

# MATERNAL MORTALITY MODULE

	How many years ago did (NAME)						
3	urvey	12 YEARS OF AGE GO TO (2)	12 YEARS OF AGE GO TO (3)	12 YEARS OF AGE GO TO (4)	12 YEARS OF AGE GO TO (5)	DIED FORE 12 YEARS OF AGE GO TO (6)	OR DIED BEFORE 12 YEARS OF AGE GO TO (7)
910	Was (NAME) pregnant when she died?	YES 1 GO TO 913 <b>↓</b> NO 2	YES 1 GO TO 913 ◀ NO 2	YES 1 GO TO 913 ↓ NO 2	YES 1 GO TO 913 ◀ NO 2	YES 1 GO TO 913 ↓ NO 2	YES 1 GO TO 913 ◀ NO 2
911	Did (NAME) die during childbirth?	YES 1 GO TO 913 ◀ NO 2	YES 1 GO TO 913 ◀ NO 2	YES 1 GO TO 913 ◀ NO 2	YES 1 GO TO 913 ◀ NO 2	YES 1 GO TO 913 ↓ NO 2	YES 1 GO TO 913 ◀ NO 2
912	Did (NAME) die within two months after the end of a pregnancy or childbirth?	YES 1 NO 2	YES 1 NO 2	YES 1 NO 2	YES 1 NO 2	YES 1 NO 2	YES 1 NO 2
913	How many live born children did (NAME) give						

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#### SECTION MM. MATERNAL MORTALITY

NO.				I	CODING CA	TEGORIES	6 Aug 2013 SKIP	
MM01	Now I would like to ask you some questions about your brothers and sisters, that is, all of the children born to your natural mother, including those who are living with you, those living elsewhere and those who have died. How many children did your mother give birth to, including you?							
MM02	CHECK MM01: TWO OR M		] (R	ONLY ONE BIR			NEXT	
MM03	How many births di	id your mother have	before you were be		IBER OF CEDING BIRTHS			
MM04	What was the name given to your oldest (next oldest) brother or sister?	(1)	(2)	(3)	(4)	(5)	(6)	
MM05	ls (NAME) male or female?	MALE 1 FEMALE 2						
MM06	ls (NAME) still alive?	YES 1 NO 2 GO TO MM08◀ DK 8 GO TO (2)◀	YES 1 NO 2 GO TO MM08 DK 8 GO TO (3)	YES 1 NO 2 GO TO MM08◀ DK 8 GO TO (4)◀	YES 1 NO 2 GO TO MM08◀ DK 8 GO TO (5)◀	YES 1 NO 2 GO TO MM08◀ DK 8 GO TO (6)◀	YES 1 NO 2 GO TO MM08◀ DK 8 GO TO (7)♥	
MM07	How old is (NAME)?	GO TO (2)	GO TO (3)	GO TO (4)	GO TO (5)	GO TO (6)	GO TO (7)	
MM08	How many years ago did (NAME) die?							
MM09	How old was (NAME) when he/she died?	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (2)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (3)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (4)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (5)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (6)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (7)	
MM10	Was (NAME) pregnant when she died?	YES 1 GO TO MM13◀ NO 2	YES 1 GO TO MM13◀ NO 2	YES 1 GO TO MM134 NO 2	YES 1 GO TO MM13 NO 2	YES 1 GO TO MM13 NO 2	YES 1 GO TO MM13 NO 2	
MM11	Did (NAME) die during childbirth?	YES 1 GO TO MM13◀ NO 2	YES 1 GO TO MM13◀ NO 2	YES 1 GO TO MM13 NO 2	YES 1 GO TO MM13 NO 2	YES 1 GO TO MM13◀ NO 2	YES 1 GO TO MM13 NO 2	
MM12	Did (NAME) die within two months after the end of a pregnancy or childbirth?	YES 1 NO 2						
MM13	How many live born children did (NAME) give birth to during her lifetime?							

