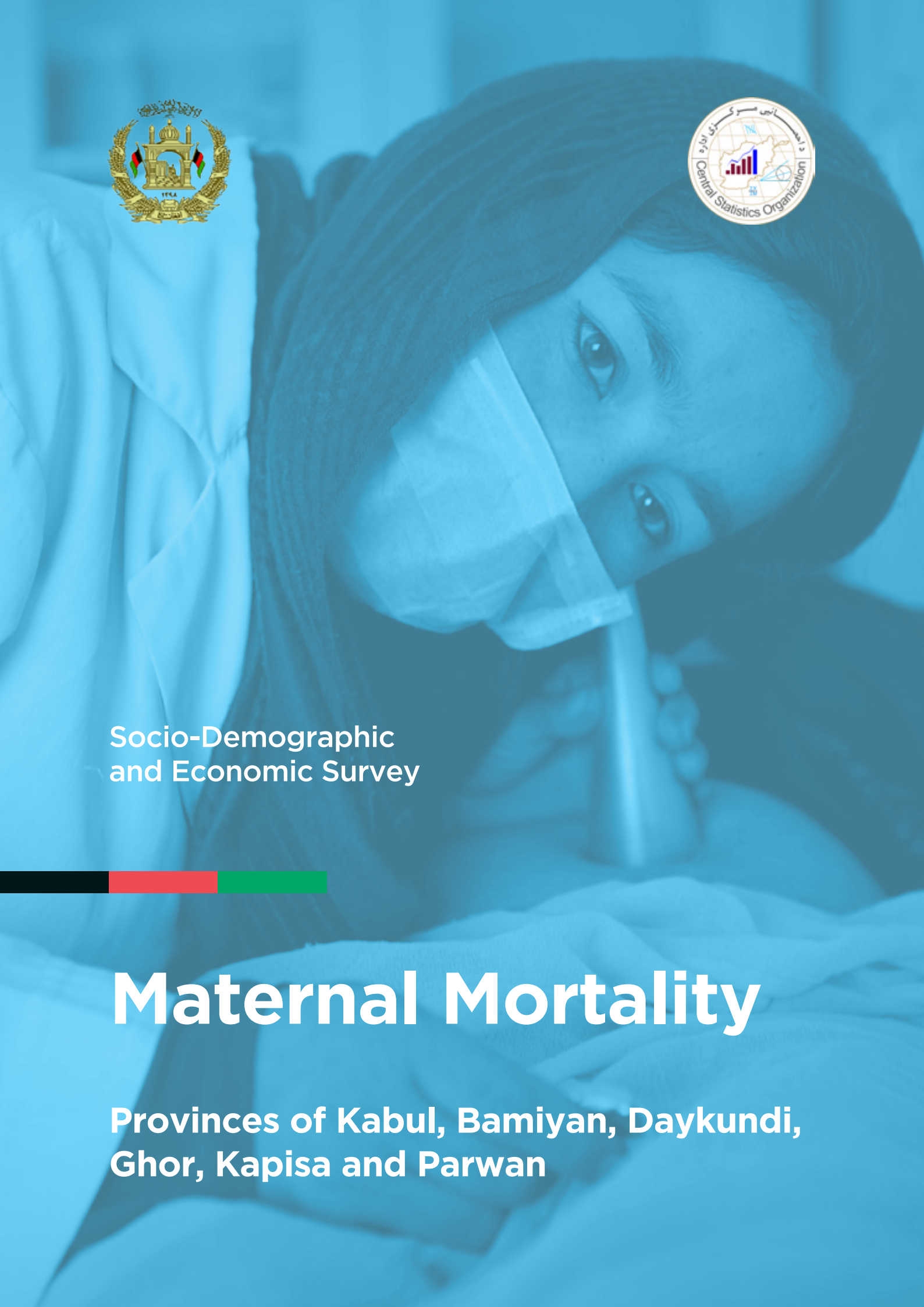

Socio-Demographic
and Economic Survey

Maternal Mortality

Provinces of Kabul, Bamiyan, Daykundi, Ghor, Kapisa and Parwan

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The Central Statistics Organization (CSO) of Afghanistan would like to thank all the organizations and individuals involved in conducting, supporting and facilitating the Socio-Demographic and Economic Survey (SDES). CSO extends its gratitude to the Government of Japan for supporting the survey in five provinces and making the preparation of the reports possible and to the United Nations Population Fund for technical support.

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Foreword

The Socio-Demographic and Economic Survey (SDES) is a historic initiative led by Afghanistan's Central Statistics Organization (CSO), with technical support from the United Nations Population Fund (UNFPA) and financial assistance of development partners. Over the past years, thousands of surveyors have fanned out across the country, going province by province to visit homes and collect detailed demographic data which will be used to create an unprecedented snapshot of the country's demographic situation down to the village level.

Good, responsive policy is predicated on such high quality and representative data. With a clear understanding of the situation on the ground, policymakers and development partners can plan services and interventions based on a population's particular situation, identify opportunities and respond to changing needs.

Yet such data is often lacking in Afghanistan. This is particularly true of data on maternal mortality – the death of women due to causes related to pregnancy and childbirth. These deaths are, in the vast majority of cases, preventable. Thus, it is a public health priority to ensure that good data is available to ensure that suitable services are available and utilized.

Using the SDES data collected in six provinces (Bamiyan, Daykundi, Ghor, Kabul, Kapisa and Parwan), the Thematic Report on Maternal Mortality goes a considerable way towards filling this gap. This Thematic Report analyses maternal mortality trends, correlates with age and education level where possible, and indicates avenues for further research.

As the first research reports emerge from the SDES, it is appropriate to express our gratitude for the contributions of all those who made this historic survey possible. The financial support of our donors have underpinned the conduct of the SDES. The cooperation of governors, district administrators and other local officials was vital to successful completion in each province, as was the assistance of the media. The surveyors and data quality staff's ceaseless efforts in the field, often in challenging environments, was fundamental to the SDES. Most importantly, though, we thank the Afghan people, who recognised the importance of this endeavor and participated fully in improving our understanding of their needs and context.

It is the aim of this report to bring information about the condition of maternal health to policy makers, programme managers, and project evaluators such that appropriate plans and programs could be prepared in order to improve the situation of the mothers in Afghanistan.

Engr. Shir Mohammad Jamizada
President General, CSO

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Country Representative, UNFPA

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Glossary

Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.[1]

A **pregnancy-related death (PRD)** is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of cause. This definition of a maternal death allows to measure maternal mortality using census alike sources.[2]

Live birth refers to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life – e.g. beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles – whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered live born.[3]

Lifetime risk (LTR) reflects the chances of a woman dying from maternal causes over the course of her 35-year reproductive life span. This indicator takes into account the probability of a death due to maternal causes each time a woman becomes pregnant.

Maternal Mortality Rate (MMrate) is the annual number of female deaths from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, expressed per 1,000 women of reproductive age.

Maternal Mortality Ratio (MMratio) is the annual number of female deaths from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, expressed per 100,000 live births, for a specified time period.[4]

1 World Health Organization (WHO) definition retrieved from http://www.who.int/healthinfo/statistics/indmaternalmortality/en/

2 World Health Organization (1993) International Statistical Classification of Diseases and Related Health Problems (10th revision), Instruction Manual, vol. 2. Geneva: World Health Organization.

3 WHO definition retrieved from http://www.who.int/healthinfo/statistics/indmaternalmortality/en/

4 World Health Organization (2015) Global Reference List of 100 Core Health Indicators. Geneva: World Health Organization. Retrieved from http://apps.who.int/iris/bitstream/10665/173589/1/WHO_HIS_HSI_2015.3_eng.pdf?ua=1

Acronyms

ASFR	Age specific fertility rate
LTR	Lifetime risk of maternal death
MDG	Millennium Development Goal
MMrate	Maternal mortality rate
MMratio	Maternal mortality ratio
PMFD	Proportion of maternal deaths among total female deaths at reproductive age
PRD	Pregnancy-related death
SDES	Socio-Demographic and Economic Survey
SMI	Safe Motherhood Initiative
WHO	World Health Organization

Executive Summary

Rada Akbar / UNFPA

Maternal mortality is a major challenge of the Millennium Development Goals (MDG) framework; despite being a key indicator of social development and, above all of, access to reproductive health care, data for measurement is often scarce or unreliable. The UN Millennium Declaration 2000 addressed maternal mortality through MDG 5, which aimed for a three-quarter reduction between 1990 and 2015. Tracking progress towards this target was, however, a difficult task in countries where data availability is a serious constraint, and reliable data is scarcest in countries (including Afghanistan) with the heaviest maternal mortality burden. There are, however, efforts underway to produce the necessary data in Afghanistan, first through a national survey, i.e., the Afghanistan Mortality Survey (APHI/MoPH, 2011), and more recently through the Socio-Demographic and Economic Survey (SDES), which included in its household questionnaire the appropriate questions for measuring maternal mortality risks.

A maternal death, however high the risk, is always a rare event. This is particularly true in relatively small populations. The 50 percent sample from households enumerated by the SDES in the provinces provided a large enough sample of women of reproductive age for the estimation of maternal mortality indicators. Kabul and Ghor have the largest sample sizes among the six provinces with approximately 487,000 and 96,000 women aged 15–49, respectively, representing about 977,000 and 192,000 women in the reproductive age group in these two provinces. The number of pregnancy related deaths registered varies from nearly 800 in Ghor to 35 in Kapisa. Random variations in the age distribution of maternal deaths are therefore expected, and these variations may conceal real differences in maternal mortality risks.

The proportion of pregnancy-related maternal deaths among total female deaths in reproductive ages (PMFD), is a relatively simple indicator but useful in assessing data quality. This study reveals a certain frailty in the quality of data, but produces convincing indicators associated with very high maternal mortality levels. In Bamiyan, Daykundi and Ghor, these proportions are around 50 percent of the total female deaths at reproductive ages. These values are well above the highest PMFD estimated for the most vulnerable countries in 2013 (World Health Organization, 2014). Nevertheless, the data replicates a similar age pattern in the age specific fertility rate (ASFR) and maternal death distribution in the provinces where there are enough cases to allow a break down by age of maternal deaths. This consistent behaviour vis-a-vis fertility patterns is a clear indication of data reliability, as the pattern complies with global parameters associated with maternal mortality.

The distribution of the timing of pregnancy related deaths – during pregnancy, at delivery (or while giving birth) and during post-partum (or within six weeks of delivery) – is an initial measure of the level of maternal mortality in a given population. Out of about 2,000 pregnancy-related deaths (PRD) identified in the six surveys over a 24-month period, more than half occurred during delivery. This is also a reassuring finding regarding data quality: it is known that most maternal deaths are related to severe bleeding, infections, obstructed labour and blood clots/embolism; all of which typically occur at the time of delivery.

