# CONSISTENCY OF PREGNANCY OUTCOME AND CONTRACEPTIVE REPORTING USING THE PREGNANCY HISTORY VERSUS BIRTH HISTORY

# DHS METHODOLOGICAL REPORTS 35

DHS Methodological Reports No. 35

# Consistency of Pregnancy Outcome and Contraceptive Reporting Using the Pregnancy History Versus Birth History

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# PREFACE

The Demographic and Health Surveys (DHS) Program is one of the principal sources of international data on fertility, family planning, maternal and child health, nutrition, mortality, environmental health, HIV/AIDS, malaria, and provision of health services.

One of the objectives of The DHS Program is to continually assess and improve the methodology and procedures used to conduct national-level surveys, as well as to offer additional tools for analysis. Improvements in methods will enhance the accuracy and depth of information collected by The DHS Program and relied on by policymakers and program managers in low- and middle-income countries.

While data quality is a main topic of the DHS Methodological Reports series, the reports also examine issues of sampling, questionnaire comparability, survey procedures, and methodological approaches. The topics explored in this series are selected by The DHS Program in consultation with the U.S. Agency for International Development.

It is hoped that the DHS Methodological Reports will be useful to researchers, policymakers, and survey specialists, particularly those engaged in work in low- and middle-income countries, and that it will be used to enhance the quality and analysis of survey data.


Sunita Kishor
Director, The DHS Program

# ABSTRACT

This study examines the consistency of reporting for two important pieces of information from the DHS reproductive calendar: first, births and terminations and second, contraceptive use. We use three measures of contraceptive use—overall contraceptive use, traditional contraceptive method use, and coitus-based contraceptive method use. For all these outcomes, we investigate within-survey consistency, comparing consistency from the early period of the calendar to the later period, and focus on if using a pregnancy history improves consistency of reporting when compared to a birth history. We find that surveys with pregnancy histories are more likely to have consistent reporting of births and terminations. Among the three measures of contraceptive use, use of a pregnancy history was only associated with improved consistency in reporting of coitus-based contraceptive method use. We also found that the later period of the calendar is more likely to have consistent reporting of births, terminations, and all categories of contraceptive use compared to the early period. These findings suggest that the DHS-8 shift to using pregnancy histories in the reproductive calendar will improve consistency of reporting of births, terminations, and some types of contraceptive use. In addition, we suggest exploring potential modifications to the reproductive calendar to improve data quality and consistency.

**Key words:** pregnancy history, birth history, reproductive history, contraceptive calendar, data quality

# ACRONYMS AND ABBREVIATIONS

CAFE  computer assisted field editing
CAPI  computer assisted personal interviews
CMC  century month code

DHS  Demographic and Health Survey
DSS  Demographic Surveillance System

LAC  Latin America and the Caribbean

MENA/WAEE Middle East, North Africa, West Central Asia, and Eastern Europe

PAPI  paper and pencil interview

WFS  World Fertility Survey

# 1    BACKGROUND

## 1.1    Reproductive Histories in DHS Surveys

Calculations of fertility and child mortality from survey data require asking women about births they have had in their lifetime. There are several different approaches to collecting these data. Some surveys only ask about the most recent and penultimate live birth. Another approach is a truncated birth history that lists all births in the 5 years before the survey. The Demographic and Health Surveys (DHS) Program, which began in 1984, decided to follow the approach used by the World Fertility Survey (WFS), which included a full enumeration of all live births, known as a full birth history.[1]

In 1986, The DHS Program pilot tested a reproductive and contraceptive calendar in experimental surveys conducted in Peru and the Dominican Republic. Each survey split the sample into those interviewed with the standard approach of asking retrospective questions about contraceptive use and those interviewed with a free-form calendar method. Analysis of these surveys showed that the calendar approach was superior to the prior method of asking retrospective questions about contraceptive use.[2] The calendar was added to the standard questionnaire for high contraceptive prevalence countries in 1990 and for all countries in 2003.

Each live birth in the past 5 to 6 years is added from the enumeration of all live births into the calendar. Each month of pregnancy is marked and the month of delivery is recorded. Pregnancies that did not result in a live birth during the calendar period are also added. For most surveys prior to the eighth phase of DHS (DHS-8), no distinction was made between miscarriages, stillbirths, and abortions.

A full pregnancy history is an enumeration of each pregnancy, its duration, and outcome, and for non-live births, if the end of the pregnancy was induced. A key distinction from the birth history is that pregnancies are not limited to those that ended with a live birth. For each pregnancy, a direct question is asked about the outcome of the pregnancy. A confirmation question is asked if a baby is reported born dead. Starting with DHS-8, a full pregnancy history is standard. Each pregnancy that occurs in the calendar period is added to the calendar similar to the birth history.



*Was the baby born alive, born dead, or did you have a miscarriage or abortion?*

| | |
|---|---|
| **BORN ALIVE** | 1 |
| **BORN DEAD** | 2 |
| **MISCARRIAGE** | 3 |
| **ABORTION** | 4 |

*Did the baby cry, move, or breathe?*

**YES    NO**

For additional details on the different approaches to collecting reproductive history data, please refer to DHS Methodological Report 25.[3]

## 1.2    Prior Analyses of Reproductive Histories

The experimental DHS survey in the Dominican Republic included a reinterview of a subsample of women approximately two-and-half months later to compare the reliability of the two different questionnaires. The experimental questionnaire elicited a truncated birth history and enumerated pregnancies that resulted in a non-live birth during the previous 5 years. Comparing the answers from the first interview and the re-

interview, live births were reported as the same year in 93% of cases, although those reported as the same month and year were 79%. The same number of pregnancies that did not end in a live birth were reported in both interviews, although the consistency of date reporting is much lower. Terminated pregnancies reported as the same year were 69%, while the same month and year was 61%.[4]

After the 1993–94 Bangladesh DHS, a survey was conducted at the Matlab Demographic Surveillance System (DSS) site. This survey randomized interviews to use either a live birth history or a pregnancy history. Each woman's survey responses were then compared to the vital statistics kept by DSS to determine the completeness of their recall. No difference was found in the completeness of reporting for live births. The pregnancy history resulted in slightly better completeness of infant deaths, although the difference was not statistically significant. The authors found that the accuracy of reporting the date of birth for live births was similar between the birth and pregnancy histories. The mean number of months difference between the DSS registry and the survey was 15 months for live births via both methods, with equal numbers shifted forward and backward in time. There were more matched early neonatal deaths found with the pregnancy history compared to the birth history, but the difference was not statistically significant.[5]

Two prior DHS methodological reports examined the quality and consistency of the reporting on terminated pregnancies and contraceptive use. By comparing the rate of stillbirths to early neonatal deaths, a 2015 DHS report found that most DHS surveys underreport stillbirths when compared to the globally accepted standard of 1.2.[6,7] This analysis, which did not include a test of statistical significance, found stillbirth to early neonatal death ratios closer to 1.2 for surveys that used a full pregnancy history compared to those that used a birth history with supplemental questions on non-live births in the calendar period. One of the recommendations from this report was to conduct a survey with an experimental design to understand if the birth history or pregnancy history resulted in more accurate reporting.

The Every Newborn INDEPTH Project conducted such an experiment in 2017–18 in a study carried out in five Health and Demographic Surveillance System (DSS) sites. Interviews were randomized to use either a full birth history with non-live birth recording via the calendar method or a complete pregnancy history. Results showed that the stillbirth rate was 21% higher using a pregnancy history compared to a birth history. The neonatal mortality rate was not statistically significantly different, and the results were not consistent across sites.[8]

Another DHS methodological report analyzed the within survey and between survey consistency of the ratio of terminations to live births as calculated over five 12-month retrospective periods as recorded in the calendar. A Wald test was used for statistical significance. The report found that overall, 80% of surveys were internally inconsistent and 70% were inconsistent between surveys.[3]

## 1.3    Contraceptive Use Reporting and Reproductive Histories

The DHS surveys routinely ask women if they are currently doing something to avoid or prevent pregnancy. Most surveys also utilize a calendar to record information about pregnancy and contraceptive use retrospectively for a period of 5 to 6 years. Months not marked with a pregnancy event are filled with contraceptive use or non-use so that every month in the calendar period is accounted for, although some surveys do not collect contraceptive activity in the calendar. Additional columns were sometimes included in the calendar to mark events in each month for the source of contraception, reason for contraceptive discontinuation, sexual activity, amenorrhea, breastfeeding status, marital status, employment, and

migration. The exact length of the calendar reference period depends on which month data collection began and if the fieldwork occurs in 2 calendar years, such as 2021 to 2022. Figure 1 shows an example of a complete paper-based calendar with one live birth, one terminated pregnancy, three episodes of contraceptive use, and two episodes of no contraceptive use. Surveys that use computer assisted personal interviews (CAPI) collect the same information but instead of a paper timeline, the questionnaire includes a series of structured questions that ask about each gap in the calendar timeline and account for every month.

In 1997, The DHS Program conducted an analysis of the first several DHS surveys that employed the calendar. This analysis found fairly consistent results when compared to the contraceptive prevalence reported through questions on current use in a prior survey to a calculated point estimate using the retrospective calendar data from a later survey. The report noted some heaping on duration of use. This included exactly 12 months of use of one method or multiple episodes of use for only one month.[9] As more surveys utilized the calendar, additional analysis of data quality in 2009 and 2015 found evidence of underreporting of contraceptive use when comparing retrospective data from one survey to current use estimates from a prior survey.[6,10]

**Figure 1    Calendar example**

## Calendar Entries for CASE #2

INSTRUCTIONS:
ONLY ONE CODE SHOULD APPEAR IN ANY BOX.
COLUMN 1 REQUIRES A CODE IN EVERY MONTH.

CODES FOR EACH COLUMN:

COL. 1: BIRTHS, PREGNANCIES, CONTRACEPTIVE USE

| | |
|---|---|
| B | BIRTHS |
| P | PREGNANCIES |
| T | TERMINATIONS |
| 0 | NO METHOD |
| 1 | FEMALE STERILIZATION |
| 2 | MALE STERILIZATION |
| 3 | IUD |
| 4 | INJECTABLES |
| 5 | IMPLANTS |
| 6 | PILL |
| 7 | CONDOM |
| 8 | FEMALE CONDOM |
| 9 | EMERGENCY CONTRACEPTION |
| J | STANDARD DAYS METHOD |
| K | LACTATIONAL AMENORRHEA METHOD |
| L | RHYTHM METHOD |
| M | WITHDRAWAL |
| X | OTHER MODERN METHOD |
| Y | OTHER TRADITIONAL METHOD |

COL. 2: DISCONTINUATION OF CONTRACEPTIVE USE

| | |
|---|---|
| 0 | INFREQUENT SEX/HUSBAND AWAY |
| 1 | BECAME PREGNANT WHILE USING |
| 2 | WANTED TO BECOME PREGNANT |
| 3 | HUSBAND/PARTNER DISAPPROVED |
| 4 | WANTED MORE EFFECTIVE METHOD |
| 5 | CHANGES IN MENSTRUAL BLEEDING |
| 6 | OTHER SIDE EFFECTS/HEALTH CONCERNS |
| 7 | LACK OF ACCESS/TOO FAR |
| 8 | COSTS TOO MUCH |
| N | INCONVENIENT TO USE |
| F | UP TO GOD/FATALISTIC |
| A | DIFFICULT TO GET PREGNANT/MENOPAUSAL |
| D | MARITAL DISSOLUTION/SEPARATION |
| X | OTHER _____ (SPECIFY) |
| Z | DON'T KNOW |

| | Month | # | COL. 1 | COL. 2 | |
|---|---|---|---|---|---|
| | 12 DEC | 01 | | | |
| | 11 NOV | 02 | | | |
| | 10 OCT | 03 | 6 | | |
| | 09 SEP | 04 | | | |
| 2 | 08 AUG | 05 | | | 2 |
| 0 | 07 JUL | 06 | | | 0 |
| 2 | 06 JUN | 07 | | | 2 |
| 0 | 05 MAY | 08 | | | 0 |
| | 04 APR | 09 | | | |
| | 03 MAR | 10 | | | |
| | 02 FEB | 11 | | | |
| | 01 JAN | 12 | | | |
| | 12 DEC | 13 | | | |
| | 11 NOV | 14 | | | |
| | 10 OCT | 15 | | | |
| | 09 SEP | 16 | | | |
| 2 | 08 AUG | 17 | | | 2 |
| 0 | 07 JUL | 18 | | | 0 |
| 1 | 06 JUN | 19 | | | 1 |
| 9 | 05 MAY | 20 | | | 9 |
| | 04 APR | 21 | | | |
| | 03 MAR | 22 | 6 | | |
| | 02 FEB | 23 | 0 | | |
| | 01 JAN | 24 | | | |
| | 12 DEC | 25 | | | |
| | 11 NOV | 26 | | | |
| | 10 OCT | 27 | 0 | | |
| | 09 SEP | 28 | B | | |
| 2 | 08 AUG | 29 | P | | 2 |
| 0 | 07 JUL | 30 | P | | 0 |
| 1 | 06 JUN | 31 | P | | 1 |
| 8 | 05 MAY | 32 | P | | 8 |
| | 04 APR | 33 | P | | |
| | 03 MAR | 34 | P | | |
| | 02 FEB | 35 | P | | |
| | 01 JAN | 36 | P | | |
| | 12 DEC | 37 | 0 | | |
| | 11 NOV | 38 | | | |
| | 10 OCT | 39 | | | |
| | 09 SEP | 40 | | | |
| 2 | 08 AUG | 41 | 0 | | 2 |
| 0 | 07 JUL | 42 | 6 | 2 | 0 |
| 1 | 06 JUN | 43 | | | 1 |
| 7 | 05 MAY | 44 | | | 7 |
| | 04 APR | 45 | | | |
| | 03 MAR | 46 | | | |
| | 02 FEB | 47 | | | |
| | 01 JAN | 48 | | | |
| | 12 DEC | 49 | | | |
| | 11 NOV | 50 | | | |
| | 10 OCT | 51 | | | |
| | 09 SEP | 52 | | | |
| 2 | 08 AUG | 53 | 6 | | 2 |
| 0 | 07 JUL | 54 | T | | 0 |
| 1 | 06 JUN | 55 | P | | 1 |
| 6 | 05 MAY | 56 | P | | 6 |
| | 04 APR | 57 | 7 | 1 | |
| | 03 MAR | 58 | | | |
| | 02 FEB | 59 | | | |
| | 01 JAN | 60 | | | |
| | 12 DEC | 61 | | | |
| | 11 NOV | 62 | | | |
| | 10 OCT | 63 | | | |
| | 09 SEP | 64 | | | |
| 2 | 08 AUG | 65 | | | 2 |
| 0 | 07 JUL | 66 | | | 0 |
| 1 | 06 JUN | 67 | | | 1 |
| 5 | 05 MAY | 68 | | | 5 |
| | 04 APR | 69 | | | |
| | 03 MAR | 70 | | | |
| | 02 FEB | 71 | | | |
| | 01 JAN | 72 | 7 | | |

# 2 DATA AND METHODS

## 2.1 Data

A total of 191 DHS surveys from 67 countries have administered a reproductive calendar (Table 1). Most (83) of these surveys were conducted in sub-Saharan Africa, 40 were conducted in Asia, 35 in the Middle East, North Africa, West Central Asia, and Eastern Europe (MENA/WAEE), and 33 in Latin America and the Caribbean (LAC). These surveys were implemented between 1990 and 2022. Most (165) reproductive calendars are based on a birth history, while the remainder (26) are based on a pregnancy history. In most cases, countries consistently implemented one type of reproductive calendar. Exceptions include Cambodia and Kenya that had conducted birth histories until their DHS-8 surveys, when they switched to the pregnancy history. Albania also switched from using a pregnancy history in the 2008–09 survey to a birth history in 2017–18.

**Table 1      Surveys and characteristics**

| Survey | DHS Phase [1] | Type of reproductive history included | Number of interview languages | Mode of data collection | Contraceptive calendar information | Included in contraceptive use reporting consistency analysis [2] |
|---|---|---|---|---|---|---|
| ASIA | | | | | | |
| Afghanistan 2015 | 7 | Birth | 3 | PAPI | Yes | No |
| Bangladesh 1993–94 | 3 | Birth | 1 | PAPI | Yes | No |
| Bangladesh 1996–97 | 3 | Birth | 1 | PAPI | Yes | Yes |
| Bangladesh 1999–00 | 3 | Birth | 1 | PAPI | Yes | Yes |
| Bangladesh 2004 | 4 | Birth | 1 | PAPI | Yes | Yes |
| Bangladesh 2007 | 5 | Birth | 1 | PAPI | Yes | Yes |
| Bangladesh 2011 | 6 | Birth | 1 | PAPI | Yes | Yes |
| Bangladesh 2014 | 6 | Birth | 1 | PAPI | Yes | Yes |
| Bangladesh 2017–18 | 7 | Birth | 1 | PAPI | Yes | Yes |
| Cambodia 2010 | 5 | Birth | 1 | PAPI | Yes | No |
| Cambodia 2014 | 6 | Birth | 1 | PAPI | Yes | Yes |
| Cambodia 2021–22 | 8 | Pregnancy | 1 | CAPI | Yes | No |
| India 2005–06 | 5 | Birth | NA | PAPI | Yes | No |
| India 2015–16 | 6 | Birth | 22 | CAPI | Yes | No |
| India 2019–21 | 7 | Birth | 18 | CAPI | Yes | Yes |
| Indonesia 1991 | 2 | Birth | 1 | PAPI | Yes | No |
| Indonesia 1994 | 3 | Birth | 1 | PAPI | Yes | Yes |
| Indonesia 1997 | 3 | Birth | 1 | PAPI | Yes | Yes |
| Indonesia 2002–03 | 4 | Birth | 1 | PAPI | Yes | Yes |
| Indonesia 2007 | 5 | Birth | NA | PAPI | Yes | Yes |
| Indonesia 2012 | 6 | Birth | NA | PAPI | Yes | Yes |
| Indonesia 2017 | 7 | Birth | NA | PAPI | Yes | Yes |
| Maldives 2009 | 5 | Birth | 1 | PAPI | Yes | No |
| Maldives 2016–17 | 7 | Birth | 2 | CAPI | Yes | No |
| Myanmar 2015–16 | 7 | Birth | 3 | CAFE | Yes | No |
| Nepal 2006 | 5 | Pregnancy | 5 | PAPI | Yes | No |
| Nepal 2011 | 6 | Pregnancy | 5 | CAPI | Yes | Yes |
| Nepal 2016 | 7 | Pregnancy | 5 | CAPI | Yes | Yes |
| Nepal 2022 | 8 | Pregnancy | 3 | CAPI | Yes | Yes |
| Pakistan 2012–13 | 6 | Pregnancy | 8 | CAFE | Yes | No |
| Pakistan 2017–18 | 7 | Pregnancy | 2 | CAFE | Yes | Yes |
| Papua New Guinea 2016–18 | 7 | Birth | 4 | CAFE | Yes | No |
| Philippines 1993 | 2 | Pregnancy | 8 | PAPI | Yes | No |
| Philippines 1998 | 3 | Pregnancy | 9 | PAPI | Yes | Yes |
| Philippines 2003 | 4 | Pregnancy | 18 | PAPI | Yes | Yes |
| Philippines 2022 | 8 | Pregnancy | 6 | CAPI | Yes | No |
| Timor-Leste 2009–10 | 5 | Birth | 6 | PAPI | Yes | No |
| Timor-Leste 2016 | 7 | Birth | 1 | CAPI | Yes | No |
| Vietnam 1997 | 3 | Pregnancy | 1 | PAPI | Yes | No |
| Vietnam 2002 | 4 | Pregnancy | NA | PAPI | Yes | Yes |

*Continued…*

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**Table 1—**_Continued_

| Survey | DHS Phase * | Type of reproductive history included | Number of interview languages | Mode of data collection | Contraceptive calendar information | Included in contraceptive use reporting consistency analysis ** |
|---|---|---|---|---|---|---|
| | | | AFRICA | | | |
| Angola 2015–16 | 7 | Birth | 12 | CAPI | Yes | No |
| Benin 2006 | 5 | Birth | 9 | PAPI | No | No |
| Benin 2011–12 | 6 | Birth | | CAPI | Yes | Yes |
| Benin 2017–18 | 7 | Birth | 8 | CAPI | Yes | Yes |
| Burkina Faso 2003 | 4 | Birth | 6 | PAPI | No | No |
| Burkina Faso 2010 | 6 | Birth | 6 | PAPI | Yes | No |
| Burundi 2010 | 6 | Birth | 2 | PAPI | Yes | No |
| Burundi 2016–17 | 7 | Birth | 2 | CAPI | Yes | No |
| Comoros 2012 | 6 | Birth | 2 | PAPI | Yes | No |
| Ethiopia 2005 | 4 | Birth | 5 | PAPI | Yes | Yes |
| Ethiopia 2011 | 6 | Birth | 5 | PAPI | Yes | Yes |
| Ethiopia 2016 | 7 | Birth | 33 | CAPI | Yes | Yes |
| Gambia 2013 | 6 | Birth | NA | PAPI | Yes | No |
| Gambia 2019–20 | 8 (7) | Birth | 11 | CAPI | Yes | No |
| Ghana 2003 | 4 | Birth | 8 | PAPI | No | No |
| Ghana 2008 | 5 | Birth | 7 | PAPI | Yes | Yes |
| Ghana 2014 | 6 | Birth | 6 | CAFE | Yes | Yes |
| Guinea 2005 | 4 | Birth | 8 | PAPI | No | No |
| Guinea 2018 | 7 | Birth | 8 | CAPI | Yes | No |
| Kenya 1998 | 3 | Birth | 23 | PAPI | Yes | No |
| Kenya 2003 | 4 | Birth | 15 | PAPI | Yes | Yes |
| Kenya 2008–09 | 5 | Birth | 15 | PAPI | Yes | Yes |
| Kenya 2014 | 6 | Birth | 18 | PAPI | Yes | Yes |
| Kenya 2022 | 8 | Pregnancy | 1 | CAPI | Yes | No |
| Lesotho 2009 | 5 | Birth | 2 | CAPI | Yes | No |
| Lesotho 2014 | 6 | Birth | 3 | CAPI | Yes | Yes |
| Liberia 2013 | 6 | Birth | 1 | PAPI | Yes | No |
| Liberia 2019–20 | 7 | Birth | 1 | CAPI | Yes | No |
| Madagascar 2003–04 | 4 | Birth | | PAPI | No | No |
| Madagascar 2008–09 | 5 | Birth | | PAPI | Yes | Yes |
| Madagascar 2021 | 8 (7) | Birth | 2 | CAPI | Yes | No |
| Malawi 2000 | 4 | Birth | 2 | PAPI | No | No |
| Malawi 2004 | 4 | Birth | 4 | PAPI | Yes | Yes |
| Malawi 2010 | 5 | Birth | 6 | PAPI | Yes | Yes |
| Malawi 2015–16 | 7 | Birth | 4 | CAPI | Yes | Yes |
| Mali 2001 | 4 | Birth | 10 | PAPI | No | No |
| Mali 2006 | 5 | Birth | 3 | PAPI | No | No |
| Mali 2012–13 | 6 | Birth | 3 | CAPI | Yes | No |
| Mali 2018 | 7 | Birth | 12 | CAPI | Yes | Yes |
| Mauritania 2019–21 | 7 | Birth | 6 | CAPI | Yes | No |
| Mozambique 2003 | 4 | Birth | NA | PAPI | Yes | No |
| Mozambique 2011 | 6 | Birth | NA | CAPI | Yes | No |
| Namibia 2006–07 | 5 | Birth | 8 | PAPI | Yes | No |
| Namibia 2013 | 6 | Birth | 7 | PAPI | Yes | No |
| Niger 2006 | 5 | Birth | 7 | PAPI | No | No |
| Niger 2012 | 6 | Birth | 2 | PAPI | Yes | No |
| Nigeria 2008 | 5 | Birth | 5 | PAPI | Yes | No |
| Nigeria 2013 | 6 | Birth | 9 | PAPI | Yes | Yes |
| Nigeria 2018 | 7 | Birth | 4 | CAPI | Yes | Yes |
| Rwanda 2000 | 4 | Birth | 1 | PAPI | No | No |
| Rwanda 2005 | 4 | Birth | 3 | PAPI | No | No |
| Rwanda 2010 | 6 | Birth | 1 | PAPI | Yes | Yes |
| Rwanda 2014–15 | 6 | Birth | 1 | PAPI | Yes | Yes |
| Rwanda 2019–20 | 8 (7) | Birth | 2 | CAPI | Yes | Yes |
| Senegal 2005 | 4 | Birth | 4 | PAPI | No | No |
| Senegal 2010–11 | 6 | Birth | 7 | CAPI | Yes | Yes |
| Senegal 2012–13 | 6 | Birth | 7 | CAPI | Yes | Yes |
| Senegal 2014 | 6 | Birth | NA | CAPI | Yes | Yes |
| Senegal 2015 | 6 | Birth | 7 | CAPI | Yes | Yes |
| Senegal 2016 | 6 | Birth | NA | CAPI | Yes | Yes |
| Senegal 2017 | 7 | Birth | NA | CAPI | Yes | Yes |
| Senegal 2018 | 8 (7) | Birth | NA | CAPI | Yes | Yes |
| Senegal 2019 | 8 (7) | Birth | NA | CAPI | Yes | Yes |

_Continued…_

**Table 1—**_Continued_

| Survey | DHS Phase* | Type of reproductive history included | Number of interview languages | Mode of data collection | Contraceptive calendar information | Included in contraceptive use reporting consistency analysis** |
|---|---|---|---|---|---|---|
| Sierra Leone 2008 | 5 | Birth | 5 | PAPI | Yes | No |
| Sierra Leone 2013 | 6 | Birth | NA | PAPI | Yes | Yes |
| Sierra Leone 2019 | 7 | Birth | NA | CAPI | Yes | Yes |
| South Africa 2016 | 7 | Birth | 11 | CAPI | Yes | No |
| Swaziland (now eSwatini) 2006–07 | 5 | Birth | 1 | PAPI | Yes | No |
| Tanzania 2004–05 | 4 | Birth | 1 | PAPI | Yes | No |
| Tanzania 2010 | 5 | Birth | 1 | PAPI | Yes | Yes |
| Tanzania 2015–16 | 7 | Birth | 2 | CAFE | Yes | Yes |
| Uganda 2000–01 | 4 | Birth | 6 | PAPI | No | No |
| Uganda 2006 | 5 | Birth | 9 | PAPI | Yes | Yes |
| Uganda 2011 | 6 | Birth | 12 | CAFE | Yes | Yes |
| Uganda 2016 | 7 | Birth | 10 | CAPI | Yes | Yes |
| Zambia 2007 | 5 | Birth | 9 | PAPI | Yes | No |
| Zambia 2013–14 | 6 | Birth | 9 | PAPI | Yes | No |
| Zambia 2018 | 7 | Birth | 8 | CAPI | Yes | Yes |
| Zimbabwe 1994 | 3 | Birth | 3 | PAPI | Yes | No |
| Zimbabwe 1999 | 4 | Birth | 4 | PAPI | Yes | Yes |
| Zimbabwe 2005–06 | 5 | Birth | 4 | PAPI | Yes | Yes |
| Zimbabwe 2010–11 | 6 | Birth | 3 | CAPI | Yes | Yes |
| Zimbabwe 2015 | 7 | Birth | 3 | CAPI | Yes | Yes |
| LAC | | | | | | |
| Bolivia 1994 | 3 | Birth | 5 | PAPI | Yes | No |
| Bolivia 2003 | 4 | Birth | NA | PAPI | No | No |
| Bolivia 2008 | 5 | Birth | NA | PAPI | Yes | Yes |
| Brazil NE 1991 | 2 | Birth | NA | PAPI | Yes | No |
| Brazil 1996 | 3 | Birth | NA | PAPI | Yes | Yes |
| Colombia 1990 | 2 | Birth | NA | PAPI | Yes | No |
| Colombia 1995 | 3 | Birth | NA | PAPI | Yes | Yes |
| Colombia 2000 | 4 | Birth | NA | PAPI | Yes | Yes |
| Colombia 2005 | 4 | Birth | NA | CAPI | Yes | Yes |
| Colombia 2010 | 5 | Birth | NA | CAPI | Yes | Yes |
| Colombia 2015 | 7 | Birth | NA | CAPI | Yes | Yes |
| Dominican Republic 1991 | 2 | Birth | NA | PAPI | Yes | No |
| Dominican Republic 1996 | 3 | Birth | NA | PAPI | Yes | Yes |
| Dominican Republic 1999 | 3 | Birth | NA | PAPI | Yes | Yes |
| Dominican Republic 2002 | 4 | Birth | NA | PAPI | Yes | Yes |
| Guatemala 1995 | 3 | Birth | 8 | PAPI | Yes | No |
| Guatemala 1998–99 | 3 | Birth | 9 | PAPI | Yes | Yes |
| Guatemala 2014–15 | 6 | Birth | 10 | PAPI | Yes | No |
| Guyana 2009 | 5 | Birth | 3 | PAPI | Yes | No |
| Honduras 2005–06 | 5 | Birth | NA | PAPI | Yes | No |
| Honduras 2011–12 | 6 | Birth | NA | PAPI | Yes | Yes |
| Nicaragua 1998 | 3 | Birth | NA | PAPI | Yes | No |
| Nicaragua 2001 | 4 | Birth | NA | PAPI | No | No |
| Paraguay 1990 | 2 | Birth | NA | PAPI | Yes | No |
| Peru 1991–92 | 2 | Birth | NA | PAPI | Yes | No |
| Peru 1996 | 3 | Birth | NA | PAPI | Yes | Yes |
| Peru 2000 | 4 | Birth | NA | PAPI | Yes | Yes |
| Peru 2004–06 | 5 | Birth | NA | CAPI | Yes | No |
| Peru 2007–08 | 5 | Birth | NA | CAPI | Yes | Yes |
| Peru 2009 | 6 | Birth | NA | CAPI | Yes | Yes |
| Peru 2010 | 6 | Birth | NA | CAPI | Yes | Yes |
| Peru 2011 | 6 | Birth | NA | CAPI | Yes | Yes |
| Peru 2012 | 6 | Birth | NA | CAPI | Yes | Yes |

_Continued…_

**Table 1—***Continued*

| Survey | DHS Phase* | Type of reproductive history included | Number of interview languages | Mode of data collection | Contraceptive calendar information | Included in contraceptive use reporting consistency analysis** |
|---|---|---|---|---|---|---|
| | | MENA/WAEE | | | | |
| Albania 2008–09 | 5 | Pregnancy | 1 | CAPI | Yes | No |
| Albania 2017–18 | 7 | Birth | NA | CAPI | Yes | No |
| Armenia 2000 | 4 | Pregnancy | 4 | PAPI | Yes | No |
| Armenia 2005 | 4 | Pregnancy | 3 | PAPI | Yes | Yes |
| Armenia 2010 | 6 | Pregnancy | 4 | PAPI | Yes | Yes |
| Armenia 2015–16 | 7 | Pregnancy | 2 | PAPI | Yes | Yes |
| Azerbaijan 2006 | 5 | Pregnancy | 3 | PAPI | Yes | No |
| Egypt 1992 | 2 | Birth | 1 | PAPI | Yes | No |
| Egypt 1995 | 3 | Birth | 1 | PAPI | Yes | Yes |
| Egypt 2000 | 4 | Birth | 1 | PAPI | Yes | Yes |
| Egypt 2003 | 4 | Birth | NA | PAPI | Yes | Yes |
| Egypt 2005 | 4 | Birth | 1 | PAPI | Yes | Yes |
| Egypt 2008 | 5 | Birth | 1 | PAPI | Yes | Yes |
| Egypt 2014 | 6 | Birth | 1 | PAPI | Yes | No |
| Jordan 1990 | 2 | Birth | 1 | PAPI | Yes | No |
| Jordan 1997 | 3 | Birth | 1 | PAPI | Yes | No |
| Jordan 2002 | 4 | Birth | 1 | PAPI | Yes | Yes |
| Jordan 2007 | 5 | Birth | 2 | PAPI | Yes | Yes |
| Jordan 2009 | 5 | Birth | 2 | PAPI | Yes | Yes |
| Jordan 2012 | 6 | Birth | 1 | PAPI | Yes | Yes |
| Jordan 2017–18 | 7 | Birth | 1 | CAPI | Yes | Yes |
| Kazakhstan 1999 | 3 | Pregnancy | 4 | PAPI | Yes | No |
| Kyrgyz Republic 2012 | 6 | Pregnancy | 3 | PAPI | Yes | No |
| Moldova 2005 | 4 | Pregnancy | 2 | PAPI | Yes | No |
| Morocco 1992 | 2 | Birth | NA | PAPI | Yes | No |
| Morocco 2003–04 | 4 | Birth | NA | PAPI | Yes | No |
| Tajikistan 2012 | 6 | Pregnancy | 3 | PAPI | Yes | No |
| Tajikistan 2017 | 7 | Pregnancy | 3 | CAPI | Yes | Yes |
| Turkey 1993 | 2 | Birth | 4 | CAFE | Yes | No |
| Turkey 1998 | 3 | Birth | 4 | PAPI | Yes | Yes |
| Turkey 2003 | 4 | Birth | 4 | PAPI | Yes | Yes |
| Turkey 2008 | 5 | Birth | 1 | PAPI | Yes | Yes |
| Turkey 2013 | 6 | Birth | 4 | PAPI | Yes | Yes |
| Ukraine 2007 | 5 | Pregnancy | 3 | PAPI | Yes | No |
| Yemen 2013 | 6 | Birth | NA | PAPI | Yes | No |

* Surveys implemented in the period of DHS-8, but which used the DHS-7 recode are indicated as 8 (7).
** Requires use of the contraceptive calendar and a previous survey within 6 years.

### 2.1.1 Birth and termination reporting data

All 191 surveys that included a reproductive calendar are included in the analysis of consistency of birth and termination reporting.

The reproductive calendar records monthly data for a woman's entire reproductive lifespan to date, which means since her first pregnancy or birth. Reproductive data—pregnancies, births, and terminations—are captured in the first column of the calendar. Terminations include any pregnancy outcome other than a live birth. In the standard DHS women's recode data file, this reproductive data are represented by a one string variable that lists the reproductive status of the woman for each month. For this analysis, the string variable is converted to event files using the *DHS Contraceptive Calendar Tutorial*.[11]

In this analysis, we limit the period of observation to a 60-month retrospective period using the century month code (CMC) and dropping the first 3 months before the date of the interview. Excluding the first three months of the interview avoids possible biased reporting of pregnancies, pregnancy outcomes, and pregnancies due to contraceptive failures, since many women do not realize they are pregnant in the early

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months of a pregnancy. In addition, the month of interview is usually an incomplete month of observation unless the interview occurs on the last day of the month.

### 2.1.2 Contraceptive use reporting data

All DHS surveys that had a contraceptive calendar and a preceding survey up to 6 years prior are included in the analysis of contraceptive use reporting. Surveys come from 36 countries, with multiple surveys from some countries. Forty-one surveys from sub-Saharan Africa, 22 from Asia, 19 from LAC, and 18 from MENA/WAEE are included. We also use current use of contraceptive estimates from the preceding survey to plot current contraceptive use trend lines, although the consistency of these surveys is not assessed in this analysis.

We used the same string variable that lists the reproductive status of the woman for each month and converted it to a file of single months. This allowed us to calculate the contraceptive prevalence by month as well as over an aggregate period of time. The code used for this conversion is available in the *DHS Contraceptive Calendar Tutorial*.[11]

To compare current use trend estimates to the calendar trend estimates, the age groups from the successive surveys must be comparable. Women over age 43 are excluded from the current use estimates, while calendar months before a woman's 15th birthday and after her 44th birthday are excluded from the analysis.

## 2.2 Measures and Methods

### 2.2.1 Terminations

The base measure used to compare reporting of terminations in pregnancy histories versus birth histories is the termination ratio. This is the ratio of terminated pregnancies to live births per 100 live births in any given month of the calendar. The monthly termination ratios are aggregated into termination ratios for two intervals: the early calendar period (the first 30 months of the observation period) and the later calendar period (the last 30 months of the observation period). Figure 2 illustrates these periods and their relationship to the date of interview. Most importantly, references to the early calendar period refer to the period that is further away in time from the date of interview, while the later calendar period is closer to the date of interview. If we use T to represent terminations and B for births, we calculate Ratio 1 (R1) = T/B for the early calendar period and Ratio 2 (R2) = T/B for the later calendar period.

**Figure 2  Study observation period**
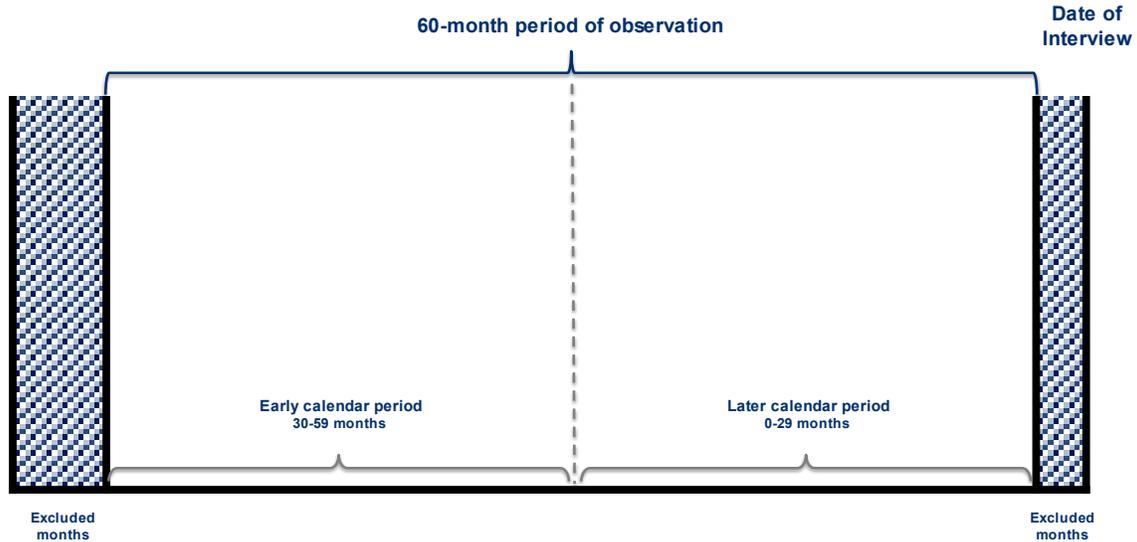


The termination ratios from the early and later calendar periods are then compared in their own ratio of ratios, with the later period as the numerator and the early period as the denominator. Using the earlier example, we can describe this ratio as R2/R1. The underlying assumption is that the "true" termination ratio should remain consistent over the entire 60-month observation period, and that any statistically significant difference in the early versus later period of observation is most likely a data quality issue due to reporting. To assess this assumption, the equality of the termination ratios from the early period and later period are tested using a Wald test. Surveys with a Wald test $p$ value above .05 are deemed "consistent," which means that is there is no statistically significant difference in birth and termination reporting in the early versus later period of observation. Surveys with a Wald test $p$ value below .05 are deemed "not consistent."

We first examine consistency in termination reporting by region and survey characteristics using a two-sample test of proportions. Logistic regression then identified characteristics of surveys that are associated with survey consistency in termination reporting. We examine the association of pregnancy history with consistency in termination reporting overall and within each geographic region.

## 2.2.2  Contraceptive use reporting

When assessing consistency of contraceptive use reporting, the underlying assumption is different since patterns of contraceptive use change over time. To determine if contraceptive use reporting is consistent across the early and later time periods when reported using the pregnancy versus birth history, we need to identify potential underlying trends in contraceptive use that may have been occurring during the same time period. Therefore, we first plot the change in contraceptive use with the current contraceptive use measure. Since reporting about a current behavior such as current contraceptive use is not subject to recall biases that may occur when reporting events that happened in the past, we use the current use estimates as the standard with which the calendar estimate is compared.

Three current use measures are estimated:

- Current use of any contraceptive method

- Current use of a traditional contraceptive method. Any of the following methods were classified as traditional methods: periodic abstinence (the rhythm method), withdrawal (coitus interruptus), prolonged breastfeeding, herbs, massage, other folkloric methods, and any other method not specifically classified as modern.

- Current use of a coitus-based contraceptive method. Any of the following methods were classified as coitus-based methods: condoms, spermicide, sponge, diaphragms/cervical caps, periodic abstinence (the rhythm method), and withdrawal (coitus interruptus).

We look at traditional and coitus-based methods separately. Although these categories are not mutually exclusive, these categories of methods are believed to be subject to greatest underreporting in the reproductive calendar. Each of these measures are estimated for all surveys that use the contraceptive calendar as well as one survey prior to the earliest available survey that used the calendar. This allowed us to plot the current use trend from the previous survey to the first calendar survey. These estimates are plotted at the median month of survey data collection for the trend line.

For each survey that used a contraceptive calendar, a total of six measures are estimated using the calendar:

- Use of any contraceptive method at the median point in the early calendar period and at the median point in the later calendar period.

- Use of a traditional contraceptive method at the median point in the early calendar period and at the median point in the later calendar period.

- Use of a coitus-based contraceptive method at the median point in the early calendar period and at the median point in the later calendar period.

Consistency of contraceptive use reporting was assessed with two metrics:

- Whether or not the current use and calendar estimate trend lines are similar. We assume that there is a straight line between the current use estimate and 95% confidence interval from the previous survey and the survey being assessed, as well as a straight line between the calendar estimate from the early calendar period to the later calendar period. We use surveys closer together (less than 6 years) to limit the potential bias from the assumption of this straight-line trend between current use estimates. Using the slope of the trend line, we calculate the current use estimate and 95% confidence interval at the median timepoint of the early calendar period and the median timepoint of the later calendar period. If there is any overlap in the 95% confidence intervals of the estimates at either the early or later calendar period, the current use and calendar estimates are deemed "similar."

- Whether or not the slope of the current use and calendar estimate trend line are similar. In this case, we use cutoffs of 0.8 and 1.2 for the ratio of the slope of the calendar estimate line to the slope of the current use estimate line. A survey with a ratio of slopes within those parameters is deemed to have "similar" slopes.

These metrics are represented visually with a graph for each country. Figure 3 is an example of a graph—the overall contraceptive prevalence graph from Armenia. Current use estimates are plotted with diamonds of different colors depending on the survey, with trend lines between them. The gray area represents the 95% confidence interval around the estimates. The within survey calendar estimates at the early and later periods of the calendar within a survey are shown with the circles, in the same color as the current use estimate for that survey. The dashed line represents the within calendar trend in the estimate, and the shaded area around the dashed line represents the 95% confidence interval around the calendar estimate.

For the current use and calendar estimates to be categorized as similar, both the early and later calendar estimate of contraceptive use must fall within the gray area of the current use estimate trend line. In this example, for each survey with calendar data, the later calendar estimate falls within the 95% confidence interval, and for the 2010 and 2015 survey, the early calendar estimate also falls within the 95% confidence interval. Therefore, all three surveys were classified as similar. The ratio of absolute value of the slopes of each survey's within calendar trend are outside of our cutoffs of 0.8 and 1.2, with the 2015 survey being the closest with a ratio of 1.6.

**Figure 3    Example graph of overall contraceptive use reporting consistency, Armenia**
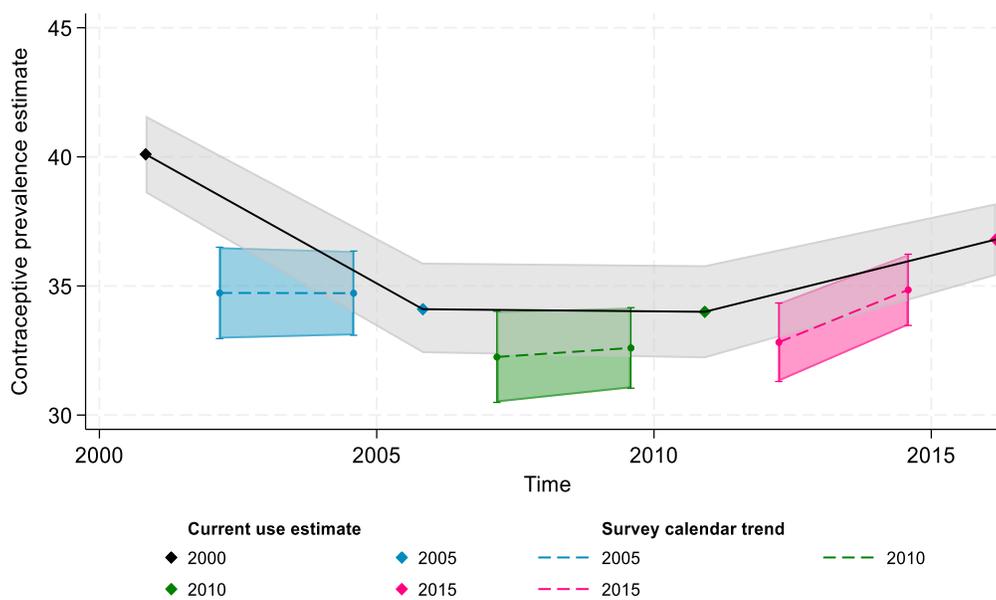


Surveys that meet both criteria are deemed to be consistent. In the example above, none of the three surveys had similar within-calendar contraceptive use trend slopes to the current use trend slopes, and none of the three surveys from Armenia were classified as consistent.

We first examine consistency of contraceptive use reporting by region and survey characteristics by using a two-sample test of proportions. We also assess if a survey is more likely to be similar to the current use estimate in the early or later calendar period. Logistic regression is then used to identify characteristics of surveys that are associated with survey consistency in contraceptive use reporting. Surveys with more than 6 years since a previous DHS are not included in the analysis but are included in the visual representations in the Appendix.

All analysis uses Stata 18.

### 2.2.3   Other measures

In addition to classifying surveys according to whether it used a pregnancy or a birth history, we also classify surveys according to:

- The mode of data collection. The DHS Program uses three methodologies to collect data: paper and pencil interviews (PAPI), computer assisted field editing (CAFE), and computer assisted personal interviews (CAPI). Regardless of the mode used, each DHS survey utilizes a standard approach in all countries to ensure comparability. With paper questionnaires, interviewers record responses directly on to a paper questionnaire. Field editors check the paper questionnaires and when data collection in a cluster is completed, supervisors ship the questionnaires to the central office where the data are entered into a computer system. With CAFE, interviewers also collect data on paper questionnaires, but field editors enter the questionnaire data into the database while the team is still in the cluster. Feedback can be provided rapidly to interviewers on any issues, and issues can be quickly addressed. With CAPI, interviewers record responses directly into a tablet computer. In this analysis, surveys that used paper and CAFE data collection are combined and compared with surveys that used CAPI. On a tablet, only one question is visible at a time while on paper, the interviewer can see all information entered on the page. The CAPI system includes checks as the data are entered and flags impossible or implausible answers for the interviewer immediately. These differences may affect the quality of data collected. See Figures 4 and 5 for a comparison of the paper and CAPI pregnancy history questions. The birth history is asked in a similar manner. See Figures 6 and 7 for a comparison of how the contraceptive and reproductive calendar are asked in the paper and CAPI surveys.

**Figure 4    Paper questionnaire - pregnancy history**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 |

| 214 | Now I would like to record all your pregnancies including live births, stillbirths, miscarriages, and abortions, starting with your first pregnancy. |
|---|---|
| | RECORD ALL PREGNANCIES. RECORD TWINS AND TRIPLETS ON SEPARATE LINES. |

| PREGNANCY HISTORY LINE NUMBER | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 |
|---|---|---|---|---|---|---|---|---|
| | IF ROW=01: Think back to your first pregnancy. Was that a single pregnancy, twins, or triplets? <br><br> IF ROW>01: Think back to your next pregnancy. Was that a single pregnancy, twins, or triplets? | IF 215=SING: Was the baby born alive, born dead, or did you have a miscarriage or abortion? <br><br> IF 215>1: FIRST OF MULT. Was the first baby in this pregnancy born alive or born dead? NEXT MULT. Was the next baby in this pregnancy born alive or born dead? | Did the baby cry, move, or breathe? | What name was given to the baby? <br><br> RECORD NAME. | Is {NAME IN 218} a boy or a girl? | CHECK 216 AND 217: TYPE OF PREGNANCY OUTCOME. <br> NOTE: IF 217=1, THEN PREGNANCY OUTCOME = <br> IF BORN ALIVE: On what day, month, and year was {NAME IN 218} born? <br> IF BORN DEAD, MISCARRIAGE, OR ABORTION: On what day, month, and year did this pregnancy end? | How long did this pregnancy last in weeks or months? <br><br> RECORD IN COMPLETED WEEKS OR MONTHS. | IF ROW=01: Were there any other pregnancies before this pregnancy? <br> IF ROW>01: Were there any other pregnancies between the previous pregnancy and this pregnancy? <br> IF 215>1 AND THIS IS NOT THE FIRST BIRTH OF THE PREGNANCY, SKIP TO 216 IN NEXT ROW. |
| 01 | SING ... 1 <br> TWINS 2 <br> TRIP .... 3 <br> QUAD .. 4 <br> QUIN ... 5 | BORN ALIVE .. 1 (SKIP TO 218) <br> BORN DEAD .. 2 <br> MISCARRIAGE 3 (SKIP TO 220) <br> ABORTION .... 4 | YES ..... 1 <br> NO ....... 2 ↓ (SKIP TO 220) | NAME | BOY .... 1 <br> GIRL .... 2 | DAY ☐☐ <br> MONTH ☐☐ <br> ☐☐☐☐ YEAR | WEEKS 1 ☐☐ <br> MONTHS 2 ☐☐ | YES .............. 1 (ADD PREGNANCY) <br> NO ................ 2 (NEXT ROW) |
| 02 | SING ... 1 <br> TWINS 2 <br> TRIP .... 3 <br> QUAD .. 4 <br> QUIN ... 5 | BORN ALIVE .. 1 (SKIP TO 218) <br> BORN DEAD .. 2 <br> MISCARRIAGE 3 (SKIP TO 220) <br> ABORTION .... 4 | YES ..... 1 <br> NO ....... 2 ↓ (SKIP TO 220) | NAME | BOY .... 1 <br> GIRL .... 2 | DAY ☐☐ <br> MONTH ☐☐ <br> ☐☐☐☐ YEAR | WEEKS 1 ☐☐ <br> MONTHS 2 ☐☐ | YES .............. 1 (ADD PREGNANCY) <br> NO ................ 2 (NEXT ROW) |
| 03 | SING ... 1 <br> TWINS 2 <br> TRIP .... 3 <br> QUAD .. 4 <br> QUIN ... 5 | BORN ALIVE .. 1 (SKIP TO 218) <br> BORN DEAD .. 2 <br> MISCARRIAGE 3 (SKIP TO 220) <br> ABORTION .... 4 | YES ..... 1 <br> NO ....... 2 ↓ (SKIP TO 220) | NAME | BOY .... 1 <br> GIRL .... 2 | DAY ☐☐ <br> MONTH ☐☐ <br> ☐☐☐☐ YEAR | WEEKS 1 ☐☐ <br> MONTHS 2 ☐☐ | YES .............. 1 (ADD PREGNANCY) <br> NO ................ 2 (NEXT ROW) |

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**Figure 5    CAPI questionnaire—pregnancy history**

**Figure 6**     **Paper questionnaire calendar**

INSTRUCTIONS:

ONLY ONE CODE SHOULD APPEAR IN ANY BOX.
COLUMN 1 REQUIRES A CODE IN EVERY MONTH.

CODES FOR EACH COLUMN:

COLUMN 1: BIRTHS, PREGNANCIES, CONTRACEPTIVE USE (2)

B  BIRTHS
P  PREGNANCIES
T  TERMINATIONS

0  NO METHOD

1  FEMALE STERILIZATION
2  MALE STERILIZATION
3  IUD
4  INJECTABLES
5  IMPLANTS
6  PILL
7  CONDOM
8  FEMALE CONDOM
9  EMERGENCY CONTRACEPTION
J  STANDARD DAYS METHOD
K  LACTATIONAL AMENORRHEA METHOD
L  RHYTHM METHOD

M  WITHDRAWAL
X  OTHER MODERN METHOD
Y  OTHER TRADITIONAL METHOD

COLUMN 2: DISCONTINUATION OF CONTRACEPTIVE USE

0  INFREQUENT SEX/HUSBAND AWAY
1  BECAME PREGNANT WHILE USING
2  WANTED TO BECOME PREGNANT
3  HUSBAND/PARTNER DISAPPROVED
4  WANTED MORE EFFECTIVE METHOD
5  CHANGES IN MENSTRUAL BLEEDING

6  OTHER SIDE EFFECTS/HEALTH CONCERNS

7  LACK OF ACCESS/TOO FAR
8  COSTS TOO MUCH
N  INCONVENIENT TO USE
F  UP TO GOD/FATALISTIC
A  DIFFICULT TO GET PREGNANT/MENOPAUSAL
D  MARITAL DISSOLUTION/SEPARATION
X  OTHER

_____
(SPECIFY)
Z  DON'T KNOW

(1) Year of fieldwork is assumed to be 2023. For fieldwork beginning in 2024, all references to calendar years should be increased by one; for example, 2018 should be changed to 2019, 2019 should be changed to 2020, and similarly for all years throughout the questionnaire.

