
Attitudes to NIPT among pregnant women under 35 years of age

ORIGINAL ARTICLE

CECILIE BRYN NORDKLEV

cnordk@ous-hf.no

Fetal Medicine Centre

Oslo University Hospital

and

Institute of Clinical Medicine

University of Oslo

Author contribution: idea, study design, questionnaire design, data collection and interpretation, statistical analyses, literature search, drafting and revision of the manuscript and approval of the submitted version

Cecilie Bryn Nordklev, specialist in obstetrics and gynaecology, senior consultant and PhD candidate

The author has completed the ICMJE form and declares no conflicts of interest.

GUTTORM HAUGEN

Institute of Clinical Medicine

University of Oslo

Author contribution: questionnaire design, literature search, drafting and revision of the manuscript and approval of the submitted version

Guttorm Haugen, specialist in obstetrics and gynaecology, and emeritus professor

The author has completed the ICMJE form and declares no conflicts of interest.

RAGNAR KVIE SANDE

Fetal Medicine Outpatient Clinic

Stavanger University Hospital

and

Department of Clinical Science (K2)

University of Bergen

Author contribution: data collection and interpretation, applied for approval from the data protection officer, revision of the manuscript and approval of the submitted version

Ragnar Kvie Sande, specialist in obstetrics and gynaecology, section senior consultant and associate professor

The author has completed the ICMJE form and declares the following conflict of interest: he is a member of the advisory group in the Norbirth network.

CATHRINE EBBING

Section for Fetal Medicine and Ultrasound

Haukeland University Hospital

and

Department of Clinical Science (K2)

University of Bergen

Author contribution: data collection and interpretation, applied for approval from the data protection officer, revision of the manuscript and approval of the submitted version

Cathrine Ebbing, specialist in obstetrics and gynaecology, senior consultant and professor

The author has completed the ICMJE form and declares no conflicts of interest.

SOLVEIG SKREDE

Centre for Fetal Medicine

St Olav's Hospital, Trondheim University

Author contribution: data collection and interpretation, applied for approval from the data protection officer, revision of the manuscript and approval of the submitted version

Solveig Skrede, specialist in obstetrics and gynaecology, senior consultant. She is the president of the Norwegian Society for Diagnostic Ultrasound in Medicine

The author has completed the ICMJE form and declares no conflicts of interest.

RAGNHILD GLAD

Fetal Medicine Unit

Outpatient Maternity Clinic

University Hospital of North Norway

and

Department of Clinical Medicine

The University of Tromsø – The Arctic University of Norway

Author contribution: data collection and interpretation, applied for approval from the data protection officer, revision of the manuscript and approval of the submitted version

Ragnhild Glad, specialist in medical genetics, senior consultant and university lecturer

The author has completed the ICMJE form and declares no conflicts of interest.

VASILIS SITRAS

Fetal Medicine Centre

Oslo University Hospital

Author contribution: idea, study design, questionnaire design, applied for approval from the data protection officer, revision of the manuscript and approval of the submitted version

Vasilis Sitras PhD, specialist in obstetrics and gynaecology, senior consultant and head of department

The author has completed the ICMJE form and declares no conflicts of interest.

Background

Non-invasive prenatal testing (NIPT) is a genetic analysis based on a blood test from a pregnant woman, which can assess the likelihood of the fetus having trisomy 13, 18 or 21. Early ultrasound has been offered to all pregnant women as part of prenatal care in Norway since 2022, while NIPT is offered to pregnant women who will be 35 years of age or older on their due date. The objective of this study was to survey attitudes to NIPT among pregnant women under 35 years of age.

Material and method

Between December 2024 and January 2025, we distributed a questionnaire to all pregnant women under 35 years of age attending an early ultrasound scan at five university hospitals in Norway.

Results

The questionnaire was answered by 1260 (99.6 %) of the 1265 pregnant women invited to complete it. Out of 1200 women who answered the question about whether NIPT should be offered to all pregnant women through the Norwegian public health service, 915 (76.2 %) answered 'yes'. Out of 1188 women who answered that they had heard of NIPT, 211 (17.9 %) had paid for it themselves.

Interpretation

Three in four pregnant women under 35 years of age in Norway think that NIPT should be offered to all pregnant women as part of early prenatal screening in the public health service.

Main findings

Among pregnant women under 35 years of age, 76 % answered 'yes' to the question 'Should NIPT be offered to all pregnant women in Norway, including those under 35 years of age, through the public health service?'

The majority of pregnant women under 35 years of age (95 %) had heard of NIPT, and 18 % of these had paid for the test themselves.

