual tapering off of the visits means that the end is not seen as abrupt.

“[NFP] has given me confidence because of all the time that has passed. Both the fact of being assigned someone you trust and can talk to. Because it takes time to build trust. I certainly can’t imagine what it would have been like without her. Because it’s about sorting things out...And the fact that I have “bonded” with [child], that [child] is so content...Well, [child] might not have been like that if I’d been full of anxiety all the time and not had any help and not been in a good way”. Participant, NFP

Capable of changing lives

Based on the families’ experiences, we find that NFP has the potential to influence and change the families’ lives. Both the interviews with the participants themselves and the nurses’ reporting on commitment, understanding and acceptance suggest that this is a programme that is well received by the participants themselves, which is important in implementing a programme in a new context.

The pilot appears to succeed in providing support in the six main NFP areas: Parental personal health, home environment, life situation, parenting, family and friends, and health and social services. The programme also seems feasible to adapt to participants with different needs for care delivery. The participants demonstrate great acceptance of the programme, with the relationship to the nurse being focal. The frequency of the home visits and the high professional standard of care delivery are also key factors in the participants’ acceptance of the programme.

8. Feasibility, suitability and model fidelity

Fixed but flexed
The findings indicate that NFP has been largely implemented as planned in Norway, and that adaptations with respect to recruitment, target population and interaction resources appear to be successful. The fact that NFP is evidence-based, with criteria and mandatory guidelines, but at the same time sufficiently flexible to allow it to be adapted at multiple levels (guidelines, individual, nurses and system) promotes implementation, acceptance and its perceived benefits. The programme’s many mandatory criteria, tools and guidelines were seen as challenges at the start of the pilot in terms of both the nurses’ caseload and the discrepancies with Norwegian guidelines. Subsequently in the process, these were seen as strengths, and practising the programme became easier as the nurses gained familiarity with the flexibility of NFP.

Compliance with the majority of programme requirements
The implementation in Norway has largely been in line with the programme criteria: 1) Participation in the programme is voluntary; 2) Only first-time mothers are eligible; 3) Sufficient number of vulnerability criteria among included participants; 4) 100% recruited no later than gestation-week 28; and 5) 60% to be recruited by the start of gestation-week 17. The pilot has largely succeeded in meeting the first three criteria. The pilot is also close to meeting programme criteria 4, with 96% recruited by week 28, and programme criteria 5 for which the number included before week 17 has increased from 35% in 2018 to 45% in 2019. The nurses are conducting a sufficient number of home visits in line with the programme criteria and cover the topics within the six programme areas.

Recruitment continually improving
The two-stage recruitment model appears to work well in Norway. The programme had challenges with recruitment during the start-up phase. There were several reasons for this: the birth rate in the pilot site was too low, and it took time to diffuse knowledge of the programme within the frontline that refers participants. Over the course of the pilot, the programme has become known within the services and recruitment is now happening at an adequate rate.

Identifies and serves vulnerable families
There is high acceptance and commitment among the participants. The programme appears to be well-suited to identifying and serving the target population ‘vulnerable families’. NFP is capable of being adapted to differing needs and can therefore embrace many different issues among the participants. The programme design and the format of home visiting is conducive to programme flexibility.

Relationship with other services is decisive
For implementation to be successful, the relationship between and other services is decisive. The pilot has succeeded in embedding the programme in adjacent services, forming working relations and diffusing information about the programme. Cooperation was challenging at the start because the programme is complex and has been time-consuming to gain familiarity with and insight into for both the services and the NFP teams. Working closely with key individuals in the services and involving them in the NFP board has been a driver for the implementation being so successful.

9. Indication of goal attainment and benefit in the Nordic context

Strong relationships and high professional quality result in high goal attainment
The programme has a good chance of attaining the goals of preventing neglect and improving child nurture and developmental conditions through early intervention. The programme is particularly successful in fostering constructive and therapeutic relationships between nurses and families. These relationships constitute one of the most effective mechanisms in the programme, and are crucial enablers for delivery of the other elements.

