

DATA & TRENDS

Comparing ideal family size with observed and forecasted completed cohort fertility in Denmark and Norway

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ABSTRACT The question of whether the ongoing Nordic fertility decline reflects delayed fertility onset, weakening preferences for children or barriers to realising fertility ideals remains unresolved. We examine whether age-specific cohort ideals track cohort fertility forecasts in Denmark and Norway, using Generations and Gender Survey round 2 (2020) data to compare the stated ideal number of children with realised and forecasted cohort fertility at age 45. In both countries, women’s ideal family size exceeds the number of children they have or can expect to have. In Denmark, the ideals-expectations gap remains stable across cohorts, but it is forecasted to widen for the most recent cohorts; in Norway, the gap grows consistently across cohorts. In both countries, the widening gap is driven by forecasted declines in cohort fertility, which in turn are driven entirely by declining fertility before age 30.

KEYWORDS Fertility • Forecasting • Generations and Gender Survey • Ideals • Nordic countries

Introduction

In the 2010s and the early 2020s, total fertility rates (TFRs) declined in both Denmark (from 1.89 in 2008 to 1.47 in 2024) and Norway (from 1.98 in 2008 to 1.40 in 2023) after two decades of relative stability (Comolli et al., 2021; Hellstrand et al., 2021). It remains unclear whether these declines reflect shifting family size preferences across cohorts, growing barriers to realising fertility ideals (see Hellstrand et al., 2022; Golovina et al., 2024 for evidence from Finland) or changes in fertility timing. Notably, the fertility decline has been steeper in Norway than in Denmark (Hellstrand et al., 2021, 2026), creating an opportunity to examine the gap between preferences and fertility both across successive cohorts and between two Nordic countries on divergent trajectories.

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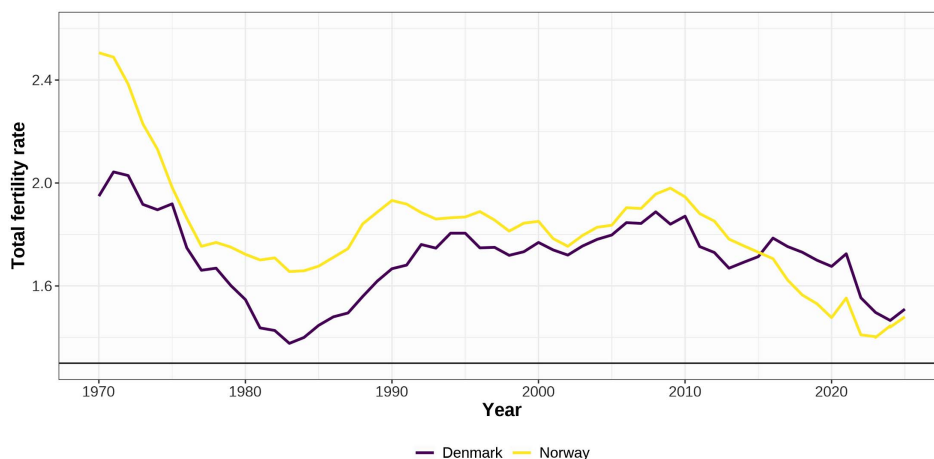
In this research note, we use the recent wave of the Generations and Gender Survey for Denmark (Simonsen et al., 2021) and Norway (Dommermuth and Lappegård, 2021) to compare women's stated ideal number of children with observed and forecasted completed fertility across cohorts. The data were collected in the fall of 2020 (Norway) and the spring of 2021 (Denmark). Ideals were expressed at the time of the survey, and thus should be viewed as age-specific (or period-specific) cohort ideals. We update the fertility forecasts from Hellstrand et al. (2021) up to the cohorts born in 1994. The updated forecasts provide support for the claim that cohort fertility is continuing to decline in Denmark and Norway. Compared to the original findings of Hellstrand et al. (2021), the updated forecasts suggest stronger declines in cohort fertility for both countries, with larger declines in Norway than in Denmark.

The research note contributes new, important information on the relationship between ideals and expected cohort fertility that is playing out during the hypothesised ongoing fracturing of the common Nordic fertility regime. We also demonstrate that in Denmark and Norway, the deficit in childbearing relative to women's ideals is expected to increase.