MM04	What was the name given to your oldest (next oldest) brother or sister?	(7)	(8)	(9)	(10)	(11)	(12)	
MM05	ls (NAME) male	MALE 1	MALE 1	MALE 1	MALE 1	MALE 1	MALE 1	
	or female?	FEMALE 2	FEMALE 2	FEMALE 2	FEMALE 2	FEMALE 2	FEMALE 2	
MM06	ls (NAME) still alive?	YES 1 NO 2 GO TO MM08← DK 8 GO TO (8)←	YES 1 NO 2 GO TO MM08← DK 8 GO TO (9)←	YES 1 NO 2 GO TO MM08◀ DK 8 GO TO (10)◀	YES 1 NO 2 GO TO MM08◀ DK 8 GO TO (11)◀	YES 1 NO 2 GO TO MM08◀ DK 8 GO TO (12)◀	YES 1 NO 2 GO TO MM08◀ DK 8 GO TO (13)◀	
MM07	How old is (NAME)?	GO TO (8)	GO TO (9)	GO TO (10)	GO TO (11)	GO TO (12)	GO TO (13)	
MM08	How many years ago did (NAME) die?							
MM09	How old was (NAME) when he/she died?	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (8)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (9)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (10)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (11)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (12)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (13)	
MM10	Was (NAME) pregnant when she died?	YES 1 GO TO MM13◀ NO 2	YES 1 GO TO MM13 NO 2	YES 1 GO TO MM13 NO 2	YES 1 GO TO MM13 NO 2	YES 1 GO TO MM134 NO 2	YES 1 GO TO MM134 NO 2	
MM11	Did (NAME) die during childbirth?	YES 1 GO TO MM13 NO 2	YES 1 GO TO MM13 NO 2	YES 1 GO TO MM13 NO 2	YES 1 GO TO MM13 NO 2	YES 1 GO TO MM13 NO 2	YES 1 GO TO MM13 NO 2	
MM12	Did (NAME) die within two months after the end of a pregnancy or childbirth?	YES 1 NO 2	YES 1 NO 2	YES 1 NO 2	YES 1 NO 2	YES 1 NO 2	YES 1 NO 2	
MM13	How many live born children did (NAME) give birth to during her lifetime?							
IF NO M	IF NO MORE BROTHERS OR SISTERS, GO TO NEXT SECTION.							

# Section MM: Adult and Maternal Mortality Module

# Q. MM01: INTRODUCTORY QUESTION

Read the question slowly so the respondent will understand that you are asking her questions on ALL her brothers and sisters, that is, all children born of her *biological* mother. This includes brothers and sisters of the respondent who may have died. The response recorded in Q. MM01 must include the respondent herself.

# Q. MM02: FILTER FOR NO SIBLINGS

Check the answer in MM01. If the mother of the respondent had two or more births, continue with MM03. If the respondent is the only child, go to [NEXT SECTION].

## Q. MM03: NUMBER OF PREVIOUS BIRTHS

Record how many brothers and sisters from her biological mother are older than the respondent herself. By comparing the age of the respondent with that of her brothers and sisters we can verify that the table for brothers and sisters is complete.

# Q. MM04: NAME OF BROTHERS AND SISTERS

Ask and record at the top of the columns the name of each brother or sister of the respondent beginning with the eldest or first-born. Do not include the respondent in a column. Indicate the respondent's place among the siblings by drawing an X on the vertical line between siblings. When the list is complete, you will ask the questions in this section for one sibling before asking about the brother or sister in the next column. Reference the brother or sister by mentioning his/her name.

If the respondent has more than 12 brothers or sisters born of the same mother, take a second Woman Questionnaire, fill in the information on the cover page, and write CONTINUATION on the top. In this second questionnaire, re-number the column numbers in Q. MM04 to (13), (14), etc. and record the additional information about the other siblings.

## Q. MM05: SEX OF BROTHER OR SISTER

Follow standard procedure.

## Q. MM06: SURVIVAL STATUS OF BROTHER OR SISTER

If a brother or sister died (Q. MM06 is NO) go to Q. MM08. If the respondent does not know if the brother or sister is still alive, circle '8' and go to the next column (if there are other brothers and sisters).

## Q. MM07: AGE OF BROTHER OR SISTER

If the brother or sister is alive, you must record their age at their last birthday. If the respondent doesn't know, persist by asking by how many years the brother or sister is younger or older than the respondent.

The ages of sisters who are still alive are used for calculating the years of exposure for estimating maternal mortality rates. After recording the response, go to the next column (if there are other brothers or sisters).

# Q. MM08: NUMBER OF YEARS THAT HAVE PASSED SINCE THE DEATH

This question and others that follow refer only to brothers and sisters who have died. Ask how many years ago the brother/sister died. If the respondent does not know, ask her the year of death and calculate to determine the number of years. You must at least get an estimate.

# Q. MM09: AGE AT DEATH

Age at the time of death is very important information. Make a maximum effort to obtain the response. This information is more important for sisters than for brothers because the age will determine which skip instruction you follow; whether to ask questions MM10-MM13 or whether to go to the next column.

## Q. MM10-MM12: PREGNANT OR GIVING BIRTH WHEN DIED

These questions are asked only for sisters who died at the age of 12 or older. The objective of these questions is to detect cases of maternal mortality. Maternal mortality may happen during pregnancy, during delivery, or during the end of a pregnancy (abortion or still birth) or even during the two months after the end of a pregnancy.

