DHS Reproductive Calendar Data, Simplified
Webinar info

• Please use the Q&A function for questions
• We’ll break for Q&A but enter your questions at any time
Overview

• Introduction to reproductive calendar data
• How IPUMS DHS simplifies use of calendar data
• How to use the IPUMS DHS calendar data
• Additional considerations
INTRODUCTION TO REPRODUCTIVE CALENDAR DATA
Research with calendar data
Contraceptive use

Contraceptive Switching after Method-related Discontinuation: Levels and Differentials

Mohamed M Ali and John Cleland

Anemic Women are More at Risk of Injectable Contraceptive Discontinuation due to Side Effects in Ethiopia

Rose Stevens, Blandine Malbos, Eshetu Gurmu, Jérémie Riou, and Alexandra Alvergne
Contraceptive failure

Global Contraceptive Failure Rates: Who Is Most at Risk?

Sarah E.K. Bradley, Chelsea B. Polis, Akinrinola Bankole, and Trevor Croft
Birth spacing

Intimate partner violence and pregnancy spacing: results from a meta-analysis of individual participant time-to-event data from 29 low-and-middle-income countries

Lauren Maxwell,1 Arijit Nandi,1,2 Andrea Benedetti,1 Karen Devries,3 Jennifer Wagman,4 Claudia García-Moreno5

Short interpregnancy interval and low birth weight births in India: Evidence from National Family Health Survey 2015-16

Ajit Kumar Kannaujiya a,∗, Kaushalendra Kumar b, Ashish Kumar Upadhyay a, Lotus McDougal c, Anita Raj c, Abhishek Singh b
Estimating infertility prevalence in low-to-middle-income countries: an application of a current duration approach to Demographic and Health Survey data

Chelsea B. Polis¹,²,*, Carie M. Cox³, Özge Tunçalp⁴, Alexander C. McLain⁵, and Marie E. Thoma⁶
The original DHS calendar data
DHS Data

- Data collection dates back to the 1980s
- Covers over 90 countries; administered about every five years
- Samples women of childbearing age (15-49 years old)
- Covers many health topics
- Basis for other important surveys, like MICS and PMA
DHS calendar data

Month-by-month retrospective reports of pregnancies, births, contraceptive use and discontinuation and other information

Generally, cover five years (60 months)

Makes longitudinal analysis possible with cross-sectional data
Categories of calendar-data variables

Pregnancies & births
## Reporting a reproductive calendar

<table>
<thead>
<tr>
<th>01</th>
<th>02</th>
<th>03</th>
<th>04</th>
<th>05</th>
<th>06</th>
<th>07</th>
<th>08</th>
<th>09</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAN</td>
<td>FEB</td>
<td>MAR</td>
<td>APR</td>
<td>MAY</td>
<td>JUN</td>
<td>JUL</td>
<td>AUG</td>
<td>SEP</td>
<td>OCT</td>
<td>NOV</td>
<td>DEC</td>
</tr>
<tr>
<td>24</td>
<td>23</td>
<td>22</td>
<td>21</td>
<td>20</td>
<td>19</td>
<td>18</td>
<td>17</td>
<td>16</td>
<td>15</td>
<td>14</td>
<td>13</td>
</tr>
</tbody>
</table>

### 2014

- **Sara**

  - 02 FEB: 23
  - 03 MAR: 22
  - 04 APR: 21
  - 05 MAY: 20
  - 06 JUN: 19
  - 07 JUL: 18
  - 08 AUG: 17
  - 09 SEP: 16
  - 10 OCT: 15
  - 11 NOV: 14
  - 12 DEC: 13

### 2015

- **Col 1**

  - 01 JAN: 24
  - 02 FEB: 23
  - 03 MAR: 22
  - 04 APR: 21
  - 05 MAY: 20
  - 06 JUN: 19
  - 07 JUL: 18
  - 08 AUG: 17
  - 09 SEP: 16
  - 10 OCT: 15
  - 11 NOV: 14
  - 12 DEC: 13

- **Col 2**

  - 01 JAN: 24
  - 02 FEB: 23
  - 03 MAR: 22
  - 04 APR: 21
  - 05 MAY: 20
  - 06 JUN: 19
  - 07 JUL: 18
  - 08 AUG: 17
  - 09 SEP: 16
  - 10 OCT: 15
  - 11 NOV: 14
  - 12 DEC: 13

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*Note: The table and diagram illustrate a reproductive calendar for an individual named Sara, showing her monthly activity dates for the years 2014 and 2015.*
Learn on your own

The Demographic and Health Surveys (DHS) Program

Contraceptive Calendar Tutorials
Questions?

