

Chapter 8

Avoidable Factors Contributing to Maternal Deaths in Turkey

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Abstract Women's deaths during pregnancy or 42 days after the termination of pregnancy are called maternal deaths. For developing countries, maternal deaths continue to be significant in number. This study represents the avoidable factors contributing to maternal deaths in Turkey using the results of the National Maternal Mortality Study conducted in 2005. According to this nationally representative study, the maternal mortality ratio is 29 per 100,000 live births which is lower than for all regions of the developing world, and at about the same level as those of the Commonwealth of Independent States (CIS) and East Asia. In this study, avoidable factors are categorized into four groups: *household and community factors*, *health service provider factors*, *health service supply factors* and *other avoidable factors*. The results indicate two striking findings. Firstly, the significant impact of household and community level factors on maternal mortality compared to the impact of health service providers and health supply factors. This finding indicates that women's position in their community and in their household is the most problematic issue when it comes to preventing maternal deaths. The second striking result of this study is that there exists a clear need to adopt different strategies for the elimination of maternal deaths in different localities and regions. Although the impact of health service supply factors on maternal mortality were limited among the avoidable factors, the problems of reaching health facilities due to a lack of transportation and long distances between home and the health facility were frequently mentioned obstacles in rural areas.

Keywords Maternal mortality · Turkey · Survey · Risk factors · Death register

8.1 Introduction

For developing countries, maternal deaths continue to be significant in number. 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*

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aggravated by the pregnancy or its management but not from accidental or incidental causes” is defined as a maternal death by the World Health Organization (WHO 1992). According to recent global estimates, 358,000 maternal deaths occurred worldwide in 2008, and developing countries constituted 99 % of these mortalities (WHO et al. 2010). Reducing maternal deaths and improving the reproductive health of women, particularly in developing countries, are among the priorities of national governments as suggested in the Millennium Development Goals (MDGs). However, most developing countries do not have accurate and reliable data about maternal mortality.

As in many developing countries, Turkey’s vital registration system is not well established and maternal mortality levels are estimated using various other data sources. The recent National Maternal Mortality Study (NMMS) studied all deaths of women of reproductive ages between 2005 and 2006, across 29 provinces, in an attempt to estimate maternal mortality levels, causes of maternal deaths and contributing factors. The survey combined a mortality study of women of reproductive ages, verbal autopsy and a review of records in health facilities, and estimated the maternal mortality ratio in Turkey to be 29 per 100,000 live births for the year 2005. Using these most recent comprehensive data, our aim is to contribute to maternal mortality studies in Turkey by presenting key avoidable factors which have not been previously examined. We have categorized these avoidable factors as *household and community factors*; *health service provider factors*, *health service supply factors* and *other risk factors*. In addition, avoidable factors by region as well as urban and rural residence were examined.

8.2 Measuring Maternal Mortality Levels

A nation’s level of maternal mortality is often used as a multi-dimensional indicator of overall health and development. Maternal mortality levels are measured by the maternal mortality ratio, the maternal mortality rate and life time risks. Among these indicators, the maternal mortality ratio (the number of deaths per 100,000 live births) is the indicator most often used. According to the WHO, UNICEF, UNFPA and the World Bank’s joint assessment, the maternal mortality ratio has shown a global decline since the 1990’s (Hogan et al. 2010; WHO et al. 2010). The numbers point to a 34 % decline from 1990 levels. According to the figures for 2008, the maternal mortality ratio is 260 per 100,000 live births globally. Sub-Saharan Africa has the highest ratio with 640 per 100,000, followed by South Asia (280), Oceania (230), South-East Asia (160), North Africa (92), Latin America and the Caribbean (85), West Asia (68), and East Asia (41) (Table 8.1).

Another indicator of maternal health is the lifetime risk¹ of dying from a maternal cause, defined as the accumulated risk by the end of the reproductive period. One woman out of 140 will die due to maternal causes globally, while one out of

¹ The lifetime risk of maternal mortality is calculated with the following equation suggested by WHO et al. (2010): $1/(1 - (1 - \text{MMRatio})^{\text{TFR}})$.

Table 8.1 Maternal mortality estimates by the WHO, UNICEF, UNFPA and the WB and NMMR estimates for Turkey. (Source: WHO et al. 2010; HUIPS 2006)

Region	Maternal mortality ratio	Number of maternal deaths	Life time risk
World total	260	–	140
Developed regions	14	1,700	4,300
Countries of the Commonwealth of Independent States (CIS) ^a	40	1,500	1,500
Developing regions	290	355,000	120
Africa	590	207,000	36
North Africa	92	3,400	390
Sub-Saharan Africa	640	204,000	31
Asia	190	139,000	220
East Asia	41	7,800	1,400
South Asia	280	109,000	120
South-East Asia	160	18,000	260
West Asia	68	3,300	460
Latin America & the Caribbean	85	9,200	490
Oceania	230	550	110
<i>Turkey (Only maternal deaths)</i>	29	387 ^b	1,536
<i>Turkey (All pregnancy related deaths)</i>	38	520 ^b	1,142

