



REPRODUCTIVE HEALTH PROGRAMME

# Turkey

## National Maternal Mortality Study 2005

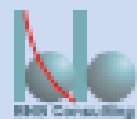
### Main Report

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Hacettepe University  
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## National Maternal Mortality Study 2005

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# ABBREVIATIONS

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AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
APH	Antepartum Haemorrhage
ASFR	Age Specific Fertility Rate
C/S	Caesarean Section
CBL	Cemetery Burial List
CDR	Crude Death Rate
CEB	Children Ever Born
COPD	Chronic Obstructive Pulmonary Disease
CT	Computer Tomography
D&C	Dilation and Curettage
DC	District Doctors
DDP	District Directorates of Population
EMRO	Regional Office for the Eastern Mediterranean
EURO	Regional Office for Europe
FBNF	Female Burial Notification Form
FD	Female Deaths
FGD	Focus Group Discussion
GDMCHFP	General Directorate of Mother and Child Health and Family Planning
GDP	Gross Domestic Product
GDPCA	General Directorate of Population and Citizenship Affairs
GFR	General Fertility Rate
GNP	Gross National Product
GP	General Practitioner
GPC	General Population Census
HFRRF	The Health Facility Record Review Form
HIV	Human Immunodeficiency Virus
HUIPS	Hacettepe University Institute of Population Studies
ICD	International Classification of Disease
ID	Identity
IPH	Intrapartum Haemorrhage
IUD	Intra Uterine Device
IUFD	Intrauterine Foetal Death
LTR	Lifetime Risk of Maternal Death
MERNİS	Merkezi Nüfus İdaresi Sistemi
MM	Maternal Mortality
MMRate	Maternal Mortality Rate
MMRatio	Maternal Mortality Ratio
MoH	Ministry of Health
MoI	Ministry of Interior
MR	Magnetic Resonance
NBDS	National Burden of Diseases Survey

NMMR	National Maternal Mortality Research
NMMS	National Maternal Mortality Study
NUTS	The Nomenclature of Territorial Units for Statistics
PFĐ	Proportion of Female Deaths
PMDF	Proportion of Maternal Deaths among Female Deaths
PPĐ	Province Project Doctors
PPH	Postpartum Haemorrhage
PPP	Purchasing Power Parity
PPR	Province Project Researchers
PPT	Province Project Teams
PRĐ	Pregnancy Related Deaths
RAMOS	Reproductive Age Mortality Study
RTA	Road Traffic Accidents
SSK	Social Insurance Institute
STI	Sexually Transmitted Infections
TDHS	Turkey Demographic andn Health Survey
TFR	Total Fertility Rate
ToT	Training of Trainers
TSIM	The Turkish Health Statistics Module
TURKSTAT	Turkish Statistical Institute
UN	United Nations
UNAIDS	The Joint United Nations Programme on HIV/AIDS
UNFPA	United Nations Found of Population Association
UNICEF	The United Nations Children's Fund
WDQ	Women Death Questionnaire
WHO	World Health Organization

# PREFACE

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Deaths during pregnancy, delivery and puerperium are largely preventable, but tragically they still affect many women and their families in developing countries. The accessibility, use and quality of health services during pregnancy, delivery and the puerperium, together with the broader context of education, gender equity, nutrition and poverty, all relate to maternal mortality, and the level of maternal mortality serves as a multi-dimensional indicator of development. However, there is not enough information on this subject and innovative approaches to the measurement of maternal mortality indicators are required.

The project “*National Maternal Mortality Study (NMMS) for the Reproductive Health Programme in Turkey*” provides an opportunity to fill information gaps on maternal mortality by providing accurate data on the current situation in Turkey, with a focus on differences by regions and between urban and rural areas. The project also offers an opportunity to raise awareness among the concerned circles. The project data collection activity also introduced a new and a close collaboration between organizations already active in the field of collecting and compiling information on deaths, particularly maternal deaths, such as the Ministry of Health, the Ministry of Interior, the Turkish Statistical Institute and municipalities. Project results can be used as a powerful advocacy tool to ascertain the commitment of administrators to improving the existing recording and reporting systems.

This report provides the major findings of the National Maternal Mortality Study in Turkey. It presents the levels of maternal mortality and major causes of maternal death in Turkey. More importantly, it also examines the avoidable factors which contributed to these deaths and identifies risk factors, so that existing programs can be improved. In addition, this report also includes the causes and risk factors of deaths in reproductive-age women. This study done in a context which evaluates the current Turkish death registration procedures and proposes methods for a new death registration system.

The National Maternal Mortality Study was conducted within the framework of the European Union funded National Programme for Reproductive Health, and implemented by the Consortium of ICON-INSTITUTE Public Sector Gmbh (Germany), Institute of Population Studies, Hacettepe University (Turkey) and BNB Consulting (Turkey). The Consortium was successful, and collaborated well in all phases of the project. Terms of Reference for the core team members are attached as Annex 1.

The official start of the project, on 4 October 2004, was approved by the European Union Delegation. The study concept was finalized in research protocol and submitted to the Ministry of Health and the Delegation of European Union on 25 November, 2004. A pre-test of the concept and all research materials in Antalya was followed by the inception

report of 4 March, 2005. Main data collection started in June 2005. Two semi-annual reports were submitted in September 2005 and February 2006. To allow for wide dissemination of the study result, the project partners agreed upon three-month no-cost extension until 31 December 2006 which was approved by the Delegation of European Union. The approval of the final report by the Ministry of Health and Delegation of European Union was followed by one national and two regional conferences to disseminate the results in December 2006.

We are grateful to the Delegation of the European Union in Ankara and to Ministry of Health of Turkey for initiating and facilitating this study. We specifically thank Figen Tunçkanat as the representative of the Delegation of the European Union. We deeply appreciate Prof. Dr. Recep Akdağ, the Minister of Health, and especially Dr. Mehmet Rıfat Köse, General Director of Mother and Child Health and Family Planning, and his colleagues for their contributions during the project. The Ministry's emphasis and strong support for the Reproductive Health Programme and for Maternal Health in particular, has greatly contributed to our project's success. Moreover, we would like to also acknowledge the efforts of health directors and other health personnel in the provinces where the project was carried out.

Our special thanks go to Prof. Dr. Tunçalp Özgen, the Rector of Hacettepe University, and all other administratives of the University as they shared all the difficulties with us and gave valuable support in every stage of the NMMS.

The project worked with 29 project teams, including a province coordinator, a province doctor and a province researcher, who worked together with district coordinators and primary informants (cemetery officials and village headmen), throughout May 2005 to June 2006. They collected information on deaths in general, and more specifically on deaths in females. We are grateful to all the project teams in that respect. The study was only possible by the work of these province project teams.

We would also like to thank the Ministry of Interior, and especially all province and district governors, mayors, village headmen and cemetery officials for their support and contributions in implementing the project.

Our thanks are also due to the Steering Committee Members from all different Institutions involved for their valuable recommendations. We would also like to thank the Pre-Review and Central Review Committee Members for their important efforts in evaluating and concluding the causes of female and pregnancy related deaths. We would like to express our thanks to all people whose great efforts and excellent work is ensured the success and accuracy of the study. We extend our gratitude to the Project Team Leader, Dr. Rudolf Schumacher, and the Principal Investigator, Dr. Oona Campbell, for their contribution and assistance.

Our sincere thanks are also due to Dr. İsmet Koç, the Technical Director and the Field Team Leader of the study, to Dr. A. Sinan Türkyılmaz, the Sampling Expert, to Dr. Banu A. Ergöçmen and Research Assistant İlknur Yüksel, the Qualitative Study Directors, and to Dr.

Turgay Ünalın, Research Assistant M. Ali Eryurt and Research Assistant Yadigar Coşkun, the Data Entry and Data Analysis Coordinators.

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Finally, we deeply appreciate the input of all the respondents who answered questions about the deceased women, even during their saddest days. Without them we would have been unable to conduct this study. We hope that the results of this project will contribute to reducing future maternal deaths in Turkey as well as to improving the existing recording and reporting systems for causes of death.

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# SUMMARY

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The Turkey National Maternal Mortality Study (NMMS) is a Turkish Ministry of Health study conducted from October 2004 to December 2006. The NMMS was implemented by a Consortium of ICON-INSTITUT Public Sector GmbH (Germany), the Institute of Population Studies, Hacettepe University (Turkey) and BNB Consulting (Turkey). The study comprised five parts:

- New field work to conduct the National Maternal Mortality Research (NMMR), This used village headmen and cemetery officials to identify all burials by age and sex, and a further team to investigate all female deaths aged of 12-50 using hospital records where these were available and verbal autopsies where not. This Reproductive Age Mortality Study (RAMOS) design then identified maternal deaths from among the female deaths of reproductive age.
- Qualitative Research, using in-depth interviews and focus group discussions to look at issues related to completeness of reporting and registration.
- Further Analysis of the Turkish Demographic and Health Survey, 2003 and of the General Census of Population, 2000 to provide a comparison group and data for the indicator denominators and the models.
- Model-Based Estimation of Maternal Mortality Indicators to measure levels of mortality at the province level
- Comparative Analyses of Existing Reporting and Recording Systems to see how they performed relative to our system.

The concept and all research materials were pre-tested in Antalya in January 2005. The main field work was conducted from June 2005 to May 2006 in 29 provinces.

The main indicators which had to be determined were the ratio of pregnancy related deaths (PRDs) and the ratio of maternal deaths per 100,000 live births. The ratio of pregnancy related deaths includes direct maternal causes, indirect maternal causes as well as coincidental causes of PRD. For the period June 2005-May 2006 the overall ratio of pregnancy related deaths was found to be 38.3 ( $\pm 2.8$  in the 95 percent confidence interval) per 100,000 live births. It was 28,2 per 100.000 live birth in urban areas and 53,7 in rural areas. For the same period, the country wide estimate for the maternal mortality ratio was 28.5 ( $\pm 2.5$  in the 95 percent confidence interval) per 100,000 live births, 20.7 in urban and 40.3 in rural areas. The NMMS results show that 58.4 percent of all pregnant women died from direct maternal causes, 15.8 percent from indirect causes and 23.2 percent from co-incidental causes. The remaining 2.4 percent were deaths for which the kind of pregnancy relation could not be specified.

The leading cause of death (17 percent of all pregnancy-related deaths) was haemorrhage, followed by hypertensive disorders of pregnancy (pre-eclampsia or eclampsia) (14 percent of all pregnancy-related deaths). Twelve percent died of other ante-, intra- or post-partum conditions such as embolism, ruptured uterus or causes directly related to a surgical procedure. Among the indirect maternal causes, the biggest group (8 percent of all PRDs) were deaths due to diseases of the circulatory system, followed by neoplasm (2 percent), other causes of death (2 percent) and suicide (1 percent). The most common coincidental cause-of-death was road traffic accidents (11 percent).

More than one-third of the women (37 percent) died before giving birth to their child. Most of these were PRDs from coincidental causes. A further 9 percent of women died during delivery, the majority (54 percent) however in the post-partum period. Almost half of these pregnancies ended with a live birth, though some of the babies died post-partum (5 percent). Thirteen percent were stillbirths. In 32 percent the pregnancy ended with an intra-uterine death or was aborted due to the death of the mother.

Over 65 percent of all maternal deaths were to women with obvious biomedical risk factors. Twenty eight percent occurred to women aged above 34 or below 18. Almost the same number of women presented with a parity above 4 as a risk factor. Diseases of the circulatory system including hypertensive disorders accounted in 18 percent as risk factors. Delays in recognising the problem and delayed health-seeking by the family attributed to 30 percent of all pregnancy related deaths. Health service provider factors were noted as contributors to maternal deaths in about 14 percent. The contribution made by a deficient health service provision, in terms of availability of staff, equipment, supplies or pharmaceuticals, was with 2 percent encouragingly low.

The levels and patterns of causes of maternal death do neither resemble a typical developing country nor the situation which can today be found in Western Europe or North America. There is no doubt that the maternal mortality ratio compares well with other countries in transition. The distribution pattern of causes for maternal deaths however is more complex. Infections, unsafe abortion and obstructed labour, which are common causes of maternal death in developing countries, play only a very limited role. However, the pattern with eclampsia and severe bleedings is where the situation in Turkey resembles more developing countries. This suggests that the health services – mainly on the primary and secondary level - are not always sufficiently prepared to cope with conditions which cause death rapidly if not immediately treated.

The main reason why the MERNIS data were not useful for our methodology was that they do not reflect actual place of residence or death. At the same time both systems currently available for the registration of deaths and causes of deaths indicated cross under reporting. 30 percent for MERNIS, and 53 percent for the maternal mortality notification system of the Ministry of Health (68 percent before our study was implemented). Under reporting occurs for reasons including the following: barriers to reporting such as the absence of cross-checks, lack of dissemination of information, lack of administrative links and cooperation between institutions, different registration procedures in urban and rural areas, misconceptions of the

system and underestimation of the importance of death registration, and the necessity of data compilation at a central location in a usable format.

The methodology which was applied in the survey achieved a 93 percent data collection coverage over the period of one year. This revealed that village headmen and cemetery officials can be used for the recording of deaths. Nevertheless underreporting deaths, especially of female deaths, was also observed in our approach. Reasons that emerged from our qualitative research included a fear of investigation and a perception that recording of death was not part of the muhtar's job and should be separately remunerated.

For the 65 percent of deaths which occur in health facilities routine reporting of causes of death is the duty of a medical doctor. Two major problems were identified: The lack of accuracy in determining the hierarchy of events which eventually lead to the death of a person and the obvious inability of recording the main cause of death in a standardised manner.

The experience of the survey demands for two main recommendations for improving vital registration in the country: The revision of the duties of the muhtars and the better integration of the health services into the death registration system, which will automatically also improve the registration of pregnancy related deaths. As a rule each death should be certified by a medical doctor. The death certificate must include details on the cause of death to be recorded in line with ICD-10 standards.



## 1.1 Background-Maternal Mortality in Turkey

Complications during pregnancy, delivery and puerperium are the most widespread causes of death and disability among women of reproductive age in developing countries; it is estimated that approximately 528,000 maternal deaths occur in the world each year. The level of maternal mortality is a multi-dimensional indicator of development, in particular of the level of provision and quality of health services, and therefore attracts considerable attention from the international community concerned with monitoring development and formulating policies to intervene and improve the lives of individuals, families, and populations. The Millennium Development Goals identify the reduction of maternal mortality ratio as one of the prime goals.

The considerable attention paid by the international community to indicators of maternal mortality contrasts sharply with information available on them. Statistically speaking, maternal death is a rare event: the most widely used indicator of maternal death, the maternal mortality ratio, is expressed as the number of maternal deaths per 100,000 births. However, repercussions of the maternal death on the surviving kin are substantial, and may include traumatic experiences such as the disintegration of the family and mortality among children of the deceased. The rare event, from a statistical point of view, is difficult to observe using conventional research tools such as sample surveys-- a research strategy often employed when routine data are absent or incomplete. Consequently, estimates of maternal mortality are lacking in most developing countries. However, even in industrialized countries where vital registration systems are complete, measured levels of maternal mortality often underestimate true levels, primarily due to the problematic nature of classifying causes of maternal death.

The case of Turkey is no exception to the dearth of information on maternal deaths. Prior to our research, only a few empirical studies provided estimates of the maternal mortality ratio on a national basis, albeit with varying degrees of precision and quality. These and other model and hospital-based efforts are summarized in Annex 2.

The earliest national study was the Turkish Population Survey, 1974-75, which used a dual-record design and produced a maternal mortality ratio estimate (MMR) of 208 maternal deaths per 100,000 life births (TURKSTAT, 1978). The survey produced erratic demographic and health estimates in general and was discontinued, although the initial plan was to set up a dual-record system to compensate for the lack of information on vital events from the vital registration system. The Turkish Demographic Survey, 1989 (TURKSTAT, 1993) employed the indirect sisterhood method and produced an MMR of 132 deaths per 100,000 for the year centred on 1981. Due to the nature of the estimation method and the sample size neither study delivered information on disparities or risk factors. In 1997-1998, a study in 615

hospitals in 53 provinces of Turkey estimated a hospital MMR of 49 deaths per 100,000 live births. Although this suffers from the biased nature of hospital-based estimates and is not altogether national in coverage, it nevertheless had the advantage of collecting information on causes of death (Akin et al. 2000; Biliker, 2003). Finally, in 2000, a Burden of Disease household survey found an MMRatio of 24 deaths per 100,000 live births. (MoH, Başkent University & School of Public Health, 2004). In summary, and in spite of a range of community and hospital-based studies carried out at the local level, the levels and components of, and disparities in maternal mortality in Turkey remained to be understood until the implementation of the NMMS.

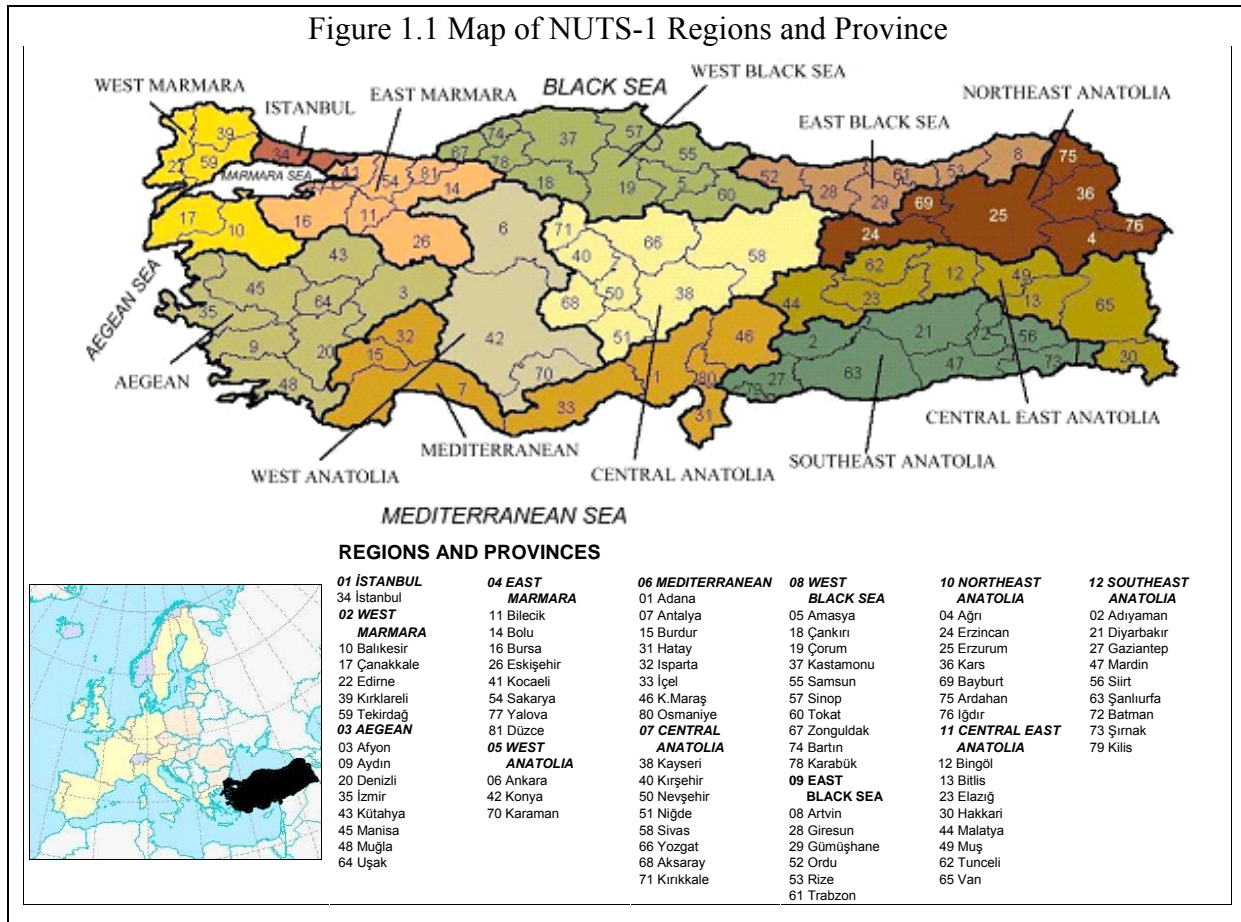
The dearth of data on maternal mortality and the absence of innovative research designs are partly due to the idiosyncratic nature of Turkey's primary data sources. The absence of information to show levels of, and disparities in, maternal mortality naturally results in an absence of policy recommendations to intensify and focus service planning and provision. The neglect of evidenced-based policy making and service provision in maternal health in turn provides little incentive to improve the existing recording and reporting systems.

## **1.2 Overview of Turkey's Population**

Turkey's latest census in 2000 showed a population of 67.4 million making Turkey among the 20 most populous countries of the world, the most populous country of the Middle East, and the second populous country of the Europe after Germany. The latest intercensal (1990–2000) estimate of the population growth rate is 18 per thousand, and according to projections by the Turkish Statistical Institute (TURKSTAT), the population of Turkey is currently around 73 million. It is expected to reach 76 million in the year 2010 and 88 million in 2025. The total population is expected stabilize around the mid 21<sup>st</sup> century at between 95 and 98 million.

Turkey has a young population structure as a result of high fertility and growth rates in the recent past. One-third of the population is under 15 years of age, whilst the proportion 65+ comprises only 6 percent according to General Population Census, 2000 (GPC-2000). However, today's prevailing demographic forces are altering the age structure in new ways. Recent decades have witnessed dramatic declines in fertility rates. In the early 1970s, the total fertility rate was around 5 children per woman; by the early 2000s it had decreased to near replacement level fertility (2.2 children per woman). The crude birth rate was estimated at 22 per thousand for the early 2000s. Mortality rates have also declined. As a result of these demographic trends, the median age of the population, which was 20 years between 1940 and 1960, has increased continuously since 1970, reaching 24 years for males and 25 years for females in 2000. There have been significant changes in growth rates by age groups; rates for young age groups have decreased whereas growth rates for older age groups have increased faster than the average for Turkey. The population of those aged 15–64 and 65+ is expected to continue to increase in the next years, while population size of youth has nearly stabilized.

Turkey is administratively divided into 81 provinces (NUTS-3<sup>1</sup>), which are in turn grouped into 26 NUTS-2 regions, and further into 12 NUTS-1 regions. Figure 1.1 below shows a map of the NUTS-1 regions and lists the 81 provinces.



As discussed above and in greater detail in Chapter 2 below, there is lack of accurate, complete and continuous information on mortality in Turkey, particularly adult mortality. Information on cause-of-death is available mainly for deaths in town and city centres, and these data are also incomplete, with poor quality cause-of-death reporting and recording. According to the National Burden of Disease in Turkey, the main causes of death in order of importance are ischemic heart disease (22 percent), cerebrovascular disease (15 percent), chronic obstructive pulmonary disease (COPD) (6 percent), and perinatal causes (6 percent). For females, they are ischemic heart disease (23 percent), cerebrovascular disease (16 percent), perinatal causes (6 percent) and lower respiratory infection (6 percent). It is only when looking at years-of-life-lost among females in rural areas that maternal mortality features, where it ranks 13<sup>th</sup> and comprises 2 percent of deaths. Similarly in females of reproductive age, maternal mortality ranks 9<sup>th</sup> in urban areas (2.7 percent) and 5<sup>th</sup> in rural areas (5.1 percent).

<sup>1</sup> NUTS is a statistical region classification that is used by member countries of European Union. The State Planning Organization and The Turkish Statistical Institute have developed the three levels of NUTS region classification in accordance to the related law of 2002/4720.

By contrast to adult mortality, data on child mortality have been available for a relatively long period from a series of demographic surveys. The infant mortality rate in the late 1950s was around 200 per thousand live births. It declined to about 130 during the mid-1970s and to an estimated 42 during the late 1990s. Likewise, crude death rates have also declined from around 30 per thousand in the 1940s to 6 per thousand in the 2000s. The TDHS-2003 shows neonatal mortality is 17 per 1000 live births, post-neonatal is 12 per 1000 live births and infant mortality is 29 per 1000 live births. Perinatal mortality is 24 per 1000 births. The latest estimates put life expectancy in Turkey at 69 years for males and 74 for females.

Marriage, predominantly civil, is widely practiced in Turkey, with low proportions never-married. Religious marriages also account for a significant proportion of the marriages; however, the main custom is to have a civil and a religious ceremony. According to the 2000 Population Census, only two percent of females had never married by the end of the reproductive ages (age 49), with the corresponding figure for males is three percent. Marriages in Turkey are very stable.

The population of Turkey has undergone an intensive process of urbanization, especially from the 1950s onwards. The proportion of the population living in cities climbed from 25 percent in 1950 to 65 percent in 2000. The rate of urbanization for the 1990-2000 period is approximately 33 per thousand. Rapid urbanization has inevitably caused problems in the provision of services and the emergence of large areas of squatter housing in unplanned settlements around metropolitan cities. Social problems related to the adaptation to city life and culture are evident.

Since the early 1960s, Turkey has had history of external migration to Western European countries, principally Germany. Migration to Western Europe continued throughout the 1960s and 1970s, after which migration increasingly was directed towards oil-producing countries of the Middle East. During the past two decades, however, political turmoil in the Middle East and changes in the policies and practices governing the labour force in the European Union have led to a reversal in migration trends. Meanwhile, political conditions in neighbouring countries have led to waves of immigration into Turkey. Since 1980s, Turkey has been subjected to flows of asylum seekers mostly from Balkans, Middle Eastern countries and also from more distant Asian and African countries. As a result, Turkey has become an emigration and transit migration country.

Turkey varies in social and cultural structure, with 'modern' and 'traditional' life styles co-existing simultaneously within the society. For the inhabitants of metropolitan areas daily life is similar to the Western countries. On the other hand, people living in outskirts of urban areas and rural settlements are relatively conservative and traditional. Family ties are still strong and influential in the formation of values, attitudes, aspirations, and goals. Although laws are considered to be quite liberal on gender equality, patriarchal ideology characterizes the social life in many ways. Turkey is a country that women were granted full voting rights in 1934 before most of the Women residing in European countries.

One of the most striking achievements since the founding of the Republic has been the increase in both literacy and education. In 1935, only 10 percent of females and 29 percent of males were literate in Turkey. According to the 2000 census figures, the female and male literacy rates for the population age 6 and over were 81 and 94 percent, respectively (Turkish Statistical Institute, 2003). Educational attainment has also increased dramatically. The gross primary education enrolment ratio is 96 percent; 100 percent for males and 93 for females (Turkish Statistical Institute, 2004). Moderate advances have also been made in increasing the proportions of males and females with higher than primary-level education. In 1998, an eight-year education became compulsory in Turkey, with primary school encompassing the first 5 years and junior high school, 3 years. Despite these achievements, considerable regional and urban-rural differences in literacy and educational attainment continue to exist in the country in addition to the gender differences.

### **1.3 Population and Family Planning Policies and Programs**

In Turkey, policies related to population have been formulated since the establishment of the Republic in 1923. During the early years of the Republic, there was a perceived need to increase fertility, since the country had suffered from heavy human losses during the First World War and the War of Independence. The defense needs of the country and the shortage of manpower, as well as high infant and child mortality rates, led Turkey to continue to follow a pronatalist population policy until the late 1960s. A number of laws directly or indirectly encouraging population growth were passed during the period. These laws included monetary awards to women with more than 5 children, tax reduction incentives, prohibitions on the advertisement, import and sale of contraceptives (except for health reasons), and prohibition of abortions on social grounds.

The high population growth rates prevailing in the 1950s which led to increased numbers of illegal abortions and, as a consequence, to high maternal mortality, brought the population debate into the political agenda. High urban population growth and employment problems were also factors contributing to the new antinatalist environment in government circles. The State Planning Organization and the Ministry of Health pioneered the policy change, and the first Population Planning Law was enacted in 1965. The law mandated the Ministry of Health to have responsibility for implementing the new family planning policy. The policy allowed the importation of modern contraceptives methods, provided services at state health institutions free of charge and supported health education for couples. In addition, the State Planning Organization incorporated the notion of population planning in the First Five-Year Development Plan.

In 1983, a more liberal and comprehensive Population Planning Law was passed. The new law legalized abortions (up to the tenth week of pregnancy) and voluntary surgical contraception on social and economical grounds. It also permitted the trained auxiliary health personnel to insert IUDs and included other measures to improve family planning services and mother and child health. The latest Five Year Development Plan of the State Planning Organization states that population policy seeks to reach a population structure which is in harmony with the balanced and sustainable development targets of the society. Thus, the strengthening of qualitative aspects of population including increased education and improved

health levels and a reduction in unbalanced development and inequalities among regions are primary objectives of population policy (State Planning Organization, 2001).

#### **1.4 Health Care System in Turkey**

The Ministry of Health is officially responsible for designing and implementing nationwide health policies and delivering health-care services. Besides the Ministry of Health, other public sector institutions, non-governmental organisations and the private sector also provide health services.

At the central level, the Ministry of Health is responsible for implementing of curative and preventive health-care services throughout the country, within the principles of primary health care. The responsibility for delivering the services and implementing programs is shared by various General Directorates (Primary Health Care, Mother and Child Health and Family Planning, Health Training) and by various Departments (Tuberculosis Control, Malaria Control, Cancer Control).

At the provincial level, the health-care system is the responsibility of Health Directorates, under the supervision of the Governor. The provincial Health Director is responsible for delivering all primary health-care services as well as curative services. A network of Health Centres and Health Houses was formed in 1961 (Decree no: 224) based on "Legislation for the Socialization of Health Services" so that services and facilities are extended down to the village level. A substantial proportion of villages have health centres or health houses. These are located so as to provide easy access to other villages.

The Health House is the most basic element of the health service. It serves a population of 2500-3000 and is staffed by a midwife. The Health Centre serves a population of 5,000-10,000 and is staffed by a team consisting of a physician, a nurse, a health officer, midwives, an environmental health technician, and a driver. Health Centres mainly offer integrated, polyvalent primary health-care services. Mother and Child Health and Family Planning Centres and Tuberculosis Dispensaries also offer preventive health services.

This network of health facilities is responsible for delivering primary health services, maternal and child health, family planning, and public education services. These health facilities are also the main sources for the health information system. In recent years, family medicine system have been launched under the scope of health transformation programme. In this system, family medicine are mainly responsible for the provision of services as regards mother and child health as well as family planning. Public health centers in this system are also in charge of public training services concerning the society.

Mother and child health and family planning services have been given a priority status in the policies of the government in recent decades. They gained importance due to the large proportion of women of reproductive age and of children in the Turkish population, the high infant, child and maternal mortality rates, the high demand for family planning services, and the limited prenatal and postnatal care. A number of programs to improve services are being implemented, with special emphasis on provinces which have been designated as priority

development areas, as well as on squatter housing districts in metropolitan cities, rural areas, and special risk groups. The initiatives include programs in immunization, childhood diarrhoeal diseases, acute respiratory infections, promotion of breastfeeding and growth monitoring, nutrition, reproductive health, and antenatal and delivery care. Information, Education, and Communication programs to promote mother and child health and family planning activities also are being widely implemented.

At present, insurance coverage is provided through three social security institutions, SSK (Social Insurance Institute), Bağkur and Emekli Sandığı, and through the Green Card program for those who do not have the financial means to purchase health insurance through any of the above. Active civil servants and their dependents are funded directly from general revenues. Private health insurance coverage in the country is low, reaching only about 500,000 people. This system of insurance leaves many without any coverage, and has inadequate coverage for many of those who are nominally covered. Ironically there are many others who enjoy multiple sources of coverage, either by design or by circumstance. Health insurance is also a strong determinant of seeking care when ill, and those without any form of financial protection are far less likely to seek care when ill compared to those with some form of financial protection. Not all those who are ill are able to get treatment for their illness; in particular, the poor are significantly less likely to get treatment when ill compared to the non-poor. This results in huge disparities in health outcomes, and the health status of Turkey's population remains poor, both in absolute terms as well as in comparison with other countries at same levels of income (World Bank, 2004). According to the measures taken recently for the health insurance system in Turkey, the three social security institutions in the health insurance system of Turkey have been unified under the same umbrella. In addition, the preparations on general health insurance system have almost been finalised. This system will be implemented starting from 2007.

## **1.5 Objectives of the Study**

The current project, National Maternal Mortality Study (NMMS) is a major opportunity to fill information gaps on maternal mortality by providing accurate data on the current situation in Turkey and on disparities within the country. The project also offers an opportunity to raise awareness among the concerned circles of policy makers, both at the centre and at the local level and should provide information to guide actions to improve services for women. It is hoped that project results can be used as a powerful advocacy tool to ascertain the commitment of administrators in activities targeting the improvement of the existing recording and reporting systems.

The specific overall objectives are:

1. To provide accurate data on the current maternal mortality situation in Turkey, with a focus on differences between the regions (as defined by NUTS-1) and by rural/urban areas.
2. To obtain valid and representative data on Maternal Mortality Ratio (obstetric risk) and Maternal Mortality Rate (burden of death in female population) for Turkey as a whole

and for the NUTS 1 regions including a rural /urban breakdown and to calculate the Lifetime Risk of maternal death (LTR).

3. To determine main causes of maternal death and the avoidable factors contributing to maternal deaths.
4. To determine the population groups at high risks of maternal mortality;
5. To contribute to the improvement of existing recording and reporting systems, with particular focus on the certification of the cause of death; and
6. To raise awareness among policy makers and planners on maternal mortality and inform policy making in reproductive health.

## 2.1 Outline of the Research Design

The project objectives included both estimating maternal mortality rates and ratios, and providing information on improving the existing recording and reporting systems. Based on our review of the advantages and disadvantages of existing Turkish data sources, and on initial visits to different parts of the country, the research strategy rested on estimating the numbers of maternal deaths (numerators of the indicators) through *de novo* data collection, and on estimating the denominators using supplementary information from other sources. In particular, existing but unused data sources were thus articulated to our planned system for reporting maternal deaths. The project activity explicitly aimed to foster collaboration between organizations already active in the field of collecting and compiling information on deaths, including the Ministry of Health, the Ministry of the Interior, the Turkish Statistical Institute (TURKSTAT), and the municipalities. The five components of our approach were:

- A National Maternal Mortality Research (NMMR)
- Further Analyses of the Turkish Demographic and Health Survey, 2003 and of the General Census of Population, 2000
- Comparative Analysis of Existing Reporting and Recording Systems
- Model Based Estimation of Maternal Mortality Indicators
- Qualitative Research

It is anticipated that the different methods used will facilitate understanding of the issues to be addressed to help establish a sustainable country-wide death recording system, including for maternal deaths.

*De novo* fieldwork and data collection included the National Maternal Mortality Research (NMMR) and the Qualitative Research; the former was a major activity of the project. The NMMR collected information on the age and sex the deceased in all burials by using primary informants at urban and rural cemeteries, thus paralleling the burial certificate system of the TURKSTAT, and expanding it to rural areas. We then used two different sources of information to establish the number of maternal deaths among all female deaths aged 12-50. For deaths outside health facilities, a verbal autopsy was conducted on household level to get a cause-of-death. For facility deaths, health facility records were reviewed to get cause-of-death. We aimed to get a verbal autopsy for all maternal deaths including those which occurred in health facilities. The research design and methods are described in more detail in Section 2.2 below.

Information from the supplementary data sources, namely the Turkey Demographic and Health Survey, 2003 (TDHS-2003) and the General Census of Population, 2000 (GPC-

2000), was used to develop estimate of maternal mortality ratios and rates, lifetime risk, and to provide a comparison group to identify high-risk groups. Comparison of the NMMR data with those collected by the Ministry of Health, the TURKSTAT and those reported to the Ministry of the Interior was undertaken to assess our data quality and to estimate the degree of under-reporting by those main sources. We also complemented these data by a series of qualitative investigations on the causes of under-reporting. The data and methods used for these four other components are described in Sections 2.2, 2.3 and 2.4 respectively.

## **2.2 De Novo Data Collection**

### **2.2.1 The National Maternal Mortality Research**

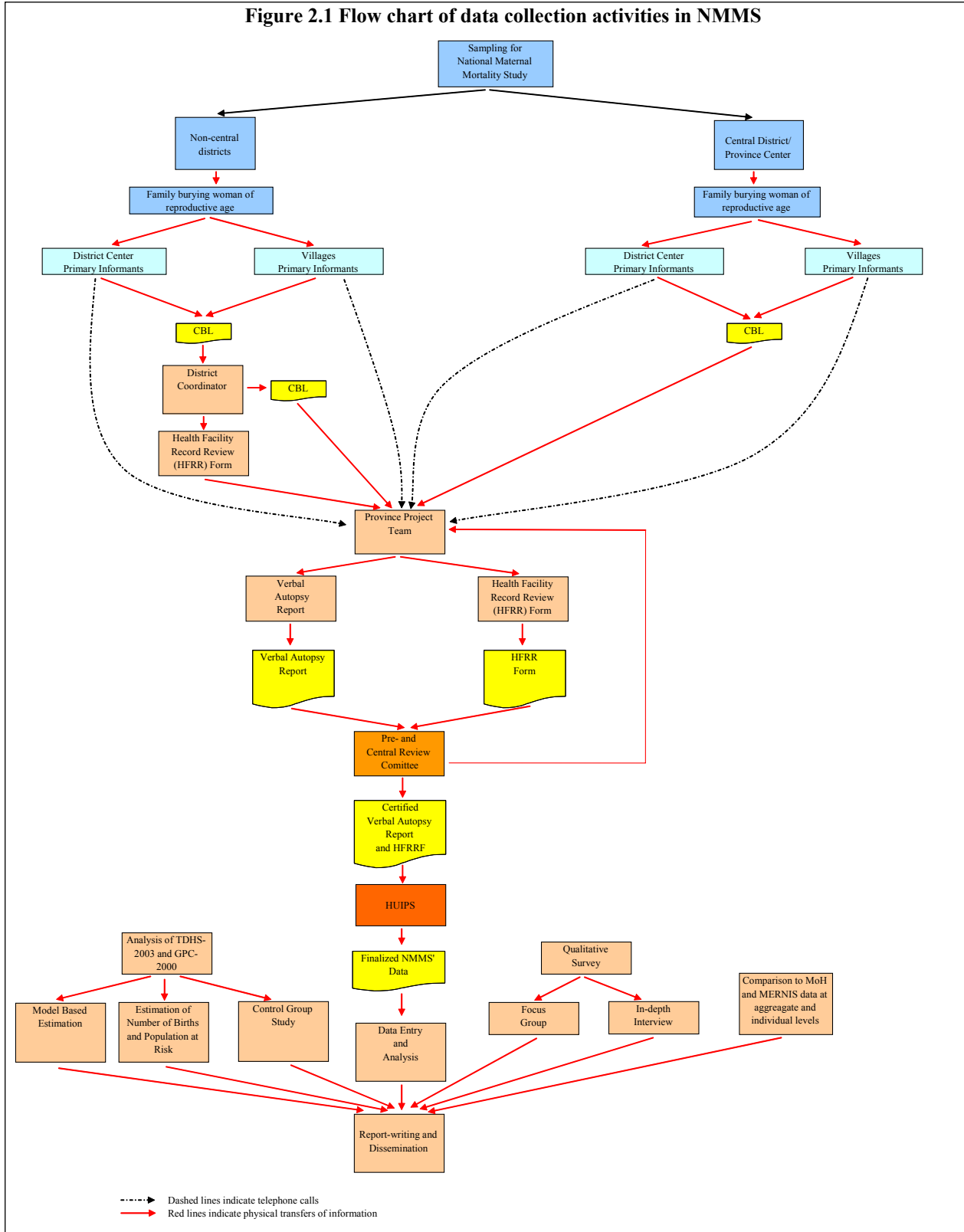
The main quantitative data collection activity of the project was the implementation of a National Maternal Mortality Research (NMMR) using a Reproductive Age Mortality Study (RAMOS) data-collection strategy. Conventionally, RAMOS involves identifying and investigating the causes-of-death of all women of reproductive age. This method has been applied successfully in countries with and without good vital registration systems. Successful studies in countries lacking complete vital registration use varied and sometimes multiple sources of information to identify deaths of women of reproductive age. Interviews with household members, health care providers, and reviews of facility records are then used to classify the deaths as pregnancy-related or maternal or otherwise.