(2) Response categories may be added for other methods, including fertility awareness methods.

| Year | | Month | | COL. 1 | COL. 2 | Year |
|---|---|---|---|---|---|---|
| 2 0 2 3 (1) | 12 | DEC | 01 | | | 2 0 2 3 |
| | 11 | NOV | 02 | | | |
| | 10 | OCT | 03 | | | |
| | 09 | SEP | 04 | | | |
| | 08 | AUG | 05 | | | |
| | 07 | JUL | 06 | | | |
| | 06 | JUN | 07 | | | |
| | 05 | MAY | 08 | | | |
| | 04 | APR | 09 | | | |
| | 03 | MAR | 10 | | | |
| | 02 | FEB | 11 | | | |
| | 01 | JAN | 12 | | | |
| 2 0 2 2 | 12 | DEC | 13 | | | 2 0 2 2 |
| | 11 | NOV | 14 | | | |
| | 10 | OCT | 15 | | | |
| | 09 | SEP | 16 | | | |
| | 08 | AUG | 17 | | | |
| | 07 | JUL | 18 | | | |
| | 06 | JUN | 19 | | | |
| | 05 | MAY | 20 | | | |
| | 04 | APR | 21 | | | |
| | 03 | MAR | 22 | | | |
| | 02 | FEB | 23 | | | |
| | 01 | JAN | 24 | | | |
| 2 0 2 1 | 12 | DEC | 25 | | | 2 0 2 1 |
| | 11 | NOV | 26 | | | |
| | 10 | OCT | 27 | | | |
| | 09 | SEP | 28 | | | |
| | 08 | AUG | 29 | | | |
| | 07 | JUL | 30 | | | |
| | 06 | JUN | 31 | | | |
| | 05 | MAY | 32 | | | |
| | 04 | APR | 33 | | | |
| | 03 | MAR | 34 | | | |
| | 02 | FEB | 35 | | | |
| | 01 | JAN | 36 | | | |
| 2 0 2 0 | 12 | DEC | 37 | | | 2 0 2 0 |
| | 11 | NOV | 38 | | | |
| | 10 | OCT | 39 | | | |
| | 09 | SEP | 40 | | | |
| | 08 | AUG | 41 | | | |
| | 07 | JUL | 42 | | | |
| | 06 | JUN | 43 | | | |
| | 05 | MAY | 44 | | | |
| | 04 | APR | 45 | | | |
| | 03 | MAR | 46 | | | |
| | 02 | FEB | 47 | | | |
| | 01 | JAN | 48 | | | |
| 2 0 1 9 | 12 | DEC | 49 | | | 2 0 1 9 |
| | 11 | NOV | 50 | | | |
| | 10 | OCT | 51 | | | |
| | 09 | SEP | 52 | | | |
| | 08 | AUG | 53 | | | |
| | 07 | JUL | 54 | | | |
| | 06 | JUN | 55 | | | |
| | 05 | MAY | 56 | | | |
| | 04 | APR | 57 | | | |
| | 03 | MAR | 58 | | | |
| | 02 | FEB | 59 | | | |
| | 01 | JAN | 60 | | | |
| 2 0 1 8 | 12 | DEC | 61 | | | 2 0 1 8 |
| | 11 | NOV | 62 | | | |
| | 10 | OCT | 63 | | | |
| | 09 | SEP | 64 | | | |
| | 08 | AUG | 65 | | | |
| | 07 | JUL | 66 | | | |
| | 06 | JUN | 67 | | | |
| | 05 | MAY | 68 | | | |
| | 04 | APR | 69 | | | |
| | 03 | MAR | 70 | | | |
| | 02 | FEB | 71 | | | |
| | 01 | JAN | 72 | | | |

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**Figure 7    CAPI questionnaire calendar**



- The number of languages into which the survey questionnaire was translated. The number of languages used in the survey was determined either as indicated in the recode file or if not available in the recode file, as described in the final report. The language of the questionnaire and the language of interview are usually both recorded at the conclusion of the interview. These may be different if the language of interview was not among the languages for which a written translation was provided in the questionnaire. Some surveys did not make this distinction so that the number of languages may include both written languages with a formal translation and interview languages that were translated verbally by the interviewer. The number of languages was not always specified in the recode file or the final report. In these cases, we entered NA, not applicable. The number of languages ranges from one to 33, with a mean of five in the analytic sample for both the termination and contraceptive use. Surveys are categorized into those with five or fewer languages and six or more languages.

- The phase of The DHS Program in which the survey was implemented. The calendar was introduced in phase 2 of The DHS Program for high contraceptive prevalence countries and expanded to all countries in phase 5. Surveys from phase 2 to 6 are grouped together as "early" DHS surveys, and surveys from phases 7 and 8 are grouped together as "later" DHS phase surveys. At the beginning of each new phase, The DHS Program updates the standard questionnaire by adding some questions and deleting others to allow for comparability over time for key indicators. The overall length of the Woman's Questionnaire has varied widely between phases as has the number of topics covered.

Other survey characteristics—such as if the pregnancy history uses a backwards or forward approach, the inclusion of specific questions that distinguish miscarriage and induced abortion, and the length of survey—have been explored in other analyses and are not included here.[3]

# 3    RESULTS

## 3.1    Terminations

The ratio of terminations to births in the later calendar period to the early calendar period ranged from 0.8 in Armenia 2015–16 survey to 2.3 in Guinea 2005.[1] The average ratio of terminations to births ratios in the later calendar period to the early calendar period is 1.3. This indicates that reporting of terminations is better in the more recent period compared to further away in time from the date of interview. The full list of ratios is shown in Appendix Table 1.

Overall, one in four surveys had consistent reporting of births and terminations (Table 2). The region with the highest proportion of consistent surveys is MENA/WAEE (49%). East and Southern Africa have the lowest proportion of consistent surveys (10.6%). The only survey characteristic that shows a statistically significant difference in consistency is the type of reproductive calendar. Surveys that used a pregnancy history had a higher proportion (57.7%) of consistent surveys compared with surveys that used a birth history (20.0%).

**Table 2       Consistency of birth and termination reporting by region and survey characteristics**

|  | % | N | *p* value |
|---|---|---|---|
| Overall (N = 191) | 25.1 | 48 | |
| Region | | | |
| Asia (N = 40) | 32.5 | 13 | |
| MENA/WAEE (N = 35) | 48.6 | 17 | NA |
| West and Central Africa (N = 36) | 16.7 | 6 | |
| East and Southern Africa (N = 47) | 10.6 | 5 | |
| LAC (N = 33) | 21.2 | 7 | |
| Survey characteristic | | | |
| Birth history (N = 166) | **20.5** | **34** | **<.001** |
| Pregnancy history (N = 25) | **56.0** | **14** | |
| Early DHS Phase (N = 150) | 25.3 | 38 | .906 |
| Later DHS Phase (N = 41) | 24.4 | 10 | |
| Questionnaires translated into less than languages (N = 94)* | 27.7 | 26 | |
| Questionnaires translated into more than 5 languages (N = 46)* | 21.7 | 10 | .45 |
| Paper data collection or CAFÉ (N=136) | 27.2 | 37 | .299 |
| Computer assisted data collection (N=55) | 20.0 | 11 | |

\* Some surveys do not have translation data available.

Table 3 shows that overall, surveys that included a full pregnancy history had over 5 times higher odds (*OR* = 5.45) of having consistent reporting of terminations and births compared to surveys that included a birth history.

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[1] Bolivia 2003–04 had a ratio of 0 because no terminations were reported in the early calendar period.

**Table 3**      **Unadjusted and adjusted odds ratio for consistency of termination and birth reporting and reproductive calendar characteristics**

| | Unadjusted Odds Ratio | 95% CI | *p* value | Adjusted Odds Ratio | 95% CI | *p* value | Adjusted Odds Ratio | 95% CI | *p* value |
|---|---|---|---|---|---|---|---|---|---|
| Pregnancy history (ref: birth history) | 5.45 | [2.29, 12.97] | < .001 | 6.70 | [2.39, 18.81] | < .001 | 5.60 | [2.11, 14.84] | < .01 |
| Later DHS phase (ref: earlier DHS phase) | 0.95 | [0.43, 2.12] | .90 | 0.29 | [0.09, 0.91] | .03 | | omitted | |
| Larger number of languages (ref: smaller number of languages) | 0.73 | [0.32, 1.67] | .45 | 0.92 | [0.38, 2.26] | .86 | 0.97 | [0.39, 2.36] | .94 |
| Computer assisted data collection (ref: paper data collection) | 0.67 | [0.31, 1.43] | .30 | | omitted | | 0.52 | [0.19, 1.40] | .19 |

For the results within the different geographic regions, however, the differences in consistency between history types were not statistically significantly different. Asia had the largest proportion of surveys that implemented the full pregnancy history (32.5% (13/40)). Figure 8 shows that of those, seven—Cambodia 2021–22, Nepal 2006, Nepal 2011 Pakistan 2012–13, Philippines 1993, Philippines 1998, and Philippines 2003—had consistent reporting of terminations and births over time. Only six of the 27 birth histories had consistent reporting of terminations and births over time. Those surveys were Bangladesh 1999–2000, Bangladesh 2007, Maldives 2009, Papua New Guinea 2016–18, Timor-Leste 2009–10, and Timor-Leste 2016.

In addition, when the ratio in the later calendar period is statistically different from the ratio in the early calendar period, the ratio of terminations to births is predominantly greater than 1. This indicates that there is a higher ratio of terminations in the later (more recent) period of the calendar compared to the early period.

**Figure 8      Ratios of terminations to births in the later calendar period compared to early calendar period in Asia**
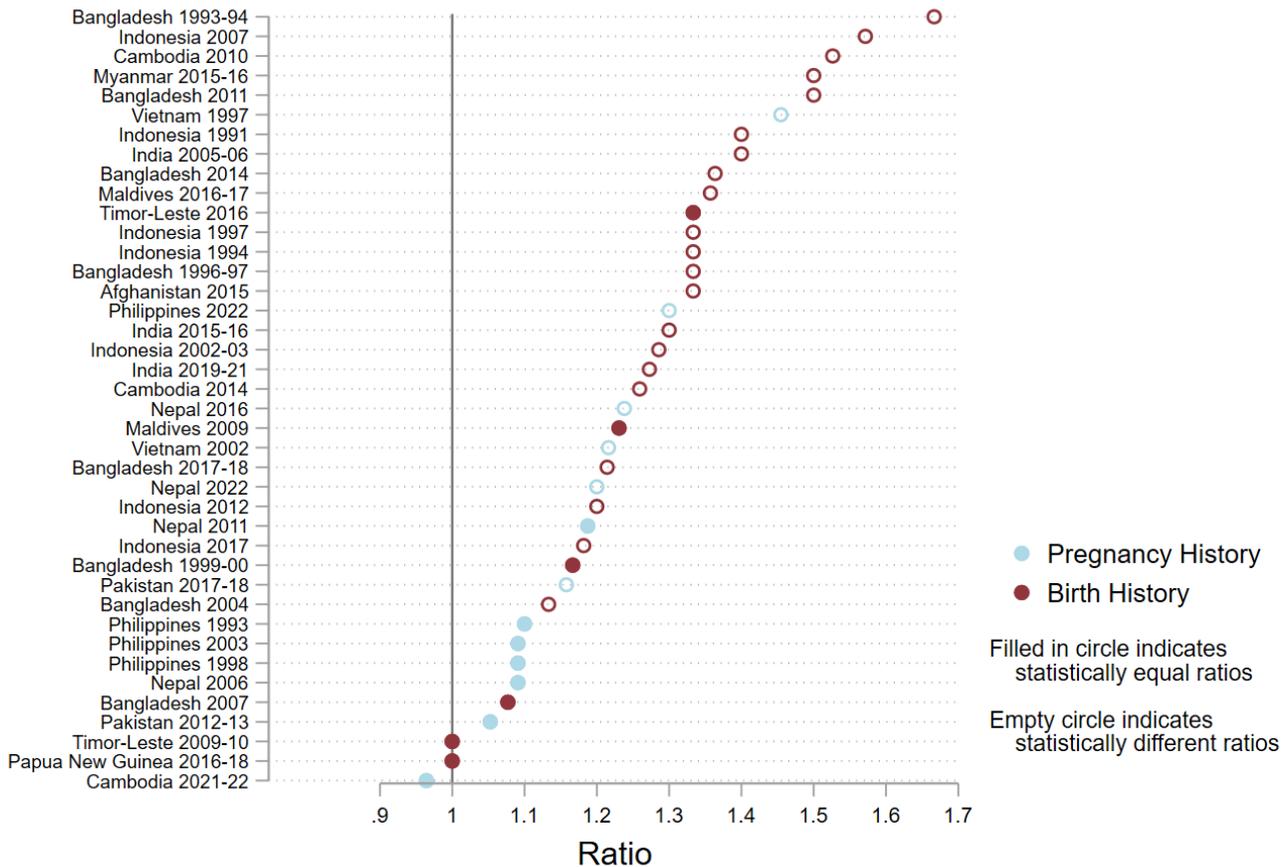


MENA/WAEE had the second largest proportion of surveys which implemented a full pregnancy history (34.3%, (12/35)). Of those 12 pregnancy histories, eight—Albania 2008–09, Armenia 2005, Armenia 2010, Kazakhstan 1999, Kyrgyz Republic 2012, Moldova 2005, Tajikistan 2012, and Ukraine 2007—had consistent reporting of terminations and births over time, while nine—Albania 2017–18, Egypt 2003, Egypt

2014, Jordan 2002, Jordan 2005, Morocco 2003–04, Turkey 2003, Turkey 2008, and Turkey 2013—of the 23 birth histories were consistent (see Figure 9).

We see the same pattern with ratios largely greater than 1, which indicates a higher ratio of terminations in the later (more recent) period of the calendar compared to the early period.

**Figure 9**      **Ratios of terminations to births in the later calendar period compared to early calendar period, MENA/WAEE**
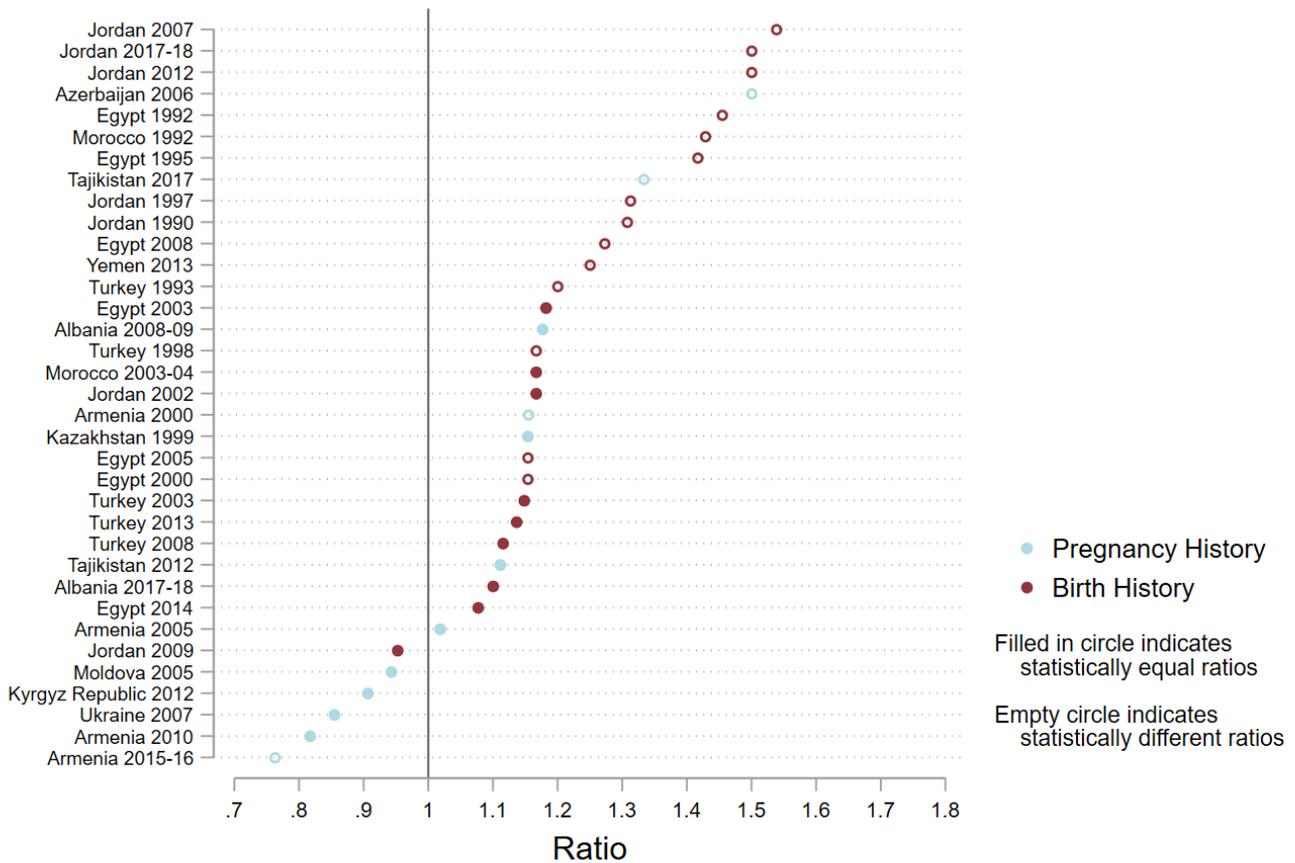


No African country had implemented a reproductive history with a full pregnancy history until the Kenya 2022 DHS. In Eastern and Southern Africa, of the 45 birth histories, only five—Burundi 2010, Lesotho 2009, Lesotho 2014, Malawi 2004, and Namibia 2013—had consistent reporting of terminations and births over time (Figure 10).

In Eastern and Southern Africa, all ratios are greater than 1, which indicates a higher ratio of terminations in the later (more recent) period of the calendar compared to the early period.

**Figure 10    Ratios of terminations to births in the later calendar period compared to early calendar period, Eastern and Southern Africa**
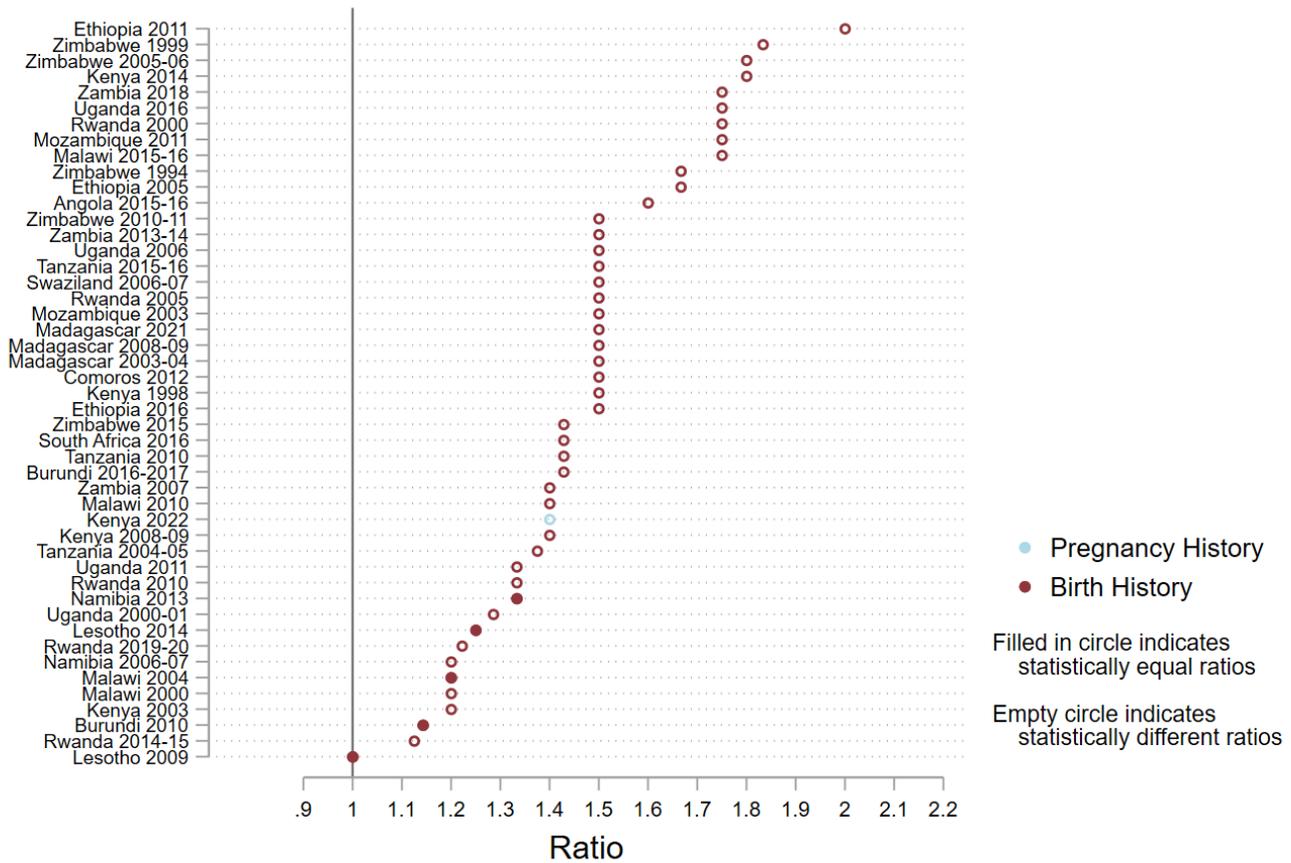


In West and Central Africa, only birth histories have been used in DHS surveys. Of the 34 surveys included in this analysis, only five—Burkina Faso 2003, Burkina Faso 2010, Gambia 2013, Mali 2018, and Senegal 2019—had consistent reporting of terminations and births over time (Figure 11).

In this region, all surveys except one had a ratio greater than 1, which indicated a higher ratio of terminations in the later (more recent) period of the calendar compared to the early period.

**Figure 11   Ratios of terminations to births in the later calendar period compared to early calendar period, West and Central Africa**
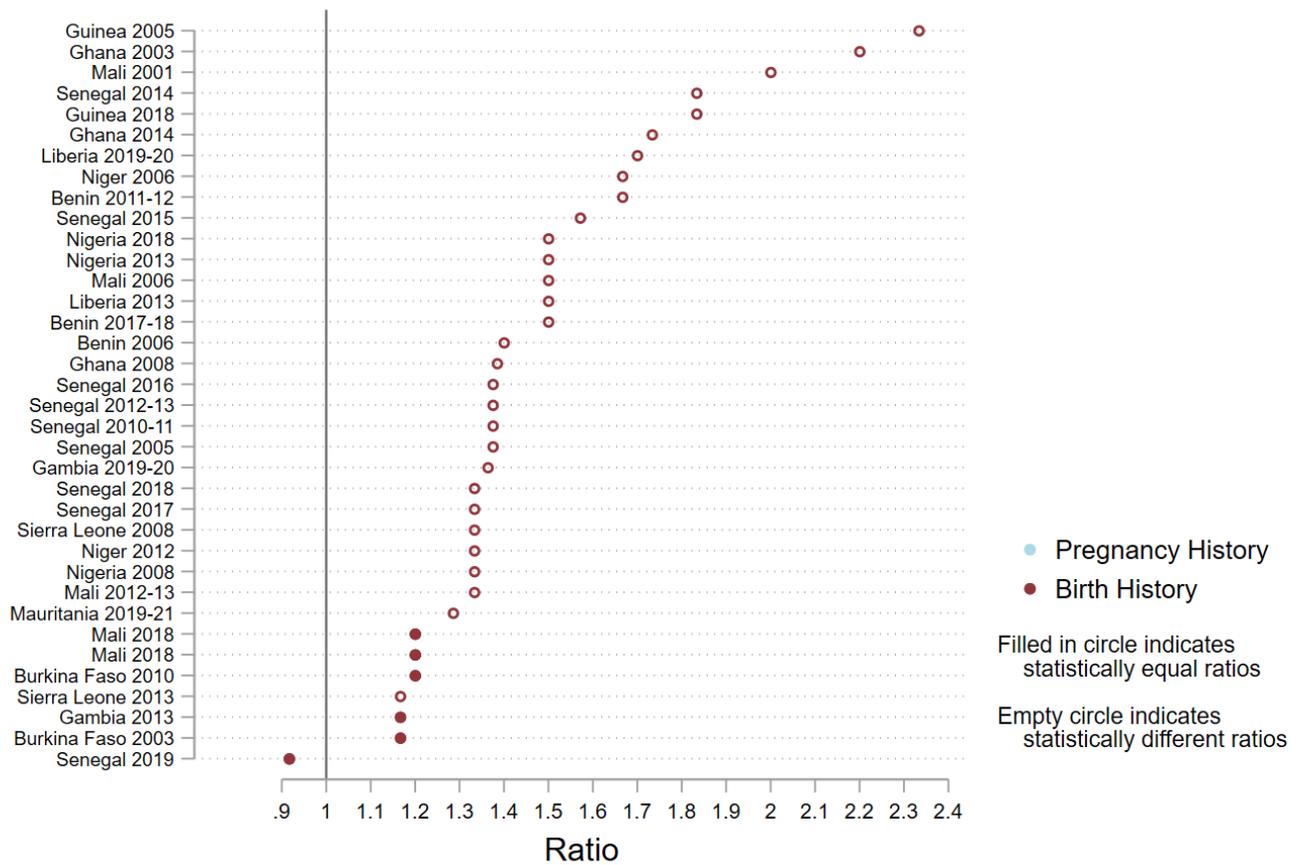


Of the 33 birth histories and 0 pregnancy histories conducted in LAC, only seven had consistent reporting of terminations and births—Bolivia 1994, Brazil NE 1991, Colombia 1990, Colombia 2015, Dominican Republic 1991, Guatemala 1998–99, and Guatemala 2014–15 (Figure 12).

We see the same pattern here with ratios largely greater than 1, which indicates a higher ratio of terminations in the later (more recent) period of the calendar compared to the early period.

**Figure 12    Ratios of terminations to births in the later calendar period compared to early calendar period, LAC**
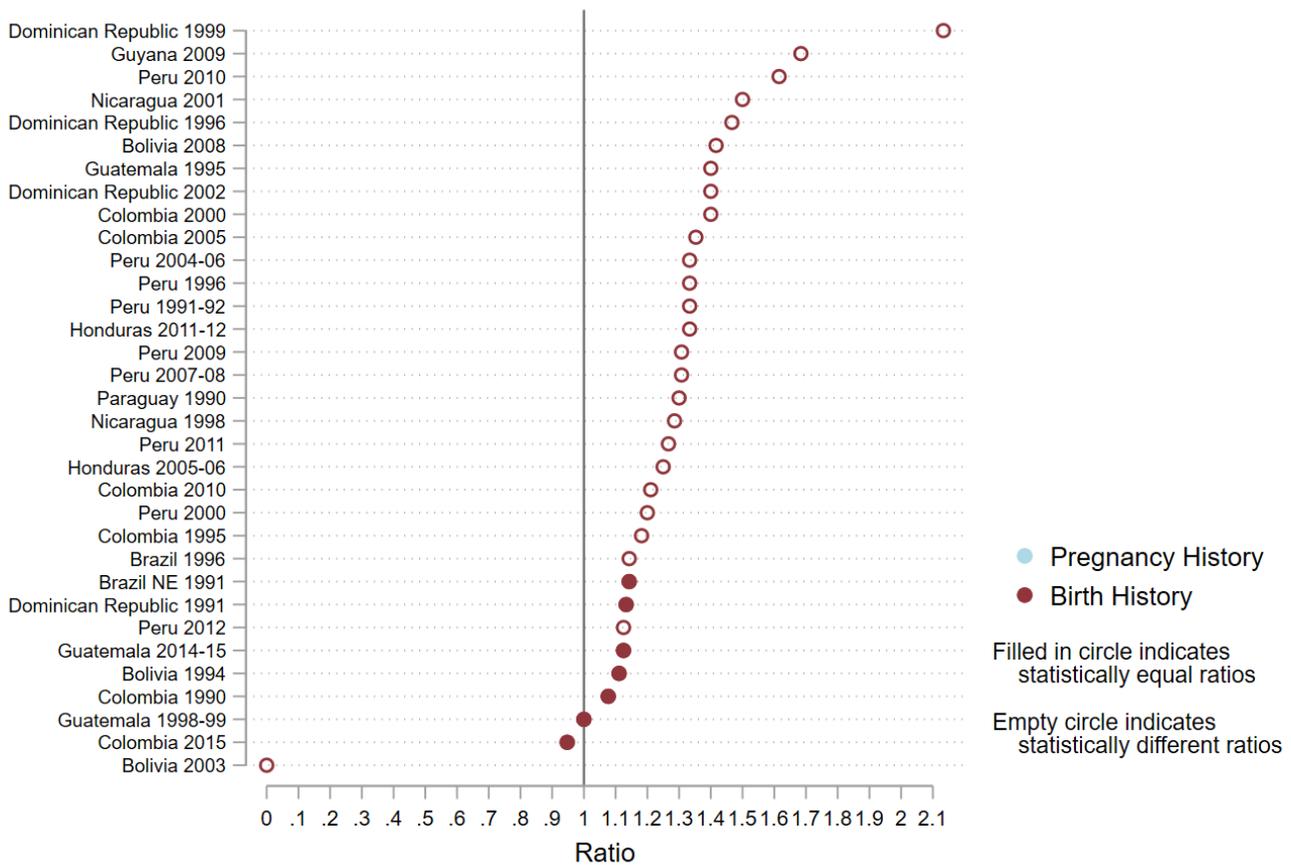


We also tested if other survey characteristics also influenced the consistency of termination and birth reporting. In bivariate analysis (see Table 2 and 3), there are no statistically significant associations between the mode of data collection, the phase of the DHS Program in which the survey was implemented, and the number of languages in which the survey was implemented on the consistency of termination and birth reporting.

When implementing the multivariate logistic regression analysis, we first assessed correlation of the covariates. Since the mode of data collection and DHS phase are highly correlated (tetrachoric correlation rho = 0.84), we implemented two models—one using mode and one using phase. In both models, surveys that used a pregnancy history compared to a birth history have greater odds of having consistent birth and terminations reporting (see Table 3). Surveys that were implemented in a later DHS phase (7 or 8) had lower odds of having consistent birth and terminations reporting.

## 3.2    Contraceptive Use Reporting

### 3.2.1    Overall

Table 4 lists the surveys that meet each of the two criteria for consistency of contraceptive use. Columns 1 to 3 list those surveys that have overlapping current use and calendar trends for any contraceptive method,

traditional methods. Columns 4 to 6 list those with similar slopes for current use and calendar trends for any contraceptive method, traditional methods, and coitus-based methods, and columns 7 to 9 list those surveys meeting both criteria for each of the three categories of contraceptives. Therefore, column 7 includes the surveys that appear in both columns 1 and 4, column 8 lists those that appear in both column 2 and 5, and column 9 lists those that appear in both column 3 and 6.

Overall, only eight surveys meet both criteria for consistent contraceptive use reporting when comparing the calendar trend with the current use measure (Table 4 column 7). More surveys meet one of the individual criteria—29 surveys have similar estimates (column 1), and thirteen surveys have similar slopes (column 4).

# Table 4     Surveys that meet criteria for consistent reporting of contraceptive use methods

| Surveys where current use and calendar trends overlap | | | Surveys where the slope of the current use and calendar trends are similar | | | Consistent surveys (meeting both criteria) | | |
|---|---|---|---|---|---|---|---|---|
| Any contraceptive method | Traditional contraceptive method | Coitus–based method | Any contraceptive method | Traditional contraceptive method | Coitus–based method | Any contraceptive method | Traditional contraceptive method | Coitus–based method |
| Armenia 2005 | Armenia 2005 | Armenia 2005 | Cambodia 2014 | Bangladesh 2017–18 | Armenia 2010 | Dominican Republic 1996 | Bangladesh 2017–18 | Armenia 2010 |
| Armenia 2010 | Armenia 2010 | Armenia 2010 | Dominican Republic 1996 | Egypt 1995 | Bangladesh 1999–00 | Dominican Republic 2002 | Nepal 2022 | Bangladesh 1999–00 |
| Armenia 2015–16 | Armenia 2015–16 | Armenia 2015–16 | Dominican Republic 1999 | Indonesia 2002–03 | Benin 2017–18 | Indonesia 2017 | Peru 1996 | Cambodia 2014 |
| Bolivia 2008 | Bangladesh 1996–97 | Bangladesh 1999–00 | Dominican Republic 2002 | Jordan 2017–18 | Cambodia 2014 | Lesotho 2014 | Uganda 2011 | Colombia 2000 |
| Colombia 2000 | Bangladesh 1999–00 | Bangladesh 2011 | Egypt 2000 | Nepal 2022 | Colombia 2000 | Madagascar 2008–09 | | Colombia 2010 |
| Dominican Republic 1996 | Bangladesh 2011 | Bolivia 2008 | Ethiopia 2016 | Peru 1996 | Colombia 2010 | Peru 1996 | | Dominican Republic 1996 |
| Dominican Republic 2002 | Bangladesh 2014 | Brazil 1996 | Indonesia 2017 | Philippines 2003 | Dominican Republic 1996 | Peru 2000 | | Egypt 2005 |
| Ethiopia 2011 | Bangladesh 2017–18 | Cambodia 2014 | Lesotho 2014 | Uganda 2011 | Egypt 2005 | Zimbabwe 1999 | | Ethiopia 2011 |
| Ghana 2008 | Benin 2017–18 | Colombia 1995 | Madagascar 2008–09 | | Ethiopia 2011 | | | Honduras 2011–12 |
| Guatemala 1998–99 | Bolivia 2008 | Colombia 2000 | Malawi 2010 | | Honduras 2011–12 | | | Indonesia 2002–03 |
| Honduras 2011–12 | Brazil 1996 | Colombia 2005 | Peru 1996 | | Indonesia 2002–03 | | | Indonesia 2017 |
| India 2019–21 | Cambodia 2014 | Colombia 2010 | Peru 2000 | | Indonesia 2017 | | | Nepal 2016 |
| Indonesia 2017 | Colombia 1995 | Colombia 2015 | Zimbabwe 1999 | | Jordan 2017–18 | | | Nepal 2022 |
| Kenya 2003 | Colombia 2000 | Dominican Republic 1996 | | | Lesotho 2014 | | | Peru 2007–08 |
| Kenya 2008–09 | Colombia 2005 | Dominican Republic 1999 | | | Malawi 2015–16 | | | Peru 2011 |
| Lesotho 2014 | Colombia 2010 | Dominican Republic 2002 | | | Nepal 2016 | | | Tajikistan 2017 |
| Madagascar 2008–09 | Colombia 2015 | Egypt 1995 | | | Nepal 2022 | | | Zimbabwe 2005–06 |
| Nepal 2011 | Dominican Republic 1996 | Egypt 2003 | | | Nigeria 2018 | | | |
| Nepal 2016 | Dominican Republic 2002 | Egypt 2008 | | | Peru 2007–08 | | | |
| Nepal 2022 | Ethiopia 2005 | Ethiopia 2005 | | | Peru 2011 | | | |
| Peru 1996 | Ethiopia 2011 | Ethiopia 2011 | | | Tajikistan 2017 | | | |
| Peru 2000 | Ethiopia 2016 | Ethiopia 2016 | | | Zimbabwe 2005–06 | | | |
| Peru 2012 | Ghana 2008 | Ghana 2008 | | | | | | |
| Senegal 2012–13 | Ghana 2014 | Ghana 2014 | | | | | | |
| Senegal 2014 | Guatemala 1998–99 | Guatemala 1998–99 | | | | | | |
| Turkey 2003 | Honduras 2011–12 | Honduras 2011–12 | | | | | | |
| Zimbabwe 1999 | India 2019–21 | Indonesia 1994 | | | | | | |
| Zimbabwe 2005–06 | Indonesia 2007 | Indonesia 1997 | | | | | | |
| Zimbabwe 2015 | Indonesia 2012 | Indonesia 2002–03 | | | | | | |
| | Indonesia 2017 | Indonesia 2007 | | | | | | |
| | Jordan 2009 | Indonesia 2017 | | | | | | |
| | Jordan 2012 | Kenya 2003 | | | | | | |
| | Kenya 2003 | Kenya 2008–09 | | | | | | |
| | Kenya 2008–09 | Kenya 2014 | | | | | | |
| | Lesotho 2014 | Madagascar 2008–09 | | | | | | |
| | Madagascar 2008–09 | Mali 2018 | | | | | | |
| | Malawi 2010 | Nepal 2011 | | | | | | |
| | Mali 2018 | Nepal 2016 | | | | | | |
| | Nepal 2011 | Nepal 2022 | | | | | | |
| | Nepal 2016 | Peru 1996 | | | | | | |
| | Nepal 2022 | Peru 2000 | | | | | | |
| | Nigeria 2018 | Peru 2007–08 | | | | | | |
| | Pakistan 2017–18 | Peru 2011 | | | | | | |
| | Peru 1996 | Peru 2012 | | | | | | |
| | Peru 2000 | Philippines 1998 | | | | | | |
| | Peru 2007–08 | Rwanda 2019–20 | | | | | | |
| | Peru 2011 | Senegal 2010–11 | | | | | | |
| | Peru 2012 | Senegal 2012–13 | | | | | | |
| | Philippines 1998 | Senegal 2014 | | | | | | |
| | Rwanda 2014–15 | Senegal 2015 | | | | | | |
| | Rwanda 2019–20 | Senegal 2017 | | | | | | |
| | Senegal 2010–11 | Senegal 2018 | | | | | | |
| | Senegal 2012–13 | Sierra Leone 2013 | | | | | | |
| | Senegal 2014 | Sierra Leone 2019 | | | | | | |
| | Senegal 2015 | Tajikistan 2017 | | | | | | |
| | Senegal 2018 | Turkey 2003 | | | | | | |
| | Sierra Leone 2013 | Turkey 2008 | | | | | | |
| | Sierra Leone 2019 | Vietnam 2002 | | | | | | |
| | Tajikistan 2017 | Zimbabwe 1999 | | | | | | |
| | Tanzania 2015–16 | Zimbabwe 2005–06 | | | | | | |
| | Turkey 1998 | Zimbabwe 2010–11 | | | | | | |
| | Turkey 2003 | Zimbabwe 2015 | | | | | | |
| | Turkey 2008 | | | | | | | |
| | Uganda 2006 | | | | | | | |
| | Uganda 2011 | | | | | | | |
| | Uganda 2016 | | | | | | | |
| | Vietnam 2002 | | | | | | | |
| | Zambia 2018 | | | | | | | |
| | Zimbabwe 1999 | | | | | | | |
| | Zimbabwe 2005–06 | | | | | | | |
| | Zimbabwe 2010–11 | | | | | | | |
| | Zimbabwe 2015 | | | | | | | |

In addition to assessing if the current use and calendar estimates were similar overall, we were also interested in whether these estimates were more frequently similar in the early or later period of the calendar. Figure 13 shows the similarity of the estimates by period, for each of the categories of contraceptive use.

Nearly seven in 10 surveys had calendar estimates that were neither similar to the current use estimates in the early calendar period nor the later calendar period. The next largest proportion (19%) were similar to the current use estimates in both the early and later calendar period. Calendar estimates that were only similar in one of the two periods were three times more likely to be similar only in the later calendar period (9%) compared to the early calendar period (3%) (see Figure 13). These differences were statistically different ($p$ value <0.001).

**Figure 13    Similarity of contraceptive use reporting in the early versus later calendar period**
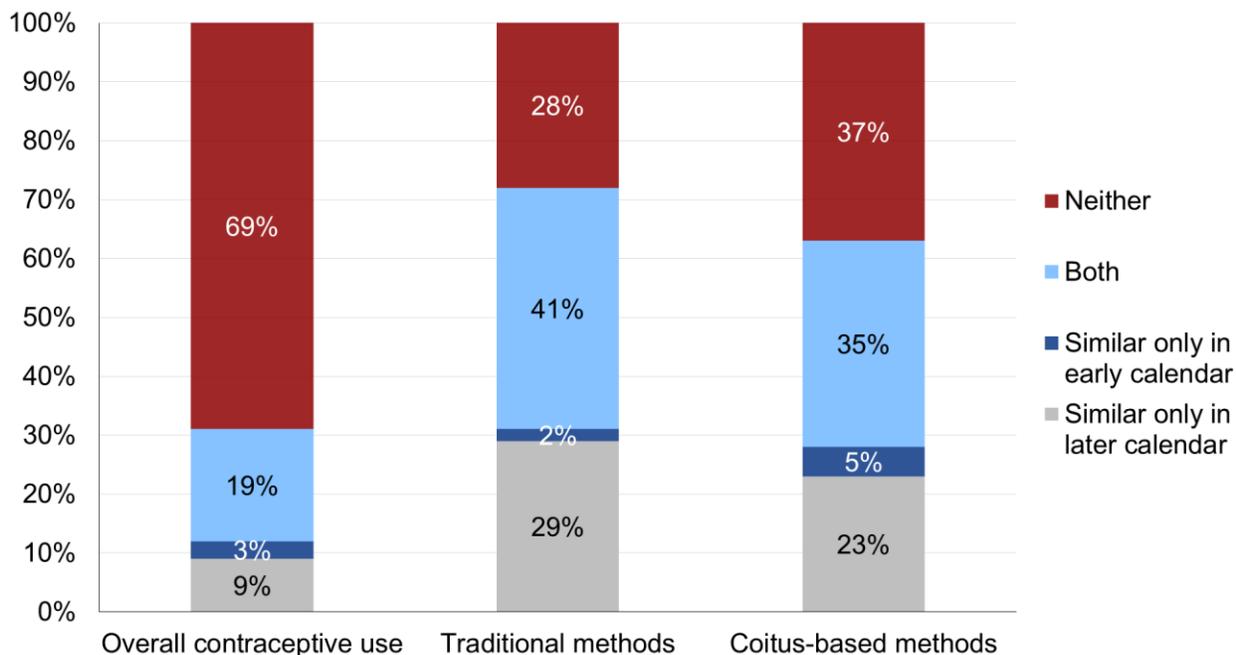


Note: N = 100 surveys

None of the consistent surveys used a pregnancy history, and Table 5 shows no association between the use of a pregnancy history and overall contraceptive use consistency in any survey. Just under one in 10 (8%) of surveys with a contraceptive calendar conducted in the early phases of The DHS Program had consistent reporting of overall contraceptive use, while only one (3.9%) of the surveys implemented in the later phases of The DHS Program had consistent reporting of overall contraceptive use. A larger proportion (10.8%) of surveys that used paper-based or CAFE data collection had consistent contraceptive use reporting compared to only 2.9% of surveys that used CAPI.

**Table 5**    **Crosstabulations of consistency of contraceptive use reporting and survey characteristics**

| | Overall contraceptive use | | | Traditional contraceptive method use | | | Coitus-based contraceptive method use | | |
|---|---|---|---|---|---|---|---|---|---|
| | % | N | *p* value | % | N | *p* value | % | N | *p* value |
| Overall (N=100) | 8.0 | 8 | | 4.0 | 4 | | 17.0 | 17 | |
| Asia (N=22) | 4.6 | 1 | | 9.1 | 2 | | 27.3 | 6 | |
| MENA/WAEE (N=18) | 0.0 | 0 | NA | 0.0 | 0 | NA | 16.7 | 3 | NA |
| Africa (N=41) | 7.3 | 3 | | 2.4 | 1 | | 4.9 | 2 | |
| LAC (N=19) | 21.05 | 4 | | 5.3 | 1 | | 31.6 | 6 | |
| Birth history (N=89) | 9.0 | 8 | 0.3 | 3.4 | 3 | 0.361 | 14.6 | 13 | .07 |
| Pregnancy history (N=11) | 0.0 | 0 | | 9.1 | 1 | | 36.4 | 4 | |
| Early DHS Phase (N=74) | 9.5 | 7 | .364 | 2.7 | 2 | 0.264 | 17.6 | 13 | .799 |
| Later DHS Phase (N=26) | 3.9 | 1 | | 7.7 | 2 | | 15.4 | 4 | |
| Questionnaires translated into less than 5 languages (N=48) | 4.2 | 2 | .342 | 4.2 | 2 | 0.911 | 20.8 | 10 | **.024** |
| Questionnaires translated into more than 5 languages (N=21) | 0.0 | 0 | | 4.8 | 1 | | 0.0 | 0 | |
| Paper data collection or CAFÉ (N=65) | 10.8 | 7 | .164 | 4.6 | 3 | 0.669 | 16.9 | 11 | .978 |
| Computer assisted data collection (N=35) | 2.9 | 1 | | 2.9 | 1 | | 17.1 | 6 | |

Due to having zero consistent surveys with some survey characteristics (using a pregnancy history and being translated into five or more languages), we were unable to estimate many of the multivariable logistic regressions (Table 6). However, none of the odds ratios that were calculated were associated with consistency of overall contraceptive use reporting.

**Table 6    Unadjusted and adjusted odds ratio for consistency of contraceptive use reporting and reproductive calendar characteristics**

| | Unadjusted Odds Ratio | 95% CI | *p* value | Adjusted Odds Ratio | 95% CI | *p* value |
|---|---|---|---|---|---|---|
| OVERALL CONTRACEPTIVE USE | | | | | | |
| Pregnancy history (ref: birth history) | omitted | | | omitted | | |
| Later DHS phase (ref: earlier DHS phase) | 0.38 | [0.04, 3.27] | .38 | omitted | | |
| Larger number of languages (ref: smaller number of languages) | omitted | | | omitted | | |
| Computer assisted data collection (ref: paper data collection) | 4.1 | [0.48, 34.79] | .20 | 0.04 | [0.00, 1.09] | .06 |
| TRADITIONAL CONTRACEPTIVE METHOD USE | | | | | | |
| Pregnancy history (ref: birth history) | 2.87 | [0.27, 30.23] | .88 | 2.37 | [0.16, 35.85] | .53 |
| Later DHS phase (ref: earlier DHS phase) | 3.00 | [0.40, 22.47] | .29 | 8.05 | [0.45, 143.92] | .16 |
| Larger number of languages (ref: smaller number of languages) | 1.15 | [0.10, 13.42] | .91 | 1.65 | [0.11, 23.91] | .71 |
| Computer assisted data collection (ref: paper data collection) | 1.65 | [0.16, 16.43] | .40 | 3.14 | [0.17, 57.26] | .44 |
| COITUS-BASED CONTRACEPTIVE METHOD USE | | | | | | |
| Pregnancy history (ref: birth history) | 3.34 | [0.86, 13.04] | .08 | **7.51** | **[1.13, 50.10]** | **.04** |
| Later DHS phase (ref: earlier DHS phase) | 0.85 | [0.25, 2.89] | .80 | 0.45 | [0.05, 3.75] | .46 |
| Larger number of languages (ref: smaller number of languages) | omitted | | | omitted | | |
| Computer assisted data collection (ref: paper data collection) | 0.98 | [0.33, 2.93] | .98 | 0.8 | [0.10, 6.12] | .83 |

Note: Although DHS phase and mode of data collection were correlated, running the models with only one of these variables did not change the results. Therefore, we only show one model with both variables included.

Appendix Figures 1–36 show the graphical representation of the current use and calendar trends in overall contraceptive use for each country.

### 3.2.2   Traditional methods

Table 4, column 8 shows that overall, four surveys—Bangladesh 2017–18, Nepal 2022, Peru 1996, and Uganda 2011—met both criteria for consistent reporting of traditional contraceptive methods when comparing the calendar trend with the current use trend. Seventy-two surveys have similar traditional method use estimates (Table 4, column 2) and eight surveys have similar slopes (Table 4, column 5). The large number of surveys that were categorized as similar is likely due to larger confidence intervals around the current use estimates for traditional contraceptive method use.

Figure 13 shows how the distribution of traditional method reporting similarities is different for traditional methods compared to overall contraceptive use. Just over four in 10 surveys (41%) had similar traditional use estimates in both the early and later calendar periods compared to current use estimates. Nearly three in 10 (29%) surveys were similar only in the later calendar period. A nearly equal proportion (28%) of surveys were not similar in either the early or later calendar periods. The remaining 2% were similar only in the early calendar period. These differences were statistically different (*p* value < .001).

As with overall contraceptive use, there were no survey characteristics that were statistically significantly associated with consistent reporting of traditional contraceptive method use in either bivariate or multivariate analyses (see Table 5 and 6).

Appendix Figures 1–36 show the graphical representation of the current use and calendar trends in use of traditional contraceptive methods for each country.

### 3.2.3 Coitus-based methods

The largest number (17) of surveys met both criteria for consistent reporting of coitus-based contraceptive methods when comparing the calendar trend with the current use trend (See Table 4, column 9). Sixty-four surveys have similar coitus-based method use estimates when comparing calendar and current use (Table 4, column 3), and 22 have similar slopes (Table 4, column 6). Of the 17 surveys with consistent coitus-based method reporting, four use a pregnancy history for the reproductive history, but this was not a statistically significant difference (see Table 5). The only statistically significant finding for contraceptive use reporting consistency was found in reporting of coitus-based methods, where more questionnaires that were translated into less than five languages had a higher proportion (20.8%) of consistency compared to those translated into more languages (0%).

The largest proportion of surveys (37%) had calendar estimates that were not similar to the current use estimates in either the early or later calendar period (see Figure 13). A slightly smaller proportion (35%) were similar in both the early and the later calendar periods. Just under one in four (23%) surveys had similar calendar and current use estimates only in the later calendar period, with the remaining 5% having similar calendar and current use estimates only in the early calendar period.

However, when using logistic regression analysis, the language characteristic was omitted because there were no consistent surveys that were translated into five or more languages. As shown in Table 6, in multivariate analysis, surveys that used a pregnancy history had over seven times the odds of having consistent reporting of coitus-based contraceptive methods when compared to those surveys that used a birth history.

Appendix Figures 1–36 show the graphical representation of the current use and calendar trends in use of coitus-based contraceptive for each country.

# 4   DISCUSSION

This study examined the consistency of pregnancy outcome and contraceptive use reporting in DHS reproductive calendars, specifically use of a pregnancy history or birth history, as well as other characteristics of the survey, such as mode of data collection, DHS phase, and number of languages. A higher proportion of surveys have consistent reporting of pregnancy outcomes compared to contraceptive use. We find that while there is a clear association between use of a pregnancy history and reporting of pregnancy outcomes, there are no straightforward effects of use of a pregnancy history and contraceptive use reporting. The effect of the use of a pregnancy history is only seen on consistency of reporting of coitus-based contraceptive methods. Other survey characteristics are associated with one outcome or the other, but no survey characteristic is associated with reporting consistency for all outcomes. We discuss key results below.

**Pregnancy history is associated with more consistent reporting of pregnancy outcomes**

Compared to a birth history, the use of a full pregnancy history results in more consistent reporting of terminations throughout the calendar reference period. This is consistent with prior research.[3,5,6,8] As noted above, a birth history requires that the woman respondent must determine if her pregnancy resulted in a live birth in order to include it in the birth history. Only after completely recalling all live births in order are women asked about non-live births, starting with the most recent one. A pregnancy history simply asks about each pregnancy in order, and this may result in better recall as compared to a birth history.

It is worth noting that Akuze, Blencowe, Waiswa, et al. found that the birth history with subsequent questions on terminations as well as a pregnancy history both resulted in reporting of fewer stillbirths than expected.[8] As stated, appropriately thorough training and refresher training are required to enable interviewers to ask about the potentially stigmatized and sensitive issues of miscarriage, stillbirth, and abortion. A standard DHS interviewer training typically includes an entire day focused on the birth/pregnancy history to prepare interviewers for these questions. New tools with videos have been developed by The DHS Program to facilitate training specifically on the pregnancy history.

**DHS phase is also associated with more consistent reporting of pregnancy outcomes**

The earliest DHS surveys were conducted on paper. In 2004, the first CAPI DHS survey was conducted in Colombia. Other countries began the switch so that currently, all DHS-8 surveys are CAPI. This makes determining the impact of DHS phase and mode of data collection difficult. When analyzing the data separately, the mode of data collection was not associated with any difference in consistency of reporting of births and terminations. However, surveys conducted in DHS-7 and DHS-8 had statistically significantly lower consistency of reporting. Something other than the mode must be responsible for this difference since a majority of DHS-7 surveys used CAPI. A similar percentage of surveys utilized a pregnancy history prior to DHS-8, although the surveys have become longer and much more complicated over time. Interviewer effects have been shown to be greater with longer questionnaires, sensitive questions, and difficult questions.[12,13] These factors are likely to have led to the inconsistency in reporting found in this analysis, although further analysis is necessary, including the yet to be completed DHS-8 surveys.

**Low levels of consistency of contraceptive use reporting for all methods, traditional methods, and coitus-based methods**

Prior research has shown that the reproductive calendar has low levels of reliability when estimating prior contraceptive use. In this study, we found a similar issue with the consistency of data from the reproductive calendar when comparing the early and later periods of the calendar. Fewer than one in ten surveys had consistent reporting of overall contraceptive use in the calendar with an even smaller proportion having consistent reporting for traditional method use. Coitus-based contraceptive use had slightly better, but still low, consistency. One theory for low reliability of calendar data is that recall bias, especially among women who have a complex reproductive history, contributes to inaccurate reporting of monthly contraceptive use.[14,15]

Earlier analyses of DHS surveys found that in many countries, traditional method users have lower discontinuation and switching rates compared with modern method users. However, these same studies show that traditional methods have higher failure rates compared to modern methods.[16,17] Therefore, women who use traditional and/or coitus-based methods may have less frequent switching and more frequent pregnancies compared to women who use modern methods. One aspect of our hypothesis for exploring consistency of the traditional and coitus-based method was that this increase in pregnancies would result in more landmarks in the pregnancy or birth history, which could lead to better consistency of reporting. While this was not found in the results for traditional methods, in the multivariate model for coitus-based methods we found that a pregnancy history was associated with survey consistency.

Previous research has shown that most traditional method users were using periodic abstinence and withdrawal, two methods also classified as coitus-based contraceptive methods.[18] Therefore, we would have expected to see relatively similar levels of consistency between the traditional and coitus-based method consistency. However, reporting of the other methods included as coitus-based methods—primarily condoms, but also including spermicide, sponge, diaphragms/cervical caps—may have contributed to improved consistency in this category. Some of the higher consistency could be due to a smaller proportion of women using coitus-based methods, which lead to larger confidence intervals and greater chance of overlap of those confidence intervals. However, if this was the main driver of the overlap, we would expect to see this for both traditional and coitus-based methods.

Our measure of consistency was based on similarity of the current use and calendar estimates and similarity of the trend lines. While a third of the surveys met the criteria for similarity of estimates for overall contraceptive use and over half met the criteria for similarity of estimates for traditional and coitus-based methods, few surveys met the criteria for similarity of trend lines. This could be because our comparisons of contraceptive use trends from current use and calendar estimates are based on an assumption of a linear trend from the previous survey's current use estimate to the next. We know that this may not be true and that contraceptive use may fluctuate from one survey to the next. Calendar data, which is collected on a monthly basis, includes these fluctuations. Even though our measures aggregated these monthly data points into one measure for each of the early and later calendar periods, these additional data points likely contributed to the dissimilarity of the calendar and current use estimate trend lines.

**Estimates in all three categories are more similar earlier in the calendar, and estimates are more consistently similar for traditional or coitus-based methods**

In general, we find that contraceptive use estimates from the calendar are more similar to current use estimates earlier in the calendar compared to later in the calendar. This finding is consistent with previous findings from the DHS Program.[6] This pattern is generally attributed to recall bias. Some individual level analysis has contradicted this finding from population-level surveys, although at the individual level, women with more complex contraceptive histories have been associated with lower reliability of reporting.[14,19] The wider confidence intervals for traditional and coitus-based method use discussed earlier may be contributing to this, because we see comparable patterns in similarity of estimates in traditional and coitus-based methods.

**Use of a pregnancy history is associated with more consistent reporting of coitus-based contraceptive use methods**

Gebreselassie et al. showed that for most women, the second most common prior event to starting a traditional method (of which periodic abstinence and withdrawal, also coitus-based methods, are the most common) was typically a birth or termination.[13] Since pregnancy histories have better reporting of births and terminations compared to birth histories, using a pregnancy history may contribute to more consistent reporting of coitus-based methods as well. However, we would expect to see this result in traditional methods as well. Condoms, primarily male condoms, would be the other coitus-based method with high enough use to influence these findings. It could be that women using condoms alone as a method have better consistency of reporting, although this analysis would need to be reproduced by method type in order to disentangle these findings.

Starting in DHS-8, the standard questionnaire added a direct question specifically asking about coitus-based method use. This question follows the question on current contraceptive use and is asked of women who report no current use. The question prompts the respondent to report use of methods which are typically underreported since they may not be considered to be currently used based on the frequency of sexual activity or the understanding of the word "current."