The experiences of the participants and the nurses indicate that many first-time mothers-to-be need extra support in a vulnerable phase of life, and that NFP is an effective means of delivering that support. The benefits of NFP arise at several levels. NFP boosts the family’s emotional environment and mental health. It boosts parental caregiving skills and attachment to the child. It helps the families with practical challenges involving housing, income security, job-seeking and educational plans. The nurse helps them to seek needed help from other sources such as mental healthcare, extended preschool, and supportive networks of family and friends. In the pilot it was discovered that families with their own home, employment and education may also have challenges that NFP can assist with. There is great conviction among the nurses that NFP has had a great effect on the quality of life of the participants, and that they have benefited from being included in the programme. The health and welfare system serving the families also states that the programme appears to have been highly beneficial.

The programme appears to have three mechanisms of effect:

1) A close relationship and therapeutic alliance between the nurse and the family.
2) Systematic and professional support in the programme materials.
3) Organisation in teams alongside ordinary services, but designed for cooperation.

While the participants’ perceptions focus on the relationship, the nurses point to the need for structuring and support. For adjacent services, it is important that the programme is of a high professional standard and able to cooperate.

Different to other services
NFP offers the participant a therapeutic relationship to the nurse and home visits over several years, and is distinct from other local authority services in both format and scale. Among enrolees, the majority state that it has been very important for them and their child to have received this follow-up. The nurse helps them with a wide variety of challenges linked to the six programme areas. They are helped to make contact with other parts of the service apparatus in order to gain more sources of support. For parents with challenges, the programme provides great benefit in that it builds parenting skills. In this way, early intervention in the form of NFP can prevent problems from worsening. The resource and strength-building focus of the programme helps parents to build their parenting skills and helps the families to identify their own potential and possibilities.

It should be mentioned that municipal healthcare in Norway is more comprehensive, lower threshold and of a higher standard than in other countries that have implemented NFP. Despite this, NFP does not overlap with other services, in that it offers a type of relationship-based care delivery to a vulnerable target population that is difficult to reach by means of other interventions. The perceptions and reactions of the services concerning the use of NFP indicate that it might be a crucial supplement to local authority welfare services in that it assists a target population that was previously underserved. Early intervention enables the impacts of care delivery to be extensive. In this sense, the benefit can scarcely be rated in terms of the extent to which it relieves other services, but instead, as an additional service to a vulnerable group.

Cost-benefit in the Nordic context
One distinct goal of NFP has been to delay and/or reduce the number of children taken into care. This would ensure that the programme is not an added cost to the services, yet without it being a cost-

saver as such. A report from Oslo Economics (2018) indicates that NFP has the potential to be socioeconomically viable in the short and the long term if it is capable of delaying or preventing care proceedings. This is based on the costs entailed by taking children into care. The pilot does offer some indications that NFP could serve to delay and prevent care proceedings[11]. In addition, we find that NFP helps participants to avail themselves of existing services in order to obtain needed help and support in time for it to have a preventive effect. NFP can also prevent mothers from having to switch to sickness benefit during parental leave and paid employment. In this way, NFP can potentially generate extensive cost-savings and benefit in Norway than in countries with more limited social services, social entitlements and where women are less likely to be in employment.

Methodological limitations

The real-time evaluation is no randomised controlled trial and is subject to methodological limitations. Without a control group, it cannot be excluded that positive or negative effects might be attributable to extraneous factors, or that those effects might have been achieved independently of the programme content. However, the results of the real-time evaluation still offer some indications of goal attainment and benefit in the Norwegian context.

[11]The quantitative data on which the real-time evaluation is based does not permit the effect of prevention of neglect and care proceedings to be measured. RBUP has access to data material that permits comparison of the number of care proceedings (meaning children being taken into care) among NFP families with national or regional figures. It would be useful if these data were analysed and published in order to provide some indication of the preventive effect of the programme.

