OLDER MATERNAL AGES, INCREASING RATES OF PLANNED BIRTHS, AND SHIFTS FROM BIRTHS WANTED LATER TO BIRTHS WANTED SOONER

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Abstract

Using two questions from the Pregnancy Risk Assessment Monitoring System, available for seven states in 2007-2020 and for 14 states in 2012-2020, we analyze the contribution of increasing maternal ages to switches in births timing in the United States. We investigate trends in births by their intended timing status and trends in births by, when they were conceived, whether the woman was trying to get pregnant and, if not, whether the woman was using contraception. Increasing maternal age explains two thirds of the increase in births conceived when women were trying to get pregnant, and half of the decreasing rates of births conceived when using contraception ("contraceptive failure"). Regarding timing, about one-third of the decrease in births wanted later and half of the increase in births wanted sooner is explained by increasing maternal ages. Our findings about age and implications are largely similar for all women and for Black women.

Note. We use women and mothers to refer to people interviewed in PRAMS to remain consistent within the text and within the current body of literature. We acknowledge that not all birthing individuals identify as women or mothers.

Introduction

In the U.S., the proportion of 'unintended' pregnancies resulting in births—defined as those births from pregnancies occurring 'earlier than desired' or as 'unwanted'—declined markedly through to the late 2000s, driven largely through declines in the 'earlier than desired' share. This shift marks an important milestone given longstanding concerns about the prevalence and consequences of unintended pregnancies, particularly among more disadvantaged women (Barber and Steinberg 2022; Finer and Zolna 2016; Kost and Lindberg 2015; Kost, Maddow-Zimet, and Little 2021; Lindberg et al. 2015). However, the proportion of 'intended' pregnancies resulting in births—defined as those occurring 'later than desired' or 'at the right time'—increased primarily due to a rise in those classified as 'later than desired'. Kost and colleagues (2023) reported significant changes between 2009 and 2015 in the categories that could be labeled as mistimed—'earlier than desired' and 'later than desired'—along with only modest changes of pregnancies and births occurring at the 'right time' or 'unwanted'. Between 2009 and 2015, the share of 'earlier than desired' pregnancies resulting in births declined from 22.0% to 17.5%, while that of 'later than desired' pregnancies resulting in births increased from 8.3% to 11.1% (Kost et al. 2023). The upward trend of 'later than desired' pregnancies resulting in births has received less attention than has the downward trend in earlier than desired' pregnancies resulting in births. However, pregnancies occurring later than desired are appropriately also described as 'mistimed,' and potentially linked to adverse health outcomes for children (Hartnett and Margolis 2019).

In the present study, we analyze data from the Pregnancy Risk Assessment Monitoring System (PRAMS) through 2020 to assess the contribution of changes in the composition of maternal ages to the upward trends of 'later than desired' pregnancies resulting in births, and the

downward trends of those occurring 'earlier than desired'. This follows analyses by Kost and colleagues who revealed significant increases of births happening 'later than desired' and decreases of those occurring at 'right time' among women aged 35-44 (Kost et al. 2023), and by Hartnett and Margolis (2020) who documented that mothers who reported that their births were 'later than desired' are older, more educated, and more likely to be mothers for the first time. It has long been noted that younger mothers—particularly those under age 25—have consistently been more likely to report that their births occurred 'too soon' (Finer and Henshaw 2006; Finer and Zolna 2011; Kost and Forrest 1995). However, whether rises in births perceived as 'later than desired,' are simply due to shifts towards older maternal ages has been yet to be thoroughly explored.

We also consider the role of the maternal age distribution in changes in a related but underused PRAMS measure, that of the 'planned' status of pregnancies resulting in births. 'Planned births' may be defined simply as those resulting from pregnancies when 'trying to get pregnant,' a question which is included for a subset of states in the PRAMS. Also asked in these states is, for women who were *not* trying to get pregnant, whether they were using contraception. The latter allows us to distinguish 'contraceptive failure' from 'contraceptive non-use' as reasons for 'unplanned' pregnancies resulting in births.

We conduct overall analyses and separate analyses for Black women who have long had substantially higher rates of unintended and unplanned births compared to White and Latino women—with this disparity persisting after controlling for sociodemographic characteristics (Higgins, Kramer, and Ryder 2016; Sweeney and Raley 2014). Black women have faced both greater barriers to contraceptive access and greater provider coercion in contraceptive decision-making (Harris and Wolfe 2014). However, like U.S. women overall, Black women have also

experienced marked increases in maternal ages. Thus we explore also the extent to which increases in maternal ages themselves can explain changes in perceived timing and planned statuses of pregnancies resulting in births among Black women through 2020.

In the following sections we discuss reasons explaining rising maternal ages and their potential connection with intentions and planning. Next, we present data and methods, results, and conclusions.

Maternal Ages

Across recent decades, the U.S. has experienced sustained increases in maternal ages, as seen in a considerable drop of mothers younger than 20 and rise of those 30 or older (Bureau n.d.; Martin et al. 2010; Mathews and Hamilton 2016; Osterman et al. 2022), and increases in mean age of mothers. By 2023, 37% of births were from mothers older than 30. This trend toward older motherhood is evident across racial and ethnic groups (Brown et al. 2025).

Rising maternal ages are found across high-income countries, and are explained by several economic and social changes (Balbo, Billari, and Mills 2013; Beaujouan 2020; Miller 2011; Mills et al. 2011; Neels et al. 2017; Ní Bhrolcháin and Beaujouan 2012; Rendall et al. 2010; Sobotka and Beaujouan 2018). One contributor to increases in maternal age has been use of more effective contraceptive methods which enable greater control over fertility timing (Kost, Finer, and Singh 2012; Mills et al. 2011). Other contributors have been higher participation in education, leading to the postponement of motherhood through inhibiting childbearing during the time of educational enrollment, increasing women's participation in the labor force, and delays in union formation (Neels et al. 2017; Ní Bhrolcháin and Beaujouan 2012; Rendall et al. 2010). Underscoring the importance of education, in the U.S., the average age of first birth for women who completed a 4-year college degree is 28, compared to 25 among those who completed High

School as their highest education level (Guzzo and Hayford 2020). Greater participation in the labor force has also change the timing of motherhood; women, especially those more educated, tend to postpone childbearing until they have secured desired job positions, wages and stability, and to when they anticipate lower penalties for employment interruptions (Balbo et al. 2013; Martin 2021; Mills et al. 2011; Shreffler 2017; Sobotka and Beaujouan 2018). This also implicates gender inequality in the labor market and within households as contributing to fertility postponement (Adsera 2004; Balbo et al. 2013; Beaujouan 2020; Guzzo and Hayford 2020; Mills et al. 2011; Perry-Jenkins and Gerstel 2020).

For younger cohorts—being those driving the shift toward older motherhood—achieving financial security has become an increasingly salient factor in decisions about whether and when to have children (Geist and Brauner-Otto 2017; Greulich and Rendall 2021; Guzzo and Hayford 2020; Lebano and Jamieson 2020; Martin 2021; Mills et al. 2011; Sobotka and Beaujouan 2018). At the same time, recent adverse macroeconomic conditions—such as the Great Recession— have had lasting impacts in fertility and the postponement of childbearing (Seltzer 2019; Sobotka, Skirbekk, and Philipov 2011). Delays in motherhood also reflect shifts toward delays in union formation (Balbo et al. 2013; Mills et al. 2011; Sobotka and Beaujouan 2018). Higher expectations about parenthood, and of the quality and stability of relationships have changed perceptions about the 'right' time to have a child (Guzzo and Hayford 2020; Lebano and Jamieson 2020; Martin 2021).

Taken together, these social transformations suggest that declines of younger mothers may reflect successful postponement of childbearing towards births from pregnancies occurring at 'the right time' in their reproductive years, instead of from pregnancies reported as 'earlier than desired.' That is, the trend toward older mothers may indicate that individuals have greater

autonomy in deciding when to have children, potentially contributing to a growing share of births classified as both optimally timed and 'planned'. At the same time, for some women, delayed fertility may be driven by conditions that do not necessarily shift their perceptions about the ideal timing to have a child, and instead generate an increasing the share of births happening 'later than desired'.

Data and Method

Data

To analyze the contribution of time trends in maternal age on changes in birth timing and planning we use two questions included in the Pregnancy Risk Assessment Monitoring System (PRAMS) (CDC 2025). We first analyze changes in each category of the standard 'pregnancy intentions' question. Additionally, we investigate trends in births by, when they were conceived, the woman was trying to get pregnant ('planned births') and, if not, whether the woman was using contraception. We evaluate these trends between 2007 and 2020 of 'trying to get pregnant', 'not trying to get pregnant while using contraception', and 'not trying to get pregnant while not using contraception'; and trends of the standard five categories of the pregnancy intention question between 2012 and 2020.

The PRAMS is a CDC coordinated, ongoing state-level surveillance system that combines birth certificate data and survey data on a representative sample of women who delivered a live-born child in a given calendar year. Each participant state/area designs a stratification methodology based on characteristics of interest. The CDC's weighted schemas allow to combine state/area level estimates (Shulman et al. 2018). Each state/area adheres to the

CDC's data collection protocol and to its yearly response rate threshold, which changed from 65% in 2007 to 50% in 2020 (CDC 2023; Shulman et al. 2018).

Major advantages of the PRAMS data are that surveys are annual and the combined sample sizes across participating states are very large, making PRAMS especially valuable for trend analyses, including trends by population subgroup. The 'trying to get pregnant' question is optional across PRAMS participating states, and therefore, we are able to analyze a smaller set of states (seven) compared to those with data available for the intendedness measure. However, the seven states have included the same question going back to 2007, the beginning of the long-term trend of increase in maternal age at childbearing (Mathews and Hamilton 2016).

The questionnaire can be answered up to one year after the delivery and is answered by mail or telephone. The questionnaire covers maternal behaviors and experiences before, during, and after the index birth. It includes questions about the woman's pregnancy intentions, plans, and contraceptive behavior around the time that she became pregnant with the index birth. All state/areas apply the core questionnaire that includes the standard 'pregnancy intention' question and decide whether to implement the standard questionnaire, which includes the 'trying to get pregnant' question (Shulman et al. 2018).