Despite uncertainties about the exact level, the MMratio is certainly high, and the provincial estimates encompass the MMratio estimated for the whole country by WHO (2014) at around 400 maternal deaths per 100,000 live births. The MMratios in the six provinces range from 235 in Kapisa to 1,882 in Ghor. Given this wide variation, MMratios indicate very high levels of maternal mortality. Decision-makers must continue and reinforce initiatives which have proved to be successful, and urgently formulate and implement new strategies to address this dramatic situation particularly in provinces which are lagging behind.

Regarding the age pattern of the maternal mortality ratio, in general, the provinces reproduce the expected J shape by age. A comparison of MMratios by broad age-groups reveals that maternal mortality risks at younger ages (15-24 years) are lower than at older ages (40 years or more); the lowest MMratios among young women, however, can be as high as 146 and up to more than 1,000. The verification of these high ratios for young women is hard evidence, enough to alert policy makers and planners about the urgent need to address this large number of avoidable deaths.

The risks of dying due to a pregnancy-related cause are certainly high among young women; yet, it must be emphasized that maternal mortality is even higher for older women; in Daykundi the risks may be more than twofold. The more critical case is Bamiyan, where the risk at ages 45 or older – with a MMratio above 4,000 – is more than six times the risk affecting younger women.

This report presents maximum and minimum level scenarios, considering the usual difficulties involved in the collection of this type of data (reporting errors, random variations and so on), which impact on the degree of uncertainty regarding the most likely level for these estimates.

In a first attempt to consider social determinants of maternal mortality, estimates were obtained by educational level of the household head and a household member with the highest educational attainment.

MMratios in all categories of the household head's education are over 1,000 for women in the 40–44 age-group. For the oldest age group (45–49 years), MMratios exceed 7,000 for all categories of the household head's completed education. When the highest level of education attained by any member of the household is used as a proxy for the socio-economic situation, the level of maternal mortality skyrockets after age 35–39 for dwellers in households where no member has attended school. Comparing the results of these two approaches shows that maternal mortality has little variation with the education level of the head of the household, but the variations in the highest education level attained in the household have an inverse relationship to the maternal mortality level.

POLICY IMPLICATIONS

The evidence from these analyses leaves little doubt about the very high maternal mortality among Afghan women in the six provinces, including Kabul. It is recognized that Afghanistan has made remarkable efforts to reduce maternal mortality, yet the level is still unacceptably high. Therefore, interventions should be reinforced, and strategies which proved successful should be replicated and expanded. The high maternal mortality risks in the provinces of Afghanistan are understood to be the consequence of a complex synergy between many social, demographic, medical, economic and cultural/ethnical factors. The findings of this report indicates that at least the following aspects need urgent attention and deeper analysis to guide more effective interventions:

a Expanding access to reproductive health care, including antenatal and delivery care, and particularly family planning and contraception practices, which are still scarce according to national studies (APHI/MoPH, 2011).

b Expanding education, particularly among women; while the SDES results suggest that improvements are undoubtedly taking place, additional efforts are badly needed.

c Gender relationships, which the SDES results suggest are very unequal in day-to-day life, must be improved.

d Attitudes pressuring men and women to marry and bear as many children as possible, as soon as possible, require culturally sensitive interventions.

FURTHER STUDIES AND RESEARCH AGENDA

This initial round of analysis of the SDES data on maternal mortality suggests that the data is promising for further in-depth analysis.

The information utilized for calculating maternal mortality levels appears internally consistent with fertility data. Yet a deeper evaluation of the data, which could not be conducted within the time frame available for this report, is recommended as a thorough diagnosis of its reliability will contribute to a more robust assessment of maternal mortality levels.

While SDES does not provide data on health care, other dimensions such as gender equity, wealth and rural/urban residence should be objects of further research in order to establish their association with maternal mortality. Such inter-relationships will help decision-makers identify where higher prevalence occurs to be able to guide effective interventions, and formulate and implement social policies to reduce Afghanistan's high levels of maternal mortality.

1

Introduction

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Reducing maternal mortality is one of the challenges of the MDG framework; despite being a key indicator of social development and of access to reproductive health care, data for measurement are very often unreliable. Maternal deaths are highly concentrated in the poorest regions in the world; WHO (2014) estimates that the sub-Saharan Africa region alone accounted for 62 percent of global maternal deaths in 2013, followed by Southern Asia at 24 percent. Afghanistan is included in the latter region.[1]

High maternal mortality prevalence affects the sex balance of the population, the family composition and even labour-force participation, as maternal death occurs at women's prime working age. High maternal mortality is associated with high infant and child mortality and, by disrupting the nuclear family, often also interferes with the child's future survivorship (Rosenfield and Maine, 1985). Children who have lost their mothers are up to ten times more likely to die prematurely than those who have not.[2]

The focus on maternal mortality as an important development indicator dates back to at least the 1980s, when demands for highlighting this issue motivated the 1987 Safe Motherhood Conference in Nairobi. The launch of the Safe Motherhood Initiative (SMI)[3] at this event was a major milestone in the effort to reduce the burden of maternal mortality throughout the world. The SMI issued a call to action to reduce maternal mortality and morbidity by one half by the year 2000. The conference emphasized the heavy burden of maternal mortality, the knowledge gap regarding its magnitude and the relatively low cost of avoiding a maternal death. Herz and Measham (1987) in their report on this conference, stated:

It should be possible to reduce by half the 500,000 maternal deaths occurring each year [1987] with an investment of less than US$2 per capita per year. Considerable progress is possible with less than US$1 per capita per year. What will it take to make this happen? (Herz and Measham, 1987, p.36)

Almost 30 years later, maternal deaths (globally numbering 289,000 according to the 2014 WHO estimate) continue to be a stubborn health and development challenge. Substantial uncertainty regarding the exact level persists, as the WHO estimate lies within a 220,000–400,000 confidence interval range. The persistency of this large number of deaths – a vast majority of them avoidable – is due to lack of, or inadequate, access to maternal health care and antenatal care. The difficulties of breaking down the vicious cycle of poor action/poor data/poor action that Graham and Campbell (1992) described still persist.

The 2000 UN Millennium Declaration included among the Millennium Development Goals MDG 5 goal, which aimed for a three-quarter reduction between 1990 and 2015 in the maternal mortality ratio (MMratio), that is, the number of maternal deaths per 100,000 live births. At the same time, as mentioned by Zureick-Brown (2013), the great challenge in tracking progress toward achieving this target was acknowledged. Reliable data were lacking in the very countries thought to have the greatest burden; Afghanistan is indeed among these. Despite the scarcity of reliable information, Afghanistan has been classified as "making progress towards improving maternal health", and its MMratio has declined by about 67 percent over the period 1990–2013, registering an annual change of near 3 percent (WHO, 2014).

1 Southern Asia comprises Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan and Sri Lanka (WHO, 2014).

2 United Nations Population Fund. (2012). Giving birth should not be a matter of life and death [factsheet]. Retrieved from http://www.unfpa.org/sites/default/files/resource-pdf/EN-SRH%20fact%20sheet-LifeandDeath.pdf.

3 Advocacy for awareness of this problem from the 1980s can be also seen in Rosenfield and Maine (1985); Boerma (1987); Mahler (1987); and Graham and Campbell (1992).

Maternal mortality in Afghanistan

In order to contextualize SDES findings and to justify the importance of specific analyses of maternal mortality, a brief profile of this phenomenon in Afghanistan is given by focusing on three points: the synergy of dimensions that determine high maternal mortality levels, the acknowledged declining trend, and the difficulty of obtaining reliable estimates.

Afghanistan is ranked among the countries with high maternal mortality; its MMratio for the most recent period (2013) is around 400 maternal deaths for every 100,000 live births, about twice the average in developing countries (WHO, 2014). Coleman and Lemmon (2011) describe the synergy of macro and micro dimensions that determine the high risk of maternal death in Afghanistan as follows: "In conjunction with the low female life expectancy and high fertility, the prenatal coverage, although in current expansion, is low and often of questionable quality; a significant majority of births occur without a skilled birth attendant present."

According to these authors, several structural factors, for which there are no "quick fixes", affect maternal mortality in Afghanistan. First, there is limited access to quality health services and, in particular, obstetric care. Access to care is especially limited in rural areas.

"Traveling with her new baby under her burka, this 25year old woman is escorted by her father along the rough roads of Badakshan (Province of Bamiyan) on her way to a health post two hours away to seek help for the bleeding she has been experiencing. There, she learned she has liver damage and may have problems with future deliveries."

Source: http://firstperson.oxfamamerica.org/2008/09/the-landscape-of-maternal-mortality/ (Accessed: 08/10/2015 19:35) - (Photo by Alix Fazzina)

The average rural woman lives in villages that are largely inaccessible by road, and the few paths available are frequently obstructed by floods and avalanches:

some women have to walk for hours, even days, to reach a clinic... [and] it is quite difficult to transport emergency cases to a clinic (UNICEF 2009).[4]

Despite improvements in women's rights since the fall of Taliban, significant social and cultural barriers still contribute to poor maternal health in Afghanistan. Despite legal efforts to avoid girl's early marriages, Coleman and Lemmon (2011) cite a number of studies which estimate that between 60 percent and 80 percent of all marriages are forced. Women have minimal economic and educational opportunities. Despite the provisions for gender equality in Afghanistan's constitution, Coleman and Lemmon point out that the gap between rhetoric and practice is large. At the micro level, community and religious

4 UNICEF. (2009). "Midwife Training Programme Aims to Reduce Maternal Mortality in Afghanistan." Retrieved from: http://www.unicef.org/infobycountry/afghanistan_47120.html. Cited by Coleman and Lemmon (2011).

leaders often resist women's employment and education. Decision-making authority within households is typically held by the eldest male, and control over decisions regarding maternal and child health is shared by older men and mothers-in-law, who can be resistant to modern contraceptive techniques and skilled birthing procedures due to a lack of education.[5] The challenges of improving maternal health are also exacerbated by a strong cultural preference for women to be seen and treated only by other women, despite a severe shortage of trained female health workers in Afghanistan.

Although high, the maternal mortality level has nevertheless followed an impressive declining trend: the MMratio was estimated to be well over 1,000 at the beginning of the current century.[6] This decline has been associated with substantial health improvements, particularly in maternal and obstetric care (APHI/MoPH, 2011). The MMratio, mentioned at the start of this section, has a range of uncertainty from 220 to 750, which highlights the difficulties of a reliable estimate (WHO, 2014). Indeed, the 2010 Afghanistan Mortaity Survey produced a ratio of 327 which confidence interval is included in this range of uncertainty.[7] Hence it is not possible to establish a precise trend for maternal mortality. Afghanistan is not alone in this situation; producing timely and accurate data on maternal mortality has been a serious challenge for many countries. Indeed, Afghanistan has made great efforts to collect these data, including the national survey on maternal mortality (APHI/MoPH, 2011), in addition to the current SDES.