10. Recommendations for continuation and further research

In order to assess the pilot, in this final report, we examined four evaluation areas: recruitment and target-group clarification, implementation and delivery, cooperation and overlap with other services, and the potential effect for other families in Norway. In this chapter, we summarise the findings and discuss the implications for a continuation of NFP in Norway. We will also be presenting recommendations for any continuation of NFP and further research.

10.1 Benefits and drawbacks of adopting NFP in Norway

Benefits

- The programme is licensed, which prevents substantial modification or any dilution that might reduce the effectiveness of the intervention.
- The programme is of a high clinical standard and receives expert support from the international office. Ongoing research on NFP in several countries is also conducive to the continuous enhancement of the programme, with learning structures to ensure updated knowledge.
- The programme appears to be adaptable in that it has been able to cooperate with different services to find solutions to many practical challenges over the course of the pilot without breaching the licence criteria. The number of home visits is adjustable, which makes it possible to reduce the number of visits for families who turn out to have less need than assumed at the time of inclusion.
- NFP can help to identify vulnerable families at an early stage and facilitates early intervention in families that would not otherwise have been discovered. NFP offers a type of care delivery not available under Norwegian local authority healthcare services at present and complements existing services.
- NFP can boost early interventions for vulnerable families, serve to prevent neglect, violence and abuse and boost parenting skills. Few other interventions/programmes do this. The programme makes it possible to prevent children being taken into care by strengthening parental care-giving and mental health. NFP shows potential for enhancing quality of life, health and care-giving in vulnerable families and is accepted by the families who receive care delivery.

Possible drawbacks

- The programme would not be as adaptable were it a locally devised service.
- NFP is best delivered in built-up locations and cannot be diffused nationwide in a country like Norway with low population density and large geographical distances to cover in rural areas. The organisation requires a certain minimum number of births, and the home visiting model imposes limitations on the team's geographical catchment area. While NFP has been trialled in rural areas (Campbell et al. 2019) this poses even greater challenges concerning nurse supervision and team affinity. NFP would also entail a networking cooperation in the municipalities of Norway in order to achieve a target population to fill the NFP team caseload.
- NFP is an intervention limited to nulliparous women[12]. Vulnerable primiparous and multiparous women are excluded even though they might be in need of additional services.
- Mis-recruitment may reduce the socioeconomic benefit of the programme. The programme has to reach a limited target population with extensive issues, and the participants must be recruited before gestation-week 28. The programme requires frontline resources for recruitment to be successful.

[12]The programme is currently being trialled for multiparous parents, and a possible future option for including a multiparous population is a topic in the dialogue between the partners in the Norwegian pilot and NFP internationally.

In spite of these drawbacks, NFP appears to be a high-intensity programme for which a need exists in Norway, and there are at present no local-authority services offering any service of comparable professional standard to the same target population.

10.2 Recommendations for organisation going forward

Organisation going forward
A wish has been expressed in the pilot sites for the NFP teams to be employed by the local authority in any continuation. This would entail close proximity to the existing Maternity and Child Health Care Centre, improved continuity of care, give the local authority the role of executive and owner and facilitate local platforming and motivation. It would also engender increased knowledge sharing between NFP and other local authority services with insight into the programme's clinical basis and mode of operation.

The potential risks of local authority organisation of NFP is that the professional environment would be too limited in size, and that it would be important for NFP to be able to consult with a body of expertise such as can be provided by RBUP. The nurses do not have scope for performing tasks extraneous to the NFP programme, and would thus require a distinct safeguard against being assigned to other local authority tasks within the district/municipality.

The Norwegian pilot has not tested what challenges, advantages and drawbacks a local authority organisation of the programme would present. This places a limitation on interpretation of the evaluation's findings, which must be taken into account if the programme is continued with an NFP team employed by a local authority.

We recommend that NFP be organised as proposed in the SINTEF study on the organisation of NFP, as described by Lippestad et al. (2018). In this proposal, the NFP team is employed by the local authority but is organised in distinct teams. Small local authorities could implement the programme by partnering with neighbouring local authorities on a shared NFP team. To gain a sufficient number of participants in an area where it is possible to preserve the team structure and deliver frequent home visits, the programme can only be delivered in relatively densely built-up districts. The Regional centre for child and adolescent mental health and child welfare (RBUP) would continue to operate a national NFP office in charge of training, clinical support and data processing.