Pregnancy-related deaths (i.e. deaths during pregnancy or 42 days after the end of pregnancy irrespective of the cause-of-death) are relatively simple to identify from family interviews since they are defined as deaths in a specific time interval. By contrast, identifying maternal deaths (i.e. death during pregnancy or 42 days after from any cause related to or aggravated by the pregnancy) requires ascertaining causes-of death so as to be able to exclude co-incidental deaths. Where medical certification of cause-of-death is not available, cause-of-death can be assigned using verbal autopsy techniques, the lay reporting of signs and symptoms of the illness leading to death. The reliability and validity of verbal autopsy for assessing maternal deaths among deaths in general has been assessed, and is high.

Burials are the only potential source of data on female deaths in Turkey that meets the criteria of completeness necessary for an initial data source in a RAMOS design. For the NMMR, burial data by age and sex were collected prospectively over a 12 month period, with more detailed information obtained on females aged 12-50 years (reproductive ages).

The sample design of the NMMR was a weighted, stratified probability sample, designed to provide national, urban/rural and 12 NUTS-1 regional estimates. The 29 provinces selected for the NMMR are listed in Table 2.1 and shown in Figure 2.2. Details of the sampling are given below in Section 2.2.2.

**Figure 2.1 Flow chart of data collection activities in NMMS**



Primary informants were designated for all cemeteries in the selected provinces. They were cemetery officials in urban areas, and village headmen (*muhtars*) in rural areas. The primary

informants were asked to obtain basic information on the deceased from their relatives, including name, age, and sex. For females aged 12-50 years, home address and address of the place-of-death were also required. The primary informants sent their information to District Coordinators or Provincial Project Teams. Province Project Teams, in collaboration with District Coordinators, either a) reviewed the health facility records of the deceased and/or interviewed doctors/health staff in charge if death occurred in a health facility or was attended by trained health staff, or b) performed verbal autopsies with the families of the deceased to ascertain the cause-of-death, if death was not attended by trained health staff, or could not be ascertained from a).

Province Project Teams sent the results of verbal autopsies and/or health facility record reviews to Hacettepe University Institute of Population Studies (HUIPS), where deaths were reviewed by two doctors. The Central Review Committee scrutinized a sample of female deaths and all maternal deaths to establish final causes-of-death. Figure 2.1 provides a flowchart of all data collection activities in NMMR. Annex 3 provides the composition and roles of various groups and individuals in the NMMR data collection system.

### **2.2.2 Sampling**

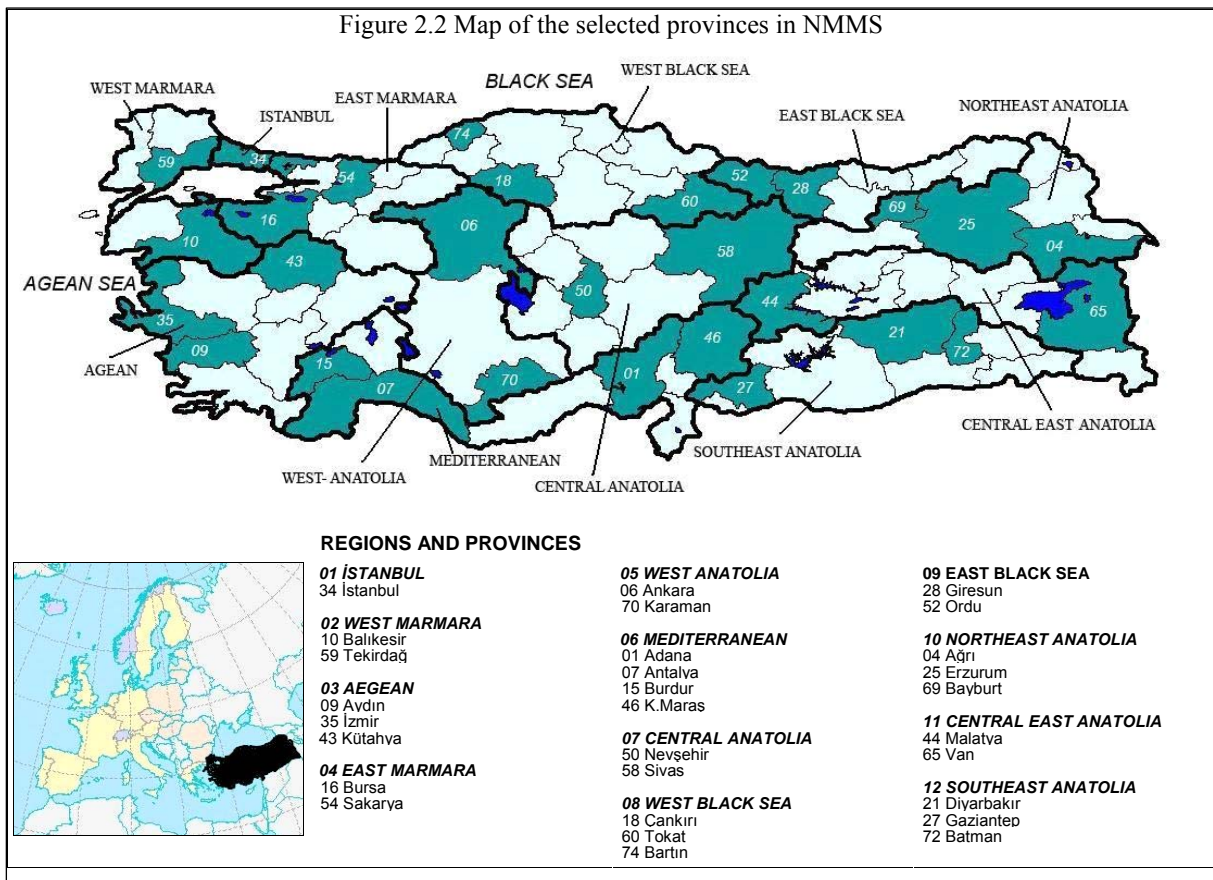
Turkey is divided administratively into 81 provinces, designated as NUTS-3 regions as described in Chapter 1 above. These can be aggregated into 26 NUTS-2 regions. NUTS-1 regions are in turn formed by aggregating NUTS-2 regions into 12 regions. The sample design of NMMR was a weighted, stratified probability sample. The organizational requirements of the fieldwork meant that we needed to work at the province 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 approach often used in household surveys, the only sampling unit was the province and the only sampling challenge was to select a representative sample from among the 81 provinces that could yield national, urban/rural and 12 NUTS-1 regional estimates.

The selection criterion for sampling was to select one province from each of the 26 NUTS-2 regions at random, with probability proportional to the estimated number of female deaths aged 15-49. An exception was made for the East Black Sea NUTS-1 Region (which is also NUTS-2 region number 19) in order to select at least two provinces in each NUTS-1 region. At the end of the sample selection process, 27 provinces were identified for NMMR field operations. Furthermore, the provinces selected for the pilot and pre-test, Antalya and Erzurum, wanted to continue data collection on their own, in parallel to our activities these data are included in our final estimates (Table 2.1 and Figure 2.2). Once a province was selected, no further sampling procedure was necessary since all districts, sub-districts, villages and settlements of the province were included in the study. The selected provinces include 16,139 urban (285) and rural (15,854) settlements with a population size 39 million implying that NMMR covers 54 percent of the country.

Table 2.1 Provinces selected for NMMR and their NUTS regions

Province	NUTS-1	NUTS-2	Province	NUTS-1	NUTS-2
İstanbul	1	1	Sivas	7	15
Tekirdağ	2	2	Bartın	8	16
Balıkesir	2	3	Çankırı	8	17
İzmir	3	4	Tokat	8	18
Aydın	3	5	Giresun	9	19
Kütahya	3	6	Ordu	9	19
Bursa	4	7	Bayburt	10	20
Sakarya	4	8	Erzurum	10	20
Ankara	5	9	Ağrı	10	21
Karaman	5	10	Malatya	11	22
Antalya	6	11	Van	11	23
Burdur	6	11	Gaziantep	12	24
Adana	6	12	Diyarbakır	12	25
K. Maraş	6	13	Batman	12	26
Nevşehir	7	14			

Figure 2.2 Map of the selected provinces in NMMS



### **2.2.3 Pilot Study**

All research methods (research design as well as forms and questionnaires) used for the NMMR study were field tested during a six week pilot in Antalya Province. Antalya was chosen because it was outside the study sample, had large population with at least one greater municipality, and had a mix of urban and rural areas with different degrees of remoteness. Since the pilot test was conducted in January, accessibility during winter time was also considered.

Based on the findings and experience during the Antalya pilot, the core team amended the study concept and the materials. Towards the end of the pilot, the MoH expressed an interest in running a parallel study in Erzurum to see how the study would run under Ministry of Health own resources. As with Antalya, Erzurum is one of the larger provinces of the country and had representative determinants. Both Antalya and Erzurum provinces committed themselves to continuing data collection after the completion of the tests without further financial support from the project.

The project team entered and analyzed the data together with the main study data. Eventually this will provide an opportunity to compare the performance of the supervised study provinces with two provinces where the methodology was applied without additional support and thus allow for information on usefulness and sustainability of certain components under non-study conditions. More details on the pilot test are in Annex 4.

### **2.2.4 Instruments**

Figure 2.3 lists the main forms and instruments used for quantitative and qualitative data collection. The actual instruments are shown in Annex 5-10. The forms and questionnaires were prepared in English and Turkish with help from experienced questionnaire designers. The questionnaires were then translated into English.

A Turkish Physician was asked to look over the Women Death Questionnaire (WDQ, Verbal Autopsy Questionnaire) items to ensure the language was suitable for lay persons and used terminology familiar to the population at large. The Health Facility Record Review Form (HFRRF) was prepared in English, translated into Turkish and back-translated into English.

**Figure 2.3 Data collection instruments used in the NMMR and qualitative study**

<b>Form or instrument</b>	<b>Description</b>
Cemetery Burial List (CBL)	The Cemetery Burial List was a monthly form for every burial taking place in villages or settlements within municipalities. The aim was to obtain the age and sex of the deceased and the addresses for deceased females aged between 12-50 years. Furthermore, it aimed to alert primary informants to fill the Female Burial Notification Form so as to provide more detailed information for those women. Every burial procedure should have been recorded the same day as the burial. The information recorded was: identification information of the settlement area where the burial took place, information on the name and job/position of the person filling the form, the number of burials and the month and year of the burials, the name, sex and age of the deceased, and the address and telephone number of deceased woman aged between 12-50 years.
Female Burial Notification Form (FBNF)	The Female Burial Notification Form aimed to get detailed information for every female burial aged between 12-50 years recorded on the Cemetery Burial List. Depending on this information, either a household interview or health facility record review was performed. This form, like Cemetery Burial List, was also submitted on a monthly basis but information on the place where the woman died was also notified to the province project coordinator via telephone within two days of the burial. The information recorded on FBNF included: identification information of the settlement area where the burial took place, date of birth and death of the deceased woman, information on the name and job/position of the person filling the form, information on the place-of-death, address and telephone number of the relatives of the deceased woman, information on whether the woman was pregnant or recently delivered when she died. Detailed rules for primary informants on filling the CBL and FBNF and on the reporting/notification system were provided in a “ <i>Village Headmen and Cemetery Official Handbook</i> ”.
The Woman Death Questionnaire (WDQ)	The Woman Death Questionnaire aimed to elicit basic demographic descriptors of the deceased women, understand her use of health services and identify signs and symptoms that could classify causes-of-death. It was based primarily on a) a validated verbal autopsy instrument of adult deaths (Chandramohan et al 1998 Access granted by D. Chandramohan) used for indirect causes of maternal deaths and for non pregnancy-related female deaths; b) verbal autopsy instrument for maternal deaths developed by Campbell as part of two studies in Egypt (Egypt Ministry of Health, 1994 and Egypt Ministry of Health and Population, 2001) and used for pregnancy-related deaths and use of maternity care services.; and c) the TDHS-2003 which was used to obtain data on socioeconomic status and maternal characteristics in a manner that would allow comparisons between women that survived childbirth and those that died. Other documents consulted were: a) the Bangladesh Maternal Health Services and Maternal Mortality Survey, 2001 (National Institute of Population Research and Training & DHS 2001); b) the WHO manual of verbal autopsies for maternal mortality (Campbell and Ronsmans, 1995); c) Beyond the numbers: Reviewing maternal deaths and complications to make pregnancy safer. (WHO, 2004); and d) First draft of the Adult Verbal Autopsy of the Turkish Burden of Disease Study (MoH, 2003)
The Health Facility Record Review Form (HFRRF)	The Health Facility Record Review Form aimed to elicit basic descriptors of the deceased women, identify sub-standard care and ascertain causes-of-death. It was developed after careful study of a number of patient files in several hospitals throughout the country to help the PPDs and the DCs extract all information needed for identifying pregnancy status, causes-of-death as well as underlying conditions. When preparing the form, the above mentioned documents were also consulted.
Evaluation form for the Pre-Review and Central Review Committee	The Evaluation Form for the Pre-review and Central Review Committees aims to allow the researchers to evaluate the results of WDQ and HFRRF and provides for a section on the final decision on the causes-of-death and on avoidable factors and substandard care. It was developed based on the WDQ and HFRRF and with help from similar form used in Egypt (Egypt Ministry of Health and Population, 2001). Definitions used match the International Classification of Diseases Version 10 (ICD-10).
Guide for In-depth Interviews and Guide for Focus Group Discussions	The guides for the in-depth interviews and focus group discussions aimed to understand why deaths in general (and female deaths in particular) are often not accurately reported and what the problems are related with recording the causes-of-death. They were developed following discussions with the project core team.

## 2.2.5 Fieldwork

### 2.2.5.1 Fieldwork Staff

National Maternal Mortality Research (NMMR) used a Reproductive Age Mortality Study (RAMOS) type data collection strategy with burials as its data source on female deaths. Burial data by age and sex were collected prospectively over 12 months, with more detailed information on females aged 12-50 years. Field staff of NMMR, either a) reviewed the health

facility records of the deceased and/or interviewed doctors/health staff in charge if death occurred in a health facility or was attended by trained health staff, or b) performed verbal autopsies with the families of the deceased to ascertain the cause-of-death, if death was not attended by trained health staff, or could not be ascertained from a). The composition and roles of various groups and individuals in the NMMR data collection system were as follows:

**Primary informants** were designated for all cemeteries in the selected provinces. They were cemetery officials in places of settlement where burial permits are compulsory, typically urban areas with municipalities and village headmen in rural settlements. The primary informants were asked to complete the Cemetery Burial List and the Female Death Notification Form to obtain basic information on the deceased from their relatives, including name, age, sex, home address and place-of-death, telephone numbers and names of the relatives living in the same household as the deceased, and in cases where possible and relevant, a question on whether the death was pregnancy-related.. Copies of the CBL and FDNF were sent to the District Coordinator at monthly basis and then passed on to the Province Coordinators. Primary informants from province centres provided their forms directly to the Province Project Coordinator, again usually at monthly intervals. Where a female death aged 12-50 years occurred, Primary informants in rural areas called the Province Project Coordinator and convey the information within two days of death. Cemeteries with many deaths submitted lists on a weekly basis. In Istanbul, computerized cemetery burial lists were used.

**Province Project Teams (PPTs)** were set up in each sampled project province. The PPT normally consists of three people: a health professional, ideally from the Mother and Child Health/Family Planning (MCH-FP) section of the Province Health Directorate, who was the *Province Project Coordinator (PPC)* and aimed to oversee the smooth running of the NMMR in the province, the *Province Project Doctor (PPD)* who was a medical doctor working in the same department, and the *Province Project Researcher (PPR)*, a non-medical university graduate, who was especially recruited throughout the project duration and was also located at the Province Health Directorate.

Province Project Teams, in collaboration with District Coordinators completed WDQ and/or HFRRF and sent them to the Project Core Team, who with the Central Review Committee, was responsible for scrutinizing the results and establishing causes-of-death and avoidable factors. More specifically and depending on the information on the deceased provided by the primary informants, the PPD visited the health facility where death took place and/or interviewed the doctor/health staff who attended death. Based on this visit the PPD completed the Health Facility Record Review (HFRR). Where the cause-of-death could not be ascertained based on the HFRR, and in all cases where death has was not attended by a trained medical person, the PPD and PPR jointly performed verbal autopsies with the family of the deceased. A verbal autopsy was attempted for all maternal deaths with WDQ. The PPD facilitated entry into the homes of the deceased and provided bereavement counselling if necessary. The PPR interviewed the family in a short time following the event, and edited and completed the Project Forms. She/he was responsible for sending those forms to the Central Review Committee at monthly intervals.

PPC and PPD for each project province were assigned by the MoH. In March and April 2005, HUIPS coordinators and the core project team visited the project provinces and interviewed three PPR candidates proposed by the province health directorates using a standard Interview Form developed by the core project team. Selection procedures were completed in Ankara after evaluating reports based. Where inappropriate candidates were proposed, province project teams were requested to propose new names. In some of the provinces more than one candidate was invited to the regional kick-off and training meetings and the final recruitment decision was taken at the end of the meeting. All PPRs signed a contract describing their rights and responsibilities and were provided with a private health insurance.

**District Coordinators (DCs)** were medical doctors and located at the district centres and were appointed by the Health Directorate in the project provinces. They mediated between the primary informants and the PPT and assumed various responsibilities. The DCs received all CBLs from the primary informants and sent or took them to the PPT at the province centre. In addition, DCs performed the Health Facility Record Reviews if the death has happened in a health facility in their district or with the attendance of a doctor from their district. DCs also kept a list of all primary informants and make sure that they reported at the required intervals. They also trained the primary informants.

The **Central Review Committee** was based in Ankara and consisted of about 7 obstetricians and 5 mid-career/senior public health experts/epidemiologists. Committee members were recruited from the universities in Ankara and from public-sector hospitals. In addition, four medical doctors were recruited to work part-time with the project. They examined the Project Burial Forms, Verbal Autopsy Reports and Health Facility Record Reviews and prepared a preliminary report for the Review Committee on all possible pregnancy related deaths. The committee finally produced a joint conclusion on the cause-of-death of each deceased female and sent final reports/dossiers to the project core team at HUIPS.

The permanent research assistants of HUIPS were appointed as **Field Coordinators** to supervise field activities in individual provinces for the whole period of the field study. Each of the 12 HUIPS Coordinators covered 2 or 3 provinces. The mean number of visits per province was approximately 14, and an average of 7 days in a month was spent in each province. At the start of the field study, supervisory visits were more intense and of longer duration; later, the duration was shortened, although the number of visits remained the same.

### **2.2.5.2 The Training of Field Teams**

Training of NMMR was conducted on all levels as shown in Figure 2.4. In May 2005, the province project teams organized kick-off and training meetings on provincial level, and trained the district coordinators in their own provinces. These meetings lasted one day and used standard training materials developed by the core project team. The key training methods and materials are also shown in Figure 2.4. A “Training of Trainers” (ToT) approach was used since district coordinators needed to train the primary informants at the next stage. All district coordinators attended the initial training, however, some district coordinators changed

subsequently and new training sessions were organized for newly assigned candidates in some provinces. HUIPS coordinators also contributed to organizing and executing the kick-off and training meetings in the province they were responsible for. District officials were invited to the introductory part of the meetings.

**Figure 2.4 The main training sessions conducted in NMMR and the key features of training methodology and main training materials**

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Sessions

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- Research assistants at HUIPS
  - Provincial teams trained during the regional kick-off meetings
  - District teams trained after the regional kick-off meetings (i.e. end of April/beginning of May 2005) and refresher training during initial stages of data collection
  - Muhtars (in May 2005) and refresher training
  - Cemetery officials (in May 2005) and refresher training
  - Central Review Committee (in May/June 2005)
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Methods

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- Training in groups not exceeding 20 participants
  - Enough time for the training to be provided
  - Choice of convenient venues
  - Training of Trainers
  - Use of participatory methods (practical exercises in small groups)
  - Use of pre-prepared PowerPoint presentations
  - Refresher sessions after one to two months
  - Evaluation of each training session
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Materials

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- Forms and questionnaires
  - Manuals for each form and questionnaire
  - PowerPoint presentations
  - Practical examples (filled forms/questionnaires, presentation of “real” cases)
  - Role play on Women Death Questionnaire (Verbal Autopsy instrument)
  - Supervised real activities (mainly during initial stages)
  - Evaluation forms
- 

After completing the provincial trainings of the DCs, primary informants were trained at the district level by the DCs in the last two weeks of May 2005. Some sessions were observed by HUIPS coordinators in a supervisory capacity. In some districts, primary informant training continued into the first two weeks of June. In total, 374 primary informant training sessions were conducted in 28 provinces; training in the pilot province of Antalya had been conducted earlier. Approximately 95 percent of the primary informants were trained during these sessions, but in some provinces of Eastern and South-Eastern Anatolia the training coverage was only 70-75 percent. This was subsequently increased to the average level after initiation of data collection.

Two reports on the organization and implementation of primary informant training have been prepared for the MoH based on the reports of HUIPS coordinators. A summary of these reports is given in Annex 11.

### 2.2.5.3 Supervision Activities

Supervision of the data collection activities conducted under the National Maternal Mortality Study comprised a set of mechanisms that was continuously maintained during the field work. HUIPS Coordinators, the Central Project Team, the Province Project Teams and the District Coordinators were responsible for various aspects of supervision and data quality.

**HUIPS Coordinators** made regular supervisory visits to their prospective provinces and had the following tasks:

- To evaluate data collection activities by reviewing the monthly reports of the province project coordinator,
- To check whether the budget of province project coordinator was used in accordance with the rules and distributed fairly to districts,
- To check the health facility record reviews performed by the province project doctor and to identify any problems,
- To check the household interviews conducted by the province project researcher and to identify any problems,
- To review the data entry process of province project researcher and the supervision reports produced by the data entry program for the province in general and for the districts,
- To evaluate the data quality of activities in the province by comparing the results of supervision reports and the results of modelling studies, and to report the results to the province project team,
- To visit districts/ health centres/ primary informants together with the province project team to identify problems in the data collection system,
- To report the field staff who broke the data flow system or who were not respecting data quality,
- To attend some of the district coordinator and primary informant training sessions in their provinces,
- To submit the data collection forms, question forms, questionnaires and data entry records gathered by the province project team to Hacettepe University Institute of Population Studies ,
- To prepare and submit a report to the Central Project Team depending on the results obtained from the monthly supervision visits on the problems including recommendations for solutions.

**The Central Project Team** was composed of project experts, Instructors of HUIPS and members of the Central Review Committee. This team visited province and district project teams in order to review data collection activities, and to evaluate, supervise and make recommendations to support the quality of the research. The supervisory visits of the central project team were on-the-spot rather than routine visits, and were planned to solve the problems emerging during the field study. The Central Project Team had the same duties as the HUIPS Coordinators but had the further authority to dismiss field staff/teams, with the approval of the MoH, if they were found to not to be complying with the study protocol.

**Province Project Team (PPT)** was responsible for supervising data collection activities conducted on provincial level and for assuring the data quality. The Province Project Coordinator (PPC) supervised the data flow and identified the problems faced during data collection. She/he allocated some of his/her time for district/ health centre/primary informants visits. Furthermore, the PPC was also responsible for the accurate use of the project budget allocated to the districts.

**The Province Project Doctor (PPD)** supervised the health facility record reviews conducted by DCs in districts and controlled whether they were done in accordance with the rules.

**The Province Project Researcher (PPR)** supervised the data flow, the quality of the information collected, and the quality of the training that primary informants received within the scope of the project. She/he conducted regular supervisory visits to the district/ health centre /primary informants and also attended the household interviews. In addition, he/she monitored the data flow from the districts using the list of settlements per district. The Province Project Researcher informed the District Coordinators about data entry problems in order to avoid repetition of mistakes. The PPR received feed back in the form of regular data quality reports as produced by the data entry program; they shared these reports regularly with the District Coordinators.

**District Coordinators (DCs)** were responsible for supervising the data collection activities in their district. They were also responsible for conducting health facility record reviews and ensuring the continuous flow of data by visiting health centres and primary informants regularly. They controlled (with the support of the health centres) whether the primary informants sent the forms on time and regularly, and they ensured the regular transfer of these forms to the province project team on monthly basis. Rapid transfer of the forms sent by the primary informants to the province project team shortened the data entry process and facilitated rapid feedback through the field supervision reports. This in turn enhanced data quality and control in the field.

The Central Project Team, HUIPS Coordinators, province project team and the district coordinators ensured data quality by using additional means of communication (e.g. telephone, fax, e-mail). Furthermore, the age and gender distribution of deaths obtained from modelling studies were used to counter-check the quality of data collected in the field.

#### **2.2.5.4 Data Quality Control**

Data quality control was maintained during the National Maternal Mortality Study through the following mechanisms:

- Question 8 of the Female Burial Notification Form was a decisive screening question. It indicated whether the reported female death was pregnancy-related or not. If the answer was “yes”, either household interview or health facility record review was conducted on the basis of place-of-death (home or health facility). If the answer was “don’t know” or if – for some reason - the question could not be asked by the primary informant, either

household interview or health facility record review was conducted depending on the place where death occurred (home or health facility). However, if the answer to this screening question was “no”, then for a sub-sample a household interview or a health facility record review was still conducted in order to control the quality of the answer to this important question.

- The data entry program used for the CBL and FNBF helped assess data quality through Data Quality Control Tables which are based on GPC-2000 data. These tables compared the age and gender distribution of the burials with the census distribution for each settlement as well as the number of burials with the expected number burials. The quality of the data produced on district and provincial basis was followed continuously by using the comparisons and tables obtained.
- Data quality was also checked by using model life tables and data like gender and age distribution of deaths by provinces, which were obtained from TDHS-2003 and GPC-2000. The portion of female deaths among all deaths and the expected number of maternal deaths was estimated and compared with numerical results received from provinces. We also compared with the data which are routinely collected by MoH on provincial basis.
- Another quality control method planned was comparison of the field data from provincial level with MERNIS and TURKSTAT death data. The comparison was made for total numbers, not for individual records. The problem we faced was that MERNIS data are based on family ledgers, but are not organized according to residence. TURKSTAT death statistics are only collected for urban areas and both are based on deaths not on burials.
- A further measure to maintain high quality of data was refresher training sessions and information meetings described above.
- Since the primary informants (village headmen and municipal cemetery official) are employees of the Ministry of Interior (MoI) and not the MoH, the forthcoming assistance of the MoI increased the quality of the data. The MoI published a circular making it compulsory for village headmen and municipalities to keep burial records starting from first of April 2005. We anticipated that this circular would affect both the data quality and coverage positively. In addition, we received some support from province governors and district governors in controlling the data flow in villages and municipalities more strictly.

#### **2.2.5.5 Field Outcomes**

Table 2.2 presents coverage rates on based on settlements and on population size. Coverage rates in terms of settlements show that 80 out of 100 settlements sent in forms as requested (91 percent of urban settlements and 79 percent of rural settlements). Since the rural settlements least likely to comply with the study requirements were small, coverage is much higher when looked at in terms of population where data were collected for settlements covering 93 percent of the target population. When the coverage rates by settlements were examined for the 12 NUTS-1 regions, West Anatolia, Central Anatolia, Central East Anatolia and Southeast Anatolia are below average, and the latter two failed to reach over 75 percent coverage. Regarding the regional aspect, there were not significant coverage problems in urban settlements. However, coverage levels of rural settlements especially in Central East

Anatolia and Southeast Anatolia were low. In terms of the population coverage, no critical problems have been marked in urban areas whereas percentage of population in rural areas especially in again Central East and Southeast Anatolia was low.

Table 2.2 Coverage rates on the basis of settlements and population size by type of settlements

Regions/Provinces	Coverage rates, settlements			Coverage rates, population		
	Urban	Rural	Total	Urban	Rural	Total
<b>İstanbul</b>	<b>97</b>	<b>91</b>	<b>92</b>	<b>100</b>	<b>92</b>	<b>99</b>
<b>West Marmara</b>	<b>98</b>	<b>89</b>	<b>89</b>	<b>100</b>	<b>90</b>	<b>96</b>
	<i>Balıkesir</i>	97	88	89	100	100
	<i>Tekirdağ</i>	100	91	92	100	91
<b>Aegean</b>	<b>98</b>	<b>91</b>	<b>92</b>	<b>100</b>	<b>93</b>	<b>98</b>
	<i>Aydın</i>	100	100	100	100	100
	<i>İzmir</i>	100	100	100	100	100
	<i>Kütahya</i>	87	75	75	94	73
<b>East Marmara</b>	<b>98</b>	<b>92</b>	<b>92</b>	<b>99</b>	<b>91</b>	<b>97</b>
	<i>Bursa</i>	98	92	92	100	89
	<i>Sakarya</i>	97	93	93	98	93
<b>West Anatolia</b>	<b>90</b>	<b>76</b>	<b>77</b>	<b>99</b>	<b>80</b>	<b>97</b>
	<i>Ankara</i>	89	73	73	99	75
	<i>Karaman</i>	100	95	96	100	95
<b>Mediterranean</b>	<b>95</b>	<b>79</b>	<b>80</b>	<b>98</b>	<b>79</b>	<b>91</b>
	<i>Adana</i>	99	77	78	100	81
	<i>Burdur</i>	100	100	100	100	100
	<i>K. Maraş</i>	95	73	74	94	70
	<i>Antalya</i>	94	80	80	98	80
<b>Central Anatolia</b>	<b>86</b>	<b>77</b>	<b>77</b>	<b>92</b>	<b>80</b>	<b>86</b>
	<i>Neveşehir</i>	100	97	97	100	99
	<i>Sivas</i>	80	75	75	90	70
<b>West Black Sea</b>	<b>81</b>	<b>78</b>	<b>78</b>	<b>80</b>	<b>77</b>	<b>78</b>
	<i>Çankırı</i>	100	96	96	100	96
	<i>Tokat</i>	65	61	61	72	65
	<i>Bartın</i>	100	93	93	100	93
<b>East Black Sea</b>	<b>92</b>	<b>83</b>	<b>83</b>	<b>88</b>	<b>83</b>	<b>85</b>
	<i>Giresun</i>	97	89	89	98	86
	<i>Ordu</i>	88	77	77	82	81
<b>Northeast Anatolia</b>	<b>84</b>	<b>82</b>	<b>82</b>	<b>88</b>	<b>80</b>	<b>84</b>
	<i>Ağrı</i>	67	71	70	64	66
	<i>Bayburt</i>	100	100	100	100	99
	<i>Erzurum</i>	93	85	85	98	87
<b>Central East Anatolia</b>	<b>80</b>	<b>68</b>	<b>68</b>	<b>94</b>	<b>67</b>	<b>82</b>
	<i>Malatya</i>	74	59	60	93	53
	<i>Van</i>	89	76	76	96	78
<b>Southeast Anatolia</b>	<b>61</b>	<b>51</b>	<b>52</b>	<b>89</b>	<b>54</b>	<b>79</b>
	<i>Diyarbakır</i>	56	50	50	80	54
	<i>Batman</i>	50	72	72	90	70
	<i>G. Antep</i>	73	43	43	96	42
<b>Total</b>	<b>91</b>	<b>79</b>	<b>79</b>	<b>97</b>	<b>80</b>	<b>93</b>

The coverage problems revealed in some regions were due to lack of interest of some of the primary informants and some district and province coordinators, as explained below in the qualitative chapter. When discussing coverage however, we draw attention to the fact that our survey was a “registry study” rather than a “sampling study”. Sampling procedure in

NMMR was only used at the beginning of the study to select the 29 provinces. Once a province was selected the NMMR aimed to register all cemetery burial data in all the settlements in the province. Therefore, the coverage of the population in particular, but also the coverage of settlements, is outstanding, since it reflects data collected from a population of almost 39 million, corresponding to approximately 54 percent of Turkey's population. Hence, if the data attained in NMMR are not biased in the sense of urban-rural distribution, it has been found that the analyses within the scope of the study will be carried out irrespective of the coverage rates.

Burial data were collected from 79 percent of rural settlements and from 80 percent of the rural population respectively. Although these levels are good compared to response rates seen in the West, they are lower than usually seen in surveys in Turkey. We analyzed the relationship between the distance of rural settlements to place of notification (health centre, district centre and province centre) and the degree of completeness of notification for three provinces (Kütahya, Gaziantep and Van) which were problematic. The results revealed that there was no statistically significant association between the distance from the settlements to the place of notification and the degree of completeness of notification. According to this finding, the data which are attained from settlements with coverage problems are found to be "unbiased" and therefore can be used. Certainly, the regularity of death notification did not depend solely on the distance of settlements to the place of notification. The characteristics of settlements and person in charge of the notification may have played a role as well. For this reason the data were analyzed assuming no bias during the data collection process.

Table 2.3 provides some basic data quality indicators. The first step of checking the quality of the NMMR data was to calculate the Crude Burial Rate - number of burials per 1,000 populations (Table 2.3), which approximates the Crude Death Rate. The value of the Crude Burial Rate as calculated from the NMMR data is 3.9 per 1,000. According to theoretical estimates based on the TDHS-2003 and GPC-2000 results, Crude Death Rate changes between 4 and 6 per thousand in project provinces. For Turkey as a whole and for many project provinces, Crude Burial Rates from NMMR data are close to lower boundary of the expected ranges and suggest the survey design used in NMMR is mostly successful in collecting burial data although it is somewhat lower than anticipated and may underestimate deaths.

The second check on data quality of the NMMR was to examine the proportion of female burials over total burials. The theoretical calculations done before data collection started indicated that the percentage of female burials out of total burials could be expected to be between 40 to 47 percent. The actual NMMR data show a percentage of female burials out of total burials of 43 percent, which is within the expected range in Turkey as a whole. The proportion also lays within the expected range in most of the project provinces, although in some provinces however it is beyond that.