^a The CIS countries are Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, the Republic of Moldova, the Russian Federation, and Uzbekistan

^b The number of pregnancy related deaths and maternal deaths obtained from NMMR are inflated to give an estimate for the whole of Turkey

1,536 women will die of maternal causes in Turkey. Both the lifetime risk and maternal mortality ratio of Turkey are at about the same level as those of the Commonwealth of Independent States (CIS) and of East Asia. Table 8.1 indicates that the maternal mortality ratio for Turkey is lower than estimates for all regions of the developing world, although it remains 40 % higher than estimates for the maternal mortality ratio in developed regions and over 80 % higher than the lifetime risk of dying from a maternal cause as estimated for these countries. Matching the CIS and East Asia would confirm the transitional status of Turkey in terms of maternal mortality indicators (Table 8.1).

As is well known, identifying the cause of death is not possible in most developing countries, due to the absence of high quality vital registration and death certification systems. Misclassification and misreporting of deaths are some of the more common statistical problems. Therefore, different data sources and various methodologies such as Reproductive-Age-Mortality-Studies (RAMOS), sisterhood indirect method and verbal autopsy are used to overcome such measurement problems. Obtaining accurate, complete and continuous information about mortality has not been possible from the registration system in Turkey. In an attempt to address the above mentioned problems, a dual-record design was used in the first national study between 1974 and 1975, and the maternal mortality ratio was then estimated as 208 per 100,000 live births (State Institute of Statistics 1978). In 1989, research that used the sisterhood indirect estimation method estimated the maternal mortality ratio as 132 per 100,000

live births (SIS 1993). Another study based on hospital records estimated the maternal mortality ratio as 49 per 100,000 births for 1997–1998 (Akin et al. 2000; Biliker 2005). Moreover, in estimates based on mathematical models, maternal mortality ratios were estimated at 180 in 1990, 70 in 2000 and 44 in 2005 per 100,000 live births (WHO 1996; WHO 2004; Turkyilmaz et al. 2009). The lack of comprehensive data about maternal mortality and the confusion resulting from the different methodologies being used in the above mentioned studies clearly requires additional surveys on the national level.

The most recent survey on maternal mortality, the National Maternal Mortality Study was carried out between July 2005 and June 2006 in 29 provinces and the national maternal mortality ratio was estimated at 29 per 100,000 live births for the year 2005. The survey used burial data, which is considered highly comprehensive when compared with other sources in the country. The reliability of this method has been confirmed by many independent studies.

8.3 The Death Registration System in Turkey

It is useful to take a closer look at the death registration system in Turkey. Death registration is recorded by the General Directorate of Population and Citizenship Affairs of the Ministry of the Interior. Procedures for the reporting and registration of deaths are as follows: The health facility where a death has occurred, or the authority issuing burial permits in urban areas, is required to report the death to the *District Directorate of Population* of the district where the death has been certified. In some cases, relatives of the deceased may obtain the death report from the medical facility and personally take it to the population district for registration in order to facilitate the process. In rural areas, village headmen are required to report deaths to the District Directorate of Population. No medical documentation is sought for the registration of death in such cases.

In both rural and urban areas, deaths must be reported within 10 days of occurrence of the event. Delay in reporting is subject to penalties, albeit not heavy. The Ministry of the Interior and the Population Districts take a passive role in the registration of deaths. No systematic analysis or effort is made to ensure that deaths are registered. A death can only be registered if the deceased appears in a family ledger, therefore birth registration is a prerequisite for death registration. The identity card of the deceased is sent (by the health facility) or brought (by the village headman) to the District Directorate of Population of the particular authority reporting the death; the identity card is then destroyed and the record of the person is ultimately deleted (“closed”) from the family ledger. A death certificate is issued by the population district where the death has been reported, which may or may not be the district where death has occurred, where the deceased had been living, or where the family ledger of the deceased appears.

In cases when death is reported by the headman, the cause of death is not recorded. In cases when a health facility reports the death, the cause of death is recorded according to the ICD-10, but such information is considered to be of very low quality.

Analyses of the reported numbers of deaths have also revealed that there exists a gross underreporting of deaths, particularly for women. According to the Ministry of the Interior, 340,015 deaths were reported in 2005. Even if one assumes a crude death rate of 6 per thousand, this implies an under-reporting of 22 %. The magnitude of under-reporting appears to be larger for infants and females.

8.4 Factors Contributing to Maternal Deaths

Identifying the causes of maternal deaths and other influencing factors has played an important role in eliminating maternal deaths. International campaigns and conferences, such as the Safe Motherhood Initiative in 1987, the Cairo Population and Development Conference in 1994, the Beijing Conference in 1995, and the Millennium Development Goals in 2000 have long called for the need to recognize the leading factors of maternal deaths and each campaign has suggested action plans to avoid them. These conventions have also highlighted the importance of social and economic factors and improvements in the health system (WHO 2004). Moreover, it has been shown that not only technical improvements are needed, but also social interventions are necessary for improving health systems (Berer 2007).