How large is the target population?
Various estimates have been proposed regarding the size of the target population in Norway. Ogden et al. (2015) estimated the target population as being 1% of all births in Norway among women under 25. Oslo Economics (2018) estimated the target population as amounting to 350 individuals in Norway per annum, assuming no age limit. In the pilot, however, the number of enrolees indicates that the target population could be somewhat larger. In Rogaland, approximately 2.5% of first-time mothers-to-be were included in the pilot each year. In Oslo, around 5% of first-time mothers-to-be were recruited per annum. The districts in Oslo have a population with more risk factors than the national average. Based on this evidence, we estimate that the target population would be in the region of 2 and 4% of all first-time mothers-to-be, meaning 400-800 families.[13] Variation would correlate with disparities in socioeconomic variables in the catchment area. Some families reside in areas where it will not be possible to deliver NFP.

Team size
The number of vulnerability factors among the participants and the degree of complexity of needs for nurse attendance mean that the original goal of a caseload of 18 to 20 participants per nurse might need to be adjusted. Organising the programme in such a way that working conditions become more sustainable over time would be important in any continuation. A potential impact of the high caseload might be that nurses leave the NFP team. This means losing the nurse's competence, which takes a long time to acquire. The risk is also that several of the nurse's participants leave the programme. In new pilot areas, the prospective number of births will offer an indication as to the size of team that

[13] The number of women pregnant with their first child was 23,500 in 2018 (Norwegian Institute of Public Health, 2019).

would be appropriate to assign. Interim Report 2 (Pedersen & Nilsen, 2018, p. 25) explains that a larger team offers greater flexibility and sustainability. NFP teams could be varied in size, from at least 4 to a maximum of 8 nurses. The National NFP office proposes larger teams in any continuation. Equally, there would be several locations where NFP could be employed, but without a sufficient number of prospective births to justify a team. Thus, there should also be the option of deploying teams of minimum size.

Digitised data collection
We consider that digital solutions for data collection would be of great benefit. It would be time-saving for the nurses and raise the quality of the data collected. The nurses found that they spent a good deal of time on data collection and paperwork after each home visit. Simplifying these procedures would potentially greatly reduce the overall workload and ensure that the nurses devote as much of their time as possible to attending to the families.

Experiences from the English and Scottish NFP trials indicated that local initiative and commitment were important for successful NFP implementation. In areas where NFP was rolled out as a state initiative, the trials were rather less successful. The Netherlands' trial reported that good results from trials were important in making other locations keen to adopt NFP. Implementation of the NFP programme should be subject to active application by local authorities to ensure sufficient local authority endorsement. The applications should undergo an approval process by clinical staff to ensure that a basis exists for delivery in line with the programme criteria (Lippestad et al., 2018, p. 38).

10.3 Recommendations for further research

RCT to measure effectiveness
NFP's licensing criteria require a randomised controlled trial (RCT) in any continuation. In compliance with the licensing criteria, we wish to offer some recommendations regarding an RCT of NFP in Norway informed by experiences from the real-time evaluation.

An RCT would be a means to demonstrate the benefits of deploying the programme, which would be important if the proposal is to implement a high-intensity home visiting programme targeting only the most vulnerable. In the US several RCTs have demonstrated positive effects. Most notable are the long-term effects, meaning the effectiveness of the programme over 20-30 years (Olds et al. 1997, Olds et al. 2004, Ball et al. 2012). These longitudinal studies indicate that children were more likely to complete further education and less likely to take drugs than the control group. In a Norwegian RCT it would be necessary to draw a distinction between short-term and long-term effects of the intervention. In the short-term, the benefit might be reduced harm to children, fewer children taken into care, and an increase in maternal employment. In the long-term, a study might examine whether the programme has the potential to alter these families' life course and prevent continuation of negative social legacies in that children complete higher education, have fewer substance abuse problems and mental health problems. The registry data available to us in Norway offer a unique option for conducting a less costly longitudinal study of families participating in NFP and families participating in a control group. This would make it possible to follow up on factors such as academic performance, educational attainment, employment and use of health and welfare services. A Norwegian RCT should include a cost-benefit analysis to determine whether the intervention is economically viable and more so than any alternative.