Background

The common Nordic fertility regime, which combines relatively high fertility rates with high rates of female labour force participation, has been explained in the literature by the high levels of gender equality and family-friendly policies that form part of the foundation of the Nordic social democratic welfare regime (e.g. Duvander et al., 2019; Esping-Andersen and Billari, 2015). However, recent period fertility declines (Comolli et al., 2021) and diverging cohort fertility trends (Hellstrand et al., 2021, 2026); in the Nordic countries have led to hypotheses suggesting (a) that the common Nordic regime is undergoing a process of fragmentation (Hellstrand et al., 2021, 2026); and (b) that the Nordic exceptionalism characterised by high female labour force participation and relatively high fertility is ending (Comolli et al., 2021). Hellstrand et al. (2021) forecasted that in Denmark, the cohort fertility rate (CFR) among cohorts born in the late 1980s would decline to around 1.80–1.85, down from 1.95 among cohorts born in the early 1970s, whereas in Norway, the CFR among the late 1980s cohorts would fall to around 1.7–1.82, down from above 2.0 among the early 1970s cohorts. The authors also forecasted that the trends in fertility levels in Sweden would be aligned with those in Denmark, and that the fertility declines would be even larger in Finland and Iceland, albeit from a higher level in Iceland. Moreover, in a recent follow-up paper, Hellstrand et al. (2026) forecasted similar trends in ultimate childlessness, with ultimate childlessness rates projected to increase slightly in Denmark and Sweden and more substantially in Norway, Finland and Iceland.

Figure 1 compares the TFR in Denmark and Norway from 1970 to 2025. In 2016, the TFR in Norway fell below that in Denmark for the first time, and although the two countries had very similar TFRs in 2025, the recent cohort forecasts outlined above suggest that Denmark and Norway might be on different cohort fertility trajectories (Hellstrand et al., 2021, 2026). Insofar as there is an emerging gap in cohort fertility between Denmark and Norway, the question of whether differences in family size ideals can explain this gap arises.

Figure 1 Total fertility rate for Norway and Denmark, 1970–2025

Note: Line indicates lowest-low period fertility at 1.3 (Kohler et al., 2002)

Source: Human Fertility Database (HFD, 2026)

Family size ideals are multidimensional in the sense that what respondents consider the ideal for society in general they might not perceive as the ideal for themselves. As detailed below, our data allow us to distinguish between the respondents' assessments of their general and personal ideals. Another complication is that because the data collected on ideals are cross-sectional, the ideals of different cohorts are collected at different ages. While this would be problematic if the cohorts' ideals changed over the life course, there is evidence suggesting that the changes over time within cohorts are limited compared to the changes over cohorts. Previous research has generally found that fertility ideals are stable or decline slightly over the life course (Bouchet-Valat and Toulemon, 2025; Dey and Wasoff, 2010; Golovina et al., 2024; Kuhnt et al., 2017; Ray et al., 2018). Moreover, it has been argued that fertility ideals are, theoretically, distinct from fertility intentions (Miller, 2011).

Method and data

Data

To examine how differences between family size ideals and realised/expected cohort fertility are evolving in Denmark and Norway, we compare two distinct sources of data. First, to obtain measures of ideals for age-specific cohort fertility, we use the Danish and Norwegian samples of round 2 of the Generations and Gender Survey. The data were collected from November to December 2020 in Norway (Dommermuth and Lappegård, 2021) and from March to June 2021 in Denmark (Simonsen et al., 2021), and included responses

to questions concerning ideal family size. For both countries, we include in our analytical sample female respondents who were aged 18–49 at the time of the survey.

To capture fertility ideals, we rely on two questions: (1) “For you personally, what would be the ideal number of children you would like to have or would have liked to have had?” (2) “Generally speaking, what do you think is the ideal number of children for a family?” Responses to both questions are measured as non-negative integers. We assume that these questions capture, respectively, respondents’ personal fertility ideals (or preferences absent any barriers) and views on general fertility ideals. We use responses from 2869 women in Norway and 4055 women in Denmark, limiting the analytical sample to the 1971–2002 birth cohorts and applying age-specific weights.