## Q. MM13: SISTER'S LIFETIME NUMBER OF BIRTHS

Ask the total number of births the sister had in her lifetime. Include all children who were born alive. Then proceed to ask questions for the sibling in the next column. If there are no more siblings, go to [NEXT SECTION].

## Notes for the Adult and Maternal Mortality Section:

- 1) The number of columns filled must be equal to the number recorded in Q. MM01 minus 1 (that is the total number of brothers and sisters born to the respondent's mother, minus the respondent herself).
- 2) Indicate the respondent's position in the table by marking an "X" in the right place. The number of columns preceding this position must be equal to the number recorded in Q. MM03.
- 3) If you add Q. MM08 (number of years passed since the death) and Q. MM09 (age at death), this gives the age the brother or sister would have today if he/she were still alive. This calculation can be made to check that the brothers and sisters were recorded in the right order.
- 4) If in Q. MM09 (age at death), the respondent tells you she doesn't know, persist to obtain an estimate. It is preferable to obtain an approximate age than no age at all. However, if the brother or sister died when he/she was still very young, record '00' for age.
- 5) Compare the age of the brothers/sisters. Suppose a woman has a first child at the age of 15 and the last at the age of 47, which is an extreme case, the range between the age of the youngest brother or sister and the eldest brother/sister cannot exceed 47-15 = 32 years.

Cross check to see if the interval between brothers/sisters is very long (5 years and above). If there is a long interval between births, be sure that the respondent has not forgotten to mention a brother or sister.

<u>Table MM.1 Adult mortality rates</u> Direct estimates of female and male mortality rates for the seven years preceding the survey, by five-year age groups, [country, year]					
Age	Deaths	Exposure years	Mortality rates <sup>1</sup>		
<u></u>		VALE			
15-19	38	26,996	1.42		
20-24	52	26,051	1.99		
25-29	51	20,387	2.49		
30-34	68	17,247	3.97		
35-39	28	14,917	1.85		
40-44	33	10,412	3.16		
45-49	18	5,917	3.06		
15-49	288	121,927	2.35ª		
		MALE			
15-19	47	28,503	1.65		
20-24	23	27,180	0.85		
25-29	46	21,459	2.12		
30-34	30	17,734	1.67		
35-39	32	15,002	2.11		
40-44	36	10,539	3.39		
45-49	24	6,188	3.95		
15-49	237	126,605	2.02ª		
<sup>1</sup> Expressed per 1,000 population <sup>a</sup> Age-adjusted rate					

Confidence limits: The confidence limits should be included in a table in the sampling error appendix (see below). Reference the CIs in discussing the 5-year rates. Precision for the 5-year rates is low, and the CIs for many of the rates may overlap, indicating there is likely no statistically significant difference between them.

Table MM.2 Adult mortality probabilities The probability of dying between the ages of 15 and 50 for women and men for the seven years preceding the survey, [country, year]					
	Women	Men			
Survey	35 <b>q</b> 15 <sup>1</sup>	35q15 <sup>1</sup>			
[yyyy country]DHS [prior yyyy country]DHS	159 159	209 209			
<sup>1</sup> The probability of dying between exact ages 15 and 50, expressed per 1,000 person-years of exposure					

- Row 1: The probability of dying between exact ages of 15 and 50 for women (based on sisters reported by female respondents in the Sibling Survival Module) and for men (based on brothers reported by female respondents in the Sibling Survival Module).
- Row 2: This row will be shown only when a prior country survey included the Sibling Survival Module. It shows the probability of dying between exact ages of 15 and 50 for women (based on sisters reported by female respondents in the Sibling Survival Module from the PRIOR survey) and for men (based on brothers reported by female respondents in the Sibling Survival Module from the PRIOR survey).

Confidence limits: The confidence limits for  ${}_{35}q_{15}$  for women and men for the current survey (and the prior survey if applicable) should be included in a table in the sampling error appendix. When comparing rates for women and men or across surveys, refer to the confidence intervals to see if they overlap.