An additional difficulty is that national level estimates conceal enormous social and regional differences. These differences are often greater for maternal mortality than for other demographic indicators. For instance, Bartlett and others (2005) in a study conducted around 2000 found MMratios varying from 418 in Kabul city (which at the time of the study had restricted mobility, education, and employment, especially for women, with medical care available only from two government-run women's hospitals and several clinics run by nongovernmental organizations) to 6,507 in Ragh in Badakshan province, a remote region in the Hindu Kush mountains, where comprehensive essential obstetric care was up to 10 day ride or walk away, at the hospital in Faizabad city. The MMratio for Ragh was more than 15 times the level estimated for Kabul.

Based on SDES data, this study aims to broaden the understanding of maternal mortality in the six surveyed provinces by providing an evidence-based perspective of this critical health issue in different contexts. The results should strengthen the knowledge base to guide health and social policies for reducing maternal mortality, contributing to improve the health and social status of women, enhancing access to reproductive health care and advancing social development in the country.

The SDES was conducted from 2011 to 2014 in six provinces: Kapisa (2014), Parwan (2014), Kabul (2013), Ghor (2012), Daykundi (2012), Bamiyan (2011). It focused on the district and lower levels, such as urban subdivisions, major villages and clusters of smaller villages. Before the survey, a listing of every household in all villages was done. Half of these listed households (i.e., every other household) were taken as part of the sample for the survey and were asked questions on education, literacy, employment, migration, functional difficulty, fertility, mortality, parent's living status, birth registration and housing characteristics. With a 50 percent sample of the total population in each province; this was a large sample size and at this stage of the analysis confidence intervals for the indicators were not calculated.

The specific objective of this report is to measure maternal mortality levels through PRD, or a woman's death while pregnant, during delivery or within 42 days of termination of pregnancy, irrespective of cause. The main indicator considered in the study is the maternal mortality ratio (MMratio).

Data will be evaluated before alternative measures to define an interval for the maternal mortality indicators are discussed. As a preliminary effort to explore some social determinants of maternal mortality patterns, MMratios are estimated by educational level.

5 Dr Zohra Shamszai (deputy manager, Health Unit HAWA Program, CARE International: Afghanistan), interview with Ashley Harden, June 23, 2011. Cited in Coleman and Lemmon (2011) p.6.

6 Coleman and Lemmon mention an even higher maternal mortality , exceeding 2,000, from a national representative survey conducted in 2002 (Coleman and Lemmon, 2011; p.2).

7 The 2010 estimate admits a CI= 260-394 (APHI/MoPH, 2011; page 150)

2

Data and Methodology

Rada Akbar / UNFPA

Several methodologies based on the indirect estimation approach[8] were developed to derive maternal mortality indexes based on survey data. In the case of the SDES, the approach adopted was to collect direct information on PRD. This approach demands specific efforts to assess the completeness of the reports and to derive corrective measures to adjust for under reporting.

The series of indicators used to measure the maternal mortality level are introduced first in this section. The specific type of data – PRD – and reliability of the data collected and pertinent adjustments are also discussed.

Indicators of maternal mortality

Different indicators have been developed for the measurement of maternal mortality. The most frequently utilized indicators are discussed in a number of publications[9] and include:

a Proportion of maternal deaths among total female deaths at reproductive age (PMFD) or proportion of maternal deaths:

$$\text{PMFD} = \frac{\text{Number of maternal deaths}}{\text{Number of deaths among women 15–49}}$$

b Maternal mortality ratio (MMratio), which is the most frequently used, is also the simplest of the indicators and very easy to understand. It refers to the number of maternal deaths per live birth, multiplied by a conventional factor of 100,000:

$$\text{MMRatio} = \frac{\text{Number of maternal deaths}}{\text{Number of live births}} \times 1{,}000$$

The MMratio is intended to express obstetric risk and can also be estimated by age. Note that the denominator is not exactly the population exposed to the risk of having a maternal death (all pregnant women); due to difficulties in obtaining this population, the number of live births is used as a proxy for the most appropriate denominator (which would be the number of women in reproductive age exposed to the risk).

c The maternal mortality rate (MMrate) is an indicator of the risk of maternal death among women of reproductive age. The MMrate is usually multiplied by a factor of 1,000. Although this indicator does not consider the probability of getting pregnant, the rate is necessary for estimating the lifetime risk of maternal death.

$$\text{MMRate} = \frac{\text{Number of maternal deaths}}{\text{Number of women aged 15–49}} \times 1{,}000$$

d The lifetime risk of maternal death (LTR):

$$\text{LTR} = 35 \times \text{MMRate} \quad \text{or} \quad \text{LTR} = 1-(1-\text{MMratio}/100{,}000)^{\text{TFR}}$$

The LTR reflects the chances of a woman dying from maternal causes over the course of her 35-year reproductive life span. This indicator takes into account the probability of a death due to maternal causes each time a woman becomes pregnant. The LTR is more reliable if general mortality (and female survivorship probabilities) is known (Wilmoth 2009).

8 There are techniques for estimating maternal mortality based on regression and other statistic models and demographic approaches such as, for instance, the Sisterhood method (Graham et al., 1989).

9 See for instance, Hill et al. (2001); and WHO (2014).

SDES data for estimating maternal mortality

The basic information needed to calculate the above indicators are: a) Population distribution by age and sex; b) Number of maternal deaths and live births for a specific time period and a well-defined population. Given the common data problems in measuring maternal mortality, evaluation of data quality is especially important as most experts, among them Hill and others (2001) emphasize.[10] In case of deficiencies, the collected data may need to be adjusted to arrive at a reliable estimate of maternal mortality indicators.

PREGNANCY-RELATED DEATHS AS A PROXY FOR MATERNAL DEATHS

SDES has collected information on household deaths including the identification of all household members who died within the 24 months previous to survey dates, as well as the sex and age, in completed years, of each deceased person. In order to distinguish maternal from other deaths, the information collected specifies the timing of a female maternal death (during pregnancy, at childbirth and in the postpartum period). Hence, this report uses PRD: a woman's death while pregnant or within 42 days of termination of pregnancy, irrespective of cause, and including deaths from accidental or incidental causes. For this reason, when this text refers to a maternal death it should be understood that the event is actually a PRD. PRD is used as a proxy for maternal death, because the SDES has no information on causes of death, and there is no national register of maternal deaths.

PRD was collected when a death of an ever married woman in the household was identified, in which case the following question was asked:

Did _____ die during pregnancy, giving birth, or within 6 weeks of delivery?[11]

Two procedures were implemented to assess the data reliability. Firstly, the total number of reported deaths was evaluated using well-established indirect techniques like the Brass growth balance method (Brass, 1975).[12] This evaluation was the subject of a specific analysis conducted in the Thematic Report on Adult Mortality, where death adjustments factors were calculated for each of the six provinces using life table models. The extreme adjustment factors were 1.7 and 1.2 for Ghor and Daykundi respectively, with the other provinces holding an adjustment factor around 1.5 (See Table 1). These adjustment factors refer to adult mortality in general. They were adopted in this report to adjust the number of maternal deaths, on the assumption that the level of underreporting of maternal deaths was similar to that affecting other deaths of adult persons. The Thematic Report on Adult Mortality provides details on this procedure.

Secondly, the information on maternal deaths is classified as follows:[13]

a Pregnancy-related deaths

b Not pregnancy-related deaths

c Not known whether pregnancy-related deaths

10 Hill and others (2001) lists four steps: 1) evaluation of the population structure; 2) evaluation of the completeness of recording the number of deaths; 3) evaluation of the completeness of recording the number of live births; and 4) evaluation of the classification of adult female deaths as maternal.

11 Data were collected as follow: Timing of the death of ever married woman 10–49 years old:
This question applies only to ever married women 10–49 years of age. If the deceased was a male, or a never married or a female 50 years old and above, leave the boxes blank. You must ascertain the precise moment when she died, i.e.:
a. whether she died during pregnancy, in which case enter code "1",
b. whether she died during delivery (while giving birth), in which case enter code "2",
c. whether she died within six weeks after she gave birth, in which case enter code "3", or
d. whether she did NOT die during pregnancy, while giving birth, nor within six weeks after giving birth, in which case enter code "4".
As this question must necessarily be asked of a third party, the person in question being dead, the respondent may not know the condition of the deceased at the time of her death. You may ask other knowledgeable members of the household. In the remote case that no one in the household knows the condition of the deceased, enter code "5" (do not know).

12 A very didactic explanation of these procedures can be seen in Hill, Stanton and Gupta (2001).

13 The distribution of cases is included in Annex, Table A.

Category (c) may have captured maternal deaths – and only maternal deaths – with unknown timing of death (during pregnancy, giving birth or after six weeks of delivery), because the question is included in the column of the questionnaire which is dedicated to maternal deaths; on the other hand, it could have included any female death with unknown pregnant/not pregnant status. To solve this ambiguity, it was decided to distribute category (c) Not known whether pregnancy-related deaths among the other two categories: (a) pregnancy-related deaths and (b) not pregnancy-related deaths by age group. We applied a pro rata distribution. Hence, the estimated number of maternal deaths is obtained by adding (a) + (c*), where c* is the proportion of not known which was assumed to be a pregnancy-related death. We believe that this procedure provides a reasonable estimate of the actual number of pregnancy related deaths; therefore, this is what we consider the most plausible scenario. We can also consider two additional scenarios:

Minimum scenario includes only well declared maternal deaths within the three event-timing categories; thus, only the adjustment factor for omission for all adult deaths is applied. Pregnancy related deaths are only those classified in category (a).

Maximum scenario, which assumes that all Not known whether pregnancy-related deaths as pregnancy related deaths.

As deaths refer to the 24 months previous to the interview, to estimate annual risks we halved the figures on the assumption that deaths are uniformly distributed during the 24 month period. The adjusted numbers of maternal deaths, according to the three scenarios, are shown in Table 1 and the classification by age groups for the most plausible scenario is included in Table B in the Annex.

LIVE BIRTHS

An additional procedure is needed to adjust the number of live births. The SDES collected information on the number of births in the 12 months before the survey, which is the basis for evaluating the data and then estimating the actual numbers of births (the denominator in the MMratio).

The number of live births, which represents women at risk of a maternal death, was estimated from the ASFRs, which were obtained by applying the Brass P/F technique using the above mentioned information. The application of Brass' method produced adjustments factors to correct fertility rates and to estimate adjusted live births by the age of the mother (see Thematic Report on Fertility and Nuptiality). The extreme values for these factors were 1.5 and 2.2 for Kapisa and Bamiyan, respectively; other provinces have adjustment factors around 2.0 (see Table 1). The adjusted numbers of live births by province are also included in Table 1. Live births by mother's age are shown in Table B in the Annex.

