New estimates of contraceptive failure for the United States  
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Introduction

Contraceptive failure is a primary cause of unintended pregnancy in the United States. Nearly half of all pregnancies are unintended, and nearly half of all unintended pregnancies occurred to women who were using contraception (Finer and Henshaw 2006). Thus, reducing the risk of failure during contraceptive use would have a major impact on reducing unintended pregnancy in the United States.

Contraceptive failure rates based on typical use in the United States were last estimated for the years 1999-2002, using calendar data from the 2002 National Survey of Family Growth (Kost et al. 2008). In the decade and a half since then, however, there have been shifts in contraceptive use patterns as well as in the demographic composition of the users of each method (Kavanaugh et al. 2011, Finer et al. 2012, Jones et al. 2012, Daniels et al. 2013, Branum and Jones 2015). In this paper we examine contraceptive use in the 2006-2010 National Survey of Family Growth (NSFG) and provide updated contraceptive failure rate estimates for the most commonly used methods in the United States as well as estimates of the probability of experiencing a contraceptive failure among demographic subgroups. As with previous studies that estimated contraceptive failure rates, we adjusted the rates for abortion underreporting in national fertility surveys (Jones and Forrest 1992, Fu et al. 1999, Ranjit et al. 2001, Kost et al. 2008).

Background

An examination of contraceptive use data from the 2006-2010 NSFG, shows that virtually all U.S. women of reproductive age who had ever had sexual intercourse reported having used at least one contraceptive method at some point in their lifetime (Daniels et al. 2013). The most common methods women or their partners had ever used were the male condom (93%), the pill (82%), withdrawal (60%), and the injectable, Depo Provera (23%). Among current contraceptive users, the most commonly reported methods were the pill (28%) and female sterilization (27%) (Jones et al. 2012).†

Currently, researchers and health care providers rely on estimates of contraceptive failure among users of these methods from the 2002 NSFG, covering the period from 1999-2002 (Kost et al. 2008). But since that time, we have witnessed substantial changes in the nation’s unintended pregnancy rates. Between 2001 and 2008, the U.S. unintended pregnancy rate rose from 49 to 54 unintended pregnancies per 1,000 women aged 15-44 (Finer and Zolna, 2014). However, between 2008 and 2010 this trend reversed, with the unintended pregnancy rate falling to 45, even lower than the rate in 2001 (Finer and Zolna, forthcoming). At the same time, there have been unprecedented declines in unintended pregnancy rates across virtually every state (Kost 2015), and in teen pregnancy rates both at the national and state levels (Kost and Henshaw, 2014).

* Note: a comparable estimate for 2011 will be calculated for this paper. Preliminary analyses indicate that the proportion will be similar to the 2001 estimate.
†Respondents could report up to four methods currently in use. These methods were ranked by effectiveness, with the most effective method listed as the “current” method in use.
In late 2010, the U.S. Department of Health and Human Service’s Healthy People 2020 initiative set a goal of reducing contraceptive failure during the first year of use from 12.4%, the failure rate measured for 2002, to 9.9% by 2010 (U.S. Department of Health and Human Services 2010). Studies prior to 2000 did not find any noticeable improvements in contraceptive effectiveness from the 1980s to the early 1990s (Fu et al. 1999, Jones et al. 1992, Trussell and Vaughan 1999, Ranjit et al. 2001) and the estimates of contraceptive failure in 2002 also showed little to no improvement (Kost et al. 2008).

In light of recent and unprecedented declines in unintended pregnancy rates in the U.S. (Finer and Zolna forthcoming), it is crucial to know if the effectiveness with which American women use specific contraceptives is improving, showing no change or declining. This analysis will contribute to understanding how patterns of contraceptive use have contributed to recent and substantial changes in American fertility. In this analysis, we provide updated estimates of contraceptive failure for the most commonly used reversible methods in the United States as of 2010, as well as an assessment of progress made in reducing failure rates since 2002.

Methods

We estimate contraceptive failure using nationally representative data from the 2006-2010 National Survey of Family Growth (NSFG), conducted by the National Center for Health Statistics (National Center for Health Statistics, 2011). The NSFG is a national probability survey of the noninstitutionalized population aged 15–44 in the United States (Lepowski et al. 2013; Groves et al. 2009). The survey contains a sample of 12,270 women, ages 15-44 and includes extensive information on the respondents’ demographic and socioeconomic characteristics, their pregnancy and union status histories, and a detailed month-by-month calendar of contraceptive use for the three years prior to the date of interview. Using these monthly calendar data, we constructed a new data file in which observations are intervals of contraceptive use observed during the period covered by the contraceptive use calendar. These intervals or “segments” of contraceptive use constitute our unit of analysis for the measurement of contraceptive failure. We also use data from the nationally-representative 2008 Abortion Patient Survey to correct for underreporting of abortion in the NSFG.

Using these data, we provide estimates of the probability of failure in the first 3, 6 and 12 months of use for the most commonly used methods in the United States: Depo-Provera‡ (“injectables”), long-acting reversible contraceptives (LARC, consisting of the intrauterine device (IUD) and implants), oral contraceptives (“the pill”), male condoms, fertility-awareness-based methods (“rhythm-”, “calendar-”, “mucus-”, and “temperature-” methods, “periodic abstinence” or “natural family planning”), and withdrawal.

Prior research has shown that the risk of contraceptive failure is affected by how long a method has been used and by socioeconomic and demographic characteristics of the user (Jones and Forrest 1992; Fu et al. 1999; Trussell and Vaughan 1999; Ranjit et al. 2001; Kost et al. 2008). We therefore examine the probability of failure by duration of use, age, race and ethnicity, union status, poverty status, parity and pregnancy intention status. In addition, we measure trends in overall contraceptive failure between 1995,

‡ Depo Provera is the only injectable currently available in the U.S., and the only one available during the time period covered by our analysis.
2002, and 2006-2010, and examine changes in subgroup differences since 1995. Finally, we identify socioeconomic characteristics associated with differential risks of failure for the four most commonly used reversible contraceptive methods in the U.S.: the pill, male condom, withdrawal and injectables.

Estimates of contraceptive failure are presented for the first twelve months of method use so that methods can be compared across an equivalent time period. In addition, it can be assumed that the risk of pregnancy for an individual woman will remain relatively constant over a one-year period; in other words, the assumption that both her fecundity and frequency of sexual intercourse will not change is more reasonable for one year as compared to longer durations.

Preliminary Findings

Analysis of the 2002 NSFG found virtually no change in failure rates between 1995 and 2002 (Kost et al. 2008). We are currently analyzing the 2006-2010 data, and our preliminary findings for contraceptive failure (not shown) indicate substantial changes in the rates since those measured in the earlier years using the 2002 and 1995 NSFGs.

Population subgroups experience different probabilities of failure and the socioeconomic factors associated with differential risks of failure are not the same for all methods. In this paper we will identify patterns of failure for subgroups of users and expect to find persistent differentials in the probabilities of failure across time and methods. These new estimates will be widely cited by demographers and others who rely on current estimates of contraceptive method effectiveness.
References


