Strategic Approach to Improving Maternal Survival in Oman

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Abstract

This study of maternal mortality in Oman tries to answer the question: Is the Fifth Millennium Development Goal achievable in Oman or not? In Oman, Maternal Mortality Ratio currently stands at 22.9/100,000, a reduction of 38.9% from its 37.5/100,000 in 2002. This figure suggests that much needs to be done to accelerate progress towards the achievement of the Fifth Millennium Development Goal. Characteristics of 135 Omani women who died during pregnancy, labour or puerperium during the period 1990-2005 were studied. Data related to maternal health in Oman were also scrutinized, e.g. age of first marriage, ante-natal, natal and post-natal care, birth spacing, fertility and perinatal mortality. The study calls for accelerated efforts and renewed commitment to maternal health and recommends a framework for national strategic directions to scale up access to essential interventions to reduce maternal mortality in Oman and move closer to the achievement of the Fifth Millennium Development Goal.

Keywords: Maternal Mortality; Millennium Development Goals; Oman.

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Introduction

Since the late 1980s, improving maternal health and reducing maternal mortality have been key concerns of several international summits and conferences, including the Millennium Summit in September 2000.[1] It was the largest-ever gathering of Heads of State ushered in the new millennium by adopting the Millennium Declaration. The Declaration was endorsed by 189 countries and was translated into eight Millennium Development Goals (MDGs) to be achieved by 2015.[2] One of the eight MDGs adopted at the Millennium Summit is improving maternal health (the 5TH MDG). For this goal, two indicators have been selected to help track progress: maternal mortality ratio and proportion of births attended by skilled health personnel. This goal and its associated targets are closely linked to other MDGs and targets, including those of reducing under-five mortality (40% of which is due to neonatal causes), of halting the spread of HIV/AIDS, of controlling malaria, of promoting gender equality and empowerment of women, and of eradicating extreme poverty.[3]

The maternal mortality ratio (MMR), which is a measure of the risk of death associated with each pregnancy, was estimated to be 400 per 100 000 live births globally in 2000. In certain settings, women face this risk several times during their lives and the cumulative lifetime risk of maternal death can be as high as 1 in 16, compared with 1 in 2800 in developed countries.[4]

In this context, country estimates of maternal mortality over time are crucial to inform planning of sexual and reproductive health programmes and to guide advocacy efforts and research at the national level. These estimates are also needed at the international level, to inform decision-making concerning resource allocation by development partners and donors.[5] In Oman, there is little or no change in Maternal mortality ratio in the last thirteen years. Accordingly, for Oman to achieve the 5TH MDG, maternal mortality ratios need to decrease at a much faster rate in the future than that of the period between 1995 and 2007.

This paper presents and tries to analyze some findings on maternal mortality in Oman. This information is needed to inform planners and to guide advocacy efforts and research at the national level. The paper also describes an outline for national strategic directions aiming at accelerating the reduction of maternal mortality in Oman and moving closer to the achievement of the Fifth MDG.

Methods

In this article the Ministry of Health (MoH) data on maternal deaths for the period 1990-2007 were reviewed, tabulated and analyzed. Most of these data were obtained from the Annual Health Reports which are published annually by MoH. Other unpublished data were obtained through personal contact with the Department of Information and Statistics, Ministry of Health. These data included information about births, deliveries and infant and child mortality obtained from the "MoH Child Health Care Register–MR2". Unpublished data included also information about all cases (135) reported in "MoH Maternal

Death Notification Records" during the period 1990 to 2005. These records give valuable information about cases of maternal deaths reported to MoH whether happened in its own facilities or outside.

Results

Table 1 shows the change in maternal mortality ratio (MMR) in Oman during the period from 1995 to 2007. The lowest figure was recorded in 2006 (13.2 per 100.000) and the highest one in 2002 (37.5 per 100.000). The figures in the last 3 years (2005-2007) were as follows: 15.4, 13.2 and 22.9 per 100.000, respectively.

Table 1: Maternal Mortality Ratio (MMR) in Oman (1994-2007)

Year	MMR (per 100,000)	Year	MMR (per 100,000)
Before 1994	n.a.	2001	23.1
1994	27*	2002	37.5
1995	22	2003	23.2
1996	21	2004	18.5
1997	n.a.	2005	15.4
1998	18.5	2006	13.2
1999	14	2007	22.9
2000	16.1		

Source: Annual Health Reports – MoH (Oman) 1990-2007.

*Ministry of National Economy (Oman).