However, this type of research design has some disadvantages. RCTs are cost-intensive in staff resources and time. NFP is a complex intervention carried out in a diversified and dynamic welfare context. This might make it difficult to measure effectiveness, especially in the short term. The benefit of NFP for participants and services could also be demonstrated by means of experience sharing and expertise from the local authorities employing NFP.

Timeframe for establishing new NFP sites
It has taken approximately one year to establish the NFP pilot in the two pilot sites, and reach a level where the programme is well-known within the services that refer the participants, and where recruitment proceeds at a sufficient rate and the nurses are familiar with the programme components. Establishing NFP in new sites would in all probability be subject to more or less the same timeframe

as for the pilot, and be equally labour-intensive in terms of establishing a physical workplace, forming partnerships with multiple services, training, extensive self-study and sharp learning curves.

In the Dutch RCT of NFP, 460 participants were included over a period of two years (Mejdoubi et al. 2013). In the English RCT of NFP, around 1600 participants were included within 13 months (Robling et al., 2016). Half of the RCT participants were assigned to NFP nurses, while the other half constituted the control group assigned to usual care. In an RCT, the timeframe for recruitment is limited. Equally, it must be taken into account that establishing new NFP teams takes time and that more sites would be required in order to succeed in recruiting a sufficient number of participants.

Experiences from the real-time evaluation that would be significance in planning an RCT:

- Allow for the fact that local authority hiring procedure is time-consuming.
- Allow for potential delays in recruitment of participants.
- Consider the appropriate caseload for NFP teams at start-up and in pilot to prevent attrition.

Key aspects to clarify and consider before launching an RCT:

- How many participants does each nurse have to attend to?
- How large do sites have to be in order to recruit sufficient numbers for both the intervention and control groups for the RCT?
- How large a team can be assigned to a site if recruitment is to be for both an intervention group and control group?

If we assume that a Norwegian RCT should include 500 participants, 250 would be assigned to care delivery. If each nurse has a caseload of max. 15 participants, this would mean that about 16 nurses are needed, in addition to team supervisors. There are currently 8 nurses and two team supervisors with NFP competence in Norway.

The NFP teams would have to recruit from sites with a sufficiently high number of first-time expectant mothers, and with a higher annual birth rate than in the Oslo districts and Rogaland municipalities. An option would be to enlarge NFP by two trial sites in densely populated areas, with the potential of recruiting twice as many participants for the intervention and control groups. In an RCT, delays in recruitment would mean increased costs and challenges in interpreting the data. Sufficient time would need to be allowed for recruitment.

These experiences are not based on a trial of the local authority as the employer. Consequently, challenges might arise in running an RCT in a local authority setting, a set-up beyond the scope of the present evaluation.

11. Conclusion

The four-year evaluation finds that the Nurse-Family Partnership is feasible to deploy in Norwegian local-authority healthcare and welfare services. The pilot demonstrates the feasibility of delivering NFP in compliance with the programme criteria, and that the programme is feasible to adapt to a Norwegian context. The number of included participants indicates that the target population in Norway is larger than originally estimated.

The real-time evaluation concludes that there is a need for and high acceptance of a high-intensity programme such as NFP in Norway. The programme offers close and structured care delivery to a target population not served by any similar scheme. The informants highlight the close relationship and comprehensive attendance from a caring professional, and the interdisciplinary coordination brought into play around the participant family and the teams as “success criteria”. Although effectiveness is not possible to measure, the real-time evaluation finds that this intervention is probably capable of preventing child neglect and children being taken into care.