> *DHS-8 questions on coitus-based methods:*
>
> *Are you or your partner currently doing something or using any method to delay or avoid getting pregnant?*
>
> **YES**   **NO**
>
> *Just to check, are you or your partner doing any of the following to avoid pregnancy: deliberately avoiding sex on certain days, using a condom, using withdrawal or using emergency contraception?*

**Limitations and strengths**

This study has some limitations. The analysis of birth and termination reporting is limited by the small number of DHS surveys that used a pregnancy history. With the introduction of the pregnancy history as the standard reproductive calendar in DHS-8, more pregnancy histories will become available, especially in sub-Saharan Africa. Additional data quality assessments should be conducted with a more balanced set of surveys.

Our contraceptive use analysis is constrained by the wording and structure of DHS data in two ways. First, the ways in which women are asked about current use of contraception and contraceptive use in the calendar are different. In the women's interview, the women are asked if they or their partner are "currently doing anything to avoid pregnancy." In the calendar, women are asked about their contraceptive use during a specific time, while for current use, no time limit is given and women may have different interpretations of the question.

Second, the wording and structure of the Woman's Questionnaires may lead to underreporting of traditional methods. For current method use, women in DHS surveys are first asked "Are you or your partner currently doing something or using any method to delay or avoid getting pregnant?" If a woman answers yes, she is then asked, "Which method are you using?" Women may not consider coitus dependent methods such as withdrawal and periodic abstinence as "current use" of a method. This structure has been shown to lead to under-reporting of traditional and coitus-based methods.[20] This wording has been improved in DHS-8, as described previously, although there is likely under-reporting for earlier surveys. Future analyses can utilize these DHS8 survey wording changes to assess if they result in improvements in reporting of coitus-based contraceptive method use in the calendar.

In the contraceptive calendar, women are asked about what (if any) method was used for each month of the previous 5 to 6 years. Even if a woman reports using more than one method in a given month, only one method is recorded, and interviewers are instructed to record the most effective method.[21] Traditional and coitus-based methods users have been shown to be more likely to use multiple methods, including modern methods. Traditional and coitus-based method use by these dual users may not have been reported.

In the contraceptive use analysis, we assessed similarity of estimates based on having overlapping confidence intervals. This is a liberal approach since some estimates with overlapping confidence intervals will in fact be statistically different. However, of the two criteria for consistency of contraceptive use consistency, the most surveys met this criterion. Therefore, it is unlikely that this approach resulted in over-estimation of consistency.

Despite these limitations, this study contributes to the evidence on the data quality of the reproductive calendar. With the inclusion of pregnancy history in DHS-8 surveys, the present study was able to incorporate more pregnancy history surveys into an analysis of consistency of pregnancy outcome and contraceptive use reporting. While we focus on the effect of pregnancy history, we chose additional survey characteristics that have been shown to influence survey responses. We find higher levels of consistency of pregnancy outcome reporting in surveys that used a pregnancy history, but minimal effect of consistency of contraceptive use reporting only for coitus-based methods. With an increased focus on monitoring and reducing perinatal mortality, including stillbirth, better consistency of reporting of pregnancy outcomes is essential. Our findings suggest continuing the use of the pregnancy history to establish the reproductive calendar. We also recommend experimenting with shortening the length of the contraceptive calendar to assess if this improves the consistency of contraceptive use reporting.

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# APPENDIX

**Appendix Table 1     Data used to determine consistency of birth and termination reporting**

| Survey | Ratio of terminations to births in the later period of the reproductive calendar | Ratio of terminations to births in the early period of the reproductive calendar | Ratio of later period to early period | p value* | Type of reproductive calendar |
|---|---|---|---|---|---|
| ASIA | | | | | |
| Afghanistan 2015 | 0.12 | 0.09 | 1.33 | < .01 | Birth |
| Bangladesh 1993–94 | 0.10 | 0.06 | 1.67 | < .001 | Birth |
| Bangladesh 1996–97 | 0.12 | 0.09 | 1.33 | < .001 | Birth |
| Bangladesh 1999–00 | 0.14 | 0.12 | 1.17 | .07 | Birth |
| Bangladesh 2004 | 0.17 | 0.15 | 1.13 | < .05 | Birth |
| Bangladesh 2007 | 0.14 | 0.13 | 1.08 | .72 | Birth |
| Bangladesh 2011 | 0.18 | 0.12 | 1.50 | < .001 | Birth |
| Bangladesh 2014 | 0.15 | 0.11 | 1.36 | < .001 | Birth |
| Bangladesh 2017–18 | 0.17 | 0.14 | 1.21 | < .01 | Birth |
| Cambodia 2010 | 0.29 | 0.19 | 1.53 | < .001 | Birth |
| Cambodia 2014 | 0.34 | 0.27 | 1.26 | < .001 | Birth |
| Cambodia 2021–22 | 0.27 | 0.28 | 0.96 | .41 | Pregnancy |
| India 2005–06 | 0.14 | 0.10 | 1.40 | < .001 | Birth |
| India 2015–16 | 0.13 | 0.10 | 1.30 | < .001 | Birth |
| India 2019–21 | 0.14 | 0.11 | 1.27 | < .001 | Birth |
| Indonesia 1991 | 0.07 | 0.05 | 1.40 | < .001 | Birth |
| Indonesia 1994 | 0.08 | 0.06 | 1.33 | < .05 | Birth |
| Indonesia 1997 | 0.08 | 0.06 | 1.33 | < .001 | Birth |
| Indonesia 2002–03 | 0.09 | 0.07 | 1.29 | < .05 | Birth |
| Indonesia 2007 | 0.11 | 0.07 | 1.57 | < .001 | Birth |
| Indonesia 2012 | 0.12 | 0.10 | 1.20 | < .001 | Birth |
| Indonesia 2017 | 0.13 | 0.11 | 1.18 | < .001 | Birth |
| Maldives 2009 | 0.16 | 0.13 | 1.23 | .07 | Birth |
| Maldives 2016–17 | 0.19 | 0.14 | 1.36 | < .05 | Birth |
| Myanmar 2015–16 | 0.12 | 0.08 | 1.50 | < .001 | Birth |
| Nepal 2006 | 0.12 | 0.11 | 1.09 | .37 | Pregnancy |
| Nepal 2011 | 0.19 | 0.16 | 1.19 | .06 | Pregnancy |
| Nepal 2016 | 0.26 | 0.21 | 1.24 | < .05 | Pregnancy |
| Nepal 2022 | 0.24 | 0.20 | 1.20 | < .05 | Pregnancy |
| Pakistan 2012–13 | 0.20 | 0.19 | 1.05 | .12 | Pregnancy |
| Pakistan 2017–18 | 0.22 | 0.19 | 1.16 | < .05 | Pregnancy |
| Papua New Guinea 2016–18 | 0.03 | 0.03 | 1.00 | .99 | Birth |
| Philippines 1993 | 0.11 | 0.10 | 1.10 | .09 | Pregnancy |
| Philippines 1998 | 0.12 | 0.11 | 1.09 | .20 | Pregnancy |
| Philippines 2003 | 0.12 | 0.11 | 1.09 | .14 | Pregnancy |
| Philippines 2022 | 0.13 | 0.10 | 1.30 | < .05 | Pregnancy |
| Timor-Leste 2009–10 | 0.03 | 0.03 | 1.00 | .96 | Birth |
| Timor-Leste 2016 | 0.04 | 0.03 | 1.33 | .32 | Birth |
| Vietnam 1997 | 0.32 | 0.22 | 1.45 | < .001 | Pregnancy |
| Vietnam 2002 | 0.45 | 0.37 | 1.22 | < .05 | Pregnancy |
| EASTERN AND SOUTHERN AFRICA | | | | | |
| Angola 2015–16 | 0.08 | 0.05 | 1.60 | < .001 | Birth |
| Burundi 2010 | 0.08 | 0.07 | 1.14 | .28 | Birth |
| Burundi 2016–17 | 0.10 | 0.07 | 1.43 | < .001 | Birth |
| Comoros 2012 | 0.09 | 0.06 | 1.50 | < .05 | Birth |
| Ethiopia 2005 | 0.05 | 0.03 | 1.67 | < .001 | Birth |
| Ethiopia 2011 | 0.08 | 0.04 | 2.00 | < .001 | Birth |
| Ethiopia 2016 | 0.06 | 0.04 | 1.50 | < .001 | Birth |
| Kenya 1998 | 0.06 | 0.04 | 1.50 | < .001 | Birth |
| Kenya 2003 | 0.06 | 0.05 | 1.20 | < .001 | Birth |
| Kenya 2008–09 | 0.07 | 0.05 | 1.40 | < .001 | Birth |
| Kenya 2014 | 0.09 | 0.05 | 1.80 | < .001 | Birth |
| Kenya 2022 | 0.14 | 0.10 | 1.40 | < .001 | Pregnancy |

*Continued…*

| Survey | Ratio of terminations to births in the later period of the reproductive calendar | Ratio of terminations to births in the early period of the reproductive calendar | Ratio of later period to early period | p value* | Type of reproductive calendar |
|---|---|---|---|---|---|
| Lesotho 2009 | 0.06 | 0.06 | 1.00 | .78 | Birth |
| Lesotho 2014 | 0.10 | 0.08 | 1.25 | .11 | Birth |
| Madagascar 2003–04 | 0.09 | 0.06 | 1.50 | < .01 | Birth |
| Madagascar 2008–09 | 0.09 | 0.06 | 1.50 | < .001 | Birth |
| Madagascar 2021 | 0.12 | 0.08 | 1.50 | < .001 | Birth |
| Malawi 2000 | 0.06 | 0.05 | 1.20 | < .05 | Birth |
| Malawi 2004 | 0.06 | 0.05 | 1.20 | .21 | Birth |
| Malawi 2010 | 0.07 | 0.05 | 1.40 | < .001 | Birth |
| Malawi 2015–16 | 0.07 | 0.04 | 1.75 | < .001 | Birth |
| Mozambique 2003 | 0.09 | 0.06 | 1.50 | < .001 | Birth |
| Mozambique 2011 | 0.07 | 0.04 | 1.75 | < .001 | Birth |
| Namibia 2006–07 | 0.06 | 0.05 | 1.20 | < .05 | Birth |
| Namibia 2013 | 0.08 | 0.06 | 1.33 | .15 | Birth |
| Rwanda 2000 | 0.07 | 0.04 | 1.75 | < .001 | Birth |
| Rwanda 2005 | 0.06 | 0.04 | 1.50 | < .001 | Birth |
| Rwanda 2010 | 0.08 | 0.06 | 1.33 | < .01 | Birth |
| Rwanda 2014–15 | 0.09 | 0.08 | 1.13 | .01 | Birth |
| Rwanda 2019–20 | 0.11 | 0.09 | 1.22 | < .001 | Birth |
| South Africa 2016 | 0.10 | 0.07 | 1.43 | .02 | Birth |
| Swaziland 2006–07 | 0.06 | 0.04 | 1.50 | < .01 | Birth |
| Tanzania 2004–05 | 0.11 | 0.08 | 1.38 | < .001 | Birth |
| Tanzania 2010 | 0.10 | 0.07 | 1.43 | < .001 | Birth |
| Tanzania 2015–16 | 0.12 | 0.08 | 1.50 | < .001 | Birth |
| Uganda 2000–01 | 0.09 | 0.07 | 1.50 | < .01 | Birth |
| Uganda 2006 | 0.12 | 0.08 | 1.50 | < .001 | Birth |
| Uganda 2011 | 0.12 | 0.09 | 1.33 | < .001 | Birth |
| Uganda 2016 | 0.14 | 0.08 | 1.75 | < .001 | Birth |
| Zambia 2007 | 0.07 | 0.05 | 1.40 | .02 | Birth |
| Zambia 2013–14 | 0.06 | 0.04 | 1.50 | < .001 | Birth |
| Zambia 2018 | 0.07 | 0.04 | 1.75 | < .001 | Birth |
| Zimbabwe 1994 | 0.10 | 0.06 | 1.67 | < .001 | Birth |
| Zimbabwe 1999 | 0.11 | 0.06 | 1.83 | < .001 | Birth |
| Zimbabwe 2005–06 | 0.09 | 0.05 | 1.80 | < .001 | Birth |
| Zimbabwe 2010–11 | 0.09 | 0.06 | 1.50 | < .001 | Birth |
| Zimbabwe 2015 | 0.10 | 0.07 | 1.43 | < .001 | Birth |
| LATIN AMERICA AND THE CARIBBEAN (LAC) | | | | | |
| Bolivia 1994 | 0.10 | 0.09 | 1.11 | .13 | Birth |
| Bolivia 2003 | 0.00 | 0.10 | 0.00 | < .001 | Birth |
| Bolivia 2008 | 0.17 | 0.12 | 1.42 | < .001 | Birth |
| Brazil 1996 | 0.16 | 0.14 | 1.14 | < .05 | Birth |
| Brazil NE 1991 | 0.16 | 0.14 | 1.14 | .35 | Birth |
| Colombia 1990 | 0.14 | 0.13 | 1.08 | .41 | Birth |
| Colombia 1995 | 0.13 | 0.11 | 1.18 | < .05 | Birth |
| Colombia 2000 | 0.21 | 0.15 | 1.40 | < .001 | Birth |
| Colombia 2005 | 0.23 | 0.17 | 1.35 | < .001 | Birth |
| Colombia 2010 | 0.23 | 0.19 | 1.21 | < .001 | Birth |
| Colombia 2015 | 0.18 | 0.19 | 0.95 | .50 | Birth |
| Dominican Republic 1991 | 0.17 | 0.15 | 1.13 | .24 | Birth |
| Dominican Republic 1996 | 0.22 | 0.15 | 1.47 | < .001 | Birth |
| Dominican Republic 1999 | 0.32 | 0.15 | 2.13 | < .001 | Birth |
| Dominican Republic 2002 | 0.21 | 0.15 | 1.40 | < .001 | Birth |
| Guatemala 1995 | 0.07 | 0.05 | 1.40 | < .01 | Birth |
| Guatemala 1998–99 | 0.07 | 0.07 | 1.00 | .87 | Birth |
| Guatemala 2014–15 | 0.09 | 0.08 | 1.13 | .08 | Birth |
| Guyana 2009 | 0.32 | 0.19 | 1.68 | < .001 | Birth |
| Honduras 2005–06 | 0.10 | 0.08 | 1.25 | < .001 | Birth |
| Honduras 2011–12 | 0.12 | 0.09 | 1.33 | < .001 | Birth |
| Nicaragua 1998 | 0.09 | 0.07 | 1.29 | < .05 | Birth |
| Nicaragua 2001 | 0.06 | 0.04 | 1.50 | < .05 | Birth |

*Continued…*

| Survey | Ratio of terminations to births in the later period of the reproductive calendar | Ratio of terminations to births in the early period of the reproductive calendar | Ratio of later period to early period | *p* value* | Type of reproductive calendar |
|---|---|---|---|---|---|
| Paraguay 1990 | 0.13 | 0.10 | 1.30 | < .05 | Birth |
| Peru 1991–92 | 0.12 | 0.09 | 1.33 | < .001 | Birth |
| Peru 1996 | 0.12 | 0.09 | 1.33 | < .001 | Birth |
| Peru 2000 | 0.12 | 0.10 | 1.20 | < .01 | Birth |
| Peru 2004–06 | 0.16 | 0.12 | 1.33 | < .001 | Birth |
| Peru 2007–08 | 0.17 | 0.13 | 1.31 | < .001 | Birth |
| Peru 2009 | 0.17 | 0.13 | 1.31 | < .001 | Birth |
| Peru 2010 | 0.21 | 0.13 | 1.62 | < .001 | Birth |
| Peru 2011 | 0.19 | 0.15 | 1.27 | < .001 | Birth |
| Peru 2012 | 0.18 | 0.16 | 1.13 | .04 | Birth |
| MIDDLE EAST, NORTH AFRICA, WEST ASIA, AND EASTERN EUROPE (MENA/WAEE) | | | | | |
| Albania 2008–09 | 0.20 | 0.17 | 1.18 | .27 | Pregnancy |
| Albania 2017–18 | 0.11 | 0.10 | 1.10 | .44 | Birth |
| Armenia 2000 | 1.64 | 1.42 | 1.15 | < .05 | Pregnancy |
| Armenia 2005 | 1.12 | 1.10 | 1.02 | .86 | Pregnancy |
| Armenia 2010 | 0.58 | 0.71 | 0.82 | .09 | Pregnancy |
| Armenia 2015–16 | 0.45 | 0.59 | 0.76 | < .001 | Pregnancy |
| Azerbaijan 2006 | 1.23 | 0.82 | 1.50 | < .001 | Pregnancy |
| Egypt 1992 | 0.16 | 0.11 | 1.45 | < .001 | Birth |
| Egypt 1995 | 0.17 | 0.12 | 1.42 | < .001 | Birth |
| Egypt 2000 | 0.15 | 0.13 | 1.15 | < .001 | Birth |
| Egypt 2003 | 0.13 | 0.11 | 1.18 | .07 | Birth |
| Egypt 2005 | 0.15 | 0.13 | 1.15 | < .05 | Birth |
| Egypt 2008 | 0.14 | 0.11 | 1.27 | < .001 | Birth |
| Egypt 2014 | 0.14 | 0.13 | 1.08 | .12 | Birth |
| Jordan 1990 | 0.17 | 0.13 | 1.31 | < .001 | Birth |
| Jordan 1997 | 0.21 | 0.16 | 1.31 | < .001 | Birth |
| Jordan 2002 | 0.21 | 0.18 | 1.17 | .08 | Birth |
| Jordan 2007 | 0.20 | 0.13 | 1.54 | < .001 | Birth |
| Jordan 2009 | 0.20 | 0.21 | 0.95 | .52 | Birth |
| Jordan 2012 | 0.27 | 0.18 | 1.50 | < .001 | Birth |
| Jordan 2017–18 | 0.18 | 0.12 | 1.50 | < .001 | Birth |
| Kazakhstan 1999 | 0.90 | 0.78 | 1.15 | .15 | Pregnancy |
| Kyrgyz Republic 2012 | 0.29 | 0.32 | 0.91 | .30 | Pregnancy |
| Moldova 2005 | 0.82 | 0.87 | 0.94 | .44 | Pregnancy |
| Morocco 1992 | 0.10 | 0.07 | 1.43 | < .001 | Birth |
| Morocco 2003–04 | 0.14 | 0.12 | 1.17 | .05 | Birth |
| Tajikistan 2012 | 0.20 | 0.18 | 1.11 | .24 | Pregnancy |
| Tajikistan 2017 | 0.20 | 0.15 | 1.33 | < .001 | Pregnancy |
| Turkey 1993 | 0.42 | 0.35 | 1.20 | < .01 | Birth |
| Turkey 1998 | 0.35 | 0.30 | 1.17 | < .05 | Birth |
| Turkey 2003 | 0.31 | 0.27 | 1.15 | .05 | Birth |
| Turkey 2008 | 0.29 | 0.26 | 1.12 | .23 | Birth |
| Turkey 2013 | 0.25 | 0.22 | 1.14 | .30 | Birth |
| Ukraine 2007 | 0.47 | 0.55 | 0.85 | .20 | Pregnancy |
| Yemen 2013 | 0.15 | 0.12 | 1.25 | < .001 | Birth |
| WEST AND CENTRAL AFRICA | | | | | |
| Benin 2006 | 0.07 | 0.05 | 1.40 | < .001 | Birth |
| Benin 2011–12 | 0.05 | 0.03 | 1.67 | < .001 | Birth |
| Benin 2017–18 | 0.09 | 0.06 | 1.50 | < .001 | Birth |
| Burkina Faso 2003 | 0.07 | 0.06 | 1.17 | .27 | Birth |
| Burkina Faso 2010 | 0.06 | 0.05 | 1.20 | .50 | Birth |
| Gambia 2013 | 0.07 | 0.06 | 1.17 | .08 | Birth |
| Gambia 2019–20 | 0.15 | 0.11 | 1.36 | < .001 | Birth |
| Ghana 2003 | 0.11 | 0.05 | 2.20 | < .001 | Birth |
| Ghana 2008 | 0.18 | 0.13 | 1.38 | < .001 | Birth |
| Ghana 2014 | 0.26 | 0.15 | 1.73 | < .001 | Birth |

*Continued…*

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**Appendix Table 1—*Continued***

| Survey | Ratio of terminations to births in the later period of the reproductive calendar | Ratio of terminations to births in the early period of the reproductive calendar | Ratio of early period to later period | *p* value* | Type of reproductive calendar |
|---|---|---|---|---|---|
| Guinea 2005 | 0.07 | 0.03 | 2.33 | < .001 | Birth |
| Guinea 2018 | 0.11 | 0.06 | 1.83 | < .001 | Birth |
| Liberia 2013 | 0.15 | 0.10 | 1.50 | < .001 | Birth |
| Liberia 2019–20 | 0.17 | 0.10 | 1.70 | < .001 | Birth |
| Mali 2001 | 0.08 | 0.04 | 2.00 | < .001 | Birth |
| Mali 2006 | 0.06 | 0.04 | 1.50 | < .001 | Birth |
| Mali 2012–13 | 0.04 | 0.03 | 1.33 | < .05 | Birth |
| Mali 2018 | 0.06 | 0.05 | 1.20 | .14 | Birth |
| Mauritania 2019–21 | 0.09 | 0.07 | 1.29 | < .001 | Birth |
| Niger 2006 | 0.05 | 0.03 | 1.67 | < .001 | Birth |
| Niger 2012 | 0.08 | 0.06 | 1.33 | < .001 | Birth |
| Nigeria 2008 | 0.08 | 0.06 | 1.33 | < .001 | Birth |
| Nigeria 2013 | 0.09 | 0.06 | 1.50 | < .001 | Birth |
| Nigeria 2018 | 0.09 | 0.06 | 1.50 | < .001 | Birth |
| Senegal 2005 | 0.11 | 0.08 | 1.38 | < .001 | Birth |
| Senegal 2010–11 | 0.11 | 0.08 | 1.38 | < .001 | Birth |
| Senegal 2012–13 | 0.11 | 0.08 | 1.38 | < .01 | Birth |
| Senegal 2014 | 0.11 | 0.06 | 1.83 | < .001 | Birth |
| Senegal 2015 | 0.11 | 0.07 | 1.57 | < .001 | Birth |
| Senegal 2016 | 0.11 | 0.08 | 1.38 | < .05 | Birth |
| Senegal 2017 | 0.12 | 0.09 | 1.33 | < .001 | Birth |
| Senegal 2018 | 0.12 | 0.09 | 1.33 | < .05 | Birth |
| Senegal 2019 | 0.11 | 0.12 | 0.92 | .31 | Birth |
| Sierra Leone 2008 | 0.08 | 0.06 | 1.33 | < .05 | Birth |
| Sierra Leone 2013 | 0.07 | 0.06 | 1.17 | < .01 | Birth |
| Sierra Leone 2019 | 0.07 | 0.05 | 1.4 | < .05 | Birth |

* *p* value of the test of equality of ratios from the later period of the calendar to the early period of the calendar. A *p* value < .05 indicates that the two ratios are statistically different, while a *p* value > .05 indicates that the two ratios are not statistically different.

# Appendix Table 2      Calendar contraceptive use estimates

| | Later calendar period | | | | | | | | | | Early calendar period | | | | | | | | | |
| | | Overall contraceptive use | | | Traditional contraceptive method use | | | Coitus-based contraceptive method use | | | | Overall contraceptive use | | | Traditional contraceptive method use | | | Coitus-based contraceptive method use | | |
| Survey | Median CMC | Esti-mate | LB | UB | Esti-mate | LB | UB | Esti-mate | LB | UB | Median CMC | Esti-mate | LB | UB | Esti-mate | LB | UB | Esti-mate | LB | UB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ASIA | | | | | | | | | | | | | |
| Bangladesh 1999-00 | 1,185 | 44.87 | 43.43 | 46.30 | 7.63 | 6.98 | 8.27 | 10.16 | 9.38 | 10.94 | 1,157 | 39.52 | 38.05 | 40.98 | 6.55 | 5.92 | 7.18 | 8.50 | 7.74 | 9.25 |
| Bangladesh 2004 | 1,235 | 49.47 | 48.21 | 50.73 | 7.96 | 7.33 | 8.58 | 10.58 | 9.81 | 11.35 | 1,207 | 44.09 | 42.66 | 45.51 | 7.09 | 6.47 | 7.71 | 9.08 | 8.32 | 9.84 |
| Bangladesh 2007 | 1,273 | 48.70 | 47.35 | 50.04 | 6.15 | 5.56 | 6.73 | 9.05 | 8.30 | 9.81 | 1,250 | 44.80 | 43.43 | 46.17 | 5.38 | 4.83 | 5.93 | 7.82 | 7.10 | 8.54 |
| Bangladesh 2011 | 1,324 | 55.04 | 54.11 | 55.96 | 7.53 | 7.03 | 8.03 | 11.29 | 10.63 | 11.95 | 1,298 | 50.29 | 49.31 | 51.27 | 6.88 | 6.42 | 7.33 | 9.59 | 9.03 | 10.14 |
| Bangladesh 2014 | 1,359 | 55.79 | 54.63 | 56.94 | 6.77 | 6.21 | 7.34 | 11.49 | 10.68 | 12.30 | 1,334 | 52.14 | 50.95 | 53.32 | 6.53 | 5.97 | 7.08 | 10.31 | 9.58 | 11.04 |
| Bangladesh 2017-18 | 1,399 | 57.69 | 56.63 | 58.75 | 8.02 | 7.57 | 8.46 | 13.64 | 12.94 | 14.34 | 1,370 | 55.79 | 54.74 | 56.85 | 7.31 | 6.89 | 7.73 | 11.52 | 10.91 | 12.13 |
| Bangladesh 1996-97 | 1,149 | 42.20 | 40.76 | 43.63 | 6.32 | 5.69 | 6.95 | 8.48 | 7.70 | 9.25 | 1,121 | 36.72 | 35.31 | 38.12 | 5.52 | 4.91 | 6.13 | 7.08 | 6.38 | 7.78 |
| Cambodia 2014 | 1,360 | 33.87 | 32.89 | 34.86 | 10.53 | 9.86 | 11.20 | 11.67 | 10.97 | 12.37 | 1,334 | 28.98 | 28.01 | 29.95 | 9.54 | 8.89 | 10.19 | 10.48 | 9.81 | 11.15 |
| India 2019-21 | 1,420 | 43.05 | 42.81 | 43.30 | 6.33 | 6.21 | 6.46 | 11.66 | 11.49 | 11.84 | 1,400 | 42.45 | 42.20 | 42.70 | 6.15 | 6.02 | 6.28 | 10.90 | 10.72 | 11.07 |
| Indonesia 1997 | 1,158 | 49.41 | 48.24 | 50.59 | 1.76 | 1.53 | 1.99 | 2.14 | 1.88 | 2.40 | 1,129 | 41.23 | 40.08 | 42.38 | 1.47 | 1.27 | 1.68 | 1.75 | 1.53 | 1.97 |
| Indonesia 2002-03 | 1,219 | 54.01 | 52.80 | 55.22 | 3.17 | 2.64 | 3.70 | 3.24 | 2.70 | 3.77 | 1,189 | 45.87 | 44.61 | 47.14 | 2.67 | 2.22 | 3.12 | 2.62 | 2.16 | 3.08 |
| Indonesia 2007 | 1,275 | 53.90 | 52.97 | 54.83 | 3.00 | 2.72 | 3.28 | 3.82 | 3.46 | 4.19 | 1,249 | 48.10 | 47.16 | 49.04 | 2.64 | 2.39 | 2.89 | 3.16 | 2.87 | 3.46 |
| Indonesia 2012 | 1,335 | 44.42 | 43.59 | 45.24 | 2.67 | 2.45 | 2.90 | 3.42 | 3.14 | 3.70 | 1,310 | 43.17 | 42.33 | 44.01 | 2.48 | 2.26 | 2.70 | 2.98 | 2.71 | 3.24 |
| Indonesia 2017 | 1,397 | 45.20 | 44.48 | 45.91 | 3.86 | 3.59 | 4.13 | 5.24 | 4.91 | 5.57 | 1,370 | 45.72 | 44.99 | 46.46 | 3.53 | 3.26 | 3.79 | 4.60 | 4.29 | 4.92 |
| Indonesia 1994 | 1,120 | 46.45 | 45.17 | 47.73 | 1.84 | 1.61 | 2.07 | 2.30 | 2.03 | 2.57 | 1,093 | 39.28 | 38.01 | 40.54 | 1.64 | 1.42 | 1.86 | 2.05 | 1.78 | 2.31 |
| Nepal 2011 | 2,000 | 35.10 | 33.62 | 36.59 | 4.45 | 3.86 | 5.05 | 7.19 | 6.47 | 7.92 | 1,970 | 34.00 | 32.34 | 35.67 | 3.83 | 3.28 | 4.37 | 5.91 | 5.23 | 6.58 |
| Nepal 2016 | 2,065 | 35.72 | 34.54 | 36.91 | 6.32 | 5.65 | 6.98 | 8.99 | 8.21 | 9.77 | 2,042 | 35.62 | 34.36 | 36.88 | 5.77 | 5.04 | 6.49 | 8.23 | 7.40 | 9.06 |
| Nepal 2022 | 2,131 | 39.37 | 38.10 | 40.65 | 9.46 | 8.72 | 10.21 | 12.27 | 11.37 | 13.17 | 2,102 | 36.91 | 35.66 | 38.16 | 7.93 | 7.19 | 8.66 | 10.45 | 9.54 | 11.36 |
| Pakistan 2017-18 | 1,399 | 27.18 | 25.55 | 28.80 | 7.20 | 6.33 | 8.06 | 14.09 | 12.79 | 15.39 | 1,370 | 20.77 | 19.36 | 22.18 | 5.60 | 4.88 | 6.33 | 10.54 | 9.44 | 11.64 |
| Philippines 2003 | 1,228 | 28.36 | 27.49 | 29.24 | 8.94 | 8.45 | 9.43 | 9.61 | 9.11 | 10.11 | 1,202 | 25.48 | 24.60 | 26.37 | 8.18 | 7.68 | 8.68 | 8.68 | 8.16 | 9.19 |
| Philippines 1998 | 1,165 | 24.92 | 23.99 | 25.85 | 9.62 | 9.12 | 10.13 | 10.23 | 9.71 | 10.75 | 1,142 | 23.64 | 22.64 | 24.64 | 9.56 | 8.99 | 10.14 | 9.99 | 9.42 | 10.57 |
| Vietnam 2002 | 1,218 | 70.79 | 69.42 | 72.15 | 19.28 | 17.21 | 21.35 | 24.26 | 22.03 | 26.50 | 1,189 | 63.52 | 61.87 | 65.17 | 17.96 | 16.14 | 19.78 | 22.19 | 20.30 | 24.07 |
| | | | | | | | LAC | | | | | | | | | | | | | |
| Bolivia 2008 | 1,284 | 39.81 | 38.93 | 40.69 | 17.50 | 16.80 | 18.19 | 20.44 | 19.73 | 21.15 | 1,262 | 39.61 | 38.65 | 40.57 | 17.72 | 16.92 | 18.52 | 20.44 | 19.62 | 21.25 |
| Brazil 1996 | 1,140 | 55.29 | 54.27 | 56.31 | 4.56 | 4.15 | 4.98 | 8.40 | 7.84 | 8.97 | 1,118 | 54.89 | 53.81 | 55.97 | 4.87 | 4.39 | 5.34 | 8.01 | 7.40 | 8.63 |
| Colombia 1995 | 1,129 | 47.79 | 46.77 | 48.81 | 9.46 | 8.95 | 9.98 | 12.04 | 11.44 | 12.64 | 1,106 | 46.86 | 45.79 | 47.93 | 9.72 | 9.13 | 10.30 | 11.65 | 11.00 | 12.31 |
| Colombia 2000 | 1,188 | 52.51 | 51.62 | 53.41 | 9.59 | 9.07 | 10.11 | 14.01 | 13.37 | 14.66 | 1,166 | 52.10 | 51.12 | 53.08 | 9.75 | 9.17 | 10.33 | 13.24 | 12.56 | 13.92 |
| Colombia 2005 | 1,240 | 55.82 | 55.17 | 56.47 | 7.79 | 7.44 | 8.13 | 14.02 | 13.54 | 14.50 | 1,214 | 54.59 | 53.88 | 55.31 | 7.93 | 7.54 | 8.31 | 13.02 | 12.53 | 13.52 |
| Colombia 2010 | 1,305 | 58.25 | 57.74 | 58.75 | 5.01 | 4.78 | 5.24 | 12.27 | 11.92 | 12.62 | 1,284 | 57.10 | 56.52 | 57.67 | 5.29 | 5.04 | 5.55 | 11.71 | 11.34 | 12.08 |
| Colombia 2015 | 1,368 | 58.59 | 57.72 | 59.46 | 3.54 | 3.24 | 3.83 | 10.40 | 9.84 | 10.96 | 1,348 | 58.04 | 57.07 | 59.01 | 3.68 | 3.14 | 4.22 | 10.00 | 9.26 | 10.73 |
| Dominican Republic 1996 | 1,147 | 41.10 | 39.89 | 42.31 | 3.25 | 2.82 | 3.67 | 4.20 | 3.76 | 4.65 | 1,118 | 38.13 | 36.86 | 39.41 | 3.21 | 2.84 | 3.57 | 3.77 | 3.35 | 4.20 |
| Dominican Republic 1999 | 1,182 | 45.36 | 42.41 | 48.31 | 3.69 | 2.70 | 4.67 | 4.77 | 3.72 | 5.82 | 1,154 | 41.87 | 38.57 | 45.17 | 3.25 | 2.32 | 4.18 | 3.93 | 2.92 | 4.94 |
| Dominican Republic 2002 | 1,217 | 48.12 | 47.27 | 48.97 | 3.39 | 3.10 | 3.67 | 4.03 | 3.67 | 4.38 | 1,190 | 46.30 | 45.40 | 47.21 | 3.18 | 2.88 | 3.49 | 3.32 | 2.96 | 3.68 |
| Guatemala 1998-99 | 1,172 | 24.64 | 20.81 | 28.46 | 4.82 | 3.69 | 5.95 | 6.07 | 4.82 | 7.32 | 1,142 | 21.79 | 18.29 | 25.28 | 4.82 | 3.64 | 6.00 | 6.03 | 4.67 | 7.39 |
| Honduras 2011-12 | 1,327 | 46.28 | 45.55 | 47.01 | 6.11 | 5.75 | 6.47 | 9.10 | 8.68 | 9.52 | 1,298 | 45.09 | 44.29 | 45.89 | 5.98 | 5.58 | 6.38 | 8.18 | 7.74 | 8.62 |
| Peru 1996 | 1,146 | 39.43 | 38.61 | 40.24 | 15.75 | 15.15 | 16.35 | 17.78 | 17.17 | 18.39 | 1,118 | 36.97 | 36.14 | 37.81 | 16.36 | 15.73 | 16.99 | 17.53 | 16.89 | 18.16 |
| Peru 2000 | 1,193 | 42.82 | 41.98 | 43.67 | 12.45 | 11.95 | 12.95 | 15.60 | 15.04 | 16.16 | 1,166 | 40.87 | 40.02 | 41.73 | 13.17 | 12.60 | 13.74 | 15.66 | 15.03 | 16.28 |
| Peru 2007-08 | 1,279 | 49.45 | 48.50 | 50.40 | 15.68 | 14.95 | 16.40 | 22.24 | 21.49 | 22.99 | 1,258 | 49.02 | 48.02 | 50.01 | 15.54 | 14.78 | 16.31 | 21.16 | 20.36 | 21.95 |
| Peru 2009 | 1,296 | 50.26 | 49.45 | 51.06 | 12.01 | 11.38 | 12.63 | 19.00 | 18.33 | 19.68 | 1,274 | 50.19 | 49.31 | 51.07 | 12.01 | 11.35 | 12.66 | 18.25 | 17.51 | 18.99 |
| Peru 2010 | 1,309 | 50.87 | 50.01 | 51.73 | 16.06 | 15.41 | 16.70 | 24.09 | 23.37 | 24.81 | 1,286 | 51.50 | 50.52 | 52.47 | 16.09 | 15.38 | 16.80 | 23.34 | 22.54 | 24.15 |
| Peru 2011 | 1,320 | 51.58 | 50.78 | 52.37 | 16.28 | 15.58 | 16.98 | 24.76 | 24.00 | 25.51 | 1,298 | 51.01 | 50.11 | 51.90 | 16.08 | 15.30 | 16.85 | 23.80 | 22.96 | 24.63 |
| Peru 2012 | 1,328 | 49.49 | 48.61 | 50.37 | 14.89 | 14.31 | 15.48 | 23.49 | 22.78 | 24.19 | 1,300 | 55.16 | 54.26 | 56.07 | 16.47 | 15.81 | 17.13 | 25.06 | 24.29 | 25.84 |

*Continued…*

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| Survey | Median CMC | Overall contraceptive use Esti-mate | LB | UB | Traditional contraceptive method use Esti-mate | LB | UB | Coitus-based contraceptive method use Esti-mate | LB | UB | Median CMC | Overall contraceptive use Esti-mate | LB | UB | Traditional contraceptive method use Esti-mate | LB | UB | Coitus-based contraceptive method use Esti-mate | LB | UB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Later calendar period | | | | | | | | | | Early calendar period | | | | | | | | |
| | | MENA/WAEE | | | | | | | | | | | | | | | | | | |
| Armenia 2005 | 1,255 | 34.72 | 33.09 | 36.35 | 21.81 | 20.39 | 23.24 | 26.14 | 24.77 | 27.52 | 1,226 | 34.73 | 32.96 | 36.50 | 22.57 | 21.10 | 24.05 | 26.69 | 25.16 | 28.22 |
| Armenia 2010 | 1,315 | 32.60 | 31.04 | 34.16 | 16.31 | 15.11 | 17.51 | 24.89 | 23.23 | 26.54 | 1,286 | 32.25 | 30.49 | 34.02 | 16.61 | 15.42 | 17.79 | 24.69 | 22.85 | 26.53 |
| Armenia 2015-16 | 1,375 | 34.85 | 33.47 | 36.23 | 17.65 | 16.54 | 18.76 | 26.09 | 24.83 | 27.36 | 1,347 | 32.82 | 31.30 | 34.34 | 17.88 | 16.65 | 19.11 | 24.80 | 23.42 | 26.18 |
| Egypt 1995 | 1,135 | 42.43 | 41.10 | 43.76 | 0.98 | 0.78 | 1.18 | 2.22 | 1.92 | 2.53 | 1,106 | 36.41 | 35.12 | 37.69 | 0.84 | 0.65 | 1.03 | 1.87 | 1.58 | 2.16 |
| Egypt 2000 | 1,187 | 45.60 | 44.61 | 46.58 | 0.66 | 0.52 | 0.79 | 1.24 | 1.06 | 1.43 | 1,165 | 41.70 | 40.68 | 42.71 | 0.63 | 0.49 | 0.78 | 1.19 | 1.00 | 1.38 |
| Egypt 2003 | 1,226 | 51.18 | 50.02 | 52.34 | 0.88 | 0.66 | 1.09 | 1.36 | 1.11 | 1.62 | 1,201 | 46.41 | 45.19 | 47.64 | 0.69 | 0.49 | 0.90 | 1.07 | 0.83 | 1.30 |
| Egypt 2005 | 1,249 | 50.55 | 49.73 | 51.37 | 0.75 | 0.61 | 0.90 | 1.35 | 1.16 | 1.54 | 1,225 | 45.83 | 45.01 | 46.66 | 0.72 | 0.57 | 0.87 | 1.26 | 1.07 | 1.46 |
| Egypt 2008 | 1,284 | 51.04 | 50.25 | 51.84 | 0.52 | 0.40 | 0.64 | 0.97 | 0.81 | 1.14 | 1,261 | 48.62 | 47.78 | 49.46 | 0.51 | 0.38 | 0.63 | 0.85 | 0.69 | 1.02 |
| Jordan 2002 | 1,216 | 48.37 | 47.04 | 49.69 | 11.67 | 10.85 | 12.49 | 14.25 | 13.33 | 15.17 | 1,189 | 43.54 | 42.11 | 44.97 | 10.03 | 9.28 | 10.78 | 11.99 | 11.15 | 12.83 |
| Jordan 2007 | 1,275 | 48.35 | 46.99 | 49.70 | 12.45 | 11.62 | 13.29 | 16.35 | 15.38 | 17.33 | 1,249 | 43.64 | 42.33 | 44.95 | 10.69 | 9.92 | 11.46 | 13.51 | 12.59 | 14.43 |
| Jordan 2009 | 1,303 | 52.06 | 50.76 | 53.36 | 14.11 | 13.11 | 15.10 | 18.64 | 17.50 | 19.77 | 1,273 | 43.70 | 42.31 | 45.09 | 11.51 | 10.57 | 12.45 | 14.28 | 13.21 | 15.35 |
| Jordan 2012 | 1,338 | 54.43 | 53.15 | 55.71 | 15.93 | 14.89 | 16.96 | 20.70 | 19.47 | 21.92 | 1,309 | 47.40 | 45.98 | 48.82 | 13.94 | 13.00 | 14.88 | 17.23 | 16.08 | 18.38 |
| Jordan 2017-18 | 1,398 | 43.44 | 42.00 | 44.88 | 11.61 | 10.78 | 12.43 | 15.49 | 14.50 | 16.49 | 1,369 | 36.93 | 35.50 | 38.36 | 9.28 | 8.52 | 10.04 | 12.33 | 11.42 | 13.24 |
| Tajikistan 2017 | 1,398 | 17.66 | 16.35 | 18.96 | 1.26 | 0.86 | 1.65 | 3.62 | 2.90 | 4.35 | 1,370 | 13.99 | 12.75 | 15.23 | 1.20 | 0.80 | 1.60 | 2.93 | 2.26 | 3.60 |
| Turkey 1998 | 1,170 | 43.81 | 42.49 | 45.13 | 17.65 | 16.59 | 18.72 | 22.85 | 21.68 | 24.01 | 1,142 | 43.90 | 42.50 | 45.29 | 18.55 | 17.40 | 19.69 | 22.94 | 21.74 | 24.13 |
| Turkey 2003 | 1,231 | 65.72 | 64.44 | 67.01 | 25.11 | 23.92 | 26.30 | 34.76 | 33.42 | 36.10 | 1,202 | 58.93 | 57.55 | 60.30 | 22.92 | 21.75 | 24.08 | 31.02 | 29.69 | 32.35 |
| Turkey 2008 | 1,291 | 67.40 | 66.06 | 68.74 | 24.85 | 23.59 | 26.11 | 37.30 | 35.86 | 38.74 | 1,261 | 60.44 | 59.00 | 61.87 | 22.88 | 21.70 | 24.05 | 32.69 | 31.38 | 34.01 |
| Turkey 2013 | 1,351 | 49.85 | 48.43 | 51.27 | 16.78 | 15.75 | 17.81 | 27.59 | 26.35 | 28.83 | 1,322 | 50.64 | 49.21 | 52.08 | 17.63 | 16.56 | 18.70 | 27.30 | 26.04 | 28.56 |
| | | AFRICA | | | | | | | | | | | | | | | | | | |
| Benin 2011-12 | 1,328 | 11.21 | 10.56 | 11.86 | 2.99 | 2.68 | 3.30 | 4.59 | 4.20 | 4.98 | 1,299 | 7.76 | 7.21 | 8.31 | 2.11 | 1.84 | 2.37 | 2.83 | 2.52 | 3.14 |
| Benin 2017-18 | 1,400 | 11.91 | 11.14 | 12.69 | 2.74 | 2.36 | 3.12 | 4.02 | 3.55 | 4.49 | 1,370 | 7.91 | 7.24 | 8.58 | 2.16 | 1.80 | 2.51 | 2.94 | 2.52 | 3.35 |
| Ethiopia 2005 | 1,250 | 7.82 | 7.12 | 8.52 | 0.64 | 0.48 | 0.81 | 0.89 | 0.70 | 1.07 | 1,222 | 5.45 | 4.86 | 6.05 | 0.50 | 0.36 | 0.64 | 0.69 | 0.53 | 0.86 |
| Ethiopia 2011 | 1,226 | 16.66 | 15.33 | 17.99 | 0.72 | 0.55 | 0.89 | 0.97 | 0.77 | 1.16 | 1,202 | 14.08 | 12.80 | 15.37 | 0.70 | 0.51 | 0.90 | 0.90 | 0.70 | 1.10 |
| Ethiopia 2016 | 1,287 | 20.77 | 19.27 | 22.28 | 0.44 | 0.32 | 0.56 | 0.57 | 0.44 | 0.70 | 1,262 | 18.63 | 17.13 | 20.12 | 0.39 | 0.26 | 0.51 | 0.49 | 0.36 | 0.62 |
| Ghana 2008 | 1,291 | 17.95 | 16.66 | 19.23 | 6.01 | 5.30 | 6.73 | 9.04 | 8.12 | 9.96 | 1,262 | 14.39 | 13.23 | 15.54 | 4.63 | 4.02 | 5.24 | 6.96 | 6.17 | 7.76 |
| Ghana 2014 | 1,363 | 18.37 | 17.02 | 19.72 | 4.65 | 3.87 | 5.43 | 6.05 | 5.15 | 6.94 | 1,334 | 11.79 | 10.68 | 12.91 | 3.34 | 2.68 | 4.00 | 4.09 | 3.37 | 4.80 |
| Kenya 2003 | 1,226 | 26.22 | 24.92 | 27.51 | 5.14 | 4.59 | 5.69 | 6.15 | 5.54 | 6.75 | 1,202 | 25.12 | 23.71 | 26.53 | 4.66 | 4.06 | 5.26 | 5.40 | 4.78 | 6.01 |
| Kenya 2008-09 | 1,292 | 29.43 | 27.86 | 31.00 | 3.98 | 3.11 | 4.85 | 5.81 | 4.90 | 6.72 | 1,262 | 27.20 | 25.55 | 28.86 | 3.72 | 2.91 | 4.53 | 4.98 | 4.09 | 5.87 |
| Kenya 2014 | 1,359 | 70.59 | 69.96 | 71.22 | 1.55 | 1.39 | 1.70 | 2.90 | 2.62 | 3.19 | 1,334 | 68.89 | 68.23 | 69.56 | 1.55 | 1.37 | 1.73 | 2.54 | 2.25 | 2.82 |
| Lesotho 2014 | 1,363 | 47.03 | 45.60 | 48.45 | 0.54 | 0.35 | 0.73 | 20.14 | 18.78 | 21.50 | 1,334 | 40.42 | 38.80 | 42.03 | 0.49 | 0.29 | 0.69 | 16.65 | 15.30 | 17.99 |
| Madagascar 2008-09 | 1,292 | 27.07 | 25.80 | 28.33 | 8.24 | 7.57 | 8.90 | 8.85 | 8.13 | 9.57 | 1,262 | 20.92 | 19.78 | 22.06 | 7.00 | 6.43 | 7.58 | 7.47 | 6.86 | 8.08 |
| Malawi 2004 | 1,235 | 17.11 | 16.29 | 17.93 | 2.33 | 1.97 | 2.70 | 2.24 | 1.87 | 2.62 | 1,214 | 15.17 | 14.33 | 16.00 | 2.26 | 1.86 | 2.65 | 2.01 | 1.63 | 2.38 |
| Malawi 2010 | 1,312 | 27.79 | 27.00 | 28.59 | 2.40 | 2.18 | 2.62 | 3.63 | 3.34 | 3.92 | 1,286 | 23.76 | 22.96 | 24.56 | 2.34 | 2.12 | 2.57 | 3.11 | 2.84 | 3.38 |
| Malawi 2015-16 | 1,376 | 36.13 | 35.30 | 36.96 | 0.75 | 0.64 | 0.87 | 2.32 | 2.11 | 2.54 | 1,346 | 27.12 | 26.28 | 27.96 | 0.65 | 0.53 | 0.76 | 1.50 | 1.33 | 1.67 |
| Mali 2018 | 1,410 | 11.62 | 10.55 | 12.68 | 0.51 | 0.35 | 0.67 | 0.32 | 0.19 | 0.45 | 1,382 | 7.50 | 6.67 | 8.33 | 0.31 | 0.20 | 0.42 | 0.16 | 0.07 | 0.24 |
| Nigeria 2013 | 1,344 | 12.09 | 11.40 | 12.77 | 3.71 | 3.42 | 4.00 | 6.76 | 6.31 | 7.21 | 1,322 | 10.41 | 9.79 | 11.03 | 3.40 | 3.12 | 3.69 | 5.73 | 5.32 | 6.14 |
| Nigeria 2018 | 1,410 | 11.21 | 10.35 | 12.07 | 3.39 | 2.92 | 3.85 | 4.92 | 4.39 | 5.45 | 1,382 | 8.25 | 7.45 | 9.05 | 2.76 | 2.39 | 3.14 | 3.71 | 3.25 | 4.18 |
| Rwanda 2010 | 1,315 | 21.09 | 20.42 | 21.76 | 2.00 | 1.77 | 2.23 | 3.01 | 2.73 | 3.29 | 1,286 | 10.21 | 9.69 | 10.73 | 1.73 | 1.52 | 1.95 | 2.24 | 2.00 | 2.49 |
| Rwanda 2014-15 | 1,364 | 28.45 | 27.63 | 29.27 | 2.15 | 1.87 | 2.42 | 3.38 | 3.03 | 3.72 | 1,334 | 24.70 | 23.90 | 25.50 | 1.82 | 1.57 | 2.07 | 2.70 | 2.37 | 3.02 |
| Rwanda 2019-20 | 1,425 | 31.91 | 30.93 | 32.90 | 2.87 | 2.55 | 3.18 | 4.48 | 4.09 | 4.87 | 1,395 | 25.93 | 24.98 | 26.89 | 2.39 | 2.11 | 2.68 | 3.56 | 3.20 | 3.91 |