Pregnancy-related maternal deaths and data quality

The magnitude of related events needs to be considered before attempting any initial approximation of the quality of data on maternal mortality. A maternal death, however high the probability of dying may be, is always a rather rare event; this is particularly true in populations of relative small size. In SDES, Kabul was the only province where information on live births and PRDs from a population of women of reproductive age close to one million. The second province by population size was Ghor, where the number of women of reproductive age was below 200,000.[14] The number of PRDs – as seen in Table 1 – varies from 35 in Kapisa to nearly 800 in Ghor, under the most plausible scenario. Random variations in the age distribution of maternal deaths therefore may be related to the small size of the population, as well as the scarce numbers of maternal deaths.

14 See the note on provincial contexts.

Under these three scenarios, the figures in Table 1 reveal variations among the six provinces. In Kabul, the number of PRDs in the minimum and maximum scenarios are respectively half or twofold the number of PRDs estimated for the most plausible scenario. In Kapisa, partially due to the small number of cases, the variation is very high, ranging from 29 percent to 117 percent of the number under the most plausible scenario.

TABLE 1

Adjustment factors for reported PRD and live births, annual number of events (live births and PRD) and proportion of PRD among total female deaths in reproductive ages (PMFD) by province

Events		Provinces					
		Kabul (2013)	**Bamiyan (2011)**	**Daykundi (2012)**	**Ghor (2012)**	**Kapisa (2014)**	**Parwan (2014)**
		Adjustment figures					
Live Births[a]		1.88	2.20	1.94	1.91	1.54	1.56
Pregnancy-related deaths[b]		1.53	1.49	1.23	1.72	1.61	1.51
Number of annual events							
Live births[c]		173,110	18,258	30,326	41,771	14,994	30,947
Pregnancy related deaths Scenarios	Plausible	508	171	382	786	35	144
	Minimum	292	91	303	601	25	102
	Maximum	1032	202	406	841	76	223
	Variation relative to the plausible scenario (%)						
	Minimum	42.6	46.8	20.7	23.6	28.6	29.3
	Maximum	103.1	18.1	6.3	7.0	117.1	54.9
PMFD (percent) according to three scenarios							
PMFD Scenarios	Plausible	16.1	45.3	49.7	52.3	12.7	22.9
	Minimum	9.6	24.3	39.5	40.4	9.0	16.2
	Maximum	32.1	53.7	53.4	56.5	27.5	35.3

Source: CSO Afghanistan, SDES- 2011-2014

a Adjustment factor estimated in the Thematic Report on Fertility and Nuptiality

b Adjustment factor estimated in the Thematic Report on Mortality

c Already adjusted according factors in (a) and (b)

The smallest variations from the PRD in the plausible scenario are observed in Daykundi Ghor, and Bamiyan which, as shown in subsequent sections, have the highest maternal mortality levels. The differences observed in the three scenarios may be partly related to different operational conditions faced in fieldwork; under certain circumstances it is more difficult to collect accurate information on potentially sensitive events such as those related to deaths of persons in the household. Additional research about quality of data and adjustment procedures is desirable, as final conclusions about the maternal mortality levels would necessarily rely on such adjustments.

The proportion of maternal deaths among total female deaths at reproductive age

Additional evidence of the need for adequate data assessment is given by the proportions of maternal deaths among total female deaths in reproductive ages (PMFD) also termed the proportion of maternal deaths. The age patterns of PMFD differ between provinces and scenarios (See Figure 1). A peculiar pattern is seen in provinces with the highest maternal mortality levels: Bamiyan, Daykundi and Ghor; where the most plausible and the maximum scenarios registered similar age patterns. This indicates that Not known whether pregnancy-related deaths might have been misclassified, most probably these deaths were in fact PRDs.

In the case of Kabul, where one would expect relatively higher data reliability, the most plausible scenario greatly differs from the maximum scenario. The same applies to Parwan and Kapisa, which have PMFD age patterns different from each other, but register some similarity between the most plausible and minimum scenario. In the case of Kapisa, the difficulties in evaluating data quality are exacerbated by a very small number of cases, which, as seen in the previous table, are well below 100 deaths under any scenario.

Figure 1 does not provide evidence on the most reliable figure among these scenarios. This highlights the need for further research on SDES data quality regarding maternal mortality. In any case, the most plausible scenario has been selected in this report to determine the maternal mortality levels. Although the estimates thereby obtained may still be affected by bias, this has the advantage of providing estimates that, on average, will be closer to the true value. Therefore, all subsequent analyses are based on the number of PRDs as estimated under the assumptions for the most plausible scenario.

The PMFD for the whole reproductive age period can also give an approximation of maternal mortality levels.[15] It is widely accepted that the more developed a society, the lower the mortality rates. In an ideal world, virtually nobody would die from avoidable causes at any age, particularly not from maternal causes. The more developed a society, the lower the PMFD. The PMFD for developed and/or high income countries can be even lower than 1 percent of all female deaths aged 15–49. On the other hand, the most vulnerable countries have PMFD as high as 20 or 30 percent. WHO (2014) reports a PMFD of about 18 percent for Afghanistan in 2013. Considering the PMFD values for the six provinces – using the most plausible scenario – Kabul and, to a lesser extent, Kapisa and Parwan register values close to the national figure (see last panel in Table 1). Bamiyan, Daykundi and Ghor have PMFD values of around 50 percent which are well over the highest value indicated by WHO (2014). It must be stressed that under other scenarios these three provinces still register similar or even higher PMFD values.

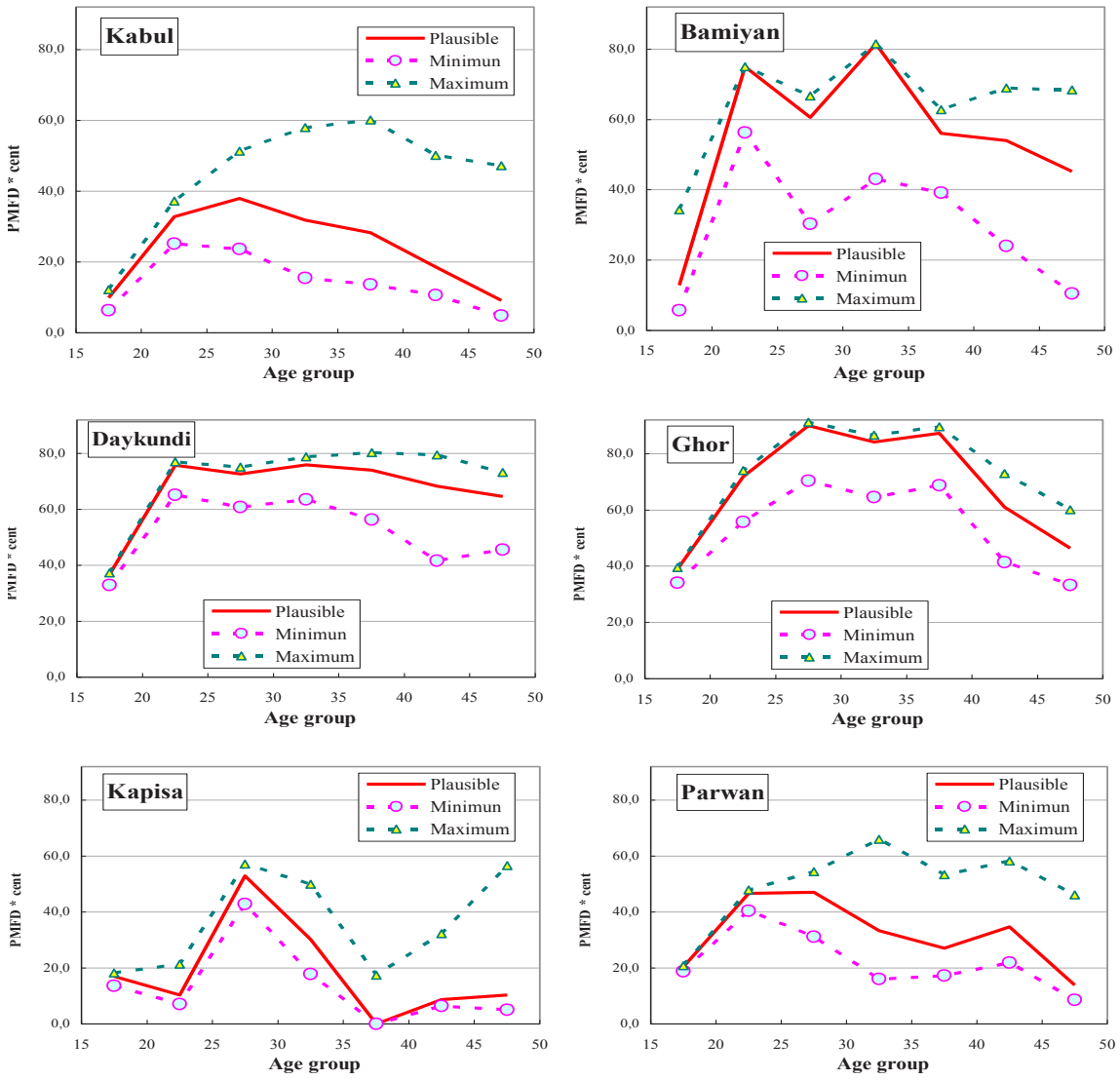
AGE DISTRIBUTION OF MATERNAL DEATHS

Another estimate of the quality of data on maternal mortality is the similarity between the age distribution of maternal deaths with the age pattern of fertility, because the actual risk of dying from a maternal cause follows the risk of having a live birth. Figure 2 illustrates a comparison of both age patterns. Some divergences are expected at the extremes of the reproductive period due to the high obstetric risks for women at those ages.

15 In conjunction with additional information, the PMFD allows to model MMratios that may validate ratios calculated directly from survey data. The detailed procedure can be seen in: Gelman and Hill (2006), cited in WHO (2010).