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Appendices

Appendix 1: Supplementary tables

Tabell 11 Supplementary table a: Referring agencies

Henvisende instanser i Oslo, Rogaland og totalt (i antall og prosent)						
Henvisende instans	Oslo	%	Rogaland	%	Totalt	%
Jordmor	75	64 %	76	48 %	151	55 %
Fastlege	12	10 %	14	9 %	26	9 %
Amathea	0	0 %	6	4 %	6	2 %
Psykiatri/DPS	4	3 %	12	8 %	16	6 %
Kvinne selv	11	9 %	20	13 %	31	11 %
Barnevernstjenesten	3	3 %	11	7 %	14	5 %
NAV	7	6 %	4	3 %	11	4 %
Psykolog/terapeut	2	2 %	1	1 %	3	1 %
Rus	0	0 %	5	3 %	5	2 %
Helsestasjon for ungdom	0	0 %	1	1 %	1	0 %
Sykehus	2	2 %	1	1 %	3	1 %
Skole	1	1 %	0	0 %	1	0 %
Annet	0	0 %	3	2 %	3	1 %
Missing	0	0 %	4	3 %	4	1 %
Totalt	117	100 %	158	100 %	275	100 %

Tabell 12 Supplementary table b: Included versus excluded participants

Characteristics	**Included**		**Excluded**	
	n	**%**	**n**	**%**
Maternal age				
16-19	19	10%	5	6%
20-24	45	24%	11	12%
24-29	35	19%	11	12%
30-34	35	19%	9	10%
35-39	10	5%	3	3%
40-41	5	3%	1	1%
No data	36	20%	50	55%
Language				
Norwegian/Scandinavian	134	72%	54	60%
Other	27	15%	8	9%
No data	24	13%	28	31%
Ethnicity				
Norwegian	106	57%	43	48%
Other European country	13	7%	6	7%
Non-European country	44	24%	11	12%
No data	22	12%	60	33%
Total	**185**		**90**	

Table 13, Supplementary table c: Enrolments and dropouts in Oslo, Rogaland and in total (in numbers and percentages)

	Oslo			Rogaland			Total		
	Enrolled	Dropouts	%	Enrolled	Dropouts	%	Enrolled	Dropouts	%
Total enrolled	84	0	0%	101	0	0%	185	0	0%
Pregnancy	81	3	4%	96	5	5%	177	8	4%
Infant	69	12	14%	78	18	18%	147	30	16%
Toddler	62	7	8%	71	7	7%	133	14	8%
Total numbers	62	22	26%	71	30	30%	133	52	28%

Table 14 supplementary table d. Participants enrolled in Oslo and Rogaland

		Oslo		Rogaland		Total	
Characteristics	**Value**	**N**	**%**	**N**	**%**	**N**	**%**
Maternal age	16-19	5	6%	14	14%	19	10%
	20-24	14	17%	31	31%	45	24%
	24-29	16	19%	19	19%	35	19%
	30-34	26	31%	9	9%	30	19%
	35-41	12	14%	3	3%	15	8%
	No data	11	13%	25	25%	36	19%
Language	Norwegian/Scandinavian	38	45%	66	65%	104	56%
	Other	21	25%	14	14%	35	19%
	No data	25	30%	21	21%	46	25%
Ethnicity	Norwegian	39	46%	67	66%	106	57%
	Other European country	5	6%	8	8%	13	7%
	Non-European country	29	35%	15	15%	44	24%
	No data	11	13%	11	11%	22	12%
Partner status	Married/cohabiting with father of child	60	71%	64	63%	124	67%
	In a relationship with father of child	2	2%	5	5%	7	4%
	Married/cohabiting (not w/biol. father)	0	0%	2	2%	2	1%
	Separated, widowed, divorced or otherwise single	2	2%	1	1%	3	2%
	No data	20	24%	29	29%	49	26%
Employment	Full-time employment	26	31%	22	22%	48	26%
	Part-time employment	16	19%	17	17%	33	18%
	Unemployed	5	6%	14	14%	19	10%
	Student/stay-at-home	13	15%	23	23%	36	19%
	On sick leave	6	7%	7	7%	13	7%
	No data	18	21%	18	18%	36	19%
Highest educational attainment	Secondary school	15	18%	36	36%	51	28%
	Further education	18	21%	35	35%	53	29%
	One-year certificate of higher education	6	7%	5	5%	11	6%
	Bachelor's	17	20%	11	11%	28	15%
	Master's	17	20%	3	3%	20	11%
	PhD/Postdoc	1	1%	1	1%	2	1%
	No data	18	21%	18	18%	36	19%
State benefits (a number receive other types of benefit)	Social security benefits*	5	6%	26	26%	31	17%
	Work clarification allowance	12	14%	18	18%	30	16%
	Unemployment benefit	4	5%	3	3%	7	4%
	Sickness benefit	3	4%	3	3%	6	3%
	Number receiving benefit	24	29%	50	50%	74	40%
Dropped out from further educ.	Age 17	2	2%	4	4%	6	3%
	Age 18	3	4%	1	1%	4	2%
	Age 19-20	3	4%	3	3%	6	3%
	Number of dropouts	8	10%	8	8%	16	9%
	Total	84	100%	101	100%	185	100%

