# Maternal Mortality Sudan 2000-2020

**Internationally comparable MMR estimates by the Maternal Mortality Inter-Agency Group (MMEIG): WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division**

Table 1: Estimates

| Year | MMR[a][*][†] | PM[b][*][†] | HIV-related indirect deaths[†] | Live births[c] (Thousands) | Maternal deaths[†] |
|------|------------|-------------|-------------------------------|----------------------------|--------------------|
| 2000 | 642 [491, 847] | 0.26 [0.2, 0.35] | 5 | 1004 | 6448 |
| 2005 | 525 [378, 741] | 0.23 [0.16, 0.32] | 12 | 1062 | 5579 |
| 2010 | 383 [301, 495] | 0.19 [0.15, 0.25] | 11 | 1272 | 4877 |
| 2015 | 298 [211, 419] | 0.17 [0.12, 0.24] | 12 | 1390 | 4146 |
| 2020 | 270 [174, 420] | 0.16 [0.1, 0.25] | 9 | 1521 | 4112 |

[a] Maternal mortality ratio (MMR) defined as maternal deaths per 100,000 live births for women of reproductive age (15-49 years).

[b] Proportion maternal (PM) defined as the proportion of all-cause deaths for women of reproductive age (15-49 years) that are due to maternal causes.

[c] UN Population Division, Department of Economic and Social Affairs. World Population Prospects. New York; 2022.

[*] The uncertainty intervals (UI) for all estimates refer to the 80% uncertainty intervals (10th and 90th percentiles of the posterior distributions). This was chosen as opposed to the more standard 95% intervals because of the substantial uncertainty inherent in maternal mortality outcomes.

[†] Figures presented in the table are estimates based on national data, such as surveys or administrative records, or other sources, produced by the international agency when country data for some year(s) is not available, when multiple sources exist, or when there are data quality issues.

Table 2: Estimates

| Period | Annual rate reduction[*] | Percent change in MMR[*] |
|---|---|---|
| 2000, 2020 | 4.21 [2.07, 6.84] | 56.93 [33.91, 74.56] |
| 2010, 2020 | 3.39 [0.34, 6.91] | 28.74 [3.31, 49.89] |

[*] Figures presented in the table are estimates based on national data, such as surveys or administrative records, or other sources, produced by the international agency when country data for some year(s) is not available, when multiple sources exist, or when there are data quality issues.

# Data from civil registration vital statistics system (CRVS)

No data available

# Excluded data from CRVS

No data excluded

# Data from other sources

Table 3: Data from other sources

| Study period[*] | Source | Source type | Maternal deaths[a] | Preganancy-related deaths[b] | Female deaths, 15-49 | Maternal PM[c] | Pregnancy-related PM[d‡] | MMR per 100,000 lb[e] | Adjusted MMR per 100,000 lb | F+[f†] | F-[g†] | U+[h†] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2004, 2006) | SHHS 2006 | Miscellaneous | NA | NA | NA | 0.2694768 | NA | 638.0000 | 701.8000 | NA | NA | NA |
| [2007, 2008) | Census | Census | NA | NA | NA | NA | 0.3382 | 743.5731 | 723.3527 | NA | NA | NA |
| [2008, 2010) | SHHS 2010 | Miscellaneous | NA | NA | NA | 0.1028772 | NA | 215.6000 | 237.1600 | NA | NA | NA |

[a] Maternal deaths defined according to the ICD-10.
[b] Pregnancy-related deaths defined according to ICD-10.
[c] Maternal PM is calculated when deaths are defined as maternal.
[d] Pregnancy-related PM is calculated when reported deaths are defined as pregnancy related deaths.
[e] The MMR in this column is calculated from the PM.
[f] False positive: true non-maternal death which may be incorrectly labeled as a maternal death.
[g] False negative: maternal death which may be incorrectly classified as a non-maternal death.
[h] Maternal deaths not registered in the CRVS.
[*] Kindly note the interpretation of notation: for a period [a,b) the observation starts on date a and ends before date b; thus a period covering 1st January 2000 through 31st December 2000 is denoted [2000,2001).
[†] Calculated from studies which undertake specialized analyses of routine reporting of maternal deaths.
[‡] Survey data has been adjusted by 1.1 for underreporting and standardized by age when obtained using the direct sisterhood method.

# Data from studies excluded in regression

No data excluded

# Predictor variables used in the model

Table 4: Predictor variables used in the model

| Year | GDP[a][*] (Per capita, PPP) | GFR[b] (Per 1000 women ages 15-49) | SBA[c] (%) |
|---|---|---|---|
| 2000 | 3939 | 160 | 46 |
| 2005 | 4561 | 150 | 58 |
| 2010 | 4745 | 160 | 73 |
| 2015 | 4623 | 150 | 81 |
| 2020 | 4077 | 140 | 85 |

[a] WHO, MMEIG. Gross domestic product (GDP) per capita measured in purchasing power parity (PPP) equivalent dollars using 2017 as the baseline year were taken from World Bank's World Development Indicators (WDI) database, and in instances supplemented by unofficial estimates derived by MMEIG using growth rates in United Nations GDP data and/or previous MMEIG GDP estimates. Geneva; 2021.