We use data from phases 5 to 8 (years 2007 to 2020) and create two balanced samples of states according to the inclusion of 'trying to get pregnant' (2007-2020) and state/area participation since 2012, reflecting the inclusion of "unsure" in the pregnancy intentions question (Maddow-Zimet and Kost 2020). Seven states asked whether mothers were trying to get pregnant

and contraceptive use among those who were not, years 2007 to 2020[1]; and seven additional states and New York City participated [2], years 2012 to 2020.

We exclude 1.5% of respondents because their child was not living with them at the time of the survey, and 5.2% and 5.5%[3] of each sample because of missing data. For each sample, we create subsamples of Black respondents. The final 'trying to get pregnant' sample has 109,971 and 11,470 Black respondents, and the intention sample has 144,867 and 22,318 Black respondents.

Measures

The intention measure has been, sometimes, misused as a measure of 'births planning' with especially detrimental consequences for women from disadvantaged groups. (Aiken et al. 2016; Auerbach et al. 2023) Evidence supports complexity in the association between intentions, planning and contraceptive use. For example, some 'intended' pregnancies happen while using contraception (Arteaga, Caton, and Gomez 2019). Therefore, pregnancy intentions, planning, and contraceptive behavior measure different constructs. (Aiken et al. 2016; Auerbach et al. 2023; D'Angelo et al. 2007; Greil et al. 2023; Mosher, Jones, and Abma 2012). By employing both measures, we aim to more effectively disentangle trends in perceptions of birth timing and planning.

Pregnancy intentions

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[1] Delaware, Illinois, Massachusetts, Maine, New Jersey, Pennsylvania, and Washington.

[2] Alaska, Maryland, Missouri, New Mexico, Utah, Wisconsin, and Wyoming.

[3] Unweighted percentages.

In all states a question is included in the core PRAMS questionnaire that asks about pregnancy "intention" as follows: "Thinking back to just before you got pregnant with your new baby, how did you feel about becoming pregnant?" Beginning in 2012, response options have been: "I wanted to be pregnant later," "I wanted to be pregnant sooner," "I wanted to be pregnant then," "I didn't want to be pregnant then or at any time in the future," and "I wasn't sure what I wanted." Before 2012, the "unsure" response option was not available to respondents, and the fractions of women choosing it since 2012 have been substantial(Maddow-Zimet and Kost 2020). Because of the resulting discontinuity in the other four response options, we analyze births by "intentions" statuses only since 2012.

Trying to get pregnant

Since 2007, states have had the option of including a question asking women whether they were trying to get pregnant when they conceived the index birth: "When you got pregnant with your new baby, were you trying to get pregnant?" We classify those who responded, "yes," as having had a "planned pregnancy." Those who responded, "no," were then asked if they were using contraception: "When you got pregnant with your new baby, were you or your husband or partner doing anything to keep from getting pregnant?" We refer to those who were using contraception at the time they got pregnant as having experienced "contraceptive failure" and as distinct from those who were "not trying to get pregnant and not using contraception." We refer to these questions, used since 2007, as the "planning" questions because they allow us to separate "planned" from "unplanned" pregnancies (two categories) and to further distinguish "unplanned" pregnancies from conception between those using versus not using contraception (a total of three categories).

Mother's Age

We use two measures of age. A seven age-group (<=17, 18-19, 20-24, 25-29, 30-34, 35-39, 40+) and a continuous version based on year of birth.

Year

Our measure of time corresponds to the year of the interview.

Covariates.

To better isolate the relationship between maternal age and the outcomes, we incorporate sociodemographic and reproductive characteristics as controls based on literature on pregnancy intentions and maternal age. Access to contraception varies between states (Rice et al. 2022) and by insurance status (Johnston and McMorrow 2020). We include State/area, and a dummy for mothers Medicaid insured before, during, or after birth. We also code a dummy distinguishing between married and not married women [4] (Mosher et al. 2012; Musick et al. 2009). Our education variable has categories 'lower than high school graduate', high school graduate', 'some college', and 'bachelors plus'. Attending to differences in unintended pregnancies and maternal ages (Mathews and Hamilton 2016; Mosher et al. 2012); mothers are classified as 'Not Hispanic White', 'Not Hispanic Black', 'Latina', 'Asian', and 'other'. Maternal ages have increased mostly through delays of first births (Matthews and Hamilton 2014), and higher-order births are more likely unintended (Mosher et al. 2012). We identify whether births are 'first', 'second/third', or 'fourth or higher' order. We also code a dummy for pregnant (vs non-pregnant), single delivery (vs multiple), and the number of months after birth.

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[4] We are unable to consider cohabitations in the marital status variable.

Analyses

Age Standardization and Decomposition:

We compare age-standardized to the first year of the period (2007 or 2012) with observed

proportions and calculate what fraction of these changes would not have happened without

changes in mothers' age composition. Using mother's distribution in and their outcome

distribution in the first year of our series (2007 for trying and 2012 for intentions), we estimate

standardized age-specific probabilities for each year after. Next, we estimate what proportion of

the change was due to changes in the distribution of mother's ages between 2007 or 2012 and

2019. We chose 2019 as the final year for decomposition analyses because 2020 data was

collected when the pandemic started, a context that could make motherhood experiences less

comparable to previous years. We conduct these analyses for all and Black women separately.

Multivariate analyses:

We also conduct multivariate analyses. We use multinomial logistic regressions (MLR) to assess

the role of age (continuous) on yearly changes in trying or not trying to get pregnant (three

categories) and intentions (five categories), reference categories are 'planned birth' for trying or

not trying to get pregnant (Table 4) and 'then' for intentions (Table 5). In Model 1, we control by

state and year, add mothers' age in Model 2, and sociodemographic characteristics and

reproductive characteristics in Models 3 and 4, respectively. Both year and age are modeled as

linear associations with the outcomes. We conduct these analyses for all and Black women

separately.

For all analyses, we use recommended weights by CDC to account for attrition and the

state/area stratification methodology. All analyses were conducted in Stata 17 (StataCorp).

Results

Overall Trends

Figure 1 shows a yearly rise in the share of planned births, from 52.5% in 2007 to 61.2% in 2020. The share of births to non-contraceptive users remained stable at around one-fourth, while births resulting from contraceptive failure decreased from 21.8% in 2007 to 14.6% in 2020. Figure 2 illustrates the continuous decline of unintended pregnancies from 29.5% in 2012 to 21.1% in 2020, and the upward time trend of births wanted then or sooner. The proportion of unwanted births remained stable, the 'unsure' category increased from 12% to 15%, and those wanted by then increased 5%. In terms of birth timing, wanted later' births decreased by one-third over the period (from 23% to 15%), and 'wanted sooner' births increased from 15% to 17.8%.

[FIGURES 1 and 2 ABOUT HERE]

Age standardized and decomposition

Figures 3 and 4 show standardized and observed proportions for each outcome, for All and Black women. As seen in Figure 3, half or more of All women were trying to get pregnant before their last birth throughout the 2007-2020 period, whereas this was true for about one-third of Black women. This fraction, however, grew strongly for both groups – from 52% to 62% and from 25% and 35%, respectively. Of the two categories of 'not trying to get pregnant', the largest difference between Black and All women, we observe a fairly stable fraction of no contraceptive users, which increased from 41% to 45% between 2007 and 2020 for Black women, while decreased slightly for All women. The fraction of births following use of contraception

("contraceptive failure") was lower for All women than for Black Women throughout the 2007-2020 period, but declined for both groups, and more for Black women (from 33.5% to 24.6%).

[FIGURE 3 ABOUT HERE]

We discuss the differences between the observed (darker colors) and age-standardized proportions (lighter colors) between 2007 and 2019, noting that the year 2020 tended to be somewhat exceptional, possibly due to the COVID-19 pandemic period of births and survey data collection from the mother.

The 2007-2019 standardized series show that without changes in age, the increase in the fraction of planned births would have been substantially lower. We estimate that two-thirds of the 5.9% increase for All and three-fourths of the 7.5% of the increase for Black women were due to changes in age (Table 1). For All women, the fraction of non-contraceptive users would have increased slightly without age-distribution changes, whereas the observed change was a slight decrease. However, changes toward older mothers suppressed a substantially higher increase of non-contraceptive users among Black women (5.6% vs 1.3%). Age composition also contributed, but less, to the downward trends of contraceptive failure for both groups.

[FIGURE 4 ABOUT HERE]

Regarding intentions, compared to all women, Black women had a consistently higher proportion of births wanted later and of those perceived happening when they were 'unsure', and, by 5%, of unwanted births. They also had a consistently much lower, by 20 percentage points, fraction of births 'wanted then'. However, Black mothers also had a lower fraction, by 5%, of births wanted sooner.

14

Without changes in the age distribution of mothers, the observed decrease in births from pregnancies 'wanted later' and the observed increase in births from pregnancies 'wanted sooner' would both have been smaller. Through visual examination, the lower overlap between darker and lighter lines in Figure 4 suggests that changes in age composition were more relevant for Black women. However, for both all women and Black women, the changing maternal age distribution has less impact on the proportions of 'unwanted' and 'unsure' births. For all women, we estimate that one-third of the 5.2% drop in wanted later births, half of the 2.0% increase of those wanted sooner, and almost all the increase of births wanted by then (1.2% higher in 2019) were due to changes in age composition (Table 2). For Black women, we also find one-third of the 7.5% lower percentage of wanted later births, half of the 2.6% higher proportion of wanted sooner, and almost all the increase of births wanted then (1.4% higher in 2019) were due to changes in the age composition. However, for Black women, one-fourth of the 2.3% decrease of unwanted births was also due to change in the maternal age distribution.

