Extended Abstract

From Fertility Intentions to Parenthood: Longitudinal Evidence on MAR, Involuntary Childlessness, and Well-Being

Mine Kühn[ab*], Zafer Büyükkeçeci[b], Mikko Myrskylä[bc]

[*]Corresponding author. Email: m.kuhn@tilburguniversity.edu

[a] Tilburg University, Netherlands

[b] Max Planck Institute for Demographic Research, Germany

[c] University of Helsinki, Finland

Abstract

Infertility affects an estimated 17.5% of adults worldwide and is increasingly recognized as a major public health concern. Medically assisted reproduction (MAR) provides a potential pathway to parenthood, yet the process is often lengthy, emotionally demanding, and uncertain in its outcome. Despite the growing prevalence of infertility and MAR use, little is known about how the broader process of trying to conceive—whether successful or not—affects well-being and health over time.

Using 14 waves (2008–2022) of longitudinal data from the German Family Panel (pairfam), this study investigates how well-being evolves before and after fertility attempts, shifting the analytical baseline to the onset of trying to conceive. We compare four groups: (1) those who conceived via MAR, (2) those who discontinued MAR and remained childless, (3) those who conceived naturally, and (4) those who remained involuntarily childless without treatment. Event-centered fixed-effects models trace changes in life satisfaction, mental health, physical health, and self-rated health across anticipation, short-term, and long-term periods.

Results show that involuntarily childless individuals—regardless of MAR use—experience persistent declines in life satisfaction and physical and self-rated health, whereas successful conception (natural or via MAR) is associated with recovery or stabilization of well-being. These findings suggest that it is involuntary childlessness, rather than MAR treatment itself, that underlies adverse outcomes.

By linking fertility attempts to multiple dimensions of well-being, this study broadens the childbearing–happiness framework and highlights the need for policies addressing the psychosocial and health inequalities associated with infertility and childlessness.

Introduction

Infertility affects an estimated 17.5% of adults worldwide and has become an increasingly important public health concern (World Health Organization, 2023). For many, medically assisted reproduction (MAR) offers a pathway to parenthood, yet the process is often prolonged, emotionally demanding, and uncertain in its outcome. Despite the growing prevalence of infertility and MAR use, relatively little is known about how these experiences—and their outcomes—affect broader aspects of individual well-being.

During the past decade, demographic research examining the link between fertility and well-being has expanded considerably. This literature shows that the transition to parenthood tends to increase well-being in the short term but is often followed by adaptation or even declines in life satisfaction over time (Balbo and Arpino, 2016; Kohler and Mencarini, 2016; Myrskylä and Margolis, 2014). Moreover, well-being itself is increasingly recognized as a determinant of childbearing, particularly in societies where fertility is a deliberate choice (Billari, 2009; Mencarini et al., 2018). However, this body of work typically neglects those who struggle to conceive or experience involuntary childlessness.

The growing use of MAR has further transformed the landscape of reproduction, allowing individuals to pursue parenthood despite biological constraints. Existing research, including longitudinal work by Tosi and Goisis (2021), has examined the mental health consequences of conceiving through MAR compared to natural conception, focusing primarily on changes before and after pregnancy and childbirth. However, these studies typically identify *the transition to parenthood* as the starting point. This focus overlooks the substantial emotional and psychological processes that occur earlier — *during the period of trying to conceive*, when expectations, uncertainty, and potential distress begin to accumulate (Greil et al., 2010).

Our study addresses these gaps by considering not only individuals' transitions into MAR treatment and childbearing, but also the initiation of *trying to conceive*. This distinction is crucial: it enables us to capture the anticipatory and cumulative mental and physical health effects of reproductive efforts, which begin well before conception and may continue even in the absence of a live birth (Greil et al., 2010). Using 14 waves (2008–2022) of nationally representative longitudinal data from the German Family Panel (pairfam), we trace changes in individual well-being and health across three key stages—anticipation (≤2 years before), short-term (0–2 years after), and long-term (>2 years after)—of (1) trying to conceive, (2) undergoing MAR treatment, and (3) experiencing childbearing.