Table 2.3 Number of burials and some basic data quality indicators

12 Region	Total number of burials	Crude Burial Rate (per 1,000)	Number. of women burials	Percentage of female burials in total burials	Number of female burials (12-50)	Number of female burials (15-49)	Percentage of female burials (15-49) in total burials	Percentage of female (15-49) burials in female burials
<b>İstanbul</b>	<b>41,254</b>	<b>3.7</b>	<b>17,608</b>	<b>42.7</b>	<b>1,584</b>	<b>1,414</b>	<b>3.4</b>	<b>8.0</b>
<b>West Marmara</b>	<b>10,433</b>	<b>6.6</b>	<b>4,548</b>	<b>43.6</b>	<b>300</b>	<b>276</b>	<b>2.6</b>	<b>6.1</b>
<i>Balıkesir</i>	6,905	6.2	3,028	43.9	178	168	2.4	5.5
<i>Tekirdağ</i>	3,528	6.5	1,520	43.1	122	108	3.1	7.1
<b>Aegean</b>	<b>25,490</b>	<b>4.9</b>	<b>10,847</b>	<b>42.6</b>	<b>828</b>	<b>753</b>	<b>3.0</b>	<b>6.9</b>
<i>Aydın</i>	5,139	5.1	2,182	42.5	174	160	3.1	7.3
<i>İzmir</i>	17,413	4.8	7,377	42.4	569	515	3.0	7.0
<i>Kütahya</i>	2,938	5.3	1,288	43.8	85	78	2.7	6.1
<b>East Marmara</b>	<b>15,031</b>	<b>5.0</b>	<b>6,404</b>	<b>42.6</b>	<b>504</b>	<b>452</b>	<b>3.0</b>	<b>7.1</b>
<i>Bursa</i>	11,378	5.0	4,859	42.7	368	334	2.9	6.9
<i>Sakarya</i>	3,653	4.9	1,545	42.3	136	118	3.2	7.6
<b>West Anatolia</b>	<b>13,575</b>	<b>3.1</b>	<b>6,056</b>	<b>44.6</b>	<b>589</b>	<b>553</b>	<b>4.1</b>	<b>9.1</b>
<i>Ankara</i>	12,746	3.1	5,698	44.7	560	526	4.1	9.2
<i>Karaman</i>	829	3.4	358	43.2	29	27	3.3	7.5
<b>Mediterranean</b>	<b>15,327</b>	<b>3.3</b>	<b>6,527</b>	<b>42.6</b>	<b>716</b>	<b>653</b>	<b>4.3</b>	<b>10.0</b>
<i>Adana</i>	6,610	3.6	2,751	41.6	302	271	4.1	9.9
<i>Burdur</i>	1,755	6.9	798	45.5	78	72	4.1	9.0
<i>K. Maraş</i>	2,816	3.2	1,196	42.5	141	126	4.5	10.5
<i>Antalya</i>	4,146	2.4	1,782	43.0	195	184	4.4	10.3
<b>Central Anatolia</b>	<b>4,575</b>	<b>4.9</b>	<b>1,950</b>	<b>42.6</b>	<b>174</b>	<b>159</b>	<b>3.5</b>	<b>8.2</b>
<i>Nevşehir</i>	1,694	5.3	727	42.9	75	69	4.1	9.5
<i>Sivas</i>	2,881	4.7	1,223	42.5	99	90	3.1	7.4
<b>West Black Sea</b>	<b>5,268</b>	<b>5.2</b>	<b>2,355</b>	<b>44.7</b>	<b>192</b>	<b>173</b>	<b>3.3</b>	<b>7.3</b>
<i>Çankırı</i>	1,509	5.7	666	44.1	52	47	3.1	7.1
<i>Tokat</i>	2,615	4.5	1,208	46.2	90	81	3.1	6.7
<i>Bartın</i>	1,144	7.1	481	42.0	50	45	3.9	9.4
<b>East Black Sea</b>	<b>5,541</b>	<b>4.6</b>	<b>2,293</b>	<b>41.4</b>	<b>174</b>	<b>164</b>	<b>3.0</b>	<b>7.2</b>
<i>Giresun</i>	2,458	5.1	1,018	41.4	66	64	2.6	6.3
<i>Ordu</i>	3,083	4.3	1,275	41.4	108	100	3.2	7.8
<b>Northeast Anatolia</b>	<b>4,488</b>	<b>3.3</b>	<b>1,962</b>	<b>43.7</b>	<b>219</b>	<b>195</b>	<b>4.3</b>	<b>9.9</b>
<i>Ağrı</i>	1,032	2.7	425	41.2	65	57	5.5	13.4
<i>Bayburt</i>	521	5.3	238	45.7	17	17	3.3	7.1
<i>Erzurum</i>	2,935	3.3	1,299	44.3	137	121	4.1	9.3
<b>Central East Anatolia</b>	<b>4,913</b>	<b>3.2</b>	<b>2,248</b>	<b>45.8</b>	<b>274</b>	<b>240</b>	<b>4.9</b>	<b>10.7</b>
<i>Malatya</i>	2,542	3.7	1,148	45.2	108	93	3.7	8.1
<i>Van</i>	2,371	2.7	1,100	46.4	166	147	6.2	13.4
<b>Southeast Anatolia</b>	<b>7,978</b>	<b>2.5</b>	<b>3,432</b>	<b>43.0</b>	<b>447</b>	<b>408</b>	<b>5.1</b>	<b>11.9</b>
<i>Diyarbakır</i>	2,515	1.7	1,055	41.9	147	134	5.3	12.7
<i>Batman</i>	800	1.9	350	43.8	65	60	7.5	17.1
<i>G. Antep</i>	4,663	3.8	2,027	43.5	235	214	4.6	10.6
<b>Total</b>	<b>153,873</b>	<b>3.9</b>	<b>66,230</b>	<b>43.0</b>	<b>6,001</b>	<b>5,440</b>	<b>3.5</b>	<b>8.2</b>

The third check was to calculate the proportion of female burials age 15-49 to total burials and to compare these to the expected percentages. According to the NMMR data, the percentage of female burials age 15-49 out of total burials is approximately 8 while the theoretically expected range is between 9 and 15. The result obtained is thus just below the lower limit for the total of Turkey. The same applies for the majority of the project provinces.

As a result of these three checks, we concluded that the NMMR design appears able to collect the information on male and female burials; however it may underreport female burials in the 15-49 age group. The procedures used for adjustment and correction of the data were discussed in the Section 2.4.

Age and sex distribution of the burials are given in Figure 2.5 below. The figure shows a not unexpected pattern of death, with male mortality happening at younger ages than female mortality. If we have underreporting of female deaths in the reproductive ages, this will exacerbate this pattern. There is some evidence of mild age heaping, especially at older ages.

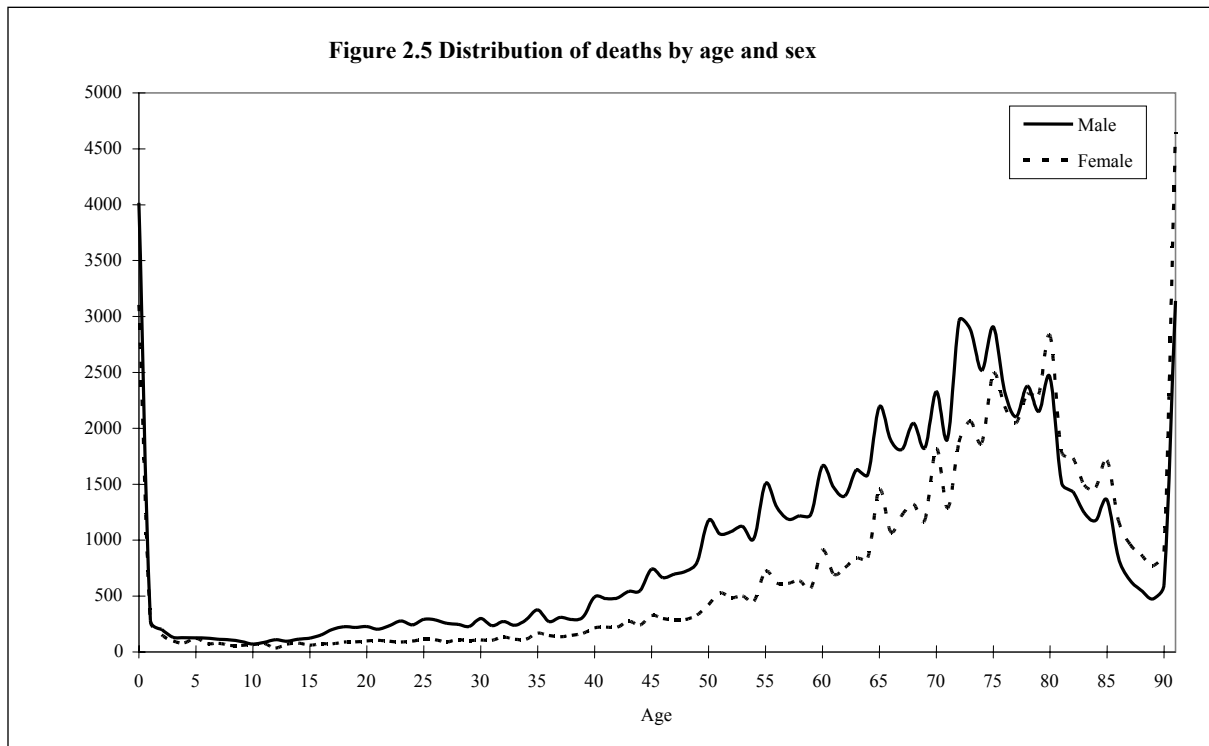


Table 2.4 shows the results of sample implementation for the deceased women requiring Health Facility Record Review Form (HFRRF) and/or Woman Death Questionnaires (WDQ). The results indicate that of 5,540 female deaths at age 15-49 were identified during field work. Of 2,417 health facility deaths, NMMR fieldwork teams successfully completed the HFRRFs based on hospital records with 2212 (92 percent). The main reason for the non-response of HFRRF was the difficulties to find the patient files of the deceased women, especially for emergency room deaths and forensic cases. A further 3,146 women deaths were identified requiring VAQ with their relatives, of whom 85 percent were

interviewed. The principal reason for non-response of WDQs was the failure to find the relatives of women after repeated visits to the household. The overall response rate for deceased women in the NMMR was calculated as 86 percent. For pregnancy-related deaths, response rates were 100 percent for both HFRRFs and WDQs.

Table 2.4 Response rates for the Hospital Facility Record Review Forms and Women Death Questionnaires<sup>(a)</sup>

Result	Pregnancy-related female		Non pregnancy-related female deaths
	Total	deaths	
Female deaths (15-49) identified	5,540	178	5,362
Female deaths requiring HFRRF	2,417	135	2,282
Female deaths with HFRRF	2,212	135	2,077
HFRRF response rate	91.5	100.0	91.0
Female deaths requiring WDQ	3,146	113	3,033
Female deaths with WDQ	2,683	113	2,570
VAQ response rate	85.3	100.0	84.7
Total (HFRRF and WDQ) response rate	86.0	100.0	85.4

<sup>(a)</sup> For some of the deceased women both of the questionnaires were filled by the field teams.

Table 2.5 presents the percentage distribution of deceased women by place of residence, place-of-death and place of burial. These are almost identical in all NUTS-1 regions, except for Istanbul. Percentage distribution of deceased women by place of burial appears to be in line with the percentage distribution of live women derived from TDHS-2003. Indeed the proportion buried in Istanbul is closest to the proportion from the TDHS-2003 suggesting that unlike residence which may be *de jure*, burial may be a good proxy for de facto residence.

Table 2.5 Place of residence, death and burial of deceased women compared to THDS- 2003

Region	Residence	Death	Burial	TDHS-2003
Istanbul	6.9	11.7	13.1	18.2
West Marmara	4.3	3.8	4.5	4.3
Aegean	14.0	15.6	14.7	14.3
East Marmara	8.3	9.6	8.3	8.8
West Anatolia	10.1	10.7	8.6	9.7
Mediterranean	12.8	12.9	12.8	12.7
Central Anatolia	7.3	6.2	6.5	5.8
West Black Sea	7.5	7.1	8.1	6.3
East Black Sea	4.1	2.8	4.3	3.6
Northeast Anatolia	5.1	3.9	3.8	3.0
Central East Anatolia	7.8	6.2	6.0	4.8
Southeast Anatolia	11.8	9.4	9.3	8.3
Total	100.0	100.0	100.0	100.0

## 2.2.6 Terms and Definitions

In order to make the results of the NMMS always comparable with international data, terms and definitions of the WHO/ICD-10 were used in the report. Unfortunately not all international publications are always explicit on their definitions, including some publications by UNICEF/UNFPA/WHO on maternal mortality ratio and maternal mortality rate. From tables presented in this report it will be easy to distinguish the two values (pregnancy related deaths and maternal deaths) where it is useful. In the text both figures may be given alternatively. Terms and definitions used in the NMMS are presented below:

*Female deaths* are all deaths of women of reproductive age. Women of reproductive age are defined as those aged 15 to 49 years.

*Pregnancy-related death* is ‘the death of a woman while pregnant or within 42 days of termination of pregnancy, *irrespective of the cause of death*.’

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

*Direct maternal deaths* are ‘those resulting from obstetric complications of the pregnant state (pregnancy, labor, and puerperium) from interventions, omissions, incorrect treatment or from a chain of events resulting from any of the above’.

*Indirect maternal deaths* are ‘those resulting from a previously existing disease or diseases that developed during pregnancy and which were not due to direct obstetric causes, but aggravated by physiological effects of the pregnancy’.

*Coincidental (accidental) deaths* are deaths among women who die during pregnancy, delivery, or the postpartum period, but not for direct or indirect obstetric causes.

*Maternal mortality ratio* is the number of maternal deaths per 100,000 live births, calculated as  $MMR_{ratio} = (\text{Number of maternal deaths} / \text{Number of live births}) * 100,000$ .

*Maternal mortality rate* is the number of maternal deaths per 100,000 women of reproductive age, calculated as  $MMR_{rate} = (\text{Number of maternal deaths} / \text{Number of women in reproductive age}) * 100,000$ .

*Lifetime risk of dying from a maternal cause* is the accumulated risk by the end of the reproductive life period. It is calculated as  $\text{lifetime risk} = (1 - (1 - MMR_{rate}))^{35}$ , where  $MMR_{rate}$  is expressed as a decimal.

*Pregnancy related mortality ratio* is the number of pregnancy related deaths per 100,000 live births. Calculated as  $PRMRatio = (\text{Number of pregnancy related deaths} / \text{Number of live births}) * 100,000$ .

*Pregnancy related mortality rate* is the number of of pregnancy related deaths per 100,000 women of reproductive age, calculated as  $PRMRate = (\text{Number of of pregnancy related deaths} / \text{Number of women in reproductive age}) * 100,000$ .

*Lifetime risk of dying from a pregnancy related cause* is the accumulated risk by the end of the reproductive life period. It is calculated as  $\text{lifetime risk} = (1 - (1 - PRMRate))^{35}$ , where PRMRate is expressed as a decimal.

*Biomedical risk factors* are conditions or habits present during pregnancy which are likely to increase the risk of an adverse outcome of a pregnancy.

*Stillbirths* are defined as fetal deaths after 22, 24, or 28 weeks of gestation. The most commonly used definition is 28 weeks, but the ICD-10 uses 22 weeks. In this study, stillbirths are defined as births after five months gestation, which corresponds most closely to the 22-week definition. This is also the definition which is most common among Turkish health staff.

*Avoidable factors* are deficiencies and failures on any level of the health system, be it individual, family, community or health facility level, which affect availability, accessibility and/or quality of care for the woman. The term sub-standard care is generally preferred over the term avoidable factors, since not all sub-standard care is avoidable within the limitations and constraints of a health system. On the other hand it seems inappropriate to use the term ‘substandard care’ to refer to individual or family factors. The NMMS takes account of the possibility that more than one avoidable factor or aspect of sub-standard care may contribute to death at the same time.

*Parity* was recorded in this study as the number of previous pregnancies (prior to the pregnancy which led to the woman's death) which had completed or passed the 22 week of gestation, regardless of the outcome of the pregnancy. This definition of parity does not include the pregnancy that led to the woman's death.

### **2.2.7 Cause of Death Ascertainment**

The causes of death were ascertained in a complex procedure with several stages. As Verbal Autopsy Questionnaires and Health Facility Record Review Forms came in from the project provinces, they were pre-evaluated initially by two, later when the workload increased, by four medical doctors with a broad background in general clinical health.

In a first step they separated pregnancy-related, where the woman died while pregnant or within 42 days of the end of pregnancy, irrespective of cause, from all other female deaths. Two different kinds of evaluation forms were in use for the two categories. For non pregnancy related causes of death the Project Core Team had decided, together with the

Project Steering Committee, to group them according to the broad categories of ICD-10. Neither the time nor the financial means were available to allow for more detail on the general causes-of-death. The form for the causes of general deaths was therefore rather brief. For the pregnancy-related deaths, we went into a much higher level of detail in order to exactly understand not only the eventual cause of death but also the circumstances and risk factors which had contributed.

After the pre-evaluation each pregnancy-related death was discussed between the pre-evaluation team and the project team leader - a medical doctor, with a experience in clinical medicine, especially in obstetrics and public health. Where a pregnancy-related death had occurred in a hospital, we also requested a verbal autopsy interview to be conducted. In about a third of the hospital deaths, additional information, such as operation-, epicrisis- or laboratory reports, was requested from the provincial and district teams, in order to allow for a better comprehension of the cause and circumstances of death. Once a satisfactory level amount of information was reached, the deceased woman's file was considered again and discussed, and a preliminary cause of death, biomedical risk factors and outcome of the pregnancy were recorded according to ICD-10 codes. Whenever sub-standard care or avoidable factors had contributed to the death the information was also entered into the evaluation form.

Periodically, completed evaluation forms were sent to members of the Central Review Committee. After they had re-evaluated the documents individually, controversial results were once more discussed in a wider forum – either in small groups or with the entire team and a final decision taken by consensus.

### **2.2.8 Data Entry, Coding and Establishing the Database**

The CBL and FBNF data were delivered to the Provincial Health Directorates, where the PPR entered them into the computers supplied to each province by the project. The software used ran under Microsoft Access and was especially developed for the project. The software kept the data in the computer environment, and produced reports and made some basic analyses to enable field activities and data quality to be monitored.

The Woman Death Questionnaires (WDQs) and the Health Facility Record Review Forms (HFRRFs) were returned to the Hacettepe Institute of Population Studies by the fieldwork teams for data processing as soon as interviews were completed in a province. The office editing staff checked that the questionnaires for all the eligible deceased women were returned from the field. Information from the Woman Death Questionnaire and the Health Facility Record Review Form were entered by data-entry clerks at HUIPS in Ankara using special software developed with the PC-EDIT. The program used a number of logic and skips controls, together with range checks and logical checks which increased the reliability of data and reduced data entry errors.

The machine entry and editing activities were initiated three months after the start of the fieldwork, and were completed three months after the completion of the fieldwork.

### 2.2.9 Qualitative Survey

Another major project objective was to understand the causes of under-registration of female deaths and improve the quality of recording of causes-of-death. Limited qualitative data collection was carried out in the form of in-depth interviews and focus group discussions with respondents selected from among agents responsible for registration surveillance, statistical compilation and death notification systems. The results of the qualitative data played a significant role in developing proposals for improving the existing registration system

In line with the general objectives of the study, the purpose of the qualitative component was specifically to understand why there is under-notification of burials in general, and of burials of women in particular, and to obtain suggestions for improving the current systems.

A preliminary qualitative study was conducted in Antalya between 2004 and January 2005. This consisted of a focus group discussion with *muhtars* and nine in-depth interviews with the municipality cemetery directory, provincial health directory, local administration, directory of population and the *muhtars*. As a result changes were made in the in-depth interview guidelines.

The quantitative research began in June 2005. The HUIPS researcher assistants and students, who worked as field coordinators in this process, observed the NMMR progress by making monthly visits. The main part of the qualitative study was initiated in the tenth month of the quantitative study, and two focus group studies and 26 in-depth interviews were completed between March and May 2006.

First of all, a focus group study was carried out with the PPRs from Adana, Ağrı, Ankara, Bursa, Diyarbakır, Giresun, İstanbul, İzmir and Kütahya who were in close contact for a whole year with the people working on the death recording system in order to obtain, within an interactive environment, their experiences with death recording, their interactions with the various state institutions and their suggestions for ways of improving the current recording system. Ten PPRs from nine provinces working in different regions were asked to evaluate the project and to talk about the experiences they had in their provinces, especially the situations they encountered during the verbal autopsy. The second focus group was held with 10 members, comprising the PPCs, PPDs and DCs of the project (Ankara, Diyarbakır and İzmir), with the aim of understanding the perceptions on registration system and their experiences with the hospital records, and with abstracting this information for the study.

In-depth interviews were held in three provinces in order to understand how the recording system proceeded, how the people responsible for the current recording system perceived their responsibilities, their opinions about the project and their suggestions for improving the recording system. Two provinces, Ankara and Diyarbakır, were selected from two different regions where the NMMR was implemented, and a third Kayseri, was selected as a 'control province', in order to understand the processes concerning burial records in areas

not included in the NMMR, In Diyarbakir and Kayseri, interviews were held with muhtars, cemetery officials, and with families that had experienced maternal mortality. In Ankara, interviews were held with district governors, staff of the General Directorate of Mother and Child Health and Family Planning (MoH), General Directorate of Population and Citizenship Affairs (MoI) and the TURKSTAT. The in-depth interviews were used to understand the reasons why burials in general, and why burials of women more specifically, were reported insufficiently. Individual interviews enabled us to see how this subject was viewed by the people working in this field and to understand the social structure and processes forming the present situation. Interviews were held with people working in the record follow-up, statistical compilation and mortality notification systems of the NMMR. A list containing of the date and place of focus groups and in-depth interviews is given in Annex 12.

All of the interviews were recorded magnetically on tape and were normally transcribed on the same day by the interviewer and the observer. The analysis revealed the following different areas of importance: The institution of the *'muhtar'*, the management of cemeteries in municipal areas, the practice of 'night burials', the perception of the current burial registration system (MERNIS, MoH, and TURKSTAT), patient record keeping and causes of death from hospitals and the participants' perception of the NMMS approach.

### **2.3 Supplementary Data Sources**

The denominator indicators were calculated (number of births and number of women at age 15-49) by using supplementary information from TDHS-2003 and GPC-2000. The detail information on calculation procedure was given in Section 2.5.1.2.

#### **2.3.1 Turkish Demographic and Health Survey , 2003**

The TDHS-2003 data are derived from a population-based sample survey of 10,836 households and 8,075 women in reproductive age. They provide detailed and high-quality information on fertility levels and differentials, characteristics of women, and a range of process variables related with maternal mortality. Previous TDHSs were also used to look at trends in use of maternity care variables. Further analyses of these data allowed us to:

- Obtain estimates of live births and general fertility rates, and use these results in conjunction with the results of the NMMR, to calculate maternal mortality ratios and lifetime risk
- Characterize women who did not die while delivering (comparison of the two groups enabled identification of risk factors of maternal mortality)
- Developed model-based estimates.

#### **2.3.2 General Census of Population, 2000**

The first national census was conducted in 1927, four years after the establishment of the Republic. Beginning with the 1935 census, subsequent population censuses were undertaken regularly at 5-year intervals until 1990. After 1990, it was decided that population censuses would be carried out in years ending with 0 by a law. The latest, fourteenth, General

Census of Population, which was carried out on 22nd October 2000, put the population of Turkey at 67.4 million. Data from the census were used to estimate:

- Projected female populations at risk during the project period
- Births by NUTS-1 regions and by urban/rural areas

The 2000 General Census of Population asked about deaths in the 12 months preceding the census. We had hoped to use female death rates in the reproductive ages to compare to our data but these have not been released by the TURKSTAT because they are assessed by them to be of poor quality.

## **2.4 Comparison Group**

A nationally representative sample of women who did not die in childbirth was obtained from the TDHS-2003, in order to provide a comparison group. Additional information was also obtained from previous demographic surveys. The sample design and sample size of TDHS-2003 makes it possible to perform analyses for Turkey as a whole, for urban and rural areas and for the five demographic regions of the country. The TDHS-2003 sample is of sufficiently size to allow for analysis on the survey topics at the level of the 12 regions (NUTS 1). In the selection of the TDHS-2003 sample, a weighted, multi-stage, stratified cluster sampling approach was used. The TDHS-2003 covered 10,836 households and interviewed 8,075 ever-married women aged 15-49 between December 2003 and May 2004, including obtaining in-depth histories for 4,132 live births in the 0-59 months preceding the survey.

## **2.5 Data Analysis Procedures**

Section 2.5 presents the main data analysis procedures used to look at levels and causes of maternal death.

### **2.5.1 Quantitative**

#### **2.5.1.1 Weighting, Adjustment, and Correction Factors**

The sample design of NMMR is a weighted, stratified probability sample. The sample was designed to provide estimates for nationwide, urban/rural and 12 NUTS-1 regions. The detail information on NMMR sampling design is given in the section 2.2.2. By the end of our field work, we had measured the proportion of maternal deaths aged 12-50 among female deaths aged 12-50. In order transform these observed data into national and NUTS-1 estimates of the maternal mortality ratio, several steps needed to be taken:

1. *Disproportional allocation rescaling*: We had to weight the sample to rescale the disproportionate allocation of the selected provinces. For example, Istanbul province comprised the entirety of NUTS-1 region 1 and NUTS-2 region 1, and thus was over-sampled relative to other NUTS-1 and NUTS-2 regions which had more component provinces. Weights for disproportional allocation rescaling are given in Table 2.6. The same procedures

are also employed for rescaling the projected numbers of women (15-49) and births in the NUTS-1 regions.

2. *Non-sending adjustment*: We also had to correct for the fact that not all settlements sent data each month. We calculated a proportion of completed settlement-months of reporting for each urban and rural area within each province. For example, if a settlement only sent nine months worth of data, we assumed this represented 75 percent (9/12) of its deaths and so adjusted upwards by cumulating settlement-based adjusted deaths to get urban and rural adjusted estimates for each province. There were a total of 58 non-sending adjustment factors (29 provinces times 2 (urban and rural)). Table 2.6 also shows non-sending adjustment factors.

Provinces	Weights for Disproportional allocation rescaling	Non-sending Adjustment Factors		
		Urban	Rural	Total
Adana	1.546	1.001	1.241	1.066
Ağrı	2.476	1.555	1.512	1.525
Ankara	0.806	1.010	1.334	1.063
Antalya	1.026	1.023	1.251	1.126
Aydın	2.050	1.000	1.000	1.000
Balıkesir	1.145	1.008	1.120	1.062
Burdur	1.026	1.000	1.002	1.001
Bursa	1.092	1.003	1.126	1.032
Çankırı	2.457	1.000	1.047	1.040
Diyarbakır	2.289	1.246	1.841	1.486
Erzurum	1.064	1.023	1.156	1.096
Gaziantep	1.485	1.040	2.370	1.278
Giresun	2.101	1.020	1.163	1.150
İstanbul	0.763	1.004	1.089	1.006
İzmir	0.759	1.000	1.002	1.000
Kütahya	4.515	1.061	1.369	1.286
Malatya	1.856	1.073	1.876	1.193
K. Maraş	2.646	1.065	1.431	1.230
Nevşehir	3.781	1.000	1.012	1.008
Ordu	2.101	1.227	1.240	1.238
Sakarya	2.950	1.025	1.076	1.060
Sivas	2.899	1.107	1.436	1.254
Tekirdağ	1.771	1.000	1.097	1.042
Tokat	4.228	1.380	1.545	1.496
Van	1.911	1.043	1.288	1.149
Bayburt	1.064	1.000	1.013	1.012
Karaman	8.010	1.000	1.049	1.020
Batman	3.494	1.110	1.432	1.255
Bartın	4.688	1.000	1.075	1.055

3. *Underreporting correction*: The third step was the correction of the under reporting of deaths that may have occurred despite sending reports. This was done for each province by using a correction factor calculating for all project provinces. This factor was calculated using a standard demographic technique (Bennet and Horiuchi Technique) that corrected for under-reporting of deaths. The factor for underreporting adjustment was found to be 1.35, implying a completeness rate at the level of 74 percent. The level of underreporting was assumed to be the same for all provinces.

Various techniques have been developed to evaluate and correct information on deaths by sex and age in relation to information on the population. Most of these (Preston-Coale Technique and Growth Balance Technique) are based on the assumption that the population is stable, which is not the case in Turkey, where fertility has been declining sharply. The Bennett and Horiuchi Technique on the other hand does not assume a stable population, but does assume that completeness and age misreporting are the same in the two censuses and that migration is nil. The latter assumption may be violated, especially by province. The technique requires information the distribution of population by 5-year age groups from two censuses and registered deaths during the intercensal period (for detailed information on the Bennett and Horiuchi Technique, see Annex 13).

Table 2.7 Numbers of female deaths (15-49) identified during data collection, number of female deaths after non-response adjustment and under-registration correction, and number of interviewed and weighted number of female by region

Regions	Identified number of female deaths	Adjusted number of female deaths	Corrected number of female deaths	Interviewed number of female deaths	Weighted number of female deaths
İstanbul	1,414	1,423	1,923	1,320	901
West Marmara	276	291	394	230	313
Aegean	753	775	1047	679	1,012
East Marmara	452	470	635	359	572
West Anatolia	553	587	793	483	591
Mediterranean	653	724	979	595	880
Central Anatolia	159	182	246	128	446
West Black Sea	173	218	294	144	558
East Black Sea	164	197	266	145	294
Northeast Anatolia	195	237	320	180	264
Central East Anatolia	240	281	380	224	412
Southeast Anatolia	408	548	740	309	646
Total	5,440	5,933	8,018	4,796	6,887

The age and sex distributions of the population for the years 2004 and 2005 were derived from projections described in Section 2.5.1.2 below. The projected population data was used without any correction on migration-free population assumption of the technique. The deaths collected from June 2004 to May 2005 as part of NMMR data collection was used as registered deaths. The technique was conducted for NUTS-1 regions, after the age and sex distribution of the population and deaths were grouped by NUTS-1 regions. The technique produced completeness of death registration, median completeness, and the adjusted age-specific death rates based on median completeness. Since median completeness was for whole

age groups, the median completeness for the women in reproductive age groups (15-49) was calculated separately and used to adjusting the number of women in reproductive age groups. After this the numbers of expected female deaths were estimated (Table 2.7). Table 2.7 also includes number of female deaths that HFRRF or VAQ was completed, and weighted number of female deaths.

In NMMS, the calculated weights as explained in Section 2.5.1.1 were used during the whole data analysis process. Due to the weighting process which was applied for data analysis, and the correction for missing cases, the number for the group totals may be different from the total number of cases actually found.

### **2.5.1.2 Projections<sup>1</sup>**

The NMMR data collection activities estimated the numbers of pregnancy related deaths (numerator of indicators) and obtained the denominator of the indicators (number of births and number of women at age 15-49) by using supplementary information from other sources. The projected age and sex distribution of population and the number of births for Turkey as a whole and for 81 provinces were estimated by using the information from GPC-2000, TDHS-1993 and TDHS-2003. The computer program “Spectrum,” developed by The Futures Groups International, was used to get population and the number of births. Spectrum projects the population for an entire country or region/provinces by age and sex, based on assumptions about components of population namely on fertility, mortality and migration (Annex 14). The steps followed during the projections are defined below.

The first step in the projection process was to prepare the raw data for projection:

- Text files of ‘the distribution of population according to age, age groups, population groups and sex’ obtained from TURKSTAT was converted to Excel files.
- Populations of single ages were deleted from the Excel files to leave the populations of five-year age groups.
- Spectrum requires the age groups to close at 80+, so the populations of 85+ age groups found in the original data were added to the 80-84 age groups.
- Populations of age groups living in areas with populations less than 2000, 2000-5000, 5001-10000 were added up to give the total rural population, and the populations of age groups living in areas with populations of 10001-20000, 20001-25000, 25001-100000, 100001-300000 and more than 300000 were added to give the urban population.
- Population with unknown ages were distributed proportionally to known age groups, separately for rural and urban.
- The summations of the rearranged data were taken to check with the original population totals.

The second step for the projection was to decide the level of the demographic components on the provincial level and to enter the data to Spectrum program. The data were

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<sup>1</sup> The projection results on number of women in reproductive age (15-49) and number of births may be different than those used by the MoH for target-settings.

entered into the program under the following assumptions on the overall, urban-rural and provincial levels:

*Overall level:*

- Population distribution by five-year age groups and sex were taken from the 2000 census, after the stages explained in the Data Preparation section above.
- The TFR values calculated in TDHS-1993 and TDHS-2003 were subtracted and divided by 10 to obtain an annual TFR change. This change was assumed to be constant until 2006. The TFR value in TDHS 2003 was taken as the base value, and the values for years around it were calculated using the annual change.
- Values for life expectancy at birth were taken from estimates by the TURKSTAT.
- ASFRs were taken from the TDHS 2003, and assumed to be constant between 2000 and 2006.
- Net migration was assumed to be zero.
- Spectrum's sex ratio at birth assumption of 105 was kept.
- The West model life table was used.

*Urban-Rural level:*

- Population distribution by five-year age groups and sex for rural and urban were taken from the 2000 census, after the stages explained in the Data Preparation section above.
- The TFR values were estimated using the same procedures as for Turkey as a whole. The calculations were carried out separately for rural and urban, using the rural and urban values of TDHS.
- There are no estimates for life expectancy at birth for Turkey's rural and urban area so national values were used for both.
- ASFRs were taken from TDHS 2003 for rural and urban separately, and were assumed constant between 2000 and 2006.
- There is no information on migration for the urban and rural definitions of this project. Therefore TURKSTAT's estimates of "city to village" and "village to city" migrations for the period 1995-2000 are used. These are administrative definitions. For these movements, the percent distribution of net migration for age groups and sexes was also calculated and entered into Spectrum. For the five-year period before 2000, migration numbers for the age group 0-4 do not exist in TURKSTAT's migration statistics. Migration for this age group was therefore assumed to be zero, which gave it no share in the age distribution of migration.
- Spectrum's sex ratio at birth assumption of 105 was kept.
- The West model life table was used for both rural and urban.

*Provincial level:*

- Population distribution by five-year age groups and sex for rural and urban were taken from the 2000 census, after the stages explained in the Data Preparation section above.
- For the base year 2000, TURKSTAT's TFR values for the provinces were used. For all five defined regions of the TDHS, one tenth of the differences between the TFR for 1993 and TFR for 2003 were calculated to be used as an annual TFR change. These changes

were added to the base year for the predictions of 2001-2006. For each province, the annual change of the region it belonged to was used.

- Life expectancy at birth values of 2000 were taken from the Human Development Report, Turkey 2004. The increases were assumed to be the same as TURKSTAT assumed for Turkey. Tekirdağ Province's life expectancy at birth for each sexes separately do not exist in TURKSTAT's report, the average of the two neighbour provinces, Edirne and Kırklareli, for each sexes separately were used.)
- ASFRs were taken from TDHS 2003 for all five regions separately, and were assumed constant between 2000 and 2006. Each province got the ASFRs of the region it belonged to.
- One fifth of the net migration between 1995 and 2000 for each province was calculated and held constant for the following years. For 77 provinces, the percent distribution of net migration for age groups and sexes was also calculated and entered into Spectrum. Net migration was calculated from the difference of provincial in and out migration by places of residence, in which intra-provincial movements cancel out.
- Net migration was very low in this period for 4 provinces: Edirne, Iğdır, Niğde, Şırnak. This caused a problem in calculating the percent distribution of migration: Since there can be both positive and negative net migrations for age groups, the absolute value of a percent value for an age group can be larger than 100. Spectrum only accepts values between -999 and 999 but where there was very low total net migration, these values were in the thousands. The migration distributions of neighbouring provinces Tekirdağ, Kars, Nevşehir and Hakkari respectively were used. For the age group 0-4, net migration was assumed to be zero, since data do not exist.
- Spectrum's sex ratio at birth assumption of 105 was kept.
- The urban percents of 73 provinces were calculated from the 1990 and 2000 censuses. One tenth of the difference between 1990 and 2000's percents was taken as the annual change. Taking the 2000 values as base values, the annual changes were added until 2006. For the eight provinces which were smaller administrative units during the 1990 census, a different method was used: The annual change was calculated from Turkey's percent urban values for 1990 and 2000. The 2000 values were again taken as base values, but the annual changes were that of Turkey's.
- East model life tables were used for provinces falling in the East region, and West model used for all other regions.

In the last step, an adjustment procedure was applied to the provincial and urban-rural projection results to bring them into line with the results of national projection. Since the projections of Turkey, Rural and Urban Turkey and the 81 provinces were made separately, the summation of projected populations of Rural and Urban did not give the total projected population for Turkey, not did the summation of 81 provinces. It is therefore necessary to adjust the populations to give the total for Turkey, assuming that projections of Turkey according to age and sex are correct.

To do this, the proportions of all five-year age groups classified by sex were found from the summation of all the five-year age groups, classified by sex in individual projections. These proportions were held constant for all age groups classified by sex, and multiplied by

the corresponding values in the Turkey projection, to obtain the adjusted populations. This procedure was followed for each year separately. For example, to adjust the Urban and Rural populations for a certain year, their projected populations for that year were summed up to give the total Turkish population at that year, each sex and age group being summed in it. The proportion of urban males aged 0-4 years is the number of urban males aged 0-4 years divided by the sum of urban and rural males aged 0-4 years. If this proportion is multiplied with the number of males aged 0-4 in the Turkey projection, an adjusted number of urban males aged 0-4 is obtained. The same steps were followed for all age groups and both sexes to obtain the adjusted populations. During the process of copying data from Excel to Spectrum and back after making the projections, some problems related to rounding appeared. For age and sex specific projections Spectrum makes, the actual summation of all age groups and sexes do not give the total number Spectrum itself calculates. The maximum difference between Spectrum's total and actual total was in the adjustments of Rural and Urban Turkey projections. To avoid these problems, Spectrum's totals were not used, rather age and sex specific projections were assumed to be correct, and used to calculate totals.

### 2.5.1.3 Other Adjustments: Istanbul's Cemetery Burial List

Istanbul had by far the largest number deaths, and since their Greater Municipality Burial data were already computerized, cemetery data were collected in a different manner to other urban cemetery burial lists. This resulted in two difficulties: a) the records had duplicates which needed to be eliminated, and b) Istanbul cemetery records included stillbirths which needed to be distinguished and eliminated.

We opted for the following strategy to eliminate duplicates—first exact duplicates with month-of-death, year-of-death, age, name, and sex were identified. Father's name and cemetery name were then checked. If these were also exact duplicates (n=133 for age 0 and n=1,757 age 1+), then these records were deleted, otherwise they were kept unless the difference was just a space in the name or if information on the father's name or cemetery was blank in one record and filled in the second and the records were sequential in recording (suggesting an incomplete entry). In this case the incomplete record was also deleted (n=18 for age 0 and n=82 age 1+).

In order to be considered a stillbirth and eliminated, the age of death had to be 0 years, and if dates of birth and death were available, the age at death had to be 0 days (or in about 20 cases, negative days—that is death occurred one or two days before birth). Within this subset, if the cause-of-death was an intrauterine foetal death (IUFD) or abortion, the case was a stillbirth, irrespective of the name. If the cause-of-death was blank, then the infant's name was used to determine status. Those named *sessiz* (silent), *ölü doğum* (stillbirth), or *cenin* (genii/jinn) were considered to be stillbirths, while those with an individual name, or named *bebek* (baby) or *sesli* (cried) were considered to be live births. For some causes, namely *adli vaka* (legal case) *anensefali*, *anhidroandroz*, *dekolman plasenta*, *düşük*, *EMR*, *fetal aromalı*, *immaturite*, *prematurite*, *plasental yetmezlik*, *solunum yetmezliği*, the case was a stillbirth if it was named *sessiz* (silent), *ölü doğum* (stillbirth), or *cenin* (genin), but a live birth if named with an individual name, or named *bebek* (baby) or *sesli* (cried). All other causes-of-death were judged to be live births, irrespective of the name.

#### 2.5.1.4 Comparative Analysis

Comparative analyses were carried out between cases of deaths identified in the NMMR, those identified during the same period by the vital registration system of the GDPCA, and those in the reporting systems of the Ministry of Health. The comparisons were carried out on the aggregate level and where possible on the individual level. On the aggregate level, analyses compared aggregate numbers of deaths by basic characteristics such as age, sex and place-of-death/burial. At the individual level, linkage and comparison were performed to the extent possible in order to recover information on the differences in causes-of-death in NMMR and MoH systems, the extent of under-registration, and on the possible time lags between occurrence of events of death and subsequent reporting, recording and registration. Identifying cases in the different systems for the purpose of comparison was problematic for several reasons: a) Despite the fact that the GDPCA (which officially registers deaths) and agents in the registration system (such as headmen) are required to use detailed identity information, there are females who do not have identity cards and who therefore are not registered. b) Furthermore, in the information sets kept by the MoH, more information is available to ascertain one-to-one comparisons of the characteristics of the deceased mother. c) Moreover, since different systems use different codes to identify the residence of deceased females (family ledger in the case of GDPCA, de facto place-of-death in the case of MoH) residence may be difficult to be ascertained.