Maternal death is an “individual tragedy for a woman, her partner, her children and her family”, and the main causes of deaths are generally known. More than 80 % of these deaths could be prevented through effective and affordable actions even in poor countries (WHO 2004). The literature about maternal mortality indicates that the majority of maternal deaths could have been prevented with timely medical care. In this regard, the frameworks developed by Thaddeus and Maine (1994) and McCarthy and Maine (1992) are useful tools for analysing the determinants of maternal deaths. McCarthy and Maine proposed a three-delay approach: reducing the likelihood that a woman will become pregnant, reducing the likelihood that a pregnant woman will experience a serious complication of pregnancy or childbirth, and improving the outcomes for those women with complications. Accordingly, family planning programmes, safe abortion services to reduce the risk of complications and improvements in labour and delivery services are suggested as means to reduce maternal deaths (McCarthy and Maine (1992).

In the three delay model presented by McCarthy and Maine, delays in the decision to seek care, delays in arrival at a health facility and delays in the provision of adequate care were the factors used in the analysis of maternal deaths. Delays in seeking medical care due to individual, family or community related problems, or difficulty reaching the health facility, as well as receiving inadequate medical care at that health facility, are the factors most often mentioned as contributing to maternal deaths (Thaddeus and Maine 1994; Barnes-Josiah et al. 1998; WHO 2004).

A multitude of factors can contribute to maternal deaths and most of them go hand in hand. Cultural factors, a family’s socio-economic level, the education and occupation of women, and women’s status within the family and community are all important factors in determining the level of medical care. The distance between

home and the health facility as well as the number of health facilities, cost of treatment and the quality of care are among the obstacles faced when accessing health services.

In seeking medical care, cultural factors and perceptions about health and illness are among the determining factors. In Haiti, for example, perceptions about inadequate and ineffective health care are presented as the leading factor for not seeking help from hospitals. If women in Haiti perceived health care services as incompetent, costly, unpleasant or dangerous they did not use the services. However, more indirect factors such as the loss of domestic labour, transportation costs or the emotional stress of travel may also result in not seeking medical care (Barnes-Josiah et al. 1998).

Another example of the influence of the overall perception of care on maternal deaths comes from Northern Nigeria, the country with highest maternal mortality ratio in the world. In Nigeria, the primary cause of maternal deaths is eclampsia², and local perceptions about the cause of eclampsia are related to the 'evil spirit' of the patient. This perception influences the way treatment is sought, and Nigerians generally seek out traditional healers instead of finding medical care from health facilities (WHO 2003; Adamu et al. 2003).

Similarly, in rural Gambia, the results of a qualitative study indicate cultural factors and the relations between health staff and patients as the primary reasons for not seeking medical care. Patients' underestimation of the severity of their complications, reluctance to challenge traditional wisdom about pregnancy and childbirth issues, previous negative experience with the health staff or negative hearsay about services at the facility, as well as lack of funds, are underlying reasons. In the same study, lack of transportation, prolonged voyages or presenting to more than one medical facility, are also mentioned. Conditions at the hospital, such as lack of blood transfusions, are the most frequent reasons cited among the avoidable factors (Cham et al. 2005). Improving conditions at these facilities and improving the quality of training for health care staff are significant issues. In Uganda, for example, inadequate antibiotic supply, poor access to family planning services, the long distances to available health services, a poor referral system, the use of traditional medicine and the poor gathering of obstetric history are the primary causes of maternal deaths. This study suggests increasing resources for health services, improving roads in rural areas, as well as better informing people about family planning services (Mbonye 2001). In addition, another hospital based study in Pakistan highlights the importance of skilled care at all levels of pregnancy, including the prenatal and postnatal periods to reduce maternal deaths (Bano et al. 2011).

Previous studies conducted in developing countries point to the disadvantaged position of women in all social areas, including health. Women and children are the most disadvantaged groups in countries where patriarchal values are high and women's status is low (Santow 1995; Caldwell 1986; Bloom et al. 2001). Maternal death levels are one of the indicators of women's status (WHO 2004). International documents and national studies have emphasized the effects of gender relations in reducing maternal deaths. In Tunisia, credit for improvements in maternal mortality

² Eclampsia is usually a consequence of pre-eclampsia consisting of central nervous system seizures which often leave the patient unconscious; if untreated it may lead to death.

ratio goes to a voluntary political commitment on gender related concerns, including access to family planning; legalization of abortion; the creation of the National Board for Family and Population, and the Tunisian Safe Motherhood initiative in 1999 (Farhat et al. 2011).