FIGURE 1

Proportion of maternal deaths among total female deaths in reproductive ages (PMFD) by province: Kabul, Bamiyan, Daykundi, Ghor, Kapisa and Parwan, 2011–2014



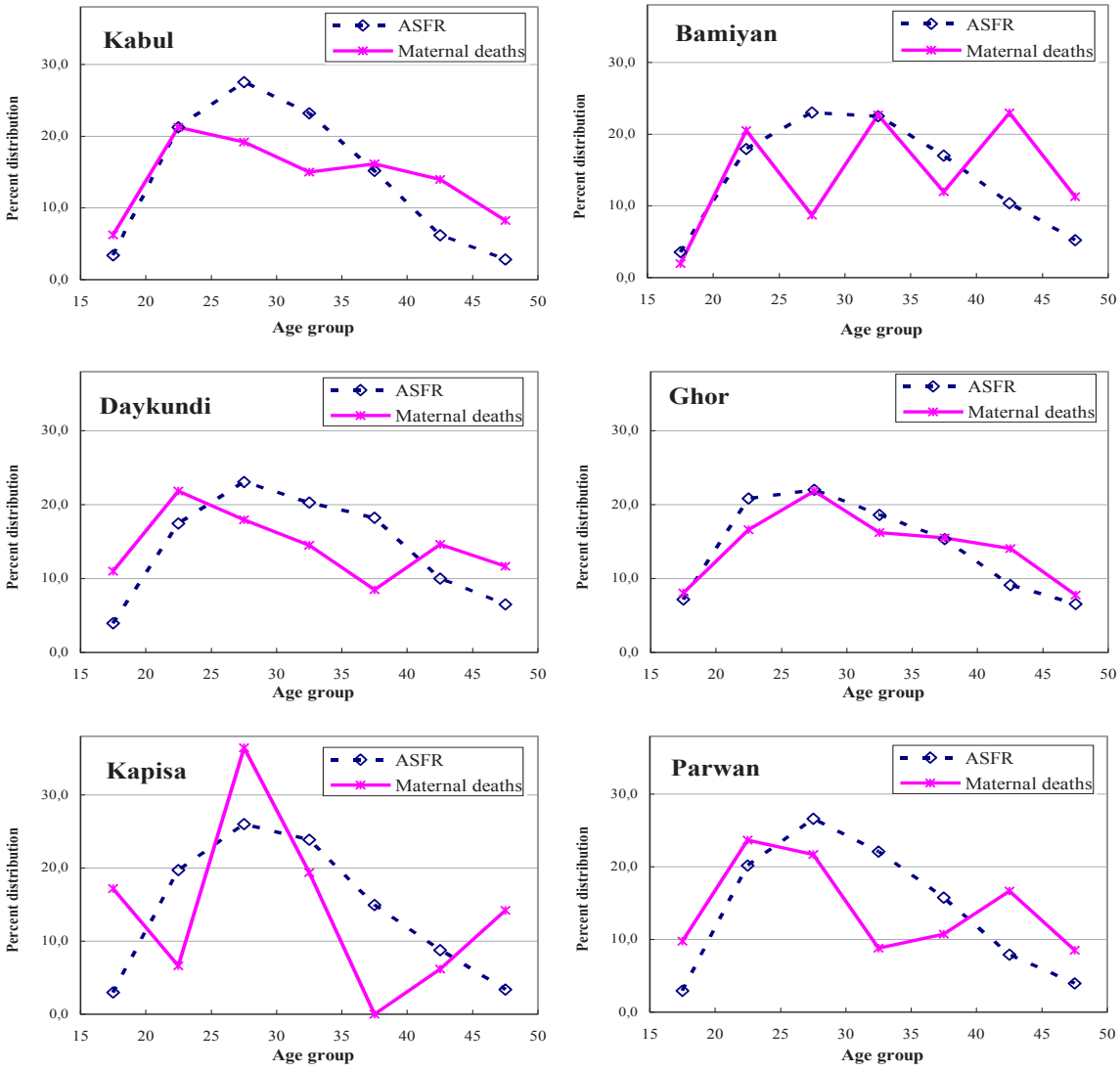
Source: CSO Afghanistan, SDES- 2011-2014

Deaths numbering about 400 or more are less affected by random variations. In Kabul, Daykundi and Ghor enough cases were reported as to allow a breakdown of maternal deaths by age while maintaining statistical stability. This relative stability is apparent in Figure 2, which compares the age pattern of the ASFR and the age distribution of maternal deaths and illustrates the similarities between the two patterns. The pattern of maternal deaths slightly departs from the ASFR pattern around the middle of reproductive period where relatively lower obstetric risks are to be expected. The maternal mortality pattern shows an increase relative to the fertility pattern by the end of the reproductive period. At those ages, the obstetric risk is generally high and maternal health care, particularly in Afghanistan, has a lower coverage than at younger ages.[16]

16 SDES does not include a module on maternal health care to support this relationship; however, the national survey on maternal mortality (APHI/MoPH, 2011) which included a detailed analysis on this issue shows a more vulnerable situation for women aged 35 or more.

FIGURE 2

Percent distribution of pregnancy related deaths and age specific fertility rates (ASFR) by age and province: Kabul, Bamiyan, Daykundi, Ghor, Kapisa and Parwan 2011–2014



Source: CSO Afghanistan, SDES- 2011-2014

Remembering that the plausible scenario is used here, if we disregard situations with very small number of cases, the profile provided in Figure 2 indicates consistent behaviour granting significant reliability to the general measures of maternal mortality obtained from the SDES data.

3

Results

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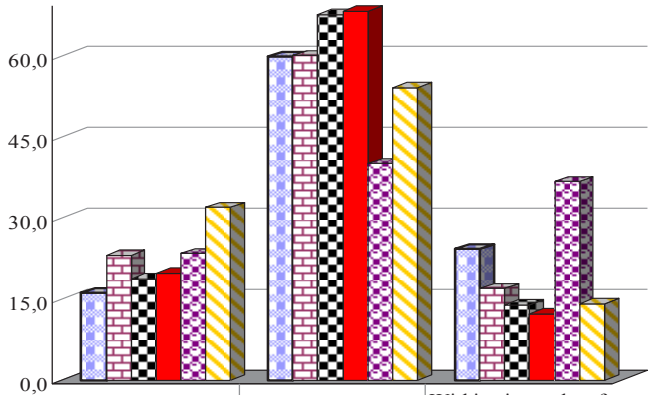
Distribution of pregnancy related deaths according to timing of death

Before defining the level of the maternal mortality in the six provinces is important to assess the distribution of PRD by timing of death, which is categorized as death during pregnancy, during delivery (or while giving birth) and during post-partum (or within six weeks of delivery). This distribution constitutes the very first approximation of the maternal mortality level, because the timing of the maternal death is associated with the availability of health care services and accordingly with the possibility of being due to an avoidable cause. Figure 3 shows the percentage distribution of PRDs reported for the 24 months prior to the surveys by timing of death.

FIGURE 3

Percent distribution of the timing of pregnancy-related deaths as reported for the 24 months before the survey* by province: Kabul, Bamiyan, Daykundi, Ghor, Kapisa and Parwan, 2011–2014



	During pregnancy	Giving Birth	Within six weeks of delivery
Kabul	16,1	59,7	24,2
Bamiyan	23,1	60,0	16,9
Daykundi	18,6	67,5	13,8
Ghor	19,7	68,1	12,2
Kapisa	23,3	40,0	36,7
Parwan	31,9	54,1	14,1

(*) Refers only to pregnancy related deaths with valid answer on the timing of death.

Source: CSO Afghanistan, SDES- 2011-2014

The majority of reported PRDs in all provinces occurred during delivery, with the exception of Kapisa where only two of five PRDs occurred during birth. In Ghor and Daykundi more than two-thirds of PRDs occurred while the woman was giving birth. Most maternal deaths are related to severe bleeding, infections, obstructed labour and blood clots/embolism, conditions that are present at the time of delivery, and which easily account for more than half of the maternal deaths around the world (see Box 1 in the Appendix). Evidence given by Bartlett et al. (2005) in their study in the Afghan territory reinforces this finding: in four cases (Kabul, Alisheng, Ragh and Maywand), two causes of death typically occurred at the time of delivery – haemorrhage and obstructed labour – and accounted for half or more of the total maternal deaths recorded (60 percent in the case of Maywand).

The distribution depicted in Figure 3 points to how fragile the health system can be regarding obstetric care. It is not a surprise that the province registering higher vulnerabilities (i.e., Ghor) presents the highest proportion of maternal deaths occurring at the time of delivery.

National data from a previous survey on maternal mortality carried out in 2010 present a different pattern: maternal deaths occurring during delivery represent 40 percent of the total (APHI/MoPH; 2011). Although this is a lower percentage than that observed from the SDES data, it still represents an important share of PRDs. These observations reinforce the need to undertake further research on causes of maternal death.

Across the six provinces, the pattern is generally similar by age. No matter the woman's age, more than half and often two-thirds of maternal deaths occurred during delivery. There is however a trend indicating a slightly higher proportion among young women and an equally lower proportion among older women (See Figure A in the Annex).

Maternal mortality risks

This section presents the relative risk of dying from a maternal cause, estimated as the PRD-based Maternal Mortality Ratio (MMratio) and its age pattern. Complementing this set of measures are the MMrate and the Lifetime Risk (LTR). In an effort to avoid random fluctuations by age, the MMratio for the broad age groups 15–24 and 40+ are presented. Three notable findings may be drawn from Table 2.

First, the lowest MMratios are in Kabul and Kapisa (293 and 235 maternal deaths per 100,000 live births, respectively). These provinces are geographic neighbours suggesting similar social contexts. Both provinces also have a relatively high proportion of urban population. As expected, the highest MMratio is in Ghor, which has a highly vulnerable social context.

Second, the provinces reveal a very wide range, i.e., from 235 maternal deaths per 100,000 live births in Kapisa to 1,882 maternal deaths per 100,000 live births in Ghor. These values encompass the MMratio estimated for the whole country in 2013, of around 400 maternal deaths per 100,000 live births but with a 95 percent confidence interval of 220 to 750 (WHO, 2014).

Third, all the provinces have very high maternal mortality risks which is consistent with the WHO (2014) classification of Afghanistan as having the highest MMratio in the region (Figure B in the Annex). WHO (2014) considers national MMratios below 20 maternal deaths per 100,000 live births in the Low (or minimum) category, which is often found in developed settings where some countries have MMratios even lower than five. Most recent estimates suggest an MMratio of 190.0 in Southern Asia, which includes Afghanistan (WHO, 2014). In short, MMratio estimates for the six provinces are unacceptably high. Because no woman should die giving life, decision-makers have no option but to urgently formulate policies and implement strategies to improve the situation.

The age pattern of the MMratio is expected to be J-shaped, i.e., at very early and later ages the MMratio is expected to be higher than at other ages during the reproductive period and peaking at ages 45–49. Kabul and Ghor exhibited this J-shaped age-pattern with the lowest MMratio at ages 25–29 in Kabul and ages 20–24 in Ghor. The trend has been plotted in Figure 4 to better visualize the age pattern by province.