Table 2 shows a comparison between the six countries of the Gulf Cooperation Council (GCC) and Yemen as regards to the figures of maternal mortality ratio (MMR) and lifetime risk of maternal death in 2005. The best figures were recorded in Kuwait (4 per 100,000 and 1 in 9600, respectively), followed by Qatar (12 and 1 in 2700), then Saudi Arabia (18 and 1 in 1400). Oman ranked sixth among the seven countries with an MMR of 64 and Lifetime risk of maternal death of 1 in 420.

Table 2: Maternal Mortality Measures (MMR) in GCC countries (2005)

Country	(MMR)	Lifetime Risk of Maternal Death: 1 in:
Kuwait	4	9600
Qatar	12	2700
Saudi Arabia	18	1400
Bahrain	32	1300
United Arab Emirates	37	1000
Oman	64	420
Yemen	430	39

N.B. Figures have been computed to ensure comparability; thus they are not necessarily the official statistics of countries, which may use alternative rigorous methods.

Source: Maternal mortality in 2005, World Health Organization; 2007.

Table 3 shows the characteristics of the 135 Omani women who died during pregnancy, labour or peurperium during the period 1990-2005. Nearly one fourth of those women (24.4%) gave birth to a maximum of 3 children during their reproductive life period. Another 29 women (21.5%) had 4 to 8 children, while 16 of them (11.9%) had 9 or more children. Those who died before becoming mothers constituted 13.3%. Regarding the number of ante-natal visits, a total of 12 women (8.9%) paid 8 or more visits to ANC clinic during their last pregnancy. Another 4 (3.0%) visited ANC clinic 4 times, 3 (2.2%) for 2 times. Home delivery was

encountered only in 2 cases (1.5%) out of the 135 women whose deaths were recorded as maternal deaths. The majority of maternal death cases (57.8%) attended health facilities for delivery. Place of delivery of a big portion of them (39.3%) was unknown. Out of the 135 which were recorded as maternal deaths, 53 (39.3%) suffered also negative outcomes. Cases ended with abortion constituted 22.2%. Foetal death and neonatal death were encountered among 11.9% and 5.2% of cases respectively.

Table 3: Characteristics of Omani women who died during pregnancy, labour or puerperium during the period 1990-2005

Variable	Age Groups (in years)					Total (N = 135)
	15-19 (N = 9)	20-29 (N = 49)	30-39 (N = 64)	40-49 (N = 11)	Unknown (N = 2)	
Number of live births:						
- zero	2	11	5	0	0	18 (13.3%)
- 1-3	1	19	11	2	0	33 (24.4%)
- 4-8	0	5	23	1	0	29 (21.5%)
- 9 or more	0	0	10	6	0	16 (11.9%)
- Unknown	6	14	15	2	2	39 (28.9%)
Number of ante-natal visits during last pregnancy:						
- 2 visits		2	1	0		3 (2.2%)
- 3 visits		0	0	1		1 (0.7%)
- 4 visits		2	2	0		4 (3.0%)
- 5 visits		1	0	0		1 (0.7%)
- 7 visits		0	1	0		1 (0.7%)
- 8 visits or more		1	8	3		12 (8.9%)
Place of delivery in the last pregnancy:						
- Health facility	7	24	38	8	1	78 (57.8%)
- Home	0	0	2	0	0	2 (1.5%)
- Other	0	1	1	0	0	2 (1.5%)
- Unknown	2	24	24	3	1	53 (39.3%)
Number of maternal deaths accompanied with negative outcome:						
- Foetal death						16 (11.9%)
- Neonatal death						7 (5.2%)
- Abortion						30 (22.2%)

Source: Maternal Death Notification Records – MoH (Oman) 1990-2005.

Table 4 shows the changes in 10 indicators related to mother and child care in Oman during the period (2003-2007). Little or no change was observed in 7 indicators (mean number of ANC visits, % registered in first trimester, % visited ANC clinic, % never visited ANC clinic, proportion of births attended by skilled health personnel, ratio of postnatal visits to registered pregnant and birth interval less than 2 years). Two other indicators showed slight increase between 2003 and 2007; pregnancy associated with hypertension (from 0.8 to 1.2%) and pregnancy associated diabetes mellitus (from 1.8 to 2.9%). On the contrary, percentage of cases of pregnancy associated with anaemia showed a tendency to decrease over years (from 34.9% in 2003 to 30.8% in 2007).