Such analyses aimed to shed light onto the magnitude of deficiencies in recording and reporting of deaths in the different systems, characterize groups most likely to be missed by the existing systems, and provide a comparative assessment of the performance of alternative reporting and recording systems in Turkey.

#### 2.5.1.5 Model Based Estimation of Maternal Mortality Indicators

In recent years, model-based analyses have become important sources of global information on the prevalence of maternal mortality, largely because of the absence of data on maternal mortality throughout the world, particularly developing countries. This is because the adoption of model based estimates is easy, with no mortality data collection required. However, model based estimations are not empirical and cannot produce trends.

The methods for the model based estimation of maternal mortality indicators used by UNICEF/UNFPA/WHO was developed by Stanton and Hill. Three models have been developed for 1990, 1995, and 2000 based on regressions between maternal mortality indicators and a number of process/proxy variables associated with levels of maternal mortality, such as GNP per capita, fertility rates, and delivery care. The final 2000 model developed by UNICEF/UNFPA/WHO is as follows:

$$\text{logit(PMDF)} = -7.069 + 1.158 \cdot \ln(\text{GFR}) - 0.0133 \cdot \text{SA} - 0.0255 \cdot \text{HIV} + 0.399 \cdot \text{LASSAME} - 1.077 \cdot \text{VRComplete}$$

Most of this information can be derived from the Turkey Demographic and Health Survey, 2003 data.

We hoped to use the model to contribute to our understanding of disparities in maternal mortality in Turkey and use as a powerful advocacy tool during the meetings with policy makers, local administrators, academics and service providers in ascertaining their commitment to the successful implementation of the project, and the subsequent adoption and sustainability of the proposed strategies in the reporting and recording systems.

After the completion of the data collection activities and based on the results from the 29 study provinces, we undertook to develop an advanced model for estimating maternal mortality also for non-sampled provinces. This was to facilitate understanding of the differences and disparities in maternal mortality on NUTS-1, NUTS-2 and NUTS-3 levels. It is hoped to be used as a powerful advocacy tool during the dissemination of the study results to policy makers, local administrators, academics and service providers in order to ascertain the subsequent adoption and sustainability of strategies in the reporting and recording systems to be proposed.

Three models were developed. The first was based on the UN model applied as it was developed using province level covariates to predict province level maternal mortality. The second used the UN variables but build a new model with different alpha and beta values based on the 29 provinces with data to use to predict the rest of the 81 provinces. The final approach was to build a new model using new variables given below: Households using safe water, households using sanitary toilet, antenatal care, births delivered at health facilities, mothers received medical care at birth, had diarrhoea in the last 2 weeks, underweight children, children under 5 years of age without birth registration, consanguinity, currently using a modern contraceptive method, proportion of deceased children, total fertility rate, gross reproduction rate, mean age at child bearing, infant mortality rate, child mortality rate, female labour force participation rate. Estimations on these three models are given in Section 3.4.

## 2.6 Timetable: Phasing of Project Activities

To achieve the project’s objectives, the research followed a time frame based on five phases (Table 2.8).

Table 2.8 Time table for phasing of project activities

Phase I - Inception and Pilot Phase	5 months	Oct 2004-Mar 2005
Phase II - Preparation of field activities	2 months	Jan 2005-May 2005
Phase III - Data collection, processing and analysis	14 months	Jun 2005-July 2006
Phase IV - Final Reporting	2 months	Aug 2006-Sep 2006
Phase V - Dissemination	2 months	Oct 2006-Dec 2006

## 3.1 Maternal Mortality

### 3.1.1 Levels of Maternal Mortality

Table 3.1.1 shows that the overall pregnancy related mortality ratio was 38.3 ( $\pm$  2.8) per 100,000 live births after correcting for the sampling disproportion and under-reporting. It ranged from a low of 12.4 ( $\pm$  5.0) per 100,000 live births in West Anatolia to a high of 93.3 ( $\pm$  17.2) per 100,000 live births in Northeast Anatolia. The mortality ratio for pregnancy related deaths in urban areas was 28.2 ( $\pm$  3.1) per 100,000 live births, while in rural areas it was 53.7 ( $\pm$  5.5) per 100,000 live births. Overall, pregnancy-related deaths constituted 4.3 percent of female deaths in the age group 15-49, but again this ranged from 2.0 percent in Istanbul to 13.0 percent in Northeast Anatolia. The lifetime risk of pregnancy related mortality was one in 1,142 women overall, but as low as one in 4,168 in West Anatolia and as high as one in 322 in Northeast Anatolia. The pregnancy related mortality rate was at 2.5 per 100,000 women aged 15-49. The level of maternal mortality ratio, which includes only deaths from direct and indirect maternal causes, was found to be quite low, with 28.5 ( $\pm$  2.5) per 100,000 live births. This suggests that the well recorded increase in the uptake of maternity care is paying off in terms of maternal mortality reduction (Table 3.1.2). Also, Turkey's near-replacement level fertility constitutes that women do on average no longer face the risk of pregnancy many times, making the lifetime risk of the maternal mortality low (1 in 1,536 women and 1.9 per 100,000 women aged 15-49 respectively). Also the proportion of maternal deaths among all deaths in the reproductive age group was found to be lower than suggested by previous estimates (3.2 percent). Figure 3.1.1 and Figure 3.1.2 present the pregnancy related mortality ratios and maternal mortality ratios in the 95 percent confidence interval.

The pregnancy related mortality ratio which was found by the NMMS is approximately half the level estimated by the UN models in 2000 (70 per 100,000 live births), although well within the 95 percent confidence interval (18-130 per 100,000 live births). It is also somewhat lower than the maternal mortality ratio found by the most recent large-scale hospital based study (49 per 100,000 live births in 1999) in Turkey (MoH, 2000). This difference may be due to secular trends (our study took place seven years after the hospital study). But it is also well known that hospital studies often over-estimate mortality as they include high risk and problematic deliveries in the numerator but only a subset of all births in the denominator, since uncomplicated homebirths are excluded. The NMMR results are higher than an estimate we made on the basis of maternal deaths recorded by the MoH in 2003 (11.9/100,000 live births), 2004 (11.0/100,000 live births) and 2005 (15.3/100,000 live births). This is probably because our methodology identified pregnancy-related deaths and/or maternal deaths in and outside of health facilities, and was therefore better at identifying overall deaths (see Section 3.3 below). In addition we applied a correction factor for under-reporting of deaths, which is not done with MoH data.

Table 3.1.1 Pregnancy-related mortality indicators<sup>(\*)</sup> by NUTS-1 region and type of settlement

Regions	Unweighted		Weighted		TFR	Pregnancy related deaths (15-49)	Maternal deaths (15-49)	PRD/ FD	Pregnancy related mortality ratio	95 percent Lower limit	95 percent Upper limit	LTR 1 in	Pregnancy related mortality rate	
	Population female 15-49	Live births	Population female 15-49	Live births										
Istanbul	3,294,995	185,219	1,952,676	104,100	1.83	901	18	11	2.0	16.9	16.9	16.9	3,180	0.9
West Marmara	439,172	21,158	443,383	19,284	1.74	313	9	8	3.0	48.1	28.7	67.4	1,367	2.1
Aegean	1,504,294	74,794	1,578,653	81,106	1.76	1,012	29	26	2.9	35.9	26.8	45.1	1,548	1.8
East Marmara	880,759	49,580	1,013,413	52,301	2.12	572	11	11	2.0	21.7	12.5	30.9	2,549	1.1
West Anatolia	1,341,066	64,033	1,176,235	65,207	1.72	591	8	5	1.4	12.4	7.4	17.4	4,168	0.7
Mediterranean	1,447,204	99,268	1,550,667	101,833	2.3	880	35	26	4.0	34.7	26.8	42.6	1,254	2.3
Central Anatolia	288,537	20,951	622,171	48,523	2.19	446	15	6	3.5	31.7	10.7	52.6	1,157	2.5
West Black Sea	336,041	25,306	778,523	42,395	1.77	558	24	11	4.3	56.7	30.9	82.6	925	3.1
East Black Sea	379,313	21,486	518,999	24,609	2.02	294	17	17	5.7	68.3	41.5	95.1	883	3.2
Northeast Anatolia	414,641	45,604	386,192	36,812	3.18	264	34	25	13.0	93.3	76.1	110.6	322	8.9
Central East Anatolia	480,260	53,818	599,469	61,557	3.07	412	34	23	8.3	55.5	40.8	70.2	502	5.7
Southeast Anatolia	884,038	102,367	1,069,940	125,857	4.19	646	57	49	8.9	45.4	35.9	54.9	536	5.3
Urban	7,949,418	458,151	-	-	2.06	3,897	129	95	3.3	28.2	25.1	31.3	1,761	1.6
Rural	3,740,903	305,434	-	-	2.65	2,990	164	123	5.5	53.7	48.2	59.2	652	4.4
Total	11,690,321	763,585	11,690,321	763,585	2.23	6,887	293	218	4.3	38.3	35.5	41.2	1,142	2.5

<sup>(\*)</sup>All the definitions and equations related with pregnancy-related mortality indicators were given in the in Section 2.2.6

Table 3.1.2 Maternal mortality indicators<sup>(\*)</sup> by NUTS-1 region and type of settlement

Regions	Unweighted		Weighted		TFR	Female deaths (15-49)	Pregnancy related deaths (15-49)	Maternal deaths (15-49)	MD/ FD	Maternal Mortality Ratio	95 percent Lower limit	95 percent Upper limit	LTR 1 in	Maternal Mortality Rate
	Population female 15-49	Live births	Population female 15-49	Live births										
Istanbul	3,294,995	185,219	1,952,676	104,100	1.83	901	18	11	1.3	11.0	11.0	11.0	4,876	0.6
West Marmara	439,172	21,158	443,383	19,284	1.74	313	9	8	2.6	42.1	24.0	60.3	1,560	1.8
Aegean	1,504,294	74,794	1,578,653	81,106	1.76	1,012	29	26	2.5	31.5	23.0	40.1	1,764	1.6
East Marmara	880,759	49,580	1,013,413	52,301	2.12	572	11	11	2.0	21.7	12.5	30.9	2,549	1.1
West Anatolia	1,341,066	64,033	1,176,235	65,207	1.72	591	8	5	0.8	7.4	3.5	11.3	6,947	0.4
Mediterranean	1,447,204	99,268	1,550,667	101,833	2.3	880	35	26	2.9	25.1	18.3	31.8	1,737	1.6
Central Anatolia	288,537	20,951	622,171	48,523	2.19	446	15	6	1.3	11.9	0.0	23.7	3,067	0.9
West Black Sea	336,041	25,306	778,523	42,395	1.77	558	24	11	2.0	26.8	9.1	44.6	1,956	1.5
East Black Sea	379,313	21,486	518,999	24,609	2.02	294	17	17	5.7	68.3	41.5	95.1	883	3.2
Northeast Anatolia	414,641	45,604	386,192	36,812	3.18	264	34	25	9.5	68.3	53.6	83.1	439	6.5
Central East Anatolia	480,260	53,818	599,469	61,557	3.07	412	34	23	5.5	36.9	24.9	48.9	755	3.8
Southeast Anatolia	884,038	102,367	1,069,940	125,857	4.19	646	57	49	7.6	38.9	30.1	47.7	626	4.6
Urban	7,949,418	458,151	-	-	2.06	3,897	129	95	2.4	20.7	18.1	23.4	2,391	1.2
Rural	3,740,903	305,434	-	-	2.65	2,990	164	123	4.1	40.3	35.5	45.0	869	3.3
Total	11,690,321	763,585	11,690,321	763,585	2.23	6,887	293	218	3.2	28.5	26.0	31.0	1,536	1.9

(\*) All the definitions and equations related with maternal mortality indicators were given in the in Section 2.2.6

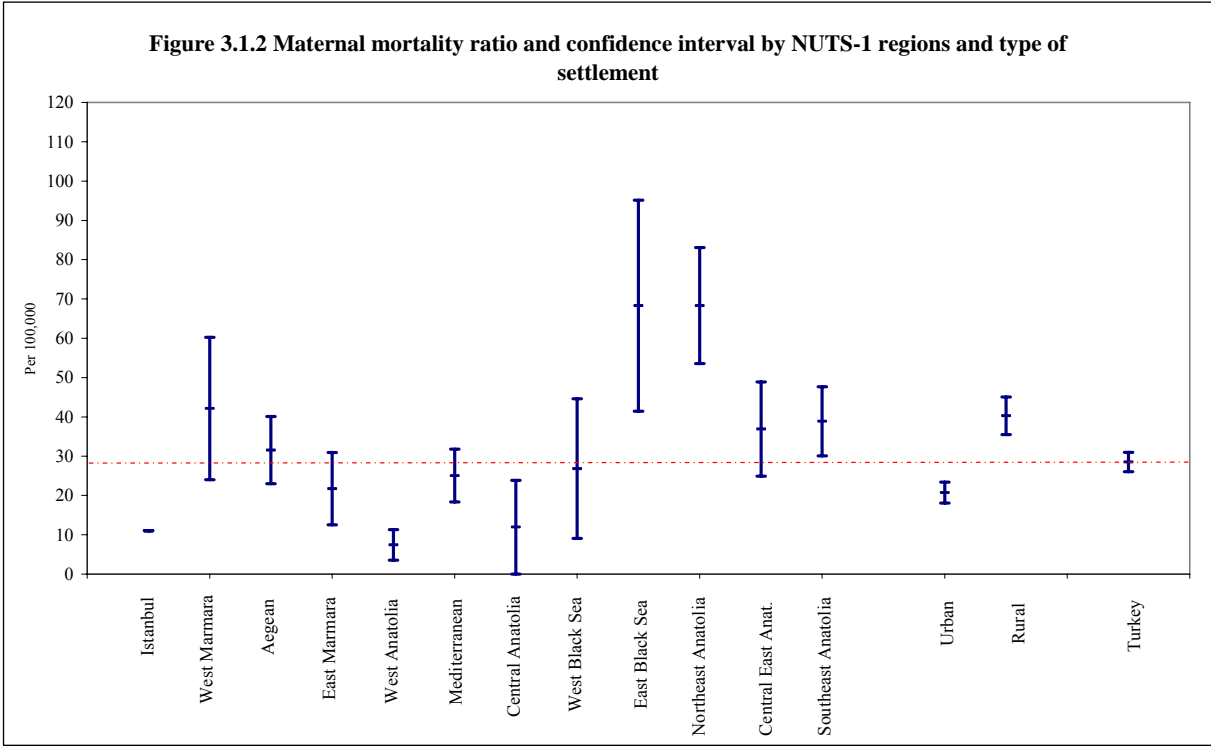
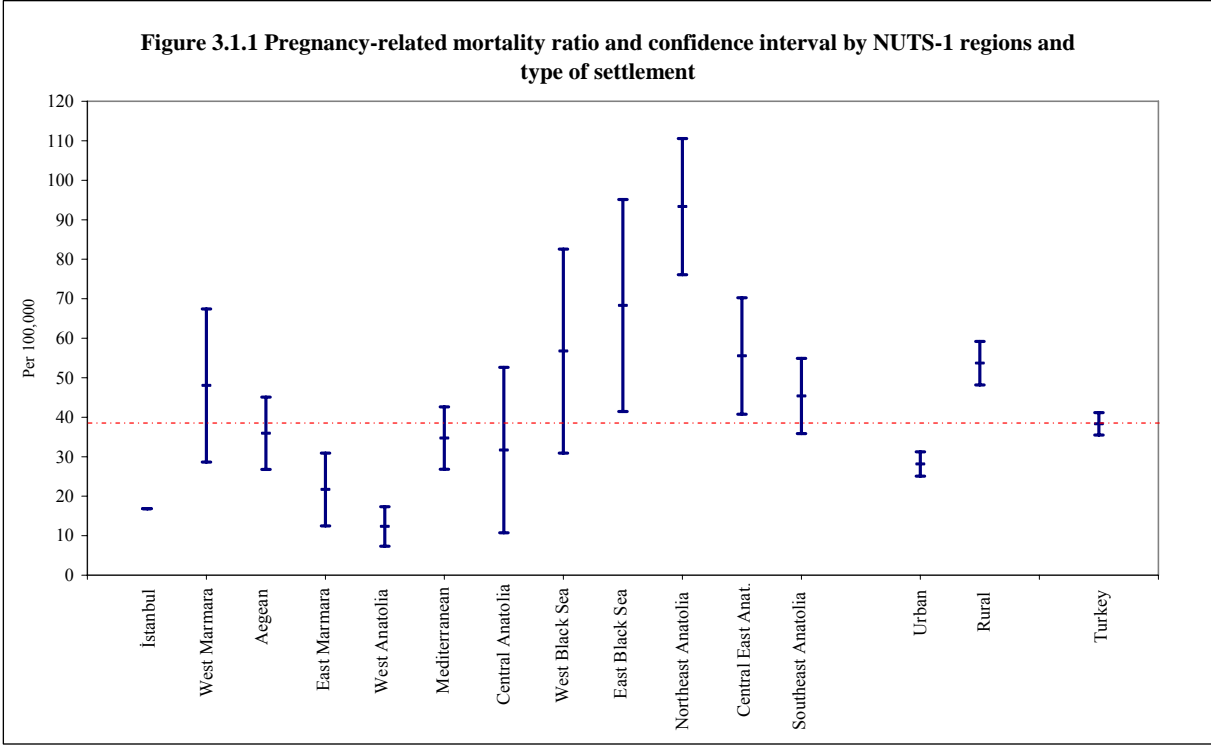


Table 3.2 presents Turkey's national data in the context of global estimates made by the UN. It shows that Turkey's levels are lower than estimates for all regions of the developing world, although still 40 percent higher than estimates for the maternal mortality ratio in developed regions and over 80 percent higher than life time risk as estimated for those countries.

Table 3.2 Maternal mortality estimates by United Nations in the world and NMMR estimates for Turkey

Region	Maternal Mortality Ratio	Number of maternal deaths	LTR 1 in
World Total	400	529,000	74
Developed Regions	20	2,500	2,800
Europe	24	1,700	2,400
Developing Regions	440	527,000	61
Africa	830	251,000	20
Northern Africa <sup>b</sup>	130	4,600	210
Sub-Saharan Africa	920	247,000	16
Asia	330	253,000	94
Eastern Asia	55	11,000	840
South-Central Asia	520	207,000	46
South-Eastern Asia	210	25,000	140
Western Asia	190	9,800	120
Latin America & the Caribbean	190	22,000	160
Oceania	240	530	83
<b>Turkey</b> (All pregnancy related deaths)	<b>38.3</b>	<b>520<sup>(*)</sup></b>	<b>1,142</b>
<b>Turkey</b> (Only maternal deaths)	<b>28.5</b>	<b>387<sup>(*)</sup></b>	<b>1,536</b>

(\*)The number of pregnancy related deaths and maternal deaths obtained from NMMR are inflated to whole Turkey.

Table 3.3.1 and Table 3.3.2 present the pregnancy-related mortality and maternal mortality indicators respectively by age of deceased women. As might be expected, figures indicate that the oldest mothers (aged 40-44 and 45-49) are at the highest risk of death, as those are women having a higher parity. The age structure of pregnancy-related deaths follows the internationally well described J-shaped pattern of mortality which confirms that the oldest and also very young women are at highest risk (Figure 3.2). Of course these two age groups are the least likely to give birth, so that the numbers of deaths are actually greatest in the lowest risk period.

Table 3.3.1 Pregnancy-related mortality indicators by age of deceased women

Age groups	Population female 15-49	Live births	Female deaths (15-49)	Pregnancy-related deaths (15-49)	Maternal deaths (15-49)	PRD/FD	Pregnancy-related mortality ratio	95 percent CL	95 percent CL	Pregnancy-related mortality Rate
15-19	1,872,243	78,755	518	15	13	2.9	18.7	12.3	25.1	0.8
20-24	2,057,164	232,842	641	37	24	5.7	15.7	12.4	19.0	1.8
25-29	1,984,007	229,418	669	104	75	15.6	45.3	39.8	50.8	5.2
30-34	1,763,463	133,542	758	59	50	7.8	44.1	36.9	51.3	3.3
35-39	1,452,164	65,059	995	43	30	4.3	65.9	53.1	78.7	3.0
40-44	1,401,408	20,545	1,401	31	20	2.2	149.1	114.6	183.6	2.2
45-49	1,159,871	3,424	1,905	5	5	0.3	146.7	63.4	230.0	0.4
Total	11,690,321	763,585	6,887	293	218	4.3	38.3	35.5	41.2	2.5

Table 3.3.2 Maternal mortality indicators by age of deceased women

Age groups	Population female 15-49	Live births	Female deaths (15-49)	Pregnancy-related deaths (15-49)	Maternal deaths (15-49)	MD/ FD	Maternal Mortality Ratio	95 percent CL	95 percent CL	Maternal Mortality Rate
15-19	1,872,243	78,755	518	15	13	2.5	16.4	10.4	22.4	0.7
20-24	2,057,164	232,842	641	37	24	3.7	10.2	7.5	12.9	1.2
25-29	1,984,007	229,418	669	104	75	11.3	32.8	28.0	37.5	3.8
30-34	1,763,463	133,542	758	59	50	6.6	37.6	30.9	44.2	2.8
35-39	1,452,164	65,059	995	43	30	3.0	46.2	35.5	57.0	2.1
40-44	1,401,408	20,545	1,401	31	20	1.5	99.6	71.4	127.8	1.5
45-49	1,159,871	3,424	1,905	5	5	0.3	146.7	63.4	230.1	0.4
Total	11,690,321	763,585	6,887	293	218	3.2	28.5	26.0	31.0	1.9



### 3.1.2 Causes of Pregnancy Related Deaths

Before looking at results in more detail it may be useful to restate the main definitions which were used throughout the process starting from the design of the methodology, during all the trainings until data compilation and analysis. According to WHO:

*A pregnancy-related death* is defined as the death of a woman while pregnant or within 42 days of termination of the pregnancy, irrespective the cause of the death.

A *maternal death* is the death of a woman while she is pregnant or within 42 days of termination of the pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to (direct) or aggravated by (indirect) the pregnancy or its management, but *not* from a co-incidental cause.

*Direct maternal deaths* are those which are directly related to physiological conditions as they are initiated by the pregnancy. Typical examples are haemorrhage, sepsis, eclampsia, obstructed labour, unsafe abortion, ectopic, embolism, surgical or anaesthetic problems during caesarean section.

*Indirect maternal deaths* are due to pre-existing or incidental (starting during the pregnancy) conditions, which aggravate as a consequence of the *physiological* changes which take place in pregnancy<sup>1</sup>. Examples are diabetes, HIV/AIDS, anaemia, heart disease, suicide.

*Coincidental (accidental)* are events which would have caused death even if the woman had not been pregnant, eg. a car accident.

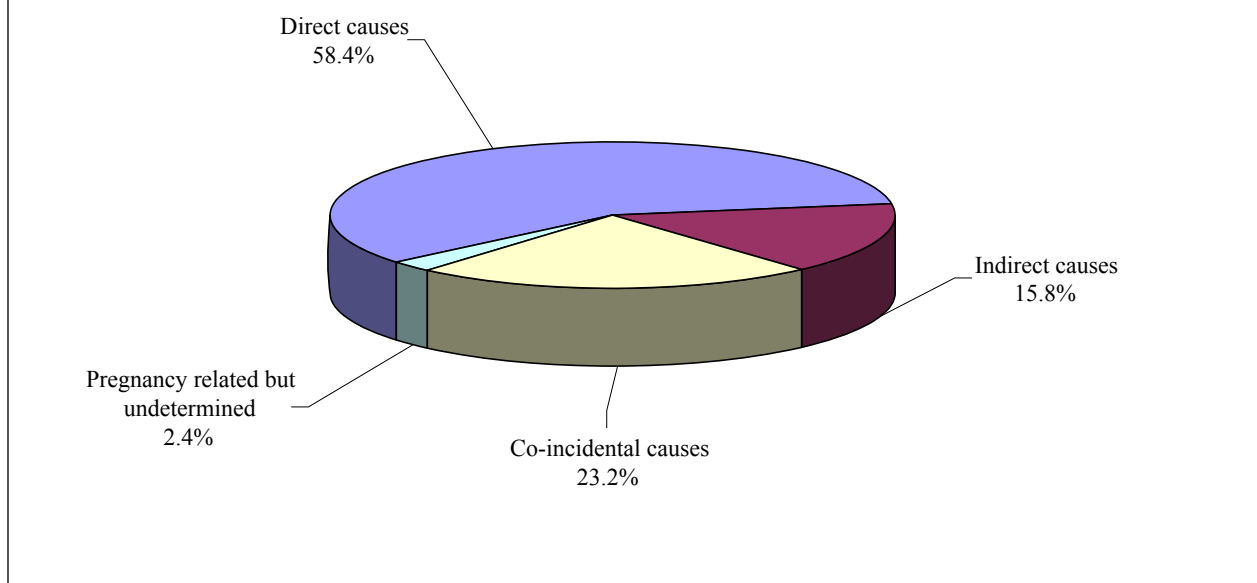
Deaths from *accidental and coincidental* causes have historically been excluded from maternal mortality statistics. However, in practice, the distinction between coincidental and indirect causes of death is often difficult to make. In order to prevent non-recognition of maternal deaths in circumstances where cause of death attribution is inadequate, ICD-10 introduced *pregnancy-related death* as a new indicator. It is defined as *the death of a woman while pregnant or within 42 days of termination of the pregnancy, irrespective the cause of the death*. Since international publications are not necessarily explicit on their definitions of these indicators, it deemed to be useful, for reasons of comparability, to present both values (pregnancy related deaths and maternal deaths) alternatively. Tables and text of this report will easily allow to distinguish between the two values wherever necessary.

As can be seen from Figure 3.3, among the pregnancy related deaths which we found during the 12 months of data collection there were 74.2 percent of women who had died of a maternal cause, 23.2 percent had coincidental causes of death. For 2.4 percent we only knew that they were pregnant when they died but had no further information, because the family of the deceased was not available for a verbal autopsy. The group of maternal deaths divides into 58.4 percent direct causes and 15.8 percent indirect causes. Table 3.4 shows the situation in the different NUTS-1 regions. It appears that higher numbers of maternal deaths are at the same time usually accompanied by an increase of co-incidental causes of pregnancy related deaths.

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<sup>1</sup> During the NMMR a number of PRDs were found to be associated with suicide. Some of the suicides were directly caused by the fact that the woman was pregnant eg followed a puerperal depression, others happened on the basis of a pre-existing psychological disorder, some however had to be considered as coincidental. In order to provide for a definition which allows to include suicide as maternal cause of death the ICD-10 definition of 'maternal mortality' was interpreted as covering both, physiological and psychological effects of the pregnancy.

**Figure 3.3 Percentage distribution of pregnancy-related deaths by causes of death**

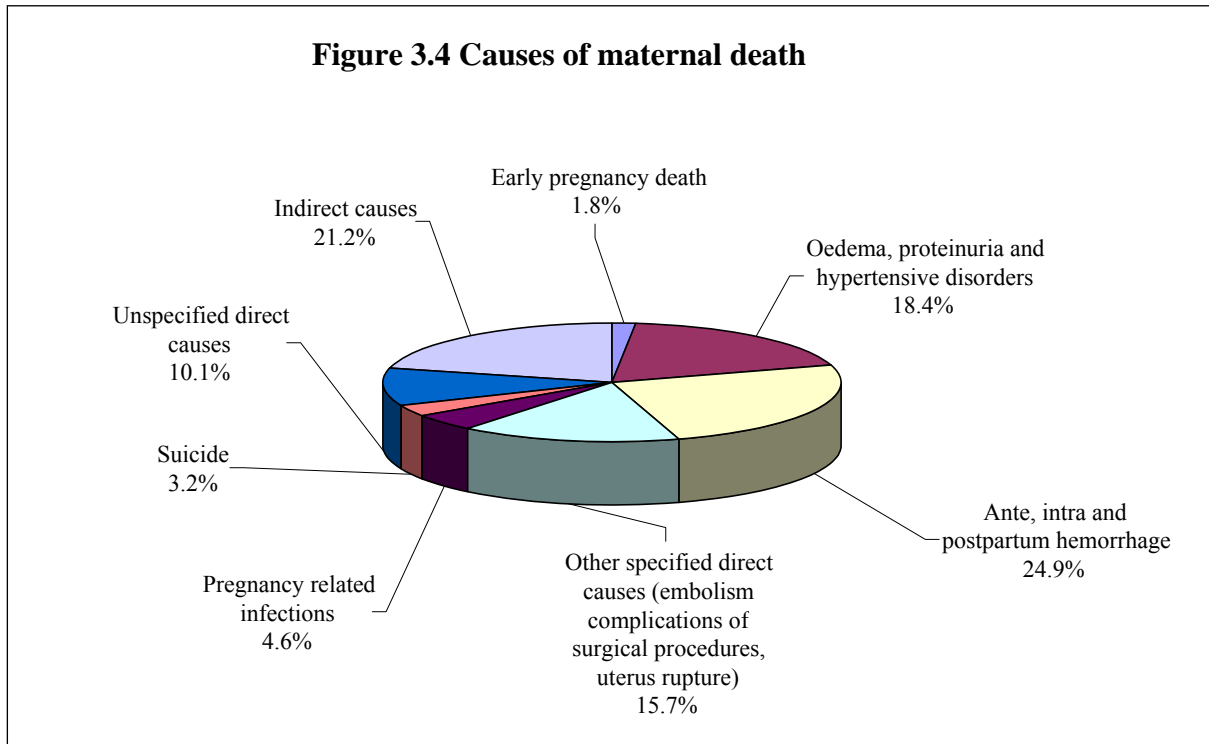


**Table 3.4 Percent distribution of female deaths 15-49 by NUTS-1 region and type of settlement**

Regions	Pregnancy related deaths							Number of female deaths
	Non-pregnancy related deaths	Pregnancy related deaths	Maternal deaths	Direct causes	Indirect causes	Co-incident causes	Pregnancy related but undetermined	
Istanbul	98.0	2.0	1.3	1.1	0.2	0.5	0.2	901
West Marmara	97.0	3.0	2.6	1.6	1.0	0.4	0.0	313
Aegean	97.1	2.9	2.5	2.1	0.4	0.4	0.0	1,012
East Marmara	98.0	2.0	2.0	1.6	0.4	0.0	0.0	572
West Anatolia	98.6	1.4	0.8	0.3	0.3	0.6	0.0	591
Mediterranean	96.0	4.0	2.9	2.3	0.6	0.9	0.2	880
Central Anatolia	96.5	3.5	1.3	1.3	0.0	2.2	0.0	446
West Black Sea	95.7	4.3	2.0	2.0	0.0	2.3	0.0	558
East Black Sea	94.3	5.7	5.7	4.4	1.3	0.0	0.0	294
Northeast Anatolia	87.0	13.0	9.5	8.7	0.8	2.3	1.2	264
Central East Anatolia	91.7	8.3	5.5	4.5	1.0	2.8	0.0	412
Southeast Anatolia	91.1	8.9	7.6	5.0	2.6	1.3	0.0	646
Urban	96.7	3.3	2.4	1.9	0.5	0.8	0.1	3,897
Rural	94.5	5.5	4.1	3.2	0.9	1.2	0.2	2,990
Total	95.7	4.3	3.2	2.5	0.7	1.0	0.1	6,887

The leading causes of maternal deaths, as can be seen from Figure 3.4 and Table 3.5, were with 25 percent (17 percent of all PRDs) bleedings short before, during or after delivery. Obstetric bleedings are always life threatening. They usually start suddenly, are heavy, cannot

easily be stopped and may lead to the death of the mother within a very short period of time if not managed timely and effectively. The possible sudden and enormous loss of blood causes shock and is often associated with systemic blood clotting followed by a drop of clotting factors. Only few of these bleedings may occur before delivery, usually due to early separation of the placenta. We found 7 such cases (2.4 percent). Also intrapartum haemorrhage as cause of death was rare (0.7 percent). Of all maternal deaths, 15.7 percent however were due to post partum haemorrhage, which amounts to more than 50 percent of all post-partum deaths. One third during the first 12 hours, as will be shown later in Table 3.6. Atonic uterus and retained placenta were mostly specified as reasons.



The second most important cause of direct maternal death was eclampsy (18.4 percent of all maternal death, 13.7 percent of PRDs), which includes conditions associated with oedema, proteinuria, hypertension and convulsions. Eclampsy may occur on the basis of pre-existing chronic hypertensive disorders or independently of it. It is a typical late pregnancy condition but can be seen even weeks after delivery. An eclampsy is always an emergency and causes death within two days if not appropriately treated.

Table 3.5 Direct, indirect and co-incident causes of pregnancy related deaths 15-49 in Turkey

Causes	Number	Percentage within categories	Percentage of pregnancy related deaths	Percentage of maternal deaths
<b>Direct Causes</b>	<b>171</b>	<b>100.0</b>	<b>58.4</b>	<b>78.8</b>
<i>Early Pregnancy deaths</i>	4	2.3	1.4	1.8
Due to abortion	1	0.6	0.3	0.5
Due to ectopic pregnancy	3	1.8	1.0	1.4
<i>Oedema, Proteinuria and Hypertensive Disorders</i>	40	23.4	13.7	18.4
Hypertension with significant proteinuria – Preeclampsia	6	3.5	2.0	2.8
Hypertension + Proteinuria with convulsions –Eclampsia	34	19.9	11.6	15.7
<i>Antepartum Haemorrhage (APH)</i>	7	4.1	2.4	3.2
APH with coagulation defect	1	0.6	0.3	0.5
Due to Abruptio Placentae	6	3.5	2.0	2.8
<i>Intrapartum Haemorrhage (IPH)</i>	2	1.2	0.7	0.9
<i>Postpartum Haemorrhage (PPH)</i>	46	26.9	15.7	21.2
PPH due to atonic uterus	13	7.6	4.4	6.0
PPH due to Retained Placenta	7	4.1	2.4	3.2
PPH due to unspecified reason	25	14.6	8.5	11.5
<i>Ante-, intra-, postpartum death due to other causes</i>	34	19.9	11.6	15.7
Ruptured uterus	3	1.8	1.0	1.4
Complication of Anaesthesia	2	1.2	0.7	0.9
Embolism	17	9.9	5.8	7.8
Cardiac arrest/failure	2	1.2	0.7	0.9
Other complications of obstetric surgery and procedures	10	5.8	3.4	4.6
<i>Pregnancy related infections</i>	10	5.8	3.4	4.6
Puerperal sepsis	7	4.1	2.4	3.2
Other puerperal infections	3	1.8	1.0	1.4
<i>Suicide (directly related with pregnancy)</i>	7	4.1	2.4	3.2
<i>Unspecified direct cause(s)</i>	22	12.9	7.5	10.1
<b>Indirect Causes</b>	<b>46</b>	<b>100.0</b>	<b>15.7</b>	<b>21.2</b>
Death due to diseases of the blood and blood-forming organs	2	4.3	0.7	0.9
Death due to diseases of the circulatory system	22	47.8	7.5	10.1
Neurological disorder	1	2.2	0.3	0.5
Infectious and parasitic diseases	2	4.3	0.7	0.9
Neoplasm	6	13.0	2.0	2.8
Suicide (indirectly related with pregnancy)	4	8.7	1.4	1.8
Other causes of death	8	17.3	2.7	3.7
<b>Coincidental Causes</b>	<b>68</b>	<b>100.0</b>	<b>23.2</b>	<b>-</b>
Death due to diseases of the circulatory system	5	7.4	1.7	-
Neurological disorder	1	1.5	0.3	-
Infectious and parasitic diseases	1	1.5	0.3	-
Neoplasm	2	2.9	0.7	-
Femicide (Murder)	6	8.8	2.0	-
Suicide	3	4.4	1.0	-
Injury	6	8.8	2.0	-
Poisoning	6	8.8	2.0	-
Road traffic accident	32	47.1	10.9	-
Other causes of death	7	10.3	2.4	-
<b>Pregnancy related but undetermined</b>	<b>7</b>	<b>100.0</b>	<b>2.4</b>	<b>-</b>
Suicide	1	14.3	0.3	-
Unspecified cause of death	5	71.4	1.7	-
No information	2	28.6	0.7	-
<b>Total</b>	<b>293</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Other important obstetric causes were found in 15.7 percent of the maternal deaths. These were mainly embolism (7.8 percent) which is more likely to occur after caesarean section, but also sudden cardiac, pulmonary or cerebral dysfunctions as can be associated with anaesthetic and surgical procedures. A ruptured uterus, which is normally the result of delayed management of obstructed labour, was in 1.4 percent cause of a maternal death. Pregnancy related infections, predominantly puerperal sepsis, caused death in 4,6 percent. 1,8 percent of the mothers died due to a problem of early pregnancy such as septic abortion or ectopic pregnancy. In 10.1 percent the cause of maternal death remained unspecified (*ICD-10 Code O95*) due to a lack of more detailed information from patient file and/or family of the deceased.

The biggest share of indirect maternal deaths (10.2 percent of all maternal deaths and 7.5 percent of all PRDs), where an underlying condition is aggravated by the pregnancy, were diseases of the circulatory (cardio-vascular and cerebro-vascular) system.

These diseases were also important coincidental causes of pregnancy related death which is not surprising since conditions of the circulatory system constituted at the same time one of the leading causes of general female death in this age group (Table 3.5). Almost two thirds of the coincidental causes of pregnancy related deaths were however accidents, most of them road traffic accidents. Also femicide (murder) played an important role.

Suicide caused 1.5 percent of all pregnancy related deaths. Half of the suicides could clearly be identified as direct causes of maternal death because they happened during a puerperal psychosis or as the consequence of an unwanted or hidden pregnancy. Four suicides were associated with an aggravated depression which had been diagnosed already before the pregnancy. They were therefore classified as indirect causes of maternal deaths.. Most of these suicides could have been prevented if the family had been more attentive. One lady had had another suicide attempt only a couple of weeks earlier. Three more suicides were classified as coincidental, for one the pregnancy relation could not be determined.

### **3.1.3 Time of Maternal Deaths and Condition for Baby/Fetus/Embryo**

Table 3.6 specifies the time period during which pregnancy related deaths have occurred and the condition of the child. 38 percent of all mothers died during the ante-partum period, half of them before and half of them after the 22nd week of pregnancy. There is no international consensus on the definition of the time period for early and late pregnancy. Late pregnancy is the period during which the foetus has a realistic chance to survive if premature delivery takes place. The 22nd week was chosen as this is the definition which is commonly used in Turkey. Furthermore, the death of any embryo before the end of week 22 was defined as abortion, irrespective whether the embryo was actually been expelled or died with the mother. A foetus older than 22 weeks and never born due the death of the mother was defined as intra-uterine death. By far the majority of ante-partum deaths were due to accidents and other external conditions hence coincidental.