TABLE 2

Maternal mortality ratio (total and by age), maternal mortality rate and LTR by province: Kabul, Bamiyan, Daykundi, Ghor, Kapisa and Parwan 2011–2014; Afghanistan 2010

Age Groups	Province						
	Kabul (2013)	Bamiyan (2011)	Daykundi (2012)	Ghor (2012)	Kapisa (2014)	Parwan (2014)	Afghanistan (2010)
MMratio[a]	293	937	1.260	1.882	23	464	374
15-19	299	263	1,614	1,245	668	821	531
20-24	206	767	1,174	1,134	51	374	257
25-29	189	318	858	1,659	306	342	211
30-34	262	1,114	1,158	1,983	268	251	289
35-39	390	807	662	2,462	--[b]	405	725
40-44	1,155	3,186	3,028	4,797	275	1,600	908
45-49	1,699	4,162	3,984	5,319	2,012	1,874	2405
Comparative risks for MMratio							
15-24	222	650	1,290	1,168	146	444	394[c]
40 or more	1,313	3,424	3,411	4,956	673	1,674	1,656[c]
Ratio of risk	5.9	5.3	2.6	4.2	4.6	3.8	4.2
The MMrate and the LTR							
MMrate[d]	0.52	2.13	2.99	4.09	0.47	0.92	0.58
LTR[e]	18.35	55.83	105.56	127.87	16.55	32.91	-

a Per 100,000 live births

b No maternal death were reported

c Estimated as the simple average from the two five-year age group rates involved because micro data were not available

d Per 1,000 women aged 15-49.

e Estimated as LTR = 1-(1-MMratio/100,000)TFR

Source: CSO Afghanistan, SDES- 2011-2014; Afghanistan: APHI/MoPH – (2011)

MMratios for the whole reproductive period are plotted in Figure 4(a). Although not consistently J-shaped, due to large fluctuations, it is apparent that the older the woman, the higher the risk of maternal death in all provinces. At the extreme age of the reproductive period (45–49), there are no provinces where the MMratio is below 1,500. Such high MMratios underscore the critical situation of women who get pregnant near the end of the reproductive period.

Despite the few number of observed events in some provinces, the MMratios for the six provinces appear suggestive of three contours:

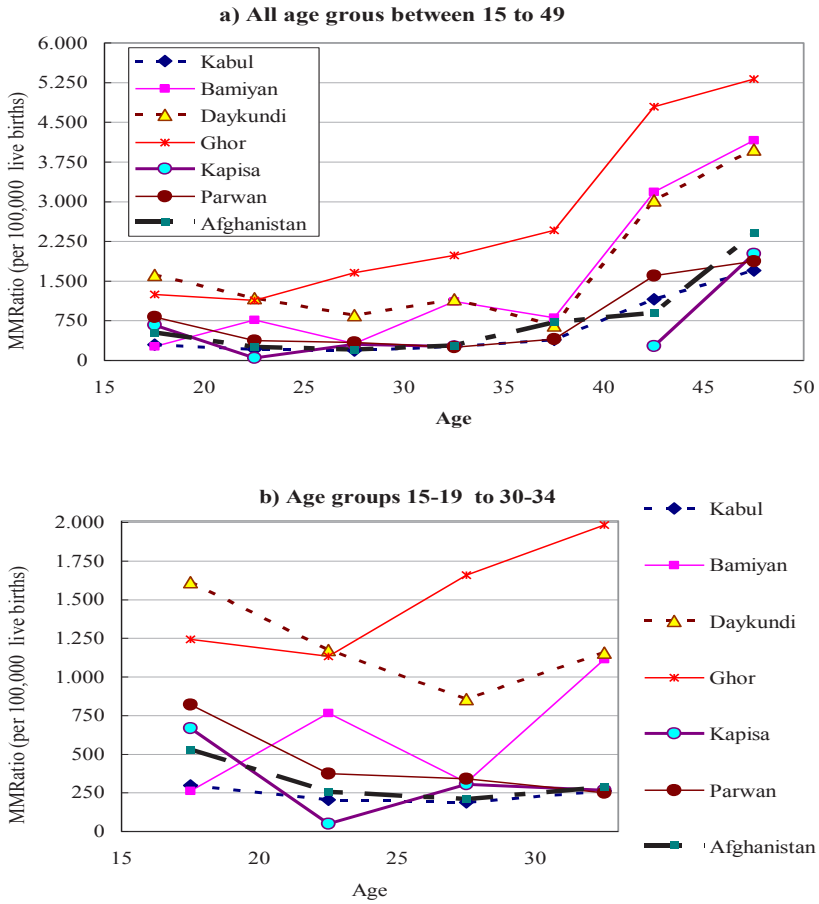
a Ghor has a consistently high and increasing maternal mortality risk by age. It exhibited the highest MMratio at older ages with about 5,000 maternal deaths per 100,000 live births among women aged 40 or more (See second panel of Table 2).

b Kabul, Kapisa and Parwan have the lowest maternal mortality risk –notwithstanding high absolute values – which increases with age.

c Midway are Bamiyan and Daykundi with the lowest MMratios at ages 25–29 but increases sharply thereafter; this trend is clearer in Daykundi which exhibits a J-shaped trend as mentioned earlier, and relatively high MMratios at ages 40 or higher.

FIGURE 4

Maternal Mortality Ratios by age and province: Kabul, Bamiyan, Daykundi, Ghor, Kapisa and Parwan, 2011–2014



Source: CSO Afghanistan, SDES- 2011-2014; Afghanistan: APHI/MoPH – (2011)

A comparison of ratios for all ages clearly indicates that risks at younger ages are lower than at older ages; however, as the second part of Figure 4 shows, even among young women risks are very high, particularly in Daykundi and Ghor. As stated earlier, these ratios can be as low as 5 or 10 maternal deaths per 100,000 live births in developed countries; therefore any ratio above 100 or 150 is a matter of serious concern. Regardless of how much higher MMratios are in other provinces, the MMratio of 222 for young women in Kabul is, per se, an urgent cause for concern since many of these are avoidable deaths.

The high risk of dying due to pregnancy related causes among young women should be noted but the risks for older women must be emphasized. The last row in Table 2 indicates that regardless of the maternal mortality level, the risk for older groups of women is more than twice the risk than for younger women. In Kabul and Bamiyan, the ratio of maternal risk among older vis-a-vis younger women is about fivefold.

The MMrate and LTR, shown in the last rows of Table 2, are complementary measures of maternal mortality. MMrate values follow the same trend as the MMratio and incorporate the number of women exposed to the risk of becoming pregnant. The LTR indicator, which considers the number of times a woman gives birth, presents a pattern that is coherent with previous measurements of maternal mortality risks. The estimation of LTR can use more adequate information on mortality by age; in a second stage of analysis, life tables for the provinces will be utilized for further in depth research.

Alternative scenarios of maternal mortality risks

The maternal mortality risks in the previous sections are based on the assumption that the number of PRDs included a proportion of those reported as Not known whether pregnancy-related deaths which constitute what we consider the most plausible scenario. In this section, MMratios are presented along with their minimum and maximum scenarios by province.

Table 3 shows that MMratios under the minimum scenario are 20–50 percent lower than those in the provable scenario, but are still rather high. This suggests that even if PRDs were perfectly captured in the survey, all provinces would have MMratios of nearly 200 maternal deaths per 100,000 live births.

On the other hand, the maximum scenario has a wider variation relative to the most plausible level of maternal mortality. In provinces like Kabul and Kapisa, the MMratio in the maximum scenario is about twice that in the plausible scenario. In contrast, the MMratios in the maximum scenario remain very close to the level for the most plausible scenario in Daykundi and Ghor, the two provinces with the highest overall MMratio of at least 1,000 maternal deaths per 100,000 live births in the most plausible scenario.

These variation ranges we believe are associated with particular situations around the sites of enumeration; during further analysis the specificities of the field enumeration may help to discern the variations between the most plausible vis-à-vis the minimum and maximum scenarios.

TABLE 3

Maternal mortality ratio for three scenarios and relative variation from the plausible scenario by province: Kabul, Bamiyan, Daykundi, Ghor, Kapisa and Parwan, 2011–2014

Province	Scenarios			Relative variation from the most plausible scenario (%)	
	Plausible	Minimum	Maximum	Minimum	Maximum
Kabul (2013)	293	168	596	-42.6	103.2
Bamiyan (2011)	937	499	1,108	-46.8	18.2
Daykundi (2012)	1,260	999	1,340	-20.7	6.3
Ghor (2012)	1,882	1,438	2,014	-23.6	7.0
Kapisa (2014)	235	167	506	-29.0	115.4
Parwan (2014)	464	328	722	-29.3	55.7

Source: CSO Afghanistan, SDES- 2011-2014

Maternal mortality differentials: educational levels and maternal mortality in Kabul[17]

In a first attempt to consider social determinants of maternal mortality, this section presents MMratio estimates according to educational levels. Formal education is a well-known socioeconomic determinant of social and demographic behaviour. The analysis is performed for Kabul, which has enough cases to allow a breakdown of maternal mortality estimates by education categories. The MMratio is analysed using two measures for formal education level: i) the household head's years of education, and ii) the highest education level attained in the household. The household head has the power to make important decisions pertaining to the household including decisions involving the woman's pregnancy and care. The highest education level of a household member is used under the assumption that the household head may not hold the highest educational level. In Afghanistan, education has improved in recent years benefiting mostly the younger cohorts. Variation in the highest education level within a household compared to other household members indicates differences in the socio-economic status of their members. Higher educational status is associated with better access to information and more capacity within the household to make health decisions and access services. In such case, it is to be expected that one household dweller with high education can positively impact women's pregnancy and care.

The education of the individual woman may have been a better indicator for assessing the influence of education on the level of maternal mortality. However this information is not available, because only the age and timing of death related to the status of pregnancy were collected on the women who had died.

For both formal education variables, three categories are used: No schooling; 1–6 years of schooling and 7+ years of schooling. The no schooling category for the variable "highest education level in the household" includes never attended school; this thus represents an extremely vulnerable situation.

The methodology used for estimating maternal deaths was slightly different from the previous case. Two categories were considered: a) Pregnancy-related deaths and b) Not known whether pregnancy-related deaths. As in the maximum scenario discussed earlier, these were taken together as pregnancy-related deaths, excluding the category Not pregnancy-related deaths from the total maternal deaths. This procedure was adopted to deal with the issue of connecting the deaths with the socioeconomic attributes. This required the creation of identification codes and, in the process, cases of a second or more deaths in a household had to be excluded.[18]

The live births (from the person dataset) and the maternal deaths (from the deaths dataset) were distributed according to the deceased woman's age and educational groups, and were adjusted by the same factors previously estimated to deal with omissions. Hence, the same adjustment factor for live births (1.88) and the same adjustment factor for maternal deaths (1.53) were applied for each educational level and age group. Table 4 shows the results for Kabul. To facilitate understanding of the magnitude in the differences, the results are plotted in Figure 5.

17 Analyses are limited to Kabul due to data processing limitations.

18 Analysing maternal deaths according to years of education requires a link between the death's dataset and person's dataset. An identification code to link the two datasets is needed, which had to be constructed because it was not available. However, during the construction process duplicated codes were found, which hampered the merging of datasets. To merge the datasets and to avoid elimination of multiple deaths in a household (duplicated identification codes) a "maternal death" variable was created from two categories (pregnancy-related deaths and not known whether pregnancy-related), assuming that not known pregnancy-related deaths were all pregnancy-related deaths. From this unique variable it was possible to construct an identification code that linked the datasets. The problem of constructing identification codes to merge datasets generating duplicated codes was an important issue affecting some of the analyses of thematic reports.