**Appendix Table 2—*Continued***

| Survey | Median CMC | Later calendar period — Overall contraceptive use | | | Traditional contraceptive method use | | | Coitus-based contraceptive method use | | | Median CMC | Early calendar period — Overall contraceptive use | | | Traditional contraceptive method use | | | Coitus-based contraceptive method use | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Esti-mate | LB | UB | Esti-mate | LB | UB | Esti-mate | LB | UB | | Esti-mate | LB | UB | Esti-mate | LB | UB | Esti-mate | LB | UB |
| Senegal 2010-11 | 1,316 | 7.28 | 6.69 | 7.86 | 0.71 | 0.51 | 0.91 | 0.95 | 0.70 | 1.21 | 1,286 | 5.07 | 4.53 | 5.61 | 0.54 | 0.35 | 0.73 | 0.78 | 0.52 | 1.03 |
| Senegal 2012-13 | 1,339 | 9.30 | 8.33 | 10.26 | 0.76 | 0.56 | 0.95 | 0.95 | 0.72 | 1.18 | 1,310 | 6.79 | 5.88 | 7.70 | 0.73 | 0.48 | 0.99 | 0.71 | 0.44 | 0.97 |
| Senegal 2014 | 1,355 | 9.60 | 8.75 | 10.45 | 0.66 | 0.46 | 0.86 | 1.11 | 0.70 | 1.52 | 1,334 | 7.87 | 6.82 | 8.92 | 0.49 | 0.27 | 0.70 | 0.85 | 0.45 | 1.26 |
| Senegal 2015 | 1,368 | 11.72 | 10.64 | 12.81 | 0.99 | 0.73 | 1.24 | 1.19 | 0.89 | 1.49 | 1,346 | 9.29 | 8.29 | 10.29 | 0.79 | 0.54 | 1.05 | 0.90 | 0.63 | 1.16 |
| Senegal 2016 | 1,381 | 13.05 | 11.98 | 14.11 | 0.85 | 0.58 | 1.11 | 0.91 | 0.53 | 1.29 | 1,358 | 10.33 | 9.41 | 11.25 | 0.69 | 0.44 | 0.95 | 0.71 | 0.40 | 1.02 |
| Senegal 2017 | 1,393 | 14.21 | 13.17 | 15.24 | 0.51 | 0.39 | 0.62 | 1.05 | 0.77 | 1.33 | 1,370 | 11.61 | 10.62 | 12.60 | 0.43 | 0.32 | 0.55 | 0.84 | 0.62 | 1.06 |
| Senegal 2018 | 1,406 | 15.37 | 14.03 | 16.71 | 0.84 | 0.62 | 1.06 | 1.07 | 0.70 | 1.43 | 1,382 | 12.98 | 11.55 | 14.42 | 0.66 | 0.44 | 0.87 | 0.80 | 0.39 | 1.20 |
| Senegal 2019 | 1,418 | 14.61 | 13.60 | 15.61 | 0.55 | 0.38 | 0.71 | 0.59 | 0.41 | 0.78 | 1,394 | 12.54 | 11.50 | 13.58 | 0.36 | 0.21 | 0.51 | 0.34 | 0.19 | 0.50 |
| Sierra Leone 2013 | 1,348 | 15.56 | 13.85 | 17.28 | 0.96 | 0.67 | 1.26 | 0.91 | 0.47 | 1.34 | 1,322 | 8.91 | 7.43 | 10.39 | 0.72 | 0.48 | 0.95 | 0.74 | 0.31 | 1.16 |
| Sierra Leone 2019 | 1,419 | 16.04 | 15.09 | 17.00 | 0.30 | 0.18 | 0.43 | 0.38 | 0.26 | 0.50 | 1,394 | 9.61 | 8.85 | 10.36 | 0.19 | 0.10 | 0.28 | 0.22 | 0.12 | 0.32 |
| Tanzania 2010 | 1,306 | 22.98 | 21.84 | 24.12 | 3.95 | 3.50 | 4.40 | 6.35 | 5.71 | 6.99 | 1,286 | 22.18 | 21.02 | 23.35 | 3.70 | 3.21 | 4.19 | 5.57 | 4.92 | 6.22 |
| Tanzania 2015-16 | 1,374 | 27.21 | 26.14 | 28.29 | 4.51 | 4.05 | 4.98 | 6.96 | 6.31 | 7.61 | 1,346 | 23.87 | 22.80 | 24.94 | 3.97 | 3.50 | 4.44 | 5.61 | 4.98 | 6.25 |
| Uganda 2006 | 1,263 | 15.97 | 14.97 | 16.97 | 3.18 | 2.79 | 3.56 | 5.40 | 4.85 | 5.95 | 1,238 | 14.01 | 12.99 | 15.03 | 2.86 | 2.44 | 3.28 | 4.45 | 3.87 | 5.03 |
| Uganda 2011 | 1,324 | 18.85 | 17.65 | 20.05 | 2.30 | 1.96 | 2.64 | 4.39 | 3.84 | 4.95 | 1,298 | 14.84 | 13.65 | 16.04 | 1.83 | 1.44 | 2.21 | 3.09 | 2.52 | 3.66 |
| Uganda 2016 | 1,384 | 23.72 | 22.87 | 24.57 | 2.57 | 2.29 | 2.84 | 4.29 | 3.91 | 4.68 | 1,358 | 19.27 | 18.48 | 20.07 | 2.09 | 1.84 | 2.34 | 3.02 | 2.70 | 3.34 |
| Zambia 2018 | 1,409 | 28.71 | 27.55 | 29.88 | 1.11 | 0.87 | 1.35 | 3.25 | 2.84 | 3.67 | 1,382 | 24.99 | 23.94 | 26.05 | 1.07 | 0.83 | 1.31 | 2.76 | 2.41 | 3.10 |
| Zimbabwe 1999 | 1,182 | 37.36 | 35.93 | 38.78 | 1.74 | 1.33 | 2.15 | 3.48 | 2.90 | 4.07 | 1,154 | 36.11 | 34.67 | 37.55 | 2.01 | 1.55 | 2.47 | 3.06 | 2.45 | 3.67 |
| Zimbabwe 2005-06 | 1,254 | 39.09 | 37.75 | 40.42 | 0.99 | 0.78 | 1.19 | 2.71 | 2.34 | 3.09 | 1,226 | 38.48 | 36.94 | 40.03 | 1.13 | 0.90 | 1.37 | 2.32 | 1.94 | 2.70 |
| Zimbabwe 2010-11 | 1,315 | 36.82 | 35.74 | 37.91 | 0.79 | 0.56 | 1.02 | 3.72 | 3.30 | 4.15 | 1,286 | 34.13 | 33.07 | 35.19 | 0.70 | 0.50 | 0.90 | 2.85 | 2.48 | 3.23 |
| Zimbabwe 2015 | 1,373 | 44.41 | 43.25 | 45.57 | 0.64 | 0.48 | 0.81 | 4.09 | 3.66 | 4.53 | 1,346 | 39.87 | 38.65 | 41.09 | 0.49 | 0.34 | 0.64 | 3.55 | 3.14 | 3.96 |

a. Overall contraceptive prevalence
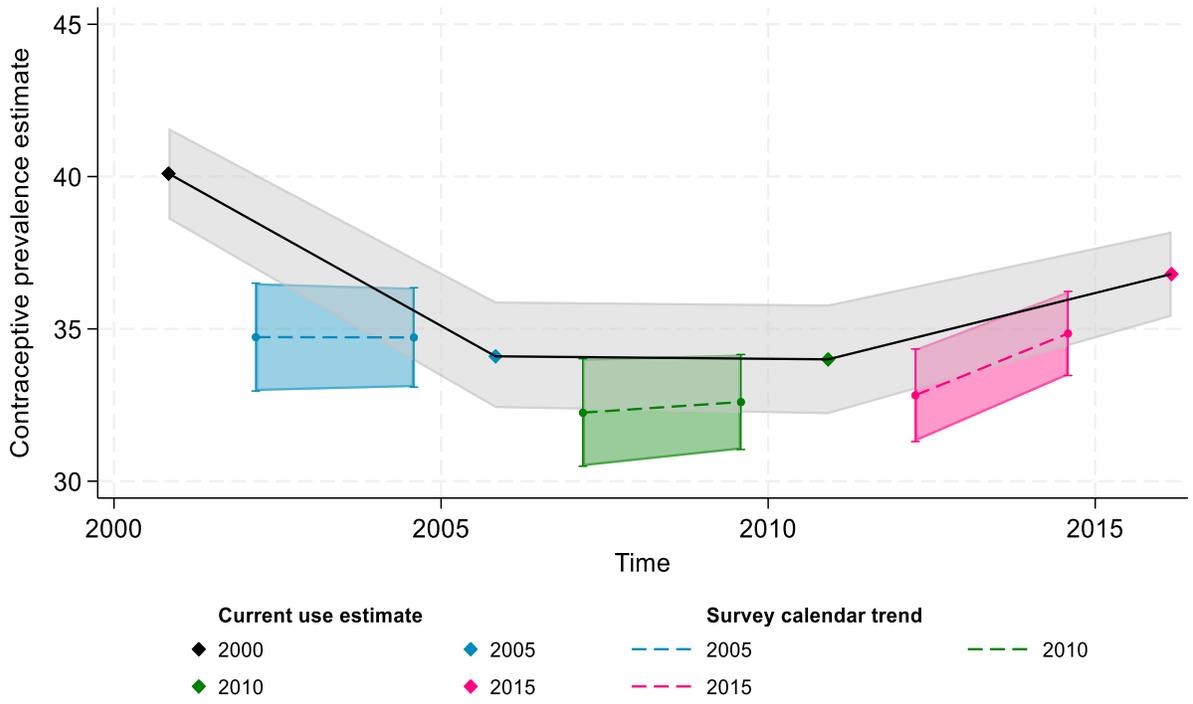
b. Traditional contraceptive prevalence
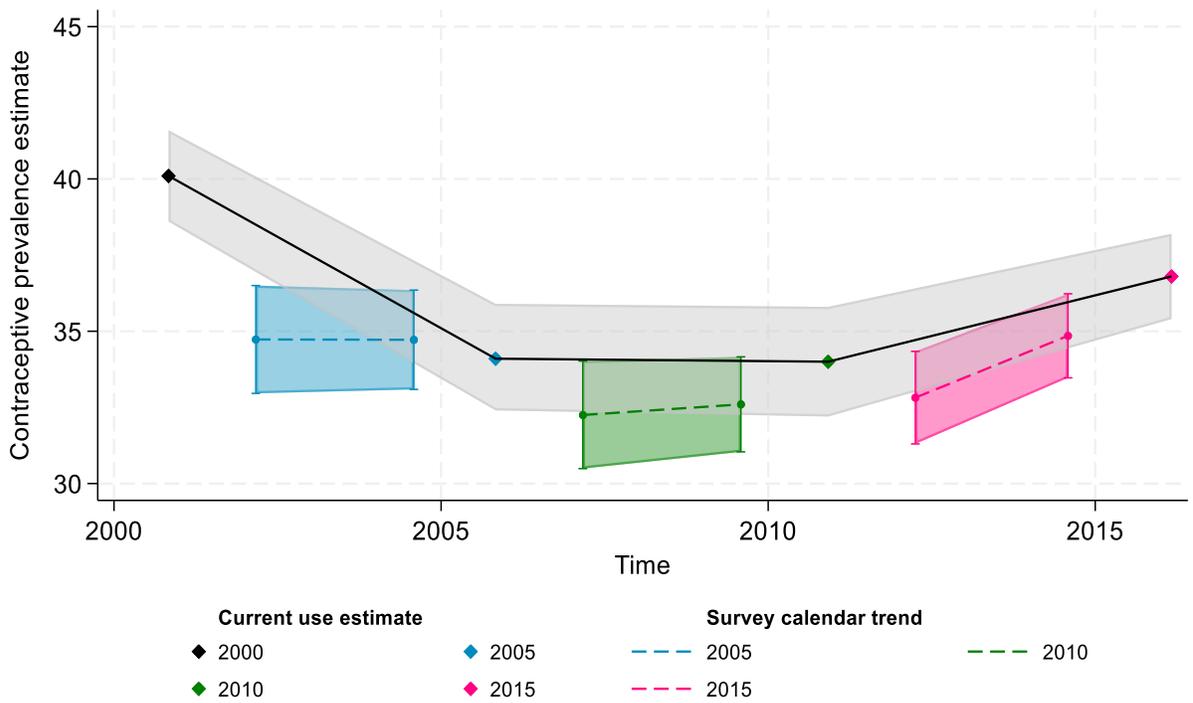
## c. Coitus-based contraceptive prevalence
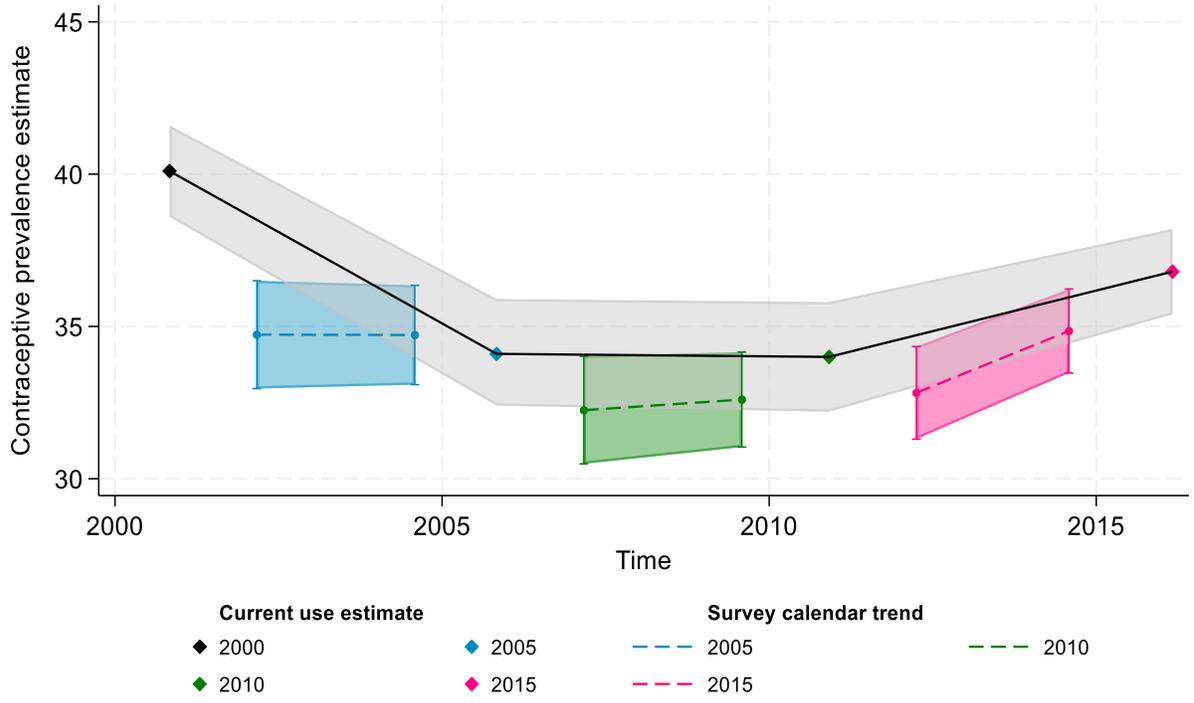
**Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Bangladesh**

## a. Overall contraceptive prevalence
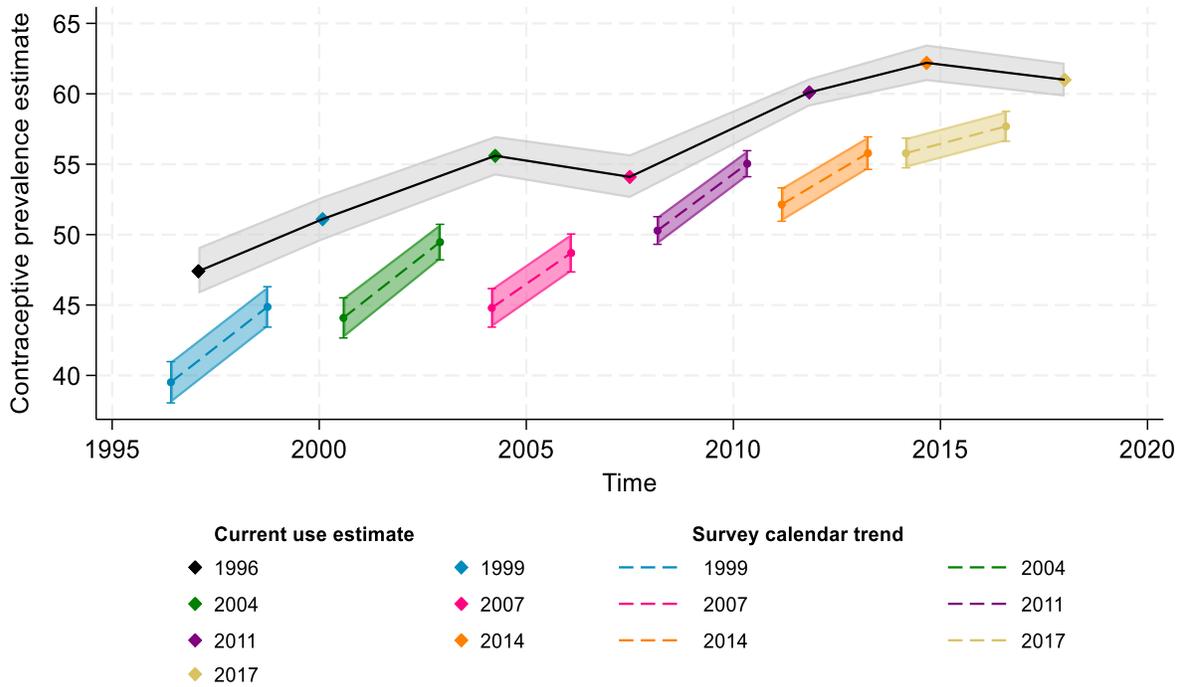


## b. Traditional contraceptive prevalence
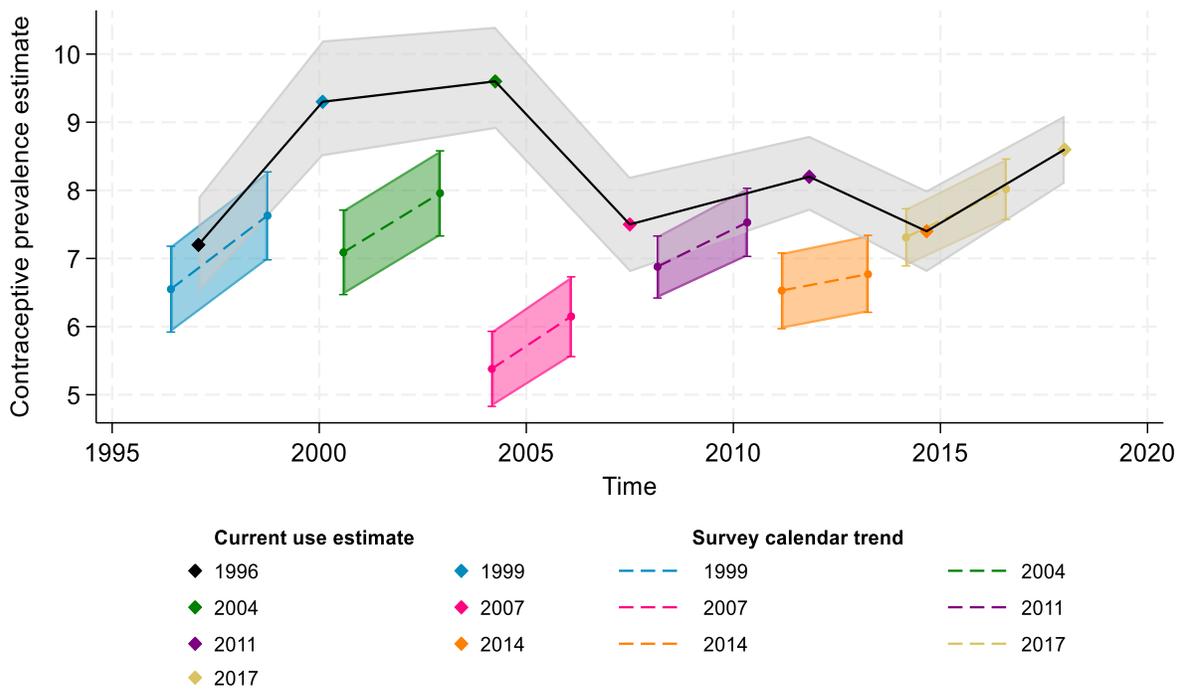
c. Coitus-based contraceptive prevalence
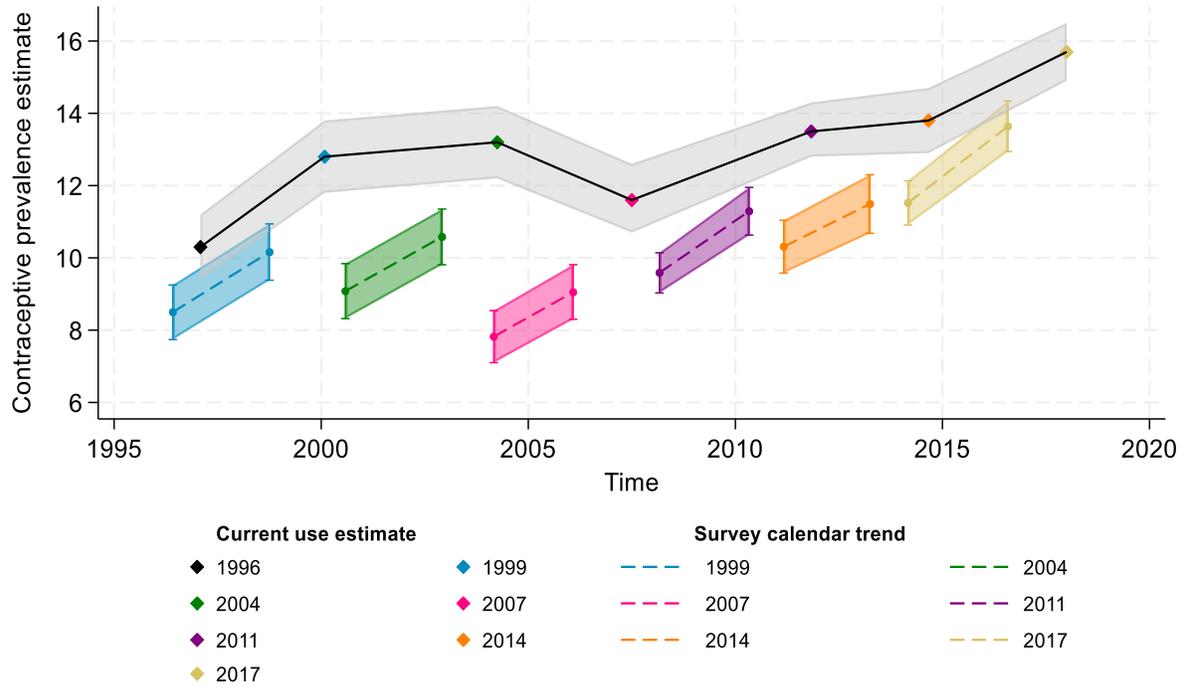
**Appendix Figure 3    Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Benin**



a. Overall contraceptive prevalence
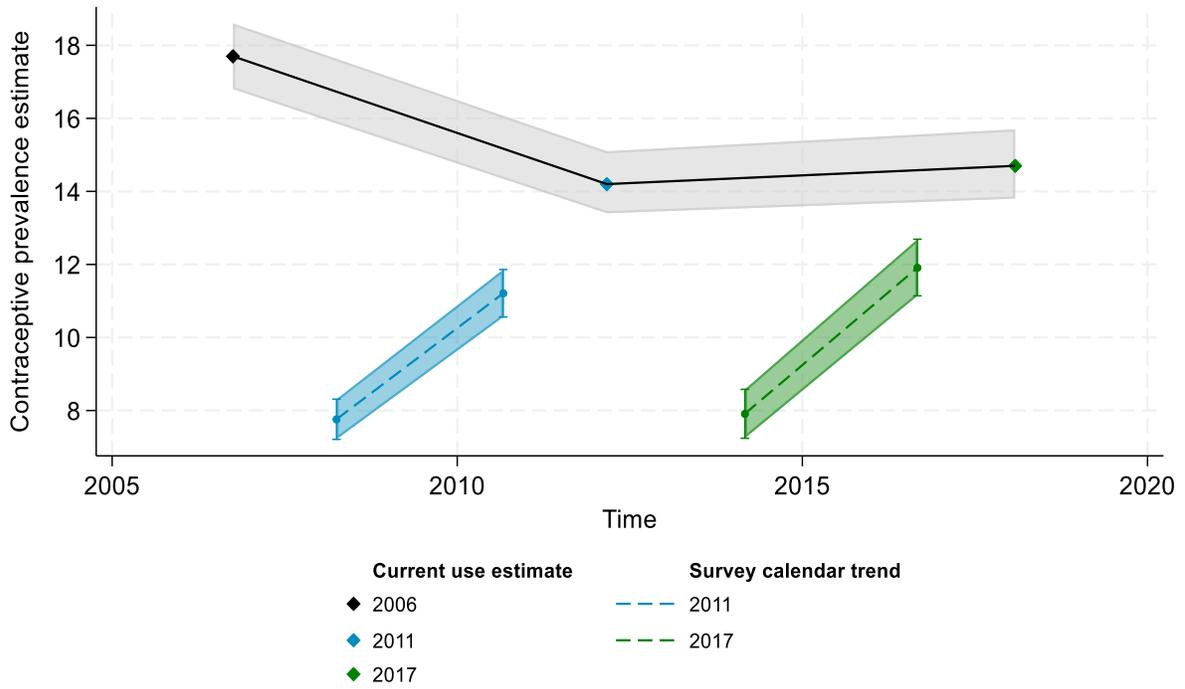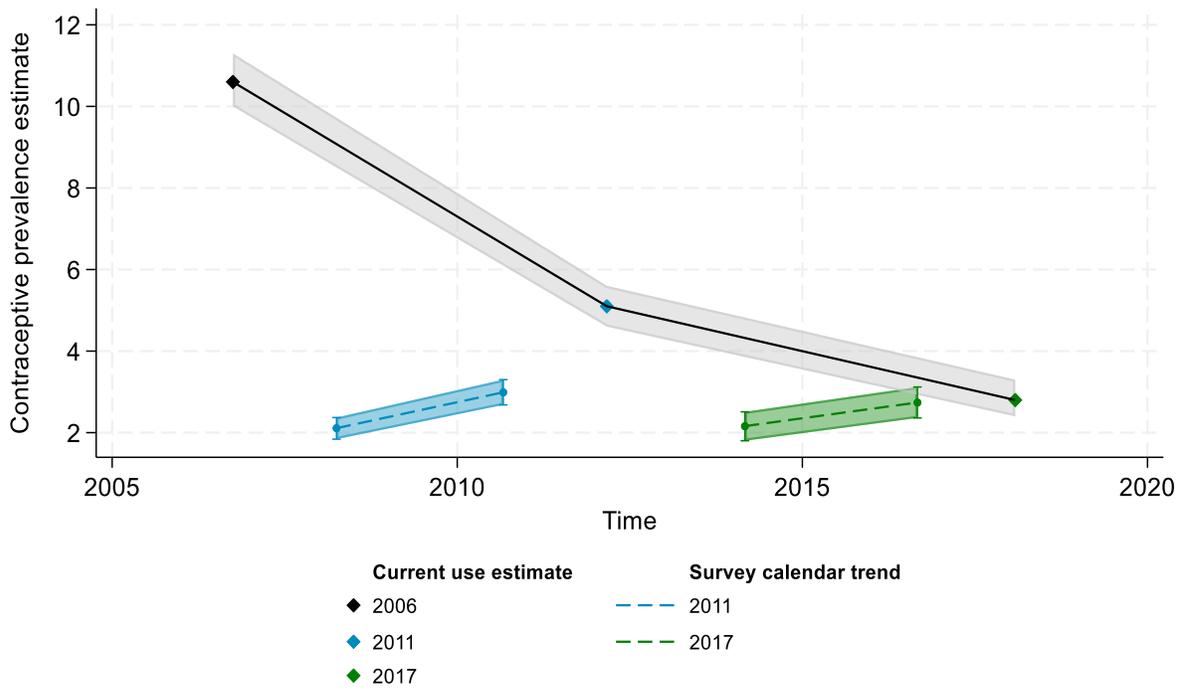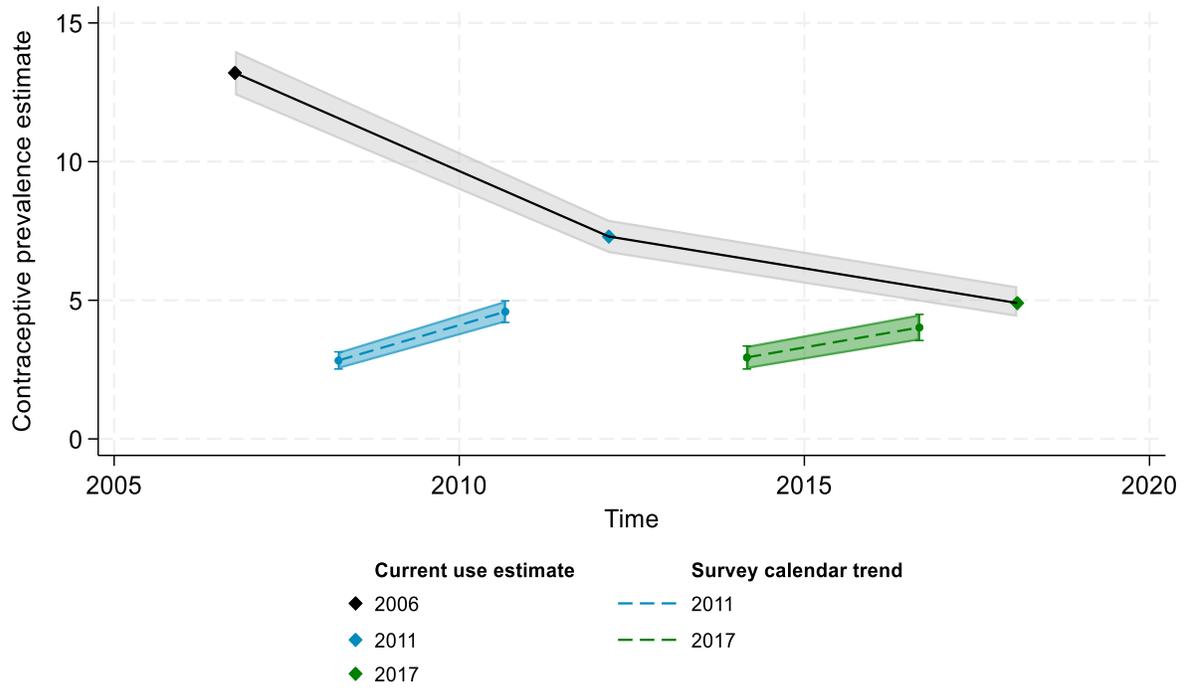


b. Traditional contraceptive prevalence

c. Coitus-based contraceptive prevalence

## a. Overall contraceptive prevalence
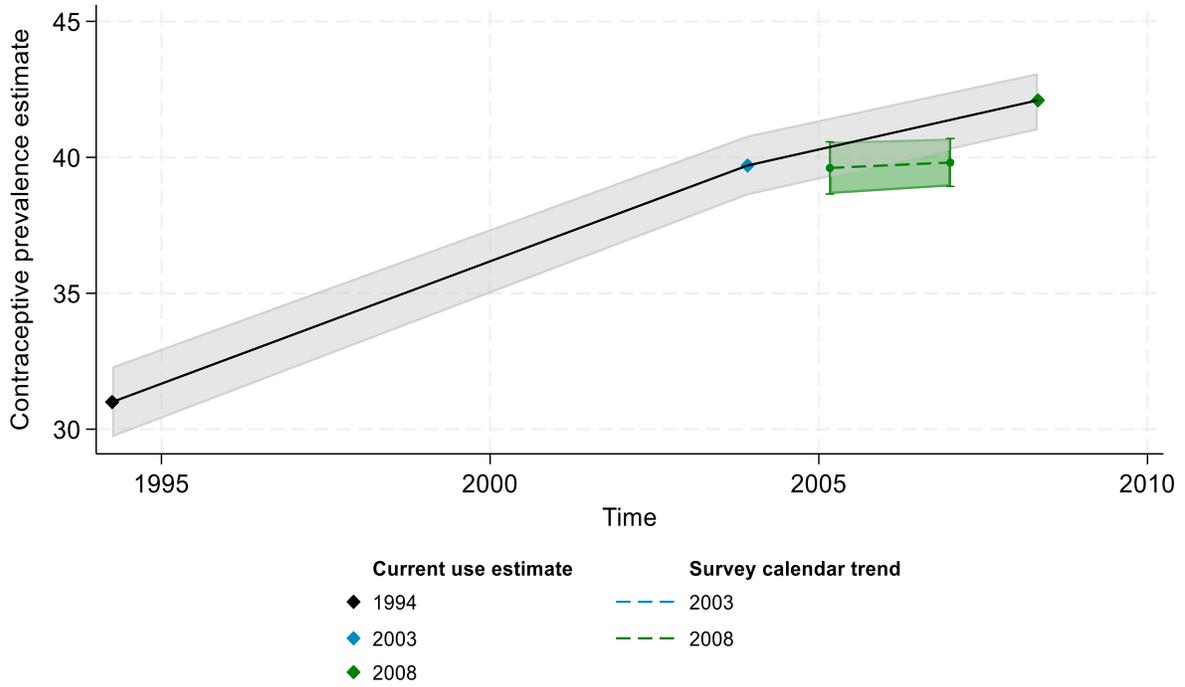


## b. Traditional contraceptive prevalence
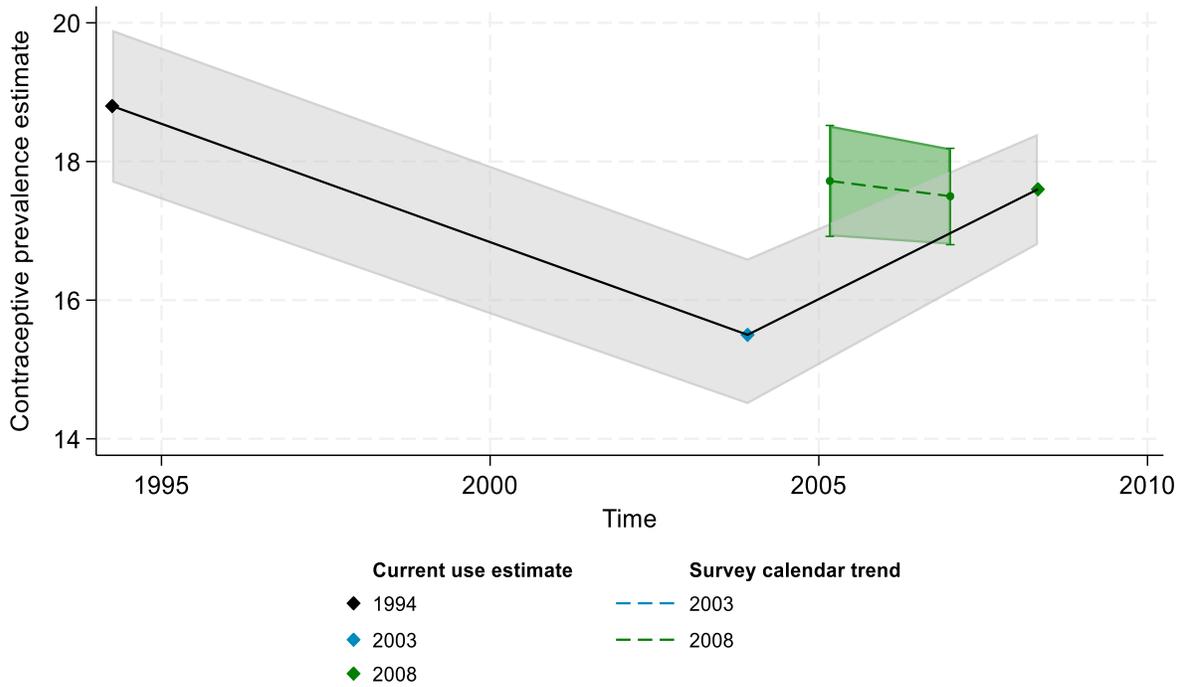
c. Coitus-based contraceptive prevalence
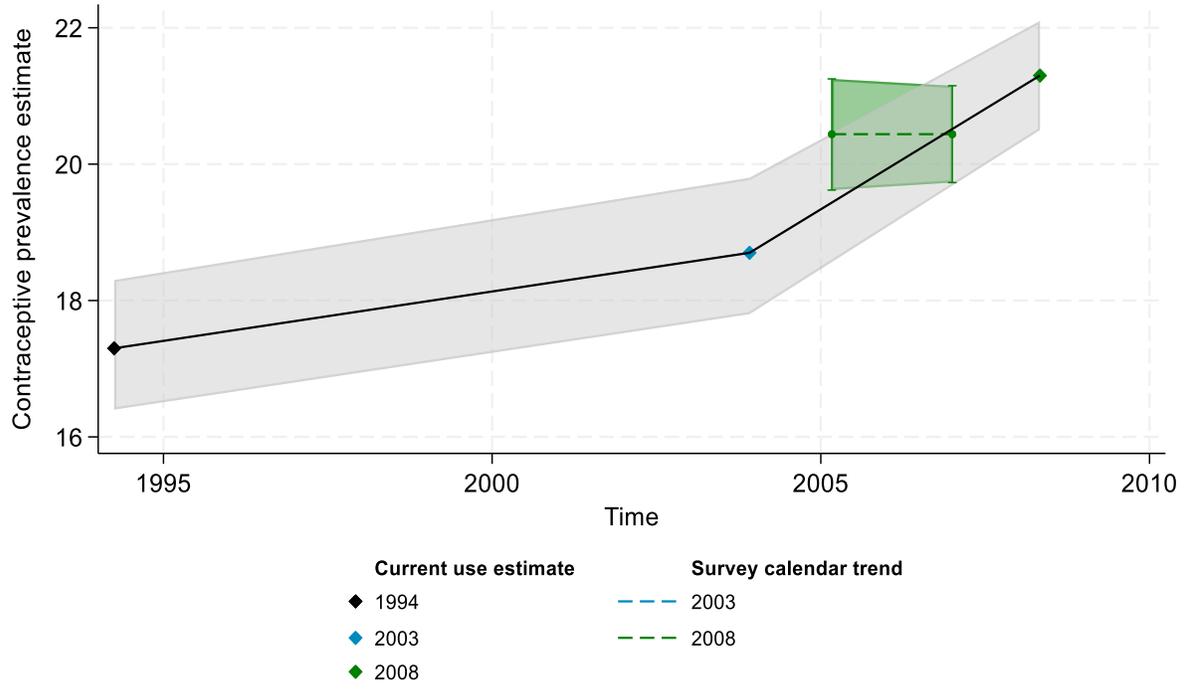
**Appendix Figure 5    Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Brazil**

### a. Overall contraceptive prevalence
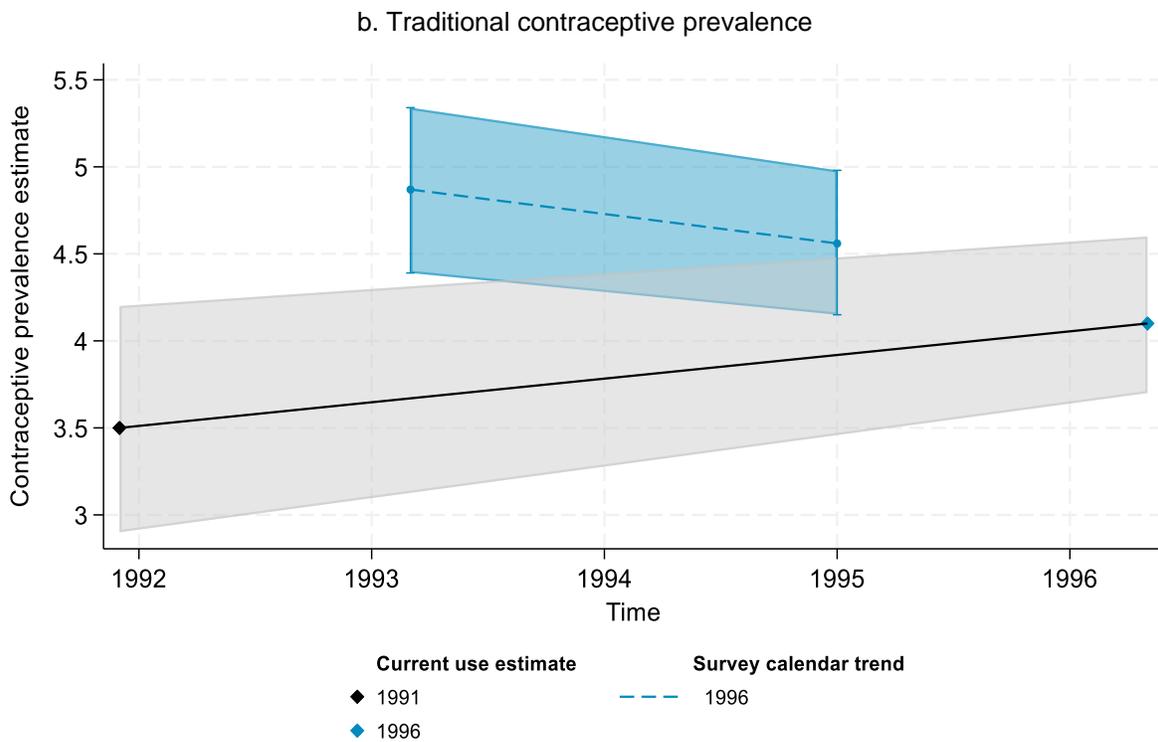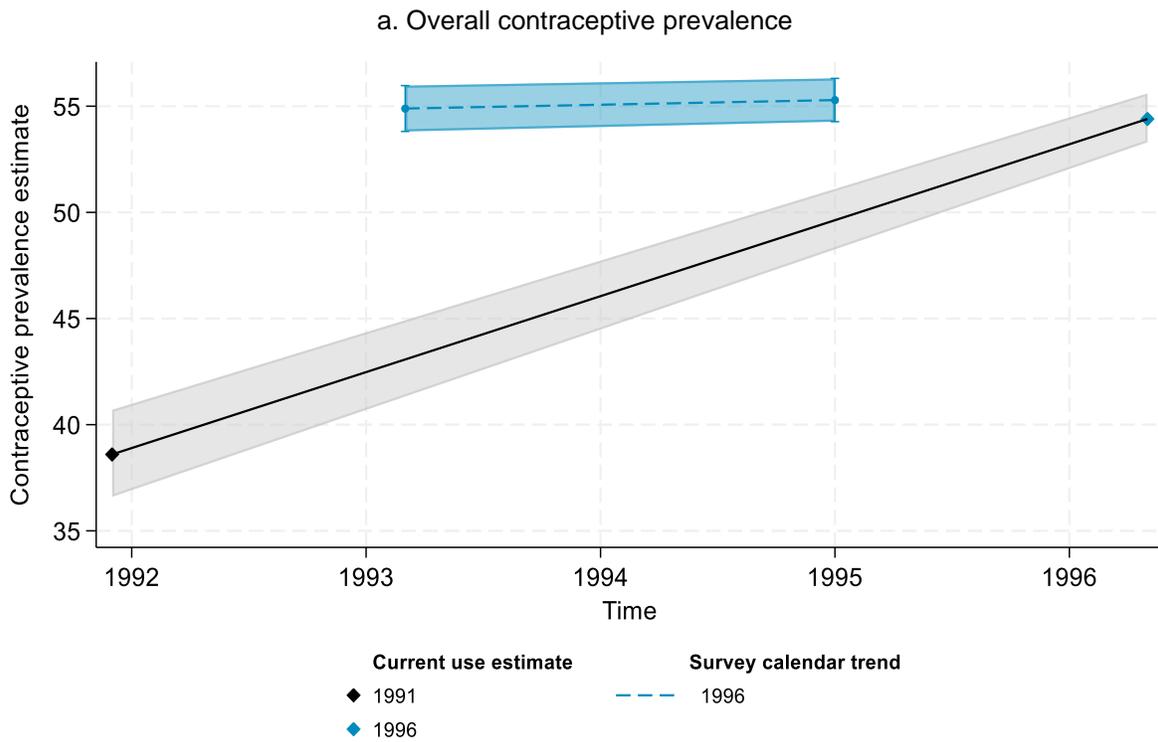


### b. Traditional contraceptive prevalence

### c. Coitus-based contraceptive prevalence
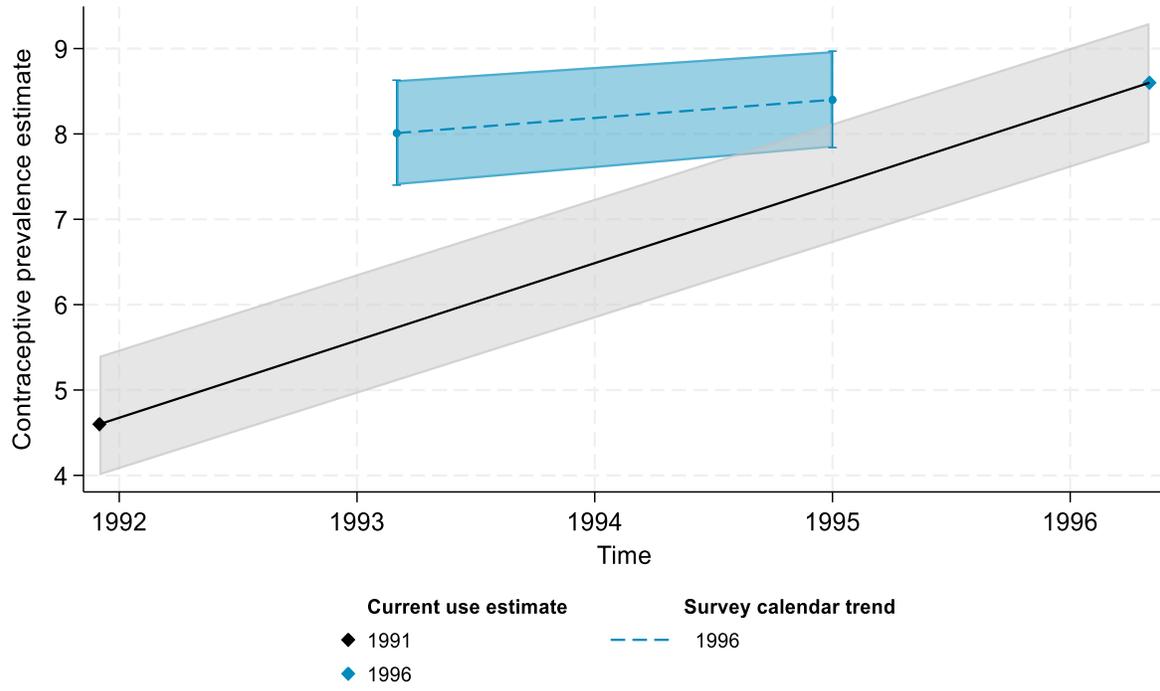
**Appendix Figure 6   Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Cambodia**

## a. Overall contraceptive prevalence
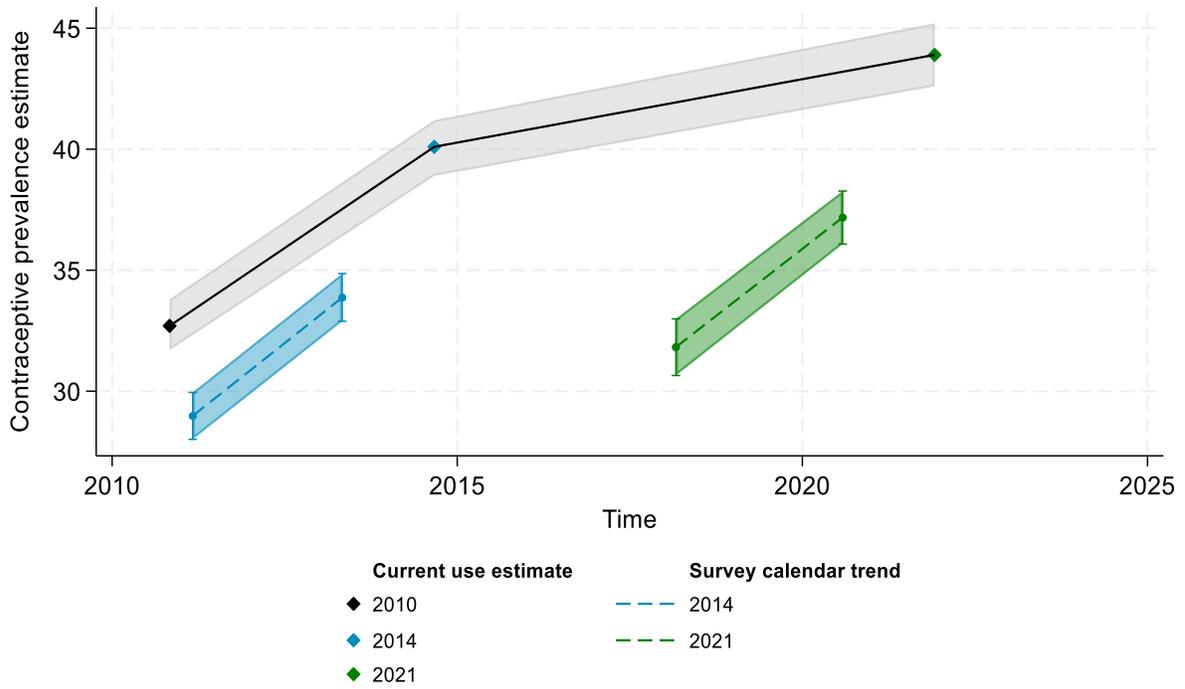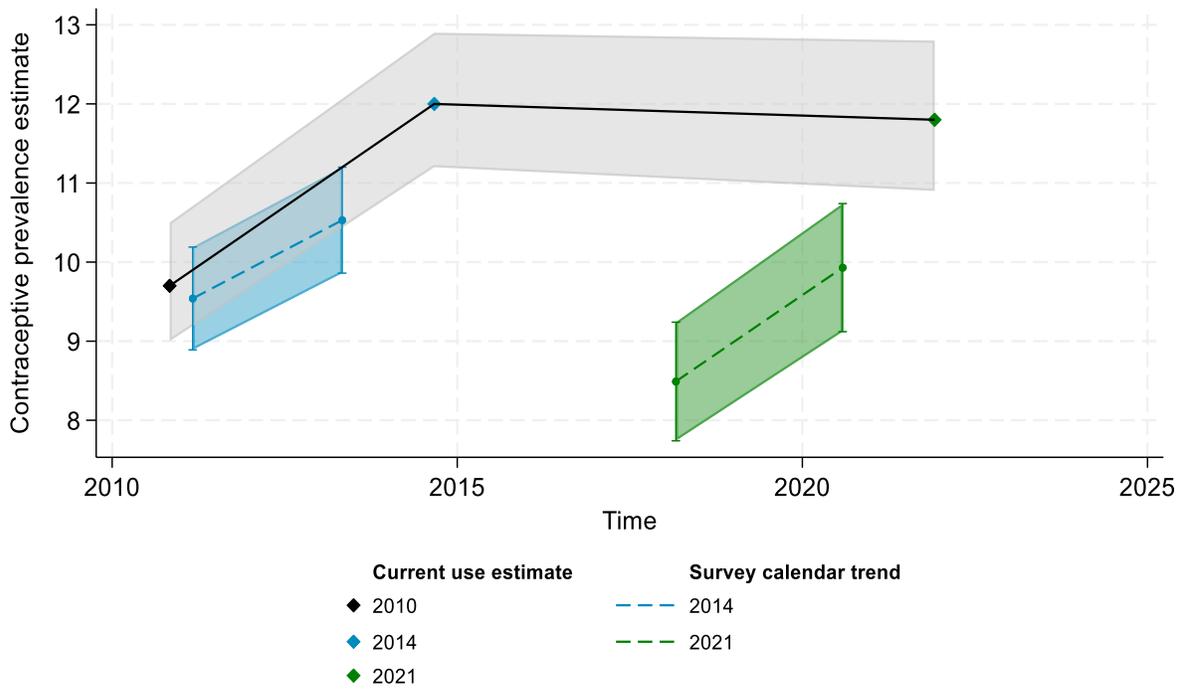


## b. Traditional contraceptive prevalence

c. Coitus-based contraceptive prevalence
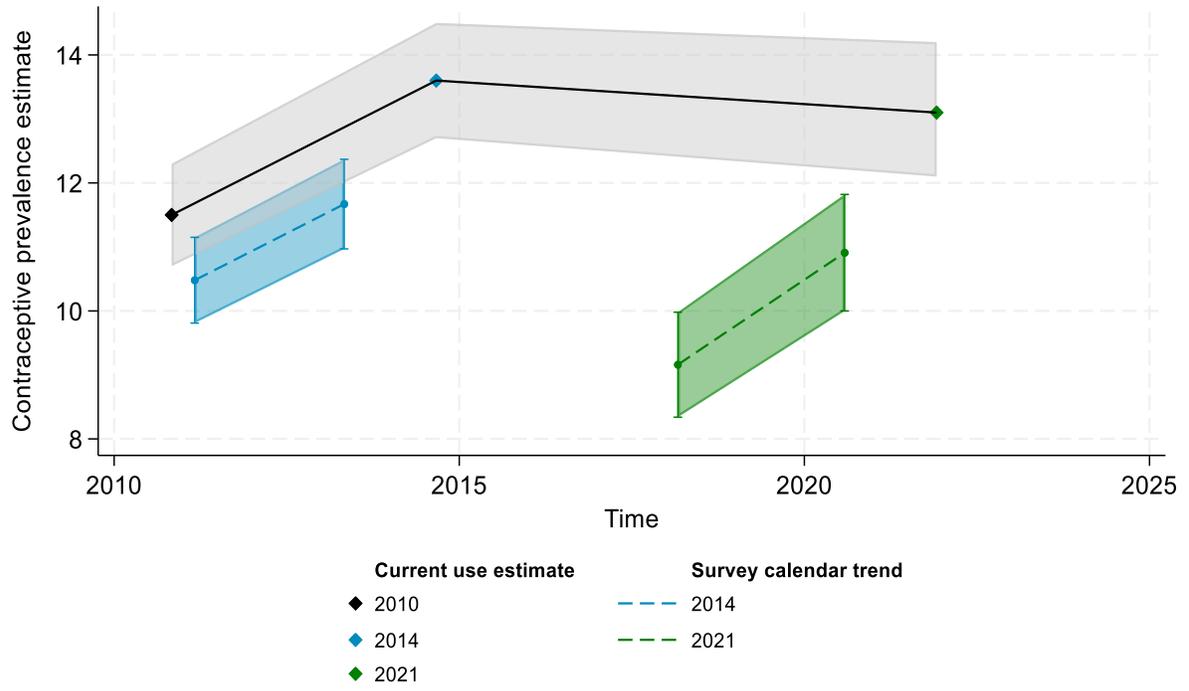
**Appendix Figure 7    Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Colombia**