Table 4: Maternal Health Indicators in Oman (2003-2007)

Indicators	2003	2004	2005	2006	2007
- Mean No. of ANC visits	8.3	8.3	8.6	8.2	7.1*
- % Registered in first trimester	62.5	64.2	65.5	64.2	64.8
- % Anaemic	34.9	31.8	33.1	31.8	30.8
- % Hypertensive	0.8	0.9	0.9	1.0	1.2
- % Diabetic	1.8	1.7	2.0	2.7	2.9
- % Visited ANC clinic 6 (4*) or more times	81.4	84.7	86.2	83.3	(86.3)*
- % Never visited ANC clinic	0.7	0.7	0.6	0.6	0.7
- Ratio of postnatal visits to registered pregnant women	1.32	1.25	1.29	1.23	1.24
- Proportion of births attended by skilled health personnel.	98%**	98.7%**	98.7%**	98%	99%
- % Birth interval less than 2 years	20.3	20.9	20.7	18.1	21.6

* The schedule ANC visits was changed in 2007 with the least number of visits required during pregnancy.
** Estimates from MR 2 Registers – MoH (Oman).
Source: Annual Health Reports – MoH (Oman) 2003-2007. ANC: Antenatal clinics

Table 5 reveals the figures for birth and total fertility rates in Oman during the period 2003-2007. Birth rate showed gradual increase since 2004 starting from 25.4 per 1000 population to 27.2 in 2007. On the contrary, total fertility rate showed mostly a gradual decrease. It dropped from 3.56 in 2003 to 3.13 in 2007.

Table 5: Birth Rate & Total Fertility Rate in Oman (2003-2007)

Year	Birth Rate (Per 1000 population)	Total Fertility Rate
2003	25.6	3.56
2004	25.4	3.19
2005	26.0	3.14
2006	27.1	3.19
2007	27.2	3.13

Source: MR 2 Registers and Annual Health Reports – MoH (Oman) 2003-2007.

Table 6 shows the Singulate Mean Age at first Marriage (SMAM). There is a marked rise of SMAM for both males and females in Oman over the last 16 years. SMAM of males jumped from 24.7 years as recorded in 1993 National Census to 26.2 in 2000 then again to 28 years in 2003 Census. The case for females was quite similar, but the recorded SMAM was 20.7 years in 1993, 23.3 in 2000 and 25 in 2003.

Table 6: The Singulate Mean Age of First Marriage (SMAM) in Oman

Sex	Mean Age (in years)		
	1993 National Census	National Health Survey 2000	2003 National Census
- Males	24.7	26.2	28
- Females	20.7	23.3	25

Source: - Annual Health Report – MoH (Oman) 2007.
- Woman and Man in the Sultanate of Oman: A Statistical Picture (in Arabic)
– Ministry of National Economy (MONE), December 2007.

Table 7 shows the numbers of foetal (still birth) and early neonatal deaths which constitute perinatal deaths in Oman during the years 2003 to 2007. All the figures showed fluctuations with a tendency to increase during that period. A sharp increase in the number of foetal (still birth) and early neonatal is noticed between 2004 and 2007 (103 more cases of foetal deaths in 2007 compared to 2004, and 63 more cases of early neonatal deaths in 2007 compared to 2004). Accordingly, perinatal mortality rate increased from 11.5 in 2004 to 13.3 per 1000 live births in 2007.

Table 7: Perinatal Mortality in Oman (2003-2007)

Year	Foetal (Still Birth) Deaths	Early Neonatal Deaths	Perinatal Deaths	Perinatal Mortality Rate (per 1000 live births)
2003	382	182	564	12.4
2004	346	181	527	11.5
2005	387	187	574	12.0
2006	367	206	573	11.2
2007	449	244	693	13.3

Source: Calculated from MR 2 Registers and Annual Health Reports – MoH (Oman) 2003-2007.

Discussion

According to the 2005 data, few developing countries are on track to achieve the 5th MDG. The global maternal mortality ratio (MMR) stands at 400 maternal deaths per 100 000 live births, compared to 430 in 1990. MMR was highest in the developing regions (450), in stark contrast to developed regions (9). The annual decrease of less than 1% on the average is far below the 5.5% annual decline which would be required to achieve the 5TH MDG. At a regional level, none of the MDG regions achieved 5.5%, although Eastern Asia came close with a 4.2% annual decline.[5]