8.5 Methodology

Quantitative data of NMMS carried out in 29 provinces in Turkey were used in this article. The data were collected by a RAMOS type of survey design³ and information about deceased women between 12 and 50 years of age was obtained from burials. Cemetery officials in urban areas and village headmen in rural areas are the primary informants for the burials and they were asked to collect age and sex distribution of all burials. After registering women's deaths, information about the cause of death as well as other background characteristics of the deceased women was gathered in two different forms. If the maternal death occurred at a health facility, the records of the facility were reviewed with the help of Health Facility Record Review Form. If the women died outside of a health facility, a Verbal Autopsy Form was carried out at the household level to determine and classify the cause-of-death (Walraven et al. 2000). Finally, the cause of the maternal death was decided by a Central Review Committee, after reviewing all the forms and information⁴.

Verbal autopsy as a “method of finding out the cause of a death based on an interview with next of kin or other caregivers” was performed with the assumption that “each cause of death investigated has a set of observable features which can be recalled during a verbal autopsy interview” (WHO 2010). This method has been used for more than two decades and is now employed widely to provide information on medical, as well as nonmedical causes of maternal death. In these verbal autopsies, interviews are conducted with the surviving spouse or family members in order to learn the signs and symptoms of the illness leading to death (Fortney et al. 1986; Geynisman et al. 2011).

In NMMS, the verbal autopsy form referred to as the Women's Death Questionnaire was developed, based primarily on a validated verbal autopsy instrument of adult deaths (Chandramohan et al. 1998) used for indirect causes of maternal deaths and for non-pregnancy-related female deaths. It was also based on two verbal autopsy instruments developed by Campbell as a part of two studies in Egypt. Other

³ RAMOS type of data collection has been used to identify and investigate the causes of deaths of women in reproductive ages. There have been successful implementations of this method mainly in low-resource countries such as Surinam, Tanzania, Ghana, Gambia, Mozambique, Taiwan, Brazil and Jordan (Mungra et al. 1998; Zahr and Royston 1991; Kao et al. 1997; Walraven et al. 2000; Songane and Bergstrom 2002; Olsen et al. 2002 cited in Geynisman et al. 2011; Alves 2007; Amarin et al. 2010).

⁴ This committee consisted of 7 obstetricians, 5 mid-career/senior public health experts/epidemiologists. Moreover, four medical doctors worked on a part-time basis to examine the burial forms, verbal autopsy reports, and health facility records.

documents such as the 2003 Demographic and Health Survey, the Bangladesh Maternal Health Services and Maternal Mortality Survey of 2001, the WHO manual of verbal autopsies for maternal mortality (Campbell and Ronsman 1995) and other WHO documents were reviewed for the development of verbal autopsy forms. In these interviews, the basic characteristics of the deceased woman and her husband were recorded, and information about the disease, treatment and manifestations of the woman's illness was obtained.

Health Facility Record Review Forms were used to identify sub-standard care and ascertain the cause of death, and information about basic characteristics of the women as well as treatments within the health facility was gathered. This form was developed after a study of a number of patient files in several hospitals throughout the country, in addition to reviewing the above mentioned documents. The form provides information in particular on the causes of death and treatment procedures, as well as the necessary background characteristics of the women. Information on 75 maternal deaths was obtained from verbal autopsy, 37 were from health facility review records and 106 cases were obtained by both instruments, to give a total of 218 maternal deaths.

8.5.1 Sampling

The sample design of NMMS was a weighted, stratified probability sample. The organizational requirements of the fieldwork meant that we needed to work at the provincial level and that once a province was selected *all* districts within the province and *all* settlements within these districts were part of the sample. Unlike the standard multistage sampling which is often used in household surveys, the only sampling unit was provincial in scope and the greatest challenge was to select a representative sample from among the 81 provinces that could yield national, urban/rural and 12 NUTS-1 regional estimates⁵. The 29 selected provinces included 16,139 urban (285) and rural (15,854) settlements with a population size of 39 million, thus covering 54 % of the country. The field work of the study was completed at the end of 2005.

Weighting, adjustment, and correction procedures were applied due to the disproportionate sample selection, incompleteness in sending of monthly-based forms and underreporting of deaths. The weighting factor ensured the sample was weighted to rescale the disproportionate allocation of the selected provinces. A “non-sending adjustment” was used to correct for the fact that not all settlements sent data each month. Correction factors were calculated for all project provinces with the help of a standard demographic technique—the Bennet and Horiuchi technique (Arriaga 1994). The factor required for the underreporting adjustment was 1.35, implying a

⁵ According to a new system of regional breakdown Turkey is divided, for statistical purposes, into three administrative levels of *Nomenclature of Territorial Units of Statistics regions* (NUTS). The 81 provinces are designated as *NUTS-3 regions*; they can be aggregated into 26 *NUTS-2 regions*, which can in turn be aggregated into 12 *NUTS-1 regions*.

completeness rate at the level of 74 %. The level of underreporting was assumed to be the same for all provinces. Such correction factors have been previously used when maternal mortality is measured in the census (Stanton et al. 2001).