Women's characteristics by 'trying-to-get-pregnant'

Tables A1–A4 (Appendix) present sociodemographic and reproductive characteristics across categories of pregnancy intention and trying to get pregnant. Women reporting a 'planned birth' are older than those in the 'not trying' categories (mean age 31.0), they are more likely to be White (66.7%), married (80.1%), and more than half hold a college degree (Table A1). One-quarter had Medicaid before, during, or after their birth, compared to over half of mothers in the 'not trying' categories. Similarly, Black women who had a 'planned birth' are also older (mean age 29.6), more likely to be married (45.6%), to have completed a college degree (26.7%), and

less likely to be insured through Medicaid relative to those who were 'not trying' (Table A2). Planned births do not differ in terms of parity.

Regarding the intentions categories, unsurprisingly, for all women and for Black women, those who answered they wanted their births 'sooner' are the oldest (mean age 31.9 and 31.5, respectively). They are also more likely to have a college degree, to be White, and to be married. Women in the 'wanted later' category are the youngest (mean age 26.9 and 26.1), less likely to have a college degree (compared to all but the 'unwanted' category). Equally for all and Black women, half of births wanted 'sooner' or 'later' are first births, compared to higher concentration of higher other births in other categories (e.g., 80% of unwanted births).

We also present the distribution of trying to get pregnant by intentions (Table A3). 80% of All women who wanted their births 'sooner' or 'then' were 'trying to get pregnant'. The fraction is 16.1% for those unsure, 9.5% of those who wanted the birth to be 'later', and 5.6% of those who did not want the birth then or any time. Contraceptive failure was disproportionally higher among unintended births, but more common among unwanted births (54.7% of unwanted births and 45.7% of 'wanted later'). The results for Black women mirror those of all women— approximately 70% of births perceived as 'wanted sooner' or 'on time' occurred when 'trying to get pregnant', while two-fifths of those reported as 'wanted later' or unwanted occurred while using contraception (Table A4).

Multinomial Logistic Regressions

[TABLE 3 ABOUT HERE]

We next present results from multivariate analyses. In Table 3, for all women, the chances of no contraceptive use and contraceptive failure decrease by 2% and 6% each additional year (aRRRs 0.980 and 0.959, respectively). Maternal age explains half of the negative time trend of not using contraception (year's aRRR changes from 0.980 to 0.993), and one-fourth of the negative trend of contraceptive failure (year's aRRR changes from 0.959 to 0.973). The relatively lower chances of no contraceptive use and contraceptive failure (compared to 'trying to get pregnant') across years, increases after adding sociodemographic and reproductive characteristics (Models 3 and 4). However, age remains statistically significant in these models; and each additional year is associated with a 5% lower chance of becoming pregnant when not trying.

Age explains almost all the decrease of 'not trying and not using contraception' of Black women (year's aRRR changes 0.982 to 0.996); and contributes marginally to the negative trend of contraceptive failure. After adding sociodemographic and reproductive characteristics, the relatively lower chance of not using contraception with each additional year remains, but differences are not statistically significant (p-value >0.05). Conversely, age remains a negative and strong predictor across models (p-value ≤0.001). Covariates included in Model 3 and 4 moderate the downward time trend of contraceptive failure.

[TABLE 4 ABOUT HERE]

Consistent with our decomposition analyses, Table 4 shows some changes in pregnancy intentions being substantially explained by changes in maternal ages. Women wanting a pregnancy 'later' decreased as a function of year and age. Controlling for age reduces the

magnitude of the time trend by one-third (aRRRs 0.951 to 0.967, Model 2), but the time trend is still negative and significant across models. As expected, women wanting their pregnancies 'sooner' increased as a function of year and age. Controlling for age decreased by half the magnitude of the positive time trend, but the year is not statistically significant after controlling by age (aRRR 1.011, p-value ≤0.001 to aRRR 1.005, p-value >0.05).

Women not wanting to be pregnant 'then or at any time' decreased as a function of year and increased as a function of age, but age has no impact on the magnitude of this negative time trend. The chances of 'unsure' women increased as a function of year and decreased as a function of age. Therefore, age suppressed increases in the 'unsure' category, which would have been approximately twice as likely. Nevertheless, year is still a strong predictor (aRRRs 1.009, p-value ≤0.05 to 1.016, p-value ≤0.001).

Covariates in Models 3 and 4 do not change our substantive results about 'later', 'then', and 'unwanted' categories. However, mother's sociodemographics moderate the negative time trend of 'later' and mediate the higher chances of 'sooner'.

For Black mothers, age explains half of the downward trend of wanting to be pregnant 'later' and of the upward trend of wanting to be pregnant sooner (aRRRs from 0.942 to 0.968; aRRRs from 0.991 to 0.982, respectively). The increase in 'unsure' would have been six times higher without changes in the mother's age (aRRRs from 0.942 to 0.968).

Remarkably, adding other covariates (Models 3 and 4) does not modify the year aRRRs; therefore, changes toward maternal ages capture the contribution of these variables on the time trends for Black women. Age is a strong predictor of the chances of Black women wanting their births 'later' or 'sooner' (aRRR=0.899, p ≤ 0.001; aRRR 1.053, p ≤ 0.001). Conversely, we

observe age and year losing predictive power on unwanted pregnancies after controlling for all the covariates.

Discussion

In the last decade, pregnancies resulting in births perceived as occurring 'too soon' or as 'unwanted' have declined in the United States. These shifts happened along with increases in births perceived as occurring 'later than desired' and those reported as happening at the 'right time'. Over the same period, the proportion of births to younger mothers declined, while the share among older mothers rose markedly. Our study examined how changes in the age composition of mothers have shaped trends in birth intentions, with particular attention to a more expansively classified set of 'mistimed' births—including both those perceived as occurring earlier than desired or later than desired. We also assessed how these maternal age shifts relate to increases in planned births and decreases in unplanned births associated with contraceptive failure. We hypothesized that rising maternal age would reflect both successful postponement and, for some individuals, increases in suboptimal fertility timing experienced at older maternal ages.

Regarding birth timing we found, for all women and for Black women, that one-third of the drop in births from pregnancies wanted later, and half of the increase of births from pregnancies wanted sooner, and almost all the increase of births 'wanted then', were due to changes in maternal age composition. For Black women, we also observed that one-fourth of the decrease of unwanted births was due to changes in maternal age composition.

In terms of 'planning', we found that two-thirds of the increase of births happening when 'trying to get pregnant and not using contraception' for all women, and three-fourths of the

19

increase for Black women, were due to changes in age composition. The upward trend of maternal ages also contributed, but to a lesser extent, to the downward trends of contraceptive failure for both groups. Results adjusted for sociodemographic and reproductive characteristics closely align with our findings from the standardization and decomposition analyses

Our findings also reveal substantive differences in the distribution of intentions and planning measures between all women and Black women. Specifically, Black women are substantively less likely to report that their most recent birth occurred while 'trying to get pregnant' and, at a lesser extent to report that they wanted to be pregnant 'then'. The extent to which these differences reflect barriers to contraceptive access, reproductive coercion, or other factors, lies beyond the scope of the present study. Taken together, our results confirm that shifts in the composition of birth timing and planning are closely associated with changes in maternal age.

Limitations

Given its relatively large sample sizes and extended time series, PRAMS offers a unique data source for studying trends in pregnancy intentions and birth planning. However, our analyses are constrained by state participation and limited to pregnancies that resulted in live births. Therefore, we are unable to observe the trends of pregnancies in terms of planning and intentions. Additionally, analyses of the 'trying to get pregnant' measure are restricted to states that opted to include this question. Our results may be biased if PRAMS participation—or the decision to include the 'trying' question—is associated with shifts in maternal age or with intentions and trying trends.

Furthermore, we acknowledge that the measures of intention and planning do not fully capture the complexity of pregnancy experiences or the dynamic nature of perceptions about

births. For instance, cultural norms and beliefs about ideal timing for childbearing may shift in response to changes in maternal age distributions (Guzzo and Hayford 2020). These limitations underscore the need for further research into the associations explored in this study.

Contribution

To our knowledge, this is the first study examining recent decades' associations between the trend toward older maternal age and perceived birth timing, for all women and for Black women in the U.S. It is also the first to investigate trends in planned births and contraceptive failure during this period. Our findings suggest that increases in maternal ages are associated with improved ability to plan childbearing and, therefore, with success in motherhood postponement. However, they also indicate that for some women, these shifts have resulted in suboptimal birth timing, suggesting that delays may come at the expense of individuals' ideal fertility. Evidence from low-fertility countries documents a growing mismatch between fertility desires and actual family size among childless individuals over age 35—sometimes resulting in involuntary childlessness. (Beaujouan 2020; Shreffler 2017; Sobotka and Beaujouan 2018). Similarly, for the U.S., Hartnett and Gemmill (2020) observe that intended parity of women aged 30-34 is similar compared with women <30 - both slightly higher than 2 children.

In line with large literature about differences between involuntary 'delays and intentional motherhood 'postponement' (Beaujouan 2020) , results from this study call for more attention to how and what factors explain trends toward older ages in the U.S., and how these changes may contribute to ideal or suboptimal fertility desires, family planning, and to what is perceived as an age and timing to have a child.

References

Adser□, Al□cia. 2004. "Changing Fertility Rates in Developed Countries. The Impact of Labor Market Institutions." *Journal of Population Economics* 17(1):17–43. doi:10.1007/s00148-003-0166-x.

Aiken, Abigail R. A., Sonya Borrero, Lisa S. Callegari, and Christine Dehlendorf. 2016. "Rethinking the Pregnancy Planning Paradigm: Unintended Conceptions or Unrepresentative Concepts?" *Perspectives on Sexual and Reproductive Health* 48(3):147–51. doi:10.1363/48e10316.

Arteaga, Stephanie, Lauren Caton, and Anu Manchikanti Gomez. 2019. "Planned, Unplanned and in-between: The Meaning and Context of Pregnancy Planning for Young People." *Contraception* 99(1):16–21. doi:10.1016/j.contraception.2018.08.012.

Auerbach, Samantha L., Kate Coleman-Minahan, Amy Alspaugh, E. Angel Aztlan, Lisa Stern, and Katherine Simmonds. 2023. "Critiquing the Unintended Pregnancy Framework." *Journal of Midwifery & Women's Health*. doi:10.1111/jmwh.13457.