Nine percent of women died during the delivery, 54.1 percent post-partum. 20.9 percent of the women died during the first postpartum day. Adding those who died intrapartum, it brings the total deaths within 24 hours either during or after delivery to 30 percent. More mothers died during the first postpartum day in rural areas as compared to urban settings (12.6 percent and 27.8 percent respectively).

Table 3.6 Time of pregnancy related death and condition for baby/fetus/embryo by type settlement

	Urban	Rural	Total	Number
<b>Time of maternal death</b>				
Ante-partum period	43.8	31.5	37.0	108
Ante-partum during early pregnancy	18.8	16.0	17.1	50
Ante-partum during late pregnancy	25.0	15.4	19.9	58
Intra-partum period	10.2	7.4	8.9	26
Post-partum period	46.1	61.1	54.1	158
0-2 hrs	0.8	5.6	3.4	10
2-12 hrs	10.2	15.4	13.0	38
12-24 hrs	1.6	6.8	4.5	13
24-48 hrs	7.8	1.9	4.5	13
48 hrs - 1 week	13.3	8.0	10.3	30
> 1 week	12.5	23.5	18.5	54
<b>Condition for baby/fetus/embryo</b>				
Live birth - still alive	42.3	42.7	42.7	125
Live birth - died later	6.2	3.7	4.5	13
Stillbirth	6.9	15.9	11.8	35
Intra-uterine death	20.8	13.4	16.7	49
Abortion	15.4	15.9	15.7	46
Ectopic	2.3	0.0	0.9	3
Unknown	6.2	8.5	7.6	22
Total	100.0	100.0	100.0	293

Overall 47.2 percent of all pregnancies ended with a live birth. 4.5 percent of the babies died unfortunately after they were born. 12 percent were delivered as stillbirths. Approximately 17 percent were intra-uterine deaths, 16 percent abortions, 1 percent ectopic pregnancies. In 8 percent the condition could not be established due to the lack of further information.

Table 3.7 Time of pregnancy related death and condition for baby/fetus/embryo

Timing of outcome for mother	Live birth-still alive	Live birth-died later	Stillbirth	Intra-uterine death	Abortion	Ectopic	Unknown	Total
Antepartum during early pregnancy	0.0	0.0	9.3	0.0	83.3	5.6	1.9	50
Antepartum during late pregnancy	8.6	0.0	8.6	74.1	0.0	0.0	8.6	58
Intrapartum	46.2	3.8	30.8	15.4	0.0	0.0	3.8	26
Postpartum	66.7	7.7	11.5	3.8	0.0	0.0	10.3	158
Total	42.7	4.5	11.8	16.7	15.7	0.9	7.6	293

All early pregnancies ended with either an abortion or as ectopic. During late pregnancy 8.6 percent of the babies survived, 8.6 percent were stillbirths, almost 75 percent died in the uterus together with the mother. For mothers who died during delivery half of the babies survived. In the case of post-partum death of the mother two thirds of the babies were alive, independently of how long after delivery the mother had died (Table 3.7).

### 3.1.4 Place of Delivery and Place of Death

Comparing data on place of delivery and place of death (Table 3.8) it is important to recall that not all women who died from a pregnancy related cause could ever deliver a baby. In the previous chapter we showed that roughly 60 percent of the pregnancies ended with a delivery, either a life or a stillbirth. Nineteen percent of the mothers delivered at home, 68 percent came to a health facility for delivery. For 13 percent no information on the exact place of delivery was available. Only a small number (2.8 percent) of those who had come to a health facility had their delivery in a primary level facility such as a health house, where no comprehensive obstetric emergency care provision exists. Most deliveries (50 percent of all PRDs) took place on secondary care level in either a general state hospital or a specialised mother and child hospital. In 15 percent birth was given in a tertiary level teaching or university hospital.

Table 3.8 Place of delivery and place of death according to level of care

Place of delivery	Number	Percent
Home	44	18.9
Health facility primary level	6	2.8
Health facility secondary level	115	50.0
Health facility tertiary level	35	15.4
Unknown	30	12.9
Total	230	100.0
<b>Place of death</b>		
Home	62	21.0
Health facility primary level	0	0.0
Health facility secondary level	93	31.7
Health facility tertiary level	83	28.3
On way to health facility or on refferal	30	10.4
Accident, outside the house	23	7.8
Unknown	2	0.8
Total	293	100.0

For the place of death of the mother the overall pattern was quite similar: Twenty-one percent died at home and 70 percent in a health facility. The distribution to the three levels of care however differs since often mothers were referred to the next higher level of care. Consequently none of the women died on primary level, 32 percent on secondary level and 28 percent on tertiary level. Tenpercent died on the way to a health facility or during referral in an ambulance. Eight percent died due to an accident outside the house, all of these were women with a coincidental cause of pregnancy related death (Table 3.8).

### 3.1.5 Type of Delivery and Management of Complications

Table 3.9 shows that out of the total number of deliveries 51.5 percent were normal vaginal deliveries, in 48.5 percent a caesarean section was performed and 1 percent ended with a vacuum extraction. We had also asked the type of delivery for the pregnancy preceding the one which ended fatally. Here the rate of caesarean sections was much lower, 15.6 percent vs. 84.4 percent normal vaginal deliveries. This was expected since the pregnancy which had ended with the death of the mother was likely to be more problematic. But the caesarean section rate for the previous pregnancy was also lower than what had been found by TDHS-2003 (21.2 percent were caesarean section).

	Delivery by Caesarean Section	Normal Vaginal Delivery	Number of births
NMMR index	48.5	51.5	195
NMMR previous	15.6	84.4	108
TDHS-2003	21.2	78.8	4,132

Decision/indication	Number	Percent
<b>Decision for Caesarean Section</b>		
Elective	26	26.8
Emergency	68	70.1
Unknown	3	3.1
Total	97	100.0
<b>Indications for Caesarean Section</b>		
Foetal distress	15	15.2
Prolonged labour	2	2.0
Pre-eclampsy	32	32.8
Antepartum Haemorrhage	12	11.9
Previous Caesarean Section	5	5.0
Twins	6	6.3
Breech position	4	4.3
Other child related problem	7	6.9
Other mother related problem	9	9.1
By choice	3	3.4
Unknown	3	3.1
Total	97	100.0

When we looked in detail at the condition under which the decision for the caesarean section had to be taken (Table 3.10) almost 70 percent were emergencies like eclampsy, foetal distress or severe ante-partum haemorrhage which did not allow for any delay, while in only 30 percent the caesarean section were elective. The main indication was with 32.8 percent

eclampsy, followed by foetal distress (15.2 percent) and ante-partum haemorrhage (11.9 percent). Other indications were twin deliveries (6.3 percent), previous caesarean section (5.0 percent), breech position of the baby (4.3 percent), prolonged labour (2.0 percent), other mother related problems like pre-existing chronic diseases (9.1 percent) and other child related problems such as pre-maturity (6.9 percent). In only 3.4 percent the decision was taken by choice.

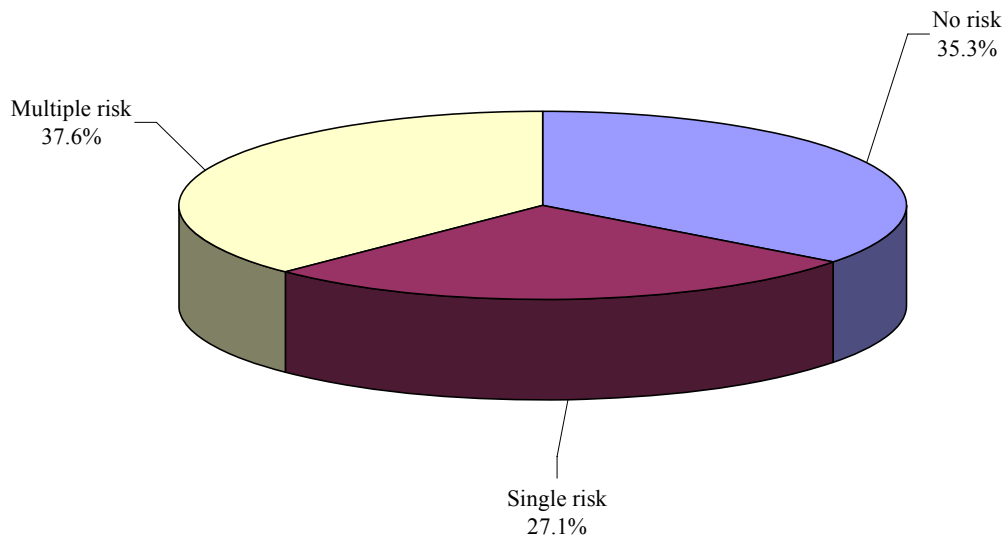
We also evaluated the kind of management of the post-partum haemorrhage which is the most severe and at the same time most frequent post-partum complication of normal vaginal deliveries as well as caesarean sections. In about 20 percent no action was taken. 20 percent of the women received blood transfusions and in 50 percent the decision for a surgical intervention was for re-laparotomy, ligation of arteries or hysterectomy.

### **3.1.6 Biomedical Contributors for Maternal Deaths**

Biomedical risk factors are conditions or behaviours present during pregnancy which might increase the risk of an adverse pregnancy outcome. In the NMMR, we considered age less than 18 or greater than 34, parity greater than four, twin pregnancy, the presence of diseases including diseases of the circulatory system, endocrine or metabolic diseases, mental or behavioral disorder, neurological diseases, other diseases and conditions, or of previous or chronic hypertensive disorder, anemia, smoking, or obesity. Table 3.11.1 and Figure 3.5 show that almost 65 percent of the women had at least one biomedical risk factor--27 percent had only one single risk factor and 38 percent had multiple factors. However, over a third had no known risk factors, and many of the biomedical risk factors only increase risk very slightly, for example, if we look specifically at NMMR data, women aged 15-19 were 20 percent more likely to die than women in the lowest risk group (those aged 20-24), but were 44 percent less likely to die than women in so-called "low risk group" aged 20-34.

Table 3.11.1 also shows the general distribution of biomedical risk factors of mothers who died from a pregnancy related cause as found in the different NUTS-1 regions and also according to urban and rural background. There seems to be a certain correlation between level of maternal mortality and the prevalence of biomedical risk factors. Particularly women with multiple risks are more likely to be found in regions with higher maternal mortality. No major differences were seen between rural and urban populations.

**Figure 3.5 Percentage distribution of maternal deaths by biomedical risk factors**



**Table 3.11.1 Percentage distribution of biomedical contributors by region and type of settlement for maternal deaths in Turkey**

Regions	No risk	Single risk	Multiple risk	Total	Number
Istanbul	54.5	27.3	18.2	100.0	11
West Marmara	37.5	62.5	0.0	100.0	8
Aegean	46.2	38.5	15.4	100.0	26
East Marmara	72.7	27.3	0.0	100.0	11
West Anatolia	40.0	40.0	20.0	100.0	5
Mediterranean	36.0	36.0	28.0	100.0	26
Central Anatolia	100.0	0.0	0.0	100.0	6
West Black Sea	0.0	36.4	63.6	100.0	11
East Black Sea	50.0	0.0	50.0	100.0	17
Northeast Anatolia	16.0	28.0	56.0	100.0	25
Central East Anatolia	17.4	8.7	73.9	100.0	23
Southeast Anatolia	28.6	28.6	42.9	100.0	49
Urban	34.4	29.2	36.5	100.0	95
Rural	36.1	25.4	38.5	100.0	123
Total	35.3	27.1	37.6	100.0	218

Table 3.11.2 Frequency of biomedical contributors (risks factors) for pregnancy related deaths independent of risk category<sup>(\*)</sup> in Turkey

Risk Categories	PRDs	Maternal deaths
Age <18 and >34	28.7	28.4
Parity>4	26.4	23.9
Previous or chronic hypertensive disorder	13.0	13.3
Diseases of circulatory system	4.8	5.0
Endocrine and metabolic diseases	5.5	6.9
Anemia	2.7	3.7
Obesity	1.7	2.3
Smoking	2.0	1.4

<sup>(\*)</sup>Present as risk factor among 293 pregnancy related deaths and 218 maternal deaths.

A common risk factor is young or older age the mother. The literature suggests that young women have an increased risk of pre-eclampsia and obstructed labour. Above the age of 34, a number of different patho-physiologies, like hypertensive or metabolic disorders, may develop or exist without being recognised. Among the 293 women who died during pregnancy, 29 percent belonged to a high risk age-group, including three women aged below 18 years (Table 3.12.1 and 3.12.2). Another common risk factor is the parity of the woman i.e. the number of times she had previously already been pregnant. Above a parity of 4 the maternal organism can no longer easily adjust to the physiological and patho-physiological changes which occur during pregnancy. The risk of severe post-partum haemorrhages increases with higher parity. More than 26 percent of all mothers who died during the period of the NMMR had a history of more than 4 previous pregnancies.

The next most prevalent biomedical risk factor was previous or chronic hypertensive disorder (13.0 percent). Other diseases of the circulatory system existed in 4.8 percent, usually heart problems which were congenital or had developed due to a previous infection. Endocrine and metabolic disorders like diabetes were reported in 5.5 percent, followed by anaemia (2.7 percent) and obesity (1.7 percent). Smoking was mentioned in 2 percent of all pregnancies. Whereas the comparison of single and multiple risk categories (Table 3.12.1 and 3.12.2) suggest that biomedical risk factors were more often found with women who died of direct or indirect maternal cause, the pattern of those factors appears to be the same for both the maternal and the coincidental causes. No information exists on the number HIV+ mothers which would also be a risk factor but might be low in Turkey.

Table 3.12.1 Biomedical contributors for maternal deaths in Turkey

Risk Categories	Number of maternal deaths	Percentage of maternal deaths
<b>No risk category</b>	<b>77</b>	<b>35.4</b>
<b>Single risk category</b>	<b>60</b>	<b>27.5</b>
Only age >34	10	4.7
Only age <18	1	0.4
Only parity>4	12	5.5
Diseases of circulatory system	3	1.3
Previous or chronic hypertensive disorder	7	3.3
Endocrine and metabolic diseases	2	0.7
Anemia	5	2.5
Smoking	1	0.3
Obesity	5	2.5
Other diseases and conditions	14	6.3
<b>Multiple risk category</b>	<b>81</b>	<b>37.1</b>
Age >34 & parity>4	25	11.6
Previous or chronic hypertensive disorder & other diseases	5	2.3
Other diseases&endocrine and metabolic diseases	5	2.2
Age >34 & prev. or chr hyp. disord. & other diseases	4	1.9
Smoking& previos or chronic hypertensive disorder	3	1.6
Parity>4 & previos or chronic hypertensive disorder	3	1.6
Age > 34 &diseases of circulatory system	3	1.6
Age >34&other diseases	3	1.4
Age >34&parity>4 &other diseases	3	1.2
Age >34&twin pregnancy	2	1.1
Previous or chronic hypertensive disorder & endocrine and metab.	2	1.1
Twin pregnancy& smoking	2	1.1
Age>34&parity>4&prev.or chr. hyp.dis.&end.andmet.dis.&oth. dis.	2	1.0
Age >34 & previous or chr. hyp.disord &twin pregnancy	2	1.0
Diseases of circ. sys.&endocrine and metabolic diseases	2	0.9
Age >34 & parity>4 &anemia	2	0.9
Age <18 & mental and behavioural disorder	2	0.9
Age <18 & parity>4 & diseases of circulatory system	2	0.9
Parity>4&other diseases	1	0.7
Parity>4&endocrine and metabolic diseases	1	0.7
Anemia&other diseases	1	0.5
Other diseases&previous or chronic hypertensive disorder	1	0.4
Age<18&parity>4 &diseases of circulatory system&other diseases	1	0.4
End.met.dis&mental and behavioral disord.& neurological diseases	1	0.3
<b>Total</b>	<b>218</b>	<b>100.0</b>

Table 3.12.2 Biomedical contributors for pregnancy related deaths in Turkey

Risk Categories	Number of pregnancy related deaths	Percentage of pregnancy related deaths
<b>No risk category</b>	<b>124</b>	<b>42.2</b>
<b>Single risk category</b>	<b>71</b>	<b>24.1</b>
Only age >34	20	6.8
Only age <18	1	0.3
Only parity	13	4.4
Diseases of circulatory system	3	1.0
Previous or chronic hypertensive disorder	7	2.4
Endocrine and metabolic diseases	2	0.5
Anemia	5	1.9
Smoking	1	0.3
Obesity	5	1.8
Other rare diseases and conditions	15	5.0
<b>Multiple risk category</b>	<b>99</b>	<b>33.7</b>
Age >34 & parity	34	11.7
Previous or chronic hypertensive disord. & other rare diseases	5	1.7
Other rare diseases&endocrine and metabolic diseases	5	1.6
Age >34&parity&dis.circ.syst.&prev.chr.hyp.dis.&end.met.dis.	4	1.4
Age >35 & prev. or chr hyp. disord. & other rare diseases	4	1.4
Smoking&previous or chronic hypertensive disorder	3	1.2
Parity & previous or chronic hypertensive disord.	3	1.2
Age > 35 &diseases of circulatory system	3	1.2
Age >34 &other rare diseases	3	1.0
Age >34 &parity & other rare diseases	3	0.9
Age >34 &twin pregnancy	2	0.8
Prev. or chronic hypertensive disord.&endocrine and metab.	2	0.8
Twin pregnancy&smoking	2	0.8
Age>34&parity&prev.orchr.hyp.dis.&end.andmet.dis.&rare dis.	2	0.7
Age >34&prev. or chr. hyp.disord & twin pregnancy	2	0.7
Diseases of circ. sys. & endocrine and metabolic diseases	2	0.7
Parity&prev. or chronic hypertensive disord. & other rare	2	0.7
Age >34 &parity &anemia	2	0.7
Age <18 & mental and behavioral disord.	2	0.7
Age <18 & parity&diseases of circulatory system	2	0.6
Parity & endocrine and metabolic diseases	1	0.5
Parity & other rare diseases	1	0.5
Anemia &orher rare diseases	1	0.4
Age <18 & mental and behav. disord.& neurological diseases	1	0.4
Age <18 & neurological diseases	1	0.3
Other rare diseases&previous or chronic hypertensive disorder	1	0.3
Age <18 & parity&dis.circ.syst.&other rare diseases	1	0.3
End.met.dis&mental and behav. disord.& neurological diseases	1	0.3
<b>Total</b>	<b>293</b>	<b>100.0</b>

### **3.1.7 Avoidable Factors Contributing to Maternal Deaths**

Table 3.13.1 and Table 3.13.2 present the sub-standard care factors for pregnancy related and maternal deaths respectively. Women died due to causes related with pregnancy have more than one factor contributing to death. In NMMR, one or more avoidable factors contributed to 49.3 percent of pregnancy related deaths compared to 61.6 percent of maternal deaths. In the urban areas, avoidable factors contributed to 46.3 percent of pregnancy related deaths, as opposed to 51.8 percent in the rural areas. Household and community factors were the most frequent avoidable factors in both urban and rural areas (26.1 and 32.7 percent respectively), in particular delay in recognizing problems and in seeking medical care and the absence of antenatal care. In terms of health provider factors, poor diagnosis and management by obstetrician was significant contributors to pregnancy related deaths. Health facility factors, on the other hand, played a relatively minor role in contributing to maternal deaths.

Three categories of avoidable factors, health service provider factors, health service supply factors household and community factors are discussed in the following sections.

#### **3.1.7.1 Health Service Provider Factors**

NMMR found that health service provider factors were significant avoidable factors, contributing to 10.3 percent of pregnancy related deaths. When only maternal deaths are considered, the contribution of health service provider factors to maternal deaths increases to 13.7 percent. Among health service provider factors, failure of early diagnosis, inadequate management by obstetricians and poor quality of antenatal care contributed more compared to other health service provider factors.

On the primary care level of the health system, sub-standard care by general practitioners and by midwives appears to be significant avoidable factors, contributing to 7-11 percent of pregnancy related deaths. Typical problems were failed diagnosis of chronic heart diseases at times despite of several antenatal care visits which had taken place. Also signs of imminent suicide were not recognized. In some occasions however mandatory treatment or hospital admission was refused by the woman or her family. The contribution of poor referral practices from primary to secondary care level, in terms of when and where to refer patients, was very limited (1.7 percent) as opposed to other factors. This is also underlined by the fact that no mother died in a primary level health facility.

Mis-diagnosis and mis-management on secondary care level was found in 15 or 20 percent respectively of all pregnancies as compared to 2 or 6 percent respectively on tertiary care level. This difference does however not reflect that 53 percent of all deliveries take place in secondary level health facilities as opposed to 14 percent in a teaching or university hospital. Tragic situations where sub-standard care was involved includes cases like failed diagnosis of eclampsy and consequently delayed caesarean section, early discharge despite of post-partum hypovolemia, a post operative abdominal abscess and an unrecognised perforation of the uterus during dilation and curretage (D&C).

Similarly to referrals from primary to secondary level frequent referrals took place between secondary to tertiary level. Communication problems between referral levels were rarely seen. They contributed to the death of a mother in 2.7 percent of all pregnancies. However it appeared that in a number of situations the decision to refer was taken even though the condition of the mother would have demanded for immediate action as a secondary level health facility does usually avail of all necessary comprehensive emergency obstetric care facilities. In 6 percent of all women who died more than one transfer had been done before the woman arrived at the hospital where she was ultimately treated, in two such occasions the mother died in the ambulance. In one occasion a difficult normal vaginal delivery had been conducted in a government hospital. Because of a post-partum haemorrhage the woman was referred 45 km to a mother and child hospital, where she did not receive an urgently needed blood transfusion but was instead - on the suspicion of a ruptured uterus further referred to a university hospital which unfortunately she never reached alive.

### **3.1.7.2 Health Service Supply Factors**

NMMR results indicate that health service supply factors such as the availability of staff, diagnostic and treatment facilities, pharmaceuticals and medical supplies played a relatively minor role in contributing to both pregnancy related and maternal deaths (1.8 percent and 2.1 percent respectively). In fact it was surprising to understand in how many cases of eclampsy a brain computer tomography (CT) or magnetic resonance tomography (MR) was readily available for the diagnosis of an intra-cerebral bleeding. Lack of back-up facilities contributed to 2 percent to pregnancy related deaths. Long distance to nearest hospital was the most important supply factor (7.9 percent), followed by lack of transportation between home and health facility (3.4 percent) and lack of surgical staff (2.7 percent). In rural areas, all health service supply factors contributed significantly more than those in urban areas (Table 3.13.1).

### **3.1.7.3 Household and Community Factors**

Failure by the woman or her family to recognize the problems and delay in seeking medical care were significant avoidable factors, contributing to 44.3 and 40.7 percent of pregnancy related deaths. Examples for such delays were situations where a difficult and long delivery had taken place at home with the help of a family member or a traditional midwife. Only after 10 days when the condition of the mother was desperate the family brought her to a hospital where a rupture of the uterus was diagnosed but could no longer be treated. In another instance a woman died of the late consequences of a post-partum haemorrhage and shock 13 days after the delivery at home. Similarly tragic was the death due to a puerperal sepsis 10 days after the retained placenta had been neglected.

Table 3.13.1 Percentage distribution of sub-standart care factors for pregnancy related deaths by type of settlements in Turkey

Sub-standart care factors	Total	Urban	Rural	Number
<b>Household and community factors</b>	<b>29.7</b>	<b>26.1</b>	<b>32.7</b>	<b>293</b>
Unwanted pregnancy but not using contraceptives	11.6	5.5	16.5	293
Delay in recognising problem	44.3	45.7	43.6	293
Delay in seeking care	40.7	34.4	45.7	293
No antenatal care	22.3	18.6	25.2	293
<b>Health service provider factors</b>	<b>10.3</b>	<b>12.3</b>	<b>8.7</b>	<b>293</b>
Poor quality antenatal care	17.5	20.9	14.7	293
Midwife failed to diagnose	11.1	9.3	12.8	293
Midwife failed to manage	10.6	9.3	11.7	293
General Practitioner failed to diagnose	9.9	10.9	9.1	293
General Practitioner failed to manage	7.5	8.5	6.7	293
Obstetrician team failed to diagnose	15.7	24.0	9.2	293
Obstetrician team failed to manage	20.5	25.6	16.6	293
Provider failed to refer	1.7	2.3	1.2	293
Obstetrician team failed to diagnose ( <i>for referred cases</i> )	2.4	5.5	0.0	293
Obstetrician team failed to manage ( <i>for referred cases</i> )	5.5	6.9	4.9	293
<b>Health service supply factors</b>	<b>1.8</b>	<b>0.9</b>	<b>2.5</b>	<b>293</b>
Lack of surgical staff	2.7	3.9	1.8	293
Lack of anaesthetic staff	0.7	0.0	1.2	293
Lack of nursing staff	1.0	0.0	1.8	293
Lack of blood	0.7	0.0	1.2	293
Lack of drugs	0.3	0.0	0.6	293
Lack of equipment	1.4	0.0	2.4	293
Lack of medical supplies	0.7	0.0	1.2	293
Operating theatre not available	0.3	0.0	0.6	293
Lack of back-up facilities	2.0	2.3	2.4	293
Lack of anaesthetic facilities	0.7	0.0	1.2	293
Lack of transportation between home and health facility	3.4	0.0	6.1	293
Lack of transportation between health facilities	0.0	0.0	0.0	293
Long distance to nearest hospital	7.9	4.6	10.4	293
Health service communication breakdown	2.7	1.5	3.7	293
<b>Other risk factors</b>	<b>7.5</b>	<b>7.0</b>	<b>7.9</b>	<b>293</b>
<b>Total</b>	<b>49.3</b>	<b>46.3</b>	<b>51.8</b>	<b>293</b>

Another problem was a number of women who committed suicide and where the family had not taken signs of depression seriously. One woman had a suicide attempt only a month before. Also refusals of treatment or hospital admission or the neglect of warnings of the risk of a pregnancy in cases of chronic heart problems or epilepsy were seen. It cannot be ruled out that in some such situations financial constraints in the family played a role. Once it was reported by the family that the ambulance demanded the money before the urgently needed transport to the hospital could start. Other important household and community factors identified by the study were failure to use preventive measures, in particular use of contraception to prevent unwanted pregnancy and use of antenatal care, which contributed to 22.3 percent and 11.6 percent of pregnancy related deaths.

Table 3.13.2 Percentage distribution of sub-standart care factors for maternal deaths in Turkey

Sub-standart care factors	Total	Number
<b>Household and community factors</b>	<b>36.2</b>	<b>218</b>
Unwanted pregnancy but not using contraceptives	14.6	218
Delay in recognising problem	55.2	218
Delay in seeking care	49.5	218
No antenatal care	25.5	218
<b>Health service provider factors</b>	<b>13.7</b>	<b>218</b>
Poor quality antenatal care	23.6	218
Midwife failed to diagnose	14.9	218
Midwife failed to manage	14.2	218
General Practitioner failed to diagnose	13.3	218
General Practitioner failed to manage	10.3	218
Obstetrician team failed to diagnose	20.7	218
Obstetrician team failed to manage	26.9	218
Provider failed to refer	2.4	218
Obstetrician team failed to diagnose ( <i>for referred cases</i> )	3.4	218
Obstetrician team failed to manage ( <i>for referred cases</i> )	7.7	218
<b>Health service supply factors</b>	<b>2.1</b>	<b>218</b>
Lack of surgical staff	3.7	218
Lack of anaesthetic staff	1.0	218
Lack of nursing staff	1.5	218
Lack of blood	0.8	218
Lack of drugs	0.5	218
Lack of equipment	2.0	218
Lack of medical supplies	1.0	218
Operating theatre not available	0.5	218
Lack of back-up facilities	2.8	218
Lack of anaesthetic facilities	1.0	218
Lack of transportation between home and health facility	3.7	218
Lack of transportation between health facilities	0.0	218
Long distance to nearest hospital	8.7	218
Health service communication breakdown	2.6	218
<b>Other risk factors</b>	<b>9.6</b>	<b>218</b>
<b>Total</b>	<b>61.6</b>	<b>218</b>

Household and community factors appear to be more frequent in rural areas (32.7 percent) in comparison with urban areas (26.1 percent). In rural areas, delay in seeking medical care, the absence of antenatal care and unwanted pregnancy played important roles in contributing to pregnancy related deaths. When the coincidental cases are eliminated, the contribution of all household and community factors increases significantly to 36.2 percent (Table 3.13.2).

In order to understand reasons behind the household and community factors, it appears to be useful to examine the background characteristics of deceased women in comparison with women interviewed in TDHS-2003. As seen in Table 3.14, women died due to maternal

causes, and causes related with pregnancy were younger and less educated as opposed to comparison group of women from TDHS-2003. In terms of place of residence, more than half of the women who died due to causes related with pregnancy were rural resident whereas only approximately a third of all women were rural resident. Additionally, almost all women who died in the maternal periods were found to be married at the time of the death.

Table 3.14 Percent distribution of women by background characteristics, TDHS-2003 and NMMR

Background characteristics	Pregnancy			TDHS-2003
	Maternal Deaths	related deaths	Female deaths	
<b>Age</b>				
15-19	7.0	5.9	7.5	2.9
20-24	11.6	13.0	9.3	12.9
25-29	31.6	32.5	9.7	18.3
30-34	24.8	21.8	11.0	18.4
35-39	13.3	14.5	14.5	17.6
40-44	9.4	10.4	20.3	16.5
45-49	2.3	1.7	27.7	13.3
<b>Marital status</b>				
Never married	2.4	1.8	25.3	29.9
Married	97.6	98.2	66.0	66.0
Widowed	-	-	3.4	1.4
Divorced	-	-	3.6	1.4
Separated	-	-	1.7	0.7
<b>Type of settlement</b>				
Urban	45.7	43.8	56.6	71.2
Rural	54.3	56.2	43.4	28.8
<b>Education</b>				
No education/Primary incomplete	38.6	38.5	34.5	21.8
First level primary	43.2	41.0	44.0	53.7
Second level primary	7.1	7.9	6.4	7.4
High school and higher	11.0	12.6	15.1	17.0
Total	100.0	100.0	100.0	100.0

Table 3.15 shows some of the key variables with respect to contraception and unwanted pregnancy. Among pregnancy related deaths, only 24.7 percent of women had previously used modern method of contraception, and 26.9 percent of these experienced contraceptive failure resulting in pregnancy that led to their death. In contrast, the TDHS-2003 shows that 42.5 percent of ever married women use of modern contraception with of these 22.1 percent experiencing contraceptive failure in the last pregnancy.

Among women who died of pregnancy-related causes, relatives of the deceased reported that approximately 48 percent of pregnancies were unwanted or wanted later, compared to TDHS-2003 figure of 20.1 percent unwanted and 13.9 percent wanted later. These suggest unwanted pregnancies were more common among women who later on died from pregnancy related causes.

Table 3.15 Percent distribution of women died due to pregnancy related casuses by contraceptive method used just before the index pregnancy in NMMR compared to women in TDHS-2003

Contraceptive method	TDHS-2003	NMMR <sup>(c)</sup>
Any method	71.0	28.0
Any modern method	42.5	24.7
Any traditional method	28.5	3.3
Not currently using	29.0	72.0
Method failed with index pregnancy	22.1	26.9
Wanted pregnancy later	13.9	16.8
Did not want pregnancy at all	20.1	31.0

<sup>(c)</sup> The values given for NMMR is just for women died due to causes related with pregnancy.

Table 3.16 Percent distribution of index pregnancy from NMMR compared to percent distribution of ever-married women who had a live birth in the five years preceding the survey by the number of antenatal care (ANC) visits for the most recent birth and the timing of the first visit, TDHS-2003

Number and timing of ANC visits	NMMR index	NMMR Previous	TDHS-2003
Number of ANC visits			
None	21.2	26.4	18.6
1	9.8	9.0	7.5
2-3	21.2	12.9	18.9
4+	31.9	26.6	53.9
Don't know/missing	15.9	25.1	0.9
Total	100.0	100.0	100.0
Median number of ANC visit	4.7	4.3	5.0
Number of months pregnant at time of first ANC visit			
No antenatal care	21.2	26.4	18.6
<4	47.7	29.5	57.5
4-5	7.7	5.9	13.8
6-7	6.7	3.6	7.2
8+	3.2	4.5	2.3
Don't know/missing	13.6	30.1	0.5
Total	100.0	100.0	100.0
Median months pregnant at first visit (for those with ANC)	3.1	3.3	2.8
Number of women	206	132	3,164

Table 3.16 presents the number of antenatal care visits related to pregnancy related deaths and comparison with women from TDHS-2003. NMMR results show that 78.8 percent of the women who had died had received antenatal care, 31.9 percent had made four or more antenatal visits during the index pregnancy. This is a lower proportion than the 81.4 percent of women who reported receiving antenatal care in TDHS-2003 and 53.9 percent with four or more visits. The median number of ANC visit also confirms this finding. The NMMR and TDHS-2003 results did not show any significant differences in the timing of antenatal care visits between women died and women alive. However, differences in the components of antenatal care are found to be marked between women died due to causes related with pregnancy and women in the control group (Table 3.17). Women died with pregnancy related

reasons were less likely to have received all routine components of the antenatal care than women in the comparison group.

Table 3.17 Components of antenatal care for index pregnancy compared to ever-married women with a live birth in the five years preceding the TDHS-2003

Survey	Weight measured	Height measured	Blood pressure measured	Blood sample taken	Urine sample taken	Abdomen measured	Baby's heart-beat	Ultra-sound	Internal examination	Number of women receiving ANC	Number of women
NMMR index	52.5	30.8	67.6	63.4	59.8	31.4	56.5	64.6	25.7	155	293
TDHS-2003	75.1	31.1	88.6	76.9	72.6	46.3	91.3	90.5	33.5	2,567	3,164

Table 3.18 shows the percent distribution of women who had died by antenatal care provider during the index pregnancy and previous pregnancy. 70.9 percent had at least one antenatal care visit from trained health personnel during the pregnancy that led to their death. This was higher than the percentage of antenatal care from trained health personnel during the previous pregnancy. The comparison of these results with those of the TDHS-2003 indicates that the women who died in the antepartum, intrapartum or postpartum period were less likely to receive antenatal care from trained health personnel than those asked in the TDHS-2003.

Table 3.18 Percent distribution of index pregnancy from NMMR compared to percent distribution of ever-married women who had a live birth in the five years preceding the survey by antenatal care (ANC) provider during pregnancy for the most recent birth, TDHS-2003

Index/previous pregnancy	Traditional birth						Total	Number of women
	Doctor	Nurse/ midwife	attendant/ other	No one	Don't know	Missing		
NMMR Index	65.3	5.6	1.7	21.2	5.8	0.4	100.0	206
NMMR Previous	46.9	9.6	7.4	26.4	9.8	0.0	100.0	132
TDHS-2003	75.4	5.5	0.2	18.6	0.0	0.2	100.0	3,164

Note: If more than one source of ANC was mentioned, only the provider with the highest qualifications is considered in this tabulation.

The NMMR also collected information on the person providing assistance during delivery for index and previous pregnancies. Among women who died, 75.5 percent had received assistance from a doctor or other trained health professional. This is a percentage comparable with those obtained in TDHS-2003. However, the likelihood of delivery under doctor's supervision is 1.4 times greater for women who died compared to women in the control group (Table 3.19). This may be originated from the fact that women who died due to causes related with pregnancy received assistance from a doctor because they experienced more complications during pregnancy and/or during delivery.

Table 3.19 Percent distribution of index live and stillbirths and previous live births from NMMR compared to live births in the five years preceding the survey by person providing assistance during delivery, TDHS-2003

Index/previous pregnancy	Traditional						Total	Number of births
	Doctor	Nurse/ Midwife	birth attendant	Relative/ other	No one	Don't know/ missing		
NMMR index	66.1	9.4	6.6	12.7	1.6	3.6	100.0	128
NMMR previous	26.0	28.8	11.8	16.5	1.6	15.2	100.0	132
TDHS-2003	46.7	36.3	8.8	7.4	0.5	0.3	100.0	4,132

Note: If the respondent mentioned more than one person attending during delivery, only the most qualified person is considered in this tabulation.

### 3.1.8 Previous Experiences of Women on Delivery, Infant Deaths, Abortion and Stillbirth

Table 3.20 presents the distribution of women who died by the total number of children ever born and the total number of children still alive in comparison with women interviewed in TDHS-2003. On average a woman who died due to causes related with the pregnancy had on average given birth to 2.8 children. 2.5 were still alive at the time of the NMMR, indicating that 11 percent of the children ever born had died after delivery. The number of children that died increased directly with the age of the mother, reflecting the natural family building process. Women age 45-49 who died during pregnancy, had an average of 6.8 births, which reflects the high levels of fertility prevailing during the 30-years reproductive period. As expected, the proportion of surviving children declined with increasing age of the mother. In summary, among women 45-49 who died, the mean number of children ever borne is almost 2 children greater than the mean number of surviving children, indicating high level of mortality among children to deceased women. Table 3.21 also confirms that children born to deceased women are 8 times more likely to die during infancy compared to those who were born to women of TDHS-2003.

Table 3.20 Percent distribution of women by mean number of children ever born and living, according to five-year age groups of women, TDHS-2003 and NMMR

Age of mother	Pregnancy related deaths (NMMR)			All women (TDHS-2003)		
	Number of women	Mean number of CEB	Mean number of living children	Number of women	Mean number of CEB	Mean number of living children
15-19	14	0.4	0.2	2,003	0.1	0.1
20-24	28	1.0	1.0	2,101	0.6	0.6
25-29	75	2.0	1.9	1,849	1.5	1.5
30-34	50	2.9	2.5	1,622	2.4	2.3
35-39	30	4.7	4.4	1,481	2.9	2.7
40-44	20	5.7	4.9	1,371	3.4	3.1
45-49	4	6.8	4.5	1,089	3.7	3.2
Total	221	2.8	2.5	11,517	1.8	1.7

Surveys	Infant mortality (1q0)	Under-five mortality (5q0)
NMMR <sup>(*)</sup>	221	271
TDHS-1998	43	52
TDHS-2003	29	37

<sup>(\*)</sup> TDHS estimates are directly calculated from the related datasets, whereas NMMR estimations are calculated with indirect estimation technique (Brass technique).