8.6 Results

8.6.1 Profile of Maternal Deaths

A total of 218 maternal deaths were recorded in the 29 provinces. The majority (70 %) of maternal deaths took place in health facilities. The mean age of the deceased women was 31.1 years; 7 % of deaths were adolescent mothers, and 32 % were in the 25–29 age groups. Almost all the women (98 %) were married at the time of death (HUIPS 2006). Although only a quarter of the country's population resides in rural settlements, the majority of the maternal deaths (56 %) took place in rural areas. In line with this finding, 45 % of all maternal deaths occurred in the eastern part of the country, which is the least developed region of Turkey. One third of the deceased women had not completed primary level education or had no education and only 15 % of them had education beyond the secondary level. These results clearly show that the women who died due to maternal causes were typically of a more rural origin, younger and less educated than the general population of the same age group.

The National Maternal Mortality Study results indicate that the reproductive behaviour of the deceased women was significantly different from that of women aged 15–49 in the general population. Among maternal deaths, only 24.7 % of women had previously used modern contraceptive methods and 26.9 % of this number experienced contraceptive failure⁶, resulting in a pregnancy that led to their death. According to the 2003 Turkey Demographic and Health Survey (TDHS-2003)⁷, 42.5 % of ever married women used modern contraceptives and 22.1 % of those women experienced contraceptive failure in the last pregnancy. Among women who died due to maternal causes, relatives of the deceased reported that approximately 31.0 % of pregnancies were unwanted compared to 20.1 % unwanted pregnancies in the TDHS-2003 (Table 8.2).

The survey results indicated that 78.8 % of women had been given antenatal care, but only 31.9 % of them visited antenatal care services four times or more during their pregnancy. Both the proportion in antenatal care and the number of antenatal care sessions taken by the deceased women were lower when compared to women in the comparison group. The number receiving antenatal care was found to be

⁶ Contraceptive failure is calculated as the percentage of contraceptive users who become pregnant accidentally within 12 months following the initiation of a contraceptive method.

⁷ TDHS is a nationally representative sample survey designed to provide information on levels and trends on fertility, infant and child mortality, family planning and maternal and child health. Survey results are presented at the national level, by urban and rural place of residence, and for each of the five regions in the country.

Table 8.2 Comparison of certain characteristics of deceased women in NMMS, and non-deceased women in Turkey Demographic and Health Survey 2003. (Source: HUIPS 2004, 2006)

Variables	National maternal mortality study 2005		2003 Turkey demographic and health survey		
	Percent	Number of cases	Percent	95 % CI	Number of cases
Mean age	31.1	218	33.9	33.65–34.17	8,075
Married	97.6	218	98.8	97.2–99.5	7,686
No education/incomplete primary level	31.8	218	21.8	20.3–23.5	8,075
East	45.0	218	16.2	15.4–17.0	8,075
Urban	43.5	218	71.2	69.9–72.5	8,075
Modern method use	24.7	218	42.5	41.2–43.7	7,686
Method failure	26.9	218	22.1	NA	7,686
Unwanted pregnancy	31.0	218	20.1	NA	7,686
No antenatal care	21.2	218	18.6	16.8–20.6	3,356
Four or more antenatal care visits	31.9	218	53.9	51.6–56.3	3,356
Antenatal care provided by health staff	71.0	218	80.9	78.9–82.8	3,356

81.4 % in 2003, and the percentage visiting the health facilities four times or more was 53.9 % according to the results of 2003 Turkey Demographic and Health Survey. Similarly, the percentage receiving antenatal care from qualified health staff was also lower for women who died due to maternal causes. Seventy-one percent of deceased women took at least one antenatal care visit from trained health personnel during the pregnancy, while this percentage was 81 % for women in the comparison group. These comparisons confirmed that the deceased women had received less antenatal care from the trained health staff.

8.6.2 Avoidable Factors for Maternal Deaths

Several issues contribute to maternal deaths and most of them can be eliminated (WHO et al. 2010). The cause of death patterns varies among countries and within countries. For example, haemorrhage is the leading cause in Africa and Asia, while hypertensive disorder is the highest cause of death in Latin America and the Caribbean (Khan et al. 2006). In Turkey, an Asian country, the primary cause of maternal deaths is postpartum haemorrhage (21 %), followed by oedema, proteinuria and hypertensive disorders (18 %) and antepartum, intra-partum and postpartum deaths (16 %) due to other causes (HUIPS 2006).

Even though many studies have been carried out, particularly in developing countries, to eliminate maternal deaths, there is no standardized approach for the study of avoidable factors (WHO 2004). In fact, the avoidable factors of maternal mortality in Turkey have not been looked at in the limited number of previous studies. In this article, we study the avoidable factors by categorizing them into four groups: *household and community factors, health service provider factors, health service supply*

factors and *other avoidable factors*. The percentage and number of avoidable factors for urban/ rural residence and regions were presented in Table 8.3.