In Oman, available data shows that MMR was 27 per 100,000 live births in 1994, it decreased to 22.9 cases in 2007. However, it increased to 37.5 per 100,000 in 2002 (Table 1), which may give the impression of deterioration in the health situation. This is not consistent with the Sultanate's policy that works toward improving the health of mothers and children. The high figure recorded in 2002 could be attributed to the improvements introduced in case monitoring and registration in public and private health institutions. This is particularly true, as the Civil Registration System was actually enforced in May 2004.[6] Taking 2002 as the base year for calculations, the required annual decline rate for achieving the 5th MDG by 2015 is 10.7%.[6] However, the fluctuations shown by MMR in the last five years and the wide gap between Oman and other Gulf countries as regards MMR and lifetime risk of maternal deaths (Table 2) suggest that much needs to be done to accelerate progress towards the achievement of the 5TH MDG. An encouraging sign is the remarkable success of Japan in reducing deaths among mothers and babies to very low figures that compares favorably with other developed countries. That success has been achieved within the lifetime of one generation.[7]

Noteworthy to state that assessing the extent of progress towards the 5TH MDG target is quite difficult, due to the lack of reliable maternal mortality data. Information is required about deaths among women of reproductive age, their pregnancy status at or near the time of death and the medical cause of death - all of which can be difficult to measure accurately in Oman because the civil registration system was not existing before 2004, and till now is incomplete. Unfortunately, estimates from hospital records – as it used to happen in Oman - are not representative of the whole population, but only the population that sought care at the hospital.[8]

Reviewing Maternal Death Notification Records of MoH during the period 1990-2005 can give us a clue to the issue. Although it is widely known that maternal deaths are usually related to risky pregnancy (women under 20 or over 40 years, too close or too many pregnancies),[2] data reviewed showed that the mean age for 135 women who died because of pregnancy, labour or peurperium related causes was 29.89 years,[9] and nearly 47.4% of them were in the age group (30-39 years), added to 6.7% who were under 20 years – Table 3. Moreover, data reviewed showed that the mean age of the deceased women increased to over 30 years since 2002. This finding might be attributed to the increase in the singulate age of first marriage (SMAM) noticed from the results of the National Health Survey conducted in 2000 and the 2003 National Census (Table 6).[9]

In Oman, attempts were executed to determine the leading causes of maternal deaths, trends of maternal deaths and the underlying conditions leading to death.[10] However, qualitative and quantitative analyses of data are needed to produce accurate and useful information. Data analysts need to establish the medical (or pathophysiological) cause of death, as well as determine the non-medical factors contributing to death. They need to examine factors related to the woman herself (care-seeking behaviour), to the community (traditions/practices) and to the health care system (accessibility/availability of adequate care).[11]

As revealed in Table 3, approximately one third (33.4%) of maternal deaths occurred among women having at least 4 children, while around one fourth of them (24.4%) were having 3 children or less. It was noticed also that more than one fifth of cases of maternal deaths (22.2%) ended with abortion. Foetal death and neonatal death were added negative outcomes in 11.9% and 5.2% of cases respectively. The underlying causes could be the negative impact of high fertility and close intervals between births and diseases that are sometimes associated with pregnancy such as heart diseases, hypertension (affecting 1.2% of pregnant women), diabetes (2.9%), and anaemia (30.8%) – Table 4.

Also, data about maternal mortality should be analyzed at more than one level. When such data are available, its analysis by place of residence, place of delivery, helps to identify those at risk. However, having a surveillance system or a death review activity is not enough to ensure that programme and policy decisions are based on good information or even that these activities are providing the information needed for preventive actions.[12] For example, MoH maternal death data showed that 57.8% of cases of maternal deaths occurring during 1990-2005 had their deliveries in health facilities and only 1.5% at home – Table 3. However, the late attendance at hospital by women with serious complications can be one of the many circumstances which may ultimately result in a mother's death. The key is collecting proper and accurate data in a timely manner, analyzing the data and producing valid information, and disseminating the information to those who need to know.[12]

Tracking progress of service provision in the period around childbirth is appropriate because this is when complications are most likely to arise and when most deaths occur. Also, tracking other indicators such as antenatal care use, although not directly related to maternal mortality, can show if progress in maternal health is going on or not. Table 3 shows ante-natal visits of women died during the period 1990-2005 because of causes related to pregnancy, labour and peurperium in their last pregnancy. Data available for 22 women out of 135 revealed that only nine (40.9%) have attended the health facility 2-5 times seeking for ante-natal care. The rest (59.1%) scored more than 7 ante-natal care visits. However, coverage of antenatal care in Oman as shown in Table 4 is quite encouraging, more than half of women (64.8%) had their first ANC visit during their first trimester and 86.3% visited ANC clinics at least 4 times during pregnancy in 2007. The ratio of postnatal visits to registered pregnant women was 1.24, which is also good in view of the two postnatal visits recommended for each woman according to the Ministry of Health policy.[13]