Table 3.22 shows the distribution of deceased women by the total number of abortions (induced or spontaneous) and stillbirths that their relatives in verbal autopsy or in health facility records reported ever having had during their reproductive lives. Figures imply that women who died with maternal causes were more likely to have spontaneous abortion and stillbirth, while they were less likely to have induced abortions as opposed to TDHS-2003 women in the control group. Mean numbers for abortions and stillbirths were also consistent with this finding.

Number of terminations	Ever married (TDHS-2003)			Pregnancy related deaths (NMMR)		
	Abortions		Stillbirths	Abortions		
	Spontaneous	Induced		Spontaneous	Induced	Stillbirths
None	79.2	76.1	96.0	68.5	84.4	82.1
1	14.6	13.8	3.5	18.9	11.3	15.5
2	3.9	6.3	0.3	5.6	1.0	1.5
3+	1.5	2.3	0.1	7.0	2.3	1.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Mean number	0.3	0.4	<0.1	0.2	0.5	0.2

### 3.2 Causes of Death Among Women Aged 15-49

Among our study population of 39 million which equals to 54 percent of the total population of the country 6,887 women in the age group of 15-49 had died during the 12 months of data collection. The causes of death as determined on the basis of women death questionnaires and hospital review request forms are summarised in Table 3.23 and Figure 3.6 according to the main categories of diseases as stipulated in the latest WHO classification of ICD-10. Almost one third (31.2 percent) of women had died of neoplasm, 18.2 percent had external causes of death such as road traffic or other accidents, suicide and murder, followed by diseases of the circulatory system (16.6 percent). PRDs ranked as fifth cause of female death (4.2 percent). For 4.1 percent there was no information. Table 3.23 also provides information on the cause-specific mortality rates among women aged 15-49.

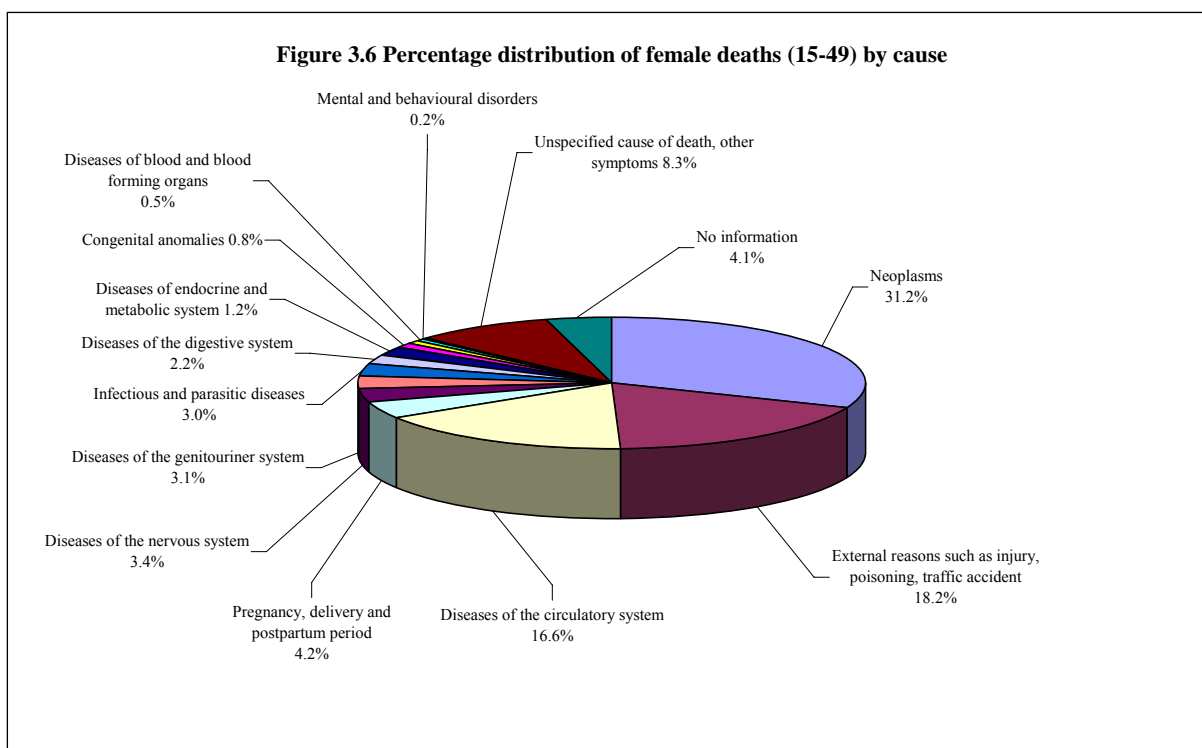


Table 3.23 Percentage distribution of causes of deaths among women aged 15-49 by type of settlements, and cause-specific mortality rates per 1,000 women aged 15-49

Cause of death	Percentage distribution			Cause-specific mortality rates per 1,000 women aged 15-49
	Urban	Rural	Total	
Neoplasms	33.2	28.6	31.2	0.184
External reasons such as injury, poisoning, RTA	18.2	18.3	18.2	0.107
Diseases of the circulatory system	16.0	17.4	16.6	0.098
Pregnancy, delivery and postpartum period	3.3	5.5	4.2	0.025
Diseases of the nervous system	3.0	4.0	3.4	0.020
Diseases of the genitouriner system	2.8	3.5	3.1	0.018
Infectious and parasitic diseases	3.2	2.7	3.0	0.018
Diseases of the digestive system	2.0	2.5	2.2	0.013
Diseases of the respiratory system	1.9	2.5	2.2	0.013
Diseases of endocrine and metabolic system	1.2	1.3	1.2	0.007
Congenital anomalies	0.6	1.2	0.8	0.005
Diseases of blood and blood producing organs	0.5	0.4	0.5	0.003
Mental and behavioural disorders	0.1	0.2	0.2	0.001
Unspecified cause of death and other conditions	7.1	11.6	9.1	0.054
No information	7.0	0.2	4.1	0.024
Total	100.0	100.0	100.0	0.589
Number	3,897	2,990	6,887	6,887

When comparing the findings for urban and rural areas as presented in Table 3.23 two features are obvious: The number of neoplasms which were diagnosed in women from rural areas is significantly lower than for urban women (28.6 and 33.2 percent respectively). At the same time unspecified causes of death were higher in rural areas (11.6 and 7.1 percent respectively). For both findings the reason may be similar. The availability of better diagnostic facilities in urban places allows for the detection of more cancer cases and also reduces the number of unclear conclusions on what had caused the death.

Table 3.24 shows a synopsis of the results of the NMMR and the WHO Global Burden of Diseases 2002 data for the female age group 15-59 years in the EURO and the EMRO countries. The EURO region comprises the EU member states, Eastern Europe and Turkey, EMRO all Arabic speaking countries plus Iran, Afghanistan and Pakistan.

Table 3.24 Percentage distribution of causes of death of NMMR and the WHO Global Burden of Diseases 2002 data for the female age group 15-59 years in the EURO and the EMRO countries

Cause of death	WHO EURO <sup>(*)</sup>	Turkey NMMR <sup>(**)</sup>	WHO EMRO <sup>(*)</sup>
Infectious and parasitic diseases (including respiratory infections)	5.0	3.1	17.0
Pregnancy, delivery and postpartum period	1.0	4.2	15.0
Neoplasms	32.0	32.3	13.0
Endocrine and metabolic disorders	2.0	1.0	3.0
Neuro-psychiatric conditions (mental and behavioral disorders, diseases of the nervous system)	3.0	4.2	3.0
Cardiovascular diseases	28.0	17.7	21.0
Respiratory diseases	2.0	2.1	4.0
Digestive diseases	7.0	2.1	5.0
Genitourinary diseases	2.0	3.1	3.0
External causes (accidents, injuries, suicide, murder)	18.0	21.9	16.0
Unspecified causes (most may be due to cardiovascular problems)	-	8.3	-
Total	100.0	100.0	100.0

<sup>(\*)</sup> Global Burden of Diseases 2002, among women 15-59 ages, WHO  
<sup>(\*\*)</sup> NMMR 2006, among women 15-49 ages

The evaluation of Table 3.24 reveals a number of remarkable findings:

- According to our results infectious diseases as causes of death in Turkey, as already demonstrated for maternal deaths, do not at all rank at a position which would be expected in a developing country. In fact the 3 percent compare favourably with European countries (5 percent) and are much lower than those for the EMRO zone (15 percent).
- At the same time, diseases of the circulatory system (cardio-vascular diseases) of which the majority are so called lifestyle conditions as they are prevalent in developed countries are getting closer to the margin which is reached in those countries (NMMR 17 percent, EURO 28 percent and EMRO 21 percent). If one added the 8 percent of women who in our survey had unspecified causes of death, the number would almost resemble the results for the EURO region. Unspecified causes are those for which the information does not suffice in order to reach at a final diagnosis. Since the death certificate commonly states

heart attack or cardio-pulmonary arrest as cause of death most statistics group them under the category of diseases of the circulatory system.

- For the share of external causes of death, which comprise all kinds of accidents as well as murder and suicide, the results of the NMMR (21 percent) do not differ much from those of the EURO (18 percent) and the EMRO region (16 percent).
- The high number of neoplasm which was detected in our survey (31 percent) is also found in other countries of the EURO region (32 percent). Figures for EMRO countries (13 percent) are however much lower. It is well known that the first reason for an increase of detected cancer cases is the access to and the quality of diagnostic facilities. The data for Turkey probably suggest that the health service makes a good effort in providing those facilities. The huge death toll however which is taken by cancer urgently asks for much more detailed investigation in terms of specification, risk factors, prevention and early screening.

We have also compared our data with the results of the Turkey National Burden of Diseases Survey, 2000 (NBDS) which was conducted in collaboration with MoH and Başkent University. The methodology of this study combined verbal autopsy tool and model estimation. Since it comprised both sexes and all age groups the results are not easily comparable with NMMR findings. Whereas the entire sample of the NBDS included 6.000 deaths NMMR had – by the nature of our methodology – to cover the same number of deaths only in the female 12-50 years age group. Only 27 maternal deaths were found in the NBDS sample (NBD, 2002). Therefore comparison with NMMR results is surely not permissible. Percentages for severe bleedings (30 percent) and eclampsy (20 percent) were close to the pattern NMMR detected. The share of abortion/miscarriage (10 percent), infection (10 percent) and obstructed labour (5 percent) as causes of maternal death however exceeded by far the number of such cases in our survey. The main differences in respect to general causes of female death relate to circulatory system diseases and external causes of death. The NBDS showed a much higher number of deaths due these diseases (37.3 percent) - if one combines the different related sub-categories – than the results of the NMMR (16.6 percent). At the same time external causes of death like accidents, murder or suicide were comparatively low (5.1 and 18.2 percent respectively). Also the high number of neoplasm as suggested by the results of the NMMR was not found in the NBDS (10.2 and 31.2 percent respectively).

### **3.3. Comparative analysis of NMMR data with MERNIS and MoH data**

The methodological approach of the NMMR was decided upon after careful consideration of the advantages and disadvantages of the available options, the existing Turkish data sources, the nature and quality of the recording and reporting systems in place as well as limitations in time and financial means. In this section, all the data collection systems on deaths using in Turkey in a parallel way were discussed, and a comparative analysis of NMMR data with MERNIS and MoH data were carried out on both aggregate and individual levels.

### 3.3.1 The Vital Registration System

Vital registration systems are often the sole data sources for the estimation of the frequency of maternal deaths. The main features and structure of the vital registration system, under the name of MERNIS in Turkey are:

- The vital registration system in Turkey is kept by the General Directorate of Population and Citizenship Affairs (GDPCA) of the Ministry of the Interior, which also keeps the population register and uses information on births and deaths and other vital events to update the latter.
- Turkey is administratively divided into 81 provinces. Each province is sub-divided into districts, 923 in total. The GDPCA has one office in each district throughout the whole country, the District Directorates of Population (DDPs).
- Births and deaths (and all other events, including marriages etc) are reported to the DDPs, which transfer the information to the central GDPCA office in Ankara, where a computerized population register system is kept.
- Transfer of all information from DDPs to the GDPCA is carried out with a well-established on-line system.
- The population registration system, set up in early 20th Century, is based on family ledgers, *rather than de facto or de jure residence*.
- At the time of establishment of the system, each family ledger was indexed on a male household head. Each family ledger has a unique identification coding system.
- With family ledgers, a recording system is maintained whereby the family lineage is kept intact through the males in the family.
- The record of a woman who marries a man from a different family ledger is transferred to the family ledger of her husband. Her name appears in her original family ledger as a “closed” record (the record is still there but indicates that the woman has died or moved to another ledger).
- Deletion of a person from a family ledger therefore occurs (i) upon death, and (ii) upon marriage, if the person is a female.

Procedures on reporting and registration of births are as follows:

- Parents are required by law to report the event to a DDP within one month of occurrence of the event, and obtain an identity card for the newborn. The emphasis of the system is on the acquisition of identity, rather than the reporting of the event.
- Health facilities or medical staff delivering the birth are not required and do not report the event to the DDP.
- In the case of a neonatal death, parents are not required by law to report the event to the DDP and are not held responsible for not reporting the event. Naturally, if the birth of a newborn has not been reported to the DDP, it is not possible to report the death of the newborn to a DDP, since the newborn does not appear in a family ledger.
- Upon the reporting of a birth, a birth form is issued by the DDP, which remains with the DDP where the event has been reported.
- The information is transferred on-line to the DDP where the father’s family ledger appears; the newborn is added to the family ledger of the father.

- Recording of information on current residence is not compulsory. However, the form does include space for writing down current residence.

Procedures on reporting and registration of deaths are as follows:

- The health facility where death has occurred, or the authority issuing burial permits in urban areas is required to report the death to the DDP of the district where 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 DDPs for registration, in order to facilitate the process.
- In rural areas, village headmen are required to report deaths to the DDP. No medical documentation is sought for the registration of death in such cases.
- In both rural and urban areas, deaths have to be reported within 10 days of occurrence of the event. Delay in reporting is subject to penalties, albeit not heavy.
- GDPCA or DDPs take passive role in the registration of deaths. No systematic analyses or efforts are 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 prerequisite to death registration.
- The identity card of the deceased is sent (by health facilities) or brought (by the village headman) to the DDP by the authority reporting death; the card is destroyed and the record of the person is ultimately deleted (“closed”) from the family ledger.
- A death form is issued by the DDP where 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.
- Although address information can be entered into the death form, it is not compulsory, and for only a fraction of deaths the address of the deceased is recorded on the death form. A recent visit to a DDP in the Ankara province revealed that for the majority of deaths reported during the current year, the address of the deceased was missing or was incomplete to the extent that the relatives of the deceased would not be located based on the information on the death form. Also, some of the deaths which had been reported had actually occurred as far back as 1998.
- In cases when death is reported by the headman, the cause of death is not recorded. In cases when a health facility is reporting death, the cause of death is indeed recorded according to the ICD-9, but it is known that such information is of very low quality.

Our assessments on data and completeness of information from the vital registration system can be evaluated as below:

- The GDPCA, although required by law, had never published any information on births and deaths until very recently. Currently, the GDPCA website includes information on the numbers of births by mother’s age and deaths by age and sex for the recent years. No information by ledgers or residence of the mother or the deceased is provided.
- An analysis of the information on births occurring in 2002 shows that the GDPCA data indicate a total fertility rate of 1.85 (calculated by using the births in the GDPCA system and projected numbers of women from the census). The TFR according to the TDHS-2003 was 2.23. The results of the TDHS-2003 indicate significant decline in the TFR, while the results of the GPC-2000 indicate a TFR of 2.53. This implies an under-

registration/late registration births by as much as 20-30 percent, and is somewhat consistent with the findings of the TDHS-2003, where approximately one-third of *surviving children* under age 1 were reported as not having identity cards (their births had not been reported to the DDPs).

- Analyses on the reported numbers of deaths have also revealed that there exists gross underreporting of deaths, particularly for women. According to GDPCA, 340,015 deaths were reported in 2005. Even if one assumes a crude death rate of 6 per thousand, an under-reporting of 22 percent is estimated. The magnitude of under-reporting appears to be larger for infants and females. Using the estimates of  $e_0$  or  $e_5$  from independent sources, one calculates an under-reporting of about 35 percent for women in reproductive age groups.
- The GDPCA indirectly admits to underreporting of deaths: The GDPCA has recently taken initiative to delete the records in the population register of those who were above 90 years of age, after consultations with headmen about the whereabouts or the survival of such persons. The situation has been caused by significant underreporting of deaths over the years.
- The vital registration system in Turkey would not allow the estimation of births and deaths by residence, even if reporting was complete. Thus deaths registered in the vital registration system are not a good starting point for identifying female/maternal deaths.

Table 3.25 Age distribution of deaths collected by MERNIS and NMMR systems in project provinces (June 2005-May 2006)

Age	MERNIS			Age	NMMR			Age	Difference (NMMR-MERNIS)		
	Males	Females	Total		Males	Females	Total		Males	Females	Total
0-4	2,672	2,210	4,882	0-4	4,815	3,747	8,562	0-4	2,143	1,537	3,680
5-9	778	613	1,391	5-9	572	394	966	5-9	-206	-219	-425
10-14	630	438	1,068	10-14	484	323	807	10-14	-146	-115	-261
15-19	1,001	473	1,474	15-19	933	388	1,321	15-19	-68	-85	-153
20-24	1,200	576	1,776	20-24	1,202	498	1,700	20-24	2	-78	-76
25-29	1,253	585	1,838	25-29	1,328	529	1,856	25-29	75	-56	18
30-34	1,311	729	2,040	30-34	1,351	577	1,928	30-34	40	-152	-112
35-39	1,528	840	2,368	35-39	1,580	769	2,349	35-39	52	-71	-19
40-44	2,526	1,297	3,823	40-44	2,574	1,181	3,756	40-44	48	-116	-67
45-49	3,571	1,704	5,275	45-49	3,670	1,546	5,216	45-49	99	-158	-59
50-54	5,341	2,342	7,683	50-54	5,509	2,368	7,877	50-54	168	26	194
55-59	6,447	3,069	9,516	55-59	6,513	3,184	9,697	55-59	66	115	181
60-64	8,055	4,101	12,156	60-64	7,840	4,083	11,923	60-64	-215	-18	-233
65-69	10,164	6,253	16,417	65-69	9,887	6,311	16,197	65-69	-277	58	-220
70-74	13,460	9,136	22,596	70-74	12,750	8,996	21,747	70-74	-710	-140	-849
75-79	12,871	12,444	25,315	75-79	12,010	11,447	23,458	75-79	-861	-997	-1,857
80+	15,779	21,972	37,751	80+	14,578	19,935	34,514	80+	-1,201	-2,037	-3,237
<b>Total</b>	<b>88,587</b>	<b>68,782</b>	<b>157,369</b>	<b>Total</b>	<b>87,596</b>	<b>66,277</b>	<b>153,873</b>	<b>Total</b>	<b>-991</b>	<b>-2,505</b>	<b>-3,496</b>

Burial data obtained in NMMR are compared with MERNIS as regards the age, sex and place of death/burial. As it is observed from Table 3.25, NMMR system registered 3,496 (991 of them are males and 2,505 are females) less deaths compared to MERNIS. For early ages, NMMR, on the other hand, registered more deaths (3,680), whereas MERNIS system registered more female deaths in reproductive age groups which are the main concern of NMMR. This may mainly be originated from the different registration systems of MERNIS and NMMR, and partly be originated from the fact that some primary informants consider MoH will investigate the causes of death, if they report the female deaths in reproductive age groups.

### **3.3.2 Data and Statistics Based on Burials and Burial Permits**

Main features of burial statistics can be summarized in the following points:

- In urban areas, burials can theoretically take place only after burial permits are issued by appropriate officials.
- In rural areas, burial permits are not necessary. Traditional arrangements suggest that each rural settlement has one (sometimes two) cemeteries where the deceased are buried.
- Headmen are required to keep record of all deaths in the village; however, the system is known not to be running.
- Cemeteries in urban areas are run by municipalities. Newly created municipalities may not actually be using burial permits.
- Burial permits are issued by medical staff of the Ministry of Health, the municipalities and other health facilities.
- The burial permit form is a three-piece form. One section stays with the health facility certifying death, one section is sent by the Health Directorate of the province to the Turkish Statistical Institute (TURKSTAT), and one section is given to the family of the deceased, to be taken to the municipality so that the deceased can be buried.
- If the relatives want to bury the deceased in another city or village, they have to go through the same procedure and obtain a “transfer permit”.
- SIS compiles the information sent by health directorates and publishes death statistics for urban centres.
- In large cities, such as Ankara and Istanbul, municipalities keep computerized recording systems of burials. However, there is no centralized data system of burials in the country.

Completeness of information from burial permits may be evaluated in a way given below:

- Several analyses have shown that records kept at Ankara and Istanbul municipalities were highly complete. Our reviews suggest some female deaths may be slightly under reported.
- Although the information compiled by the TURKSTAT is based on the same cases of death in the cemeteries, the level of completeness in the TURKSTAT statistics is far below that of the cemeteries. Health facilities simply fail to send the form to the TURKSTAT in many cases.
- In the TURKSTAT statistics, there are large proportions of deaths of unknown causes. These statistics appear to suffer from some undercoverage; maternal deaths account for less-than-expected proportion of all female deaths.

- A comparison can be made between the number of deaths published in the death statistics for urban areas (province and district centers) and the number expected deaths in province and district centers based on independent estimates. By dividing 2000-2002 figures to the mid-year population estimates for urban areas, crude death rates have been obtained, ranging from 4.0 per 1000 in 2000 to 3.8 per 1000 in 2002. The implied levels of crude death rate (calculated based on Coale and Demeny East Model Life Table System) was found to be 5.1 per 1000 for the urban areas in 2002. The comparison of the two figures for 2002 indicates that the published number of deaths for 2002 is roughly 25 percent below the number of deaths expected. This finding also provides significant evidence that incomplete reporting of deaths is not confined to rural areas in Turkey.

We did not compare NMMR data to TURKSTAT data since TURKSTAT only collects burial statistics for urban areas and their definition of urban does not coincide with the NMMR.

### **3.3.3 Hospital/Health Facility Records and Statistics**

In Turkey, about three quarters of all deliveries occur in health facilities (TDHS-2003 78 percent, NMMR 68 percent) From TDHS-2003 it is known that about a quarter is not in Ministry of Health facilities; therefore maternal deaths occurring in hospitals would be a biased sample of all maternal deaths. Also, we found that women who are dead on arrival are not included in hospital record keeping systems. The MoH runs at least two reporting systems that may yield information on maternal deaths. One system is exclusively on maternal deaths. All province health directorates send information on cases of maternal deaths every month to the Ministry of Health in Ankara. In 2004, 166 cases were reported in this way. In 2005, with an impact of NMMR, the reported number of maternal mortality increased to 229. The second system is computerized information which also flows from provinces to the central Ministry. These data are evaluated by the MoH as being of poor quality and were not released to us and not used in the study.

Concerning the maternal deaths obtained within the system of the Ministry of Health (Table 3.26), during the NMMR period, 135 maternal deaths have been reported from the provinces considered in NMMR. The NMMR system, at the same time, found 178 maternal cases in those provinces. Out of the 135 maternal deaths reported by the MoH system, 106 coincided with the ones found by NMMR. The NMMR system however determined 72 maternal cases that the MoH system did not find. In the system of Ministry of Health, the data of maternal death are collected based on the place of death while in NMMR, the notification system runs according to the place of burial. Therefore, it appears to be difficult to compare these two systems on a one-to-one basis. On the other hand, overall comparison revealed that the two data collection systems functioned in a way that they mutually reinforced each other. Particularly, the data collection activities of NMMR had a positive effect on the maternal notification system of Ministry of Health. When assessing these data in two phases as pre- and post- study (NMMR), the notification of maternal deaths increased by 27 percent after the commencement of NMMR. Hence, it can be concluded that the NMMR methodology was able improve the routine reporting system.

Table 3.26 Comparison of maternal mortality data of NMMR with MoH data

Provinces	2005							2006					Total
	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	
Adana	0	1	0	2	1	2	0	5	0	1	1	0	13
Ağrı	0	0	0	1	0	0	1	0	0	0	0	0	2
Ankara	1	0	0	2	0	3	0	0	0	2	2	0	10
Antalya	0	1	0	1	0	2	0	1	1	0	0	1	7
Aydın	0	0	3	0	0	0	0	0	1	0	0	0	4
Balıkesir	0	0	0	0	0	0	0	0	0	1	0		1
Bartın	0	0	0	0	0	0	0	1	0	0	0	0	1
Batman	0	0	0	0	0	0	0	0	0	0	0	0	0
Bayburt	0	0	0	0	0	0	0	0	0	0	1	0	1
Burdur	0	1	0	0	0	0	0	0	0	0	0	0	1
Bursa	0	3	1	0	0	0	0	0	0	1	0	0	5
Çankiri	0	0	0	0	0	0	0	0	0	0	0	0	0
Diyarbakir	0	0	0	0	0	0	0	0	1	0	0	1	2
Erzurum	1	0	2	0	2	2	1	2	1	1	0	2	14
Gaziantep	1	1	0	1	2	0	2	0	0	2	0	0	9
Giresun	1	0	0	0	0	0	0	0	0	0	1	0	2
İstanbul	1	0	2	2	3	1	1	2	2	2	5	0	21
İzmir	1	2	0	0	1	1	1	3	4	2	0	0	15
K.Maraş	0	0	1	0	1	0	0	0	0	0	0	0	2
Karaman	0	0	0	0	0	0	0	0	0	0	0	0	0
Kütahya	0	0	0	0	1	0	0	0	0	0	1	0	2
Malatya	0	0	0	1	0	1	0	0	0	1	0	0	3
Nevşehir	0	0	0	0	0	0	0	0	0	0	0	0	0
Ordu	0	0	0	0	1	0	0	0	0	0	0	1	2
Sakarya	0	1	0	0	0	1	0	0	0	0	0	0	2
Sivas	0	0	0	0	0	0	0	1	0	0	1	1	3
Tekirdağ	0	0	1	0	1	0	0	0	1	0	1	0	4
Tokat	1	0	0	0	0	0	0	1	0	0	0	0	2
Van	1	0	1	0	0	0	0	0	2	1	1	1	7
<b>MoH Total</b>	<b>8</b>	<b>10</b>	<b>11</b>	<b>10</b>	<b>13</b>	<b>13</b>	<b>6</b>	<b>16</b>	<b>13</b>	<b>14</b>	<b>14</b>	<b>7</b>	<b>135</b>
<b>NMMR Total</b>	<b>14</b>	<b>12</b>	<b>13</b>	<b>12</b>	<b>16</b>	<b>17</b>	<b>7</b>	<b>17</b>	<b>18</b>	<b>15</b>	<b>19</b>	<b>18</b>	<b>178</b>

### 3.4 Results of Model Based Estimation of Maternal Mortality Indicators

As discussed in Chapter 2, model-based analyses have been done by using three different model approaches. All models are multivariate linear regression models. In order to make model based estimations firstly the NMMR data were used to calculate “Proportion of Maternal Deaths among Female Deaths (PMDF)” variable for 29 study provinces. In addition to that, the provincial level data of GPC-2000 and Türkyılmaz’s (Türkyılmaz, 2003) provincial level estimates for some selected demographic and health indicators were also used.

The first approach we applied is to use the 2000 UN model formula applied exactly as it was developed (with UN alphas and betas) to the 81 province-level covariates to predict province-level proportions of maternal deaths among female deaths (PMDF). The methods for the model based estimation of maternal mortality indicators used by UNICEF, UNFPA and WHO was developed by Stanton and Hill. Three models have been developed for 1990, 1995, and 2000 based on regressions between maternal mortality indicators and a number of process/proxy variables associated with levels of maternal mortality, such as GNP per capita, fertility rates, and delivery care. The UN model, as reported by UNICEF/UNFPA/WHO, 2004 in the report ‘Maternal Mortality in 2000’ is as follows:

$$\text{logit (PMDF)} = -6.15 + 1.24*\ln(\text{GFR}) - 0.014*\text{logis (SA)} - 0.26*\text{GDP/PPP} + 0.53*\text{LASSAME} - 0.62*\text{VRComplete}$$

The above model has a  $R^2$  value of 0.91. In this model (Model 0) GFR is the General Fertility Rate, logitSA is percentage of births by skilled attendant, GDP/PPP is gross domestic product per capita based on purchasing power parity conversion, LASSAME is a dummy variable for Latin America, sub-Saharan Africa and the Middle East-North Africa and VRComplete is a dummy variable for countries with complete death registration.

However we ran into problems with this because the formula shown in the UN report looks wrong and does not predict the PMDF shown in the report for Turkey. When we contact with the persons constructed the model we got the below corrected (Model 1):

$$\text{logit(PMDF)} = -7.069 + 1.158*\ln(\text{GFR}) - 0.0133*\text{SA} - 0.0255*\text{HIV} + 0.399*\text{LASSAME} - 1.077*\text{VRComplete}$$

Model 1 works in as much as it predicts the right PMDF but is slightly more difficult for us to apply at the province level since we do not have provincial level HIV prevalence. However we assumed this to be zero as national estimates for Turkey (from UNAIDS webpage) suggest there are fewer than 2000 cases for a population of 73 million (a prevalence of 0.00002).

The second approach we used about was to use the significant variables in Model 1 (GFR and percentage of skilled attendant at delivery) to build a new model (Model 2) with different alpha and beta values based on the 29 provinces data. The equation obtained from the Model 2 was as follows:

$$\text{logit(PMDF)} = -11.665 + 1.75442 \cdot \ln(\text{GFR}) + 0.01019 \cdot \text{SA}$$

The  $R^2$  for the model is 0.53. The SA variable had a p value of 0.174 but we retained it anyway. The final approach was to build a new model assuming the dependent variable as “proportion of maternal deaths in female deaths” (PMDF) and forming linear regression models giving the highest  $R^2$ . In order to make this possible, several regression scenarios were performed by using the variables obtained from Türkyılmaz’s study based on the data from TDHS-1998 and 2000 Population Census. The variables entered into regression models as follows: Households using safe water, households using sanitary toilet, antenatal care, births delivered at health facilities, mothers received medical care at birth, had diarrhoea in the last 2 weeks, underweight children, children under 5 years of age without birth registration, consanguinity, currently using a modern contraceptive method, proportion of deceased children, total fertility rate, gross reproduction rate, mean age at child bearing, infant mortality rate, child mortality rate, female labour force participation rate. The “births by skilled attendant, households with safe water and mean age at child bearing” stayed significant in the method. The below regression model (Model 3) was obtained with a  $R^2$  value of 0.75.

$$\text{logit(PMDF)} = -18.154 + 0.020 \text{ SA} + 0.499 \text{ magedchild} - 0.013 \text{ safewater}$$

Table 3.27 presents the results of obtained and estimated values of PMDF. When the PMDF estimates were compared it can be seen that, the estimates of Model 1 are really different from the observed estimates relative to Model 2 and Model 3. Model 3 estimates have more similar estimates with observed values than other models but there are still significant differences between observed and predicted values.

Although the power of the regression model of UN estimates are high as 0.91, still the confidence interval of MMRatios are very discussible. For example UN 2000 model is estimating MMR as 70 per 100,000 with a confidence interval of lower 18 and higher 130. Therefore making predictions by using regression models for such a rare statistic as maternal mortality ratio is very sensitive.

Table 3.27 PMDF values observed and estimated by regression models

Province	PMDF observed	PMDF estimated by UN model-2000 (Model 1)	PMDF estimated by Model 2	PMDF estimated by Model 3	Province	PMDF observed	PMDF estimated by UN model-2000 (Model 1)	PMDF estimated by Model 2	PMDF estimated by Model 3
Adana	0,029	0,033	0,039	0,032	Konya	-	0,042	0,044	0,043
Adıyaman	-	0,074	0,043	0,064	Kütahya	0,013	0,031	0,021	0,012
Afyon	-	0,035	0,042	0,026	Malatya	0,037	0,029	0,030	0,044
Ağrı	0,108	0,095	0,107	0,148	Manisa	-	0,029	0,025	0,017
Amasya	-	0,028	0,026	0,018	K. Maraş	0,038	0,053	0,066	0,053
Ankara	0,018	0,020	0,019	0,018	Mardin	-	0,342	0,314	0,065
Antalya	0,034	0,022	0,021	0,030	Muğla	-	0,024	0,020	0,017
Artvin	-	0,021	0,015	0,046	Muş	-	0,098	0,051	0,082
Aydın	0,024	0,026	0,025	0,019	Nevşehir	0,015	0,026	0,019	0,015
Balıkesir	0,029	0,022	0,020	0,021	Niğde	-	0,043	0,045	0,039
Bilecik	-	0,021	0,019	0,020	Ordu	0,036	0,031	0,029	0,047
Bingöl	-	0,062	0,048	0,097	Rize	-	0,016	0,014	0,049
Bitlis	-	0,122	0,072	0,110	Sakarya	0,015	0,030	0,030	0,028
Bolu	-	0,022	0,019	0,022	Samsun	-	0,027	0,022	0,019
Burdur	0,012	0,026	0,021	0,018	Siirt	-	0,072	0,032	0,068
Bursa	0,013	0,024	0,024	0,020	Sinop	-	0,025	0,019	0,030
Çanakkale	-	0,022	0,014	0,018	Sivas	0,040	0,041	0,037	0,036
Çankırı	0,018	0,027	0,025	0,026	Tekirdağ	0,017	0,020	0,019	0,014
Çorum	-	0,037	0,033	0,013	Tokat	0,044	0,044	0,053	0,034
Denizli	-	0,029	0,027	0,018	Trabzon	-	0,019	0,016	0,065
Diyarbakır	0,068	0,113	0,057	0,057	Tunceli	-	0,021	0,014	0,040
Edirne	-	0,017	0,015	0,019	Şanlıurfa	-	0,113	0,067	0,090
Elazığ	-	0,039	0,023	0,041	Uşak	-	0,023	0,024	0,016
Erzincan	-	0,030	0,029	0,063	Van	0,080	0,167	0,085	0,073
Erzurum	0,090	0,056	0,048	0,066	Yozgat	-	0,045	0,036	0,030
Eskişehir	-	0,017	0,015	0,021	Zonguldak	-	0,016	0,011	0,021
Gaziantep	0,068	0,067	0,052	0,029	Aksaray	-	0,070	0,101	0,035
Giresun	0,056	0,021	0,018	0,037	Bayburt	0,118	0,038	0,048	0,070
Gümüşhane	-	0,033	0,032	0,084	Karaman	0,000	0,039	0,036	0,034
Hakkari	-	0,145	0,134	0,133	Kırıkkale	-	0,034	0,038	0,027
Hatay	-	0,040	0,047	0,032	Batman	0,029	0,107	0,034	0,047
Isparta	-	0,025	0,024	0,033	Şırnak	-	0,177	0,130	0,059
İçel	-	0,030	0,030	0,037	Bartın	0,021	0,018	0,015	0,018
İstanbul	0,013	0,026	0,025	0,022	Ardahan	-	0,015	0,006	0,034
İzmir	0,022	0,020	0,019	0,019	Iğdır	-	0,122	0,118	0,056
Kars	-	0,103	0,132	0,030	Yalova	-	0,022	0,021	0,023
Kastamonu	-	0,020	0,016	0,015	Karabük	-	0,015	0,013	0,026
Kayseri	-	0,058	0,059	0,022	Kilis	-	0,051	0,049	0,037
Kırklareli	-	0,018	0,017	0,022	Osmaniye	-	0,041	0,046	0,059
Kırşehir	-	0,035	0,045	0,033	Düzce	-	0,026	0,024	0,024
Kocaeli	-	0,028	0,028	0,019					

## RESULTS OF QUALITATIVE STUDY

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The qualitative study was conducted in order to facilitate better understanding of the current burial registration system in the country. Focus was on the following areas: The institution of the ‘muhtar’, the management of cemeteries in municipal areas, the practice of ‘night burials’, the perception of the current registration system for burials (MERNIS, MoH, TURKSTAT), patient records and causes of death from hospitals, and the participants’ perception of the NMMS approach.

### 4.1 ‘Muhtars’, the Primary Source of Information

In municipal areas, cemetery officials are in charge of the burial records whereas in villages this is the responsibility of *muhtar*. In the NMMS they are defined as primary informants since they deal with the body of the deceased. At the beginning of the project, *muhtars* and cemetery staff from 29 provinces were trained about the project goal and their duties within the project, trainings repeated to ensure full participation. In most of the focus group and in-depth interviews, the *muhtars* were identified specifically as having a negative approach towards maintaining of burial records. This situation, which was mentioned in all project provinces, revealed the importance of in-depth interviews with *muhtars*. Priority was given to how *muhtars* perceived their own duties and their opinions on the system of *muhtar* offices in Turkey.

#### 4.1.1 The ‘muhtars’ Own Perception of Their Duties

*Muhtars* reported their duties and responsibilities as solving the road, water, electricity and sewage problems of the village, ensuring the security of the village and necessary notifications to the gendarme and police headquarters. Regarding health, they mentioned making the necessary applications for the construction of health centres, schools, mosques, and water taps, they mentioned providing applications for green card (for free health care) and Social Assistance and Solidarity Fund. Making the required notifications to the DDPs was either mentioned last or not mentioned at all.

*“Now I am serving my villagers, at the moment I feel like the happiest person in the world. I took water to their homes when there wasn’t. They had electricity problems, we changed their electricity network. The village pump broke down; we had a new pump installed. I had the social assistance foundation give financial aid to the poor. I am having coal delivered. Well, I am doing whatever I can.”* (Muhtar, Diyarbakır)

The *muhtars*, who said that serving the villagers was important for them, stated that they were in general happy about being a *muhtar*. It was claimed that in villages where kinship marriages were more widespread, services of the *muhtars* were mostly directed to their own relatives. However, *muhtars* did not receive sufficient financial support for their duties and tried

to solve problems with their own efforts, they stated their job was not profitable; on the contrary, they claimed that it was financially a costly duty.

*“There is nothing the muhtar can do. The state does not bring any service to the muhtar, but when it is indispensable to do [Muhtar have to do some work by himself]... There is no profit in being a muhtar; you will do wrong if you do it for profit, being a muhtar means serving the public, serving God, serving the society. If you serve the society you will be serving God.”* (Muhtar, Kayseri)

Another said: *“...I have provided water to all the houses; I did this by my own means. Neither the municipality nor the state did this... I did it myself. I fetched it here from a distance of 300-400 meters away- we constructed our roads ourselves...”* (Muhtar, Diyarbakır)

Almost all of the *Muhtars* expressed how important the credit it brought was, and it was a means for learning something new for the *Muhtars* having little education.