	Percentage of female				
	deaths			Maternal	
	that are	Maternal	Exposure	mortality	
Age	maternal	deaths	years	rate <sup>1</sup>	
15-19	21.1	8	26,996	0.29	
20-24	42.3	22	26,051	0.86	
25-29	47.1	24	20,387	1.20	
30-34	47.1	32	17,247	1.84	
35-39	42.9	12	14,917	0.84	
40-44	45.5	15	10,412	1.44	
45-49	33.3	6	5,917	1.03	
Total 15-49	41.7	120	121,927	0.96ª	
General fertility rate (GFR) <sup>2</sup>	1	72ª			
Maternal mortality ratio (MMR) <sup>3</sup>	5	57 CI: (X, Y	)		
Lifetime risk of maternal death <sup>4</sup>	0	.034			
CI: Confidence interval <sup>1</sup> Expressed per 1,000 woman-years of exposure <sup>2</sup> Expressed per 1,000 women age 15-49 <sup>3</sup> Expressed per 100,000 live births; calculated as the age-adjusted maternal mortality rate times 100 divided by the age-adjusted general fertility rate <sup>4</sup> Calculated as 1-(1-MMR) <sup>TFR</sup> where TFR represents the total fertility rate for the seven years preceding the survey <sup>a</sup> Age-adjusted rate					

The percentage of female deaths that are maternal equals the number of maternal deaths in column 2 of MM.3 divided by the number of adult female deaths in column 1 of MM.1, expressed as a percentage.

The lifetime risk of maternal death is calculated from the MMR using the formula given in the footnote. It is interpreted as the risk of a woman with average fertility dying during pregnancy, childbirth or in the 2 months following a birth throughout the course of her reproductive life. It is expressed as a proportion in the table. For example, a lifetime risk of 0.034 indicates that out of every 100 women, 3.4 (or 3 percent) will have a maternal death. It may be useful to include the percentage and/or the inverse of the proportion in the text for ease of interpretation. For example, a proportion of 0.034 is equivalent to 1 in 29 women.

Confidence limits: The confidence limits for the 5-year and total maternal mortality rates, and the maternal mortality ratio (MMR) should be included in a table in the sampling error appendix. Note that the confidence intervals for the 5-year maternal mortality rates are likely to be especially wide relative to the rate itself. Confidence intervals for many of the 5-year rates are likely to overlap, especially in the older age groups. If you choose to discuss the 5-year maternal mortality rates in the text, refer to the confidence intervals when deciding how to interpret them.

For countries with measurements of the MMR from previous DHS surveys, the report should include Figure MM.1 (below), and the text must include a discussion of whether or not the observed difference can be interpreted as a change in the level of maternal mortality.

The reference periods before each estimate should be the same length. The approximate calendar years included in the reference period should be noted in the figure. If a previous survey included the maternal mortality chapter, but no confidence limits were published, the confidence limits for the previous survey must be calculated and included.



There are three possible outcomes when comparing confidence intervals:

1. **The confidence intervals do not overlap.** In this case, the difference between the estimates is statistically significant, i.e., that the maternal mortality ratio has increased/decreased.

2. The confidence intervals overlap to the extent that either confidence interval encompasses the point estimate of the other survey. In this case, the difference between the estimates cannot be statistically significant. We conclude that the survey has not detected a change. Note that this is not the same as saying that the survey concludes there has been no change. There could be a change that was too small to be detected by the survey. Even with their large sample sizes, DHS surveys are able to detect only large changes in the maternal mortality ratio.

3. The confidence intervals overlap, but neither confidence interval includes the point estimate of the other survey (only the tails overlap). In this case, it is not possible to determine whether or not the difference between the two estimates is statistically significant based on the confidence intervals. The sampling statistical for the survey will need to perform a test to determine whether the difference is statistically significant. The sampling statistician will give you the confidence interval for the difference between the maternal mortality ratios of the two surveys. The difference between the ratios is the simple

arithmetic difference between the point estimates of the two surveys. In the example above, the difference would be 107 maternal deaths per 100,000 live births. If the confidence interval for the difference does not include zero, then the difference between the two surveys is statistically significant. If the confidence interval for the difference includes zero, then the difference between the two surveys is not statistically significant. Include the difference and the confidence level for the difference in a footnote in the chapter, as recommended in options 3a and 3b below.

Most of the time, two consecutive DHS surveys will have independently selected samples. In the event that this is not true, for example if a second survey purposively included clusters from the prior survey or if both surveys were selected from the same master list of clusters (if the master list includes a sample of all of the clusters in the country), consult with your sampling statistician because different formulas must be used to test whether or not a difference is statistically significant when samples are not independent.

The following section includes example text to include in the final report chapter for all of the possible outcomes described above.

1. The confidence intervals do not overlap.

"As shown in Figure MM.1, there is no overlap between the confidence intervals surrounding the estimates of the maternal mortality ratio (MMR) for the [yyyy country] DHS and the [yyyy country] DHS. The difference between the yyyy and yyyy estimates of the MMR is statistically significant and not likely to be due to sampling error. Therefore, it can be concluded that the MMR has [increased/decreased] between the yyyy and yyyy surveys."