In further analyses, we focus on couples who are trying to conceive, which allows us to account for selection into parenthood, as individuals with higher levels of well-being may be more likely to pursue parenthood, introducing potential bias. Within this selected group, we define four categories based on the combination of MAR treatment and its outcome: those who conceived naturally, those who conceived through MAR (MAR+), those who underwent MAR but did not achieve a live birth (MAR−), and those who remained involuntarily childless without treatment. We first examine differences in well-being across these groups at the onset of trying to conceive to capture baseline associations and then analyze how their well-being trajectories evolve over time since the initiation of attempts to conceive.

Our study contributes to literature in four ways. First, we expand the childbearing–well-being framework by integrating experiences of infertility and MAR, moving beyond simple parenthood comparisons. Second, we shift the analytical baseline to the onset of trying to conceive, allowing us to trace how well-being and health changes from the initial decision to pursue parenthood through subsequent stages of treatment, success, or continued childlessness, thereby considering selection into parenthood and capturing anticipatory and adaptive processes. Third, we assess multiple dimensions of well-being and health —life satisfaction, mental health, and physical health—providing a more holistic picture of how fertility processes intersect with subjective and functional health. Fourth, we use within-person fixed-effects models to reduce selection bias and identify within-individual changes, offering new policy-relevant insights into how infertility and MAR contribute to health inequalities in the context of delayed parenthood and reproductive stratification.

Data

Data Set and Sample

We use 14 waves of longitudinal data from the German Family Panel (pairfam), collected between 2008 and 2022 (Brüderl et al., 2020; Huinink et al., 2011). Pairfam provides detailed information on family dynamics, fertility intentions, health, and well-being, making it well suited to study the long-term consequences of medically assisted reproduction (MAR) and involuntary childlessness. The analytical sample comprises respondents who were actively trying to conceive. Respondents are grouped into four fertility outcome categories: (i) natural conception—couples who conceived naturally after trying; (ii) involuntarily childless—those who remained childless despite trying; (iii) MAR−—couples who underwent MAR but did not conceive; and (iv) MAR+—couples who received MAR and successfully conceived. Respondents were included if they had at least one valid observation prior to and one after attempting

conception. Data are structured at the person-wave level, allowing multiple observations per individual across waves. Cases with missing data on key variables were excluded.

Well-being and health outcomes

We examine four dimensions of well-being and health. Life satisfaction is measured on an 11-point scale ranging from 0 ("completely dissatisfied") to 10 ("completely satisfied"). Self-rated health provides a general assessment of overall health. Mental and physical health are captured by the Mental Component Summary (MCS) and Physical Component Summary (PCS) derived from the SF-12, which in turn is based on the SF-36 instrument (Ware et al., 1996).

Controls

We include a quadratic term for age to account for potential nonlinear life course effects. To capture changes in well-being over time, we interact the four fertility pathways with the quadratic term for the duration since the initiation of trying to conceive, estimated within a growth curve modeling framework. The models additionally control for key relationship and sociodemographic characteristics, including a quadratic term for union duration, marital status, educational attainment, educational homogamy between partners, the age difference within the couple, and the woman's partnership order.

Statistical analysis

We use event-centered fixed-effects models to estimate within-person changes in well-being around fertility-related events, isolating the effects of attempts to conceive, MAR treatment, and the transition to parenthood. Three temporal windows are considered: anticipation (≤2 years before the event), short-term (0–2 years after), and long-term (>2 years after).

To disentangle the combined impact of MAR and parenthood, we estimate models including both factors simultaneously. Additionally, we use a group-based approach comparing natural conception, involuntarily childless, MAR−, and MAR+ respondents. This allows us to trace long-term trajectories of life satisfaction, mental health, physical health, and self-rated health, providing a comprehensive view of how fertility experiences shape well-being over the life course.