Balbo, Nicoletta, Francesco C. Billari, and Melinda Mills. 2013. "Fertility in Advanced Societies: A Review of Research." *European Journal of Population / Revue Européenne de Démographie* 29(1):1–38. doi:10.1007/s10680-012-9277-y.

Barber, Gabriela A., and Julia R. Steinberg. 2022. "The Association between Pregnancy Intention, Fertility Treatment Use, and Postpartum Depression." *Social Science & Medicine* 314:115439. doi:10.1016/j.socscimed.2022.115439.

Beaujouan, Eva. 2020. "Latest-Late Fertility? Decline and Resurgence of Late Parenthood Across the Low-Fertility Countries." *Population and Development Review* 46(2):219–47.

Brown, Andrea D., Brady E. Hamilton, Dmitry M. Kissin, and Joyce A. Martin. 2025. "Trends in Mean Age of Mothers in the United States, 2016 to 2023." *National Vital Statistics Reports: From the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System* 74(9):1–6. doi:10.15620/cdc/174598.

Bureau, US Census. n.d. "Stable Fertility Rates 1990-2019 Mask Distinct Variations by Age." Retrieved November 16, 2022. https://www.census.gov/library/stories/2022/04/fertility-rates-declined-for-younger-women-increased-for-older-women.html.

CDC. 2023. "Are PRAMS Data Available to Researchers? | CDC." https://www.cdc.gov/prams/prams-data/researchers.htm.

CDC. 2025. "PRAMS Data." https://www.cdc.gov/prams/php/data-research/index.html.

D'Angelo, Denise, Letitia Williams, Brian Morrow, Shanna Cox, Norma Harris, Leslie Harrison, Samuel F. Posner, Jessie Richardson Hood, Lauren Zapata, and Centers for Disease Control and Prevention (CDC). 2007. "Preconception and Interconception Health Status

of Women Who Recently Gave Birth to a Live-Born Infant--Pregnancy Risk Assessment Monitoring System (PRAMS), United States, 26 Reporting Areas, 2004." *Morbidity and Mortality Weekly Report. Surveillance Summaries (Washington, D.C.: 2002)* 56(10):1–35.

Finer, Lawrence B., and Stanley K. Henshaw. 2006. "Disparities in Rates of Unintended Pregnancy In the United States, 1994 and 2001." *Perspectives on Sexual and Reproductive Health* 38(2):90–96. doi:10.1363/3809006.

Finer, Lawrence B., and Mia R. Zolna. 2011. "Unintended Pregnancy in the United States: Incidence and Disparities, 2006." *Contraception* 84(5):478–85. doi:10.1016/j.contraception.2011.07.013.

Finer, Lawrence B., and Mia R. Zolna. 2016. "Declines in Unintended Pregnancy in the United States, 2008-2011." *The New England Journal of Medicine* 374(9):843–52. doi:10.1056/NEJMsa1506575.

Geist, Claudia, and Sarah Brauner-Otto. 2017. "Constrained Intentions: Individual Economic Resources, Regional Context, and Fertility Expectations in Germany." *Socius* 3:2378023116685334. doi:10.1177/2378023116685334.

Greil, Arthur L., Karina M. Shreffler, Stacy M. Tiemeyer, and Julia McQuillan. 2023. "Prospective Attitude about the Importance of Planning Pregnancies Is Associated with Retrospective Attitude toward a Specific Pregnancy." *Socius* 9:237802312311153619. doi:10.1177/23780231231153619.

Greulich, Angela, and Michael S. Rendall. 2021. "Women's Employment and First Birth in Europe."

Guzzo, Karen Benjamin, and Sarah R. Hayford. 2020. "Pathways to Parenthood in Social and Family Contexts: Decade in Review, 2020." *Journal of Marriage and Family* 82(1):117–44. doi:10.1111/jomf.12618.

Harris, Lisa H., and Taida Wolfe. 2014. "Stratified Reproduction, Family Planning Care and the Double Edge of History." *Current Opinion in Obstetrics and Gynecology* 26(6):539–44. doi:10.1097/GCO.0000000000000121.

Hartnett, Caroline Sten, and Rachel Margolis. 2019. "Births That Are Later-than-Desired: Correlates and Consequences." *Population Research and Policy Review* 38(4):483–505. doi:10.1007/s11113-019-09513-6.

Higgins, Jenny A., Renee D. Kramer, and Kristin M. Ryder. 2016. "Provider Bias in Long-Acting Reversible Contraception (LARC) Promotion and Removal: Perceptions of Young Adult Women." *American Journal of Public Health* 106(11):1932–37. doi:10.2105/AJPH.2016.303393.

Johnston, Emily M., and Stacey McMorrow. 2020. "The Relationship Between Insurance Coverage and Use of Prescription Contraception by Race and Ethnicity: Lessons From

the Affordable Care Act." *Women's Health Issues: Official Publication of the Jacobs Institute of Women's Health* 30(2):73–82. doi:10.1016/j.whi.2019.11.005.

Kost, K., and J. D. Forrest. 1995. "Intention Status of U.S. Births in 1988: Differences by Mothers' Socioeconomic and Demographic Characteristics." *Family Planning Perspectives* 27(1):11–17.

Kost, Kathryn, Lawrence B. Finer, and Susheela Singh. 2012. "Variation in State Unintended Pregnancy Rates In the United States." *Perspectives on Sexual and Reproductive Health* 44(1):57–64. doi:10.1363/4405712.

Kost, Kathryn, and Laura Lindberg. 2015. "Pregnancy Intentions, Maternal Behaviors, and Infant Health: Investigating Relationships With New Measures and Propensity Score Analysis." *Demography* 52(1):83–111. doi:10.1007/s13524-014-0359-9.

Kost, Kathryn, Isaac Maddow-Zimet, and Ashley C. Little. 2021. "Pregnancies and Pregnancy Desires at the State Level: Estimates for 2017 and Trends Since 2012." doi:10.1363/2021.33141.

Kost, Kathryn, Mia R. Zolna, and Rachel Murro. 2023. "Pregnancies in the United States by Desire for Pregnancy: Estimates for 2009, 2011, 2013, and 2015." *Demography*. doi:10.1215/00703370-10690005.

Lebano, Adele, and Lynn Jamieson. 2020. "Childbearing in Italy and Spain: Postponement Narratives." *Population and Development Review* 46(1):121–44. doi:10.1111/padr.12313.

Lindberg, Laura, Isaac Maddow-Zimet, Kathryn Kost, and Alicia Lincoln. 2015. "Pregnancy Intentions and Maternal and Child Health: An Analysis of Longitudinal Data in Oklahoma." *Maternal and Child Health Journal* 19(5):1087–96. doi:10.1007/s10995-014-1609-6.

Maddow-Zimet, Isaac, and Kathryn Kost. 2020. "Effect of Changes in Response Options on Reported Pregnancy Intentions: A Natural Experiment in the United States." *Public Health Reports (Washington, D.C.: 1974)* 135(3):354–63. doi:10.1177/0033354920914344.

Manzer, Jamie L., and Ann V. Bell. 2021. "'We're a Little Biased': Medicine and the Management of Bias through the Case of Contraception." *Journal of Health and Social Behavior* 62(2):120–35. doi:10.1177/00221465211003232.

Martin, Joyce A., Brady E. Hamilton, Paul D. Sutton, Stephanie J. Ventura, T. J. Mathews, Sharon Kirmeyer, and Michelle J. K. Osterman. 2010. *Births: Final Data for 2007*. *National Vital Statistics Reports*. 24. Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System. https://www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58_24.pdf.

Martin, Lauren Jade. 2021. "Delaying, Debating and Declining Motherhood." *Culture, Health & Sexuality* 23(8):1034–49. doi:10.1080/13691058.2020.1755452.

Mathews, T. J., and Brady E. Hamilton. 2016. *Mean Age of Mothers Is on the Rise: United States, 2000-2014*. *NCHS Data Brief*. 232. Centers for Disease Control and Prevention, National Center for Health Statistics. https://www.cdc.gov/nchs/data/databriefs/db232.pdf.

Matthews, T. J., and Brady E. Hamilton. 2014. "First Births to Older Women Continue to Rise." *NCHS Data Brief* (152):1–8.

Miller, Amalia R. 2011. "The Effects of Motherhood Timing on Career Path." *Journal of Population Economics* 24(3):1071–1100.

Mills, Melinda, Ronald R. Rindfuss, Peter McDonald, and Egbert te Velde. 2011. "Why Do People Postpone Parenthood? Reasons and Social Policy Incentives." *Human Reproduction Update* 17(6):848–60. doi:10.1093/humupd/dmr026.

Mosher, William D., Jo Jones, and Joyce C. Abma. 2012. "Intended and Unintended Births in the United States: 1982-2010." *National Health Statistics Reports* (55):1–28.

Musick, Kelly, Paula England, Sarah Edgington, and Nicole Kangas. 2009. "Education Differences in Intended and Unintended Fertility." *Social Forces* 88(2):543–72. doi:10.1353/sof.0.0278.

Neels, Karel, Michael Murphy, Máire Ní Bhrolcháin, and Éva Beaujouan. 2017. "Rising Educational Participation and the Trend to Later Childbearing." *Population and Development Review* 43(4):667–93. doi:10.1111/padr.12112.

Ní Bhrolcháin, Máire, and Eva Beaujouan. 2012. "Fertility Postponement Is Largely Due to Rising Educational Enrolment." *Population Studies* 66(3):311–27. doi:10.1080/00324728.2012.697569.

Osterman, Michelle J. K., Brady E. Hamilton, Joyce A. Martin, Anne K. Driscoll, and Claudia P. Valenzuela. 2022. *Births: Final Data for 2020*. *National Vital Statistics Reports*. 17. Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System.

Perry-Jenkins, Maureen, and Naomi Gerstel. 2020. "Work and Family in the Second Decade of the 21st Century." *Journal of Marriage and Family* 82(1):420–53. doi:10.1111/jomf.12636.