TABLE 4

Maternal mortality ratio (per 100 000 live births) according to woman's age at death by highest schooling of the household head and highest schooling in the household: Kabul, 2013

Age Groups	Household Head Schooling			Highest schooling in the household		
	0 Schooling	1 to six	Seven or more	0 Schooling	1 to six	Seven or more
MMratio [a]	662	517	572	552	503	646
15-19	589	-- [c]	252	250	616	373
20-24	271	209	219	177	264	252
25-29	335	194	210	293	249	253
30-34	429	533	526	378	264	613
35-39	834	559	966	983	708	886
40-44	3,598	2,544	3,018	5,916	3,189	2,903
45-49	7,570	11,272	10,508	20,059	4,899	9,128
Number of PRD [b]	634	154	551	190	218	930

a Number of pregnancy-related maternal deaths per 100 000 live births

b As reported over a 24 month period. Not adjusted. It includes the categories Pregnancy-related deaths and Not known whether pregnancy-related deaths and excludes the non-pregnancy-related deaths.

c No events registered in this category

Source: CSO Afghanistan, Kabul SDES 2013

Overall, the MMratio does not present relevant differences as expected, which may be related to the size of the population involved. It is important to consider that in Kabul it is possible that access to maternal health – although scarce – would be similar for most people in terms of distance and cost.

On the one side, this would contribute to relative homogeneity in terms of maternal mortality, which in any case is very high (MMratio exceeds 500). On the other hand, the age composition of each educational level should also be considered. In examining the MMratio differential by age, further methodological procedures – such as standardization techniques, for instance – would be necessary to better assess the level of maternal mortality according to socioeconomic groups.

The age pattern shows the expected association between education and maternal mortality in most cases. The MMratio is higher for older age groups irrespective of education level. For ages older than 35–39, MMratio differences between the lowest education group (No schooling) and other groups are striking particularly by the highest education attained by a household member. The lower the formal education, the higher the risk of dying from a pregnancy related cause after ages 35–39 when the highest level of education attained in the household is considered.

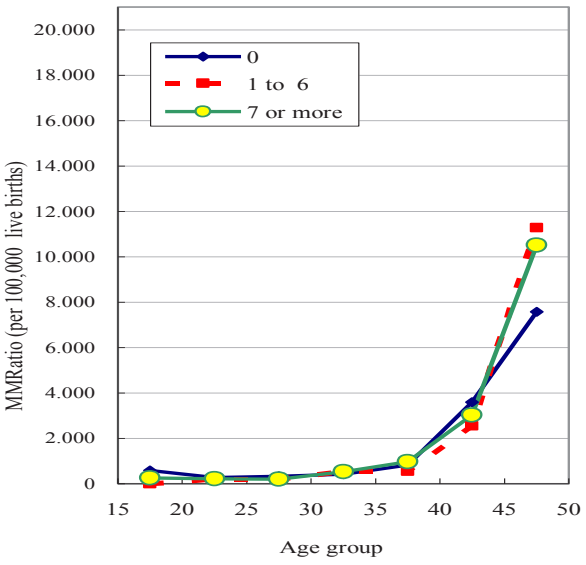
Relevant observations are the differences in the MMratio for the first three age groups, when comparing the household head's education with the highest education attained by a household member. When the household head has no schooling it impacts more negatively on maternal mortality than when the highest household attainment is no schooling. Moreover, when the household head has 1–6 years of

schooling it impacts more positively on MMratio than when that level of education is measured through highest household's attainment. This may occur because in Afghanistan the household head plays an important role in the household decision-making, including maternal health care and even on women's life conditions. Hence, lower maternal mortality among young women (15–29 years) is associated with a higher education level for the household head. In contrast, improving the highest education in the household as a whole does not translate to lower maternal mortality ratio for young women.

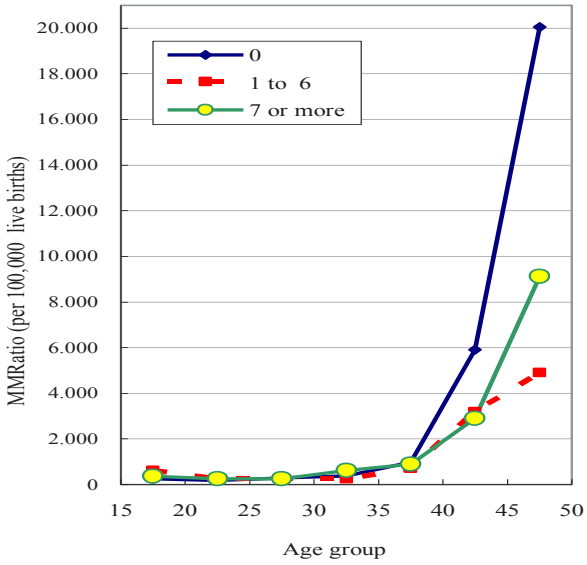
FIGURE 5

Maternal Mortality Ratio (per 100,000 live births) by age of household head and highest schooling in the household, Kabul, 2013

A) HOUSEHOLD HEAD SCHOOLING



B) HIGHEST SCHOOLING



Source: CSO Afghanistan, Kabul SDES 2013

For older women (40–49 years old), there are smaller maternal mortality differentials by education of household head (Figure 5a) than maternal mortality differentials by highest education of a household member (Figure 5b). Moreover, all MMratios surpass the four-digit mark after age 35–39. At the very end of the reproductive life, MMratios are always above 7,000 maternal deaths per 100,000 live births.

Finally, although a scarce number of deaths in these breakdown categories may randomly alter any trend, in the case of Kabul, the classification of deaths using any educational category always resulted in a figure above 100 cases (see last row in Table 4). Despite distortions within the age group categorization this value shapes the expected relationship between educational attainment and maternal mortality.

4

Discussion and Conclusions

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Although international sources have reported that Afghanistan has made notable efforts in reducing the maternal mortality, SDES data for six provinces of Afghanistan – Kabul, Bamiyan, Daykundi, Ghor, Kapisa, and Parwan – pregnancy-related maternal mortality indicators in this report conform with the high MMratio estimates from other data sources. As SDES provides cross-sectional data for each province at a particular date, this report is unable to confirm a downward trend. This deserves further research using the lifetime risk indicator by age.

The information used for estimating maternal mortality levels appears to be internally consistent when compared to the fertility data. However, a thorough evaluation of the data is still necessary. Information on adult mortality as a whole, as well as on live births, has been evaluated. A more robust examination of the reliability of the maternal mortality information will contribute to a better assessment of the maternal mortality level.

The results obtained here are only the first step towards a thorough understanding of the maternal mortality situation in Afghanistan. Further analyses exploring the relationship with traditional determinants are required, such as those established by the Safe Motherhood Initiative: reproductive health care access, women's education, gender relationships and attitudinal behaviour (the framework for safe motherhood is provided in Box 2 in the Appendix).

It is relevant to highlight that, particularly in Afghanistan, high maternal mortality risks are the consequence of a complex synergy of many social, demographic, medical, economic and cultural factors (Fernandez, Jha and Eelens, 2012). These factors structure three types of barriers responsible for the high maternal mortality risks found in these provinces:

GENDER BARRIERS

- Early and child pregnancies, narrowly spaced births and high fertility.
- Restrictions for women on leaving the house without a male escort.
- Low level of education of women.
- Lower status of women and discrimination against women.
- Gender based violence and various harmful traditional practices.

ACCESS BARRIERS

- Custom of home deliveries, limited availability and access to health services.
- Limited number of female health service providers.
- Limited knowledge of safe practices for maternal health in family and community.
- Low level of security in parts of the country.

CAPACITY BARRIERS

- Inadequate quality of provided care, lack of antenatal, emergency obstetric care, postpartum care and modern family planning services.
- Insufficient number of skilled birth attendants, especially female.

POVERTY AND DEPRIVATION

The SDES did not collect data on health care; yet, other dimensions as gender equity, education, poverty and rural/urban residence should be the objects of further research using this dataset in order to establish their association with maternal mortality levels and to expand the knowledge base for policy design, programme implementation and best strategies to reduce Afghanistan's extremely high maternal mortality levels.

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Annex

Basic data for estimating maternal mortality measures in the provinces of Bamiyan, Daykundi, Ghor, Kabul, Kapisa and Parwan (2011–2014)

TABLE A

Number of deaths declared in the question "Did _____ die during pregnancy, giving birth, or within 6 weeks of delivery? (weighted data)

Province	Pregnancy-related deaths	Non pregnancy-related deaths	Not known	Total
Bamiyan	353	36	163	552
Daykundi	511	131	231	873
Ghor	816	259	469	1544
Kabul	381	773	965	2119
Kapisa	31	88	62	181
Parwan	134	173	159	466
Relative distribution (percent)				
Bamiyan	63	6	29	100.0
Daykundi	58	15	26	100.0
Ghor	52	16	30	100.0
Kabul	18	36	45	100.0
Kapisa	17	48	34	100.0
Parwan	28	37	34	100.0

Source: CSO Afghanistan, SDES 2011-2014

TABLE B

Live births, maternal deaths and women by age adjusted with corresponding factors (weighted data)

Age group	Live births	Maternal deaths	Women
	Kabul (2011)		
15-19	10.607	32	255.772
20-24	52.365	108	200.870
25-29	51.446	98	152.329
30-34	29.048	76	102.247
35-39	21.037	82	113.150
40-44	6.145	71	80.992
45-49	2.462	42	71.322
Total	173.110	508	976.682
Adjustment factor	**1,877**	**1,538**	

Age group	Live births	Maternal deaths	Women
	Ghor (2012)		
15-19	5.100	63	48.399
20-24	11.511	131	37.421
25-29	10.338	172	31.879
30-34	6.428	127	23.398
35-39	4.944	122	21.871
40-44	2.301	110	17.143
45-49	1.149	61	11.921
Total	41.771	786	192.032
Adjustment factor	**1,912**	**1,724**	

Age group	Live births	Maternal deaths	Women
	Bamiyan (2011)		
15-19	1.275	3	21.781
20-24	4.571	35	15.366
25-29	4.696	15	12.287
30-34	3.485	39	9.317
35-39	2.538	20	8.996
40-44	1.231	39	7.139
45-49	463	19	5.323
Total	18.258	171	80.209
Adjustment factor	**2,203**	**1,493**	

Age group	Live births	Maternal deaths	Women
	Kapisa (2014)		
15-19	905	6	21.072
20-24	4.566	2	15.919
25-29	4.189	13	11.073
30-34	2.549	7	7.344
35-39	1.746	0	8.040
40-44	791	2	6.198
45-49	249	5	5.107
Total	14.994	35	74.753
Adjustment factor	**1,541**	**1,613**	