According to the results of the National Maternal Mortality Study, 134 (61.6 %) maternal deaths could have been avoided among the 218 deaths in the country as a whole. Avoidable maternal deaths were higher in rural areas ($n = 78$) than in urban areas ($n = 56$), and these proportions were also different across regions. Avoidable factors in the regions of Central East Anatolia, South East Anatolia, North East Anatolia, Black Sea and Central Anatolia were above the national average. Among the avoidable factors, *household and community factors* constituted the highest percentage on the national level, including rural and urban areas, followed by *health service provider factors*, and other factors. Interestingly, the *health service supply factors* were found as the least frequent contributing factors for maternal deaths. Even though few maternal deaths were observed in the Central Anatolia regions, it could be said that most of the maternal deaths in those regions could be attributed to household and community factors. Only in the East Marmara region is the proportion of avoidable factors lower than 10 % (Table 8.3). The detailed information about these avoidable factors on the national level as well as urban and rural residence are shown in Table 8.4.

8.6.2.1 Household and Community Factors

The household and community factors include delays in recognizing medical problems, delays in seeking medical care, not using contraceptives even where there was no desire for another child, as well as not seeking antenatal care. Knowing the reasons behind these delays, as has been stated in many studies, is essential in order to understand the relationship between the community and the health-care system, as well as to shed light upon women's status within the community. Nationally, delays in recognizing medical problems (89.2 %) and delays in seeking medical care (80.4 %) are the most frequent avoidable factors. Even though the real causes of delays could not be known without information about lifestyle and perceptions of the health care system by the deceased woman and her family, the explanations in a verbal autopsy give some clues.

In one case, for example, a woman had a difficult and long delivery with the help of a traditional birth attendant at home. However, her family took her to a hospital only after a delay of 10 days, where a rupture of the uterus was diagnosed, but could no longer be treated. Similarly, a woman died because of postpartum haemorrhage 13 days following her delivery at home. Another woman died due to neglect of puerperal sepsis 10 days after the birth. In some other cases, women and their families refused treatment or refused to stay at the hospital, or they ignored the risk of being pregnant in cases of chronic heart problems or epilepsy. Sometimes, too, families lacked adequate economic resources to provide medical care from health facilities. In one urgent case, for example, an ambulance team demanded money before transport of the patient to the hospital. In addition to delays in recognizing the medical problem, there were some cases of not recognizing women's psychological problems. One

Table 8.3 Maternal mortality ratio and percent distribution of avoidable factors for maternal deaths by regions in Turkey

Variables	Maternal mortality ratio	Number of cases (n)	Household and community factors (%)	Health service provider factors (%)	Health service supply factors (%)	Other risk factors (%)	Percentage of avoidable factors (%)	Number of cases (n)
<i>Place of residence</i>								
Urban	20.7	123	32.9	16.4	0.8	8.4	58.6	56
Rural	40.3	95	38.6	11.5	2.8	10.6	63.6	78
<i>12 regions</i>								
Istanbul	11.0	11	24.0	4.4	-	8.7	37.1	4
West Marmara	42.1	8	43.1	2.5	0.9	-	46.4	4
Aegean	31.5	26	44.0	16.0	0.8	3.9	64.8	17
East Marmara	21.7	11	8.8	18.5	1.9	26.4	55.6	6
West Anatolia	7.4	5	20.7	31.0	1.5	-	53.2	3
Mediterranean	25.1	26	26.5	16.9	2.5	3.9	49.8	13
Central Anatolia	11.9	6	69.0	5.2	-	-	74.2	4
West Black Sea	26.8	11	59.4	16.7	-	-	76.1	9
East Black Sea	68.3	17	14.9	2.4	-	11.9	29.2	5
Northeast Anatolia	68.3	25	29.8	17.9	6.5	19.9	74.1	19
Central East Anatolia	36.9	23	50.6	13.2	3.8	8.8	76.4	17
Southeast Anatolia	38.9	49	41.4	16.6	1.6	12.3	71.8	34
<i>Total</i>	28.5	218	36.2	13.7	2.1	9.6	61.6	134

Table 8.4 Number of avoidable factors by type of settlement in Turkey. (Source: HUIPS 2006)