Rendall, Michael, Encarnacion Aracil, Christos Bagavos, Christine Couet, Alessandra DeRose, Paola DiGiulio, Trude Lappegard, Isabelle Robert-Bobée, Marit Rønsen, Steve Smallwood, and Georgia Verropoulou. 2010. "Increasingly Heterogeneous Ages at First Birth by Education in Southern-European and Anglo-American Family-Policy Regimes: A Seven-Country Comparison." *Population Studies* 64(3):209–27. doi:10.1080/00324728.2010.512392.

Rice, Whitney S., Sara K. Redd, Alina A. Luke, Kelli Komro, Kimberly Jacob Arriola, and Kelli Stidham Hall. 2022. "Dispersion of Contraceptive Access Policies across the United

States from 2006 to 2021." *Preventive Medicine Reports* 27:101827. doi:10.1016/j.pmedr.2022.101827.

Seltzer, Judith A. 2019. "Family Change and Changing Family Demography." *Demography* 56(2):405–26. doi:10.1007/s13524-019-00766-6.

Shreffler, Karina M. 2017. "Contextual Understanding of Lower Fertility Among U.S. Women in Professional Occupations." *Journal of Family Issues* 38(2):204–24. doi:10.1177/0192513X16634765.

Shulman, Holly B., Denise V. D'Angelo, Leslie Harrison, Ruben A. Smith, and Lee Warner. 2018. "The Pregnancy Risk Assessment Monitoring System (PRAMS): Overview of Design and Methodology." *American Journal of Public Health* 108(10):1305–13. doi:10.2105/AJPH.2018.304563.

Sobotka, Tomáš, and Éva Beaujouan. 2018. "Late Motherhood in Low-Fertility Countries: Reproductive Intentions, Trends and Consequences." Pp. 11–29 in *Preventing Age Related Fertility Loss*. Springer, Cham.

Sobotka, Tomáš, Vegard Skirbekk, and Dimiter Philipov. 2011. "Economic Recession and Fertility in the Developed World." *Population and Development Review* 37(2):267–306. doi:10.1111/j.1728-4457.2011.00411.x.

Sweeney, Megan M., and R. Kelly Raley. 2014. "Race, Ethnicity, and the Changing Context of Childbearing in the United States." *Annual Review of Sociology* 40:539–58. doi:10.1146/annurev-soc-071913-043342.

Figure 1. Trying to get pregnant before last birth by year. All women. 2007-2020, weighted
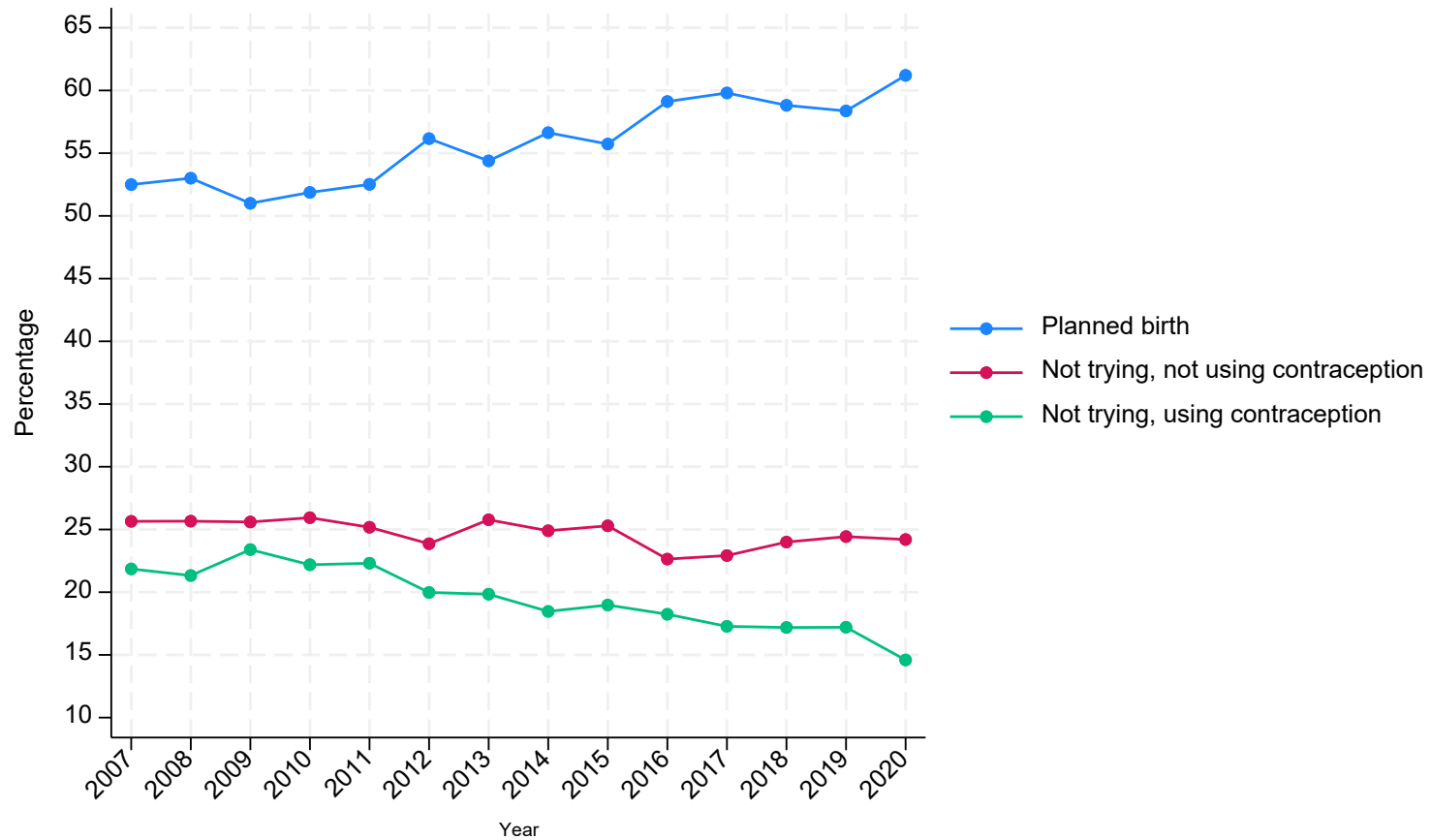
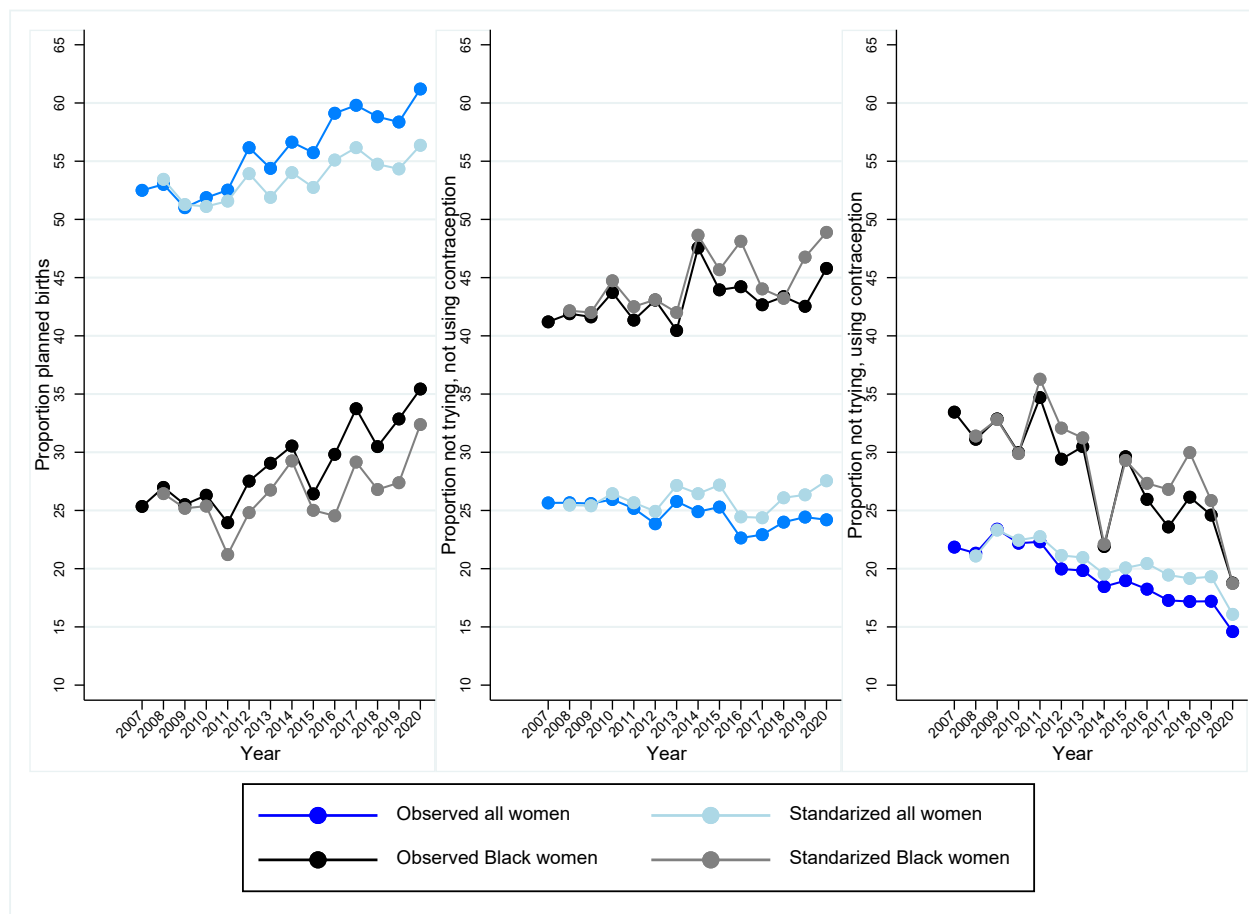*Source:* PRAMS. *States:* DE, IL, ME, MA, NJ, PA and WA.