Age group	Live births	Maternal deaths	Women
	Daykundi (2012)		
15-19	2.600	42	36.787
20-24	7.097	83	22.896
25-29	7.985	68	19.506
30-34	4.782	55	13.283
35-39	4.901	32	15.142
40-44	1.840	56	10.384
45-49	1.121	45	9.694
Total	30.326	382	127.692
Adjustment factor	**1,943**	**1,235**	

Age group	Live births	Maternal deaths	Women
	Parwan (2014)		
15-19	1.712	14	41.217
20-24	9.110	34	31.843
25-29	9.133	31	24.154
30-34	5.046	13	16.090
35-39	3.796	15	16.983
40-44	1.495	24	13.285
45-49	655	12	11.586
Total	30.947	144	155.158
Adjustment factor	**1,563**	**1,515**	

Source: CSO Afghanistan, SDES 2011-2014

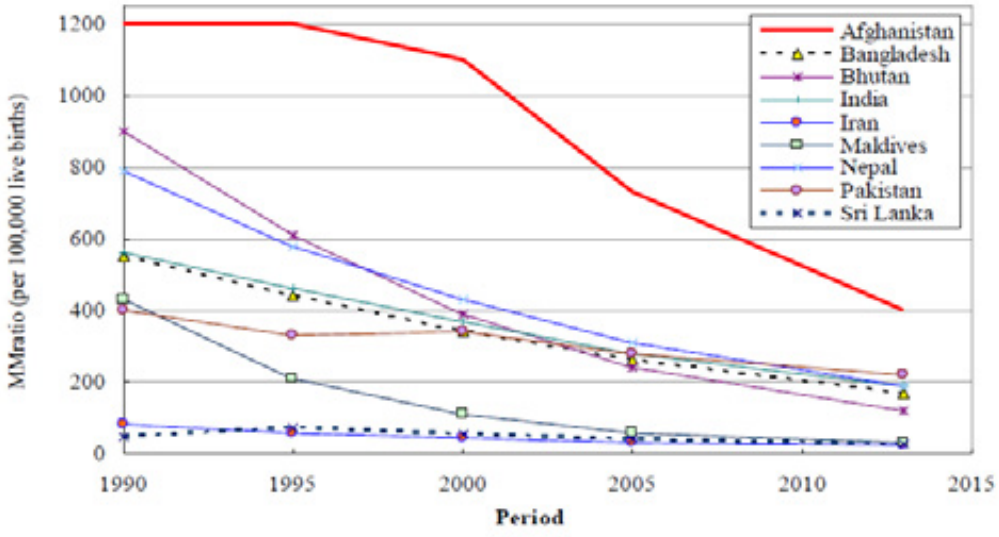
FIGURE A

SDES: Proportion of PRDs by age occurred at the time of delivery in the provinces of Bamiyan, Daykundi, Ghor, Kabul, Kapisa and Parwan (2011-2014)

* The dotted line is the result of a polynomial adjust
Source: CSO Afghanistan, SDES 2011-2014

FIGURE B

Maternal mortality ratio (MMratio): maternal deaths per 100,000 live births, 1990–2013, by countries of Southern Asia*

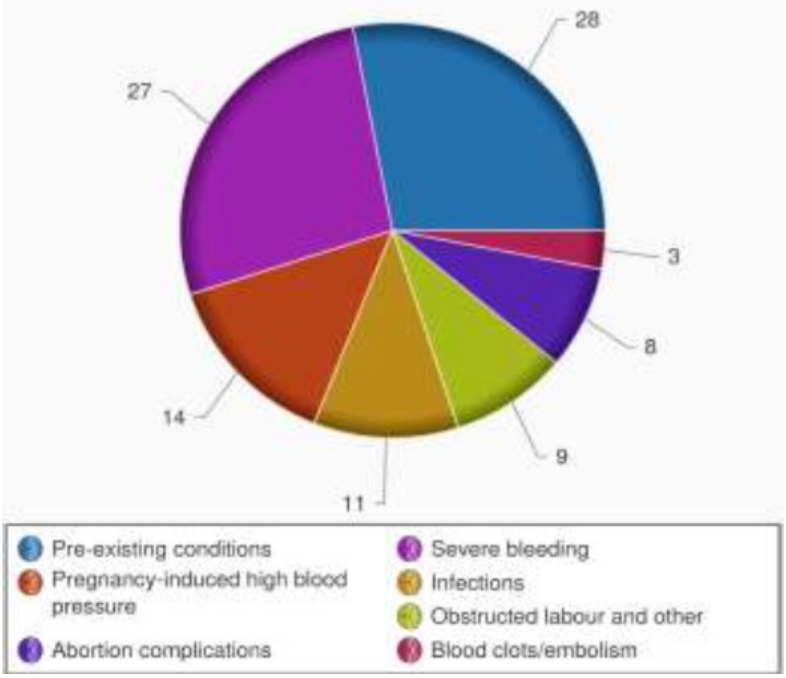


* According to WHO criteria (WHO, 2014)
Source: WHO (2014): Data Trends in maternal mortality: 1990 to 2013. Estimates by WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division.

Appendix

APPENDIX FIGURE 1

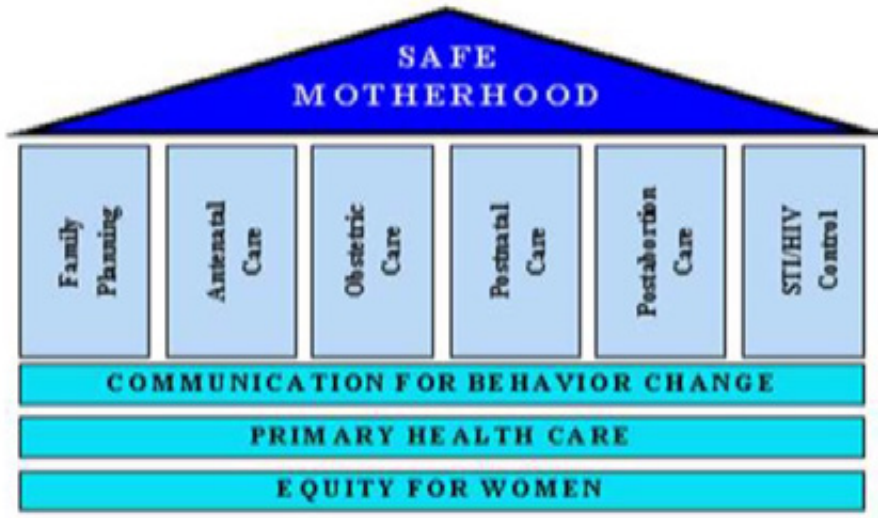
Causes of maternal death in the world by percentage



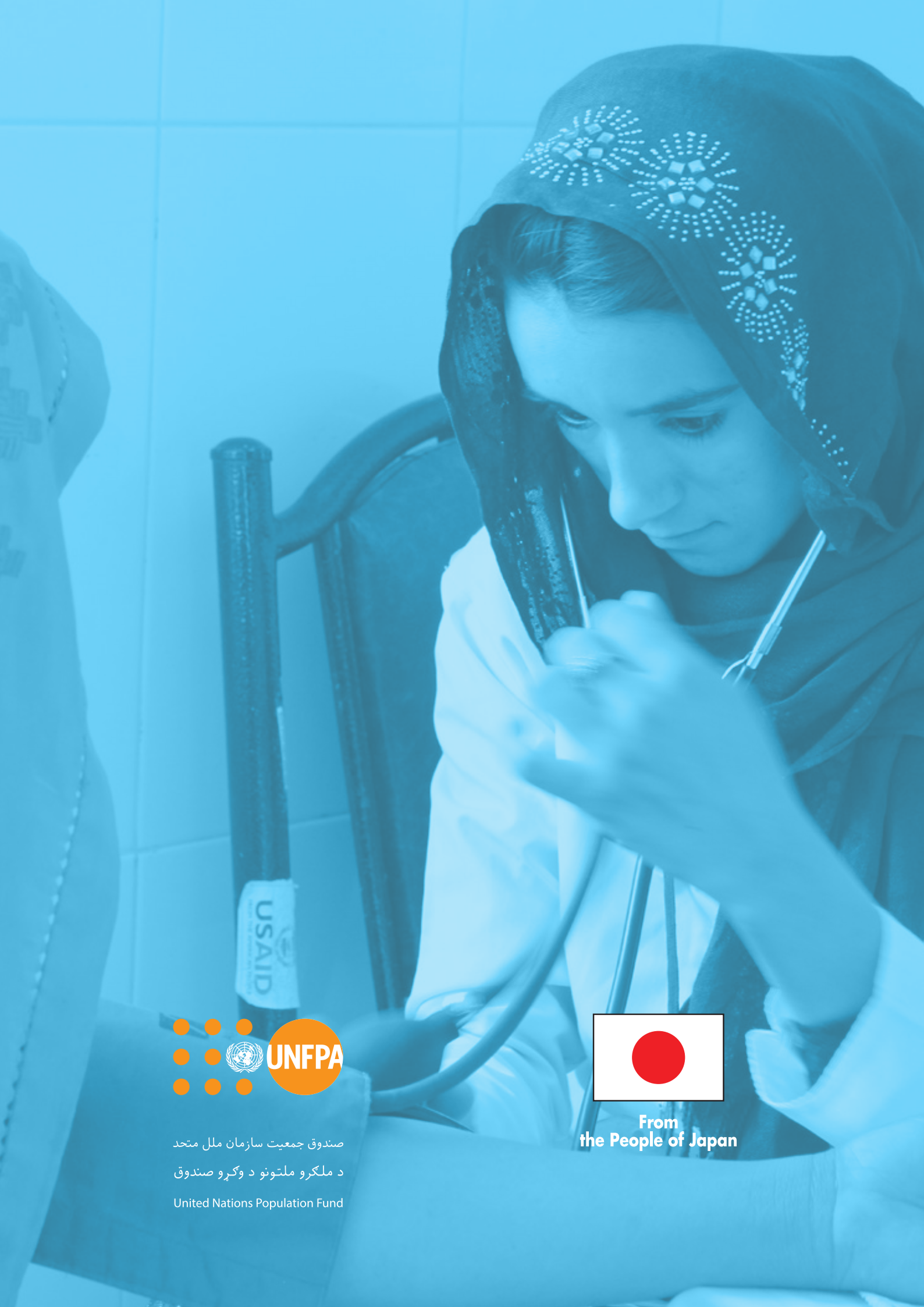
Source: WHO – Maternal mortality – Fact sheet N°348, updated May 2014. Say, L. et al. (2014). Global causes of maternal death Retrived fromhttp://www.who.int/mediacentre/factsheets/fs348/en/

APPENDIX FIGURE 2

Pillars of Safe Motherhood



Source: http://siteresources.worldbank.org/INTPRH/Images/Pillars.gif – http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTHEALTHNUTRITIONANDPOPULATION/*XTPRH/0,,contentMDK:20200213~menuPK:548457~pagePK:148956~piPK:216618~theSitePK:376855,00.html*



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