Please use the Q&A function at the bottom of your screen for questions
IPUMS DHS calendar data

A simpler alternative to the original DHS data
What is IPUMS DHS?

IPUMS DHS is a collection of consistently coded and documented DHS data available for free over the Internet.
Advantages of IPUMS DHS

- Harmonized variables
- Harmonized geography
- Discovery: easily determine which samples have which variables
- Documentation, such as survey text, at user fingertips
- Cross-sample identifiers
Samples and countries

To date, standard, continuous, and interim DHS surveys for:
• 170 samples
• 41 countries
• Africa, Middle East, and South Asia
IPUMS DHS makes using the calendar data simpler
Survey format

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>JAN</td>
<td>01</td>
</tr>
<tr>
<td>2014</td>
<td>FEB</td>
<td>02</td>
</tr>
<tr>
<td>2014</td>
<td>MAR</td>
<td>03</td>
</tr>
<tr>
<td>2014</td>
<td>APR</td>
<td>04</td>
</tr>
<tr>
<td>2014</td>
<td>MAY</td>
<td>05</td>
</tr>
<tr>
<td>2014</td>
<td>JUN</td>
<td>06</td>
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<tr>
<td>2014</td>
<td>JUL</td>
<td>07</td>
</tr>
<tr>
<td>2014</td>
<td>AUG</td>
<td>08</td>
</tr>
<tr>
<td>2014</td>
<td>SEP</td>
<td>09</td>
</tr>
<tr>
<td>2014</td>
<td>OCT</td>
<td>10</td>
</tr>
<tr>
<td>2014</td>
<td>NOV</td>
<td>11</td>
</tr>
<tr>
<td>2014</td>
<td>DEC</td>
<td>12</td>
</tr>
<tr>
<td>2015</td>
<td>JAN</td>
<td>13</td>
</tr>
<tr>
<td>2015</td>
<td>FEB</td>
<td>14</td>
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<tr>
<td>2015</td>
<td>MAR</td>
<td>15</td>
</tr>
<tr>
<td>2015</td>
<td>APR</td>
<td>16</td>
</tr>
<tr>
<td>2015</td>
<td>MAY</td>
<td>17</td>
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<tr>
<td>2015</td>
<td>JUN</td>
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<tr>
<td>2015</td>
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<tr>
<td>2015</td>
<td>AUG</td>
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<td>2015</td>
<td>SEP</td>
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</tr>
<tr>
<td>2015</td>
<td>OCT</td>
<td>22</td>
</tr>
<tr>
<td>2015</td>
<td>NOV</td>
<td>23</td>
</tr>
<tr>
<td>2015</td>
<td>DEC</td>
<td>24</td>
</tr>
</tbody>
</table>

P: Paid
B: Balances
L: Late
Original DHS data format
Original DHS data format
Some complicated steps are unnecessary with IPUMS DHS
DHS Step 1: Destring the data

Unnecessary with IPUMS
DHS Step 2: Change data format

Wide format

Mo20  Mo21  Mo22  Mo23  Mo24  Mo25  Mo26  Mo27  Mo28  Mo29
  0  B  P  P  P  P  P  P  P  P

Long format

Unnecessary with IPUMS

r  23
P  26
P  27
P  28
P  29
DHS Step 3: Put data in time order

Unnecessary with IPUMS
IPUMS DHS includes some useful features
New variables

- **Count variables**: how many times an event happened in the five years
- **Censoring variables**: incomplete events
- **Categorical variables**: e.g., all possible things that happen in a month as a single variable
Additional benefits

• Consistent numeric codes for every variable
• Zeros
• Household variables are available without merging files
• Easy data discovery
• Documentation
Questions?

Please use the Q&A function at the bottom of your screen for questions.
How to access IPUMS DHS calendar data
HEALTH-RELATED MICRODATA FOR LOW- AND MIDDLE-INCOME COUNTRIES

IPUMS-DHS facilitates analysis of Demographic and Health Surveys, administered in low- and middle-income countries since the 1980s. IPUMS-DHS contains thousands of consistently coded variables on the health and well-being of women, children, births, men, and on all members of randomly selected households, for 32 African countries and 9 Asian countries. Users can determine variable availability at a glance and create data files with just the variables and samples they need.