Second, to obtain information on realised and expected completed cohort fertility, we combine updated fertility data from the national statistical agencies in Denmark and Norway with data from the Human Fertility Database (HFD, 2026). We obtain full population age-specific incidence rates that relate the births of women in specific cohorts to all other women in that cohort. For full details on data and methods, we refer readers to Hellstrand et al. (2021).

Method

Since the data on personal and perceived general ideals for completed cohort fertility come from a survey with a limited sample size, we use a model to smooth the association between fertility ideals and cohorts in order to reduce year-to-year variation due to sampling variation. Specifically, we use locally estimated scatterplot smoothing (LOESS), a semiparametric technique for carrying out locally weighted regression (Cleveland, 1979). Compared to other methods, LOESS allows for a more flexible mapping of the association between cohorts and fertility ideals, because it relies on fitting weighted least squares regressions to localised subsets of the data. We estimate LOESS curves with a bandwidth of one and a second-degree polynomial, and report 95% confidence intervals. Results are robust to increases (decreases) in bandwidth of 50%. To examine the differences between fertility ideals and realised/expected cohort fertility, we obtain point estimates for each cohort.

To estimate the ultimate number of children born to women in cohorts still of reproductive age, we rely on forecasting. We only provide forecasts for cohorts we have already observed up to at least age 30 to ensure that we are observing at least as many years as we aim to forecast. We report the results from four forecasting techniques: five-year extrapolation, freeze rate, Bayesian and non-parametric forecasts. The five-year extrapolation method of Myrskylä et al. (2013) extrapolates recent age-specific trends in fertility five years into the future, and freezes the rate thereafter. This approach performs well when fertility at higher ages evolves in a continuous manner without interruptions. The freeze rate method of Ryder (1986) assumes that each subsequent cohort will experience the same age-specific fertility rates as those observed in the last period covered in the data (which in our case is 2021). Bayesian forecasting of fertility (Schmertmann et al., 2014) draws on a priori patterns over age and time informed by historical data in the Human Fertility Database and weighted based on historical plausibility (i.e. how common that scenario has been) under

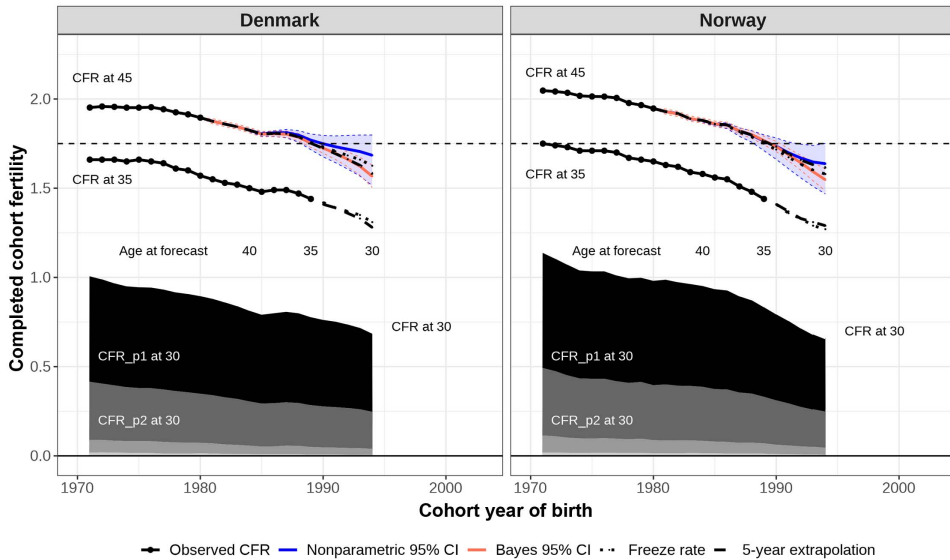
model-based assumptions for trends and age schedules. The Bayesian approach allows for probabilistic forecasts informed by history, but does so under strong modelling assumptions. The nonparametric approach of Hellstrand et al. (2020) relaxes parametric assumptions by applying recuperation paths at older ages to women with incomplete age schedules, allowing older age fertility in this group to increase following the main patterns in the historical data. We base the universe of fertility recuperation paths on data from the Human Fertility Database from which we derive nonparametrically a probabilistic distribution of potential trajectories for not yet observed ages.