Greater concern should be placed on adolescent women (15–19 years). According to the National Health Survey (NHS) conducted by Ministry of Health (Oman) in 2000, as many as 10.3% of them managed only one or two antenatal visits throughout their pregnancies.[14] This finding confirms that the foundations for maternal risk are often laid in girlhood. According to NHS, prevalence of anaemia among adolescent girls was 40.9%.[14] The negative impact of maternal anaemia on both the mother's and baby's health is universally recognized. Anaemia predisposes to haemorrhage and sepsis during delivery and has been implicated in at least 20 per cent of post-partum maternal deaths in Africa and Asia.[15] Iron supplements provided during routine ANC visits have not alleviated this problem and unless the underlying causes are identified and addressed, the prevalence of anaemia in Oman may remain high.[16]

A key indicator of service provision is the coverage by a skilled birth attendant.[5] Nevertheless, there is a sense of progress, backed by the tracking of an increase in the uptake of care during pregnancy and childbirth. The proportion of deliveries in the developing world assisted by a skilled birth attendant increased from 43% to 57% between 1990 and 2005.[17] This figure is far lower than the global target for this indicator, which was set at a special session of the United Nations in 1999. This global target aims to assure that at least 90% of births worldwide be attended by skilled health personnel by 2015.[18] Luckily, Oman could achieve that target long time before the proposed date and now 99% of births are attended by skilled health personnel – Table 4. Birth attendants in Oman include doctors, midwives and trained staff nurses depending on the type and location of the facility. However, home deliveries do occur in Oman, especially in some regions.[13] There are many reasons explaining why some women did not receive the care they need before, during and after childbirth. In some remote areas, there may be no availability of professional care. Or, if available, the care may not be acceptable to them. In other cases, the women may lack access to health facilities, because there is no transportation available. To improve maternal health, gaps in the capacity and quality of the health system and barriers

to accessing health services must be identified and tackled at community level.[16]

Quite noticed in Oman is the drop in total fertility rates in the past 14 years, from an average of 6.0 in 1995, to 4.7 in 2000, to 3.13 from the latest available data, in 2007. This drop in total fertility rates is probably due to the increased age at marriage[16] –Table 6. However, it is well known that fertility remains high in some areas in Oman. An important threat is the increasing number of women who are now reaching reproductive age due to high levels of fertility in the previous generation. Fortunately, it seems that Omani women have become well aware of the available birth spacing methods. In 2000, 94.7% of women had heard of at least one modern method of birth spacing and 74% had heard of five or more methods.[13] Birth interval of less than 2 years was found in approximately 20% of all births in Oman in the last 5 years – Table 4. The majority of others must be using a birth control method.

Important to know, the factors that cause maternal morbidity and death also affect the survival chances of the fetus and newborn.[14] Moreover, maternal mortality and morbidity have a direct negative impact on the survival chances of the newborn.[4] Avoiding complications that affect the mother will also improve perinatal outcomes and avert most neonatal deaths.[7] Sufficient information about foetal and early neonatal deaths in Oman is available from the foetal death notification system and the Child Health Care Register (MR 2 register) applied and used in Oman. A survey conducted in 1998/99 concluded that perinatal mortalities average 21 per 1000 births with regional disparities.[19] The present study showed much lower figures for the years 2003-2007 (12.4, 11.5, 12.0, 11.2, and 13.3 per 1000 live births, respectively – Table 7). This is also mirrored in neonatal and all postnatal mortality rates that have fallen significantly in the past two decades.[19] This gives some optimism to Oman in terms of achieving the 4th MDG which focuses on child mortality - most of which is made-up of deaths among newborns and infants.

Conclusion

The risk of a woman dying as a result of pregnancy or childbirth during her lifetime is about 1 in 420 in Oman which is considered very high compared with other Gulf and developed countries. Such a discrepancy poses a huge challenge to meeting the fifth MDG to reduce maternal mortality by 75% between 1990 and 2015.

Noting with concern the recommendations of the intercountry consultation for making pregnancy safer in the Eastern Mediterranean Region held in Casablanca, Morocco in June 2005,[3] this paper recommends an outline for a national strategy aiming at accelerating the reduction of maternal mortality in Oman and moving closer to the achievement of the 5th MDG.