41 COUNTRIES — 170 SAMPLES — OVER 15,000 VARIABLES — 27 MILLION PERSON RECORDS

USE IT FOR GOOD — NEVER FOR EVIL
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WOMEN</strong></td>
<td>EACH RECORD WILL BE A WOMAN OF CHILDBEARING AGE</td>
</tr>
<tr>
<td><strong>CHILDREN</strong></td>
<td>EACH RECORD WILL BE A CHILD UNDER AGE 5</td>
</tr>
<tr>
<td><strong>BIRTHS</strong></td>
<td>EACH RECORD WILL BE A BIRTH REPORTED BY A WOMAN OF CHILDBEARING AGE</td>
</tr>
<tr>
<td><strong>HOUSEHOLD MEMBERS</strong></td>
<td>EACH RECORD WILL BE A HOUSEHOLD MEMBER</td>
</tr>
<tr>
<td><strong>MEN</strong></td>
<td>EACH RECORD WILL BE A MAN</td>
</tr>
<tr>
<td><strong>WOMAN MONTHS</strong></td>
<td>EACH RECORD WILL BE A WOMAN-MONTH FROM RETROSPECTIVE CALENDAR DATA.</td>
</tr>
</tbody>
</table>
Log in using DHS program credentials

Select samples & variables

Select samples and variables to build a data extract.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Variable Label</th>
<th>Benin</th>
<th>Mali</th>
<th>Nigeria</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALEVENTWFP</td>
<td>Any pregnancy, birth, termination, or contraceptive use for woman month (no/yes)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CALCONTR</td>
<td>Contraception used during woman-month</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CALCONTR_TOTAL</td>
<td>Number of months women used contraception during calendar period</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CALCONTR_START</td>
<td>Initiated using contraceptive method during woman-month</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CALCONTR_CHANGE</td>
<td>Initiated using a different contraceptive method during woman-month</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CALCONTR_STOP</td>
<td>Final month of period of continuous use of a contraceptive method</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CALCONTR_STOP_TOTAL</td>
<td>Times stopped period of continuous use of a contraceptive method</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CALREASON</td>
<td>Reason for discontinuation of contraceptive</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Description

CALCONTR is a dichotomous variable (0 for no, 1 for yes) indicating whether the woman used a contraceptive method during that month of the calendar period.

The related variable CALCONTR\_TOTAL reports the total number of months women used contraception during the entire calendar period.

For information on the type of contraception used during a month, see CALREPROD\_ALLEVENTS.
Comparability — Index

GENERAL

Comparability

Apart from universe differences, CALCONTR is largely comparable across samples. Some samples with a large number of cases coded "not in universe or missing response" include subgroups of women who were not administered the questions to collect calendar data. For details, see the country-specific comparability text for information about why large numbers of cases were coded "9" (not in universe or missing response) in CALCONTR for some samples.

Some other samples that collected data on births, pregnancies, terminations, and contraceptive use included months with missing data (filled with blanks), but all or nearly all women included in the sample had at least one calendar month reporting a meaningful response for a reproductive event. IPUMS DHS has coded the months with missing data in these samples as "Not in universe or missing response" (code 9) in CALCONTR.