Avoidable factors	Urban % (n)	Rural % (n)	Turkey % (n)
<i>Household and community factors</i>	56.1(31)	60.7(47)	58.8(79)
Unwanted pregnancy but not using contraceptives	12.6(7)	30.7(24)	23.7(32)
Delay in recognizing problem	98.8(55)	83.0(65)	89.6(120)
Delay in seeking care	73.7(41)	85.7(67)	80.4(108)
No antenatal care	39.6(22)	43.4(34)	41.4(55)
<i>Health service provider factors</i>	28.0(16)	18.1(14)	22.2(30)
Poor quality antenatal care	48.56(27)	30.7(24)	38.3(51)
Midwife failed to diagnose	21.5(12)	26.9(21)	24.2(32)
Midwife failed to manage	21.5(12)	24.2(19)	23.1(31)
General Practitioner failed to diagnose	25.1(14)	19.2(15)	21.6(29)
General Practitioner failed to manage	19.8(11)	14.0(11)	16.7(22)
Obstetrics team failed to diagnose	53.9(30)	19.2(15)	33.6(45)
Obstetrics team failed to manage	55.6(31)	34.6(27)	43.7(59)
Provider failed to refer	5.5(3)	2.5(2)	3.9(5)
Obstetrician/medical team failed to diagnose	12.6(79)	–	5.5(7)
Obstetrician/medical team failed to manage	16.2(9)	10.2(8)	12.5(17)
<i>Health service supply factors</i>	1.5(1)	4.4(4)	3.4(4)
Lack of surgical staff	–	3.8(3)	6.0(8)
Lack of anesthesia staff	–	2.5(2)	1.6(2)
Lack of nursing staff	–	3.8(3)	2.4(3)
Lack of blood	–	2.5(2)	1.3(2)
Lack of drugs	–	1.3(1)	0.8(1)
Lack of equipment	–	5.2(4)	3.2(4)
Lack of medical supplies	–	2.5(2)	1.6(2)
Operating theatre not available	–	1.3(1)	0.8(1)
Lack of back-up facilities	5.5(3)	5.2(4)	4.5(6)
Lack of anesthesia facilities	–	2.5(2)	1.6(2)
Lack of transportation between home and health facility	–	10.2(8)	6.0(8)
Lack of transportation between health facilities	–	–	–
Long distance to nearest hospital	10.8(6)	16.7(13)	14.1(19)
Health service communication breakdown	3.6(2)	5.2(4)	4.2(6)
<i>Other risk factors</i>	14.3(8)	16.7(13)	15.6(21)
<i>Percentage of avoidable maternal deaths</i>	58.6(56)	63.6(78)	61.6(134)

woman had attempted to commit suicide 1 month before her delivery; however her husband and her family did not realize the extent of her depression.

Recognizing medical complications is more common in urban than in rural areas, whereas a delay in seeking medical care is more often found in rural areas. Household and community factors are the most frequent factors in the Central East Anatolia (76.4%), North East Anatolia (74.1%), South East Anatolia (71.8%), Central Anatolia region (69.0%), followed by West Black Sea (59.4%) and Central East Anatolia (50.6%) (Table 8.3). Failure to use preventive measures, in particular use of contraception to prevent unwanted pregnancy (23.7%) and absence of antenatal care (41.4%) are the other leading significant factors. Both unwanted pregnancies and lack of antenatal care are more frequent in rural areas. Even though the number of cases is limited, household and community factors are significant in Central

Anatolia, West Black Sea and Central East Anatolia regions where the percentage of avoidable factors is higher than the country average.

8.6.2.2 Health Service Provider Factors

After reaching the health facility, failures in diagnosing or managing the problems by obstetricians, general practitioners, medical teams or midwife and poor quality of antenatal care are all factors related to the health service providers that are recognised as indicators of quality of provision. Twenty two percent of maternal deaths were attributed to these factors, and their proportion was higher in urban areas (28 %) than in rural (18.1 %). Among these factors, inadequate management by obstetricians, poor quality of antenatal care and lack of early diagnoses contributed more to maternal deaths than other health service providers. Within Turkey's health system, general practitioners and midwives are responsible for providing primary care. Sub-standard care given at the primary level contributed 16–24 % of maternal deaths nationally. In these primary care services, the typical and most often mentioned problem is the failure to manage chronic heart diseases, even when antenatal care was frequently sought. Moreover, signs and symptoms of imminent suicide were not recognized. In some of the cases, the woman and her family refused to undergo treatment or stay at the hospital. Misdiagnosis (33.6 %) and mismanagement (43.7 %) at the secondary care level were found to be high when compared to the third care level, where these contributions were 5.5 and 12.7 %, respectively. Failure to diagnosis eclampsia and consequently delaying caesarean section, early post-partum discharge even in the presence of hypovolemia, post operative abdominal abscess and an unrecognized perforation of the uterus during dilation and curettage were examples of insufficient or sub-standard care.

Among the health service provider factors, referral of patients to other health facilities (3.9 %) was the least contributing factor for maternal deaths. Both referrals from primary to secondary care level, and from secondary to third care levels were expedient and there was no communication problem among the health facilities during these referrals. However, in some emergency situations, patients were transferred to third level care facility even when the necessary comprehensive emergency obstetric care facilities existed in the secondary level.

More than one emergency medical transfer between the health facilities resulted in maternal deaths. In one case, a woman was referred because of post-partum haemorrhage to a mother-child hospital from a government hospital where she had had a difficult vaginal delivery. She was then referred to a university hospital on suspicion of a ruptured uterus instead of being given an urgently needed blood transfusion and she died on the way to the university hospital.