2. The confidence interval from either survey encompasses the point estimate from the other survey.

"As shown in Figure MM.1, the confidence intervals for the maternal mortality ratio (MMR) for the [yyyy country] DHS and the [yyyy country] DHS overlap. The confidence interval for the [yyyy country] DHS spans the point estimate of the MMR in the [yyyy country] DHS [and vice versa]. The difference between the yyyy and yyyy estimates of the MMR is not statistically significant. Any change that may have occurred between the two surveys was not large enough to be significant with the sample sizes of the surveys."

3a. The tails of the confidence intervals overlap, and the statistical test concluded the difference is statistically significant.

"As shown in Figure MM.1, the confidence intervals for the maternal mortality ratio (MMR) for the [yyyy country] DHS and the [yyyy country] DHS overlap. Because it is still possible for a difference to be statistically significant even if the confidence intervals overlap, a statistical test of significance was conducted. The test concluded that the difference between the yyyy and yyyy estimates of the MMR is statistically significant and not likely to be due to sampling error<sup>1</sup>. Therefore, it can be concluded that the MMR has [increased/decreased] between the yyyy and yyyy surveys."

## Footnote for 3a:

"<sup>1</sup> The difference in the MMR between the two surveys is X deaths per 100,000 live births. The confidence interval for this difference is (Y,Z). The confidence interval does not include zero, indicating that the difference between the two estimates is statistically significant."

3b. The tails of the confidence intervals overlap, and the statistical test concluded that the difference is <u>not</u> statistically significant.

"As shown in Figure MM.1, the confidence intervals for the maternal mortality ratio (MMR) for the [yyyy country] DHS and the [yyyy country] DHS overlap. Because it is still possible for a difference to be statistically significant even if the confidence intervals overlap, a statistical test of significance was conducted. The test concluded that the difference between the estimates of the MMR for the yyyy and yyyy surveys is not statistically significant. Any change that may have occurred between the two surveys was not large enough to be statistically significant with the sample sizes of the surveys."

#### Footnote for 3b:

<sup>"1</sup> The difference in the MMR between the two surveys is X deaths per 100,000 live births. The confidence interval for this difference is (Y,Z). The confidence interval includes zero, indicating that the difference between the two estimates is not statistically significant."

		Number of cases			Confidence limits			
Variable	Value R	Standard Error SE	Un- weighted N-UNWE	Weighted	Design Effect DEFT	Relative Error SE/R	Lower R-2SE	Upper R+2SI
Vanable	K		OMEN	IN WEIG	DLIT	JL/IX	IN ZJE	1(125)
Adult mortality rates								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44								
45-49								
15-49 (age-adjusted)								
Adult mortality probabilities								
<sub>35</sub> q <sub>15</sub> [survey year]								
35q15 [prior survey year]								
Maternal mortality rates								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44								
45-49								
15-49 (age-adjusted)								
Maternal mortality ratio (MMR)								
[year]								
Maternal mortality ratio (MMR)								
[prior]								
			MEN					
Adult mortality rates								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44								
45-49								
15-49 (age-adjusted)								
Adult mortality probabilities								
35q15 [survey year]								
<sub>35</sub> q <sub>15</sub> [prior survey year]								

This table will be produced by the sampling statistician, and will be placed at the end of the sampling error appendix after the regional tables.

#### C.8 Completeness of Information on Siblings

Completeness of data on survival status of sisters and brothers reported by interviewed women, age of living siblings and age at death (AD) and years since death (YSD) of dead siblings, (unweighted) [country, year]

	Sist	Sisters		Brothers		olings
	Number	Percent	Number	Percent	Number	Percent
All siblings						
Living						
Dead						
Survival status unknown						
Living siblings						
Age reported						
Age missing						
Dead siblings						
AD and YSD reported						
Missing only AD						
Missing only YSD						
Missing AD and YSD						

Working table. Completeness of information for dead sisters
Percentage of sisters who died at ages 15-49 with information missing on whether or not the death was maternal (unweighted), [country, year]
Percent
Deaths that could not be classified as maternal or non-maternal
Total number of sisters who died at ages 15-49

C.9 Sibship size and sex ratio of siblings				
Mean sibship size and sex ratio [country, year]	of siblings at birth,			
Age of respondents	MeanSex ratiosibshipof siblingssize1at birth2			
15-19 20-24 25-29 30-34 35-39 40-44 45-49				
Total				
<sup>1</sup> Includes the respondent <sup>2</sup> Excludes the respondent				