Norway is one of the few Western countries in which prenatal screening is regulated by law. Chapter 4 of the Norwegian Biotechnology Act defines prenatal screening as the 'examination of fetal cells, a fetus or a pregnant woman with the aim of obtaining information about the genetic characteristics of the fetus or to detect or rule out disease or developmental abnormalities in the fetus' (1). In Norway, publicly funded prenatal screening has been available to pregnant women over 38 years of age and those with specific risk factors. In 2017, the Norwegian Directorate of Health approved non-invasive prenatal testing (NIPT) as a screening method for trisomy 13, 18 and 21. The test implemented in the Norwegian public health service analyses cell-free DNA from the placenta circulating in maternal blood and has high sensitivity and specificity (> 99 %) in detecting trisomies early in pregnancy (2). Although test performance is very good, the positive predictive value (PPV) in pregnant women under 35 years of age is lower than in those over the age of 35 years because the prevalence of trisomy is lower in younger women. Therefore, an abnormal test result does not necessarily indicate a chromosomal defect in the fetus (3), and in these cases, the recommendation is to follow up with a sample from the fetus (amniotic fluid test).

In May 2020, the Norwegian Parliament adopted amendments to the Biotechnology Act and expanded access to prenatal screening to all pregnant women (4, 5). This provision was implemented in 2021–2022, and all pregnant women are now offered an early ultrasound scan in gestational weeks 11–13⁺⁶. Early ultrasound assesses the gestational age, number of fetuses, chorionicity in a multiple pregnancy and anatomy of the fetus (6). Women who will be over the age of 35 years on their due date or who have specific risks are also offered NIPT (7). The test and ultrasound scan are performed at the hospital where the woman is due to give birth. Prior to the examinations, the woman/couple will receive information and counselling and will sign a consent form (8).

The technological advances have led to an ongoing discussion, particularly among specialists in fetal medicine, geneticists, ethicists and politicians, about which groups of pregnant women should be offered prenatal screening and which methods should be offered (9–13). A 2019 survey of pregnant women in the Oslo area found that the majority believed that prenatal screening should be offered by the public health service to all pregnant women (14).

The objective of this study was to survey attitudes to NIPT among pregnant women under 35 years of age.

Material and method

A non-validated, anonymous questionnaire in Norwegian was distributed to all pregnant women under 35 years of age attending an early ultrasound scan in gestational weeks 11–13⁺⁶ at the university hospitals in Oslo, Stavanger, Bergen, Trondheim and Tromsø between December 2024 and January 2025 (see Appendix 1 – in Norwegian). The women answered the questionnaire in the waiting room and returned it to

reception. The answers were recorded and stored in the Services for Sensitive Data (TSD) at the University of Oslo. The project was submitted to and approved by the relevant data protection officers at the five study sites.

Data are presented descriptively as the mean with standard deviation (SD) and as the number (*n*) and percentage (%).

Results

The questionnaire was answered by 1260 (99.6 %) of the 1265 pregnant women invited to complete it (Table 1). Out of 1250 women, 1182 (94.6 %) answered that they had heard of NIPT, of whom 211 (18 %) had paid for it themselves (see Appendix 2 – in Norwegian).

Out of the 1200 pregnant women who answered the question 'Should NIPT be offered to all pregnant women in Norway, including those under 35 years of age, through the public health service?', 915 answered 'yes', and of these, 784 (86 %) answered 'yes, free of charge' and 131 (14 %) answered 'yes, for a charge'.

The 915 women who answered 'yes' to offering NIPT to all pregnant women gave the following reasons (multiple answers were allowed): 'Women must decide for themselves if they want to take up the offer' (*n* = 535; 59 %), 'If there is a serious fetal abnormality, there is the option to terminate the pregnancy' (*n* = 578; 63 %), 'For information purposes only' (*n* = 143; 16 %), 'To be prepared to care for a sick child' (*n* = 412; 45 %) and/or 'Other' (*n* = 14; 2 %).

The 109 (9 %) women who answered 'no' to the question gave the following reasons (multiple answers were allowed): 'Prenatal screening contributes to a "sorting society"' (*n* = 27; 25 %) and/or 'Women who want NIPT without a medical indication should pay for it themselves' (*n* = 51; 47 %). Six women (6 %) selected the reason 'Other diseases (for example cancer or cardiovascular disease) are more important and should be prioritised'.

Table 2 shows answers and demographic characteristics grouped by the response options ('yes', 'no' or 'unsure') regarding whether to offer NIPT to all pregnant women. Out of 169 pregnant women who selected 'yes' to the question 'Is religion important to you?', 44 (26 %) answered 'no' to offering NIPT to all pregnant women. Of the 689 nulliparous women, 547 (79 %) answered 'yes'.