Results

We first present results on the development in (expected) completed cohort fertility together with personal and general fertility ideals. For our forecasts, we assume that women's reproductive years end at age 44, and we forecast the expected CFRs only for women who were at least 30 years old in 2021. We further provide freeze rate and five-year extrapolation forecasts to age 35, as well as realised cohort fertility at age 30.

The results represent a seven-year update of results for Denmark and Norway from Hellstrand et al. (2021), as well as new comparisons to gain more insight into the timing of fertility decline along the life course. The observed and the forecasted cohort fertility are presented in Figure 2. For Norway, all methods predict a continuous decrease in the completed fertility quantum. Even the upper limit of the 95% confidence interval of the least drastic decrease (the nonparametric method) still predicts a continuous decrease to below 1.75 children per woman. Furthermore, in all forecasts, the median predictions are at or below the threshold for very low cohort fertility at 1.75 children per woman for the youngest cohorts. The median CFR predictions forecast a 16–21% decline relative to the 1980 cohort depending on the forecast technique used. For Denmark, the forecasts also predict a decrease in the CFR followed by a plateau, and then a further decrease, with little room for recuperation. The medians of all forecasts of the CFR for the youngest cohort are below the lowest-low rate, although the 95% confidence interval of the nonparametric method includes 1.75. The median predictions forecast a decline of 11–17% among the 1994 cohort relative to the 1980 cohort.

When we compare forecasts at age 45 with forecasts at age 35 and realised fertility at age 30, it is evident that declining fertility at ages below 30 is driving the decline. Figure 3 shows the ratios and absolute differences between cohort fertility at age 30 and observed/forecasted cohort fertility at ages 35 and 45. The ratios are increasing and showing similar shapes, which indicates that an increasing share of births will occur after age 30. At the same time, the absolute differences are much more constant, which suggests that there will be little relative change in the age structure of births above age 30. Further, as can be seen from Figure 2, first- and second-parity fertility rates at age 30 decline at similar rates, which indicates that the decline is driven by a decrease in first births before age 30 (as was also found in Hellstrand et al., 2021). In both Denmark and Norway, close to 60% of all births to the 1994 cohort are forecasted to occur after age 30, whereas less than half of all births to the