*“... but when you go, when you arrive at a government office, when you go there as a Muhtar, you are immediately welcomed. It has such advantages.”* (Muhtar, Ankara)

*“I didn’t use to know politics, I learned it. I learned about government offices... you have credit in the places you go to, they respect you and so on... There are such things. You have some respect in the village too, of course, as a muhtar. Well, I like these things too. They trust me; I try to do something for them.”* (Muhtar, Kayseri)

*Muhtars’* low level of education, the lack of pre-service training, and the lack of a regular application of burial permits and a registration system of cemeteries, all reinforce the insensitivity of the *muhtars* towards the issue of recording. Most *muhtars* claimed that they did not receive any in-service training or orientation training after being elected and stated that they had learned the work more during practice. The *muhtars* explained that the district governors sometimes arranged meetings with in order to convey the demands about certain issues, but also added that these meetings were usually not held on a routine basis.

It was observed that there was generally no mentioning of knowledge transfer from the *muhtar*. Some *Muhtars* expressed that they were in more advantageous position, since they have worked as a committee member of village administrative board before the election.

*“We didn’t get any information from any institution; I mean we weren’t told by private or district administrations that the duties of a muhtar were such and such. We do them with what we know... Well, this happens, we have meetings. Assistant governors come. Well they say ‘TEDAŞ’ is in difficulty and what do they say, they say you collect the money... We also have difficulty when we go to the institution. And why do we bear with it, it is because we don’t know the duties of Muhtars.”* (Muhtar, Diyarbakır)

*“During the first year I experienced great difficulty but later I learned it... Although I had no consultant I learned it all with my own effort.”* (Muhtar, Kayseri)

*“What kind of a duty is a muhtar responsible for, what are we doing? It is just like the real and pirate CDs... Well, the real one is the one with the label on it, ours is the pirate one... I mean we have only been able to realize 50 percent of our responsibilities, well, I don’t know, greater things, for instance, there is an environment for me, so I wish that those mountains would become a green forest. Well, you see my wife’s behavior; she can’t go beyond it...” (Muhtar, Ankara)*

Most of the muhtars that we interviewed are only primary school graduates. Therefore, even though there were *muhtars* stating that they had experienced difficulty from time-to-time, for many of them the post of a *muhtar* was not defined as one requiring education.

*“In fact being a muhtar is not so... it is not a thing that requires education. I don’t know how it is in the west, but the muhtar is not different from any common citizen in the village. You bring something to the village, it doesn’t suit someone’s benefit, and you end up in the police station. They say reach an agreement. When you do, the man doesn’t and the work remains as it is...” (Muhtar, Diyarbakır)*

*“I swear, Muhtarlık isn’t as intensive as it is believed to be. We don’t go anywhere such as a government official, or get up in the morning and go to places until evening. It doesn’t have a responsibility.” (Muhtar, Ankara)*

That the work of any *muhtar* is done as a secondary work since most of the *muhtars* are farmers or tradesmen prevents them from feeling as civil servants. It has been defined that what is more important for the *muhtars* is to do more visible services which would contribute to their reelection and maintain their esteem.

In some cases the family of the *muhtars* that we talked to stated that they did not want their husbands or sons to be a *muhtar* again saying that the duties of a *muhtar* delayed other work. However, it was also expressed that once people gained experience in working as a *muhtar*, they do not give it up easily, it becomes a habit.

*“Well, the man got this at 40 years of age but it became a habit, he can’t give up the stamp [special muhtar’s stamp] there are ones who work as a Muhtar for 4-5 periods. For example, last year, it was summer month last year; we were laboring, to express it in our terms. There was a Muhtar in ...village, he died. I mean he was a muhtar when he died. They left it to the first member, they had election or they didn’t. That is to say, it becomes a habit. Now the stamp, they tell me that you can’t leave the position for the following period. I can leave it and so forth; it is very difficult to submit that stamp. They say once you get it, it is very difficult to give it back. The experienced ones say this.” (Muhtar, Ankara)*

The muhtars’ approach to the issue of recording is in fact important in terms of their approach towards burial records. A *muhtar* explained that he himself had no official marriage before being a *Muhtar* and that he obtained official marriage certificate after becoming *Muhtar*.

*“I myself got married in 1982 too. I got the official marriage document issued in 1987-88. I had become a muhtar. I said that I wouldn’t do yours before I did mine. Today [birth] recording is done as soon as birth occurs.” (Muhtar, Diyarbakır)*

Muhtars stated that positive improvements have been experienced recently in all kinds of records, and especially in having an identification card issued in order to get a Green Card. A *muhtar* from Diyarbakır stated that there was nobody without an ID card, and that everybody was married officially.

*“The man is 85 years old; he hasn’t got an ID card yet. Thank God we had IDs given to them. I mean there is no one left without one. There is no one without an official marriage certificate in the village. For example a child is born, comes to the world, the man [father] goes the following day right away and has his [the child] ID card issued.”(Muhtar, Diyarbakır)*

However, the same *muhtar* did not display the same sensitivity to burial permit. He observed that burying a dead body without a burial permit would not be perceived as a problem, and that the *muhtar’s* authorization was sufficient as a burial permit.

*“...no, now, there is not a problem if there is a village Muhtar. Of course a village Muhtar can be a guarantor there. Of course it is written there on the form, we sign it. We take the responsibility. There, of course, there the men have trust. They trust the village Muhtars, they do thing, and they help us. God bless them.” (Muhtar, Diyarbakır)*

There were similar views in all the three provinces concerning *muhtars’* views on registering the burials and making burials without burial permits. It was observed that they generally did not possess burial records and it was not perceived as a very important problem to bury without having a burial permit. It was also discovered that not all of *muhtars* were informed of the circular on burial permits and records, which was sent to the municipality and *muhtars* on April 2005 by the Ministry of Interior, within the framework of the NMMS. Muhtars to a great extent were not informed during their training of the Village Law, which generally defines the duties and authorization of a *muhtar*, and especially of the Public Health Law, which describes their duties and authorization regarding burials.

The *muhtars* stated that there were very few deaths in their village, as most of the deaths occurred in hospitals, and also claimed that the number of notifications they would have to make to the MERNIS system was rather low. For this reason some said that they had forgotten how to fill out the MERNIS forms. While filling out the MERNIS forms, some would go to population directories generally with the relative of deceased and have the forms filled out by petition writers in the street. A *muhtar* from Ankara, who said no mistakes must be made in the MERNIS forms, claimed that he was very careful and had the form filled out on a typewriter or computer by paying for it to ensure it would turn out as desired.

*“...Moreover, as there isn’t much intensity, there is a trip once a year. We forget, we have got a sample form, but one of our friends made a mistake, that’s why court and so on, it took such a long time. It has to be corrected by means of a court decision.”(Muhtar, Ankara)*

The same *Muhtar* asserted he was afraid of a judicial situation arising because of the MERNIS forms which it can be actually understood he interprets the word “record” as more or less associated with inquiry, or a judicial situation. While the muhtars were speaking among themselves about the project during their NMMS training, they claimed that by recording deaths, they feared graves might be opened.

*“It was feared wondering whether graves would be opened, whether autopsy would be done, let’s say someone died and taking him out of his grave came to the agenda. He hasn’t got a resume, what are you to use. The head of the health group said that ‘write, the owner of the dead has hesitations’. They were even going to cut up Great Özal [the former Prime Minister]”. (Muhtar, Ankara)*

Other muhtars had a similar perception, while *muhtars* stated proudly that there was no incidents of murder, or a crime record, they stated that they were careful when some ‘foreign’ person came for a burial, but added that apart from that there was no need for recording.

*“No one from here acts against the state. Go to the judiciary. We have no criminal record. We are so pleased... no, they explained it all to us.. They said [show] the identification card. To tell the truth, Doctor they told us. Let’s say he was shot in the east and came here, let’s say he is a terrorist. They told us all these, we have to tell the truth.” (Muhtar, Kayseri)*

Because everybody in the village knows each other closely, Muhtars perceive no need for a burial permit at once, unless there is a skeptical situation. During the interviews, the *Muhtars* expressed that they gave permission for burials without burial permits but, that they later experienced difficulties because of this from time to time.

*“I bury the man who died at ho me, I straight away buried him. No, we have no chance of going to the registration office and informing them, we can’t. Oh we go to the municipality but the municipality doesn’t accept.” (Muhtar, Diyarbakır)*

A *muhtar* from Kayseri, which was not in the NMMS, expressed that he did not issue burial permits, that there was no need for this, except when there were traffic accidents which needed to be written up by the public prosecutor together with a doctor. The *muhtar*, who also claimed that he was not informed of the circular sent by the Ministry of Interior, explained not keeping record in an interesting way:

*“The buried citizen is someone we all know, no there is no need [register] no we have no such thing anyway, the state keeps record, when the registration office is notified, they cancel the registration.” (Muhtar, Kayseri)*

Although muhtars often claimed that the circular of the Ministry of Interior on issuing burial permits had not reached them, sensitivity towards this subject has slightly increased. Another *muhtar* from Kayseri, who stated that he had improved himself in this area compared with the past, explained that he no longer buried anyone without seeing his burial permit but could delay it a little if the person was someone he knew.

*“In the old days, here, no such thing as a burial report was written, when there is a death occurring out of the village, the hospital gives a burial report. We prepare a burial report here for the ones who have been ill and died a natural death,... we go to the registration office, we inform them, we have the registration cancelled... for example last year a funeral came from Ankara, I said burial report, I even said “open the corpse [unwrap the funeral shroud]”. Let me look at his face...” (Muhtar, Kayseri)*

Another muhtar, on the other hand, stated that it was not really right to ask for information for a death certificate while there was suffering for the dead, and that, for this reason, he felt they need some more time.

*“we issue that, but going there suddenly, it is a bit strange, when there is a death, before I thing the dead, going there straight away, they may say ‘did he come for work’, it can happen like that, it is possible. I mean this is humanity... after he is buried one day later, we ask from an acquaintance, you can’t say a thing to his relative as well, we ask for his identification card.” (Muhtar, Kayseri)*

During the implementation of the NMMR, full participation by the *muhtars* in the project could not be ensured and some *Muhtars* refused to participate in training inspite of repeated training sessions. This resulted in incomplete notifications by *muhtars* some places. Questions posed to understand the *muhtars*’ attitude towards notification. It was found that infrastructure services of the village were priority for the *muhtars*, whereas they were not convinced of the necessity of death certification.

*“In fact the knot is there, he passed away, I wish he had been under control while alive.” (Muhtar, Ankara)*

*“If the death occurred at home, the relative of the deceased may or may not notify the death. He ignores it, why bother. He died anyway... Why should I bother myself? Will I go and investigate why he died? Should I go and question him. The man won’t tell me anyway. He died anyway.” (Muhtar, Diyarbakır)*

Furthermore, some of the *muhtars* were not very keen on supporting to the NMMS claiming that they did not get sufficient support from state institutions in the fields of education and health, and thus were angry with the related institutions.

*“Well, it is an extra job for me. MERNIS isn’t, this is my job. But they have imposed other duties besides this... you don’t look at the important thing... you go and search for the cause of death. There is no nurse, no teacher; it is in fact a matter of education and culture. My teacher frequently gets a medical report... since the health directory doesn’t provide enough service to my village; I didn’t really want to support the project of the health directory voluntarily. ... I haven’t seen any service being given from any institution. No need to tell this to you again...I didn’t see it from any institution, the health directory, what service have you given what education have you given. I am not a teacher, I am not an educated person, and they say family planning. He says God has given it, what I can do. Educate them first. The teacher goes to OFIS (a district) and just sits there. Another teacher is in prison, but appears to be in Mermer, and*

receives a salary. I find these [forms] unnecessary. A fish begins to stink at the head.” (Muhtar, Diyarbakır)

*Muhtars’* low level of education, their old age, and their forgetfulness were also mentioned. A young high school graduate *muhtar* from Ankara stated that the *muhtar* post is an institution which does not change very easily, that the same *muhtar* continues working at the post for years and years, and that there is very little sensitivity to this issue owing to their being very old.

“*The muhtars of the village that you couldn’t get are generally old. They are old. As I said, there are approximately 36-37 villages; there wouldn’t be 15 Muhtars under the age of 50. And as I said some of them, old age and forgetfulness, now the man in his 40s but he has made this a habit. He can’t submit the stamp. There are ones who do it 4-5 periods. For example last year... the man died being a muhtar... Well, the man may not be able to write, he may have forgotten how to write, he can’t write exactly, as I said he is old...*” (Muhtar, Ankara)

The same Muhtar also stated that old *muhtars* had lost the forms, forgot to fill them out and didn’t care much.

“*They might not be giving the form because most people lose the form, they can’t find the form, and they don’t give them. He took the form he was given. He brought the file and threw it somewhere, his wife is also old. She may have taken it and put it under one of the carpets. It must be there. Now the old may do it like this... I mean the man is innately insensitive... He can’t take responsibilities so much, go to those who didn’t give you their form and you may not be able to find it in their home.*” (Muhtar, Ankara)

It can be said that *muhtars* do not take the processes related to recording seriously. From the perspective of *muhtars*, who state that serving their village is important, recording deaths specifically is not regarded as a situation which the citizens would see and admire. As stated previously, what *muhtars* understand from providing service is to provide substructure services, and in relation to cemeteries, to construct a mourning house, to construct a morgue, and to establish a place for condolence. All of these show that *muhtars* want their services to be visible and to be admired by the people in the village.

Related to the NMMS, some of the *muhtars* stated that taking the forms to the town, especially in winter months was a problem in terms of both transportation and cost.

“*Now, instead of coming here, 25 kms, the man would go out of his house and there is a medical center 3 kms away. It would be better I mean.*” (Muhtar, from the focus discussion, Antalya)

“*Instead of coming here, the medical center is 6km from my place. There is a medical center in my village too. Instead of coming here, in this traffic jam and stuff.*” (Muhtar, from the focus discussion, Antalya)

“*Now bringing it here, 40 km, bringing it here.*” (Muhtar, from the focus discussion, Antalya)

The muhtars who participated in the focus group interviews in Antalya also stated that when there were no deaths<sup>1</sup> it was meaningless to fill out the monthly forms for notification.

*“I want to believe this as well. It is not always necessary to give an empty notification. If the man has died then we notify him here. We give notification of the dead man, I mean once a month uuumm there is no condition that the man is going to die in the village. That’s why we should give notification of the dying people.”* (Muhtar, from the focus discussion, Antalya)

They also stated that having the responsibilities related to deaths imposed on them was not meaningful and should have been the responsibilities of the health staff. They mentioned that they did not know what to write about the reason of death and that they had not received any training in this area.

When *muhtars*’ opinions were asked about low number of deaths of women, no clear answer was received from them. They stated that they only experienced problems in underreporting of infant deaths.

*“If a new born baby does not have an official record, it is not notified (at death), I do not know but if he is old then we are informed. We are not informed of children.”* (Muhtar, Diyarbakır)

#### **4.1.2 Views on the Muhtarlık as an Institute**

The *muhtars* of villages, who are elected, defined in the village as a representative of the state, but on the other hand, they are not exactly considered as a state official. Because *muhtars* themselves do not know their own duty and responsibilities, and nor do others. The district governors who are in charge of the *muhtars* explained this situation in the following way:

*“Even if you informed them of the project topic they do not see themselves as a state official completely. It is a pity that they do not have a secretary, maybe they haven’t got an office, this is natural too of course. There are the newly selected people with no experience. I myself informed the Muhtars as much as possible. In fact they were told that it is a project within the European Union that these need to be followed as well.”* (Kaimakam, Ankara)

That *muhtars* did not have enough training was mentioned as a problem by another district governor in the following way:

*“It can’t be said that they have received serious education. They are occasionally informed by the directory of correspondence. For example, if there is a project related to the village, we have them called and tell them. For example, Muhtar wants many things and we explain to him why they can’t be possible. They are also informed about the administration of village and providing service to the villages. There is a routine meeting once every 6 months. But we come together when there is a need.”* (Kaimakam, Ankara)

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<sup>1</sup> In order to distinguish in the NMMR the condition of no notification and notification of zero burial and to ensure the continuity of the recording process, the primary sources in settlements were asked to report monthly whether or not there were burials.

During the focus group interview, project researchers and project doctors/coordinators also mentioned the trouble they had owing to the *muhtars*.

*“There have been times when we sat together with the doctor and called each and every Muhtar, town centers, but villages, the Muhtars are so insensitive, this is very important, at last they even said uuumm, our calling them [is a form of] abuse, there were even those who said, ‘Are you going to sack me if I don’t send it’”* (PPR, from focus group discussion, Ankara)

Initially, the province project researchers stated that the reason for lack of reporting by *muhtars* was their level of education, but later they agreed that this was related to job awareness and *muhtars’* personalities.

*“To me, the difference between the muhtars who sent them and who didn’t was. I in the beginning thought that it was culture, I mean, the difference between being educated and not but that is not the case... To me, well, it is related to their job consciousness, not their cultural level but their personalities.”* (PPR, from focus group discussion, Ankara)

In the group focus interview carried out with project doctors/coordinators, it was mentioned that working with *muhtars*, from the perspective of the Health Ministry staff, caused quite a difficulty at first. They complained that the sanctions towards the *muhtars* were insufficient due to the different perspectives of the *muhtars* during trainings and their being bound to a different ministry.

*“...what was different in this project was our working with people from different ministries and different sectors, having different views. We didn’t experience such difficulty in the training of doctors or health personnel, we don’t remember any. But everyone one of us went to the town group directories and participated in the training of muhtars. For one thing their perspective is very different. They are not aware of their legal responsibilities and legal sanctions and training them became our job here. However, since we were from a different ministry and we did not have the authority of imposing sanction these were done by means of extraordinary relations by executing amiable ways and thus they became operations implemented by executing amiable ways. ... However, we also encountered muhtars who were really illiterate and couldn’t fill out forms and [they] said, ‘I don’t understand, you take this, I will come to you every month and you will fill it in for me’ and that was how the data was collected, and because the team with whom we actually collaborated in data collection... It was in my opinion one other difference in the project [having to work as a team with muhtar’s made this project different from others].”* (Province Project Coordinator, focus group discussion, Ankara)

In the focus group interviews held with doctors/coordinators, the importance of the fact that *muhtars* did not consciously carry out their duties, their lack of training and their being elected were mentioned as the causes of the lack of interest displayed by *muhtars* towards the project. Furthermore, that the Ministry of Interior needs to produce a standard in this issue was raised as one of the most important issues. Moreover, it was added that the rationale among *muhtars* was *“he is dying anyway; I mean what’s the use of notification.”*

In addition in the interviews held with the Ministry of Interior, and the TURKSTAT specialists, the problematic aspects of the *muhtar* system were mentioned. And in the interviews we held with the officials of the General Directorate of Population and Citizenship, it was stated that the *muhtar* system did not proceed in a sound way in Turkey, and that *muhtars* did not carry out their responsibilities due to the difference between being elected and being assigned. For this reason, it was proposed that *muhtars* not be kept responsible for keeping life records.

*“I am against such a thing as the post of Muhtar anyway; oh what does the duties of a Muhtar mean, I’m sorry but the nurse at the medical centre is a literate person. Nurses receive how many years of education. Isn’t that right, oh what the duties of a Muhtar are unclear” because a Muhtar comes with election, it is none of the man’s business... he says he is elected, he is not assigned. There would be fear, something in those assigned.”* (Statistician, Ankara)

Another official from the General Directorate of the Population and Citizenship Affairs emphasized that the *muhtar* system should be revised:

*“...I swear in Turkey muhtars are a great problem, a real problem. For one thing muhtars, I mean there is this as well now. We are having difficulty in finding muhtars in some villages, whoever they find to be muhtar, that is they do not want to be muhtar... that is it is a burden a complete burden, don’t consider his being in the east, he sees it difficult as well. I mean I don’t know we should revise this muhtar system in Turkey. Either as I mentioned earlier there are approximately 40 thousand, between 40 to 50 thousand things, villages or 42 thousand or 32 thousand. I mean if Turkey is not giving 38 thousand state officials, a major part of the system in Turkey is still resolved by the public.”* (Experienced at MoI, Ankara)

## **4.2 The Management of Cemeteries in Municipal Areas**

In-depth interviews were also held with the cemetery staff, which was the second primary source of the project. In the interviews, staff at different levels of administration was consulted since cemetery procedures are conducted by different people in province and town municipalities. In province municipalities, interviews generally were held with cemetery directors and chief officers. In the towns, interviews were held with chief officers working in the cemetery departments and in some cases with the cemetery guards. In the municipalities (Ankara, Diyarbakır and Kayseri) administrators who were careful about keeping burial records regularly, implementing the circular from the Ministry of Domestic Affairs, and not doing burials without a burial permit, was encountered.

People who worked in the above mentioned municipalities mentioned the role and sensitivity of the municipality heads in their attempt to ensure regular cemetery records of municipalities. They stated that cemetery services are important in serving people.

*“...this is something our excellence the municipality director gave to our people, he sympathized with people’s sadness in this subject, that is when I first came, there was something that motivated me most, let me tell you that as well. The director of the cemeteries, I worked at this post for 5 or 7 years but we have a saying, the cemetery directory is a place of exile...”* (Cemetery director, Diyarbakır)

The cemetery director and chief officer whom we interviewed in Kayseri explained that since the municipality directors who worked in Kayseri so far have been sensitive to this subject of death, a regular system was established and that they continued to work on improving this system. Moreover, they added that the public was very sensitive to this issue as well.

*“The municipality directors and the director today are acting sensitively... if the directors had not acted so sensitively there wouldn't have been such a regular thing... Our municipality director is especially very careful in issues of burial and cemetery. That is, the idea that people, people who have no respect to their history would have no respect for themselves is of course an idea that all people should have... Now in our Kayseri, the storekeepers of Kayseri would definitely know all about uuumm who died, who didn't that day. Now our people in Kayseri are more connected to each other, that is conservative. When going to the midday prayers or afternoon prayers, the storekeepers would definitely take a look at the funeral board in the great mosque in the market place. Who died today because in Kayseri they definitely go to that funeral, that is they definitely go to that cemetery and participate in the burial process, that is there is such a conservatism among the storekeepers, I mean in the people living in the city center of Kayseri that is in its people.”* (Cemetery chief officer, Kayseri)

It was also stated that there was no problem experienced in the Kayseri City Municipality regarding burial permits, that the people were sensitive and that without a permit; permission was not given for burials. In Diyarbakır, on the other hand, there were complaints of the insensitivity of the citizens' regarding this issue.

*“Our citizens are ignorant in this issue, now a man today, a man who has graduated from university; he is a veterinarian in an institution, his relative died. He says the report, from that thing he says, was I to come and look for a doctor?, well was I going to come and look for this? I said look, the way you are thinking is slightly wrong, like a man who lives in the village, or a person who doesn't know at all or I don't know, any person... just like how a person comes to midwife first and gives report of the person being born to get a census record, so when a person is dying a doctor definitely comes, sees the person, writes the burial [notification], you go and take that to somewhere, you bury it and it is recorded on a record book. The man comes today and asks for the [report] 1966 record, in 1966 the man's father died, and he has not submitted his death incident until now.”* (Cemetery director, Diyarbakır)

Similarly, in Kayseri it was stated that citizens did not have enough knowledge in the issue of the necessity of getting a burial permit.

*“I mean, a citizen can wait for 15 years to give a notification or uuumm you can get the thing of a person who died in 1978, 1979 only now. In fact, the other day something happened, a citizen applied at the weekend, he asked for the information of a person who had died in the 6th month of 1971. There is none for that month; we now only have records as of the last months of 71. Since we don't have such a burial permit available, I noted down that we could not give the necessary information and assistance. I gave it to the old man and told him that the way to do it was through court decision; you can have the record deleted from the registration office in 3 days. He died in 71, no inheritance declaration was given, it has been 35 years.”* (Cemetery chief, Kayseri)

It is observed that the financial records kept for the sale of the cemetery plots have an important role in keeping the record books at cemeteries updated.

*“Well the funeral record book and the grave sale book, I mean they are like the land registration of the province or like the registry at the registration office, the grave sale book we use at the cemetery is just the same. I mean it is legally valid. For example when a mistake is made in the registry, we have no chance of correcting it.”* (Cemetery chief officer, Kayseri)

In a town in Kayseri, after the circular sent by the Ministry of Interior in April 2005, the Department of Gardens and Cemetery was founded. It was explained that burial records were kept previously as well but were not transferred onto the book, and that now a book was being prepared in accordance with the information asked for in the circular and that these records were kept on the computer as well. From this respect, it can be said that the circular, especially its influence in the municipality, is motivating.

*“We have just started keeping a burial record book. Since its something new, after the April of 2005.”* (Cemetery director, Kayseri)

*“Now look... Now we have one head imam. And we have four imams here in Karşıyaka. In the Sincan cemetery there is no-one at the imam post. I have a friend at the ‘gassal’ [body washer] post and he is working both as an imam and as an administrator there. Washing a corpse is his duty anyway, due to his being a ‘gassal’. And he is doing that duty as well. There is one imam at the Asri cemetery. He carries out the duties of both the administration and the burial procedures. There is one more imam and there of course the number of funerals is higher compared to Sincan’s.”* (Cemetery chief officer, Ankara)

The cemetery chief officer in Ankara explained that doing burials without permission could only be possible in the case when the corpse is transferred.

*“Well of course. You say okay, you do the necessary procedures. Again in transfer procedures there is a road permission document...Let me mention that to you again later. Uuumm, they give this road permission document. They take it. They say take it and do the burial.. The man does not take it to Çubuk, he returns and takes it to Solfasol and does the burial there. There is no official there. There is no one. Well what happens? Well maybe 1 month later, maybe 5 years later, maybe 10 years later...the end. I mean, if it is a male child, the person does not come and ask about him until the military service... Arrives for the person. And the document given to him that day would be in his pocket, or rather it would be worn out and he would have thrown it away. Right when his military age comes, he says oh my god what have I done. And comes here and asks about it but it is too late. Hey there is no record, he is not defined here. If it is a female child, this is [not asked about] right until the death of the father until the inheritance declaration is announced.”* (Cemetery chief officer, Ankara)

In addition to the low number of personnel employed at cemeteries, that the education level of the personnel is low is one of the reasons of not keeping regular records. In one of the towns in Diyarbakır, an 18 year-old son of the cemetery guard explained this situation as “some say what female death and so on, it must be because of ignorance, I mean for example if it wasn’t

*for me, my father wouldn't exactly understand as well and wouldn't write on paper".* The same person said that most *muhtars* participated in the training meetings held for the project, but did not show the expected attention and thus described *muhtars* as ignorant.

He explained by saying: *"no they all came. Rarely, since they don't know Turkish, but they don't do it, some say what female death, it must be because of ignorance, I mean for example if it wasn't for me, my father wouldn't exactly understand as well and wouldn't write on paper."*

The same person added that the project coordinator explained this subject in Kurdish as well but the *muhtars* still did not show any interest.

*"That is Kurdish, the hoca explained it but I swear I mean they don't do anything. ...I mean they don't want to bother...why do I need to tire my brain because of things like I will go there and they will ask me questions."*

### **4.3 The Practice of 'Night Burials'**

One concern was reported in East and Southeast Anatolian regions, burials might be done without notifying the *muhtar* or the municipality officials. The most important difference that we encountered between the regions was the burials done at night. In provinces of the shafi religious sect the prevailing view is that burying the corpse straight away leads to less pain being felt. The climate conditions also affect this situation and that a corpse should not be kept awaited in hot weather.

*"I mean, well the cultural reason, some say, well, it is better for your dead to be buried as soon as possible, it is better not to trouble the people around, it is better to alleviate the pain as soon as possible. In general, I mean the reason is this. I mean for example a man has had a traffic accident, or I don't know he might be young, a sudden death, people want to remove the dead of especially people who die young earlier. I mean, because after the burial ends, the pain is a bit more relieved. But the most important thing, but the hot weather, the most influential factor might be the hot weather. Well, we especially say, if we establish our morgues we will definitely have these rules enforced. If it is for the good of our people too, if the system is better in this way, it should be in that way in my opinion."* (Cemetery director, Diyarbakır)

The cemetery director of the Diyarbakır municipality added that they gave permission for night burials in order to serve the people.

*"Our supervision is this. It is in fact in our control, well when you say to some citizens, they say well it is summer, it is hot, they convince you, well they say the man is going to smell, where shall I put him, the next morning he will again deal with it. Well whatever. In these kinds of things it gives trouble to people, and we have not refused because of this until now, I mean as far as possible. If it is not too late in the night, I mean we definitely don't refuse. Burials are against our cemetery, we prepare the burial place."* (Cemetery director, Diyarbakır)

In addition, in the focus group interviews held with province project researchers, the participants from the East Anatolia Region stated that night burials were mostly done in places where Shafiism was widespread.

*“if I’m not mistaken only in the East and Southeast it exists, burial straight away occurs there... not only [for]murder, they bury straight away in villages, it might be due to their religious sect. For example, people on this side of the region are generally from the Hanefi, and people on that side are from the Shafi religious sect.”* (PPR, focus group discussion, Ankara)

In the interviews we held in Kayseri, on the other hand, it was stated that night burials were prohibited in the *Hanefi* religious sect and that they were in no way to be done after the evening prayer.

*“And perhaps here because of people’s religious sect thing, because there is the Hanefi religious sect in Central Anatolia the evening prayer burial is considered a sin. For this reason, there are no burials done in the afternoon. Even in the afternoon, even at the afternoon prayer, few generally the dead are buried after midday prayer (the walkie talkie rings) it is frequent then, not even in the afternoon time. Never is there in the evening and at night. For instance, I worked in the east, my real job is a teacher, I worked in Sarıkamış. Well someone’s relative died and was buried; I said can a burial occur at this hour. Well they said, it is the Shafi religious sect. I mean I was shocked. But burials do not occur after working hours in our place here. It is as such in our regulations anyway. I mean it is done until the working hours end, if not it is not done.”* (Cemetery chief officer, Kayseri)

#### **4.4 Opinions on the Current Registration System for Burials**

In the interviews with specialists in TURKSTAT, information was obtained about the studies carried out regarding the compilation of the mortality statistics and reasons of death in Turkey. It was stated that in Turkey, the mortality statistics as of 1986, only covered city and town centers and that because the statistics compiled from districts and villages in 1982 were not reliable, collecting data from these places were terminated.

It was expressed that forms from the province health directories were compiled monthly, sometimes separate forms from hospitals also arrived. Before regional directories were established, because the forms sent from provinces arrived collectively, attention was drawn to the problems experienced in scope.

*“Let’s say the number of forms in January coming from the town of Ceyhan in Adana, we can say that in Adana there are 10 hospitals, let’s say 7 of them sent some and 3 didn’t, how do you determine this? We cannot determine this. Since a collection arrives, we have no cardex on the basis of hospitals.”* (Expert, TURKSTAT, Ankara)

It was stated that the death data from the provinces were not so functional since they were troublesome in scope, the mortality figures were not evaluated on the basis of age and gender, and accurate data could not be derived in especially early age and old age data from the comparisons made with MERNIS. It was also added that when the information derived from

MERNIS was compared with the one they compiled themselves, differences appeared between male and female mortalities especially in old-age deaths.

*“I mean we have longer life span expectancy. There is a difference of 4-5 years in men’s life span expectancy compared to women’s. Well, when you go to MERNIS, the thing for men appears to be longer, why, because there is a notification of properties, or you know from retirement, the state announced it, because they receive a salary, they are not removed from MERNIS because it depends on declaration, as it depends on declaration, the number of men living in MERNIS appears higher.”* (Expert, TURKSTAT, Ankara)

That the district directorate has become a part of the process now, at least in terms of being able to check the missing records in the districts, is believed to be beneficial. However, it was also underlined that if the deaths occurring at homes had been buried without receiving a burial permit from TURKSTAT, or if the form had not reached the institution, it would remain unknown.

Today, within the framework of the changes occurring in the TURKSTAT structure, new arrangements are also taking place in this area in terms of starting to carry out especially the European Union projects and passing onto a system in line with EUROSTAT. Various institutions have begun compiling death statistics and reasons of mortalities in a compatible way with the EU countries.

Regarding causes of death, it is stated that more sanctions should be imposed by the Health Ministry in this area and that it was important to make doctors more sensitive towards this issue. It is also asserted that the Health Ministry has to give importance to this issue and develop new policies.

*“In our country Turkey, we have a few doctors who know how to fill out death forms. I mean, while the real cause has to be written, the last cause is written, and the person filling out the form must be a doctor but it may be a different person.”* (Expert, TURKSTAT, Ankara)

That death causes are arranged according to ICD-8 in Turkey has also been brought to the agenda as another problem. The specialists interviewed have stated that the causes of deaths in European Union countries have been classified according to ICD-10 and as 4 causes with three steps. It has been stated that continuing to enter the causes of death according to ICD-8 would prevent the inclusion of the current death causes and only state the real death cause, so activities regarding the adoption of ICD-10 have been in progress; however, it was also expressed that it would be quite difficult to for the system to operate completely and would take time.

It was stated that the death causes would be associated only with the Turkish Republic identification number, independent of death numbers as a result of the new programme which TURKSTAT is going to put into practice in 2009.

Concerns were expressed regarding the fact that the Family Practitioner System might not be much sufficient in the beginning phases, and that it would not be possible to acquire the

medical history of patients. Moreover, it was also stated that the approaches of citizens regarding the use of health services are effective.

*“... There is uuumm in our people; we never go to the doctor before we fall ill. Especially in rural areas, there are lots of cases like this. Well, if there is no family practitioner or doctor, it would be a little difficult to detect the first middle, and last death.”* (Expert, TURKSTAT, Ankara)

TURKSTAT, in addition, is planning to apply a verbal autopsy within a sample group aimed at understanding the causes of death occurring at home. But it has also been stated that this is not definite yet.

It has been emphasized that the Formal Statistics Programme which TURKSTAT initiated in 2006 would contribute to a more regular compilation of the data related to death statistics and death causes.

#### **4.5 Opinions on Hospital Records and Cause of Death Certification by Medical Doctors**

In the focus group discussion held especially with the project coordinators/doctors and with other Ministry authorities and TURKSTAT specialists, emphasis was laid on the fact that the reasons of death were recorded in the required way and on the hospital recording system issue. The project doctors, who had to examine the hospital records to fill out the SKKIF within the framework of the NMMS, stated that generally these records were not kept regularly. They stated that especially the concept of maternal death is not established except in the gynecology/obstetrics departments and that even though it is written many times, difficulties are experienced here.

*“Of course another problem - maybe we are going to talk about this later, let me tell you all of it at one go – in hospitals, in other medical centers, like my friend said, not perceiving these definitions, I mean that the departments other than Gynecology do not know the definition of Maternal Mortality. That they do not feel this in themselves. Perhaps the notification system of the recordings should be dealt with in a different way as of the faculties of Medicine.”* (Province project coordinator, focus group discussion, Ankara)

*“... Hospitals do not know the concept of ‘Maternal Mortality!’ They think that it is just a death that occurs while giving birth. Although we wrote and sent the definition of this twice we still encounter maternal mortalities in hospitals coincidentally owing to this project. Just two months ago in the university hospital Mehveş hanım came across one – even though it said “there are no maternal mortalities” in the records – one incident of maternal mortality that had occurred during that month was encountered.”* (Province project coordinator, focus group discussion, Ankara)

Doctors who expressed their criticisms to *muhtars* within the scope of the project claimed that the same situation was valid for health personnel as well.

*“Later we saw that it is not just an issue of muhtars. Okay muhtars don’t do it owing to their lack of education or sensitivity, but even our own health employees do not do these notifications in hospitals correctly. The files in the hospitals are highly insufficient”* (Province project coordinator, focus group discussion, Ankara)

Regarding this issue, owing to the realization of the fact that the health personnel does not have sufficient information, the subject of health education has come to the agenda. A participant, who is the town coordinator, stated that he himself had not been very sensitive to burial permits before the project. Upon this, emphasis has been laid on the fact that this issue is not taken much into consideration in medicine education.

*“Well when we first came, you called the town health group directory; we showed strong reaction against this project in the month of May. And here there was a different method. Many of our friends showed reaction, but I wasn’t one of those who showed strong reaction. Well, it is as you, I mean the legal obligation of muhtars; normally they give the burial permit in villages. But we didn’t know this either. I mean even we ourselves didn’t know this. For instance a man would come from the village; I would give a thing I mean I would give a death report. I would give it without inquiring about when the death occurred.”* (Province project coordinator, focus group discussion, Ankara)

*“So our education must be strong from this respect, and maybe from now on it will occur without fear, the Turkish Penal Code will follow these developments but education of course has a priority. From this respect, I think this should be integrated into medicine education a little more carefully.”* (Province project coordinator, focus group discussion, Ankara)

That there was no difference among regions regarding the issue of poor hospital archives shocked the participants coming especially from the Eastern regions.

*“We think only we have these kinds of problems but apparently you also have them, in the end no place in Turkey is different from another, yes it is a problem.”* (Province project coordinator, focus group discussion, Ankara)

Even if the focus group participants were from different regions, they stated that they had to solve problems related to hospital records more through personal relations, and that because of the circulation generally experienced in the health sector, most of the time the required doctors could not be found.

*“But when we as health staff look at the hospital dimension of the work, okay it is called National Maternal Mortality, at least they should be interested in it but there is the same problem in the hospital dimension, it is not all that different from the muhtars. I mean unfortunately my doctor friends do not take ownership either, unfortunately. The files are incredibly insufficient (//yes there aren’t any) in fact there aren’t any. (//we have to mark those that are unknown, unknown, unknown, missing) I mean in my town. Yes there aren’t files, the ones found are insufficient. The bad side of it is we experience the greatest problem in this; I mean in the first step, the doctor goes and unfortunately does not find a doctor or nurse, nor a health personnel as his addressee, but finds a cleaner. This created a serious problem for us; I mean that was the*

*greatest problem. Hospitals did not take ownership of this work at all; they did not show interest at all. The problem still continues we have not gotten used to it completely but some personal relations come to the agenda; I mean if I know a doctor there in that hospital personally I telephone and request and such things happen. Or friends from the other team call. Unfortunately hospitals have not taken ownership either.”* (District coordinator, focus group discussion, Ankara)

*“There is a lot of doctor circulation [move from one district/province to another] as well, you cannot find that doctor either. Her/his specialization ends, in another death s/he would be gone on rotation, s/he doesn’t happen to be there that day. S/he would be appointed to another place or on maternity leave, many things occur. Many times did we talk about the fact that the doctor could not be reached.”* (District coordinator, focus group discussion, Ankara)

That there is fear of supervision was mentioned as a reason why hospitals do not take ownership of this issue. Just as the way *muhtars* approach the recording issue is associated with legal incidents, so it can be said that the fear among health staff of mistakes and going through interrogation is dominant.