Figure 2. Pregnancy intentions by year. All women. 2012-2020, weighted (unweighted N=144,867).
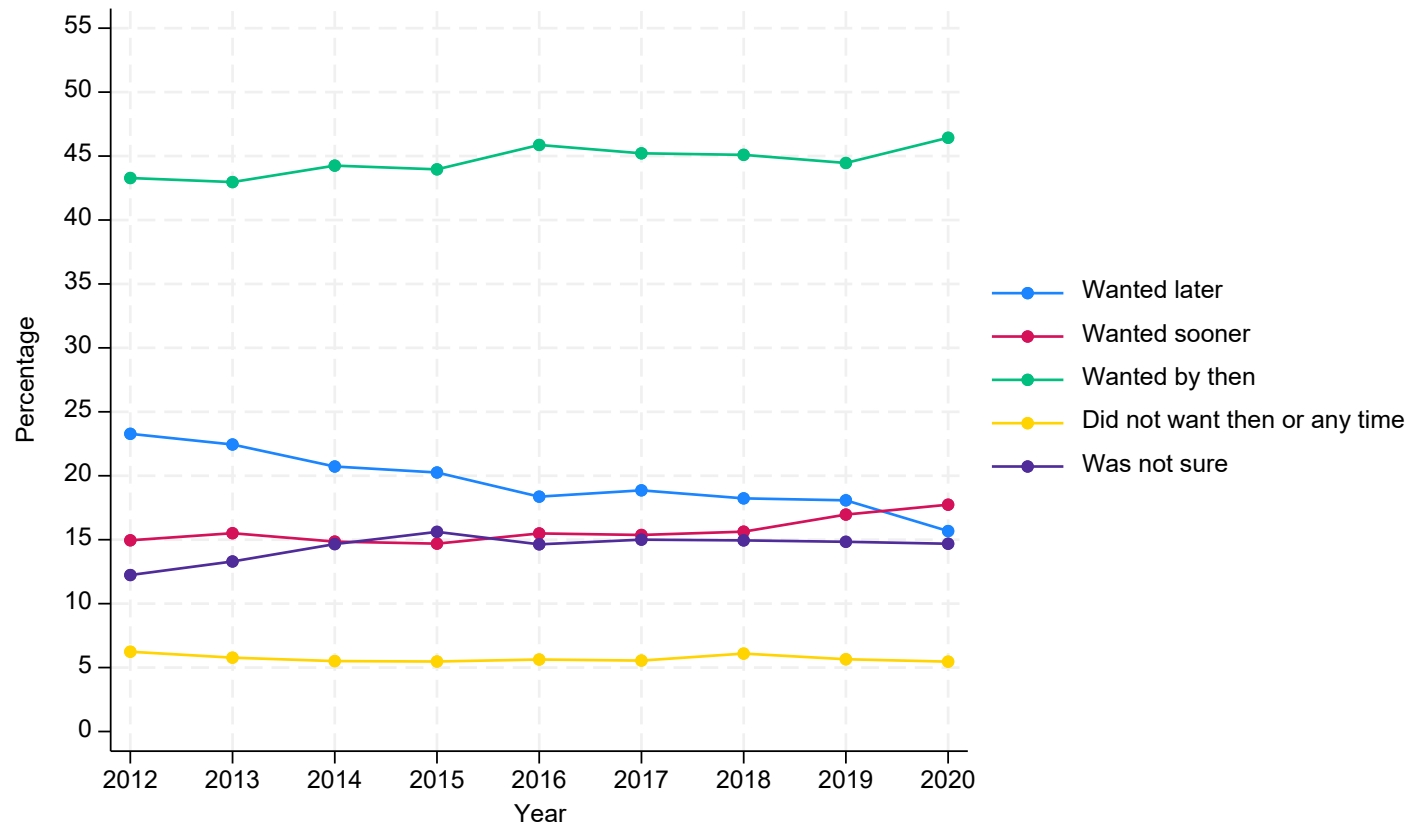
Source: PRAMS. *States:* AK, DE, IL, ME, MD, MA, MO, NJ, NM, NYC, PA, UT, WA, WI and WY.

Figure 3. Trying to get pregnant, observed and age-standardized proportions, by year, all women (N=109,971) and Black women (N=11,470), 2007-2020, weighted.

Source: PRAMS. *States:* DE, IL, ME, MA, NJ, PA and WA.

Figure 4. Pregnancy intentions, observed and age-standardized proportions, by year. All women (N=144,867) and Black (N=22,318) women, 2012-2020, weighted.

A. Categories: wanted later and wanted sooner
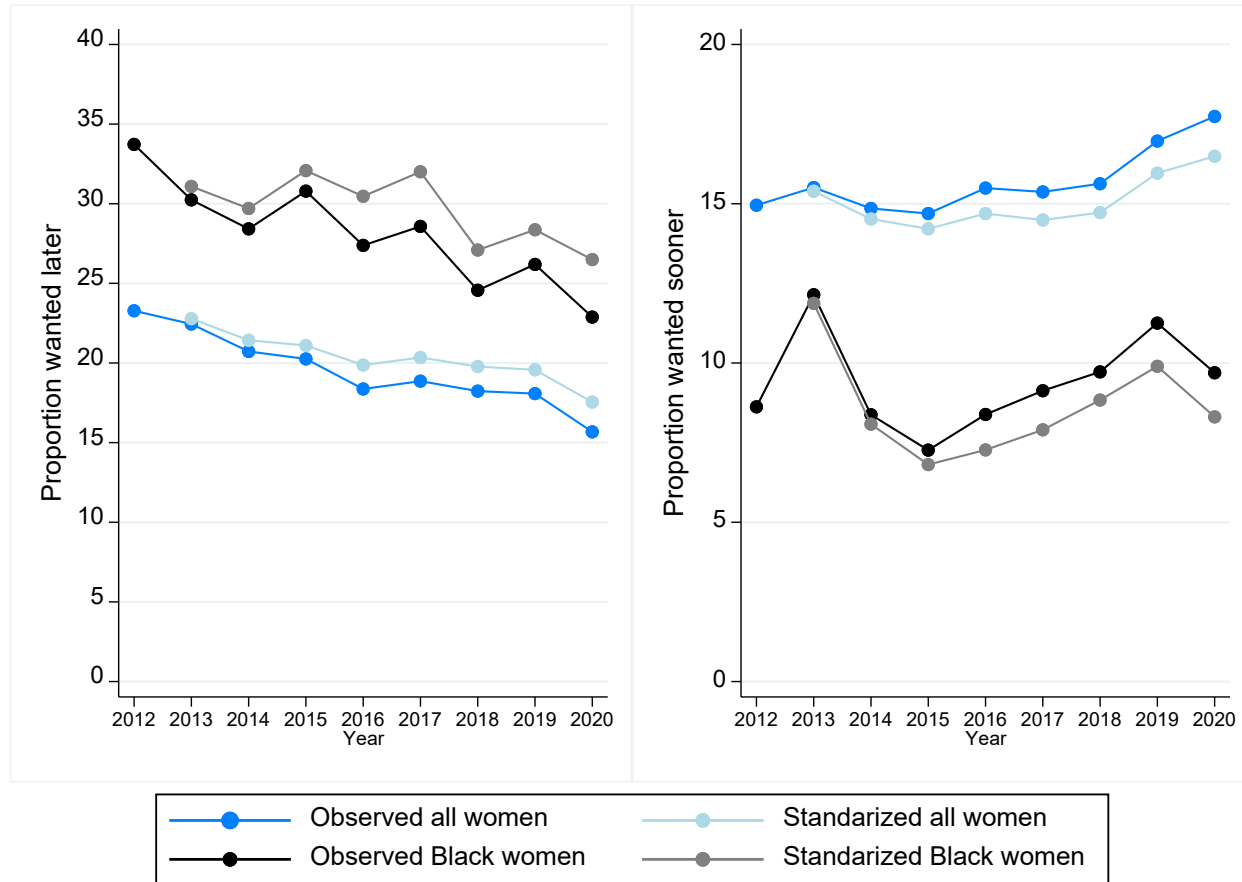
B. Categories: wanted then, unwanted and unsure.
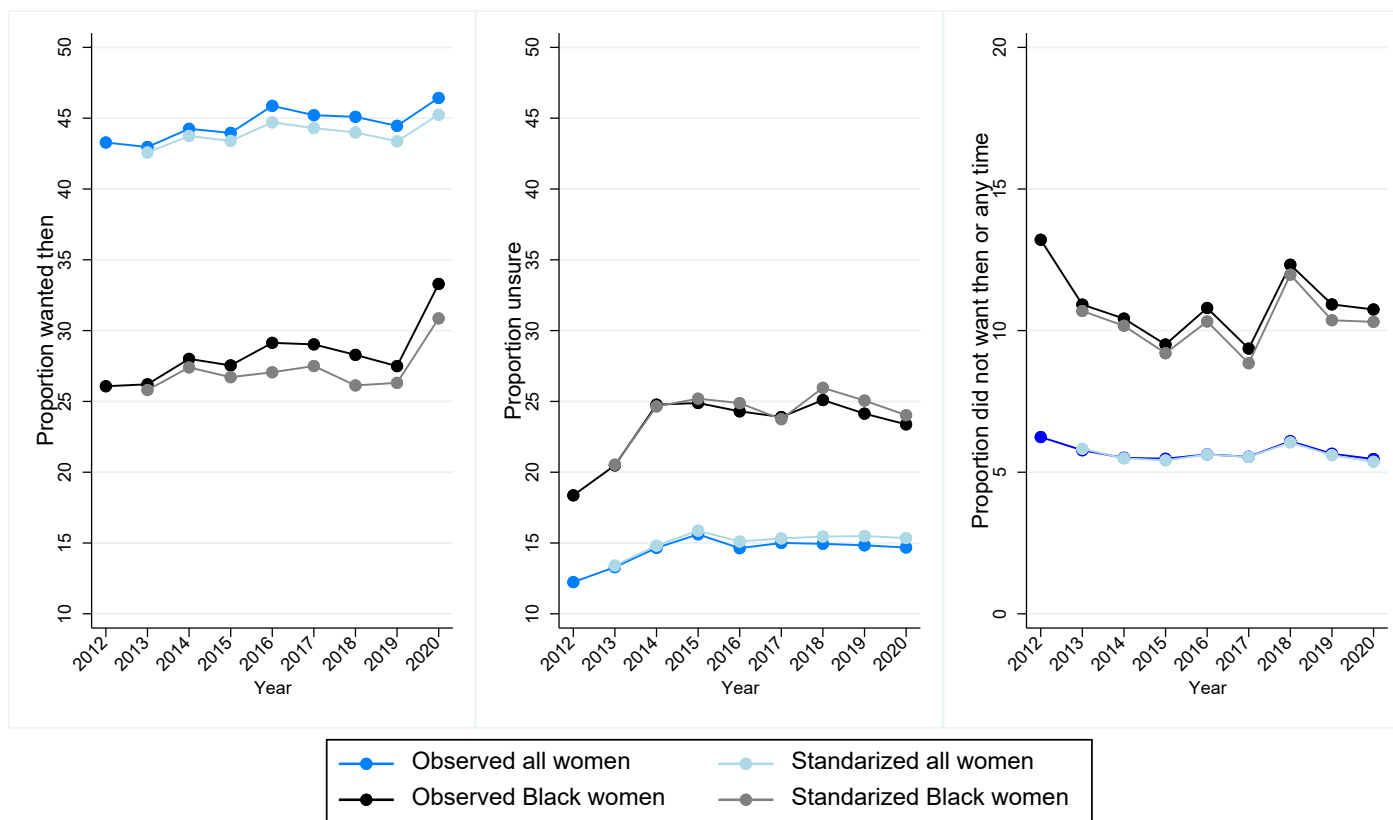
Source: PRAMS. *States:* AK, DE, IL, ME, MD, MA, MO, NJ, NM, NYC, PA, UT, WA, WI and WY.