Figure 2 Realised/forecasted cohort fertility in Denmark and Norway

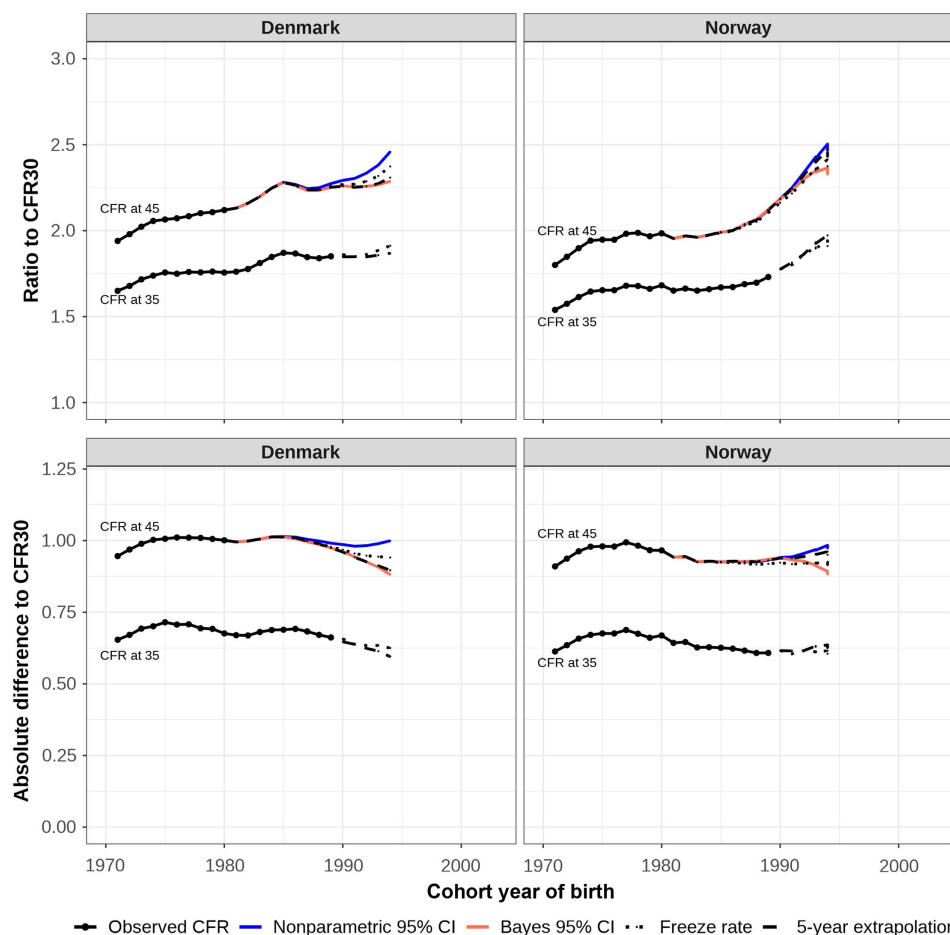
Notes: Dashed line indicates the threshold between low and very low cohort fertility at 1.75 (Zeman et al., 2018). Forecasts for age 35 are only produced using freeze rate and five-year extrapolation. CFR: Cohort fertility rate. CFR_p: Parity-specific cohort fertility rate. Parities higher than two are not labelled
Source: Statistics Denmark, Statistics Norway, Human Fertility Database (HFD, 2026)

1970 cohort occurred after age 30 (see Supplementary material [Figure S.1](#), available online at <https://doi.org/10.1553/p-m677-8z27>).

[Figure 4](#) reports the stated personal and perceived general family size ideals from the Danish and Norwegian GGS samples as fitted LOESS curves. In both Denmark and Norway, we see a larger difference between personal and general ideals among younger cohorts than among older cohorts (who also responded to the survey at younger ages). In general, younger cohorts report lower age-specific personal family size ideals relative to perceived general ideals. In both Denmark and Norway, there are some indications of a slight decline in personal family size ideals between the cohorts born in the early 1970s and the cohorts born in the 1980s (Norway) and 1990s (Denmark). Personal ideals are at roughly identical levels in the two countries. Unlike personal ideals, perceived general family size ideals are not declining. In Denmark, we observe a shallow U-shape, whereas in Norway, we find that general family size ideals are higher in recent cohorts.

[Figure 5](#) reports the differences between observed/forecasted cohort fertility and the two measures of age-specific family size ideals. We use the median forecasted parameter estimates and the standard errors obtained from the LOESS curves. Both the nonparametric and the Bayesian forecasts have their own error interval, so we reproduce the figure at upper and lower bounds of predictions in [Figure S.2](#) in the Supplementary Materials.

Figure 3 Ratio and absolute difference between observed/forecasted cohort fertility at age 35 and age 45 relative to observed cohort fertility at age 30