Results

Figure 1 presents the estimated anticipation, short-term, and long-term effects of trying to conceive, undergoing MAR treatment, and transitioning to parenthood on four well-being dimensions. Life

satisfaction increases significantly during the anticipation phase of trying to conceive and continues to rise in the short- and long-term following parenthood. These patterns suggest that both fertility planning and the transition to parenthood are associated with heightened subjective well-being over time. Depressive symptoms show a somewhat different trajectory. Anticipation of trying to conceive is associated with higher depressive symptoms, indicating psychological strain during early fertility attempts. However, symptoms decline markedly following the birth of a child, pointing to an improvement in mental health after successful parenthood. In contrast, undergoing MAR treatment is linked to elevated depressive symptoms in both the anticipation and short-term phases, reflecting the emotional burden and uncertainty of treatment. Associations with physical and mental health are statistically insignificant. potential measurement limitations in the data.

Figure 1: Anticipation, short-term, and long-term effects of trying to conceive, undergoing medically assisted reproduction (MAR), and becoming a parent on life satisfaction, depressive symptoms, and physical and mental health**.**

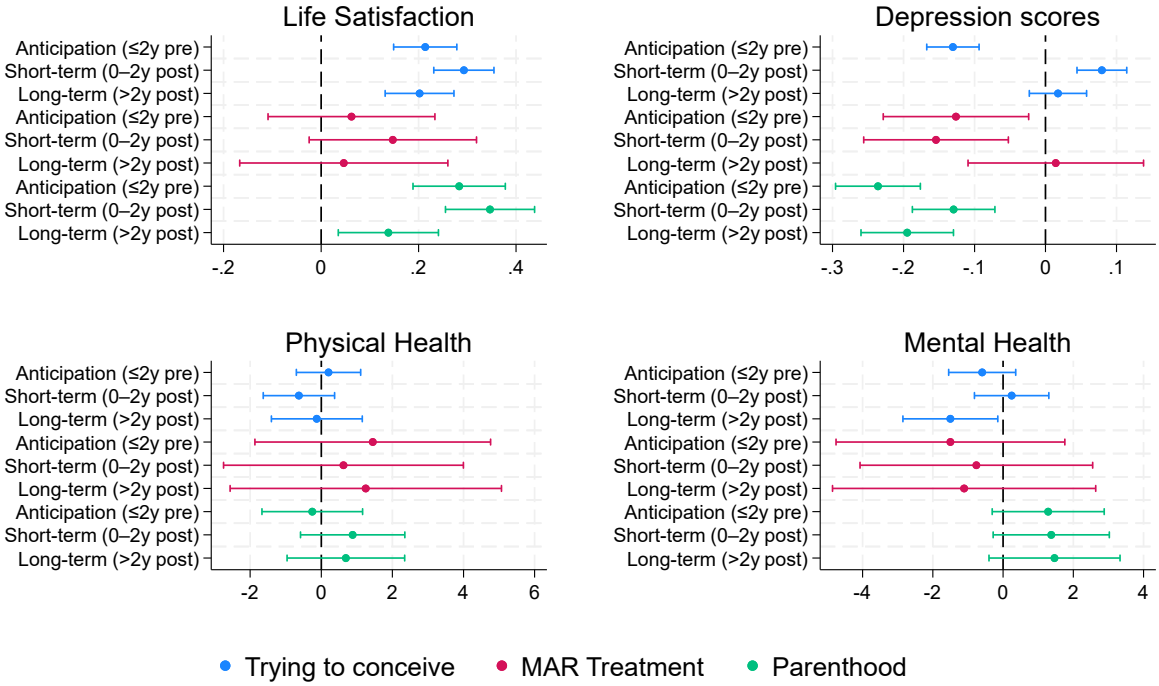
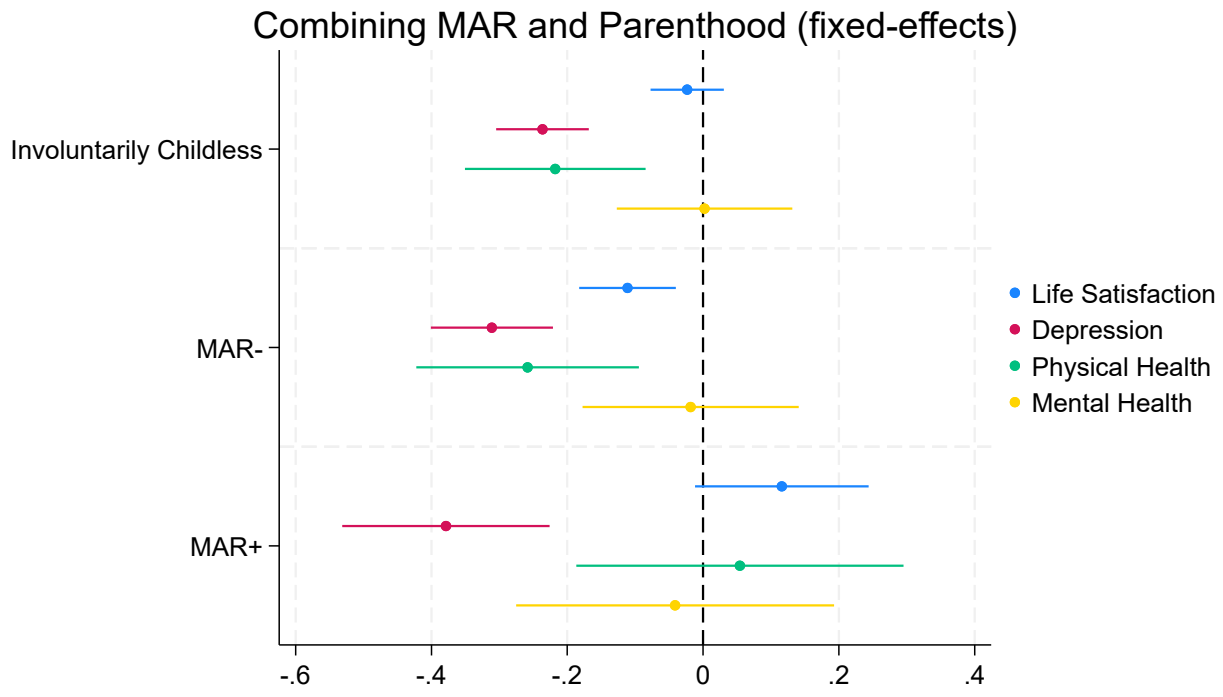