Note (*) we adjust the scale of proportion according to the maximum and minimum proportion of each category.

Table 1. Decomposition of 'Trying to get pregnant': observed vs standardized to age composition in 2007, by year, all women and Black women, 2007 and 2019, weighted percentages.

	All women			Black women		
	Planned birth	Not trying, no contraception	Not trying, using contraception	Planned birth	Not trying, no contraception	Not trying, using contraception
observed 2007	52.5	25.6	21.9	25.3	41.2	33.5
observed 2019	58.4	24.4	17.2	32.9	42.5	24.6
standardized 2019	54.3	26.3	19.3	27.4	46.8	25.9
% change due to changes in age composition	68.6	157.3	45.4	72.9	-316.3	14.1
N	**109,971**			**17,385**		

Source: PRAMS. States: *DE, IL, ME, MA, NJ, PA and WA.*

Table 2. Decomposition of pregnancy intentions: observed vs standardized to age composition 2012, by year, all women and Black women, 2012 and 2019, weighted percentages.

	All women					Black women				
	Wanted Later	Wanted Sooner	Then	unwanted	Unsure	Wanted Later	Wanted Sooner	Then	Unwanted	Unsure
observed 2012	23.3	15.0	43.3	6.2	12.2	33.7	8.6	26.1	13.2	18.4
observed 2019	18.1	17.0	44.5	5.7	14.8	26.2	11.3	27.5	10.9	24.1
standardized 2019	19.6	16.0	43.4	5.6	15.5	28.4	9.9	26.309	10.4	25.1
% change due to changes in age composition	28.7	50.0	92.4	-8.6	-25.2	28.9	51.6	83.4	-24.5	0.923
N	**144,867**					**22,318**				

Source: PRAMS. *States:* AK, DE, IL, ME, MD, MA, MO, NJ, NM, NYC, PA, UT, WA, WI and WY.

Table 3. Adjusted relative risk ratios (and 95% Confidence Intervals) from multinominal logistic regression models assessing the association between year and ages on trying to get pregnant (reference category: trying to get pregnant), 2007-2020, weighted.

		All women				Black women			
		Not trying, no contraception		Not trying, using contraception		Not trying, no contraception		Not trying, using contraception	
		aRRR	95% CI	aRRR	95% CI	aRRR	95% CI	aRRR	95% CI
Model 1	Year	0.980[a]	(0.975 ,0.984)	0.959[a]	(0.954 ,0.964)	0.982[c]	(0.969 ,0.996)	0.946[a]	(0.932 ,0.960)
Model 2	Year	0.993[b]	(0.988 ,0.998)	0.973[a]	(0.968 ,0.978)	0.996	(0.982 ,1.010)	0.958[a]	(0.943 ,0.972)
	Age	0.914[a]	(0.910 ,0.917)	0.909[a]	(0.905 ,0.912)	0.943[a]	(0.934 ,0.951)	0.946[a]	(0.937 ,0.956)
Model 3	Year	0.984[a]	(0.979 ,0.989)	0.961[a]	(0.956 ,0.966)	0.989	(0.975 ,1.004)	0.951[a]	(0.936 ,0.966)
	Age	0.978[a]	(0.974 ,0.982)	0.971[a]	(0.966 ,0.975)	0.980[a]	(0.970 ,0.989)	0.972[a]	(0.961 ,0.983)
Model 4	Year	0.984[a]	(0.979 ,0.989)	0.960[a]	(0.954 ,0.965)	0.992	(0.977 ,1.007)	0.951[a]	(0.936 ,0.967)
	Age	0.961[a]	(0.957 ,0.966)	0.942[a]	(0.937 ,0.947)	0.962[a]	(0.951 ,0.973)	0.945[a]	(0.933 ,0.957)
N		109,970				17,385			

Source: PRAMS. *States* : DE, IL, ME, MA, NJ, PA and WA.

Abbreviations: CI, confidence interval; aRRR, adjusted relative risk ratio.

Note: Model 1 includes state (reference: Pennsylvania) and year; Model 2 adds Age, Model 3 adds race/ethnicity (reference: Black), education (reference: high school), and marital status (reference: not married); and Model 4 adds pregnant (reference: not pregnant), parity (reference: first birth), number of months after the birth, and single delivery (reference: multiple delivery).

a p ≤ 0.001; b p ≤ 0.01; c p ≤ 0.05.

Table 4. Adjusted relative risk ratios (and 95% Confidence Intervals) from multinominal logistic regression model assessing the association between age and pregnancy intentions (reference category: I wanted to be pregnant then), 2012-2020, weighted.

		All women							
		Wanted later		**Wanted sooner**		**Did not want then or any time**		**Was not sure**	
		aRRR	95% CI	aRRR	95% CI	aRRR	95% CI	aRRR	95% CI
Model 1	Year	0.951[a]	(0.944 ,0.959)	1.011[b]	(1.003 ,1.020)	0.986[c]	(0.973 ,0.999)	1.009[c]	(1.001 ,1.018)
Model 2	Year	0.967[a]	(0.959 ,0.975)	1.005	(0.997 ,1.014)	0.985[c]	(0.972 ,0.998)	1.016[a]	(1.007 ,1.024)
	Age	0.887[a]	(0.884 ,0.891)	1.050[a]	(1.046 ,1.054)	1.009[c]	(1.002 ,1.016)	0.955[a]	(0.950 ,0.959)
Model 3	Year	0.961[a]	(0.954 ,0.969)	0.961[a]	(0.953 ,0.969)	0.978[b]	(0.965 ,0.991)	1.011[c]	(1.002 ,1.020)
	Age	0.921[a]	(0.917 ,0.925)	0.912[a]	(0.908 ,0.917)	1.073[a]	(1.067 ,1.080)	1.012[a]	(1.007 ,1.017)
Model 4	Year	0.961[a]	(0.953 ,0.969)	1.004	(0.996 ,1.013)	0.978[b]	(0.965 ,0.991)	1.010[c]	(1.001 ,1.020)
	Age	0.912[a]	(0.908 ,0.917)	1.064[a]	(1.059 ,1.068)	1.030[a]	(1.022 ,1.038)	0.996	(0.991 ,1.001)
N		**144,867**							

(Table 4 continued next page)

| | | Black women | | | | | | | |
| | | Wanted later | | Wanted sooner | | Did not want then or any time | | Was not sure | |
		aRRR	95% CI	aRRR	95% CI	aRRR	95% CI	aRRR	95% CI
Model 1	Year	0.942[a]	(0.921 ,0.963)	0.991	(0.962 ,1.021)	0.968[c]	(0.939 ,0.998)	1.002	(0.979 ,1.024)
Model 2	Year	0.968[b]	(0.946 ,0.990)	0.982	(0.953 ,1.012)	0.965[c]	(0.936 ,0.995)	1.012	(0.989 ,1.035)
	Age	0.899[a]	(0.890 ,0.907)	1.040[a]	(1.027 ,1.052)	1.013[c]	(1.001 ,1.026)	0.958[a]	(0.949 ,0.968)
Model 3	Year	0.965[b]	(0.943 ,0.987)	0.984	(0.954 ,1.014)	0.968[c]	(0.938 ,0.998)	1.013	(0.990 ,1.037)
	Age	0.907[a]	(0.898 ,0.917)	1.038[a]	(1.024 ,1.051)	1.049[a]	(1.036 ,1.062)	0.989[c]	(0.979 ,1.000)
Model 4	Year	0.967[b]	(0.945 ,0.990)	0.984	(0.954 ,1.014)	0.975	(0.944 ,1.006)	1.015	(0.992 ,1.039)
	Age	0.899[a]	(0.888 ,0.909)	1.053[a]	(1.038 ,1.068)	0.996	(0.981 ,1.011)	0.972[a]	(0.960 ,0.984)
N		22,318							

*Source:* PRAMS. AK, DE, IL, ME, MD, MA, MO, NJ, NM, NYC, PA, UT, WA, WI and WY.

Abbreviations: CI, confidence interval; aRRR, adjusted relative risk ratio.