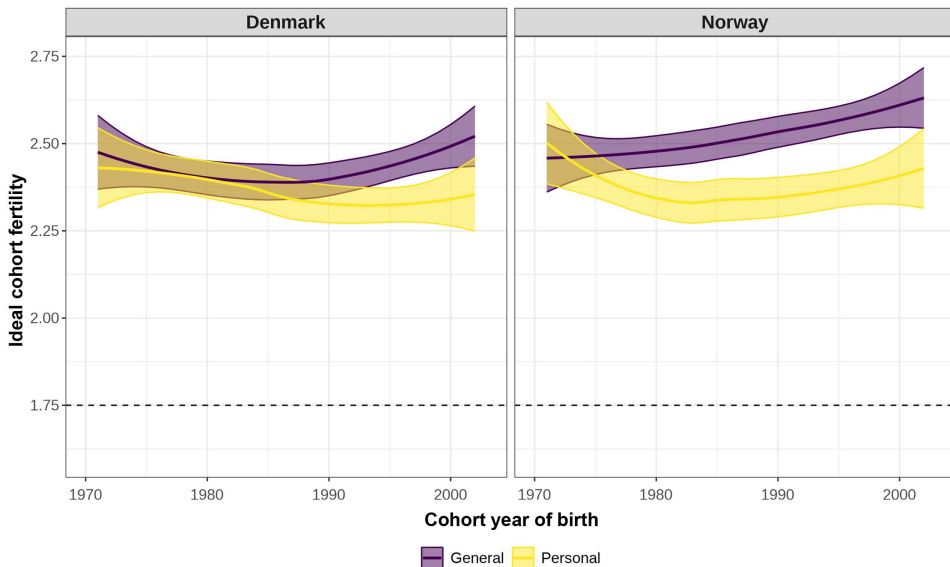


Notes: Ratio calculated as cohort fertility rate (CFR) at age 35 (45) over CFR at age 30. Difference calculated as CFR at age 35 (45) subtracted by CFR at age 30

Sources: Statistics Denmark, Statistics Norway, Human Fertility Database ([HFD](https://www.hfd.org/), 2026)

In Denmark, women express on average a personal ideal family size that is 0.5 children higher than they had/can expect to have across cohorts, with few indications of change until the cohorts born in the late 1980s and later, where we see a widening gap. Depending on the forecast type, the cohorts born in 1994 are forecasted to have 0.64–0.74 fewer children than their age-specific personal ideal. For perceived general family size ideals, we see first a slow and then a more drastic increase in the gap across cohorts. In Norway, we see an increasing gap between the personal ideal family size and the realised/forecasted number of children. Whereas women born in 1971 have 0.45 fewer children than their ideal number, that

Figure 4 Realised/forecasted cohort fertility and personal and general cohort fertility ideals (LOESS estimates) in Denmark and Norway



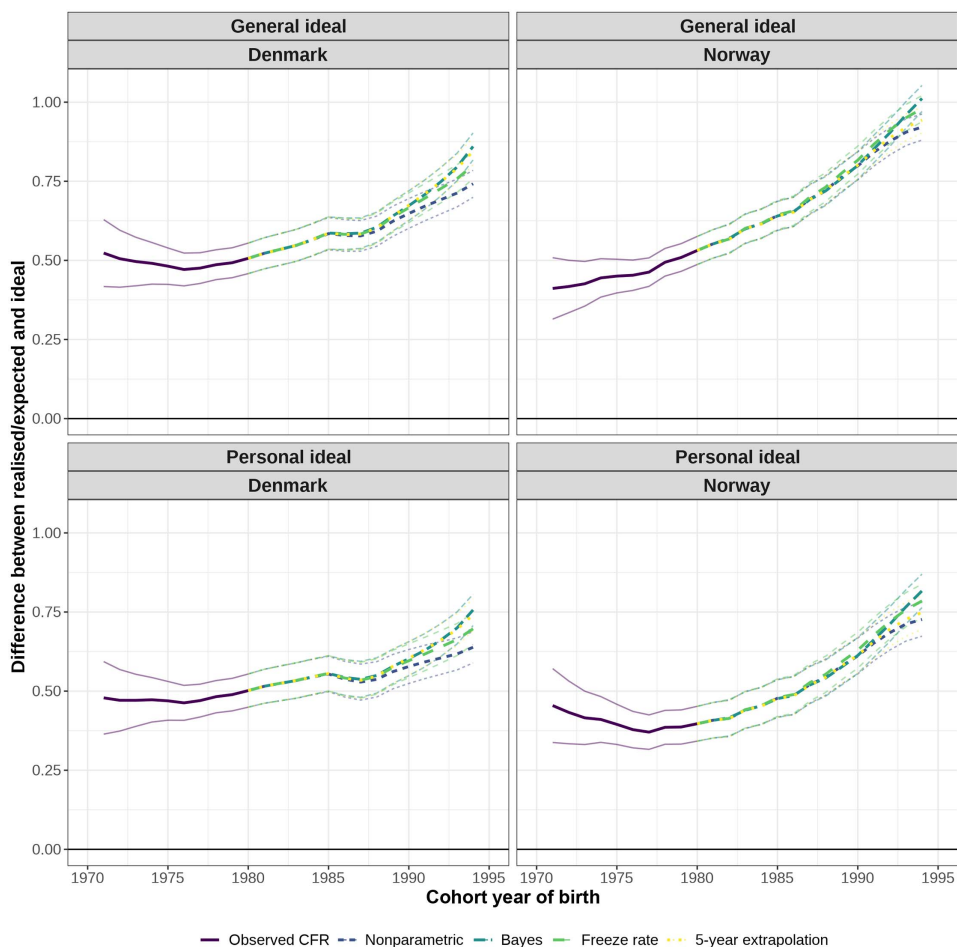
Notes: Ideal trends are estimated using LOESS with one-year bandwidth span and second-order polynomial in the bottom panel. Trends remain stable when the span is increased (decreased) by 50%. Dashed line indicates the threshold between low and very low cohort fertility at 1.75 (Zeman et al., 2018)