Out of 1249 participants, 835 (67 %) reported having undergone an ultrasound even before the invitation for an early ultrasound in weeks 11–13⁶ offered by the public health service (see Appendix 2 – in Norwegian). Of these, 694 (83 %) had paid to have the scan at a private provider. In answer to the question 'What did you want to know?', 400 (48 %) selected 'whether there was a fetal heartbeat', 'number of fetuses' and 'whether the fetus is healthy', while 242 (29 %) only selected the first answer regarding heart activity.

Discussion

In response to the question about whether NIPT should be offered by the public health service to all pregnant women regardless of age, three in four pregnant women under 35 years of age answered 'yes', 9 % answered 'no' and 15 % were unsure.

This is almost the same result as in a similar Norwegian study from 2020 (i.e. before the latest expansion of access in the Biotechnology Act) (14). In that study, pregnant women of all ages were asked about prenatal screening in general, whereas our study mainly focused on attitudes to NIPT. Furthermore, our study included participants from five university hospitals, while the 2020 study only covered the Oslo region (catchment area of Oslo University Hospital and Akershus University Hospital).

Among pregnant women in our study who indicated that religion was important to them, 26 % answered 'no' to offering NIPT to all pregnant women, compared to 12 % who said 'no' to prenatal screening in the 2020 study. The datasets are relatively small, and the studies are not directly comparable, but it can be assumed that a woman's attitude to religion is relevant to her attitude to prenatal screening in general and NIPT specifically.

Among pregnant women under 35 years of age who already had children, 12 % answered 'no' to offering NIPT to all pregnant women, compared to 7 % of nulliparous women. As multiparity is more common among women over the age of 35 years, our findings may not be representative of the overall pregnant population in Norway. However, the trend seems to be the same as before (14). Having previous experience of motherhood may influence attitudes to prenatal screening. Similarly, it is interesting that 10 % (99 out of 998) of women educated to university and college level answered 'no' to offering NIPT to all pregnant women, compared with 5 % (10 out of 200) of those with a lower level of education (Table 2).

A total of 68 % and 18 % of pregnant women under 35 years of age reported having had an ultrasound scan and/or NIPT earlier in pregnancy, respectively. For both variables, the vast majority (79 % and 95 %, respectively) thought that NIPT should be offered by the public health service.

In addition to the aforementioned study by Sitras et al. (2020), a study about attitudes to prenatal screening in Norway has been previously published (15). This was a general population study that included men and women (pregnant and not pregnant) and did not specifically focus on NIPT. A limitation of our study is that we only included pregnant women who are not currently offered NIPT through the public health service. Therefore, we cannot draw any conclusions about attitudes to this testing in the general population. However, figures from the Medical Birth Registry of Norway for 2024 show that 75 % of all women who gave birth in Norway were under 35 years of age. The variation in the counties represented ranged from 66 % in Oslo to 79 % in Trøndelag (16).

Among women who wanted NIPT to be provided, three in five women answered that this was to enable the pregnancy to be terminated if abnormalities were detected, while almost one in two women wanted the test in order to be prepared for having a child with a disability. This does not necessarily reflect what their actual decision would be if

the test found abnormalities. Nonetheless, it demonstrates variations in the attitudes to prenatal screening among pregnant women in Norway. This is also reflected in what the pregnant women wanted in terms of the content of an early ultrasound scan.

A strength of the study is that it included pregnant women at university hospitals in all regions of Norway. This is in contrast to the previous study, which only included pregnant women in the Oslo area. A limitation of the study is the use of a non-validated questionnaire as no validated instrument exists for this purpose. This may have contributed to some inconsistent answers (e.g. 1188 answered that they know about NIPT, while 1200 answered the question about whether or not it should be offered on the public health service). We chose to create a questionnaire that had almost identical questions to the previous study in the Oslo area. This allowed us to compare the results from the two studies, although this was complicated by the age restriction in our recent study. Nevertheless, pregnant women under the age of 35 years represent the majority of the pregnant population in Norway.

It has been decided that pregnant women without a medical indication will be able to pay for NIPT through the public health service (17, 18). This will ensure equal access regardless of age or region of residence, but price may be a limiting factor. The policy was implemented on 1 September 2025.

Our findings indicate that the majority of younger pregnant women would like the prenatal screening on offer through the public health service to include NIPT. Many women want this test in order to have the option of terminating the pregnancy if serious fetal abnormalities are found, while others want to be prepared to care for a child with a disability. Women's autonomy is firmly upheld in modern society, and the new abortion law has further strengthened women's right to self-determination. The extent to which current biotechnology legislation and the policies being pursued reflect the society and times we live in and align with people's expectations remains open for discussion.

The article has been peer-reviewed.

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