Note: Model 1 includes state (reference: Pennsylvania) and year; Model 2 adds Age, Model 3 adds race/ethnicity (reference: Black), education (reference: high school), and marital status (reference: not married); and Model 4 adds pregnant (reference: not pregnant), parity (reference: first birth), number of months after the birth, and single delivery (reference: multiple delivery).

a p ≤ 0.001; b p ≤ 0.01; c p ≤ 0.05

APPENDIX

Figure A1. Mean age by year, all women (N=109,971) and Black women (unweighted N=11,470), 2007-2020, weighted.
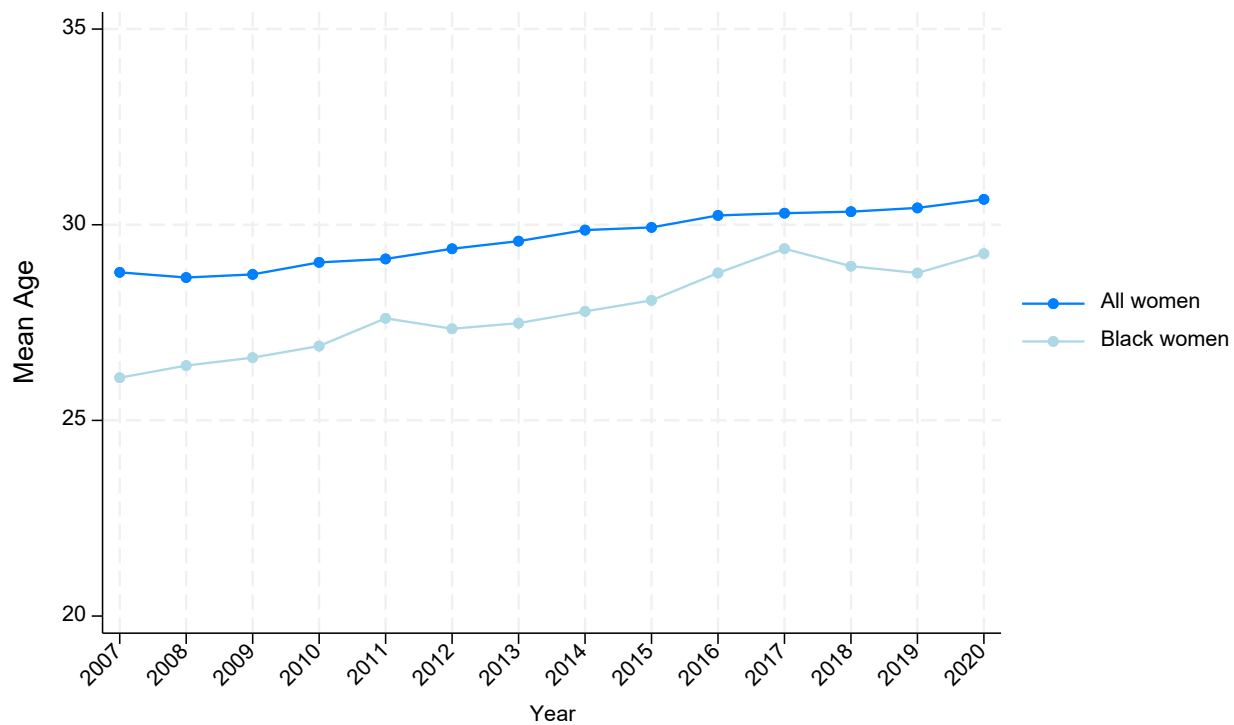
Source: PRAMS. DE, IL, ME, MA, NJ, PA and WA.

Table A1. Characteristics of respondents by trying to get pregnant, 2007-2020, weighted (N = 109,971)

	Planned birth (Unweighted N= 60,538)	Not trying, no contraception (Unweighted N= 27,569)	Not trying, using contraception (Unweighted N = 21,864)
	% or Mean	% or Mean	% or Mean
Mean age[a]	31.0	28.0	27.8
Race and ethnicity[a]			
White	66.7	52	49.3
Black	6.3	21.2	17.5
Asian	8.6	4.9	4.5
Native/Other	2.3	3.1	3.1
Hispanic	16.1	18.9	25.6
Married[a]	80.1	42.1	41.4
Education level[a]			
<HS	8.7	17.6	17.4
High School	17.4	31.9	29.6
Some College	20.9	28.3	31.1
Bachelors+	52.9	22.2	21.9
Medicaid before, during or after pregnancy[a]	26.7	56.7	58.1
Pregnant now[a]	0.348	0.618	0.303
Parity[a]			

First birth	42.9	40.7	37.7
2nd or 3rd	50.8	46.8	47.1
4th or higher	6.4	12.5	15.2
Months after birth[a]	4.00	4.00	4.00
Single delivery[a]	97.7	98.7	98.6

Source: PRAMS. DE, IL, ME, MA, NJ, PA and WA.

Note: Chi square tests were used to assess differences between the three categories of trying to get pregnant for categorical variables and ANOVA test for continuous variables.

a $p \leq 0.001$; b $p \leq 0.01$; c $p \leq 0.05$

Table A2. Characteristics of Black women by trying to get pregnant, 2007-2020, weighted (N = 17,385)

	Planned birth (Unweighted N = 60,538)	Not trying, no contraception (Unweighted N =27569)	Not trying, using contraception (Unweighted N = 21,864)
	% or Mean	% or Mean	% or Mean
Mean age[a]	29.6	27.0	27.0
Married[a]	45.6	18.0	21.9
Education level[a]			
<HS	11.0	17.1	16.0
High School	30.8	39.1	33.9
Some College	31.5	32.3	35.0
Bachelors+	26.7	11.5	15.2
Medicaid before, during or after pregnancy[a]	57.3	73.9	71.0
Pregnant now[a]	0.927	0.73	0.395
Parity			
First birth	39.1	38.4	36.1
2nd or 3rd	50.7	45.7	46
4th or higher	10.2	15.9	17.9
Months after birth[a]	4.4	4.6	4.7
Single delivery	97.7	98.1	98.1

Source: PRAMS. DE, IL, ME, MA, NJ, PA and WA.

Note: Chi square tests were used to assess differences between the three categories of trying to get pregnant for categorical variables and ANOVA test for continuous variables.

a $p \leq 0.001$; b $p \leq 0.01$; c $p \leq 0.05$

Table A3. Characteristics of respondents by pregnancy intentions, 2012-2020, weighted (N = 144,867)

	Wanted later (Unweighted N=28,611)	Wanted sooner (Unweighted N=22,537)	Then (Unweighted N=62279)	Did not want then or any time (Unweighted N=8,891)	Was not sure (Unweighted N=22,549)
	% or Mean	% or Mean	% or Mean	% or Mean	% or Mean
Mean age[a]	26.9	31.9	30.5	30.6	29.0
Race and ethnicity[a]					
White	47.6	65.4	63.2	42.7	49.7
Black	18.8	7.8	8.3	25.0	21.0
Asian	6.0	10.8	7.3	5.4	5.8
Native/Other	4.0	2.9	2.9	4.7	4.9
Hispanic	23.7	13.1	18.3	22.3	18.6
Married[a]	43.2	82.4	75.0	42.8	42.9
Education level[a]					
<HS	15.3	6.5	10.0	16.5	16.4
High School	28.7	15.8	18.6	32.6	30.5
Some College	30.7	22.6	24.2	32.6	30.5
Bachelors+	25.3	55	47.3	18.4	22.5
Medicaid before, during or after pregnancy[a]	56.4	26	33	63.1	59.5

(Table A3 continuous)

Pregnant now[b]	0.543	0.366	0.397	0.308	0.382
Parity[a]					
First birth	45.4	46.9	39.2	19.6	35
2nd or 3rd	45.7	47.1	51.8	50.1	48.5
4th or higher	8.9	6	9	30.2	16.5
Months after birth[a]	4.3	4	4.2	4.3	4.3
Single delivery[a]	98.6	97.1	98.3	98.2	98.6
Trying to get pregnant[a]*					
Planned birth	9.6	90.3	86.9	5.8	16.1
Not trying, no contraception	44.8	7.6	10	39.5	52
Not trying, yes contraception	45.7	2.1	3.1	54.7	31.9

Source: PRAMS. *States:* AK, DE, IL, ME, MD, MA, MO, NJ, NM, NYC, PA, UT, WA, WI and WY.

Note: Chi square tests were used to assess differences between the five categories of intentions for categorical variables and ANOVA test for continuous variables.

Note (*) Trying to get pregnant was not asked in Maryland years 2012 to 2020.

a $p \leq 0.001$; b $p \leq 0.01$; c $p \leq 0.05$

Table A4. Characteristics of Black respondents by pregnancy intentions, 2012-2020, weighted (N = 22,318)

	Wanted later (Unweighted N=5,995)	Wanted sooner (Unweighted N=2,306)	Then (Unweighted N=6,524)	Did not want then or any time (Unweighted N=2,415)	Was not sure (Unweighted N=5,078)
	% or Mean	% or Mean	% or Mean	% or Mean	% or Mean
Mean age[a]	26.1	31.5	30	29.9	28.2
Married[a]	20.6	52.5	42.6	23.9	21.5
Education level[a]					
<HS	12.9	10.2	9.6	14.9	15.8
High School	35	29.8	29.4	35.2	37.2
Some College	35.6	31.4	34.1	38	33.1
Bachelors+	16.5	28.6	26.9	11.9	13.9
Medicaid before, during or after pregnancy[a]	71.5	57.2	60.8	76.8	74.2
Pregnant now[c]	0.9	0.4	1.1	0.4	0.5
Parity[a]					
First birth	46.1	42.4	37.4	16.6	34.3
2nd or 3rd	44.3	49.2	50.5	49.6	47.6
4th or higher	9.7	8.4	12.1	33.8	18
Months after birth[b]	4.6	4.4	4.6	4.5	4.7

Single delivery	97.9	98.2	98.1	98.1	98
Trying to get pregnant[a]*					
Planned birth	6.5	76.4	72.6	2.4	11.2
Not trying, no contraception	52.9	18.5	20.4	52.6	58
Not trying, yes contraception	40.7	5.1	7.0	45.0	30.8

Source: PRAMS. *States:* AK, DE, IL, ME, MD, MA, MO, NJ, NM, NYC, PA, UT, WA, WI and WY.

Note: Chi square tests were used to assess differences between the five categories of intentions for categorical variables and ANOVA test for continuous variables.

Note (*) Trying to get pregnant was not asked in Maryland years 2012 to 2020.

a $p \leq 0.001$; b $p \leq 0.01$; c $p \leq 0.0$