Source: Generations and Gender Survey 2020 for Denmark and Norway

difference decreases to 0.37 for the 1977 cohort, and then increases continuously to between 0.73 to 0.82 for the youngest (1994) cohort. The gap between perceived general family size ideals and realised/expected completed cohort fertility also increases. For the 1971 cohort, the gap was 0.41, whereas for the 1994 cohort, the gap grows to between 0.92 and 1.01. Thus, whereas the gap between the ideal family size and realised/expected cohort fertility in Denmark increases by 30–50% across older to younger cohorts, the gap appears to have doubled in Norway, where women are increasingly having fewer children than their ideal. At the upper and lower bounds of the prediction intervals (Figure S.2), few substantial differences are observed, although for the upper bound of the nonparametric forecast for Denmark the gap between ideal and forecasted fertility is constant across all included cohorts.

Discussion and conclusion

In this research note, we compared completed and forecasted completed cohort fertility among Danish and Norwegian women born between 1971 and 1994 with their personal and perceived societal family size ideals. Our updated cohort fertility forecasts predicted

Figure 5 Difference between ideal and realised/forecasted fertility in Denmark and Norway

Notes: Standard errors are obtained only from LOESS curves; 95% confidence intervals

Sources: Generations and Gender Survey 2020 for Denmark and Norway, Statistics Denmark, Statistics Norway, Human Fertility Database (HFD, 2026)

that in both Denmark and Norway, cohort fertility will continue to decline to reach a very low level. In both countries, we (unsurprisingly) found that fertility ideals were higher than realised/expected cohort fertility. Assuming that the age-specific stated ideal number of children remains constant across the life course, the gap in Denmark increases at a slower pace across cohorts than the gap in Norway. In Denmark, the gap is expected to increase rapidly only among the youngest cohorts, whereas in Norway, the gap is increasing across far more cohorts. Norwegian women's completed cohort fertility appears to be on track to fall increasingly short of their ideal number of children.

The present study is not without limitations. First, younger cohorts may overstate their ultimate ideals. Thus, our findings on the growing gap should be viewed as an upper bound for the younger cohorts, who may be expected to downgrade their ideal family size across the life course. Second, women with more years of education are overrepresented in the surveys (Dommermuth and Lappegård, 2021; Simonsen et al., 2021). If family size ideals differ across educational groups, the levels of the ideals may be affected. However, since cohort fertility does not differ substantially between educational groups in the Nordic cohorts who recently finished their childbearing careers (Jalovaara et al., 2019), we do not consider this issue to be overly concerning.

This study investigated whether declines in forecasted cohort fertility across the Nordic countries may be attributable to changing family size ideals. We found instead that ideals appear to be similar in Norway and Denmark, with only slightly lower personal fertility ideals being reported among recent birth cohorts. This suggests, insofar as the present forecasts are correct, that the increasing gap between ideal and forecasted fertility found for both countries (although less drastic in Denmark than in Norway) may reflect changing opportunity structures (Dey and Wasoff, 2010). Whatever the drivers, Norway (and Denmark to a lesser degree) might be facing an increasing unmet demand for children.

Supplementary materials

Available online at <https://doi.org/10.1553/p-m677-8z27>

Supplementary file 1. Figures S.1–S.2



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