**disability benefit, welfare benefit, other benefit*

Table 15 Supplementary table e. Average time spent, Oslo

		N	Personal health %	Environment %	Life situation %	Parenting %	
Pregnancy	NFP goals		35-40	7-10	10-15	23-25	10-15
	Avg (min-max)	65	31 (18-65)	10 (0-31)	15 (1-39)	28 (7-66)	16 (2-32)
Infancy	NFP goals		14-20	7-10	10-15	45-50	10-15
	Avg (min-max)	37	18 (4-30)	9 (3-20)	12 (0-32)	44 (21-74)	16 (8-24)

Table 16 Supplementary table f. Average time spent, Rogaland

			Personal health %	Environment %	Life situation %	Parenting %	
Pregnancy	NFP goals		35-40	7-10	10-15	23-25	10-15
	Avg (min-max)	66	26 (9-48)	14 (4-23)	14 (3-32)	28 (16-43)	17 (7-29)
Infancy	NFP goals		14-20	7-10	10-15	45-50	10-15
	Avg (min-max)	29	16 (5-33)	10 (3-19)	11 (3-21)	49 (32-73)	15 (7-22)

Table 17 Supplementary table g. Commitment, understanding, acceptance

Mothers, Oslo

		Commitment	Understanding	Acceptance
	N	Avg (max-min)	Avg (max-min)	Avg (max-min)
Pregnancy				
Sessions 1-10	65	4.5 (3.3-5)	4.3 (2.5-5)	4.4 (2.9-5)
Sessions 11-28	21	4.6 (3-5)	4.3 (2.7-5)	4.3 (2.3-5)
Infancy phase				
Sessions 1-10	36	4.6 (3.1-5)	4.3 (2.9-5)	4.4 (3.1-5)
Sessions 11-20	36	4.6 (3.6-5)	4.4 (3.4-5)	4.6 (3.7-5)
Sessions 20-32	27	4.7 (3.3-5)	4.3 (3.3-5)	4.5 (3.4-5)

Mothers, Rogaland

		Commitment	Understanding	Acceptance
	N	Avg (max-min)	Avg (max-min)	Avg (max-min)
Pregnancy				
Sessions 1-10	67	4.5 (2.3-5)	4.4 (2.5-5)	4.5 (2.5-5)
Sessions 11-28	15	4.3 (2-5)	4.2 (2-5)	4.5 (2-5)
Infancy phase				
Sessions 1-10	29	4.5 (3.6-5)	4.5 (3.5-5)	4.6 (3.5-5)
Sessions 11-20	29	4.5 (3.4-5)	4.5 (3.5-5)	4.6 (3.4-5)
Sessions 20-32	12	4.5 (3.3-5)	4.6 (4-5)	4.8 (3.7-5)