Researchers may choose to recode those "not in universe or missing response" cases in CALCONTR as "0" for "No contraceptive use during the month" for their analyses. If so, researchers should not recode as "0" those cases coded as "99" (not in universe) in CALCONTR_TOTAL. Only cases relating to women with no valid calendar data for any month are coded "99" in CALCONTR_TOTAL.
<table>
<thead>
<tr>
<th>Code</th>
<th>Label</th>
<th>Benin</th>
<th>Jordan</th>
<th>Mali</th>
<th>Nigeria</th>
<th>Zambia</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Became pregnant while using</td>
<td>107</td>
<td>2,249</td>
<td>39</td>
<td>891</td>
<td>451</td>
</tr>
<tr>
<td>02</td>
<td>Wanted to become pregnant</td>
<td>1,334</td>
<td>4,602</td>
<td>748</td>
<td>2,289</td>
<td>1,926</td>
</tr>
<tr>
<td>03</td>
<td>Husband disapproved</td>
<td>120</td>
<td>165</td>
<td>144</td>
<td>213</td>
<td>252</td>
</tr>
<tr>
<td>04</td>
<td>Lack of access/availability</td>
<td>23</td>
<td>16</td>
<td>19</td>
<td>60</td>
<td>258</td>
</tr>
<tr>
<td>05</td>
<td>Cost</td>
<td>22</td>
<td>3</td>
<td>6</td>
<td>35</td>
<td>11</td>
</tr>
<tr>
<td>06</td>
<td>Fatalistic</td>
<td>54</td>
<td>8</td>
<td>23</td>
<td>27</td>
<td>16</td>
</tr>
<tr>
<td>07</td>
<td>Doctor's opinion/advice</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>08</td>
<td>Changed method</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>09</td>
<td>Rest</td>
<td>0</td>
<td>105</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Side effects</td>
<td>370</td>
<td>1,655</td>
<td>353</td>
<td>936</td>
<td>1,848</td>
</tr>
<tr>
<td>11</td>
<td>Gained weight</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>Lack of sexual satisfaction</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>Created menstrual problem</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>Health concerns</td>
<td>0</td>
<td>41</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>30</td>
<td>Other method-related</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>31</td>
<td>Wanted more effective method</td>
<td>194</td>
<td>1,616</td>
<td>91</td>
<td>586</td>
<td>550</td>
</tr>
<tr>
<td>32</td>
<td>Inconvenient to use</td>
<td>77</td>
<td>254</td>
<td>16</td>
<td>349</td>
<td>165</td>
</tr>
<tr>
<td>33</td>
<td>IUD fell out</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>34</td>
<td>Method expired</td>
<td>0</td>
<td>32</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>35</td>
<td>Afraid of forgetting method</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>36</td>
<td>Lack of privacy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>37</td>
<td>Did not like method</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>38</td>
<td>Ended breastfeeding/period returned</td>
<td>0</td>
<td>1,533</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>40</td>
<td>Low risk of pregnancy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>41</td>
<td>Infrequent sex/husband away or ill</td>
<td>187</td>
<td>247</td>
<td>69</td>
<td>735</td>
<td>442</td>
</tr>
</tbody>
</table>
Be sure to select the data format that works best for you.

<table>
<thead>
<tr>
<th>SAMPLES:</th>
<th>3</th>
<th>(show)</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>VARIABLES:</td>
<td>50</td>
<td>(show)</td>
<td>Change</td>
</tr>
<tr>
<td>DATA FORMAT:</td>
<td>.dat (fixed-width text)</td>
<td>Change</td>
<td></td>
</tr>
<tr>
<td>ESTIMATED SIZE:</td>
<td>1051.4 MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Examples using IPUMS DHS calendar data
Data in the default LONG format
Long format overview

• Each row is a month of time
• Ideal for studying trends
• Event history or hazard models
Contraceptive discontinuation over time

Kaplan-Meier survival estimates

- Country = Mali
- Country = Nigeria
Perc. women becoming pregnant while using FP

**Injectables**

- Injection
  - 0% - 3%
  - 3% - 6%
  - 6% - 9%
  - 9% - 12%
  - 12% - 15%
  - 15% - 18%
  - 18% - 22%

**Pill**

- Pill
  - 0% - 3%
  - 3% - 6%
  - 6% - 9%
  - 9% - 12%
  - 12% - 15%
  - 15% - 18%
  - 18% - 22%
Data in EVENT format
Event format basics

• Event: change to a new state, e.g., becoming pregnant
• Episode: length of time or duration in this state
• Event files are good for studying:
  – What happens before or after an episode or event
  – Duration, such as 12-month method discontinuation rates
Event data files

• Each row is an episode and includes:
  – Month episode started
  – Month episode stopped
  – Episode duration
  – Events that precede/follow episode
Examples

• How many women switch to a new method after stopping one type?
  – How does this vary across type of method?

• Are short birth-spacing intervals associated with lower-birth weights?

