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# Estimates of unintended pregnancy rates over the last decade in France as a function of contraceptive behaviors☆,☆☆,★

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## Abstract

**Objective:** We investigate trends in contraceptive behaviors in France and how they may have contributed to fluctuations in unintended pregnancy rates over time and across subgroups of the population between 2000 and 2010.
**Study Design:** Data are drawn from three national surveys in France, comprising 4714 women ages 15 to 49 in 2000, 8613 in 2005 and 5260 in 2010. We used multinomial and simple logistic regression models to explore trends in contraceptive behaviors over time. We estimated trends in unintended pregnancy rates in relation to population shifts in contraceptive behaviors between 2000 and 2010.
**Results:** A third of women were not using contraception at the time of the surveys. However, only 2.4% in 2000, 3.2% in 2005 and 2.4% in 2010 had an unmet need for contraception (p=.002). Among contraceptive users, user-dependent hormonal methods decreased from 59% in 2000 to 52% in 2010 (p<.0001), while long-acting reversible methods increased from 22% to 24% (p=.04). Changes in contraceptive behaviors resulted in fluctuations in unintended pregnancy rates estimated to have risen from 3.16% to 3.49% between 2000 and 2005, and to have decreased to 3.26% in 2010. Small changes in unmet need for contraception exerted the largest effects.
**Conclusion:** This study indicates that changes in contraceptive behaviors over the past decade in France have potentially resulted in significant fluctuations in unintended pregnancy rates. Our results also demonstrate that a simple algorithm combining contraceptive behaviors and typical-use failure rates may be an acceptable proxy for monitoring trends in unintended pregnancies.
**Implications:** This study offers a framework towards assessing trends in unintended pregnancies, when data on abortions and unintended births are not available. In the context of high contraceptive coverage, gaps of use undermine efforts to improve contraceptive effectiveness, as small fluctuations in unmet need contribute significantly to trends in unintended pregnancy rates.


*Keywords:* Contraception behavior; Unintended pregnancy; Contraceptive failure rates; Population-based survey; France

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## 1. Introduction

After experiencing a large-scale increase in use of very effective methods of contraception [hormonal contraception and the intrauterine device (IUD), as sterilization is marginal in France] from the 1970s to the mid 1990s, the gain in very effective contraceptive coverage in France seems to have stalled to a high of 82% of women in need of contraception (women who have been sexually active in the past year, nonsterile, not pregnant or trying to conceive), while 15% were using barrier or natural methods (condoms, withdrawal or fertility awareness methods) and less than 3% had an unmet need for contraception (women in need of contraception who are not using a method) [1]. This stabilization was confirmed in the 2005 French Barometer survey [2]. Annual abortion rates have increased from 13.6 to 14.8 per 1000 women ages 15 to 49 between 1999 and 2006 and stabilized since at 14.7 per 1000 in 2010 [3]. These fluctuations are more pronounced in women under the age of 25 years, with a 12% increase in abortion rates between 1999 and 2006 (from 18.99 per 1000 to 21.53 per 1000) followed by a subsequent 3% drop in the next 3 years, leveling out at 20.9 per 1000 in 2010 [3]. Abortion rates, however, result from a complex series of conditional decisions involving sexual activity, contraceptive practices and decisions to terminate an unintended pregnancy (pregnancies that are either mistimed or unwanted) [4]. Therefore, in order to improve our understanding of recent trends in reproductive behaviors and outcomes in France, we explore how patterns of contraceptive behaviors may contribute to fluctuations in unintended pregnancies rates over time.

## 2. Materials and methods

### 2.1. Study population

In this study we use data from the 2000 and 2005 waves of the National Health Barometer Survey, a periodic national French study assessing knowledge, attitudes and behaviors of the general population with respect to health. We also use data from the FECOND study, the most recent national survey on sexual and reproductive health in France conducted in 2010.

The two waves of the Health Barometer survey shared the same study protocol. Sampling design and data collection have been published in detail elsewhere [5]. A two-stage probability sampling procedure was used to identify 13,685 male and female respondents between the ages of 12 and 75 years in 2000, and 30,514 respondents of the same ages in 2005. An initial sample of households was drawn from the telephone directory, from which one eligible respondent per household was then randomly selected to participate. The present analysis includes 4775 women aged 15–49 years in 2000 and 8776 in 2005.

The FECOND study followed the same methodology for selecting a national probably sample of 7340 male and female respondents' ages 15 to 49 who had a landline. The survey also included a subsample of 1193 individuals who were cell phone only users to represent the growing population who does not own a landline (14% of the 15–49 age group in France in 2009). One eligible individual per telephone number was randomly selected for participation. Both samples were merged as a unique population as individuals responded to the same questionnaire. The overall refusal rate was 20% among eligible participants. All three studies received approval from the relevant French government oversight agency (CNIL, the Commission Nationale de l'Informatique et des Libertés).

### 2.2. Sociodemographic and reproductive health histories

In all three surveys, data were collected via anonymous telephone interviews, after participants had given oral consent. Questionnaires included a set of social and demographic questions as well as indicators of women's sexual and reproductive histories. We retained factors that were comparable across the three surveys, including age, level of education, professional situation, marital and cohabitation status, number of children in the household, lifetime sexual experience, sexual activity in the last year, history of abortion and sexually transmitted disease. While questions were identical in the 2000 and 2005 Health Barometer surveys, some formulations differed slightly in the 2010 FECOND survey. In particular, all women were asked about a current partner at the beginning of the survey in the FECOND survey, while current partner status resulted as a combination of living with a partner or having a boyfriend/girlfriend in the Health Barometer surveys. Women were asked about their own children, adopted children and children currently living in the household in the FECOND survey, while they were only asked if they had children and, if so, if the children were living in the household in the Health Barometer surveys. Finally, the FECOND study provided a detailed description of all pregnancy outcomes, whereas the Health Barometer Surveys collected lifetime history of abortions with a single question: "In the course of your life, have you ever had an elective abortion, by taking the RU pill or having a surgical intervention?"

### 2.3. Current contraceptive practices

All three surveys collected the same information on current contraceptive behaviors and reasons for nonuse. A hierarchical algorithm was used to identify the most effective method based on typical-use failure rates [6,7] if women reported more than one method. Women were considered not to be at risk of an unintended pregnancy if they were: (a) sterile or their partner was sterile, (b) pregnant or trying to conceive, (c) had no heterosexual activity in the last 12 months or (d) had just given birth or were breastfeeding. The later criteria were based on women's reasons for not using contraception, rather than an objective assessment of pregnancy risk, in the absence of data on the date of last