## a. Overall contraceptive prevalence
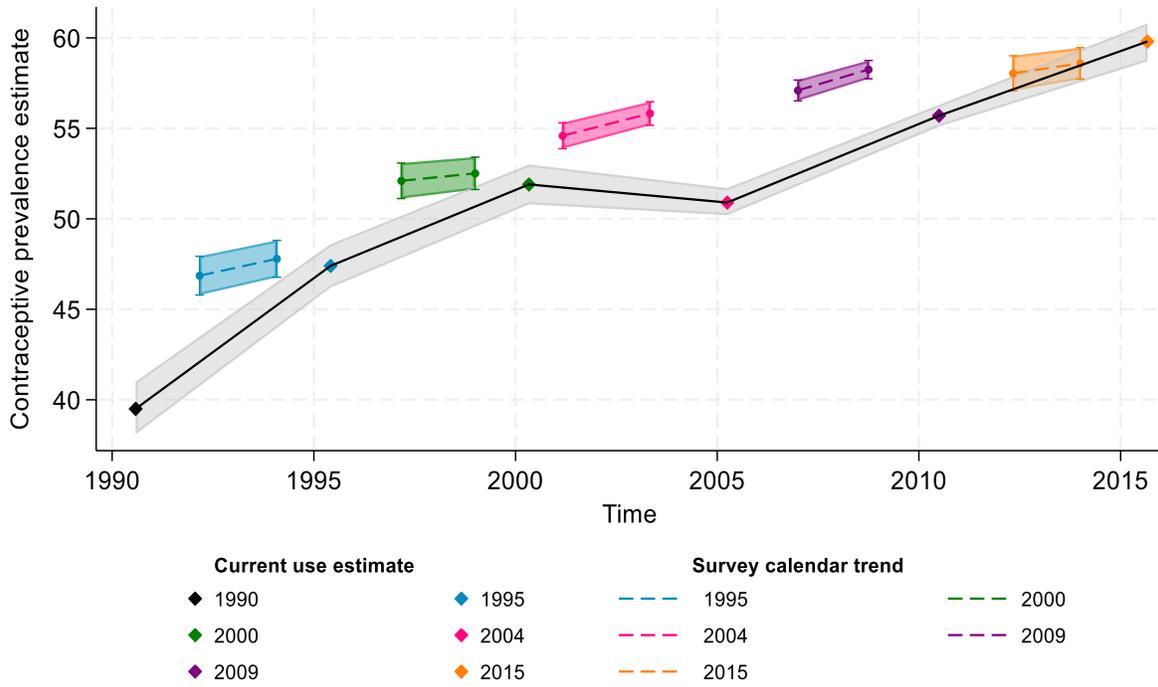


## b. Traditional contraceptive prevalence
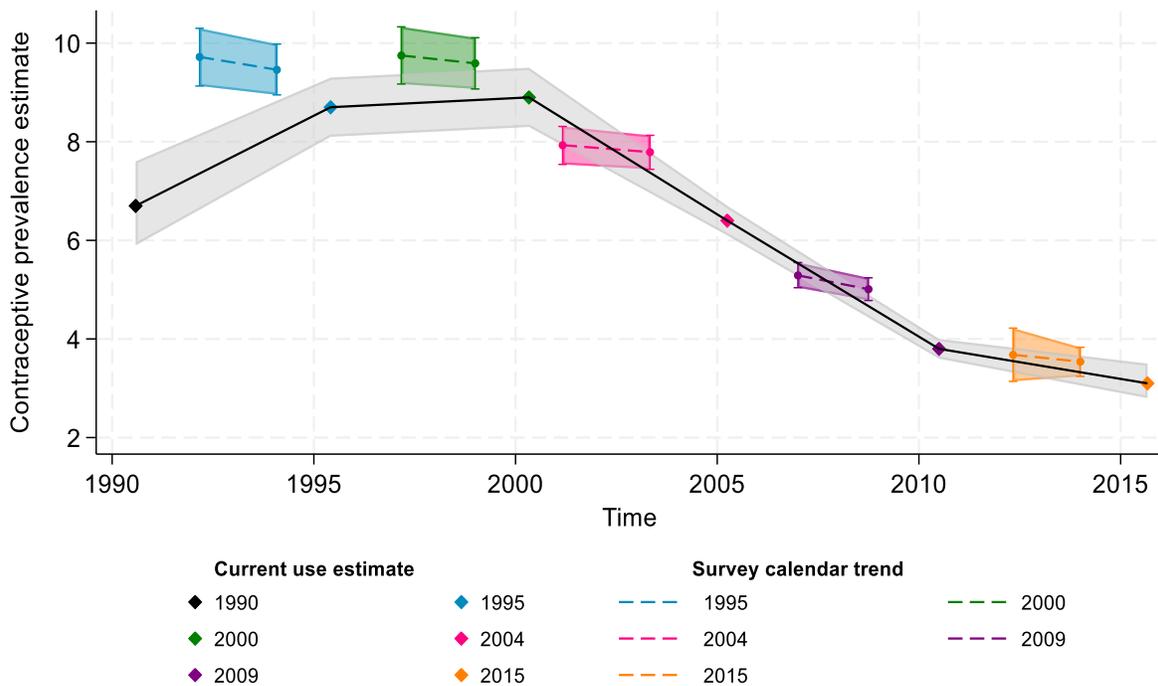
## c. Coitus-based contraceptive prevalence
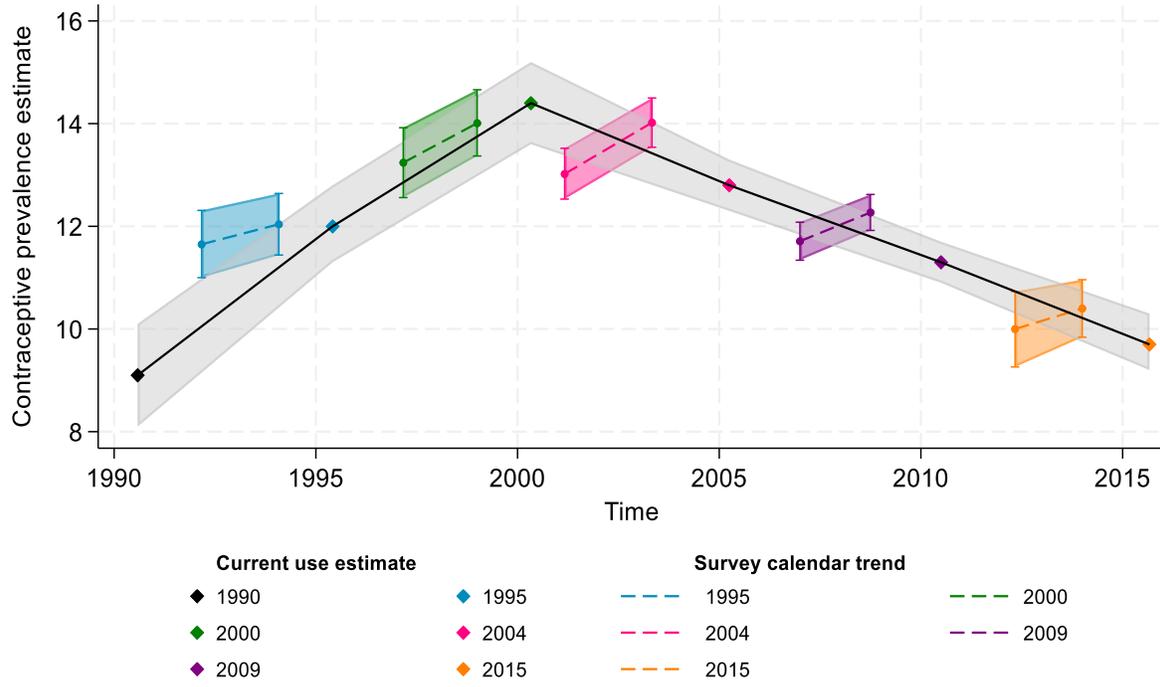
**Appendix Figure 8    Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Dominican Republic**

a. Overall contraceptive prevalence
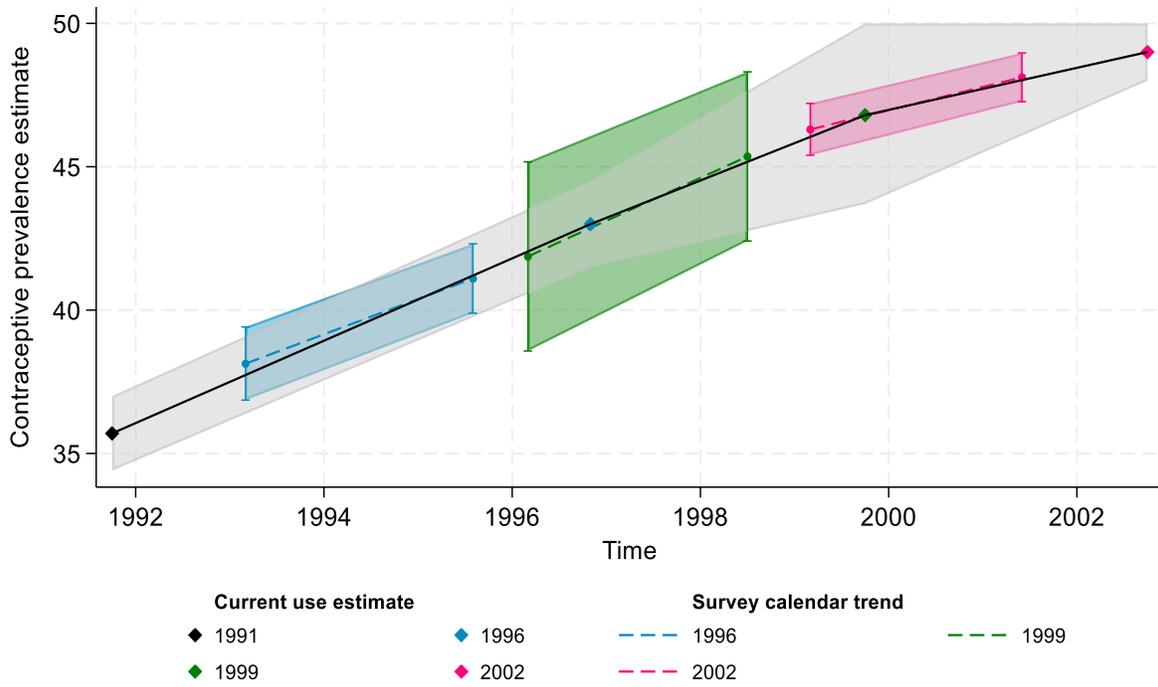


b. Traditional contraceptive prevalence
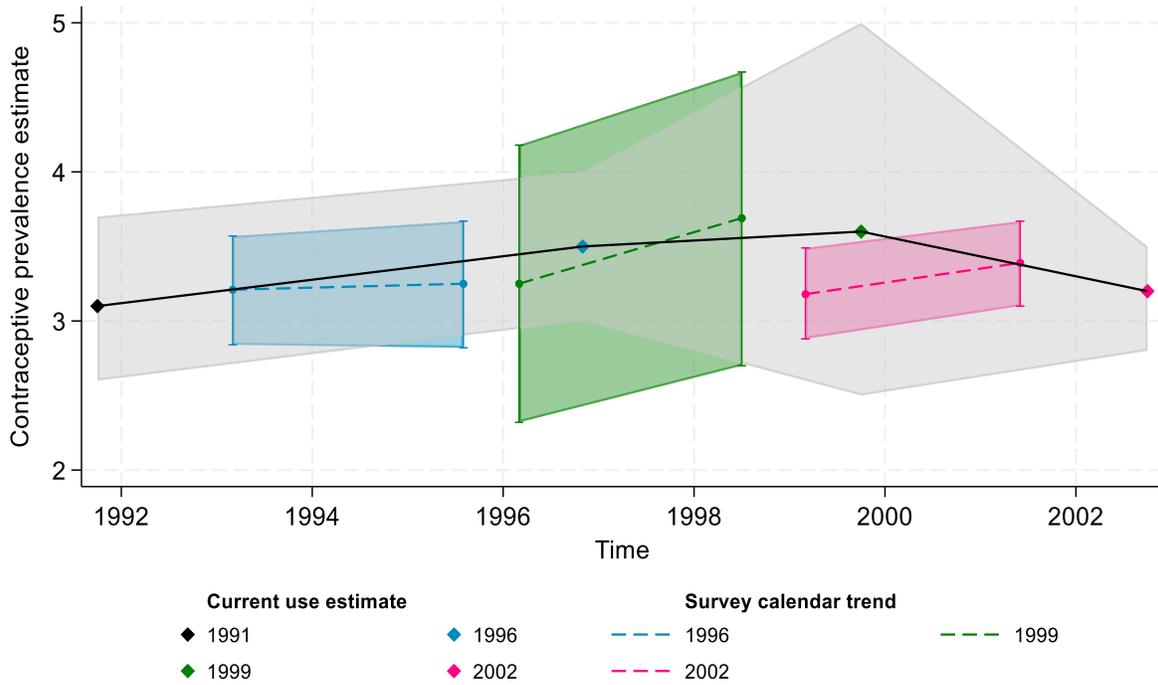
c. Coitus-based contraceptive prevalence
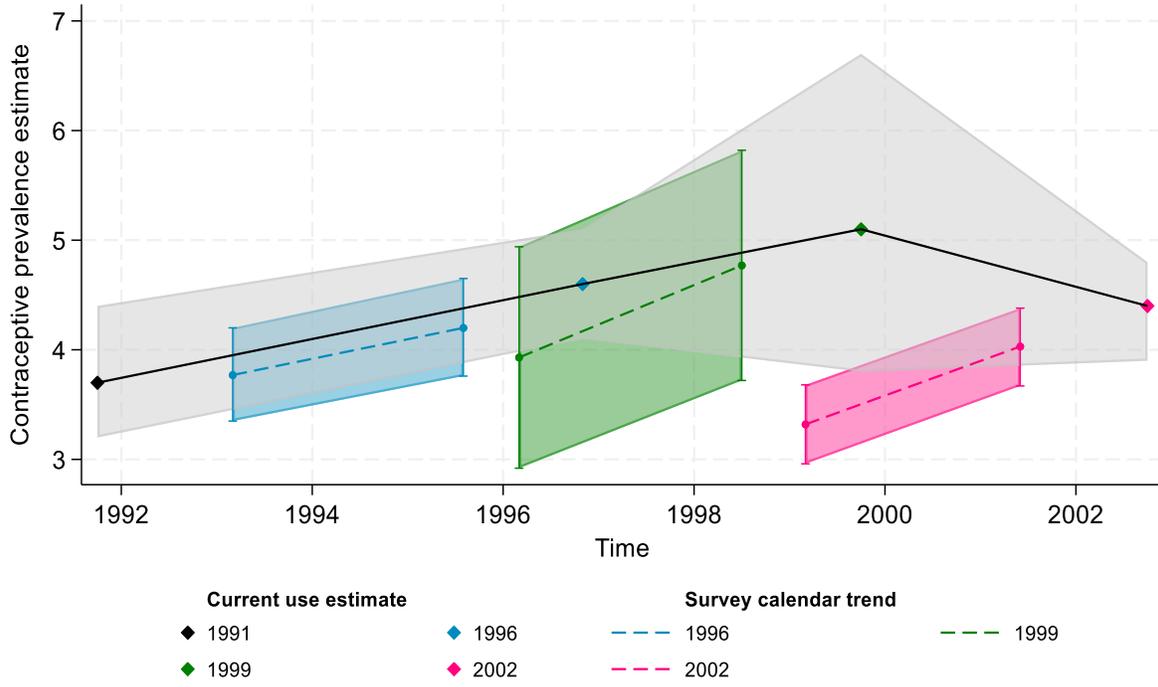
**Appendix Figure 9    Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Egypt**



a. Overall contraceptive prevalence
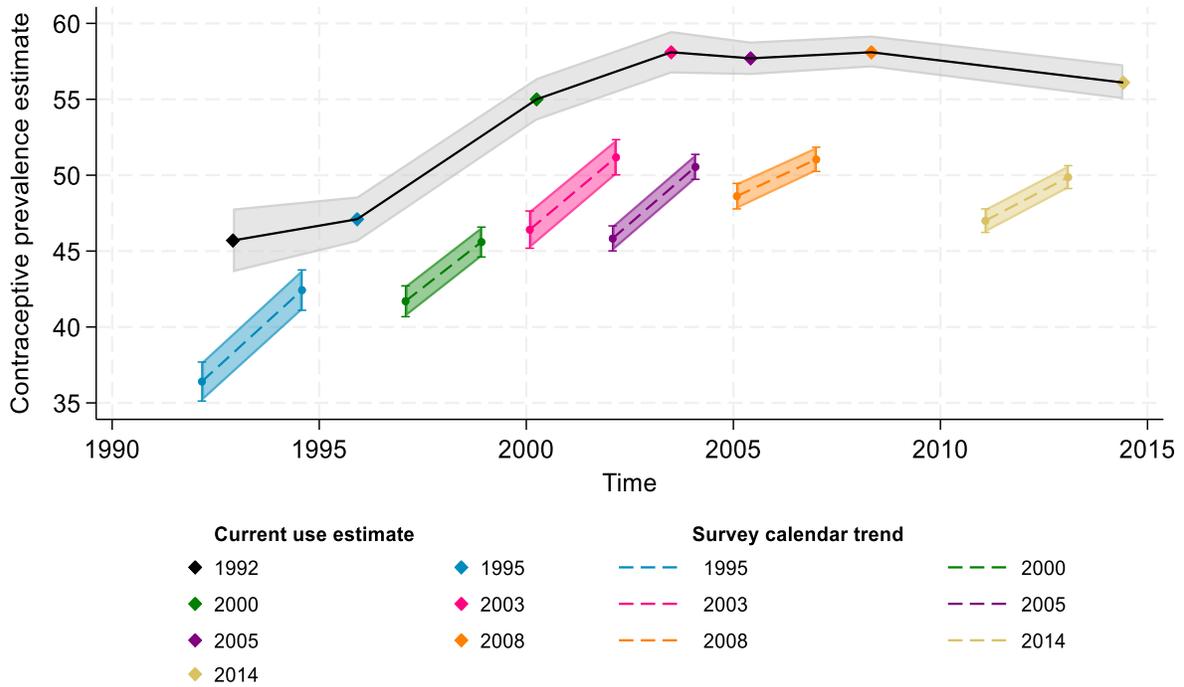


b. Traditional contraceptive prevalence
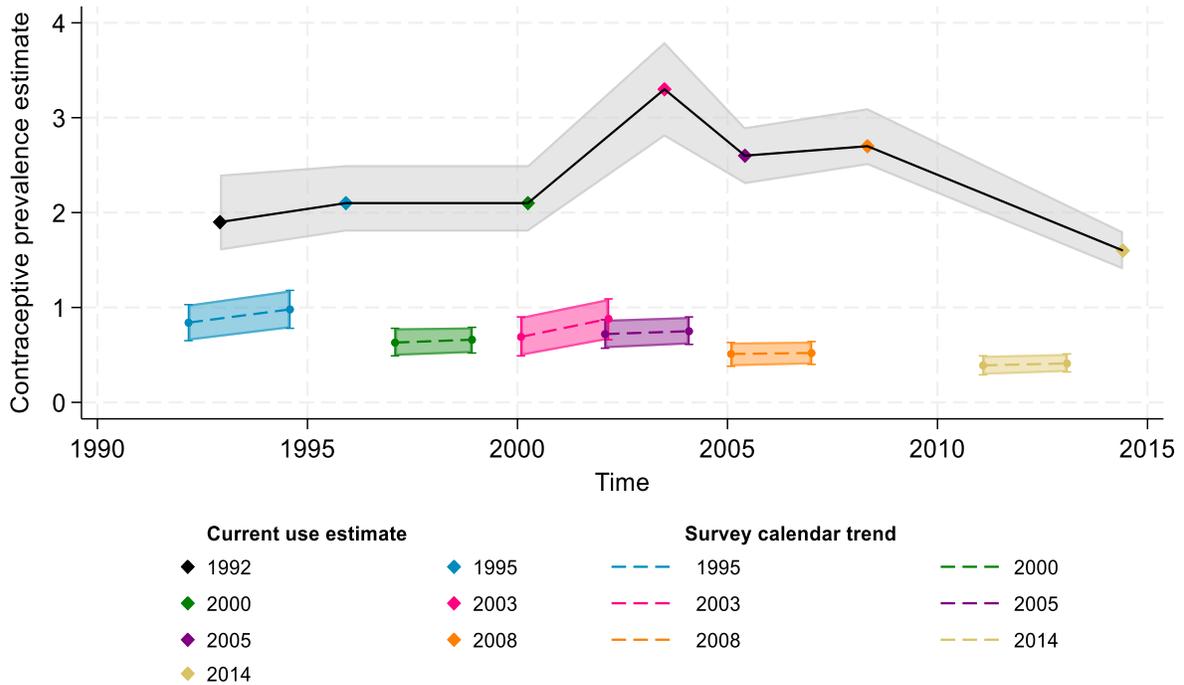
## c. Coitus-based contraceptive prevalence
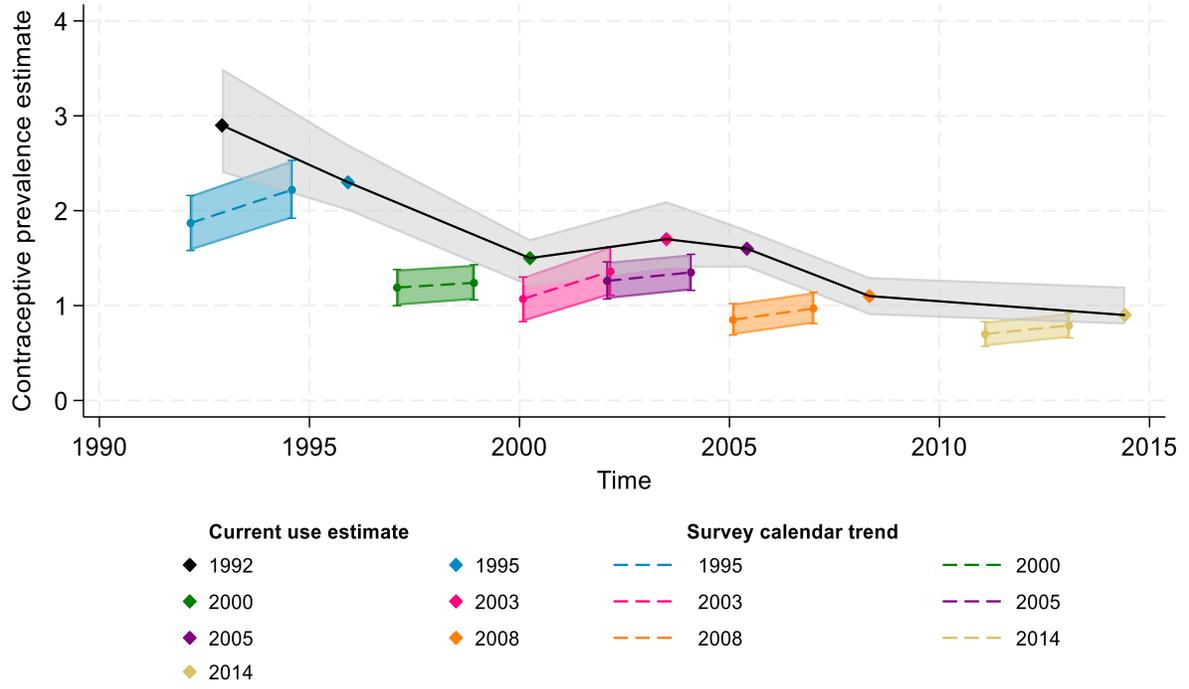
**Appendix Figure 10  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Ethiopia**

### a. Overall contraceptive prevalence
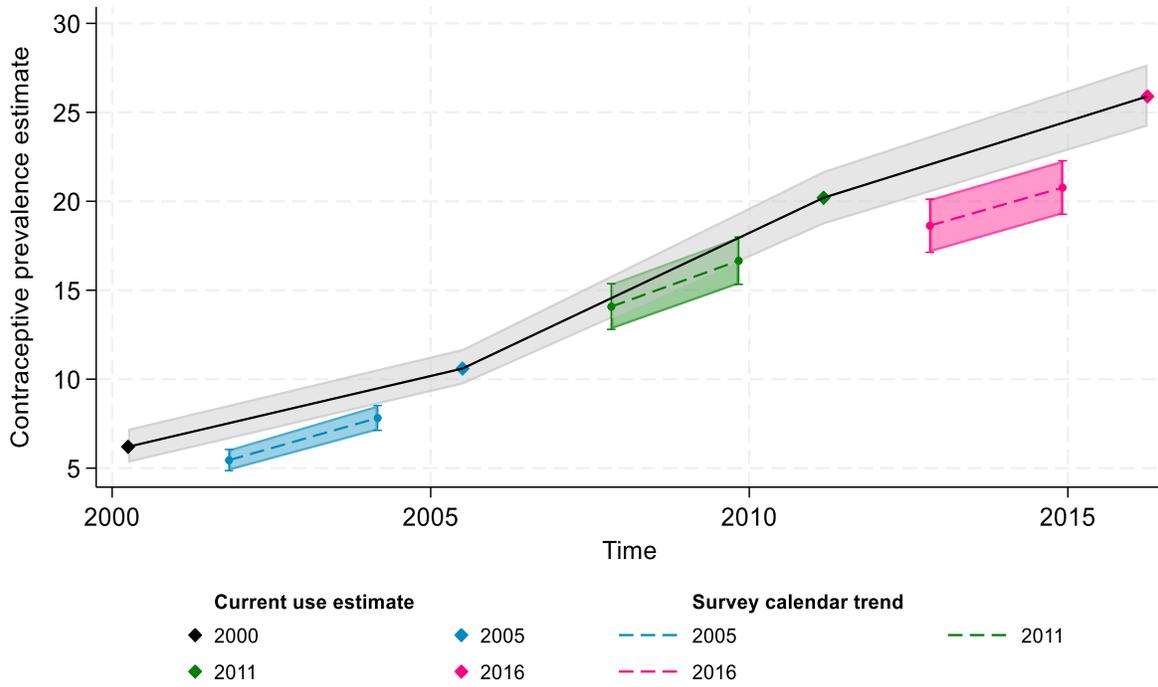


### b. Traditional contraceptive prevalence
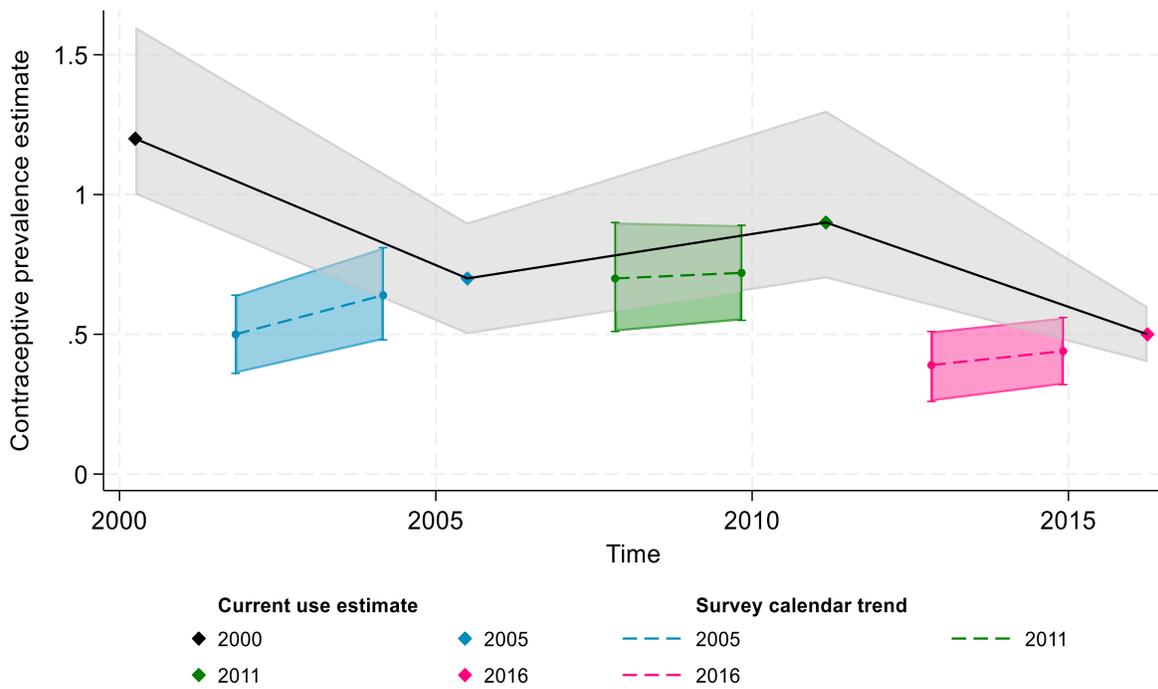
## c. Coitus-based contraceptive prevalence
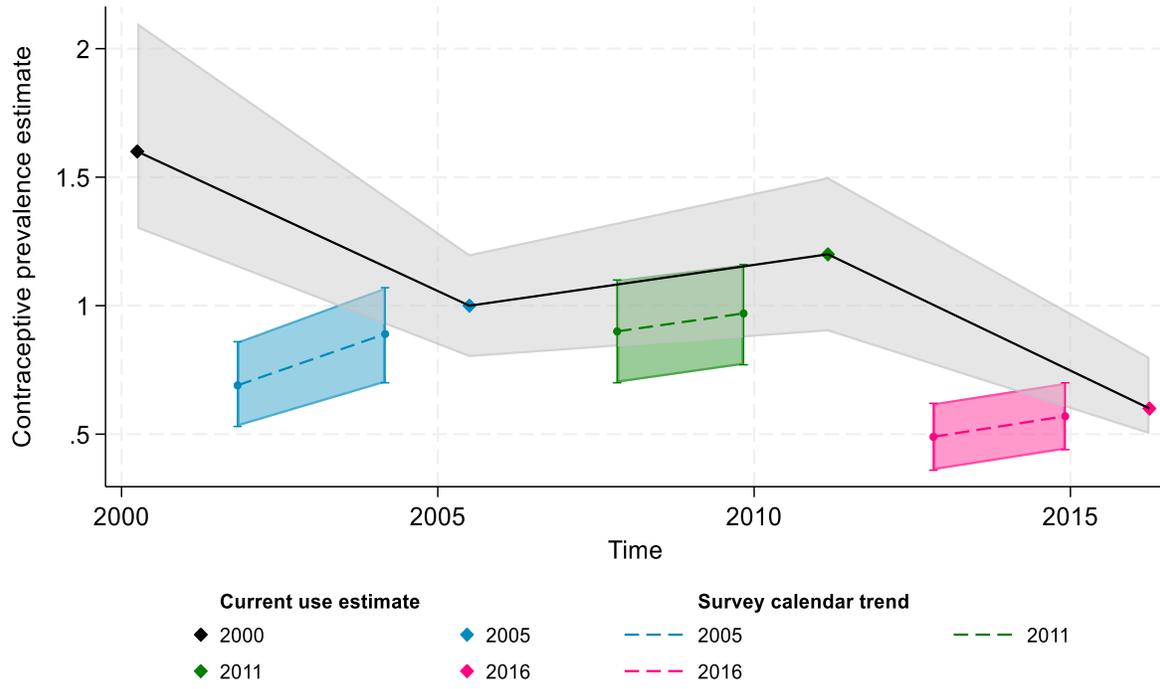
**Appendix Figure 11  Overall, traditional, and coitus-based contraceptive prevalence among women, age 15–43, comparing current use and calendar estimates, Ghana**

a. Overall contraceptive prevalence
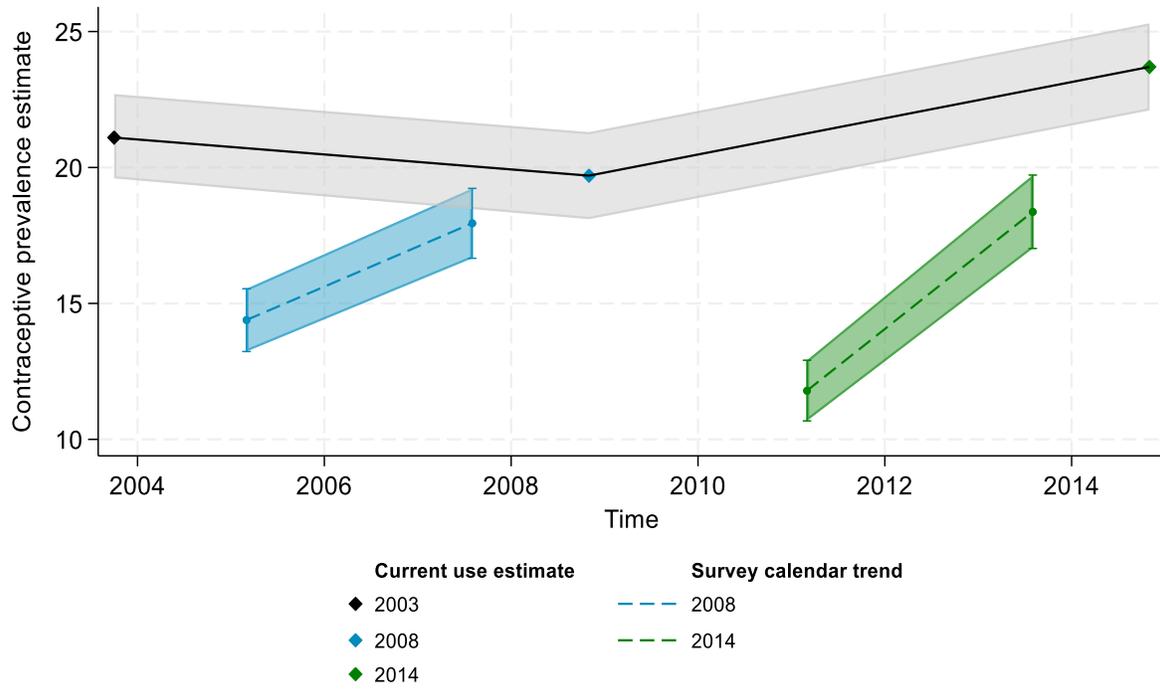


b. Traditional contraceptive prevalence
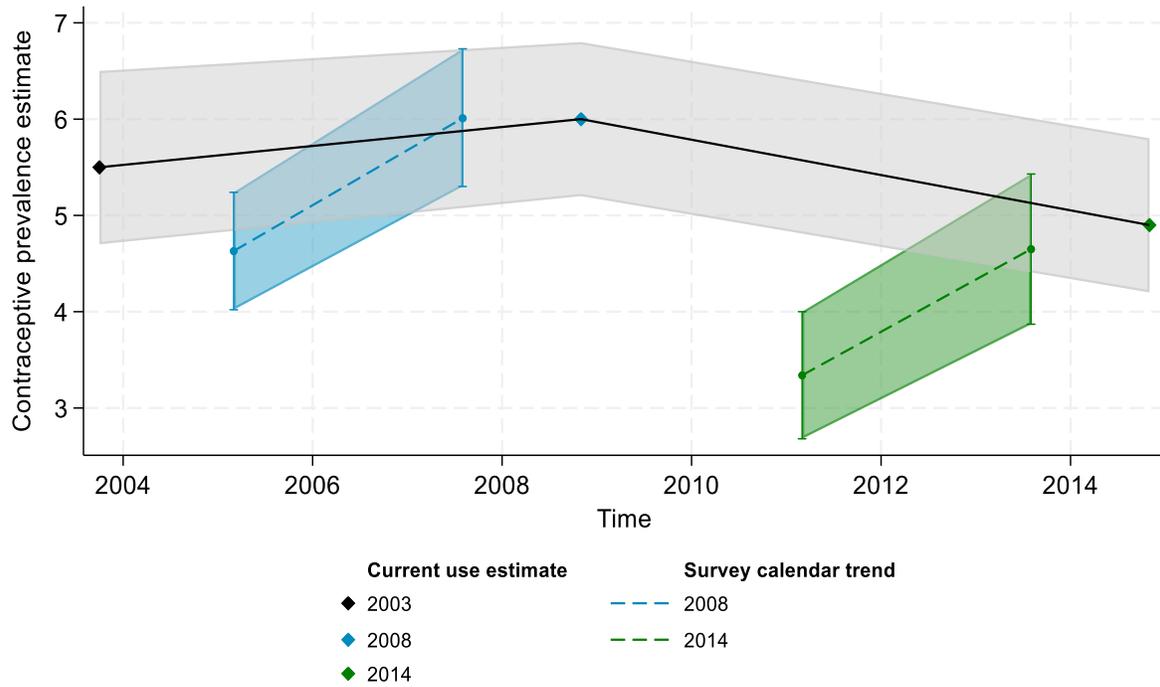
c. Coitus-based contraceptive prevalence
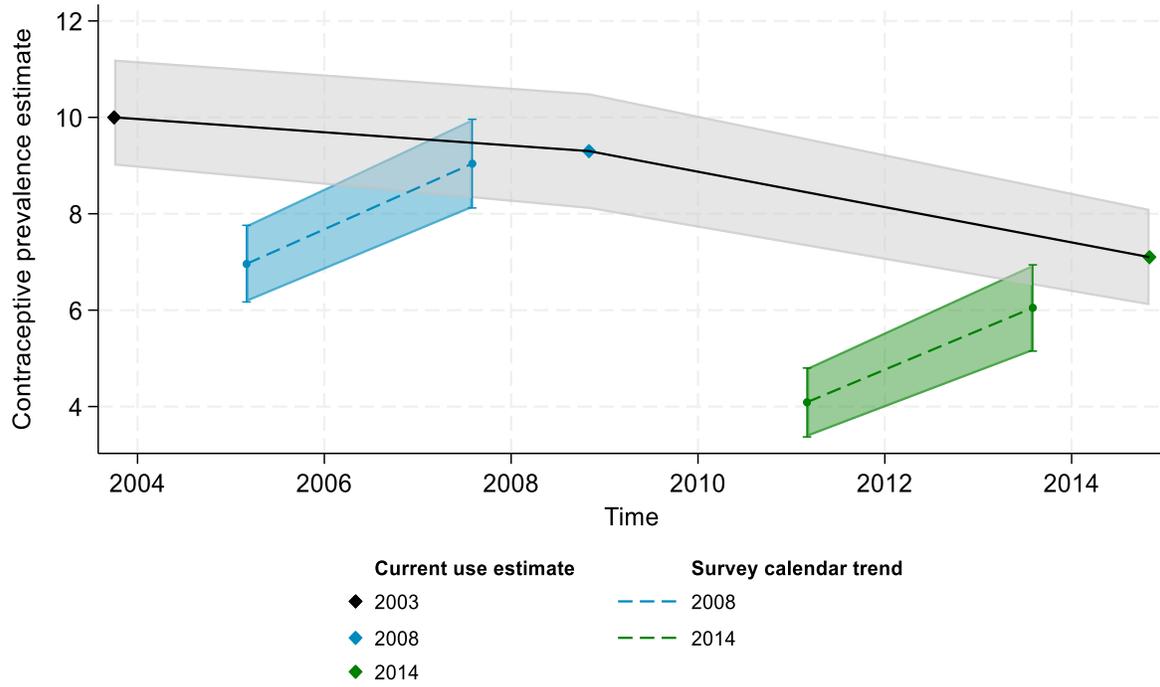
**Appendix Figure 12  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Guatemala**

### a. Overall contraceptive prevalence
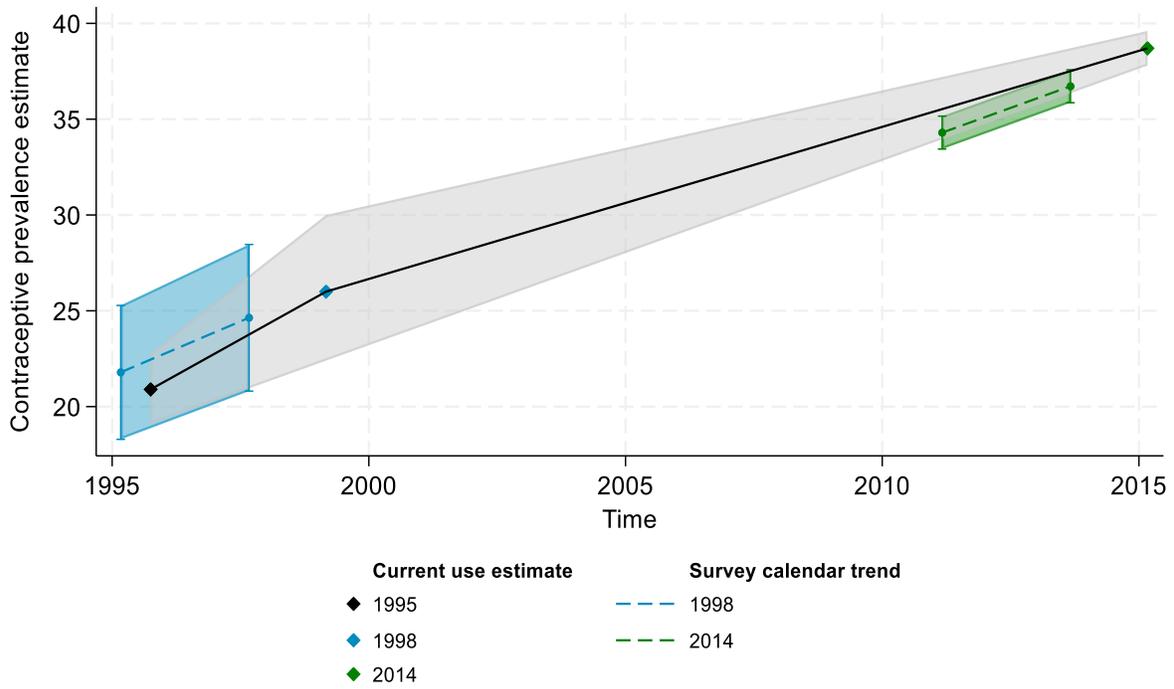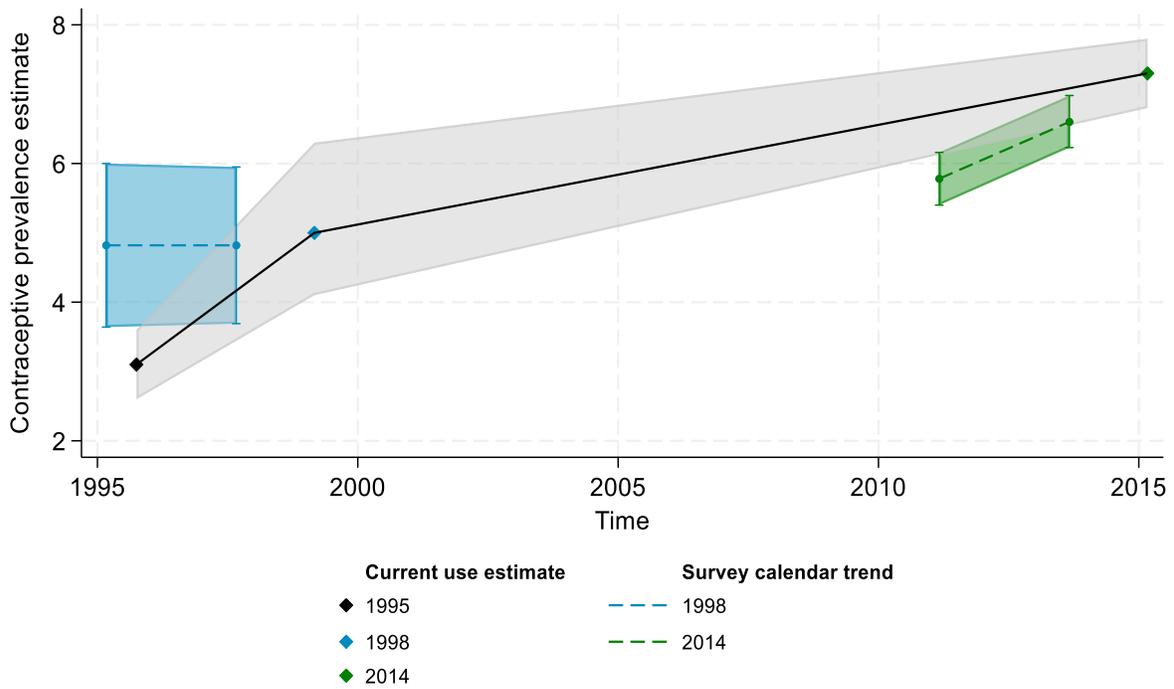


### b. Traditional contraceptive prevalence

### c. Coitus-based contraceptive prevalence
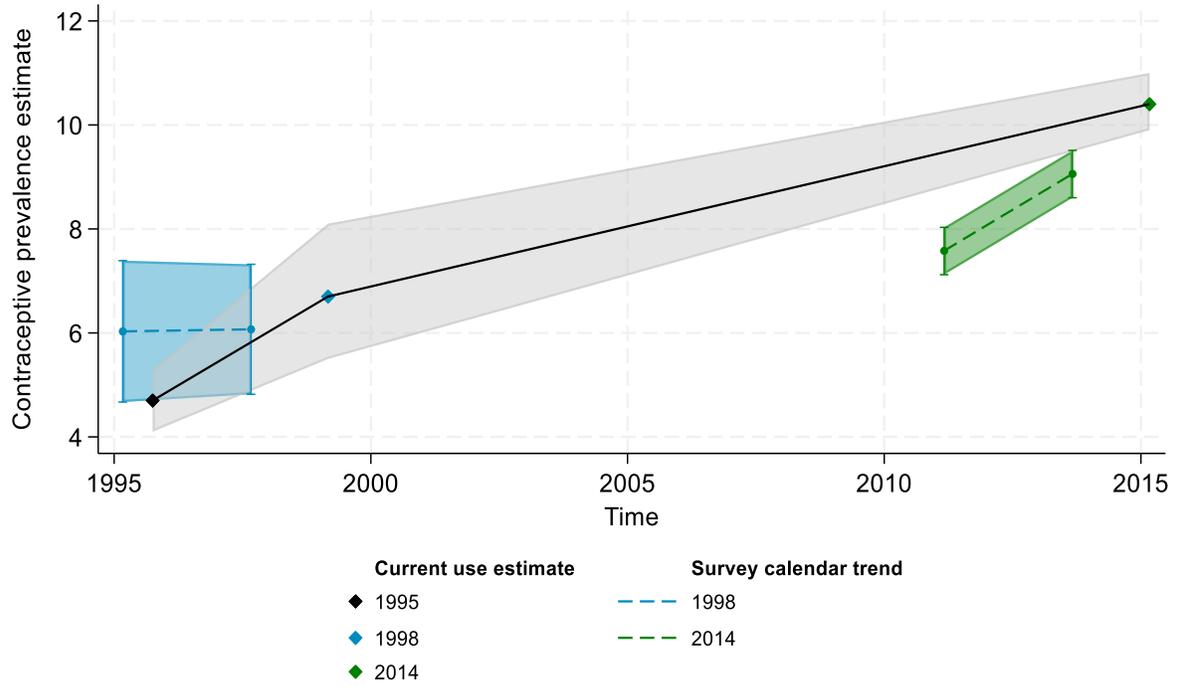
**Appendix Figure 13  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Honduras**

a. Overall contraceptive prevalence
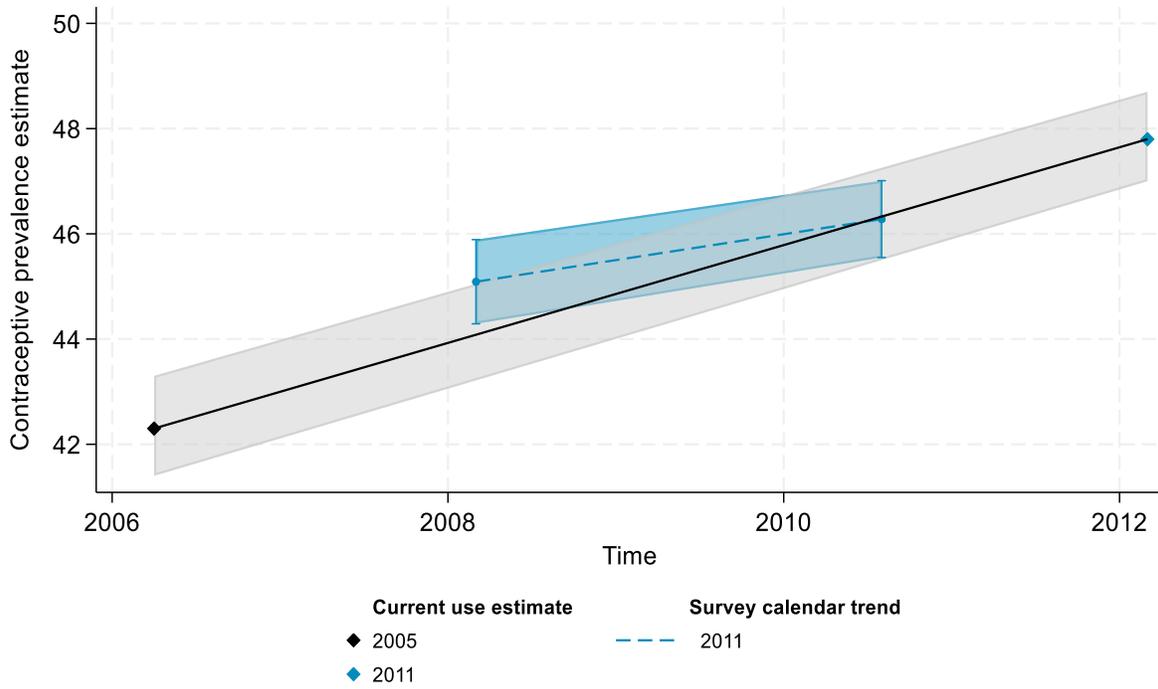


b. Traditional contraceptive prevalence
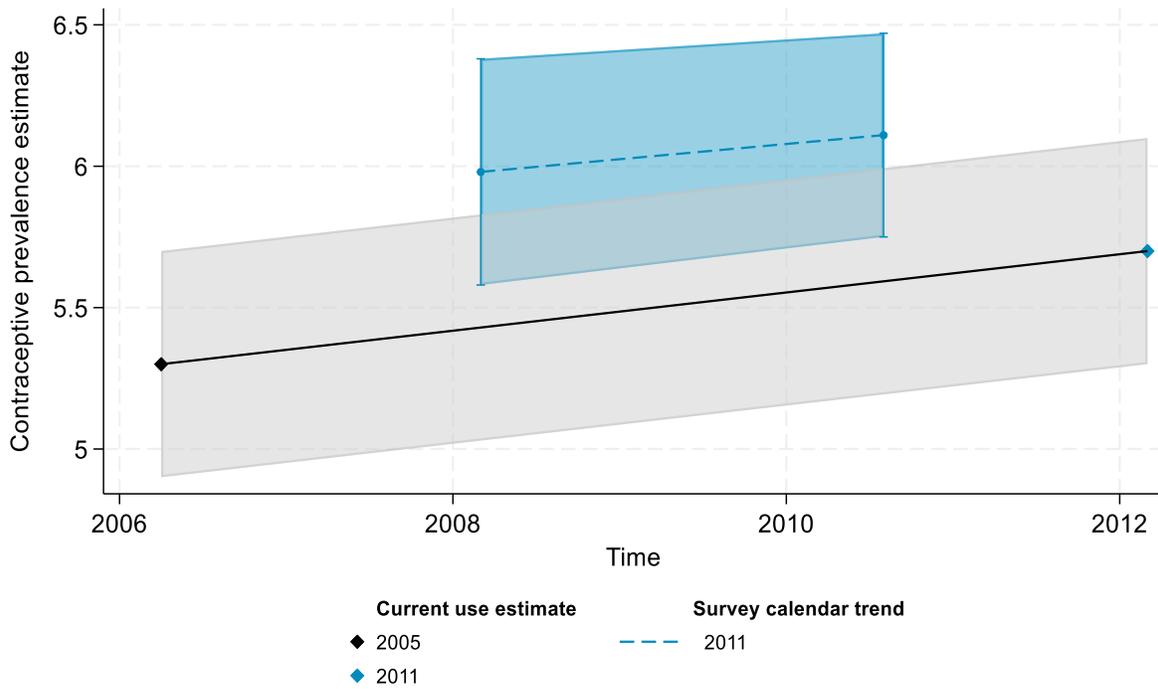
## c. Coitus-based contraceptive prevalence
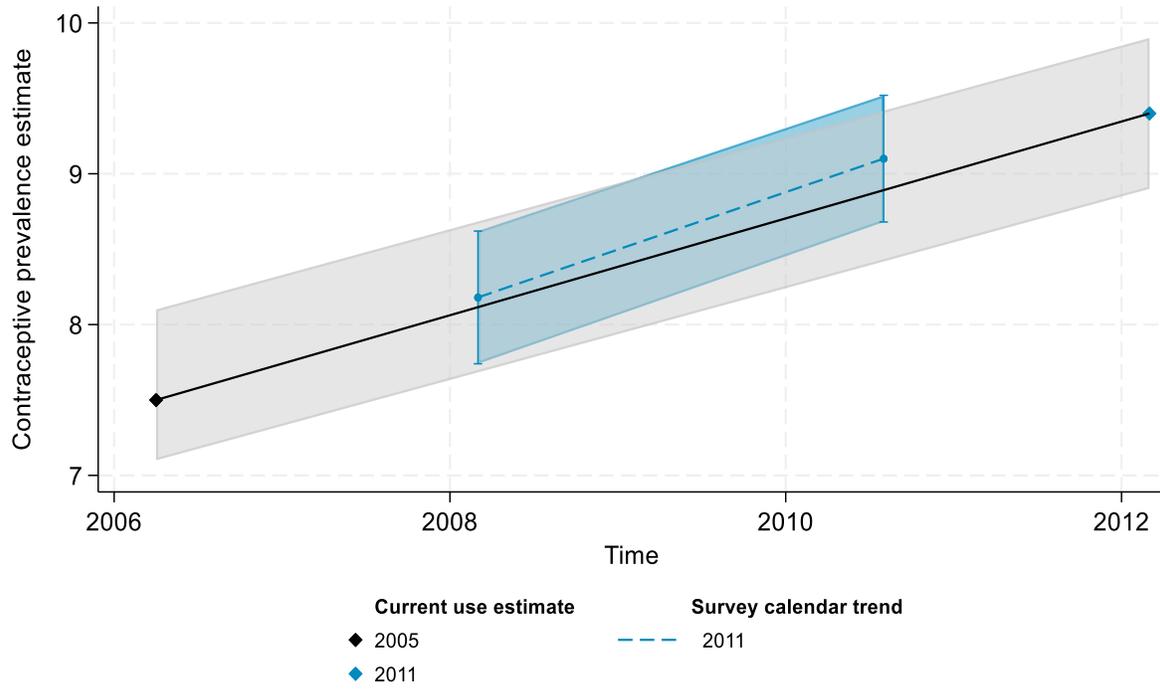
**Appendix Figure 14   Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, India**