In DHS and IPUMS DHS require some data manipulation
ADDITIONAL CONSIDERATIONS
A limitation: Recall bias

Research shows that the calendar data are most accurate for older women, women who don’t switch methods a lot & for long-acting methods.
IPUMS DHS calendar data files are large

Strategies if you have a slow Internet connection

– Browser extension that facilitates large downloads
– Download one sample at a time
IPUMS PMA is another source for calendar data

pma.ipums.org

MONITORING KEY FAMILY-PLANNING INDICATORS

IPUMS PMA harmonizes the Performance Monitoring for Action (PMA) data series (it was formerly known as Performance Monitoring and Accountability 2020 - PMA2020). It provides an interactive web dissemination system for PMA data with variable documentation on
Learn on your own

MAKING THE CONTRACEPTIVE CALENDAR DATA WORK FOR YOU
Questions?
Thank you very much!
DATA AVAILABLE

USA
U.S. Census and American Community Survey microdata from 1850 to the present.

CPS
Current Population Survey microdata including basic monthly surveys and supplements from 1962 to the present.

INTERNATIONAL
World’s largest collection of census microdata covering nearly 100 countries, contemporary and historical.

TIME USE
U.S. and international time use data from 1965 to the present.

NHGIS
Tabular U.S. Census data and GIS boundary files from 1790 to the present.

GLOBAL HEALTH
Health survey data for Africa and Asia, including harmonized data collections for DHS and PMA2020.

HIGHER ED
Data on the science and engineering workforce in the U.S. from 1993 to the present.

HEALTH SURVEYS
Health survey data from the National Health Interview Survey and the Medical Expenditure Panel Survey.

TERRA
Integrated data on population and the environment from 1960 to the present.
### Summary variables in IPUMS DHS

<table>
<thead>
<tr>
<th>Category</th>
<th>Variable Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What type of event occurred in month?</strong></td>
<td>CALREPROD_ALLEVENTS</td>
<td>Pregnancy, termination, birth, or contraceptive use (by type) occurred</td>
</tr>
<tr>
<td></td>
<td>CALREPROD_PBT</td>
<td>Pregnancy, termination, or birth occurred</td>
</tr>
<tr>
<td><strong>Total events during calendar period</strong></td>
<td>CALCONTR_TOTAL</td>
<td>Total months woman used contraception</td>
</tr>
<tr>
<td></td>
<td>CALPREG_TOTAL</td>
<td>Total months woman was pregnant</td>
</tr>
<tr>
<td></td>
<td>CALBIRTH_TOTAL</td>
<td>Total live births during period</td>
</tr>
<tr>
<td></td>
<td>CALTERM_TOTAL</td>
<td>Total pregnancy terminations during period</td>
</tr>
<tr>
<td></td>
<td>CALABORT_TOTAL</td>
<td>Total abortions during period</td>
</tr>
<tr>
<td></td>
<td>CALMISCAR_TOTAL</td>
<td>Total miscarriages during period</td>
</tr>
<tr>
<td></td>
<td>CALSBIRTH_TOTAL</td>
<td>Total stillbirths during period</td>
</tr>
<tr>
<td></td>
<td>CALCONTR_STOP_TOTAL</td>
<td>Total times woman stopped using contraceptive method during period</td>
</tr>
<tr>
<td><strong>Details on contraceptive use</strong></td>
<td>CALCONTR_START</td>
<td>Woman began using contraceptive method that month</td>
</tr>
<tr>
<td></td>
<td>CALCONTR_CHANGE</td>
<td>Woman began using different contraceptive method that month</td>
</tr>
<tr>
<td></td>
<td>CALCONTR_STOP</td>
<td>Woman stopped using contraceptive method that month</td>
</tr>
<tr>
<td></td>
<td>CALREASON</td>
<td>Reason woman stopped using a contraceptive method</td>
</tr>
<tr>
<td><strong>Details on pregnancy</strong></td>
<td>CALPREG_LENGTH</td>
<td>Cumulative duration of non-truncated pregnancy in months</td>
</tr>
<tr>
<td></td>
<td>CALPREG_LONG</td>
<td>Cumulative duration of non-truncated pregnancy exceeds 9 months</td>
</tr>
<tr>
<td></td>
<td>CALPREG_LC</td>
<td>Duration of reported pregnancy truncated by start of calendar period</td>
</tr>
<tr>
<td></td>
<td>CALPREG_RC</td>
<td>Duration of reported pregnancy truncated by end of calendar period</td>
</tr>
</tbody>
</table>