8.6.2.3 Health Service Supply Factors

The results of this survey indicate that several *health service supply factors*, such as adequate number of healthcare staff, sufficient equipment for diagnostic and treatment facilities, and availability of pharmaceuticals and medical supplies, played a

relatively minor role (3.4 %) in contributing to maternal deaths. In fact, it was surprising to learn how, in many cases of eclampsia, a brain computer tomography or magnetic resonance tomography was readily available for the diagnosis of an intra-cerebral bleeding. Lack of back-up facilities contributed to 4.5 % of maternal deaths. Long distance to the nearest hospital was the most important supply factor (14.1 %), followed by lack of transportation between home and the health facility (6.0 %) and lack of surgical staff (6.0 %). In rural areas, all health service supply factors contributed significantly more than those in urban areas.

8.6.2.4 Other Avoidable Factors

Other factors that contributed to maternal deaths are births at home with the help of a traditional birth attendant, economic problems of the family affecting their ability to reach a health facility and also lack of social security, the latter of which is a major obstacle in seeking medical care. In 15.1 % of cases, some of these factors were responsible for maternal deaths. These factors were found to be higher than the health supply provider factors, especially in rural areas. The percentage where '*other factors*' were most significant in causing maternal mortality was highest in the Northeast Anatolia region that is one of the lesser developed regions of the country. The results also confirm that the differences among the regions are parallel to their development level.

8.7 Discussion and Conclusion

Our main goal in this article has been to provide information to policy makers about which avoidable factors are most important for the elimination of the maternal deaths in Turkey. Using the results of National Maternal Mortality Study carried out to estimate the level of maternal deaths in the country we categorized the avoidable factors into four groups. The result of this study indicates two striking findings: Firstly, the significant roles of household and community level factors are observed clearly among the avoidable factors when compared to the influence of *health service providers* and *health supply factors*. This finding indicates that the status of women in their community and in their household is the most problematic issue when it comes to preventing maternal deaths. Delays in recognizing medical problems and delays in seeking medical care constituted the main reasons behind maternal mortality, which in turn gives an indication of the importance of society's approach to diseases and overall health care systems, as well as women's position in the household and in the greater community.

Of course, our point is not to blame the individuals and community, but rather to highlight the importance of women's status and of community dynamics as important tools in the battle to eliminate maternal mortality. Even though there are no legal barriers to women's participation in education, labour force and political life,

there are many problems in practice because of cultural values and patriarchal social structures. The educational level of women and their participation in the labour force lag behind men. At the household level, for example, there is gap between spouses in terms of age and educational level, particularly for women who are living in rural areas and less developed regions, and for less educated women. Sixty-two percent of women who have 5 or more children are less educated than their husbands. Similarly, the education gap increases in rural areas and less developed regions of the country (HUIPS 2009).

Some studies in Turkey also point to the importance of power relations within the family, beliefs that diseases come from God, and a lack of women's autonomy when it comes to seeking health care (Akşit 1993). According to a qualitative study, the decisions for seeking medical care and antenatal care were made by the mother-in-law, and these interventions influenced women's behaviour when seeking help (Conseil Sante et al. 2007). Although levels of coverage of antenatal care have been increasing and according to the last two demographic and health surveys, attendance was found as 81 % in 2003 and 92 % in 2008, there is still variation by women's education level and household wealth status.

In a similar vein, the number of visits and timing of antenatal care has been increasing nationally. Three quarters of women had attended antenatal care sessions four times or more, there are still regional and urban/rural variations. Women's empowerment and participation in the decision making processes at the household level were influenced by their autonomy within the family. However at the country level, the decisions for marriage, timing and number of children were mainly taken by the community instead of being individual decisions. For example, only 42 % of women choose their husband by themselves.

Additionally, one in four women had faced at least one controlling behaviour by their husbands, and 37 % of women's husbands insisted upon knowing where she was all the time (HUIPS 2009). These controlling behaviours and women's traditional gender roles may result in their neglecting to seek health care for themselves in some cases. The perceptions of home deliveries as "natural" also affected women's and community tendencies not to seek out a health facility until an emergency situation occurred. The results of the study indicate the importance of women's empowerment through increasing their education and awareness not only in health related matters, but also in other social areas.

The second striking result of this study is that there is a need to provide different strategies in the elimination of maternal deaths according to urban/rural residence and regions. Although the *health supply provider factors* were limited among the avoidable factors, the problems of reaching health facilities due to a lack of transportation and long distance between the home and the health facility were frequent obstacles in rural areas. Moreover, women in rural areas were more likely to give birth at home. Therefore, increasing the number of health facilities in rural areas and improving the ways to seek medical care should be taken into consideration by policy makers. These issues appear to be common across all regions, but particularly in less developed ones where maternal deaths and total fertility rates were higher than in the western parts of the country.

In conclusion, to eliminate maternal deaths, special efforts should be made to provide safe motherhood programmes, and in these programmes gender equality issues as well as the many cultural factors that prevent a woman from seeking medical care should be considered.

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