### a. Overall contraceptive prevalence
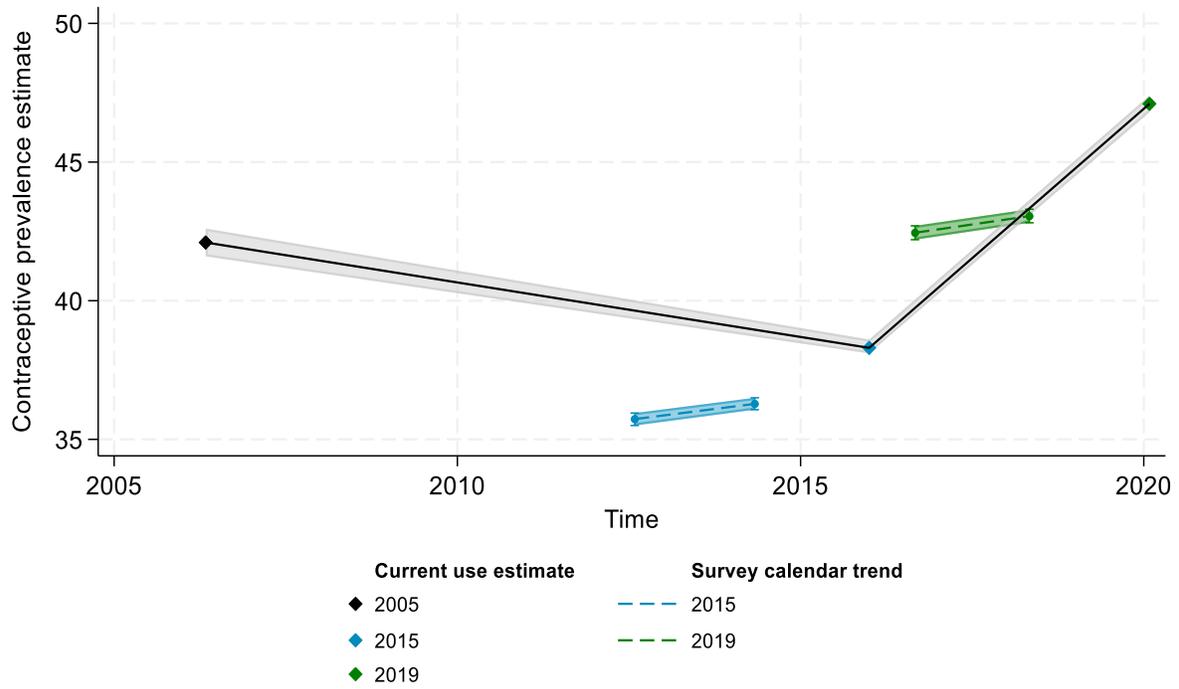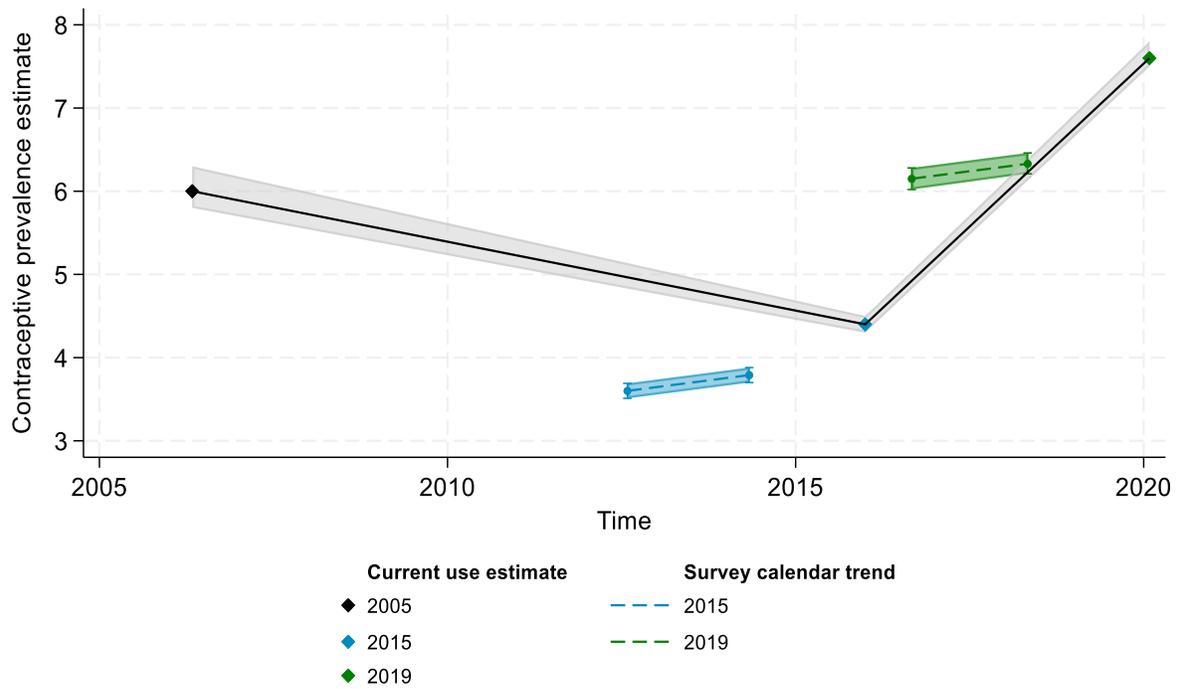


### b. Traditional contraceptive prevalence

## c. Coitus-based contraceptive prevalence
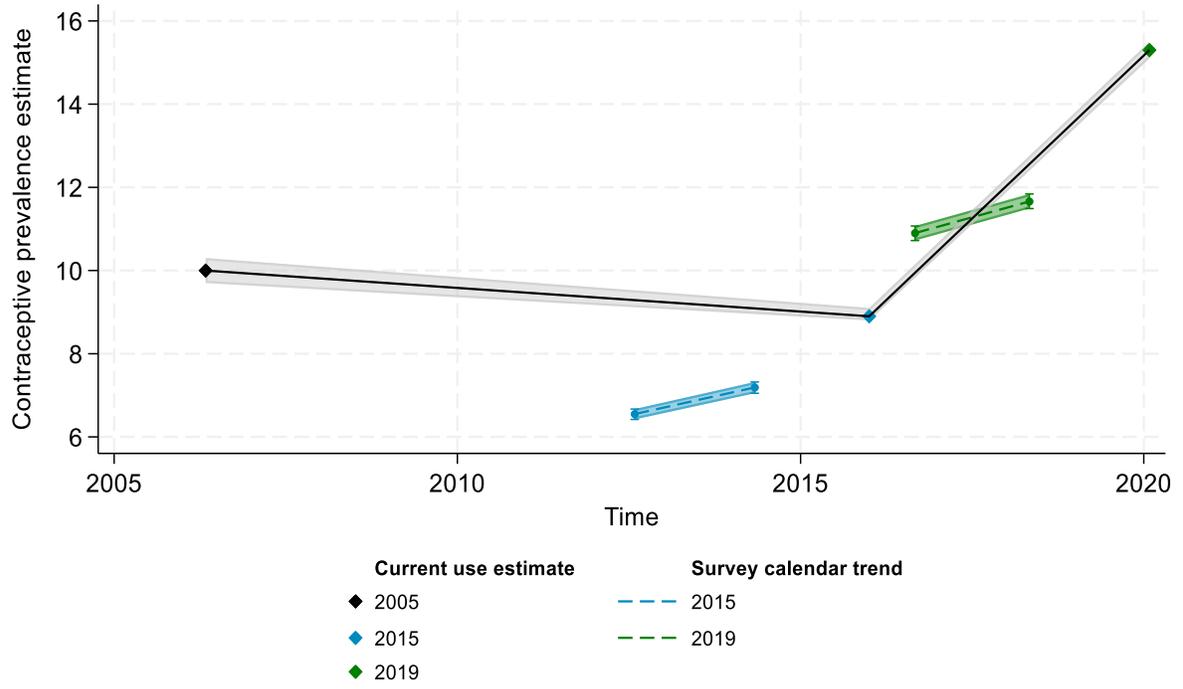
**Appendix Figure 15   Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Indonesia**



a. Overall contraceptive prevalence
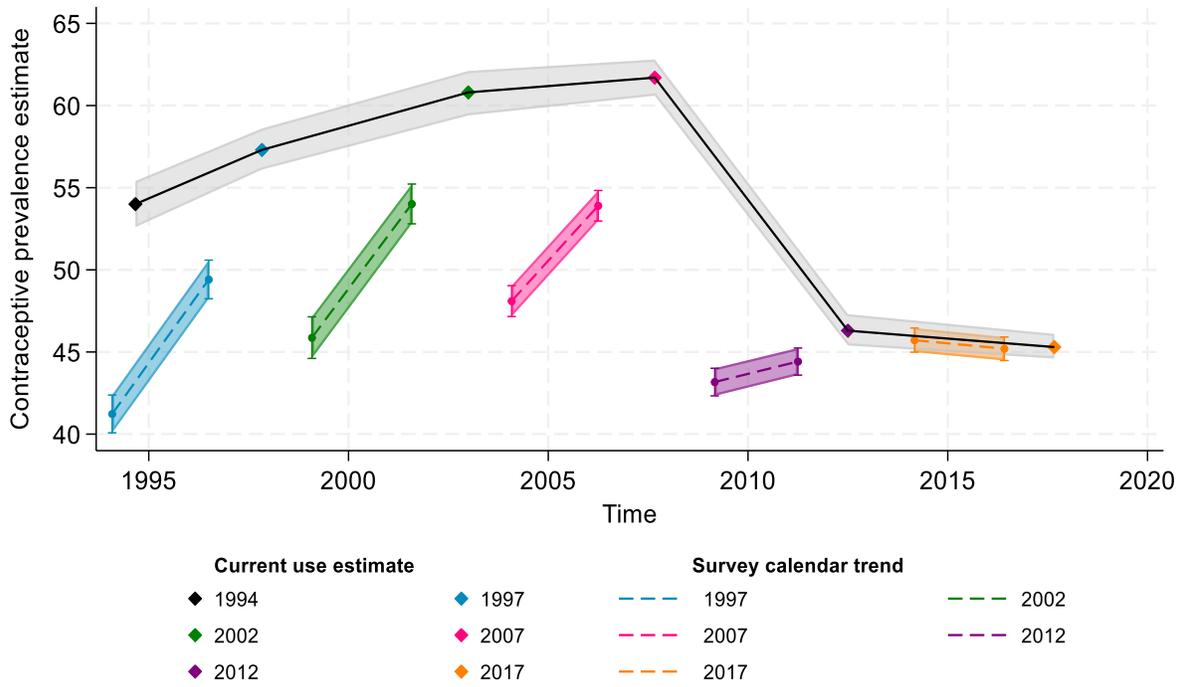
b. Traditional contraceptive prevalence
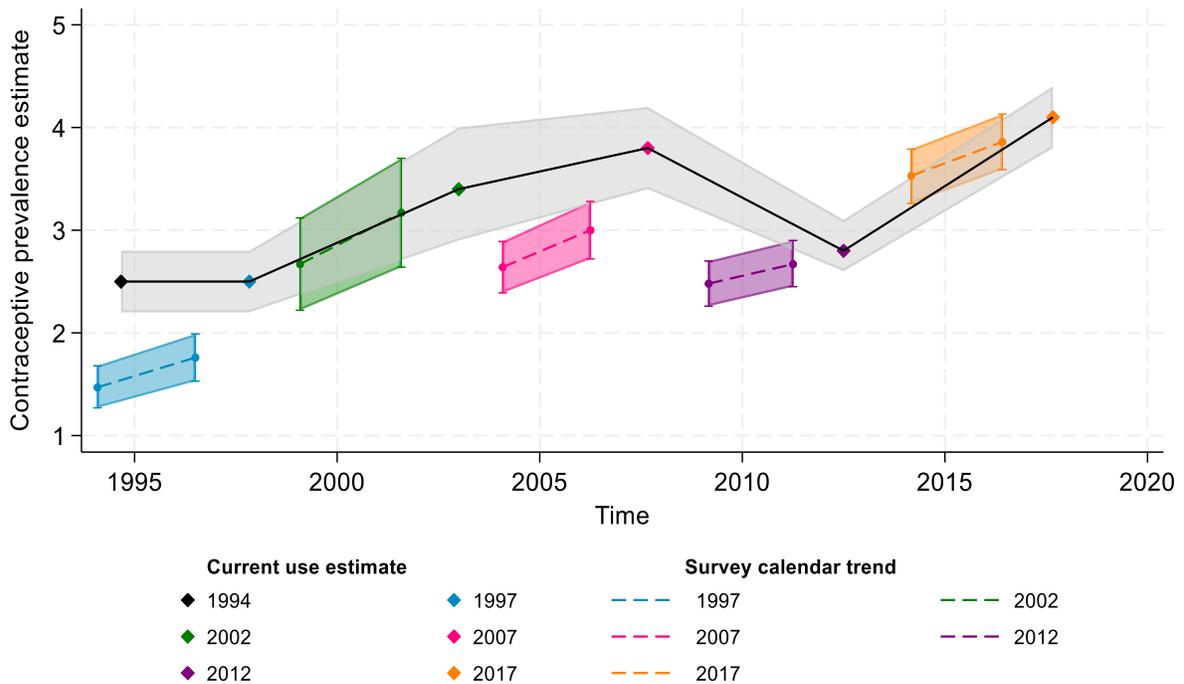
c. Coitus-based contraceptive prevalence
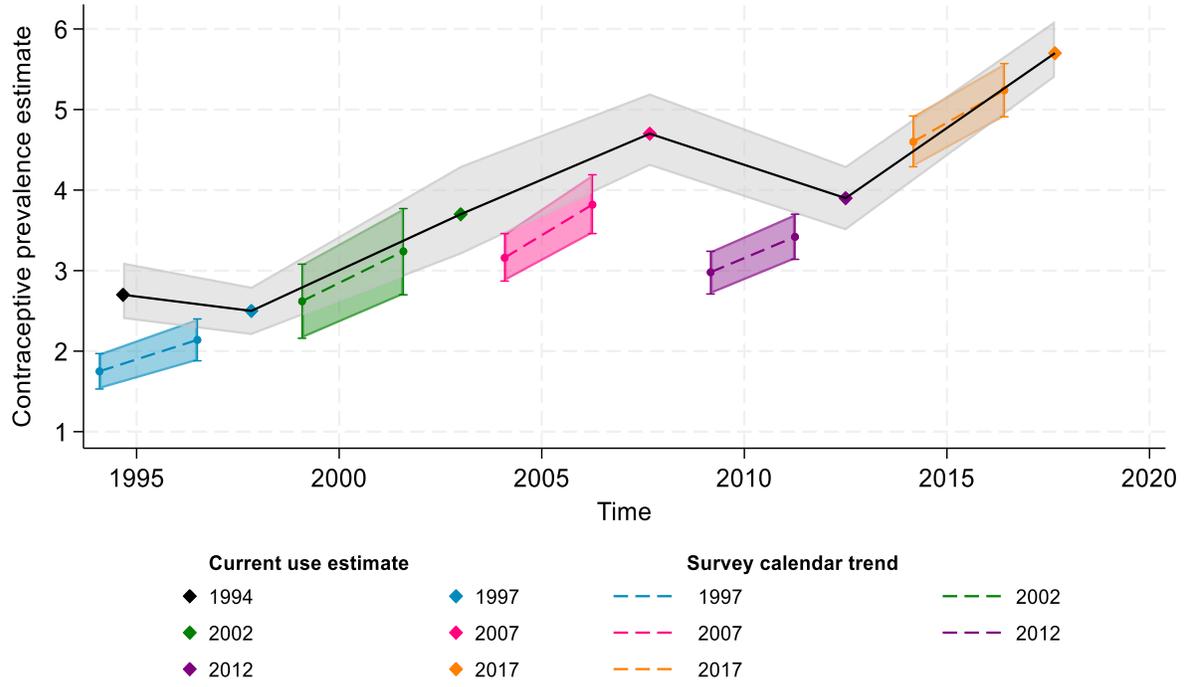
**Appendix Figure 16  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Jordan**



a. Overall contraceptive prevalence
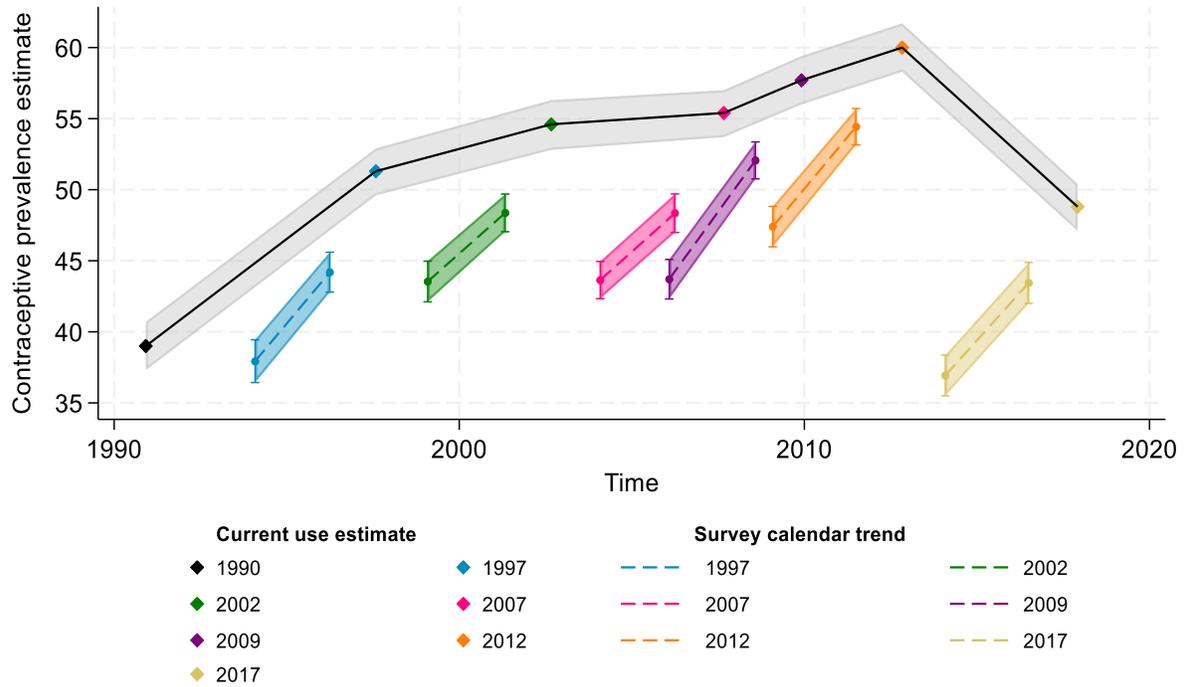


b. Traditional contraceptive prevalence
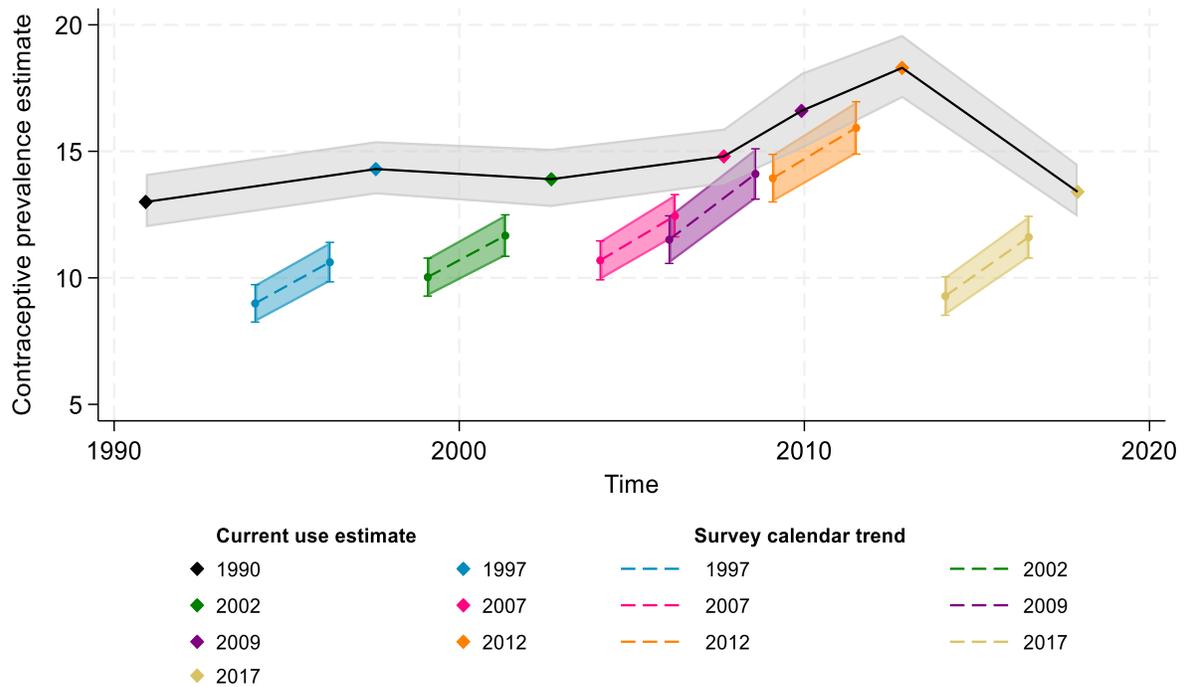
c. Coitus-based contraceptive prevalence
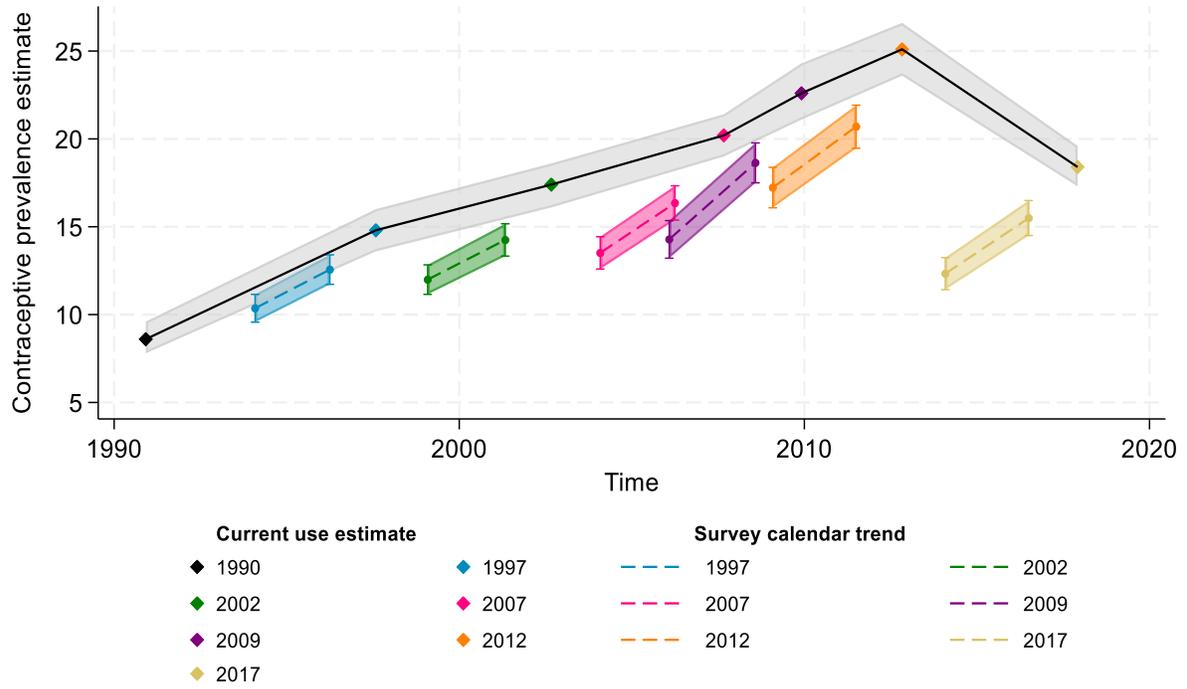
**Appendix Figure 17   Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Kenya**



a. Overall contraceptive prevalence
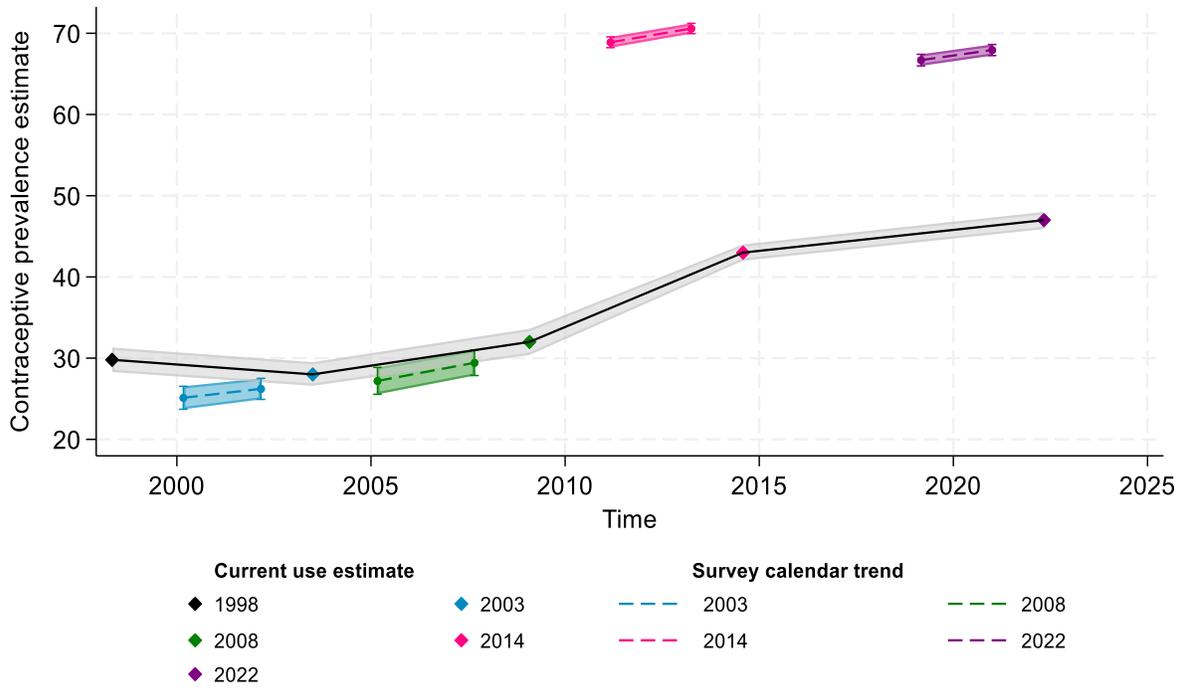
b. Traditional contraceptive prevalence
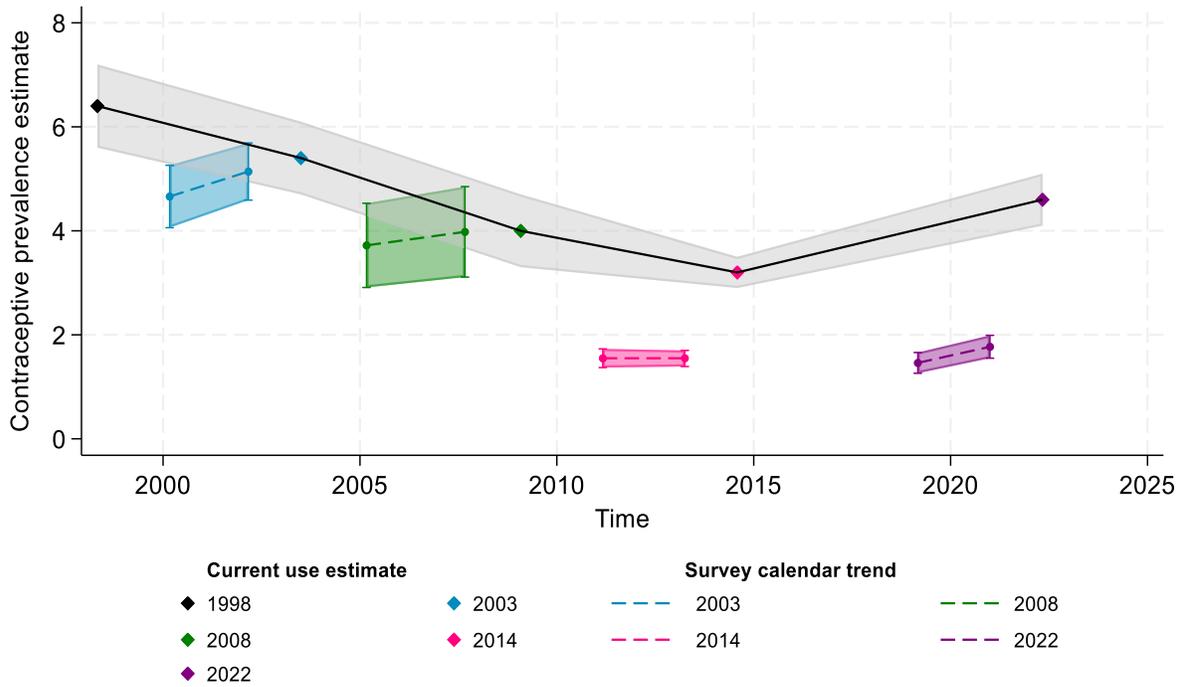
c. Coitus-based contraceptive prevalence
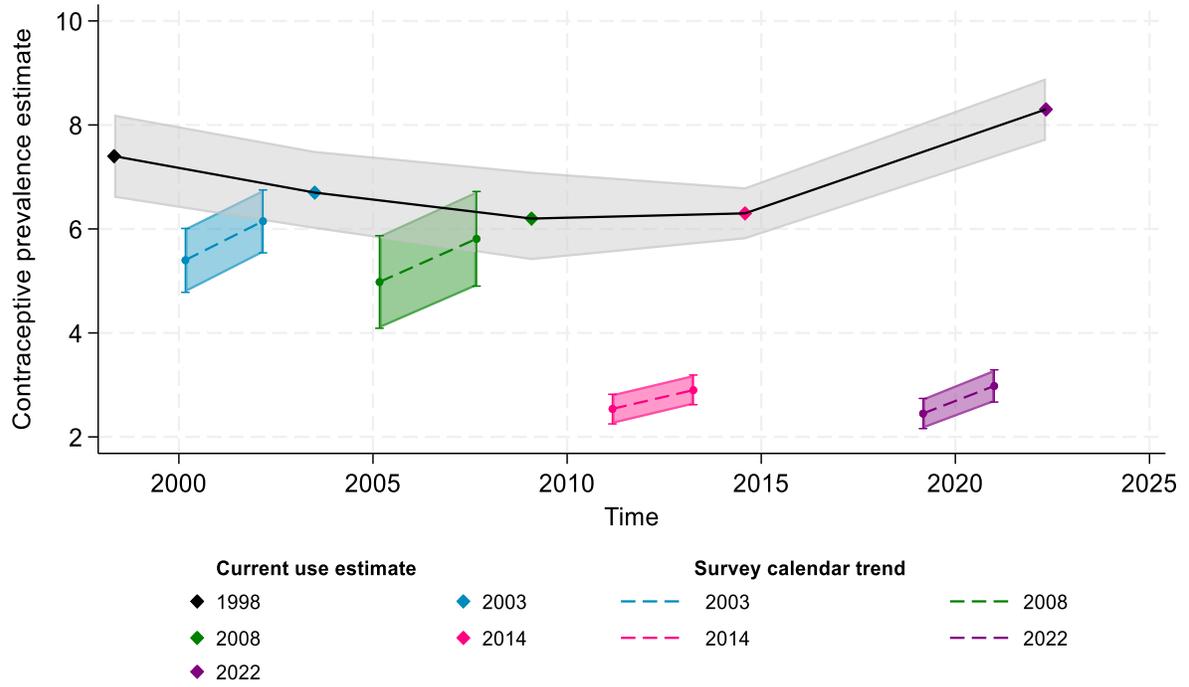
**Appendix Figure 18   Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Lesotho**

a. Overall contraceptive prevalence
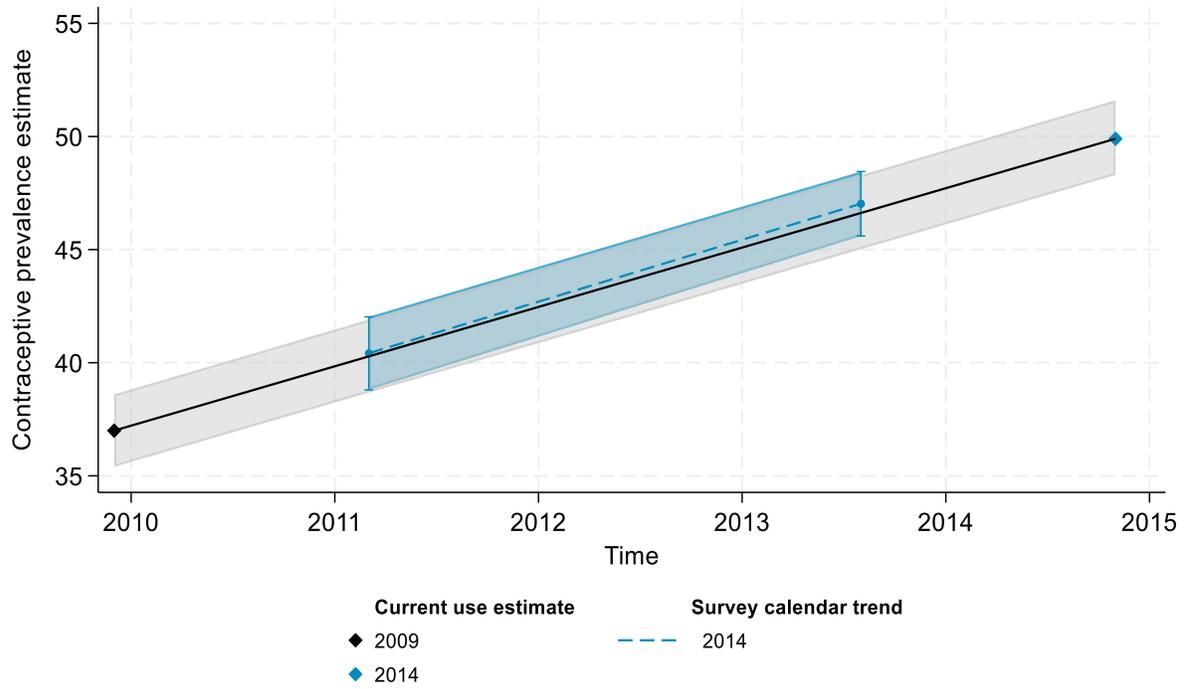


b. Traditional contraceptive prevalence

## c. Coitus-based contraceptive prevalence



Current use estimate
◆ 2009
◆ 2014

Survey calendar trend
- - - 2014
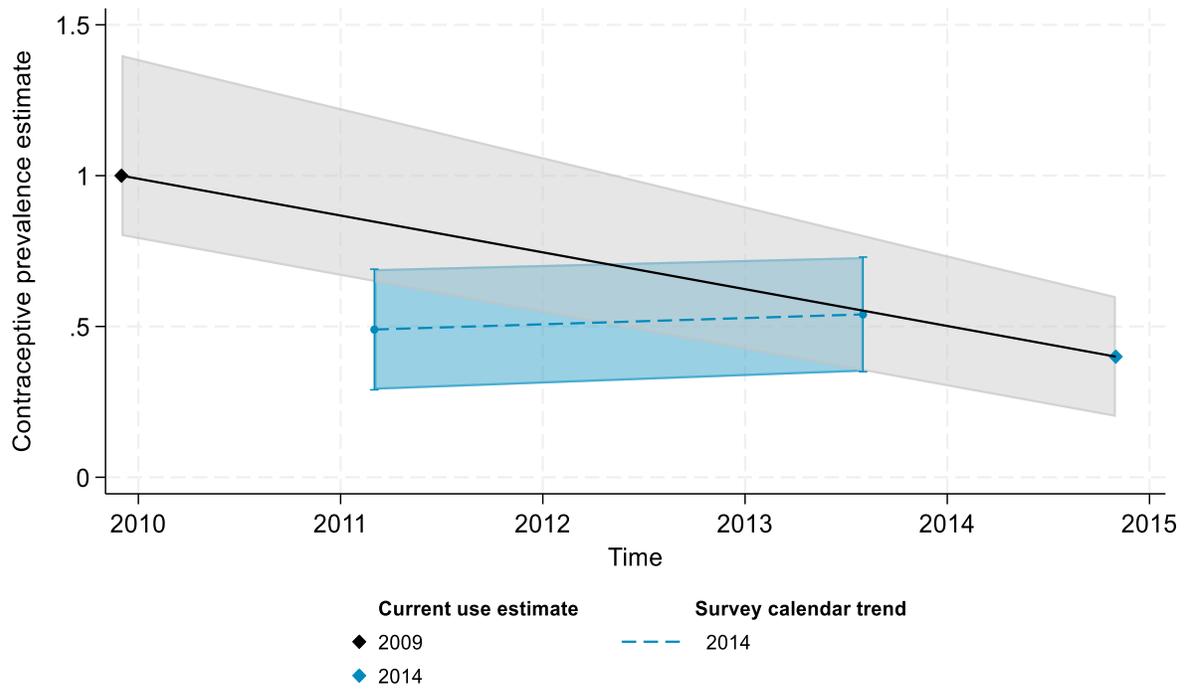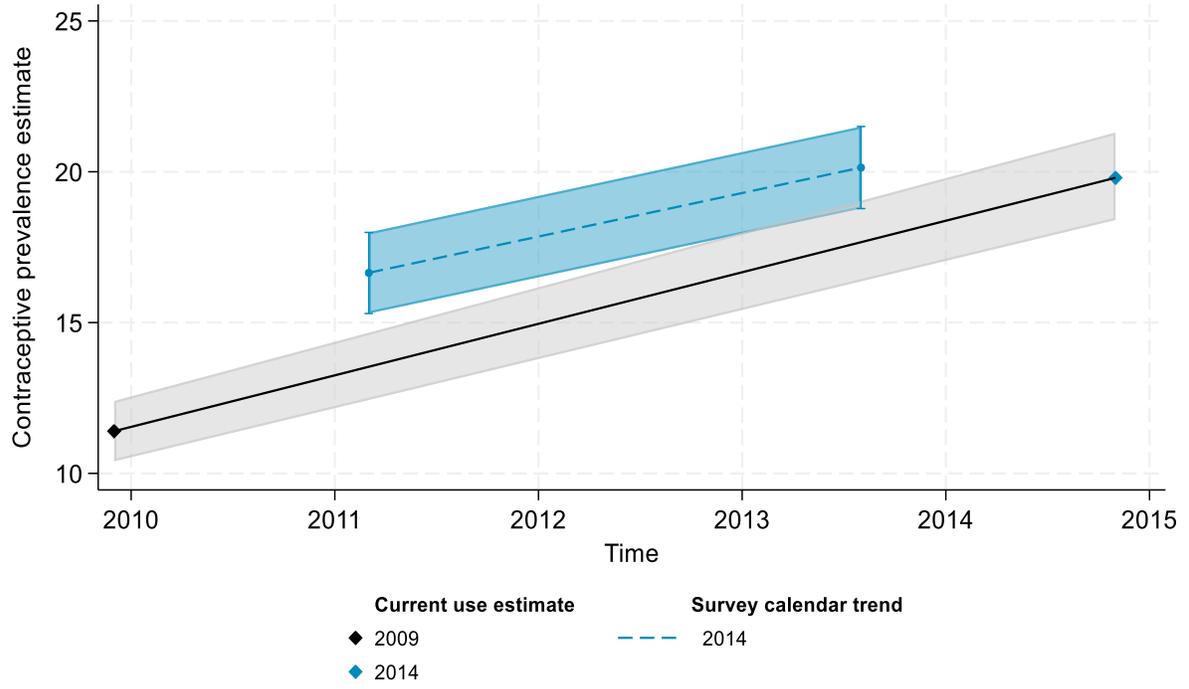
**Appendix Figure 19  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Madagascar**

### a. Overall contraceptive prevalence
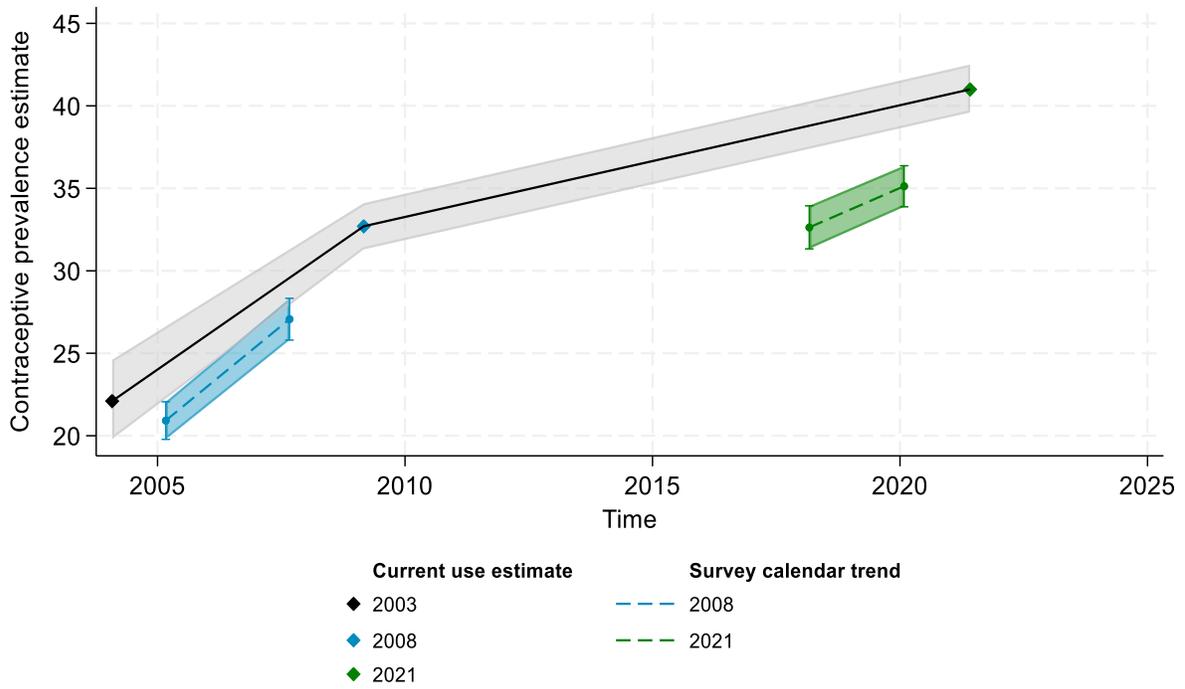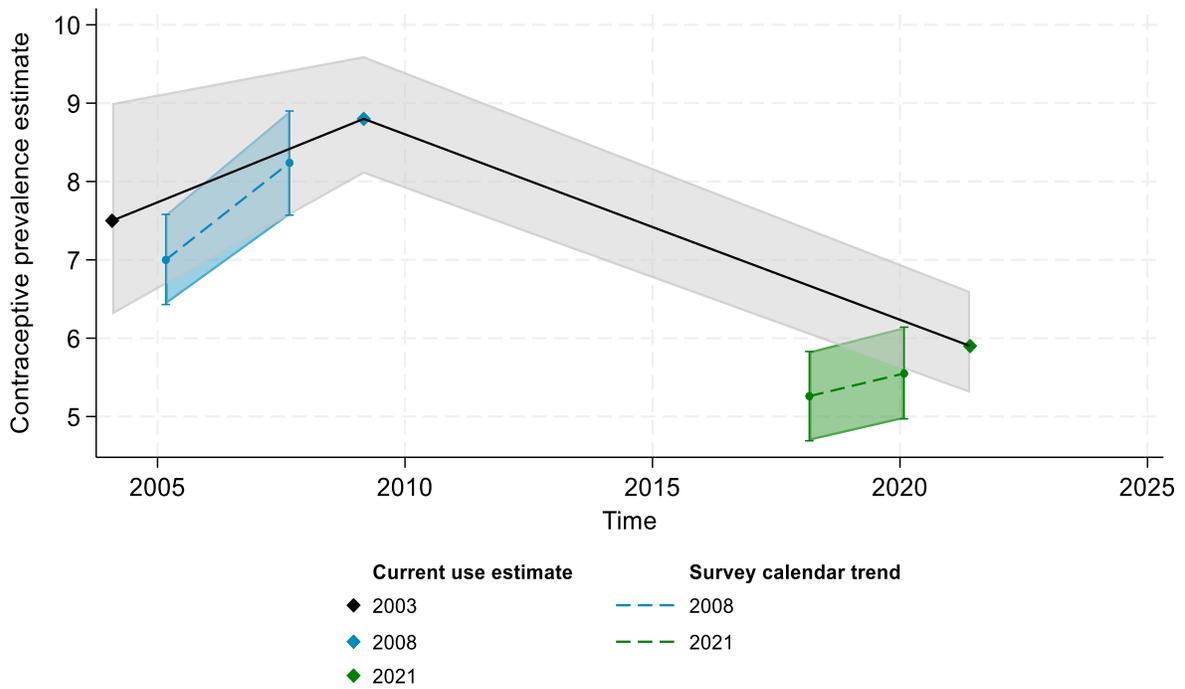


### b. Traditional contraceptive prevalence

### c. Coitus-based contraceptive prevalence
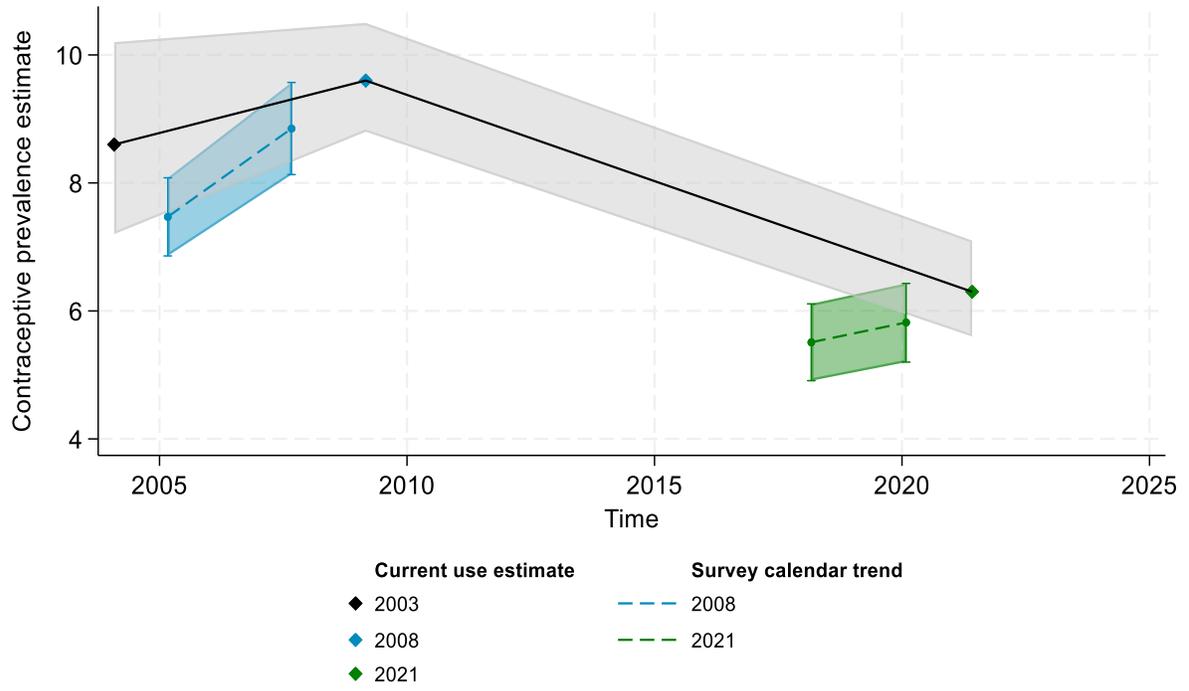
**Appendix Figure 20   Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Malawi**

### a. Overall contraceptive prevalence
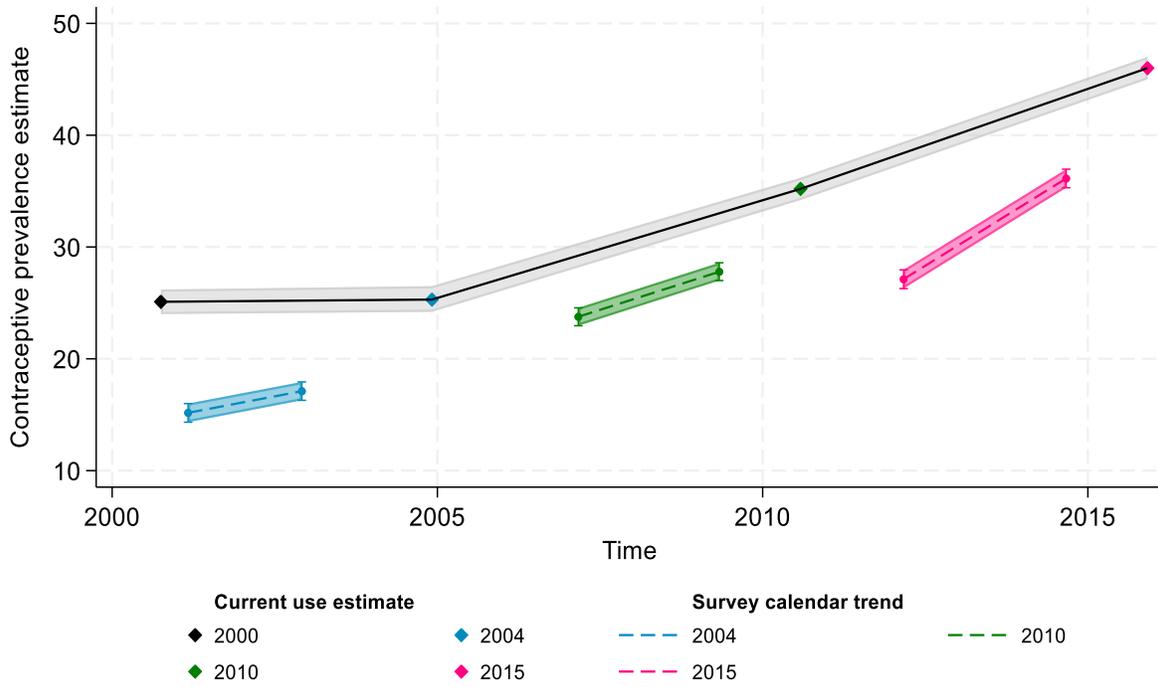


### b. Traditional contraceptive prevalence
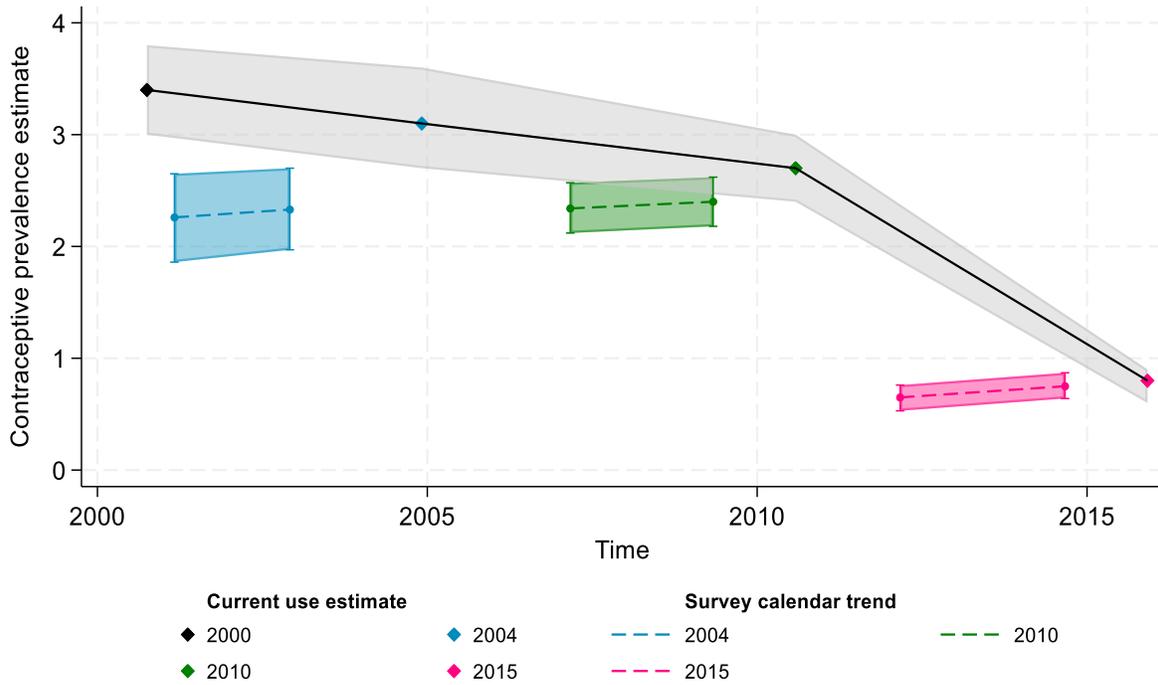
## c. Coitus-based contraceptive prevalence
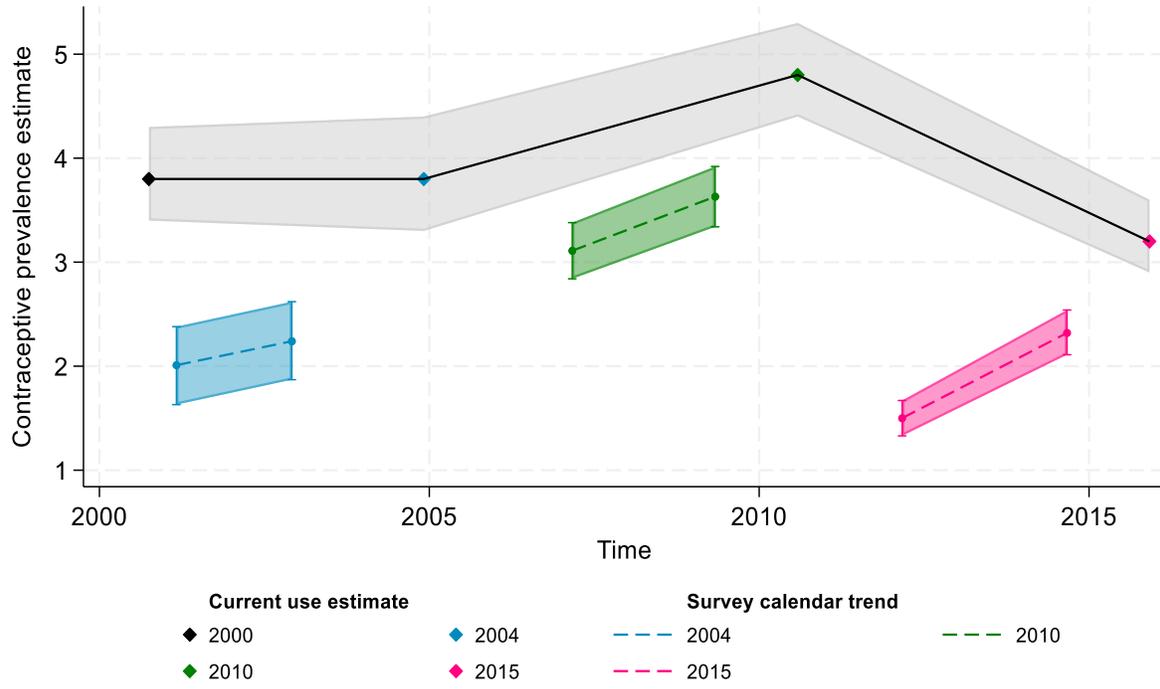
**Appendix Figure 21   Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Mali**



a. Overall contraceptive prevalence
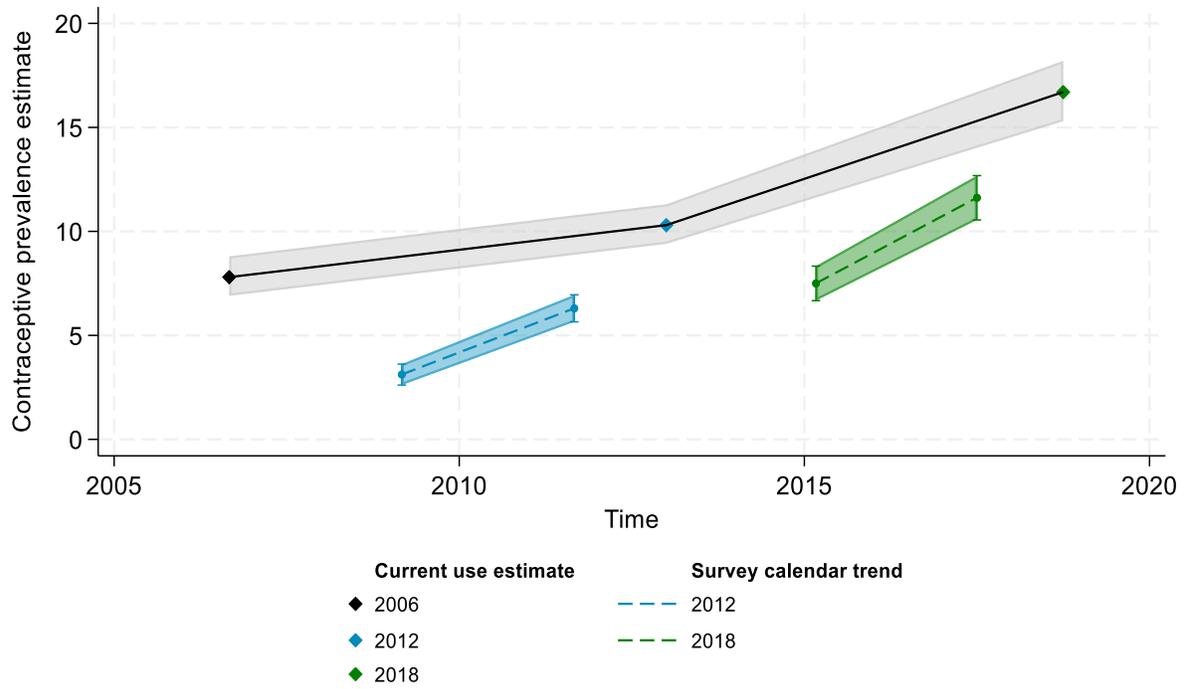
b. Traditional contraceptive prevalence
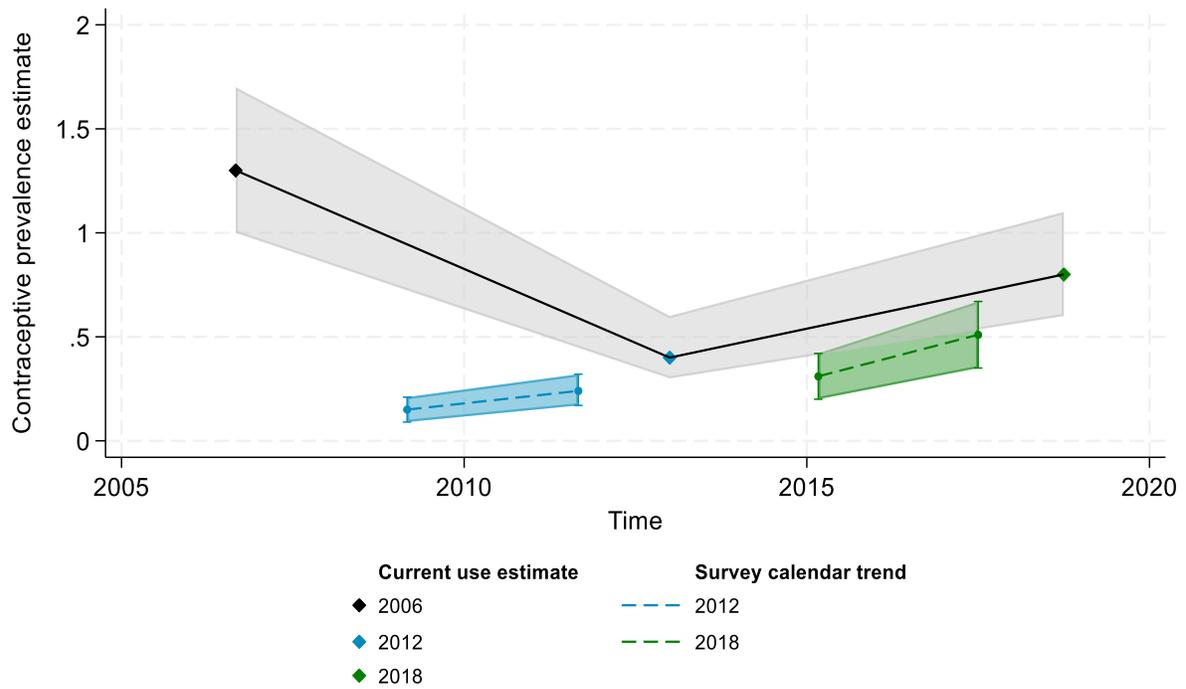
## c. Coitus-based contraceptive prevalence
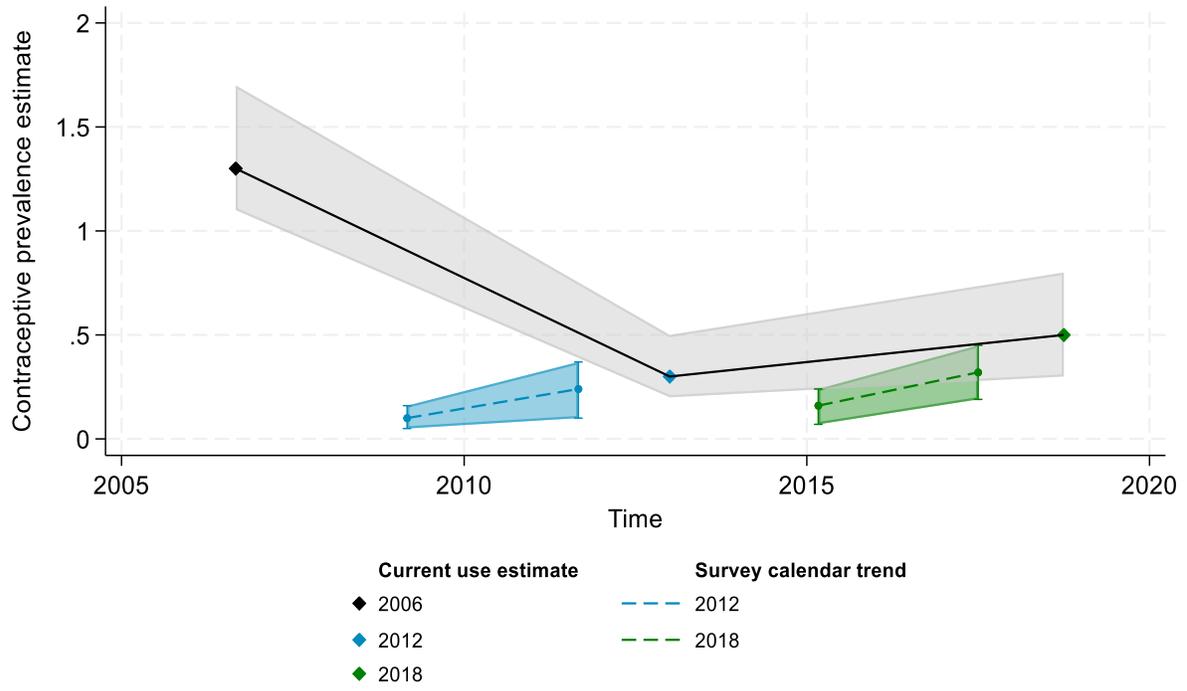
**Appendix Figure 22  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Nepal**