Figure 2 shows the results for the combined associations of MAR treatment and parenthood status with individual well-being and health. Compared to individuals who conceived naturally, those who underwent MAR treatment but remained childless (MAR−) report substantially lower life satisfaction. In contrast, individuals who conceived through MAR (MAR+) exhibit higher life satisfaction than their counterparts

with natural conception, suggesting that the successful resolution of infertility through treatment can yield long-term well-being benefits that may even exceed those of spontaneous conception.

Depressive symptoms display a different pattern. All three groups—MAR−, MAR+, and the involuntarily childless—show lower levels of depressive symptoms compared to parents with natural births. Mental health, measured through the standardized mental component summary score, however, shows no statistically significant differences across groups. In terms of physical health, both childless groups—MAR− and involuntarily childless—report significantly poorer outcomes relative to parents, irrespective of conception mode. These patterns suggest that while subjective well-being and depressive symptoms are responsive to reproductive experiences, physical health differences are more structural and persistent.

Figure 2: Fixed effects on life satisfaction, depressive symptoms, physical and mental health among individuals who are trying to conceive.



Note: Natural births are the reference category.

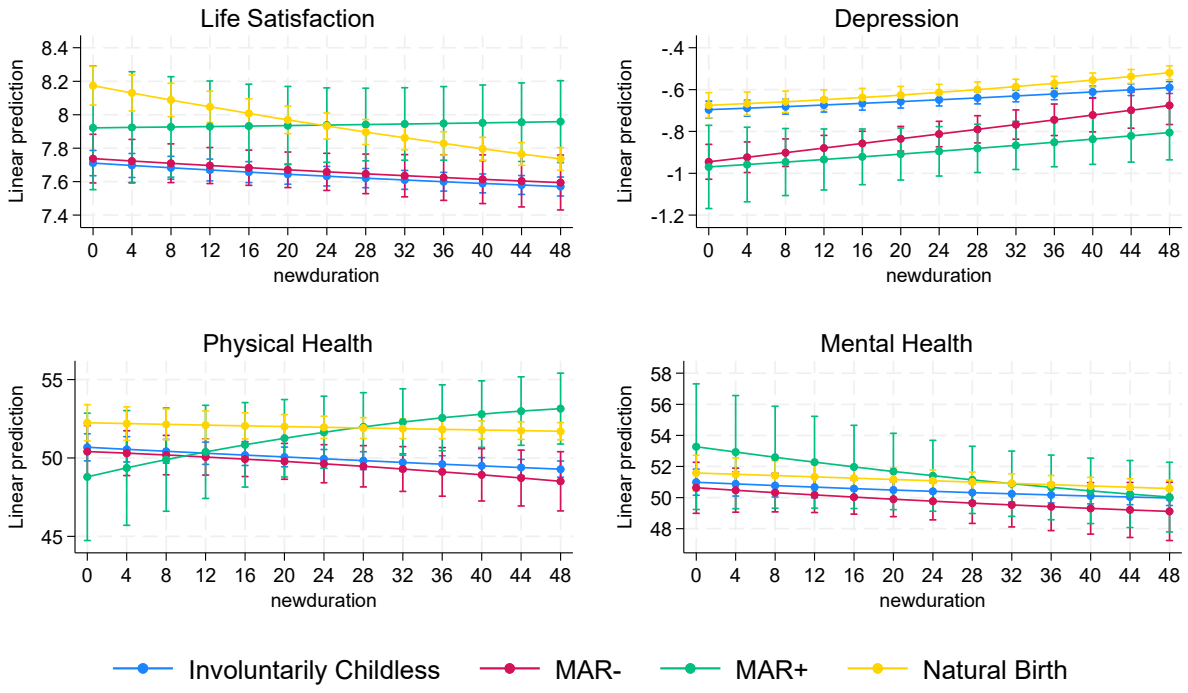
Figure 3 illustrates long-term trajectories of life satisfaction, depressive symptoms, and physical and mental health across fertility pathways. Individuals who conceived naturally display the highest levels of life satisfaction around the time of birth, but their satisfaction declines sharply in the years that follow, consistent with prior evidence of adaptation after parenthood. In contrast, those who conceived through

MAR (MAR+) experience a gradual rise in life satisfaction over time, eventually surpassing the levels of natural parents approximately three years after conception. This pattern suggests that the emotional rewards of achieving parenthood after a prolonged fertility struggle may yield more sustained improvements in subjective well-being. Both childless groups—those who discontinued MAR (MAR−) and those who remained involuntarily childless without treatment—exhibit persistently lower life satisfaction.

For depressive symptoms, we observe that individuals in both MAR groups report consistently lower depression levels than those with natural births or involuntary childlessness, suggesting potential psychological resilience or relief following treatment experiences.

Physical health outcomes reveal that childless individuals—regardless of treatment history—show poorer health trajectories, with differences becoming more pronounced over time. In contrast, no consistent or statistically significant differences emerge for mental health across the groups. The results highlight substantial divergence in well-being patterns over time depending on conception mode and childbearing outcomes.

Figure 3: Well-being trajectories among individuals who are trying to conceive.



Note: Baseline is the first year of trying to conceive.

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