The central objective of the strategy is to ensure safe pregnancy and childbirth through the availability, access and use of quality skilled care for all women and their newborns. The essential component of skilled care is the presence of a skilled attendant and other key skilled professionals supported by an appropriate environment with access to basic supplies, drugs and relevant emergency services.

Health education interventions and linkages with the education sector should be improved to empower individuals, families and communities to make healthy decisions and to act upon those decisions, including the decision to seek care at other levels of the continuum when needed.

Strengthening monitoring of maternal deaths is a priority. Maternal death reviews can provide information about the quality of care provided by the maternal health care programme. Such information will also help define the problem, determine its scope, identify the medical and non-medical factors involved that lead to the problem, and determine the interventions necessary to control the problem and prevent any future reoccurrence. Dissemination of the information is essential in order to build and influence a supportive public opinion and for it to be translated into public health practice conducted at all levels.

The following key issues for implementation of the proposed strategy are intended as a guide for prioritizing strategy elements:

- *Build on existing efforts* and strengthen the processes, structures and systems for planning, implementing and evaluating the national woman's health strategy.
- *Strong evidence-based political commitment and strategic partnerships* at all levels are crucial for gaining the needed intersectoral collaboration. All stakeholders should be actively involved in identifying priorities and assessing needs.
- Identify the components which need strengthening in *programme management and planning* for building the continuum of care. Evidence-based interventions should be promoted, with clear lines of accountability and reporting and monitoring of progress.

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References

1. United Nations Millennium Declaration. Fifty-fifth Session of the United Nations General Assembly. New York: United Nations; 18 September 2000 (General Assembly document, No. A/RES/55/2).
2. Tracking progress in maternal, newborn and child survival. The 2008 report. New York, UNICEF, 2007.
3. Making Pregnancy Safer in the Eastern Mediterranean Region. Report of An Intercountry Consultation. Casablanca, Morocco, 14-17 June 2005. World Health Organization, Regional Office for the Eastern Mediterranean, Cairo 2005.
4. Making A Difference in Countries: Strategic Approach to Improving Maternal and Newborn Survival and Health: Ensuring skilled Care for Every Birth. World Health Organization Department of Making Pregnancy Safer. World Health Organization 2006.
5. Maternal mortality in 2005. Estimates developed by WHO, UNICEF, UNFPA and The World Bank. Geneva, World Health Organization, 2007.
6. Ministry of National Economy. Oman. Mellenium Development Goals and Targets: Achievements and Challenges, 2004.
7. Graham WJ. Japan: Setting an example to the world in reducing maternal mortality. J. Immpact, University of Aberdeen, UK: May 29th 2008.
8. Measuring Maternal Mortality: Challenges, Solutions, and Next Steps. Immpact, Population Reference Bureau (PRB), February 2007.
9. Al-Lawati S, Al-Muzahmi S. Maternal Morality in Oman-First Draft, Ministry of National Economy (MoNE), 2008 (unpublished report).
10. Ministry of Health. Oman. Review of Maternal Mortality in Oman, 1991-2000. Community Health and Disease Surveillance Newsletter 2000 p;9(Issue 4):1-3.
11. Berg CJ, Danel I, Mora G. Guidelines for maternal mortality epidemiological surveillance. Washington DC, Pan American Health Organization, 1996.
12. Chichakli LO, Atrash HK, Musani AS, Mahaini R, Arnaoute S. Maternal mortality surveillance and maternal death reviews in countries of the Eastern Mediterranean Region. East Mediterr Health J 2000 Jul;6(4):625-635.
13. Ministry of Health. Oman. Manual on Ante-natal Care, Third Edition, 1996. P. 26
14. Ministry of Health. Oman. National Health Survey 2000, Directorate General of Planning, Department of Research and Studies, 2001.
15. UNICEF. Progress for Children: A Report Card on Maternal Mortality, 2008.
16. UNICEF. Oman. Beyond 2003: Situation Analysis of Children and Women in Oman. Muscat: UNICEF Office, 2006.
17. The Millennium Development Goals report 2007. Statistical annex. New York, United Nations, 2007.
18. Key actions for the further implementation of the Programme of Action of the International Conference on Population and Development. Adopted by the Twenty-first Special Session of the United Nations General Assembly. New York: United Nations; 1999. UNFPA; 1999 (para. 64).
19. Ministry of Health and UNICEF. Oman. Report on Perinatal/Neonatal Infant Mortality, 1999.