## a. Overall contraceptive prevalence
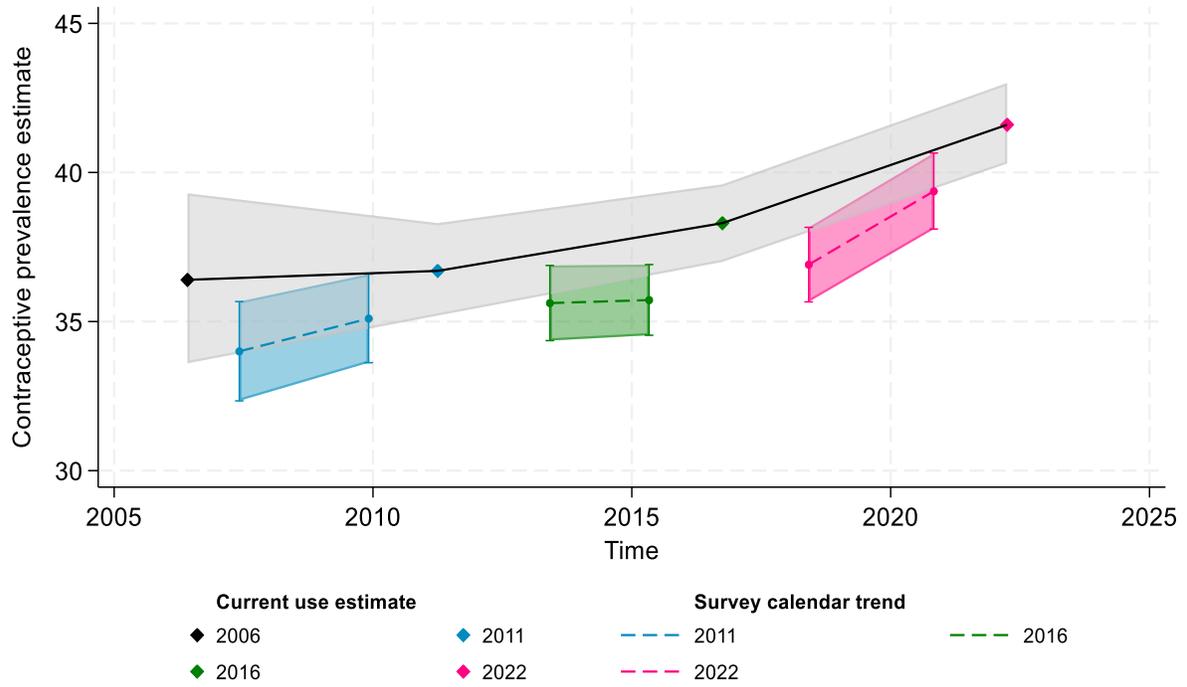


## b. Traditional contraceptive prevalence
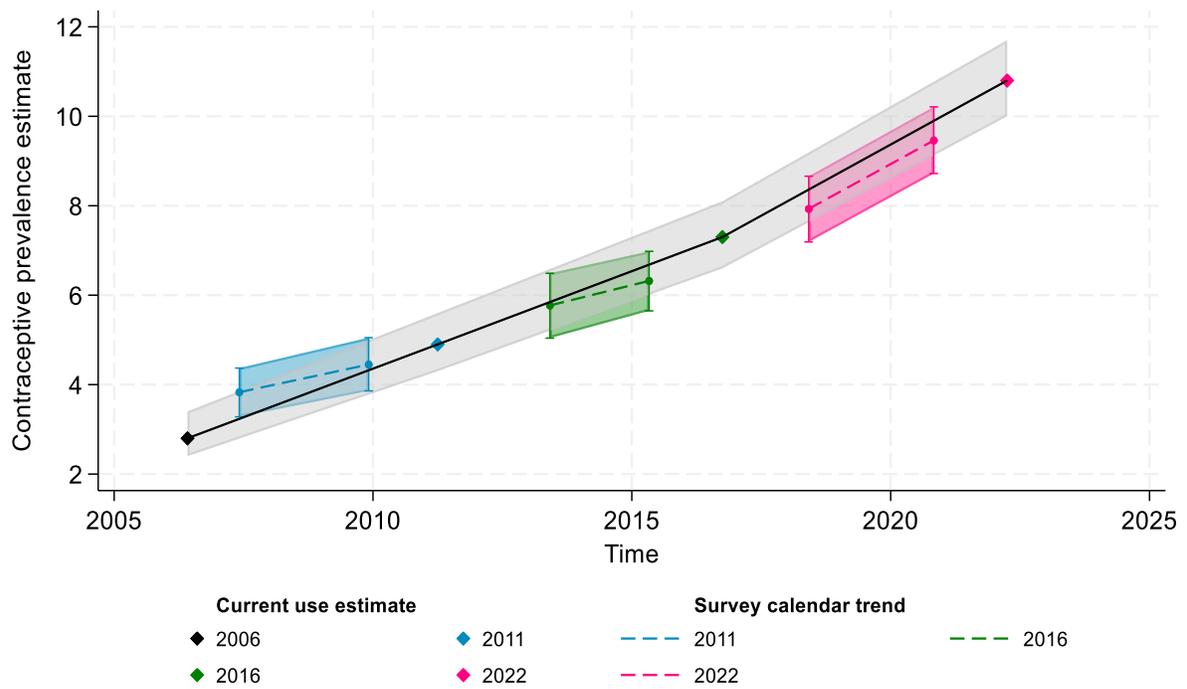
c. Coitus-based contraceptive prevalence
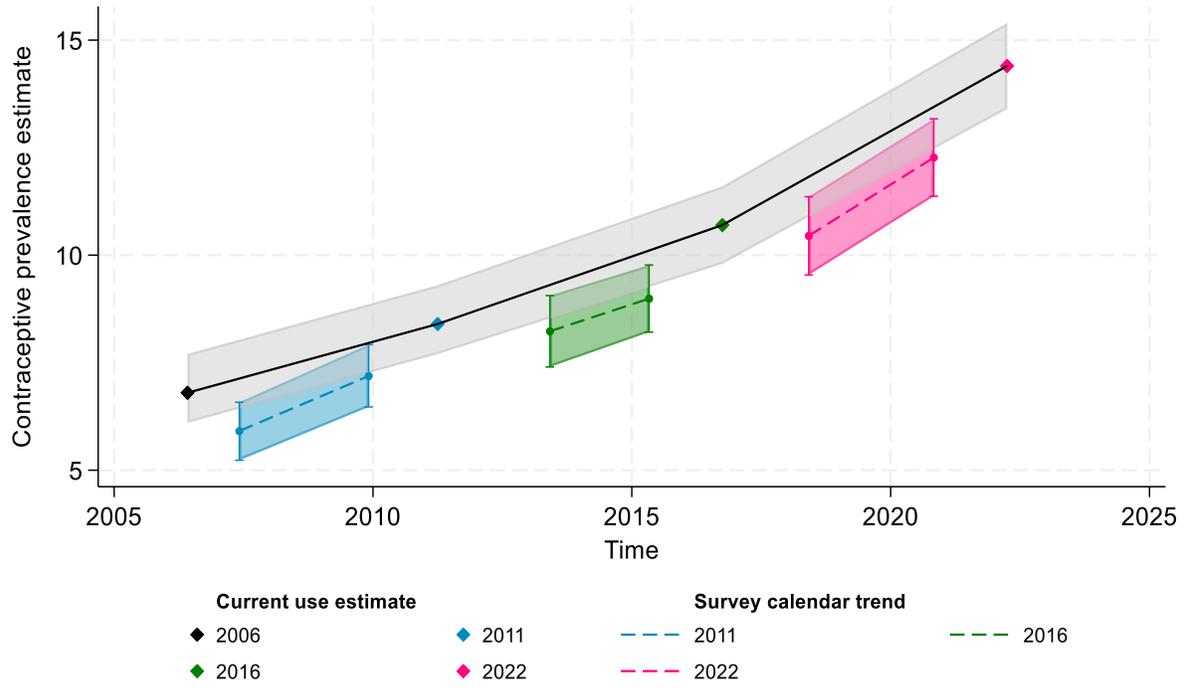
**Appendix Figure 23  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Nigeria**

a. Overall contraceptive prevalence
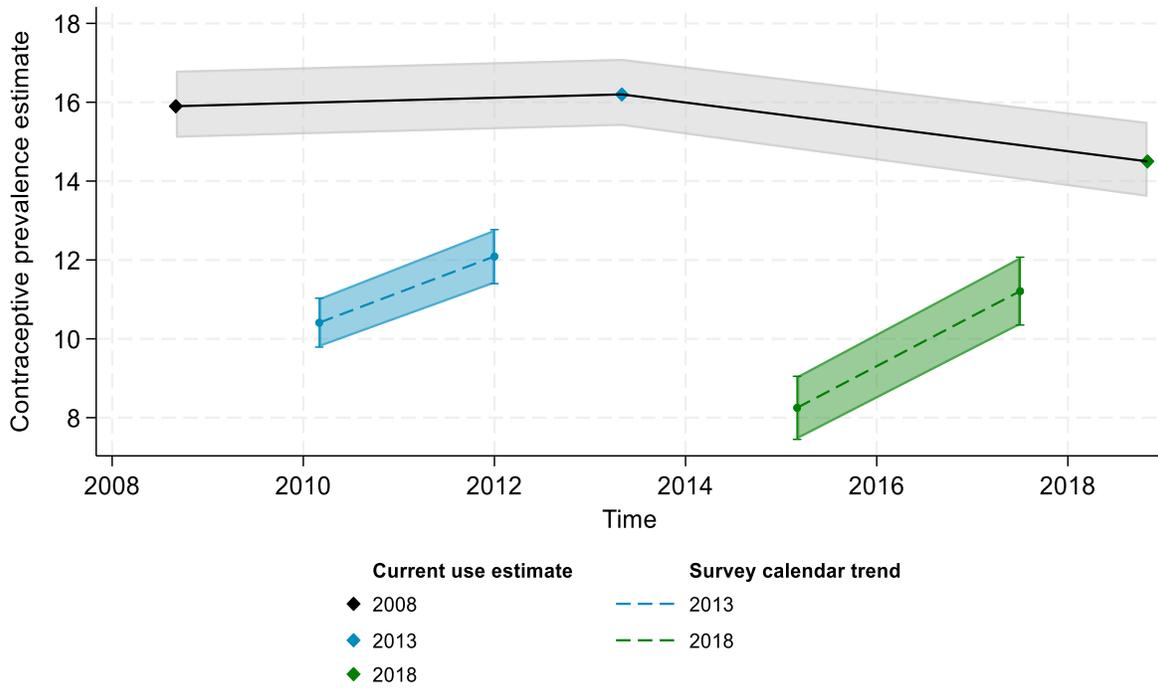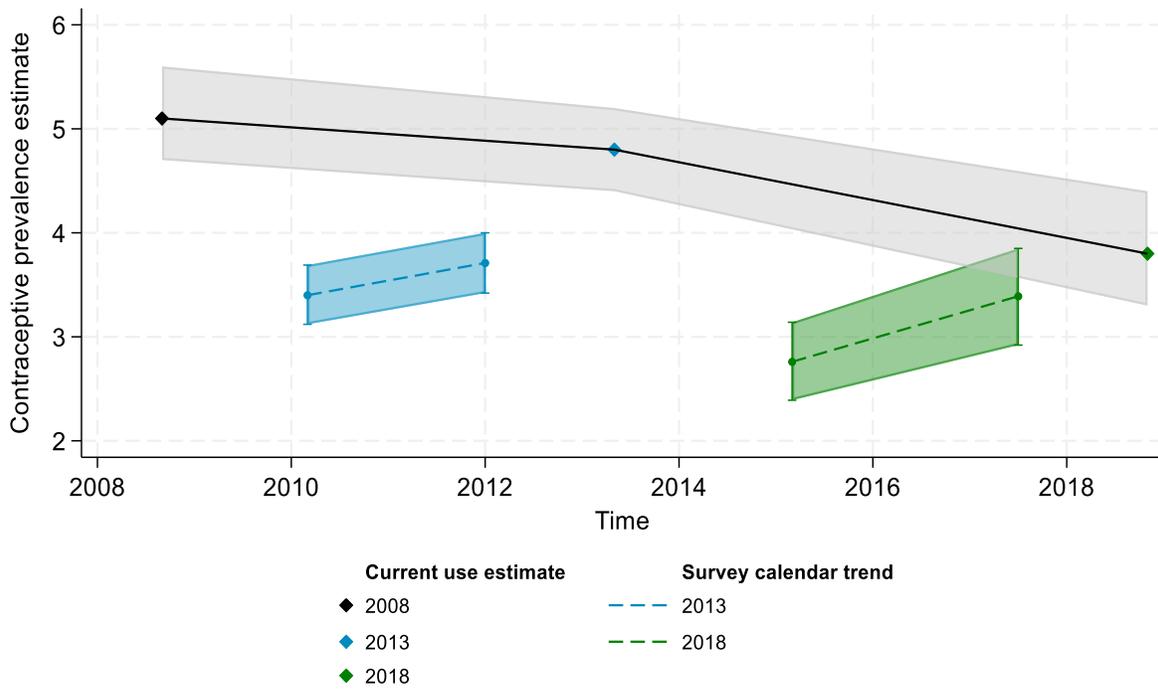


b. Traditional contraceptive prevalence

### c. Coitus-based contraceptive prevalence
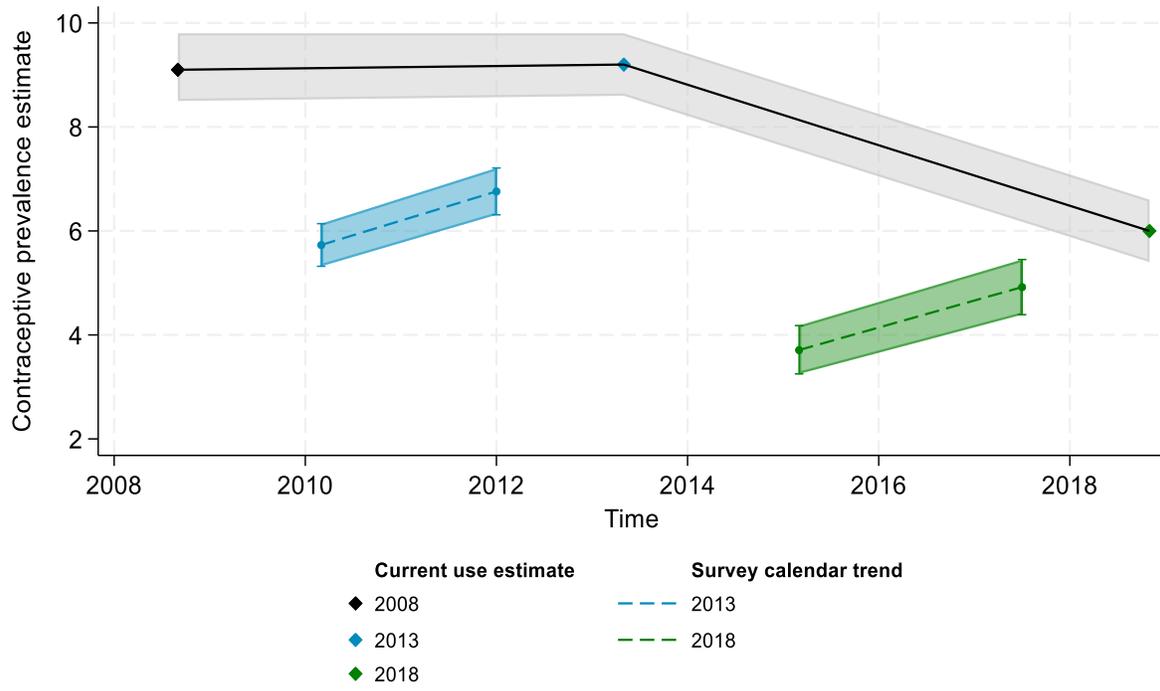
**Appendix Figure 24  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Pakistan**

## a. Overall contraceptive prevalence
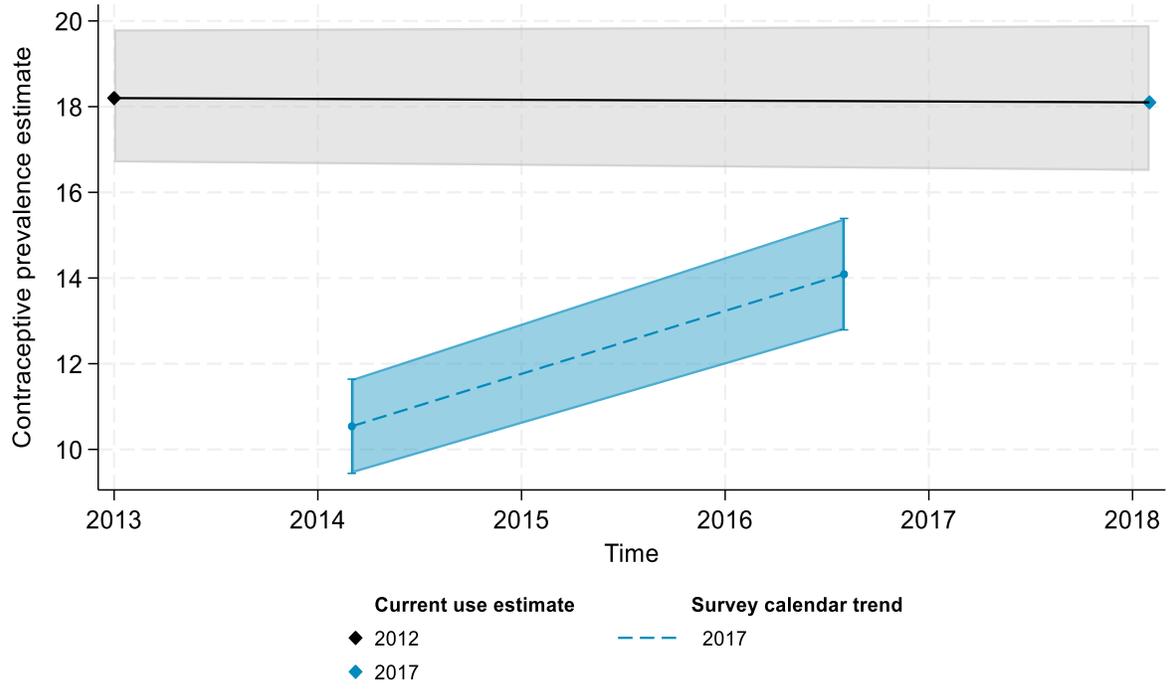


## b. Traditional contraceptive prevalence

### c. Coitus-based contraceptive prevalence
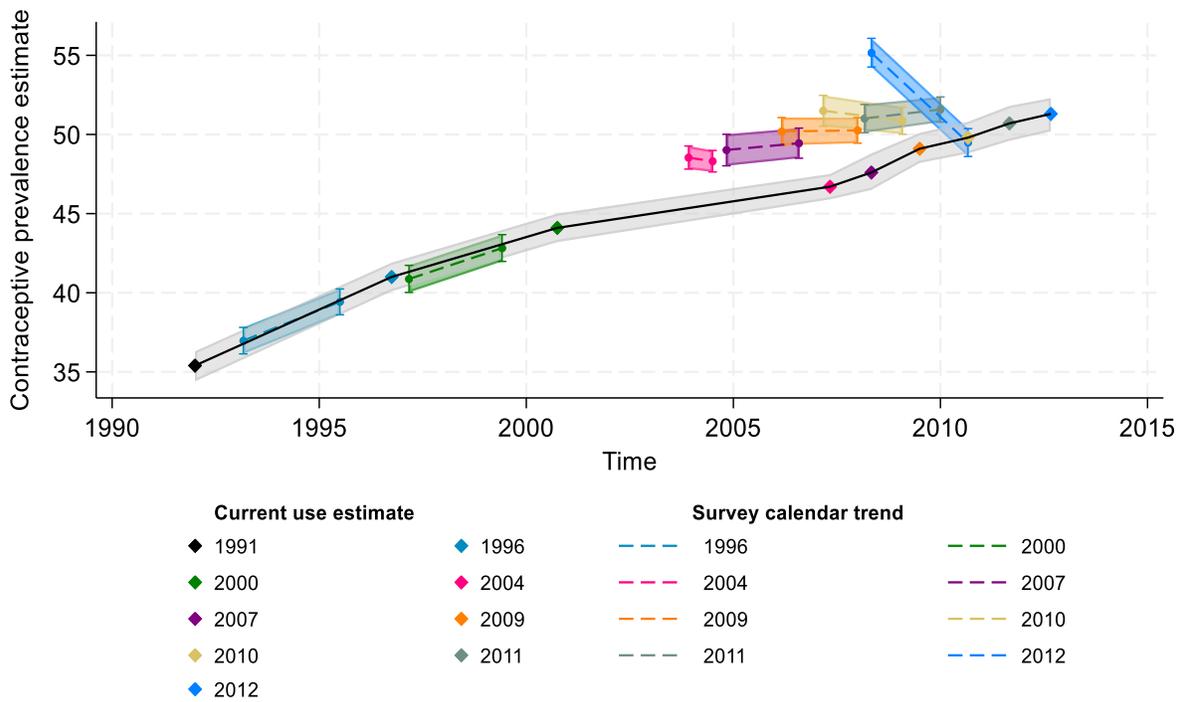
## a. Overall contraceptive prevalence
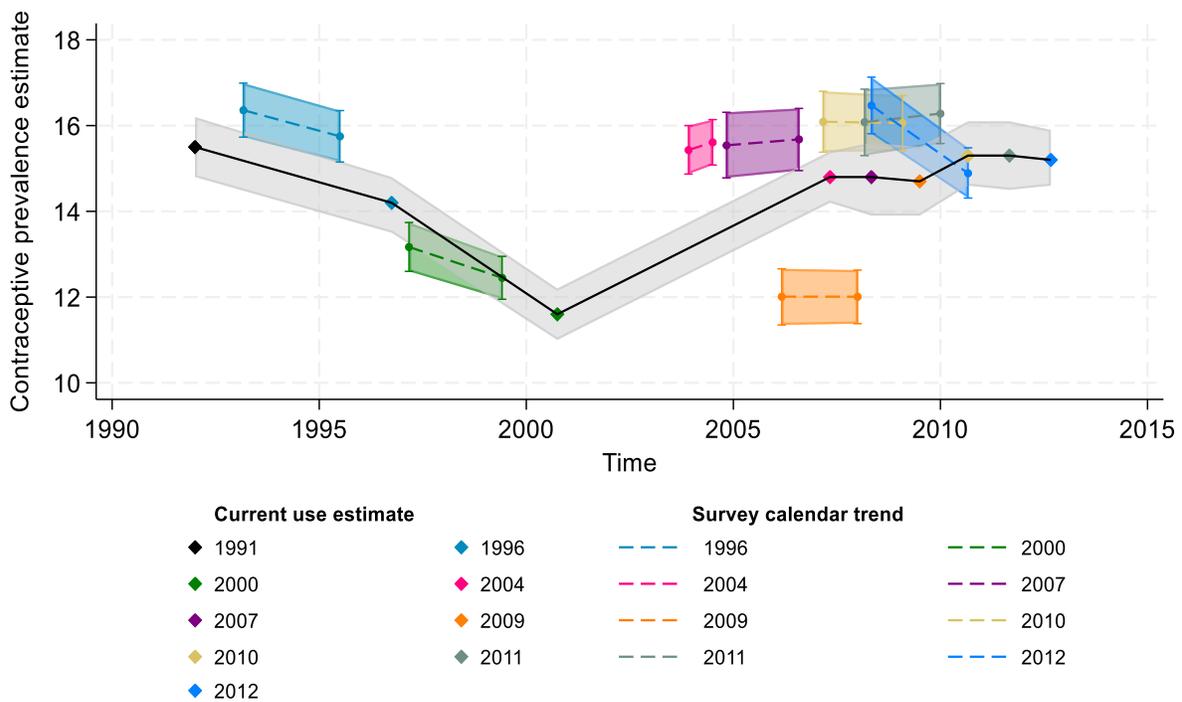


## b. Traditional contraceptive prevalence

## c. Coitus-based contraceptive prevalence
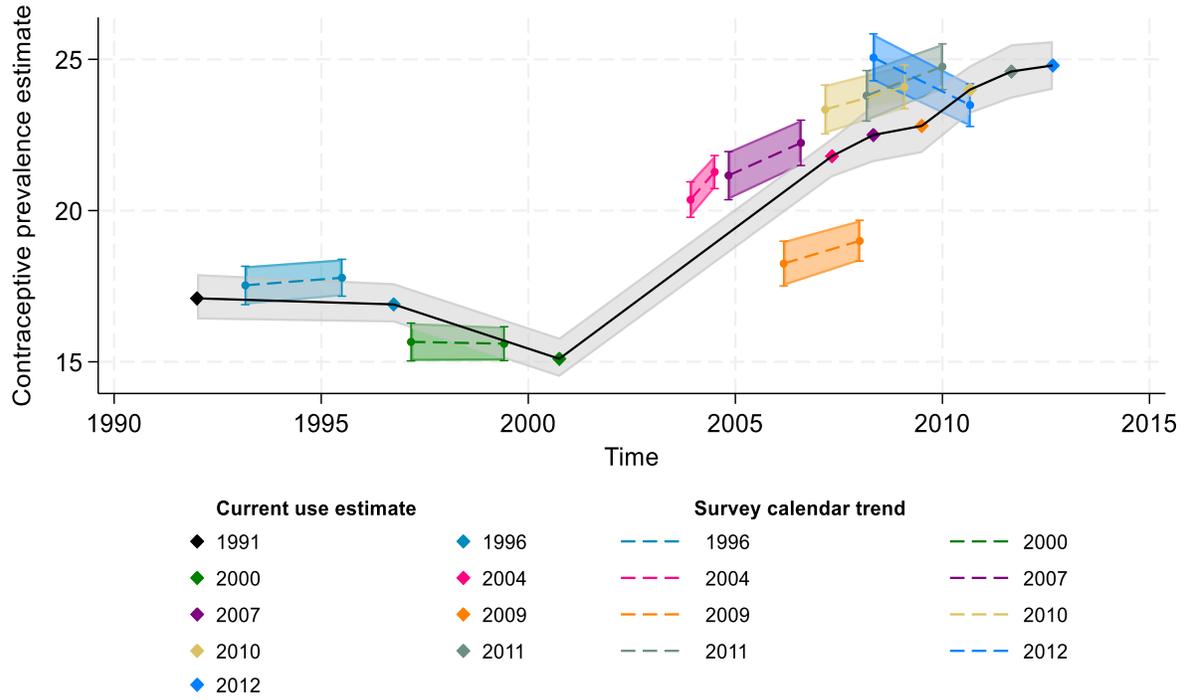
**Appendix Figure 26   Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Philippines**

## a. Overall contraceptive prevalence
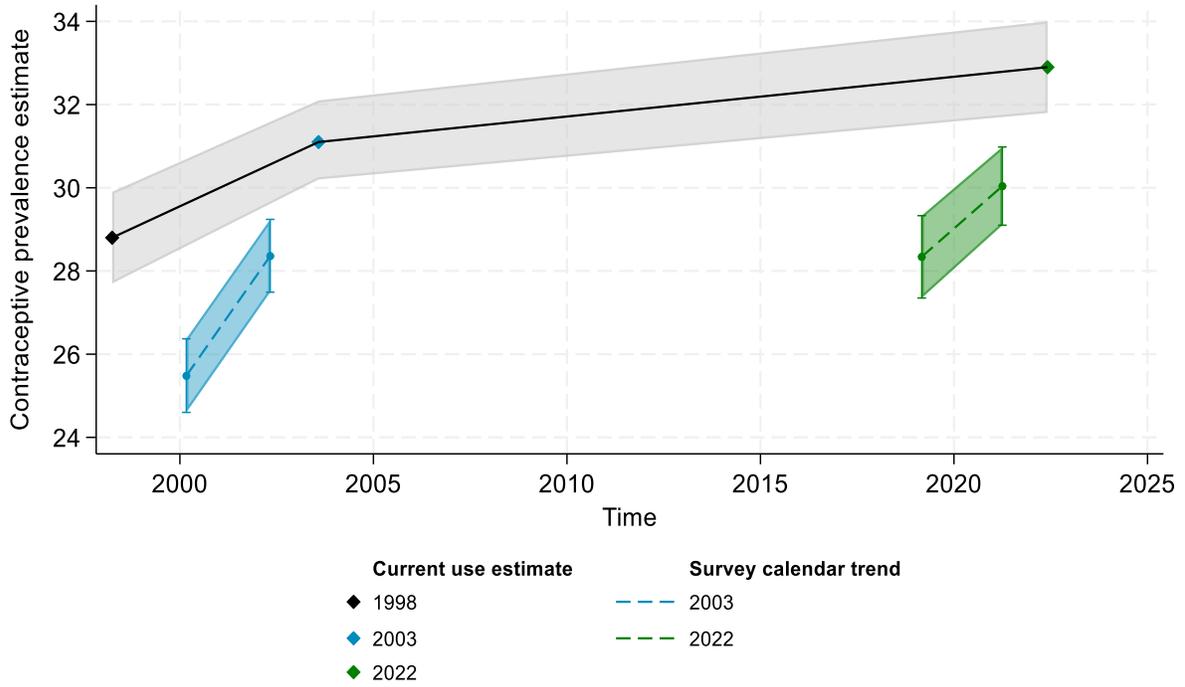


## b. Traditional contraceptive prevalence
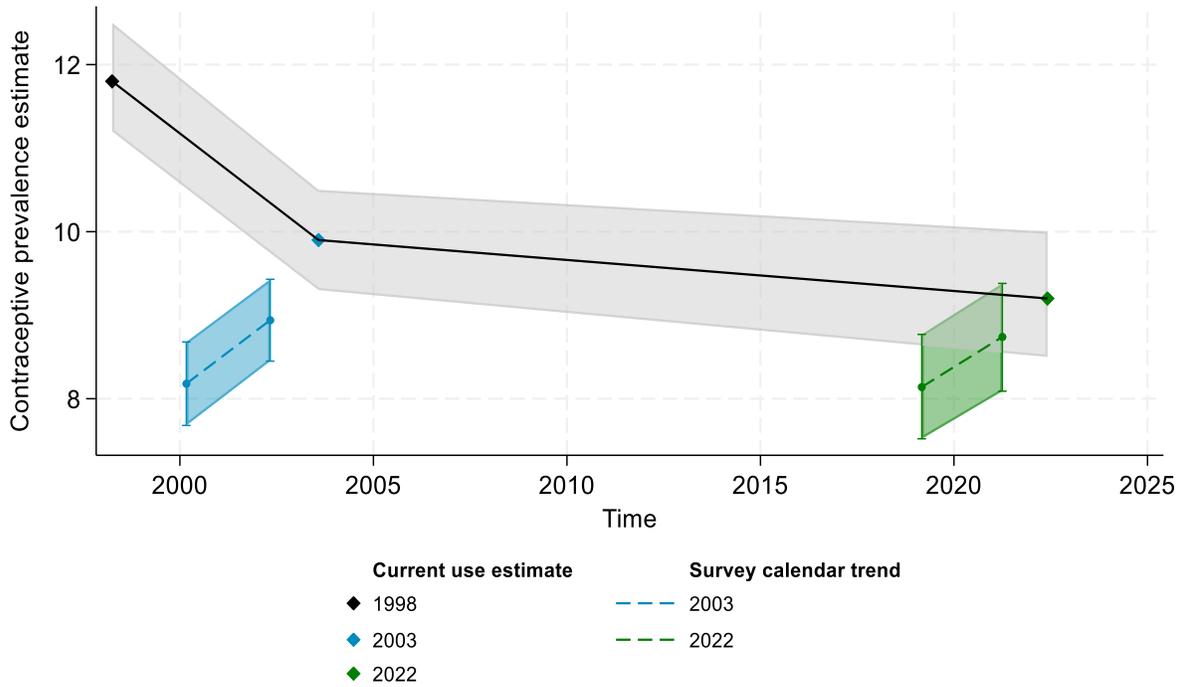
## c. Coitus-based contraceptive prevalence
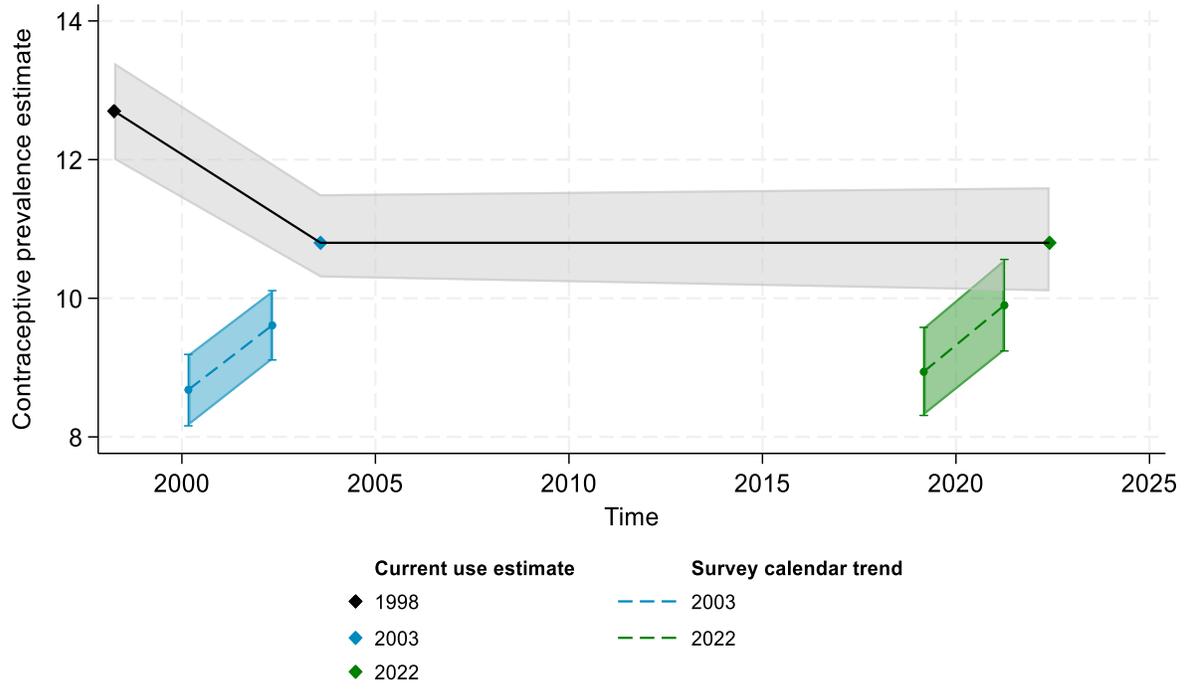
**Appendix Figure 27   Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Rwanda**



a. Overall contraceptive prevalence
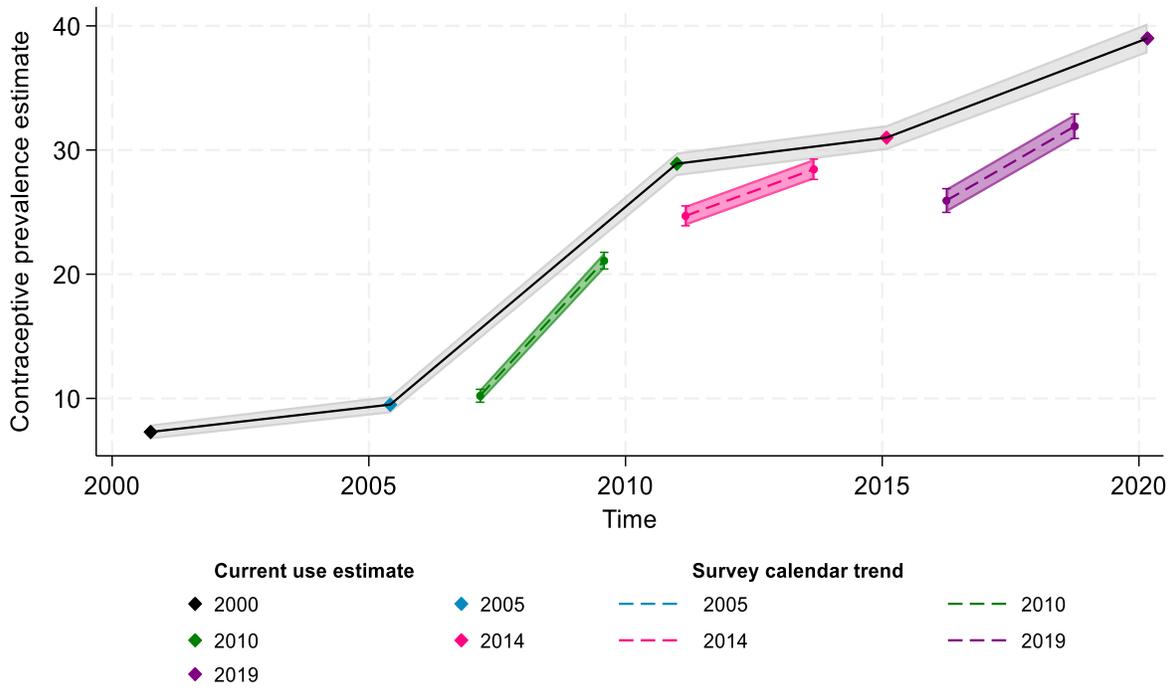


b. Traditional contraceptive prevalence
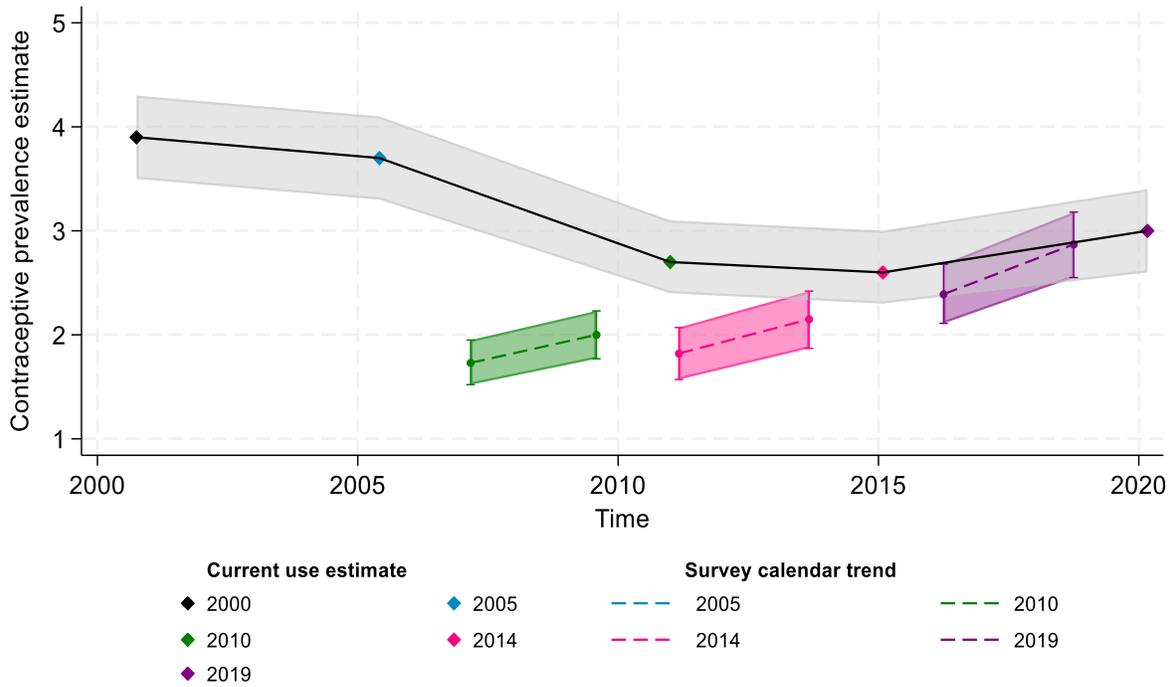
c. Coitus-based contraceptive prevalence
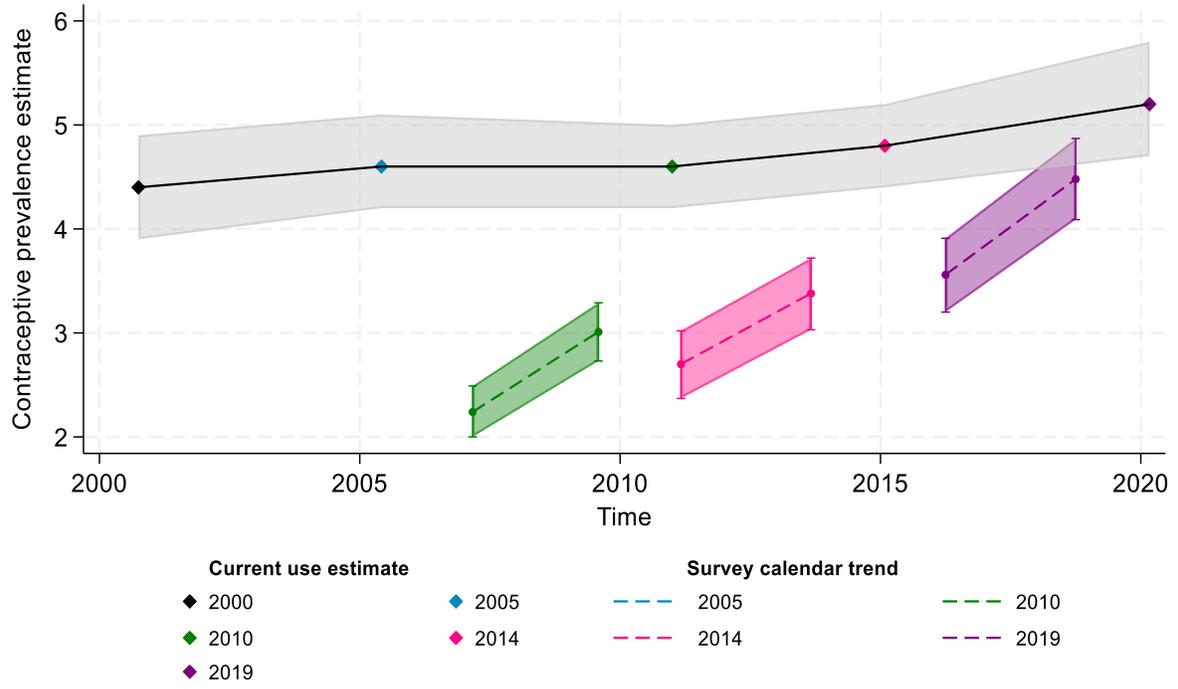
**Appendix Figure 28  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Senegal**

a. Overall contraceptive prevalence
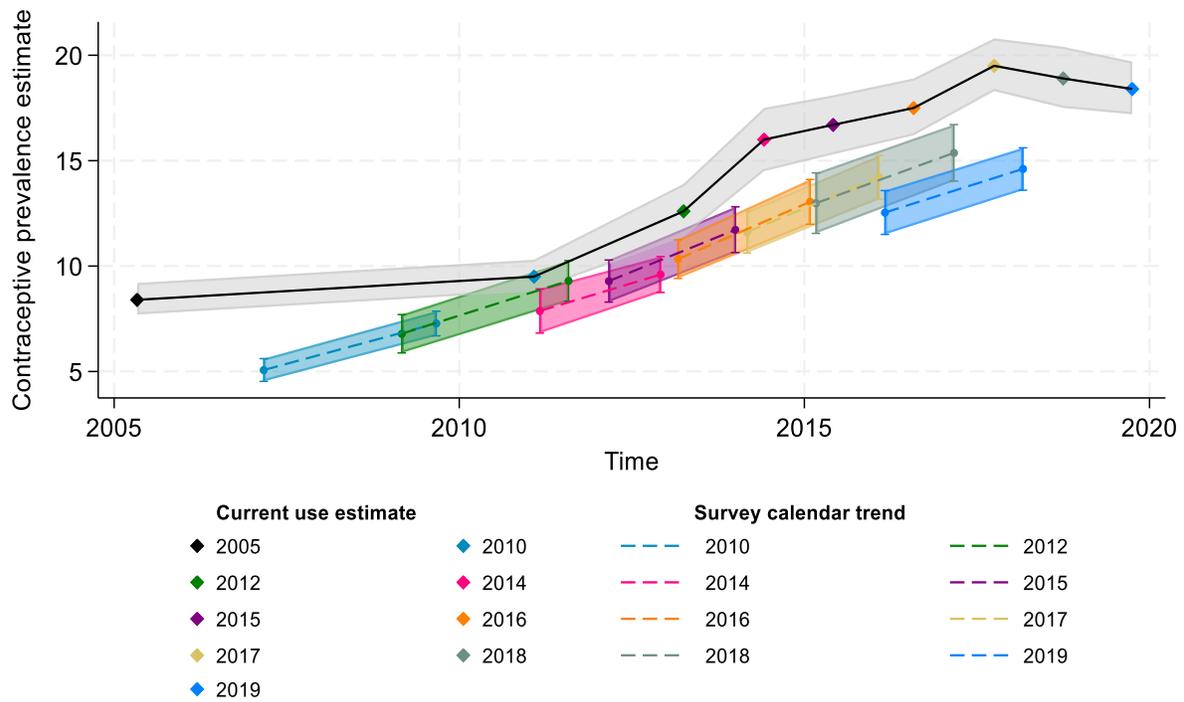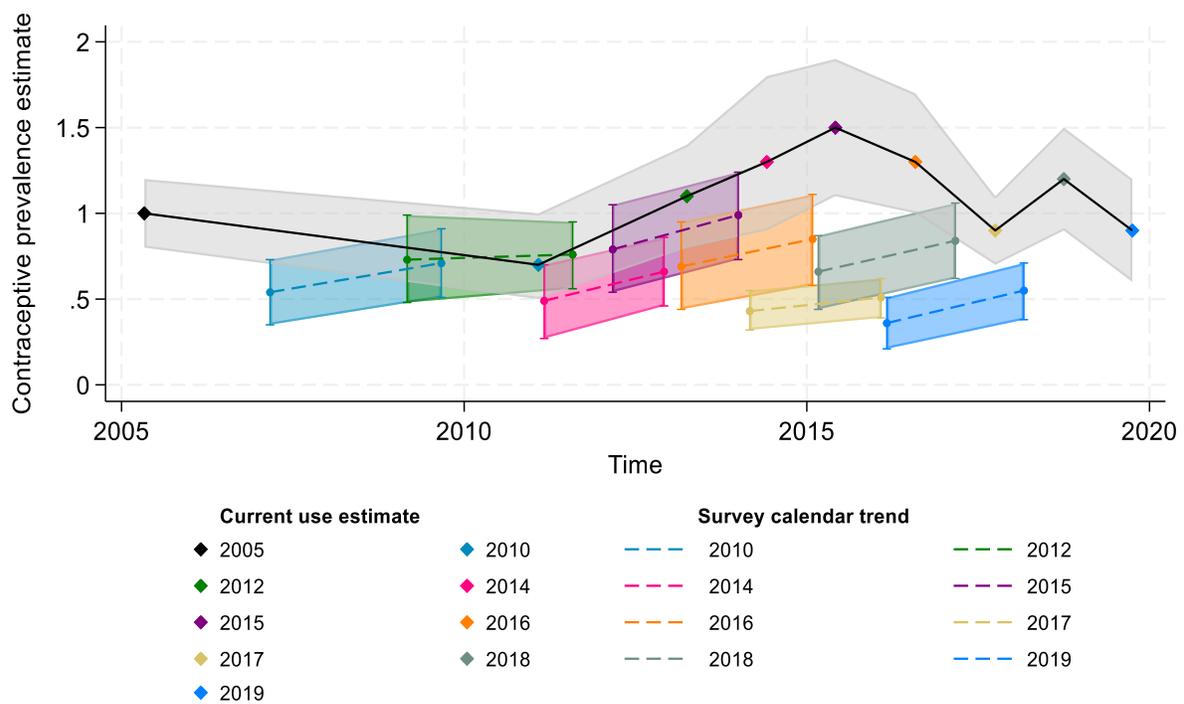
b. Traditional contraceptive prevalence

## c. Coitus-based contraceptive prevalence
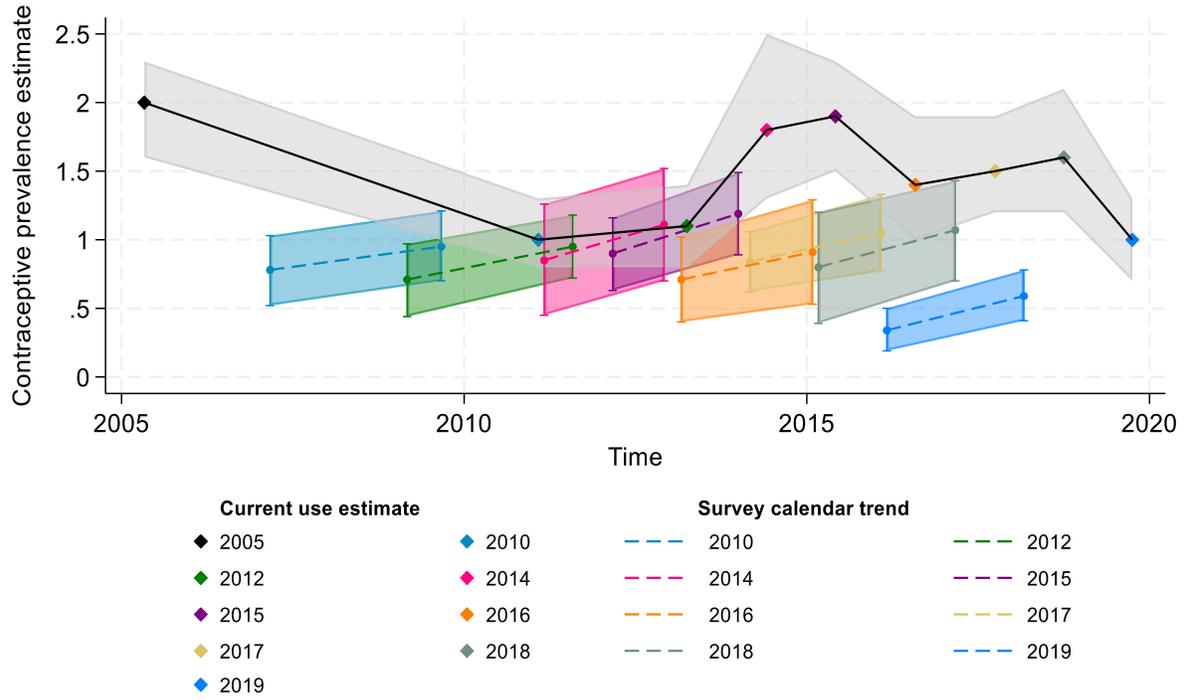
**Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Sierra Leone**