[b] General fertility rate (GFR) from UN Population Division, Department of Economic and Social Affairs. World Population Prospects. New York; 2022.

[c] Skilled Birth Attendant (SBA) from WHO, UNICEF joint SBA database. Geneva; 2022. In some instances, supplemented with unofficial estimates derived by MMEIG. Annual series were estimated by fitting a multilevel time series (AR1) model with region- and country-specific intercepts and slopes.

[*] A 5-year moving average was calculated.

# Estimates

(Input data) The following adjustments were applied to maternal deaths depending on the source type:

1. An age-standardization was applied to population based surveys that obtained data from the direct sisterhood method.
2. An upward adjustment of 10% was applied to all input data that were not obtained from CRVS or specialized studies, to account for underreporting.

(Model adjusted data) The following model adjustments were applied to maternal deaths depending on the source type and the definition of reported deaths

1. A model adjustment derived from BMis was applied to maternal deaths obtained from CRVS.
2. A model adjustment was applied to observations of pregnancy-related deaths to remove accidental/incidental (non-maternal) deaths from the count.
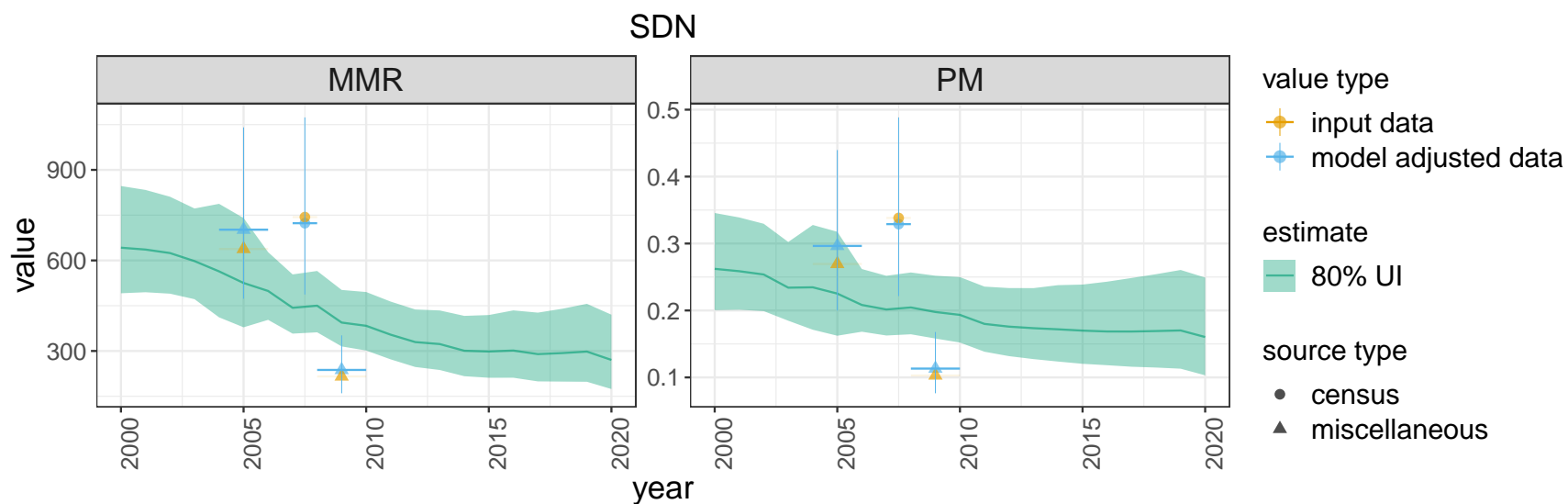
# Crisis years

The criteria for crisis-years are described below.

1) a year in which (a) there are at least 10 deaths attributable to mortality shocks among women of reproductive age (i.e. 15–49 years) and (b) these deaths constitute at least 10% of the total number of deaths to women aged 15–49 in that respective country-year (12) and in addition (c) in the five-year period surrounding the year, there are at most two additional crisis years; and
2) a year identified by the United Nations Inter-Agency Group for Child Mortality Estimation (UN IGME) as a crisis year for the estimation of child mortality (this includes crises in potentially longer periods, i.e. for recent ongoing crises).

Table 5: Crisis years

| Year | Crisis deaths[a] women ages 15-49 |
|------|-----------------------------------|
| 2004 | 3613 |
| 2005 | 3787 |

[a] UN Population Division, Department of Economic and Social Affairs. World Population Prospects. New York; 2022.