Fathers, Oslo

		Commitment	Understanding	Acceptance
	N	Avg (max-min)	Avg (max-min)	Avg (max-min)
Pregnancy				
Sessions 1-10	31	4.3 (3-5)	4.3 (2.5-5)	4.4 (3-5)
Sessions 11-28	7	4.2 (3-5)	3.8 (3-5)	4.4 (3.7-5)
Infancy phase				
Sessions 1-10	24	4.2 (2-5)	4.1 (2-5)	4.2 (2-5)
Sessions 11-20	22	4.4 (2-5)	4.1 (2-5)	4.2 (2-5)
Sessions 20-32	13	4.3 (2-5)	4.5 (1.7-5)	4.5 (2.7-5)

Fathers, Rogaland

		Commitment	Understanding	Acceptance
	N	Avg (max-min)	Avg (max-min)	Avg (max-min)
Pregnancy				
Sessions 1-10	43	4.3 (1-5)	4.4 (1-5)	4.5 (1-5)
Sessions 11-28	5	4.3 (3-5)	4.3 (4-5)	4.7 (4-5)
Infancy phase				
Sessions 1-10	22	4.4 (3-5)	4.5 (3.7-5)	4.5 (3.7-5)
Sessions 11-20	19	4.1 (3-5)	4.3 (3.6-5)	4.3 (3.6-5)
Sessions 20-32	3	4.3 (3-5)	4 (3-5)	4 (3-5)

Table 18 Supplementary table h: Pregnancy outcomes in Oslo, Rogaland and in total.

Pregnancy outcomes	*Oslo*		*Rogaland*		*Total*	
	n	*%*	*n*	*%*	*n*	*%*
Gestational age at birth						
<37 weeks (premature)	4	6%	3	4%	7	5%
37-42 weeks	58	91%	63	94%	121	92%
>42 weeks	2	3%	0	0%	2	2%
No data	0	0%	1	2%	1	1%
Total	64	100%	67	100%	131	100%
Birth weight						
Very low (<1500 g)	0	0%	0	0%	0	0%
Low (<2500 g)	5	8%	6	9%	11	8%
Normal (2500-4500 g)	58	90%	60	91%	118	91%
High (>4500 g)	0	0%	0	0%	0	0%
No data	1	2%	0	0%	1	1%
Total	64	100%	66	100%	130	100%
Hospitalised in neonatal ICU, number of days						
0.5-3 days	9	56%	4	50%	13	54%
5-9 days	4	25%	1	12.5%	5	21%
11-17 days	0	0%	2	25%	2	8%
20-28 days	3	19%	1	12.5%	4	17%
Total in neonatal ICU	16	100%	8	100%	24	100%
Exclusively breastfed						
Yes	32	50%	43	64%	75	57%
No	32	50%	23	34%	55	42%
No data	0	0%	1	2%	1	1%
Total	64	100%	67	100%	130	100%

Appendix 2 Overview of instruments

Overview of instruments used to measure mental health, self-mastery and loneliness

Generalised anxiety scored using Generalized Anxiety Disorder-scale (GAD-7)
Feeling nervous, anxious or on edge
Not being able to stop or control worrying
Worrying too much about different things
Trouble relaxing
Being so restless that it's hard to sit still
Becoming easily annoyed or irritable
Feeling afraid as if something awful might happen

Symptoms of depression scored using Patient Health Questionnaire (PHQ-9)
Little interest or pleasure in doing things
Feeling down, depressed or hopeless
Trouble falling or staying asleep, or sleeping too much
Feeling tired or having little energy
Poor appetite or overeating
Feeling bad about yourself - or that you are a failure or have let yourself or your family down
Trouble concentrating on things, such as reading the newspaper or watching television
Moving or speaking so slowly that other people could have noticed
Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual
Thoughts that you would be better off dead, or of hurting yourself

Mastery scored using the Pearlin Self-mastery Scale
I have little control over the things that happen to me.
There is really no way I can solve some of the problems I have.
There is little I can do to change many of the important things in my life.
I often feel helpless dealing with the problems of life.
Sometimes I feel that I'm being pushed around in life.
What happens to me in the future mostly depends on me.
I can do just about anything I really set my mind to.