## a. Overall contraceptive prevalence
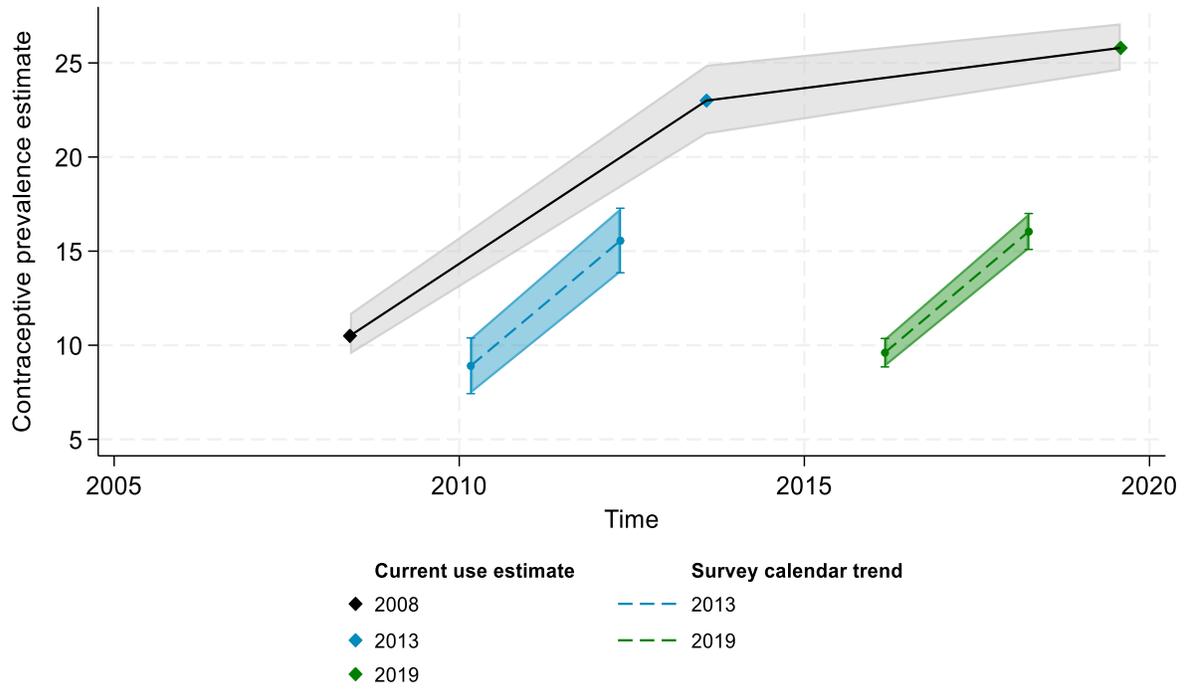


## b. Traditional contraceptive prevalence
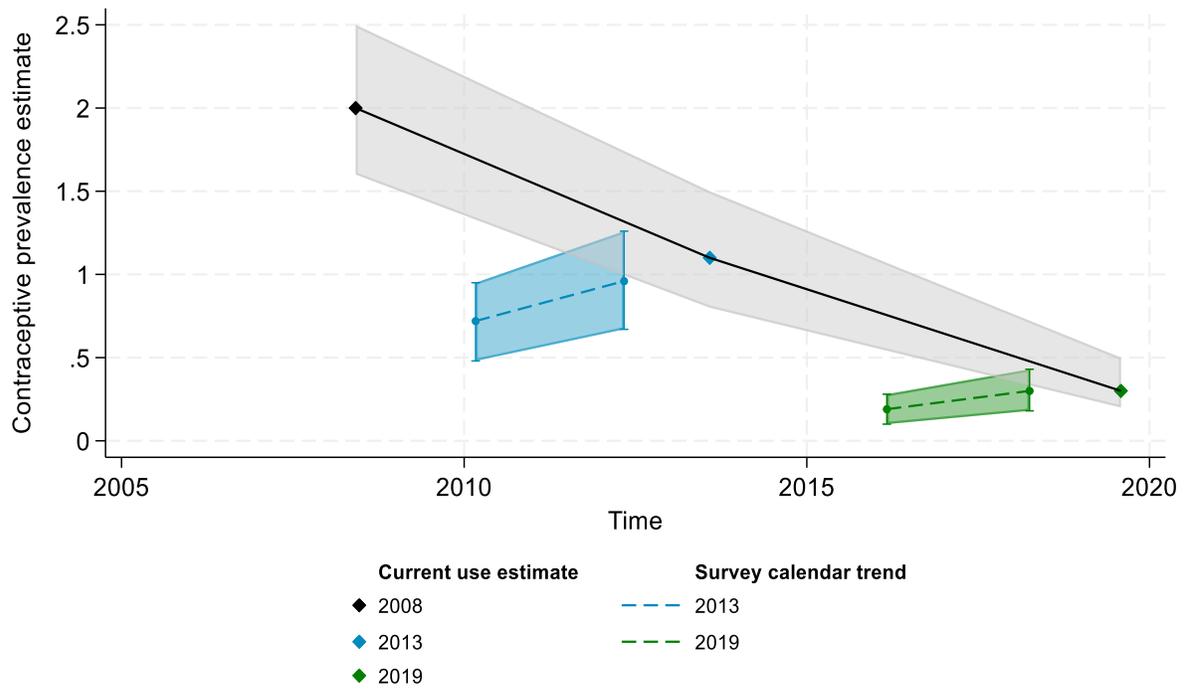
c. Coitus-based contraceptive prevalence
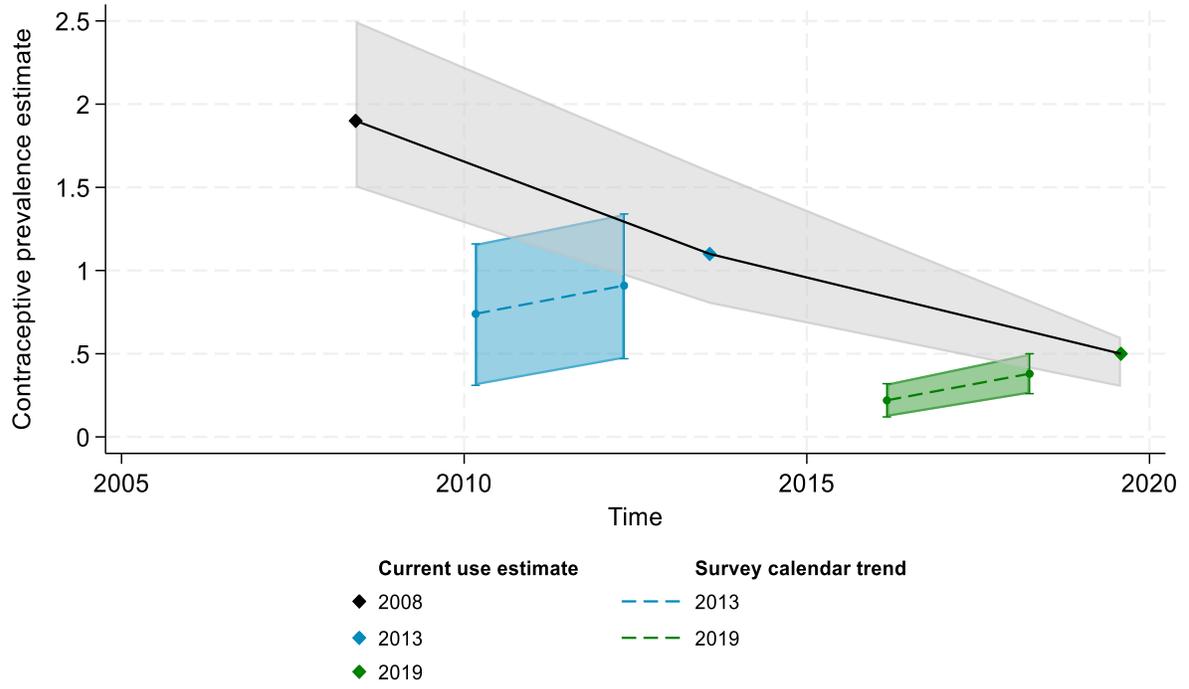
**Appendix Figure 30  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Tajikistan**

a. Overall contraceptive prevalence
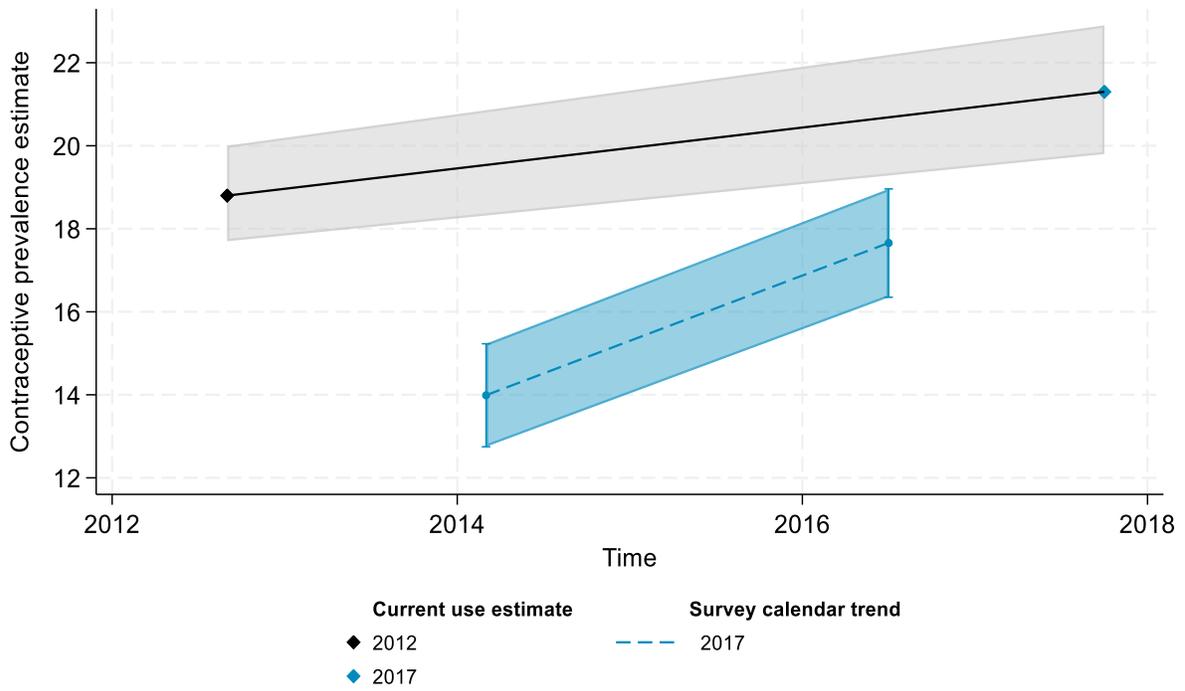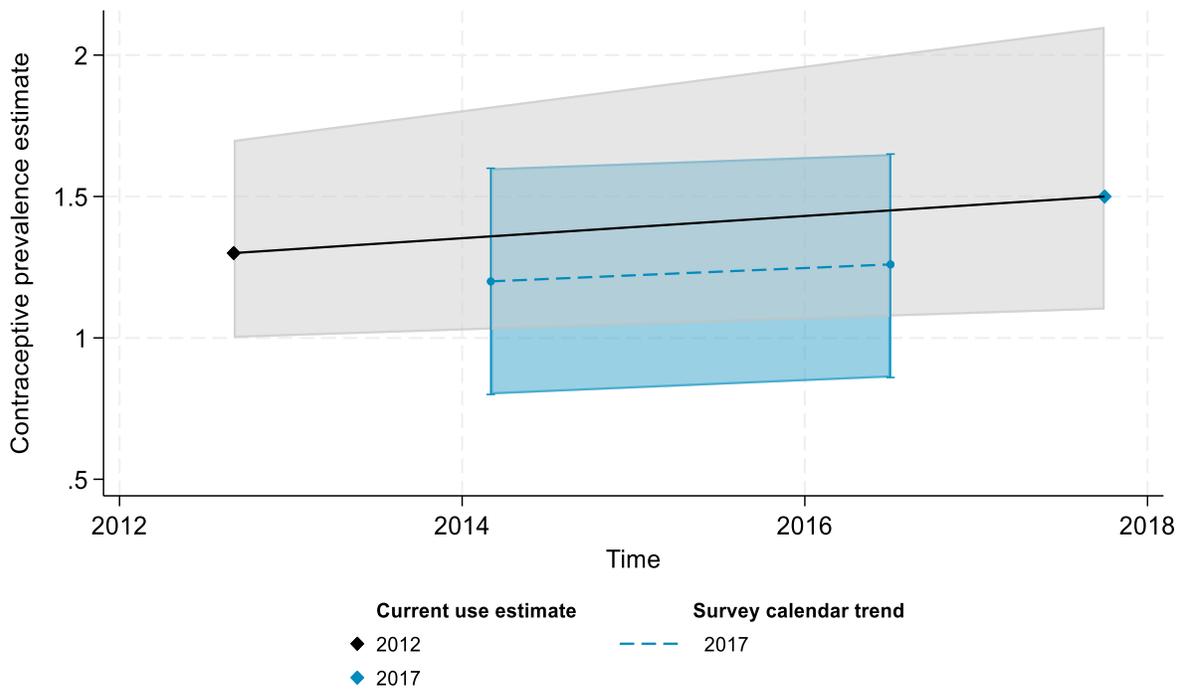


b. Traditional contraceptive prevalence

### c. Coitus-based contraceptive prevalence
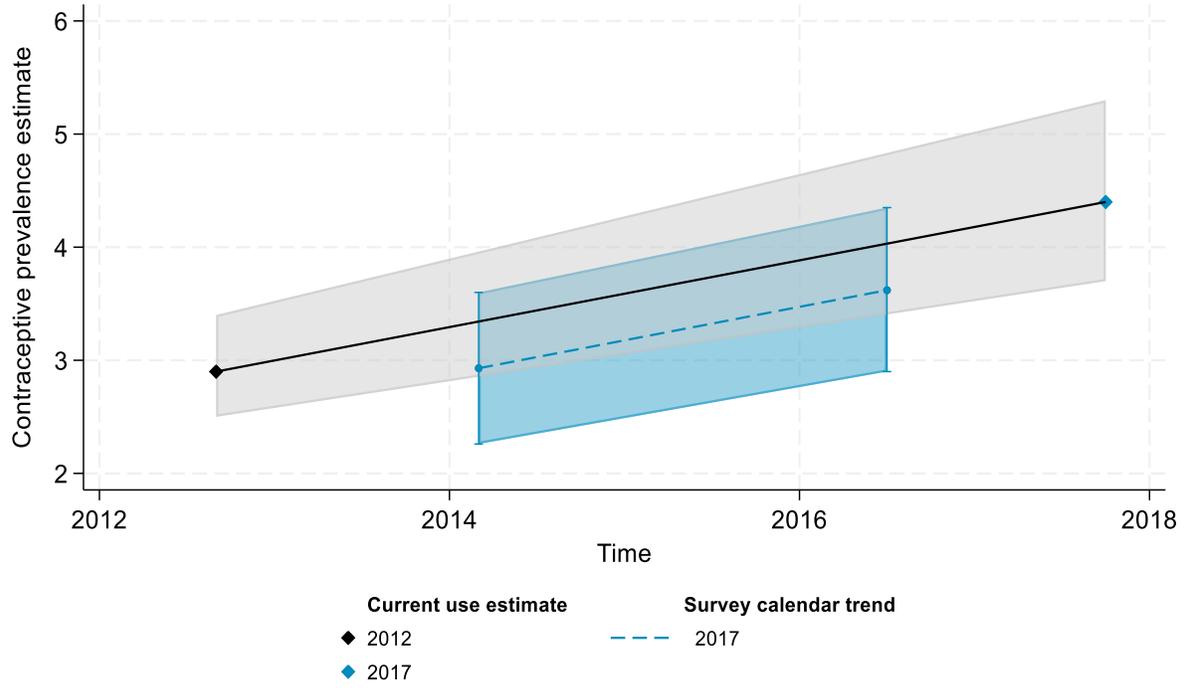
**Appendix Figure 31  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Turkey**

## a. Overall contraceptive prevalence
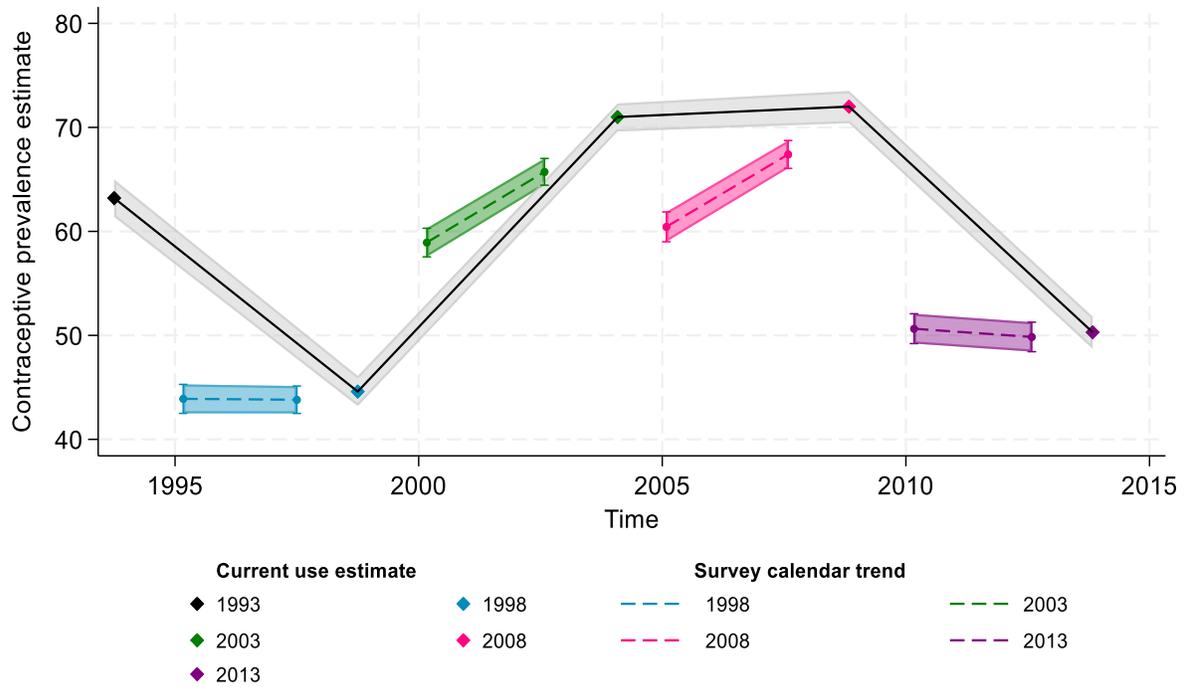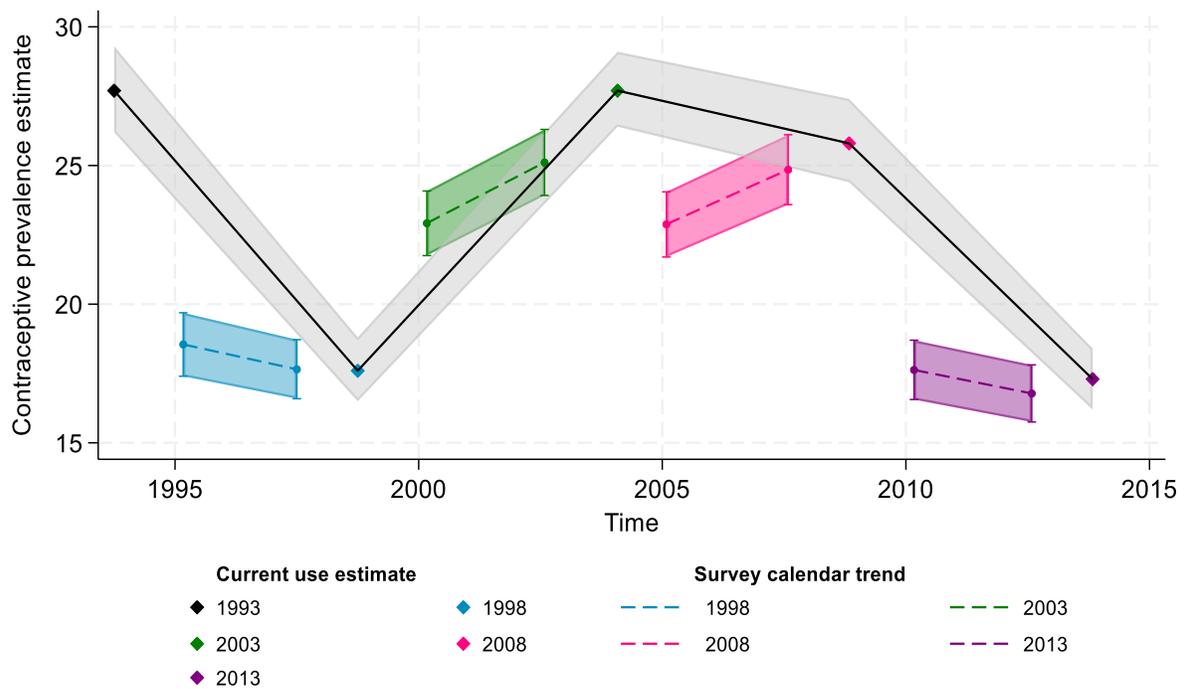


## b. Traditional contraceptive prevalence

## c. Coitus-based contraceptive prevalence
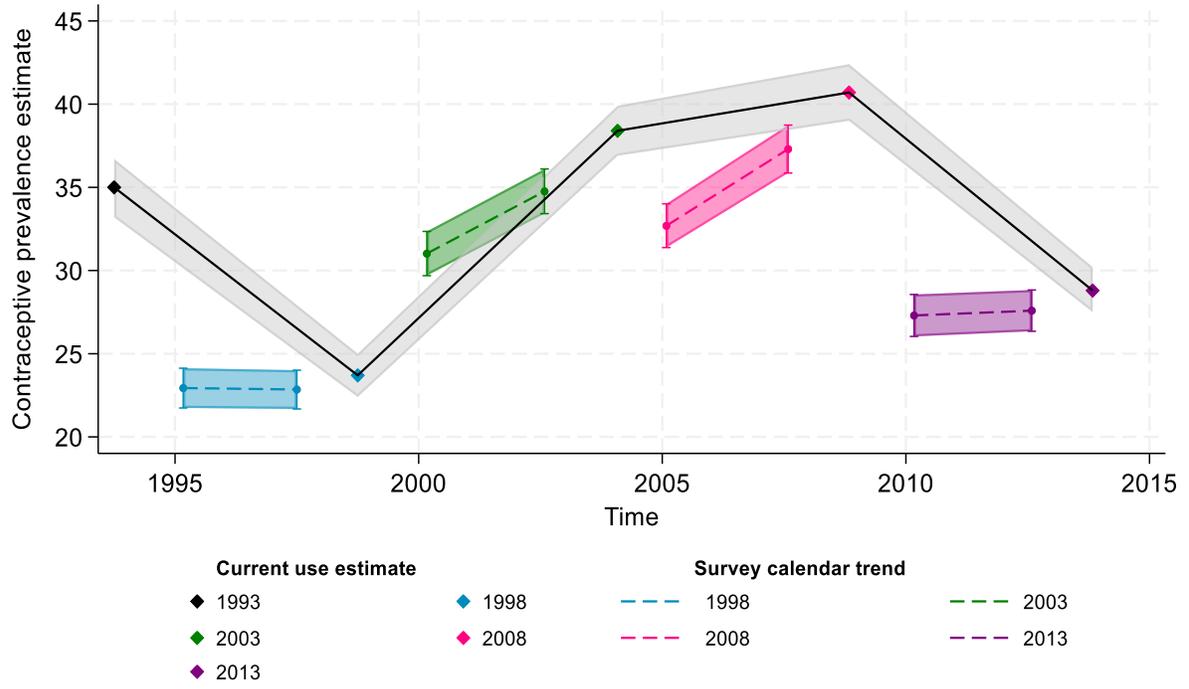
**Appendix Figure 32  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Tanzania**

### a. Overall contraceptive prevalence
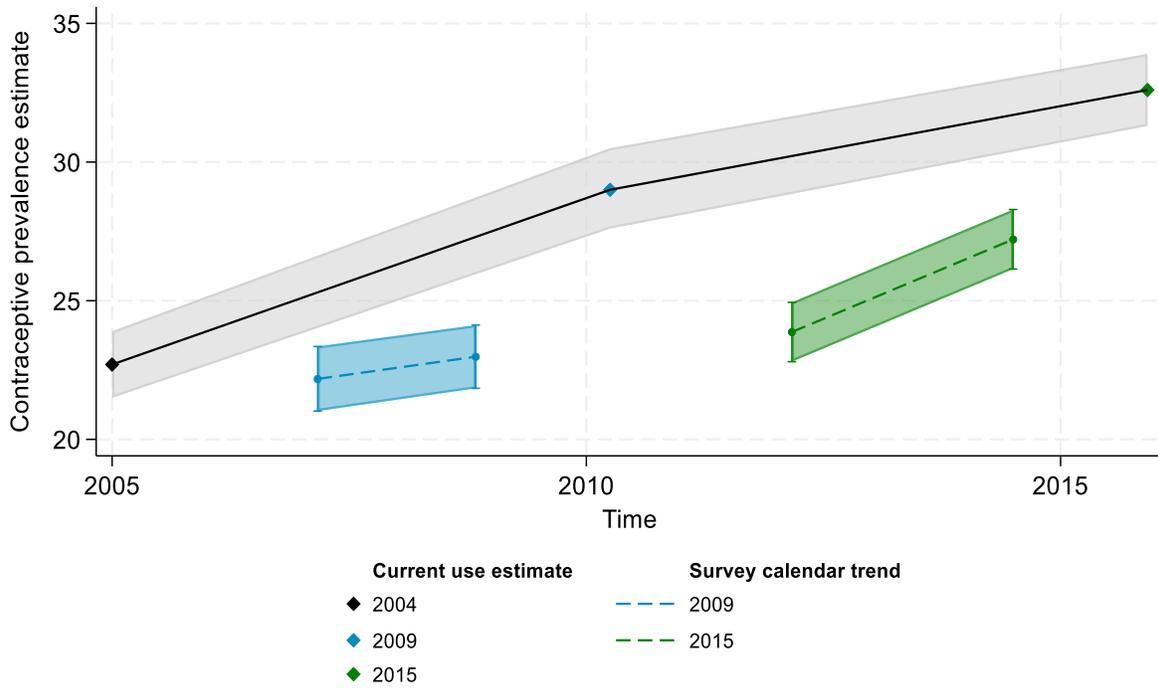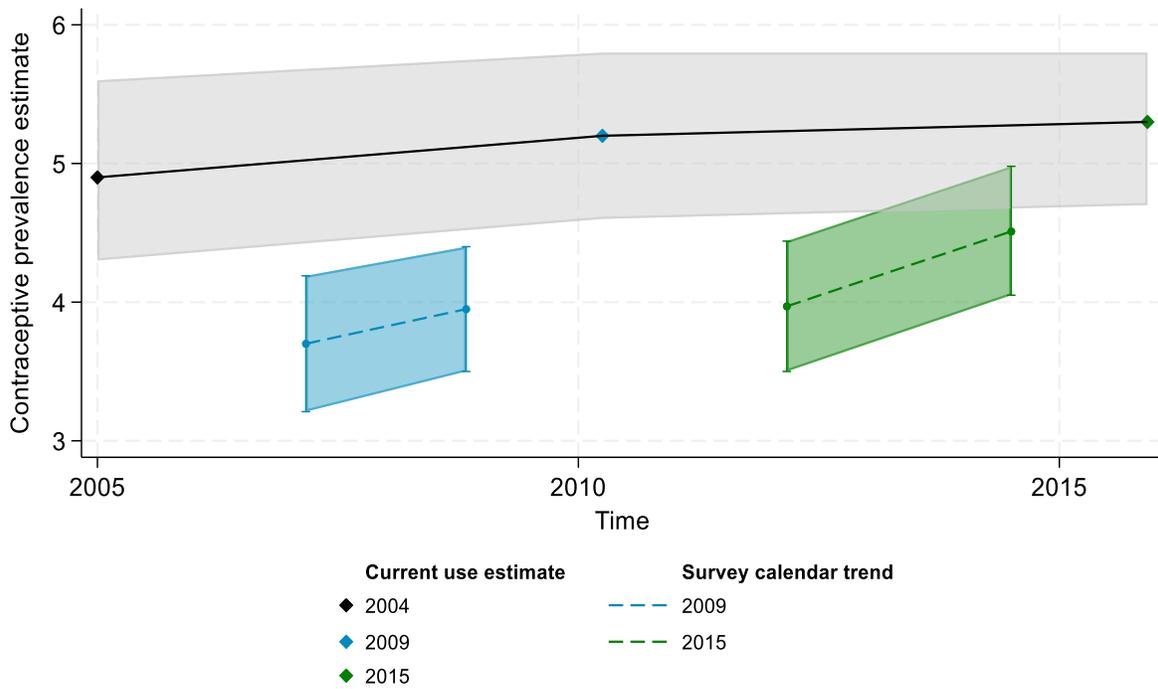


### b. Traditional contraceptive prevalence

c. Coitus-based contraceptive prevalence
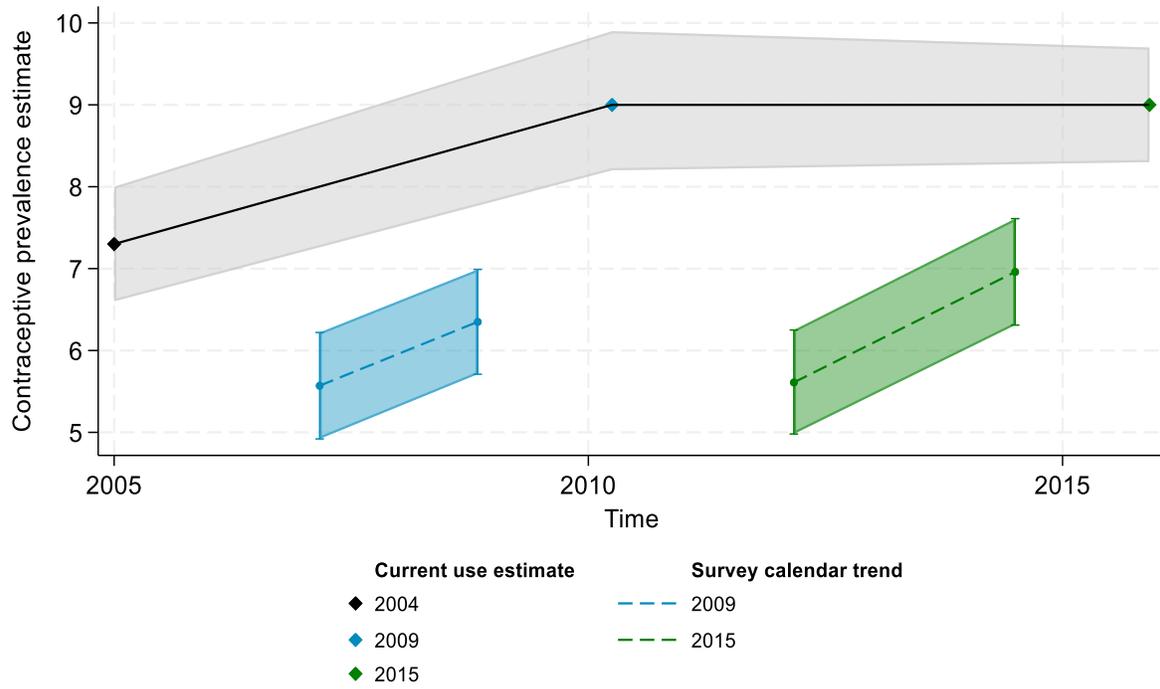
**Appendix Figure 33  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Uganda**



a. Overall contraceptive prevalence
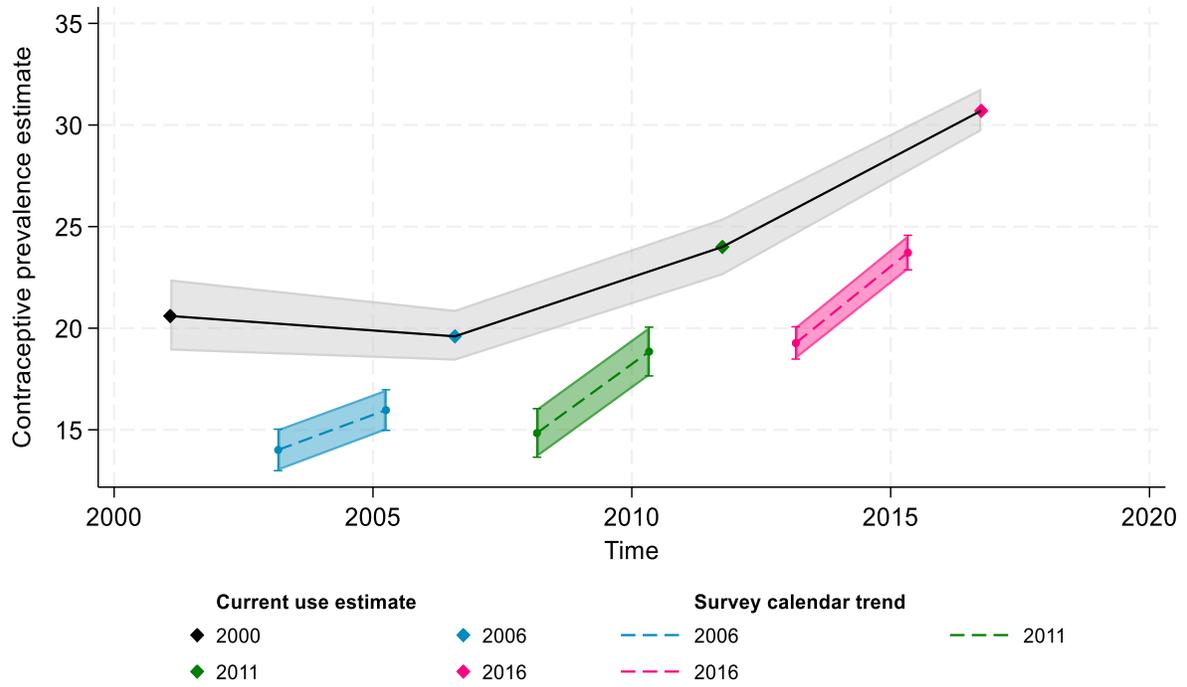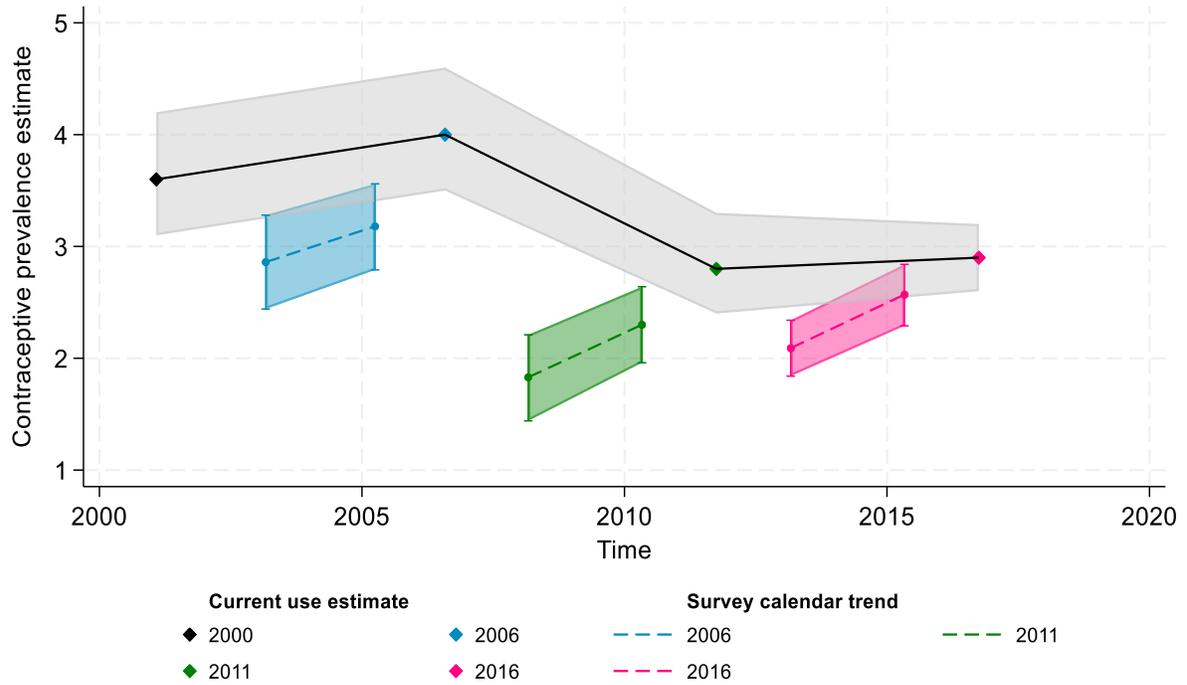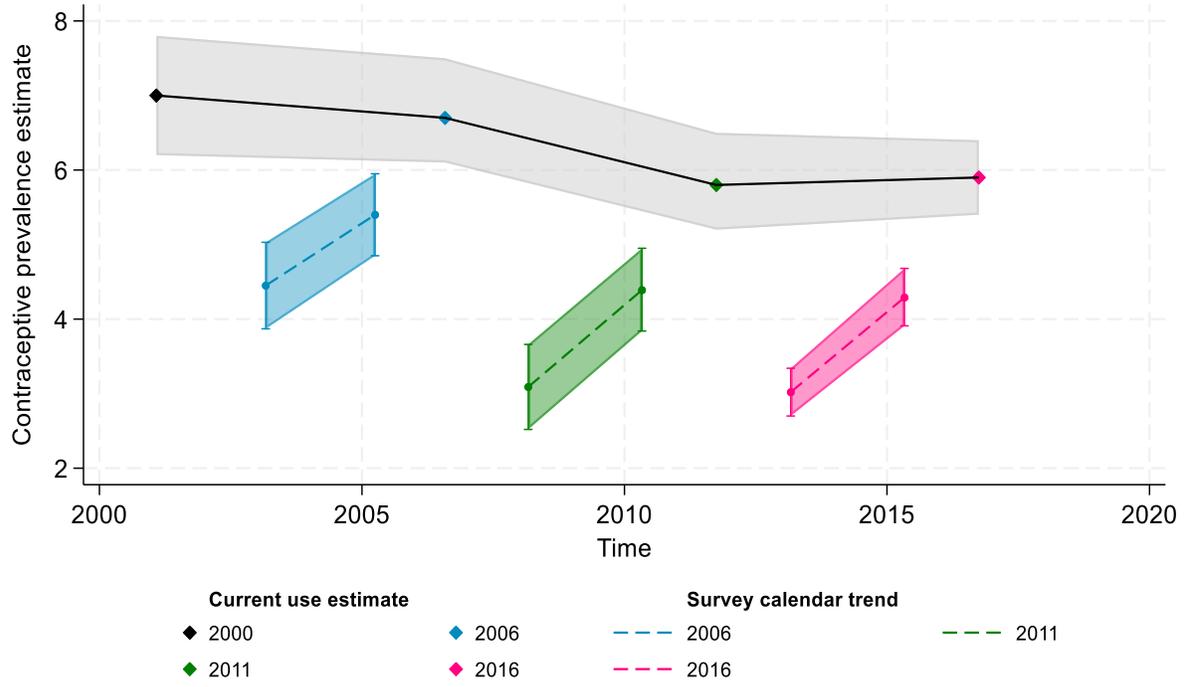


b. Traditional contraceptive prevalence

### c. Coitus-based contraceptive prevalence
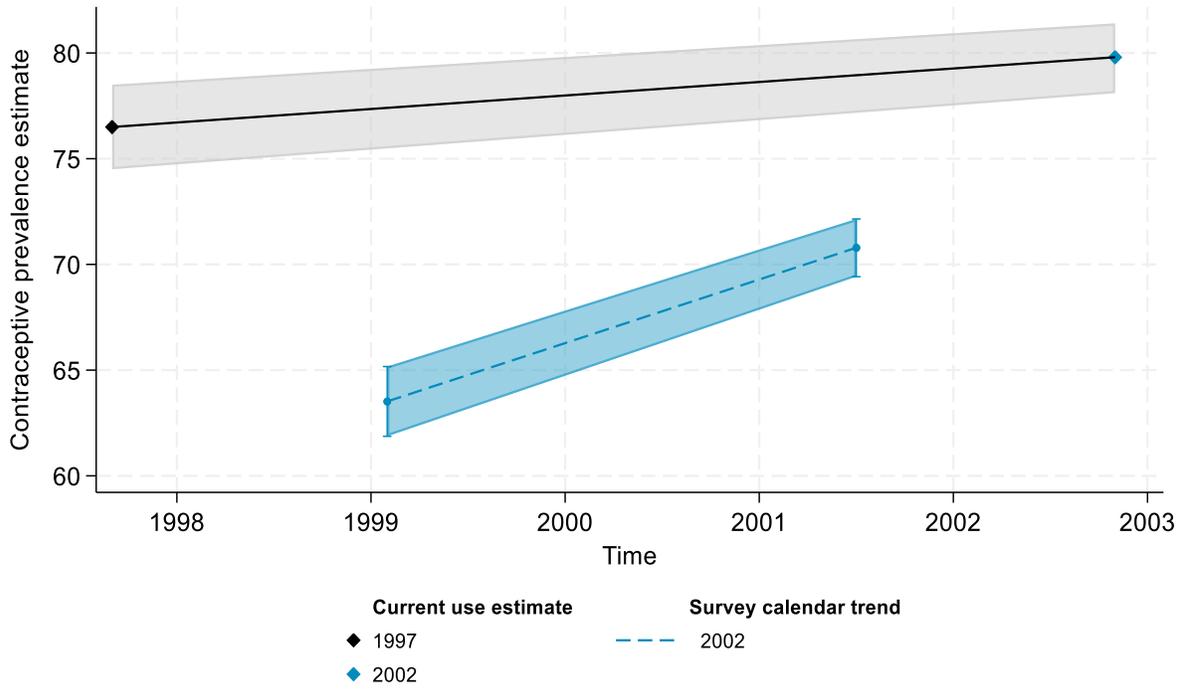
## a. Overall contraceptive prevalence
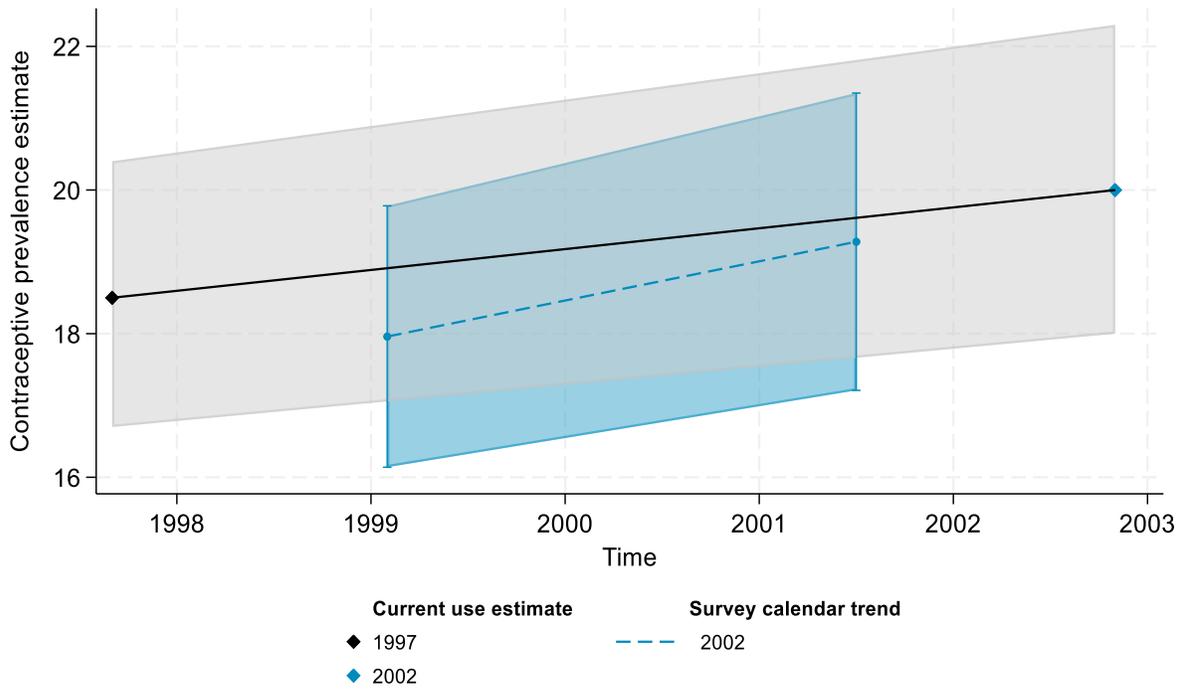


## b. Traditional contraceptive prevalence

## c. Coitus-based contraceptive prevalence
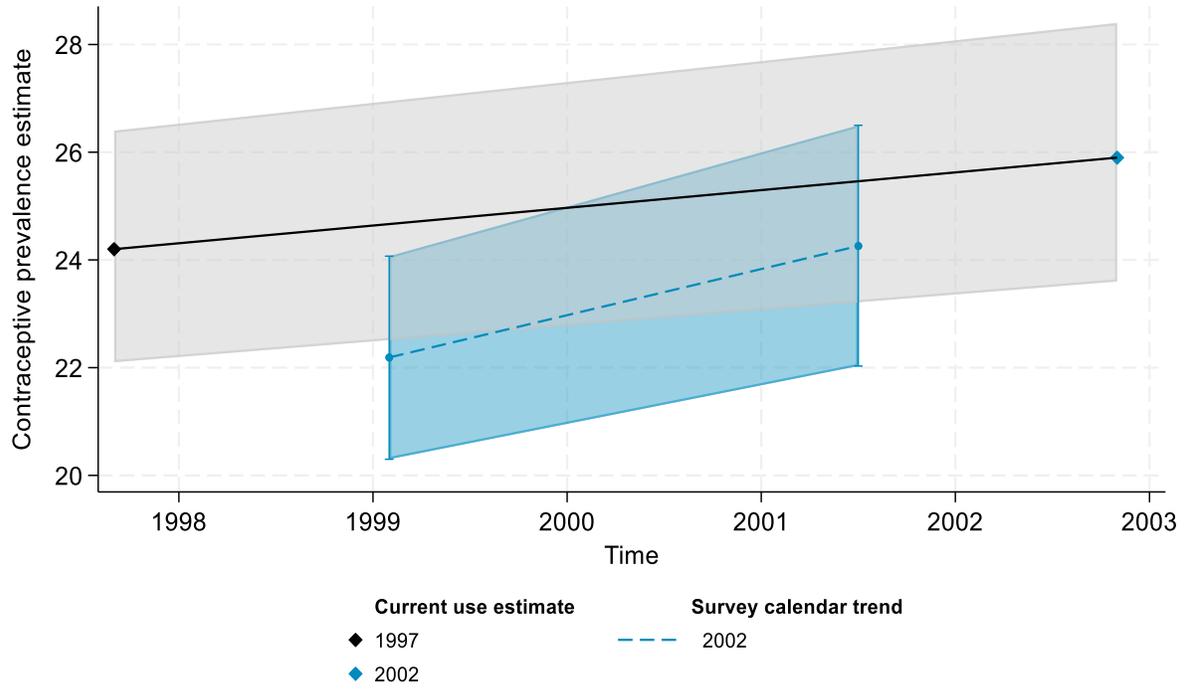
**Appendix Figure 35  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Zambia**



a. Overall contraceptive prevalence
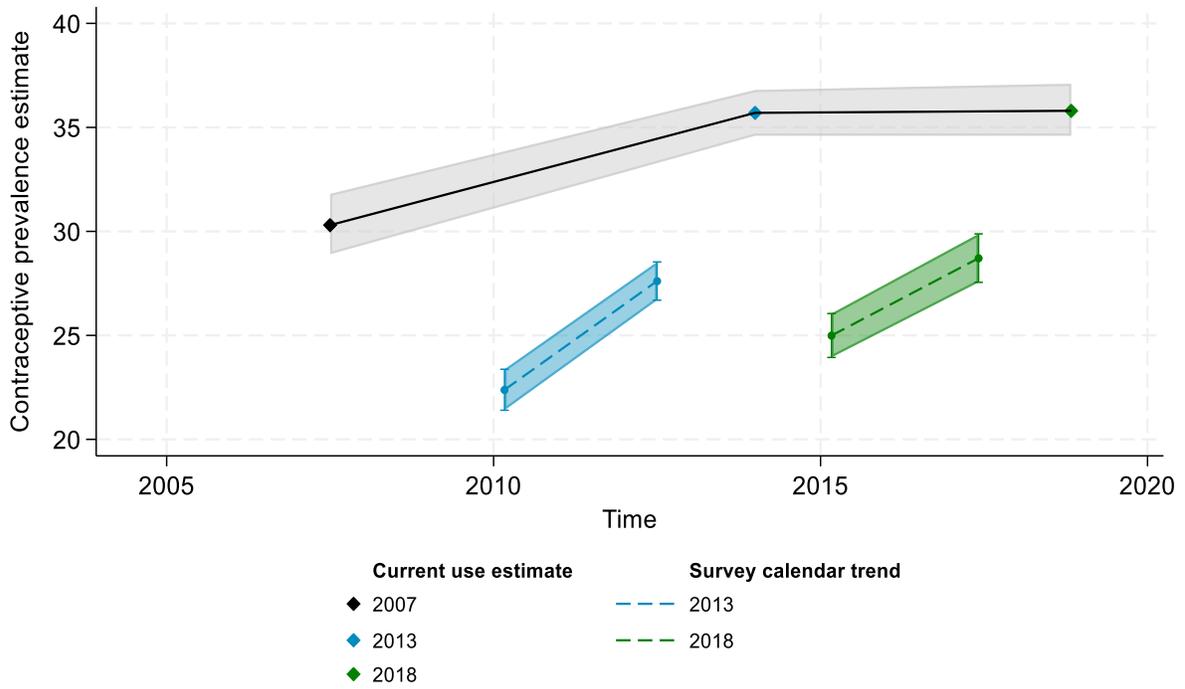


b. Traditional contraceptive prevalence
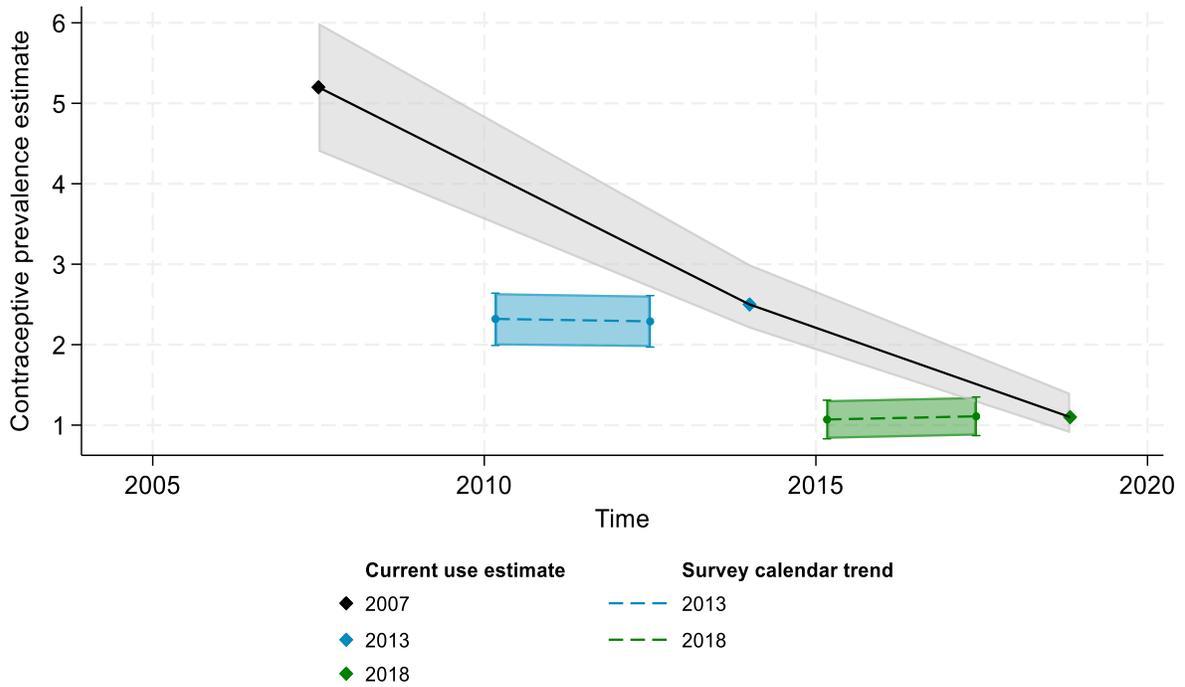
c. Coitus-based contraceptive prevalence
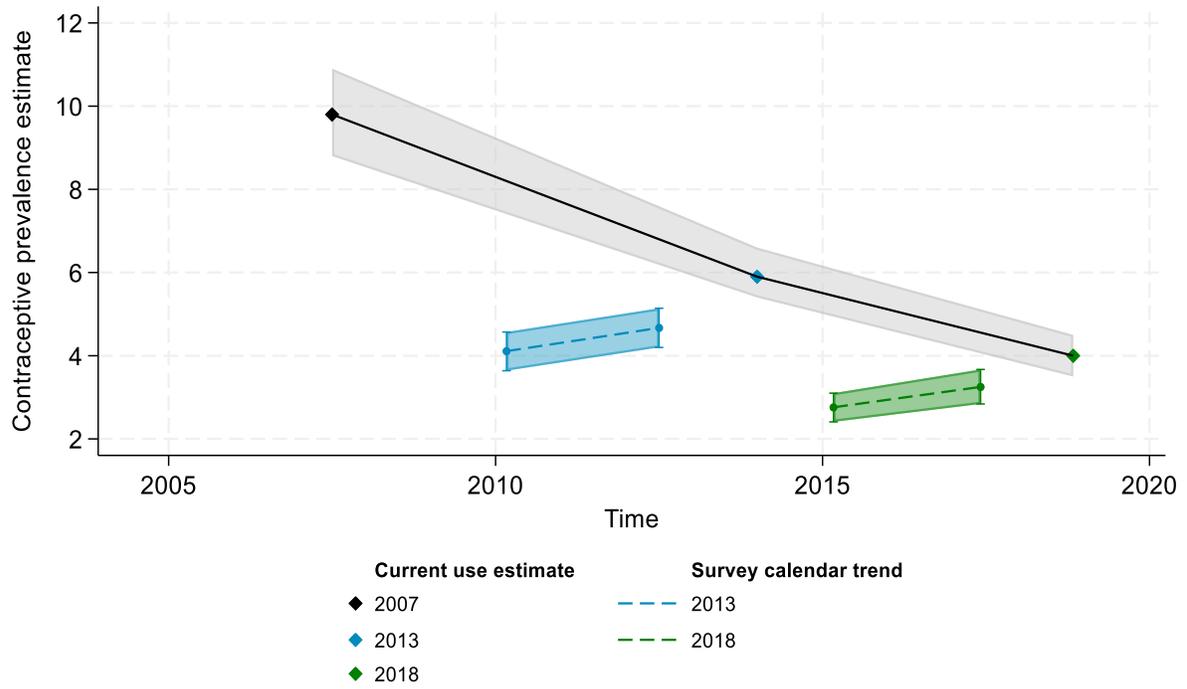
**Appendix Figure 36  Overall, traditional, and coitus-based contraceptive prevalence among women age 15–43, comparing current use and calendar estimates, Zimbabwe**

## a. Overall contraceptive prevalence



## b. Traditional contraceptive prevalence

## c. Coitus-based contraceptive prevalence



Current use estimate
- ◆ 1994
- ◆ 1999
- ◆ 2005
- ◆ 2010
- ◆ 2015

Survey calendar trend
- --- 1999
- --- 2005
- --- 2010
- --- 2015