*“And they are afraid of things as well; since they are afraid of supervisions as well they don’t want to give information. Now what Neşe Hanım says is right, we are continuously being evaluated.”* (Province project coordinator, focus group discussion, Ankara)

The Diyarbakır province coordinator explains the fact that doctors, in their approach to this issue, are afraid to assume responsibility:

*“After every death a responsibility arises. For instance, a death incident occurs in the department, all the doctors disappear. No-one wants to take the responsibility. I mean they say the dead should be removed as soon as possible; whatever happens. I mean there is such an approach.”* (District coordinator, focus group discussion, Ankara)

While project coordinators/town doctors express their opinions on the health reforms in the health system, they have stated that the ‘Family Practitioner System’ is not suitable to the conditions of the country that it would be more difficult to reach the information currently available within this system and talked about the disadvantages of the commercialization of the health system.

*“I mean in my opinion, if these policies concerning health continue, we may not even be able to find the current information because health has exclusively become privatized. It is going to be worse. I mean we will even long for these days because when it becomes privatized, when there is competition, no one is going to want to take care of a patient who may die. I mean in our hospitals it is always as such... what will happen then.”* (Province project doctor focus group discussion, Ankara)

That the system of family practitioner has entered our country’s agenda and that we need to be careful about what is to be experienced later are among the issues that are emphasized.

*“The family doctor system [new system of MoH] is coming. It is coming from today to tomorrow. Now 10 provinces will start but in one-two years it will be established. And assignments to hospitals will be done by them; the patient has to pay himself in direct consultation. In cases when assignments are not done, either he will die at home or maybe we will see deaths at health centers. In that sense it is right says our friends. Perhaps certain organizational structures should be thought of according to this. A new system is being brought but what it will bring with it is not thought of. And that is as a suggestion maybe...”* (Province project coordinator, focus group discussion, Ankara)

Doctors, who also mentioned the problems created by campaigns and projects being prioritized among the work carried out in the health sector, stated that the campaigns and projects were one of the obstacles in the routine work. They also claimed that it was importance for the health personnel to discuss what they need to do among themselves, other than campaigns and projects.

*“We need to seriously sit and talk this over with the health staff and our own staff... We need to, need to mention uuumm, perhaps in Turkey; unfortunately we do work through campaigns and projects. In other words, the reason why projects and campaigns appear is that our routine work is not done properly anyway. I mean the emergence of this project is this anyway.”* (Province project coordinator, focus group discussion, Ankara)

#### **4.6 The Participants’ Evaluation of the NMMS System**

A majority of the people we interviewed stated that they believed in the necessity of conducting research and that referring back to the recordings especially when there were more administrative and judicial problems was a very positive approach.

*“Of course, entering a record is positive; I mean it’s positive for us. It has never happened. But for instance what if it happens! There may be a conflict or a fight, we may have to take them out of cemeteries, and we would submit these documents if we have to. There would be proof available. It has got lots of advantages in this respect. Because records are kept, and a recording system is established, it has a lot of advantages, of course.”* (Cemetery chief, Ankara)

The cemetery director of Diyarbakır Municipality stated that he found the research very important as he was informed by means of the research and it shed light on what to do in preventing maternal mortalities. He explained the project’s contribution to following up burial permits more regularly and to being more careful in keeping records:

*“...we receive information from you. We are informed. If there had not been these duties, perhaps we would not have had information as well. Now if we can say something somewhere, if we can express one or two words, how pleasant it is for us... When these mother deaths become disclosed tomorrow or the following day, when it is realized, maybe with these mother deaths the people will appear on TV and discuss the causes of maternal mortalities. Uuumm when these discussions emerge, we’ll all benefit from them. I mean they will be beneficial for all of our mothers. To our young daughters, sisters. I think they’ll all benefit.”* (Cemetery director, Diyarbakır)

The city project researchers stated in their interviews that the project was defined as ‘death of women’ or ‘female deaths’ since the project being on maternal mortalities caused it to be perceived from a narrow perspective. Also, in the focus group interviews held with project coordinators/doctors, they claimed that they were confronted with the following question asked specifically by *muhtars*: why do you study only women and mothers, isn’t the death of men important?

*“They sometimes say “why only women, why don’t you detect the men.” (District project coordinator, focus group discussion, Ankara)*

Disturbance related to the *muhtars*’ lack of interest in the project from the very beginning was expressed by the *muhtars* themselves as well.

*“Rather disinterested, I mean, a female doctor and a branch director is speaking to him. The man, excuse me, I am sorry, but he uuumm his nose. I mean now, plus the Head of the Group was inside. There was the Head of the Group together with us inside. I mean there is such insensitivity; I mean what I should say, is lack of authority or whatever...” (Cemetery chief officer, Ankara)*

In order to increase the motivation of the *muhtars* and/or of cemetery officials, suggestions were made in the research regarding the usefulness of developing different formulas.

*“Maybe, it might have been derived from uuumm. Maybe it may have derived a little from you as well, or it might have been originated from the Hacettepe people because this project is a very extensive project. Probably, some fee, some payment must have been received, or will be or is being received for this project. Now, from of this payment if a very little share had been given to these people as well, they might have been more enthusiastically... because you know, no matter how hard a job a worker works, he gets lighter when he receives his wage, his salary in return for his work,... Now, I might think! Well, I am too, I mean I’m uuumm on this issue.. If I were given a little money too, I would finish this in one day, two, well, in one day not two. I mean something like this.” (Cemetery chief officer, Ankara)*

That the project was planned in a way that necessitated the cooperation of institutions was generally evaluated as a positive approach in terms of strengthening the communication between institutions. The greatest problem experienced in this issue has been the *muhtars*. Especially the personnel of the Health Ministry emphasized that working with *muhtars* was difficult, that training to *muhtars* should be provided by the Ministry of Interior and that they did not have sanctions to impose on *muhtars*. It was also explained that in some cases, even the district governors could not impose sanctions on *muhtars* for the insufficient notifications in the project.

*“We say muhtar, okay the district governor calls them once a month, the province governor doesn’t see them very much, and generally the district governor calls for them but the district governors don’t have sanctions to impose on them either. Depending on how many towns the district governor is in charge of, there are that many inquiries about muhtars. But apparently, to dismiss a muhtar, the signature of the Minister of Interior is a must; we learned this by means of the project.” (Province project coordinator, focus group discussion, Ankara)*

It has been expressed that the circular which the Ministry of Domestic Affairs had sent to the *muhtars* and municipalities concerning not making burials without a burial permit and keeping a recording book was effective in general, if not everywhere in promoting sensitivity. The common discourse of the ones who had a duty in every phase of the project has been that this issue is dealt with more carefully than it was in the past. It has also been observed that the project and the circular within the scope of the project have been effective in the keeping of records in some areas of settlement, which had never been done so.

When the interviewees were asked to make an evaluation of the project, they stated that it was important for *muhtars* to continuously follow it up. It can be said that their being continually warned when forms had not been sent could be perceived as an indicator that this work is important. This situation once more draws the attention to the importance of supervision and warning procedures within the process of establishing data collecting systems.

#### **4.7 Resume of the Qualitative Study**

In the implementation phase of carrying out the NMMS, especially the *muhtars'* insufficient notification was emphasized. The *muhtars'* lack of interest and education was mentioned by everybody involved in the different phases of the project, mostly involving the *muhtars* themselves. It has also been observed that because *muhtars* are elected, they focus more on visible services, and the infrastructure services of the village have a priority as well.

That *muhtars* should focus on the essential services to be provided prior to death was considered of more importance. It was observed that *muhtars* were not convinced as to what the general use was of dealing with dead people. Carrying out a study based only on death of women or mothers was interpreted especially by *muhtars* as discrimination. This can be taken as an indication of the situation the country is in terms of social gender.

Since keeping records was associated more with a judicial case by *muhtars*, it was observed that they feared making notifications. Similar to *muhtars'* fear of judicial cases, it has been noticed that the hospital personnel did not fill out the forms completely due to their fear of being investigated as well. Due to the tension between the *muhtar's* being a civil servant and being elected at the same time, the system of the post of *muhtar* has not run properly in Turkey. Moreover, at the time *muhtars* are elected, they do not have thorough information about their jobs and they learn the job in practice. Furthermore, it was also observed that the *muhtars* who were succeeded as a result of an election did not transfer any information while handing over the post about the work and procedures carried out.

It was claimed burials were made in some places without a burial permit and without informing the officials (and that in some provinces in the Eastern Anatolian Region there were night burials, and similar cases in other provinces in cases of transfer). It was explained that the most important problem which the Metropolis municipalities expressed about cemetery services and burials without permission was the lack of personnel.

Although the health personnel have been informed during training of how to state death causes or record regularly, it was stated that owing to little importance attributed to this issue in

health services, the personnel developed similar behavior to those of the health organization. It was mentioned that as there is very much circulation in the health sector, many problems are experienced in reaching information of patients. The bad aspects of the high turn-over occurring in the posts of high level administrators especially after a change in government and its impacts upon the entire staff were mentioned.

It was explained that as the people who are in the administration positions in the health sector are not always of health origin, the health personnel's trust in their administrators have decreased and the interruptions the applications carried out, and a general tendency to abandon studies after a while have decreased the motivation level of the staff in the health sector.

It was emphasized that the data collected regarding death causes were both insufficient in terms of scope and quality. It was mentioned that the basic reasons of this were the fact that the health personnel did not fill in the death causes, that they were incompetent in writing the death causes and had problems in reading the forms.

The importance of the system developed by the NMMR and which depended upon continuous follow-up was mentioned by all of the interviews. Involving the Health Ministry, the Ministry of Domestic Affairs, the Turkish Statistics Institute, municipalities in the activities of collecting data for the project created attempts aimed at increasing the cooperation among these institutions.

Only authorities of institutions can provide an answer to questions of whether women burials are insufficiently notified when compared to men's, and they have stated that as women did not have property registered on them and had no salary, they were insufficiently notified. However, the *muhtars* or the municipality officers did not make any discrimination in this issue. It was observed that they were not aware of missing women burials.

## 5.1 Maternal Mortality: Levels, Causes and Contributing Factors

The overall pregnancy related mortality ratio was found to be 38.3 ( $\pm$  2.8) per 100,000 live births. It ranged from a low of 12.4 ( $\pm$  5.0) per 100,000 live births in West Anatolia to a high of 93.3 ( $\pm$  17.2) per 100,000 live births in Northeast Anatolia. The pregnancy related mortality ratio for urban areas was 28.2 ( $\pm$  3.1) per 100,000 live births, while for rural areas it was 53.7 ( $\pm$  5.5) per 100,000 live births. Overall, pregnancy-related deaths constituted 4.3 percent of female deaths aged 15-49, but again this ranged from 2.0 percent in Istanbul to 13.0 percent in Northeast Anatolia. The pregnancy related mortality rate was 2.5 per 100,000 women aged 15-49. The lifetime risk of pregnancy related death was one in 1,142 women overall but was as low as one in 4,702 in West Anatolia and as high as one in 337 in Northeast Anatolia. The NMMS results show that 59 percent of all pregnant women died from direct maternal causes, 16 percent from indirect causes and 23 percent from co-incidental causes. The remaining 2 percent were deaths for which the kind of pregnancy relation could not be specified. When only direct and indirect causes were taken into account, the maternal mortality **ratio** was at 28.5 ( $\pm$  2.5) per 100,000 live births.

The pattern of maternal deaths in Turkey is typical for a country in economical transition. The diminution of infectious conditions and the reduction of obstructed labour as a main cause of maternal death are supportive signs, as such conditions are much more common in developing countries. These changes are more prevalent in urban as well as Western and Central Anatolian regions as opposed to rural areas and the East of the country, as it is also true for the generally lower number of maternal deaths. Main contributing development factors are probably improvements of general as well as health infrastructure. Maternal mortality is highest in regions with a poorer network of good roads, harsher winter conditions and longer distances to the next secondary level health facility which provides comprehensive obstetric emergency care services.

Whereas the availability and accessibility of emergency care services are crucial, it is also the utilisation of preventive measures which makes a difference. The fact that – according to TDHS-2003 – about 75 percent of the pregnant mothers make use of ANC services and deliver in health facilities constitutes a considerable level of awareness. That this must still be improved is on the other hand evident from the fact that the mothers who died during their pregnancy – as seen from NMMS data – had an overall ANC attendance rate which was 5-10 percent lower. It is on the level of the family and the local community where final decisions on the use of modern services are taken. Failed recognition of an obstetric problem and delayed health care seeking by the family was by far the most frequent sub-standard care factor contributing to the death of the mother. Also the importance of use of modern family planning methods and the contributory potential of the two most important

biomedical risk factors – age and parity of the mother – need to be brought closer to the attention of the communities. Warning signs of imminent suicide were neglected by the family in 4 percent of the maternal deaths. Community and family awareness is therefore an area where the MoH must concentrate even more efforts.

It has also been shown that throughout the country most maternal deaths are due to obstetric haemorrhage and eclampsy, conditions which usually occur short before, during or after delivery. Unlike infections and also obstructed labour these are situations which always constitute an absolute emergency for mother and child which normally lead to the death of the mother within a very short period of time if not adequately managed. Hence even a minor reduction of a delay may decide upon death or life. This explains why in rural areas where access to appropriate care is less easy post-partum death of a mother during the first 24 hours was more frequent than in urban settings.

Availability as well as quality of comprehensive emergency obstetric care services play an important role. Long distances to the closest health facility with comprehensive emergency obstetric care, as they are not uncommon in remote areas of the country are not acceptable. At the same time these are unfortunately the regions where one finds the highest turn over of medical staff because they are not preferred by the majority of health workers. For no surprising this has repercussions on the quality of a service despite of its availability. Our data have shown that in about 25 percent of maternal deaths recognition and decision making by health staff on secondary and tertiary care level was a contributing factor. Especially disturbing was that in 20 percent of severe post-partum haemorrhage no action at all was taken until the mother eventually died.

That there is usually a good network of emergency care facilities in urban areas could be seen from the fact that many of the women who later on died for reasons of eclampsy had a brain-CT scan or even an MR which helped to detect an intra-cerebral bleeding. Easy availability can however also have adverse effects as became evident from a more detailed evaluation of the number and reasons for referrals in urban places where there may be more than one health facility in close vicinity providing the same level and pattern of care. In a number of situations it was a discussible referral which delayed the timely life saving treatment of a mother.

The situation demands for several measures. First and foremost each hospital needs a following-up committee to evaluate all fatal events as well as the more frequent near misses in order to understand the chain of events which contributed to the adverse outcome. This must include good communication with other levels, facilities and departments which were also involved. It should be understood that it is not an issue of accusation but the only way to learn and understand the problem, so that steps can be taken to improve the situation. Measures will mainly consist of in-service training, as it was also seen during NMMS that supply factors such as the lack of staff, medicines or support facilities, including the availability of ambulances, were rarely decisive contributors. At the same time ways must be found to further increase the attraction for working in more remote places.

The transitional situation of Turkey can also be seen from the pattern of general causes of deaths among women age 15-49. Findings were very close to the mean of all countries of the WHO EURO region. This was also true for the high number of cancer cases, which causes almost one third of deaths in this female age group. It is well known that the first reason for an increase of detected cancer cases is the access to and the quality of diagnostic facilities. The data for Turkey probably suggest that the health service makes a good effort in providing those facilities. The huge death toll however which is taken by cancer urgently demands for more detailed investigation in terms of specification, risk factors, prevention and early screening.

## **5.2 Problems and Recommendations for Current Systems and NMMS System**

### **5.2.1 MERNIS and MoH Systems**

One of the important missions of the National Maternal Mortality Study (NMMS) is to evaluate the Turkish population records system, in particular the death records system, and to make recommendations for the development and/or changes in this system. The Turkish population records system is run by the General Directorate of Population and Citizenship Affairs (GDPCA) under the supervision of the Ministry of Interior (MoI) within the framework of the MERNIS project. The GDPCA, which has a directorate in every district in Turkey, continuously updates the information about vital events such as birth, death and marriage, which is sent online from the District Directorates of Population (DDPs). Below is a list of the main problems faced in the implementation of the current Turkish population records system(s), especially the death records system and the recommendations devised in order to solve these problems:

1. Under the MERNIS system a death is officially recorded once the authorities (health institutions, village headmen, coroner, the office of Attorney General, gendarmerie etc...) inform the DDPs. In some cases relatives' reporting is also accepted with a condition of a death certificate is provided. Throughout this process, the DDPs take passive role in the registration of deaths. In order to overcome this problem, after a detailed analysis of all death reports, institutions that have failed to send deaths reports must be warned. In the following phase, it is necessary to calculate the basic mortality indicators based on age and sex from the reported deaths. Once these indicators are estimated, it is necessary to carry out in-depth examination of the quality of the reported deaths, and then share the results of these analyses with the concerned institutions at both province and district level. Such measures will contribute to identify the extent of under-reporting and thus enable authorities do something to improve the level and the quality of reporting.
2. The population records system used in Turkey within the framework of the MERNIS project is based on a system established at the beginning of the 20<sup>th</sup> century. In this system, population records are kept on the basis of family ledgers, not according to a person's *de facto* or *de jure* place of residence. In accordance with the population records system based on the family ledger, when a person living in Ankara, but whose family ledger was recorded in Kayseri dies, the report of his death is made to the province in which family ledger is recorded (in this case Kayseri), not to the province where he

resided at the time of his death (in this case, Ankara). In addition to making the proposed analyses more difficult, this practice does not comply with international population records systems. It is necessary to make a transition from the system based on family ledger to a population records system based on a person's permanent place of residence. In this respect, Turkey has covered a lot of ground. Taking into consideration the disadvantages of the current system, in accordance with the new law (Decree No. 5490; Approval Date: 25/04/2006; Titled *Law on Population Services*) which was passed in 2006, the population records system will be based on the place of residence from 2007 onwards. Currently piloting efforts are being made in 237 different settlements in collaboration with TURKSTAT and MoH to ensure the rules of the law will be applied from the beginning of 2007.

3. Basically, the MERNIS system is based on reporting of deaths from the village headmen and the health institutions. Therefore, village headmen and in particular, health institutions in rural areas must be better integrated into the system. This condition dictates that village headmen and health houses work together to carry out detailed screening to record vital events, and appropriately report them to DDPs. Village headmen have very important duties in this cooperation process. In order to carry out these duties, the village headmen must have a high level of education and frequently undergo in-service training.
4. The health system has an important function in the reporting of deaths. However, in the cases where the health system has no access to an area, death reports are made by the village headmen. Yet it is a well-known fact that the quality of these kinds of reporting is lower than those reported by health facilities. In addition to making efforts to improve the educational qualities of the village headmen, over time, it is also necessary to strip them from the authority of reporting deaths. To make this possible, it is necessary for the health system to become widespread and reach all areas of residence. The family GP system, whose pilot project is being implemented, is seen as a great opportunity in this respect.
5. Although it is legally an obligation to report a case of death within ten days, sometimes the concerned institutions either make a late report, or refrain from reporting the death at all. Although delay in the reporting is a serious problem, generally short delays are deemed acceptable. However, failure to report the death, which is, not entering the death as a record, is a very important problem. Unfortunately, both problems exist in the MERNIS system. Calculations reveal that only 70 percent of deaths are reported into the MERNIS system. Problems have been observed in particular, in the reporting of deaths of infants and women. The most essential condition for a death to be recorded within the MERNIS system is that there is a birth record of the deceased person. Therefore, birth registration is prerequisite to death registration. As a result, it is impossible to register the death of a child who hasn't been registered within the system. According to the findings of TDHS-2003 report 26 percent of children under the age five do not have a birth certificate. Taking this figure into consideration, we can see the extent of the problem of not being able to keep the records of the infant deaths in this age group. A similar situation is true in the case of women. Although the country's overall death report stands at 70 percent, this percentage drops to 64 percent in the case of women. This shows that women are at a disadvantage positions during both birth and death registration process.

Therefore, it is necessary to take the necessary measures to register both births and deaths with a special emphasis to children and women's registration.

6. In addition to the MERNIS system, in Turkey there is another death records system based on burial records. This system is used in areas with a municipality and according to this system; health institutions is responsible to issue a three-piece form which is called as *burial permit*. One copy is kept by the health institution; another is sent to the Health Directorate of Province; and the third copy is given to relatives of the deceased to carry out the paperwork necessary for burial. Without doing any checking, the Health Directorates of Province send these forms to the Turkish Statistical Institute (TURKSTAT), which issues the yearly death statistics. This system, which is existent only in municipal areas, does not have any link with the MERNIS system. Since these two systems work independent of each other, they are unable to cross-check their records. It is important to restructure these two systems, thus enabling the MERNIS and MoH systems to control one another. This will help both systems overcome their problems, pertaining to data quality and coverage.
7. Another problem of the current system is that it works differently in urban and rural areas. In rural areas, particularly in areas where there are no doctors, it is the village headmen who provide necessary information for the population registration system, whereas in urban areas the information is provided by doctors working at health institutions. Naturally, the quality of the data provided by village headmen who have a low educational level and are not well-informed about the records system is low. Therefore, Turkey must make fast moves to adopt a widespread death report system based on its health institutions.
8. In addition to the data quality problems experienced within the MERNIS and MoH systems, there are also problems with the reporting of the causes of death. The reporting of the causes of death made by both the village headmen and health institutions are problematic. It is common procedure to write terms defining death such as "*heart failure*" "*ceased breathing*" in MERNIS forms and burial permits as the causes of death. In fact, it has been observed that "*old age*" and "*fate*" are given as the causes of death, especially in rural areas. This shows that there is no particular standard among the people (e.g. village headmen, imams, doctors etc...) reporting the cause of death. In order to overcome this problem people other than the doctors must be prevented from making reports of death and its causes. Furthermore, the health staff must undergo in-service training to make cause of death reports according to the ICD-10 standard. Moreover, the procedure of writing the causes of death in MERNIS forms or burial permits and reporting them to the authorities must be revised and be considered to be a part of medical training. It is also believed that some of the problems pertaining to the reporting of the causes of deaths stems from the current forms in use. For more detailed recommendations on this issue see Section 5.3.
9. In Turkey, the population records system is perceived to be a part of the finance, judiciary and security services provided by the state. Two concrete examples of this approach can be seen with the Citizenship ID number and the newly adopted law no 5490. Using the

population records system as a tool to follow the changes in the characteristics and structure of the population on a daily basis becomes a secondary task. Therefore, the population records system must be taken up primarily as a tool to follow the vital events. In this respect, it is necessary to have GDPCA staff undergo short in-service training sessions to be able to analyze the existing data and produce meaningful demographic indicators.

### **5.2.2 MoH Maternal Mortality Notification System**

By using the data from MERNIS and burial permits, it is possible to obtain a limited amount of information on deaths, which is also low in quality, as to the causes of death. However, it is not possible to gather any information from these two sources as to the level and causes of maternal mortality, which are the main subjects of NMMS. As a result, the indicators pertaining to maternal mortality was started to collect through the *Maternal Mortality Notification System* working under the MoH. This system was started in 2003 following a hospital based survey carried out by the MoH, General Directorate of Mother and Child Health and Family Planning (GDMCHFP) in 1998-1999, and whose results were published in a report titled *Survey on Maternal Mortality and Causes of Maternal Mortality Based on Health Facility Records in Turkey* in 2002. In this system, the maternal mortality data collected through the Provincial Health Directorates of MoH, and transferred to the GDMCHFP on a monthly basis. With the help of this system 181, 166 and 229 maternal deaths were reported in 2003, 2004 and 2005 respectively. During the one year period from June 2005 to May 2006, when NMMS's fieldwork carried out, with the positive impact of NMMS 235 maternal deaths were reported. Yet the maternal deaths reported through this system do not fully reflect the reality in Turkey. The reasons behind the underreporting of maternal deaths may be explained with four different but highly interrelated factors:

The first one is that the system mainly concentrates on the deaths that occur in health institutions. Analysis of the data from this system reveals that 92 percent of the deaths reported are deaths that occurred at health facilities. Most of the deaths occurring outside the health institutions, for example at home, are not entered into the system. According to the results of TDHS-2003, about a quarter of births take place at home so it can be said that in this respect the system has problems with regard to its comprehensiveness.

The second reason why the system underestimates maternal deaths is that the system works in cooperation with the *maternity services* but doesn't have as well-established relations with other services. The most significant proof of this procedure is that the majority of the deaths reported to the system are from the maternity services.

The third reason why the system is suffering from a lack of comprehensive data collection is that there are no organic ties between the maternal mortality notification system and the other registration systems. Even though the same health staff and/or health institutions provide data for both the maternal mortality notification system and burial permit system it can be seen that no connection has been established between these two systems. The same is also true for the MERNIS system.

The fourth reason for under-coverage of the maternal mortality notification system is mainly related with how the MoH looks upon the system. Rather than seeing the maternal mortality notification system as a tool to determine the causes of maternal deaths through in-depth analysis of the data, or the risk factors or avoidable factors resulting from the quality of the health services, and thus immediately take the necessary precautions, the MoH sees the system as a tool to determine the reasons for the deaths caused by the health service providers. Although the factors related to the quality of the service providers are also important in the prevention of maternal deaths, to concentrate solely on this issue and thus turn every maternal death into an investigation intimidates the service providers and thus results in an unwillingness to report such deaths.

Taking into account all the factors which weaken the comprehensiveness of the maternal mortality notification system, it is obvious that the following steps must be taken: developing an screening program during pregnancy so that it will be possible to include deaths occurring at home into the system; integration of other services into the system so that maternal deaths occurring outside the maternity services are included in the system; integration of the maternal mortality notification system with MERNIS and health facility records working on the basis of burial permits; help the concerned parties understand that the maternal mortality notification system should be used as a tool to understand the causes of maternal deaths, the risk factors and avoidable factors and thus be used as an instrument to develop a sustained policy to prevent maternal mortality rather than a tool that is used to intimidate the service provider. Additionally, a unit which will systematically analyze the data on maternal deaths collected by the MoH' district, province and central organizations and share the findings of these analyses with the concerned sectors must be set up. In addition to evaluating the quality of the data, the unit must be equipped with the tools to analyze the level of maternal deaths, their reasons, the risk factors and the avoidable factors. The staff to be employed in this unit must be a health staff who has received in-service training, statisticians and medical secretaries.

### **5.2.3 NMMS System**

The data collection system used in NMMS has many new features. Results of the research show that the NMMS system manages to keep deaths records and in particular maternal deaths records better than the other systems. However, the NMMS is not a perfect system. In this section the problems NMMS faced prior to and during data collection will be discussed under three headings: problems arising from province teams; problems arising from primary informants; and other problems.

#### **5.2.3.1 Problems Arising from Province Teams**

Within the NMMS system the province teams consist of a Province Project Coordinator, a Province Project Doctor, a Province Project Researcher, and District Coordinators. The province team, which is responsible for the training of the primary informants in center of provinces and districts, the implementation and coordination of data collection activities, consists of medical doctors except for the Province Project Researchers. Province Project Researchers are non-medical people recruited under the project budget to

perform data entry and verbal autopsy activities within the NMMS framework. The biggest problem faced within the province teams during the NMMS process was the high turnover of the health personnel in the teams, and in particular the district coordinators. Of the district coordinators, 72 out of 380 (19 percent) had to leave their posts. Since the newly appointed district coordinators were not informed by the ex-coordinators there was a delay in their adaptation period and this hampered the project activities for a certain period. The newly appointed district coordinators were put through a training program carried out by the central project team and as a result further delays and problems in the project activities were greatly reduced.

It was observed that due to their administrative duties some of the health staff in the province teams devoted limited time to NMMS activities. In particular, the people acting as the Province Deputy Director and the District Health Director passed on their duties to other health staff. In some cases, the Province Project Researchers had to carry out and coordinate all the NMMS activities at province level on their own. Such developments caused the NMMS system to slow down and in fact come to halt at certain points. The participation of health staff in the implementation of the many health related projects at province and district level was another factor slowing down the NMMS activities. In addition, some of the health staff in the province team pointed out that they couldn't receive any revolving fund payment from the hospitals they worked for due to their participation in NMMS activities. This also prevented the health staff from taking part full-time in the NMMS activities. In this respect, accepting data collection as one of the performance indicators for the revolving fund payment would greatly help the efforts to reduce the quality and under-coverage problems of all the data collected by the MoH.

The heavy workload of the staff working in the province teams delayed certain activities such as hospital record review, and verbal autopsy with the relatives of the deceased women. Although the nature of NMMS's data collection system leads to delays in the reporting of maternal deaths, the abovementioned problems which occurred both at province and district levels caused even further delays. One other reason for the delay in the verbal autopsy activities performed by the province project researcher was the failure to provide her with a vehicle for transportation. Depending on the size of the province, a certain amount of financial support was allocated to research activities from the NMMS budget but despite this, in some provinces the province project researchers couldn't make it to their appointments with the relatives of the deceased women because of lack of transportation. All of these problems led to delays in the health facility record review and verbal autopsy work. As a consequence of these delays, only 2,500 of the 4,500 expected questionnaires could be sent in the first 9 months of the NMMS fieldwork to the Hacettepe University Institute of Population Studies. In the last three months of the fieldwork and the two months following the fieldwork the number of questionnaires sent to the centre reached to 3,500.

In the NMMS provinces where the province project coordinator had a heavy workload the province project coordinator had to work alone to carry out all the NMMS activities. In these provinces, the province project researcher had difficulties communicating with the district coordinators who were doctors and this led to disruption in the project activities. Moreover, in areas except for the pilot provinces (Antalya and Erzurum), where the province

project researcher was not from within the health system, from time to time the province project researcher had difficulties with the health staff due to her lack of medical training.

### **5.2.3.2 Problems Arising from Primary Informants**

In NMMS, the village headmen and the municipality officials who report burials in the place of residence are defined as primary informants. At the overall level 16,139 primary informants took part in the 29 project provinces included into the NMMS. The primary informants underwent a training program to understand what the NMMS is and to understand their duties in the context of the NMMS. In compliance with the Training of Trainers principle, the primary informants' training was carried out by province and district teams who had been trained by academic staff from Hacettepe University Population Studies Institute. Although the primary informants' training sessions were organized in small groups, the village headmen' participation level was lower than expected at the beginning. With the cooperation of the local authorities, a majority (94 percent) of the primary informants' training was completed prior to the fieldwork. The training of the remaining primary informants was completed during the first month of the fieldwork through new training programs. It was observed that the reason put forward by the village headmen as an excuse not to participate in the training program was their “*just tell us what to do and we'll do it*” approach. The village headmen who attended the training program said that this was the first time they had been asked to undergo training for a duty they had been asked to do, and that, for example, they hadn't received any training to fill in the MERNIS forms. This shows that in-service training for village headmen is necessary with regard to their duties regarding the registration system.

Both during and after the training sessions some of the village headmen and municipality officials said that it wasn't their duty to keep burial records or report them. In order to persuade them, certain laws which clearly define these duties were explained to them within the training program. In addition, the duty assigned to primary informants under circular no. 80442, which was issued by the MoI on 21 February 2005 within the framework of NMMS was explained to them during the training program. The fact that village headmen and municipal officials are unaware of the duties assigned to them by laws. This shows that they, in particular village headmen should undergo training as to their job descriptions.

Although the clauses of the laws pertaining to burial records are quite clear, in many of the 29 provinces included in NMMS, including provinces and central districts, burial records were not kept. Within the framework of the NMMS, following a circular issued by the MoI, the number of settlements where burial records have been started to be kept has been increasing. As a consequence of the NMMS, in some settlements officials have become more aware of the importance of keeping burial records and have started keeping records. Village headmen have given heavy workload, insufficient pay, job description, and the duty of keeping burial records belonging to health clinics as their reasons for not keeping records. In most villages there were no Village Books (*Köy Defteri*) for keeping records and even if there were one only financial record were kept. Some village headmen asked how they could be expected to keep death records when there were no proper records of those alive. The municipalities gave a lack of personnel as a reason for not keeping burial records. It was also

noted that the municipalities that kept records did this for financial purposes. Nevertheless, there are quite a few municipalities, especially some of the Greater Municipalities, which keep records on computers and regularly send the data requested by NMMS via online.

It was observed that in the Eastern Anatolia Region burials took place during the night because of the belief that the deceased shouldn't be kept waiting. Burying the dead without a burial permit makes it impossible to keep burial records. Apart from the night burials, in cities with more than one cemetery it is difficult for the municipality to control all cemeteries and as a result illegal burials take place. Due to the geographical conditions in the area, the dead are buried in gardens instead of public cemeteries in the Black Sea region and as a result emerges as an obstacle to keeping proper burial records. Another common action is to obtain a burial transfer permit claiming the dead is to be buried in another town/city but to actually bury the deceased in the local cemetery. Since these local cemeteries are not controlled by the municipality it was impossible for primary informants to keep records of such burials.

During the NMMS' fieldwork a new law allowing greater municipalities to expand their geographical borders enabled municipalities to include some villages in territory. As a result some primary informant village headmen hesitated to hand in their burial lists because they were no longer village headmen but instead, headmen of a certain area within the city/town. Since burials in these cemeteries continued, it was decided to keep these villages within the NMMS system.

At the root of the problems stemming from primary informants was the fact that primary informants worked under the MoI while the province project teams asking for the burial records worked under the MoH. The village headmen and municipal officials didn't want to work under the control of the province project teams who were the staff of another ministry. This problem was overcome to a great extent once the MoI and other province and district officials involved into the project with official circulars. Yet some of the primary informants remained reluctant to give information to the staff of a different ministry.

Within the NMMS system, the main responsibility of the primary informants has been defined as keeping and handing the cemetery burial lists to the province or district project teams on a monthly basis even if there weren't any burials in the area of residence. The main purpose of this rule was to define the months in which burials took place but weren't reported. Another purpose was to contribute to the establishment of the habit of keeping records and reporting. However, village headmen were reluctant to fill in forms and report for the months in which no burials took place. This problem was greatly overcome with the efforts of province and district project teams in collaboration with province/district governors.

### **5.2.3.3 Other Problems**

NMMS is a MoH project carried out under the Turkey Reproductive Health Program. However, because no MoH official was present during the initial visits to the provinces within NMMS and during the province project teams' training sessions, the project was perceived more as a Hacettepe University study than one carried out by the MoH. As a result of this *false perception* some of the province and district project teams didn't show much interest in

the project at first. This perception was greatly changed after the MoH's efforts through province and district authorities.

Taking into consideration the size of the provinces which were part of NMMS, funds were allocated from the NMMS budget for the project activities at the provincial level. However, during the first visits to project provinces some of the province project teams wanted funds to be allocated to the Province Health Directorate since NMMS was a research financed by the European Union. Yet the province project team rejected these requests and allocated the money as previously planned. Nevertheless, these requests show that European Union projects are seen as an opportunity to demand funds for the various needs of the province. The MoH should take necessary measures to prevent such tendencies.

NMMS has tried to determine maternal deaths, which are known as rare events. This process, which began with primary informants' determining all maternal deaths within the 12-50 age groups, continued with the review of the health facility records kept by health facilities or verbal autopsies carried out by the province and district project teams. After the data was transferred to the centre, the causes of death were determined by a pre-review committee and a central review committee and data entry and analyses were carried out. As can be seen, just as in all RAMOS type studies, determining the death of a mother takes months. Therefore, it took 16 months to obtain the full results of the 12-month fieldwork. Taking into consideration that NMMS was more a registry study than a survey/sampling study, it will be better understood how difficult the record keeping process is. It must be said that using the NMMS methodology as a routine – if not unfeasible – it needs major commitment on central, provincial and district level.

### **5.3 Recommendations on Improved Death Certification**

Based on the experience made during the NMMS, the suggestions from the qualitative study in particular, and following several meetings with representatives of the MoH and TURKSTAT on the issue of death certification a number of recommendations are considered essential for improving the current death and causes of death certification system:

- Death certification and establishing cause(s) of death is not necessarily the same and should in the discussion be treated separately.
- Death certification is an administrative act in which different partners are involved. As a rule death should be certified by a medical doctor. This was also emphasized during the in-depth interviews with representatives of the health service. Main reasons are that sure signs of death must be established and it has to be decided whether the deceased died of a natural or an unnatural cause. In order to allow for this, the body must be thoroughly examined by a specially trained person with a medical background. In most countries this is a medical doctor.
- A death certificate must be issued which states the above, sex and age of the deceased, but also further details on the cause(s) of death. To establish detailed cause(s) of death is always a time consuming exercise, more so in an environment where about two thirds of

the deaths occur outside a hospital. From the examination of the dead body alone this may not be possible. Usually only a physical autopsy would allow for more detailed information. But this is no option for a routine procedure.

What is however at least as important as examining the dead body is taking the history of conditions and events which were eventually leading to the death. Taking this history can be done by a doctor, but also by any other health staff and even by a lay person.

In case of a hospital death usually a medical doctor will collect all necessary information from the patient records supplemented by talks to the health staff who attended to the deceased during death. For all other cases a Verbal Autopsy tool can be used which is described below.

- Verbal Autopsy uses a validated questionnaire which is in use in different countries comparable with Turkey. Responsibility for conducting the Verbal Autopsy should rest with the District Health Directorate. The questionnaire is applied during an interview with family members of the deceased ideally by a lay person. It does not need a medical staff. The questionnaire can however also be used as a checklist by a medical doctor during death certification (see above). At a later stage the questionnaire must be evaluated by a medical professional. Using the information in the questionnaire it will be possible to determine the cause(s) of death.
- It is important that causes of death are strictly formulated according to certain rules. The major ones being: Do not enter a terminal event such as ‘cardiac arrest’ as cause of death, state the chain of underlying conditions which were leading to the death and strictly use WHO ICD-10 terminology.
- Once causes are ascertained they need to be coded, preferably in a centralised manner.
- The VA tool could be used as a general routine for all cases of death. The responsibility for implementation should, as mentioned, rest with the District Health Directorate. A second option would be a Sample Vital Registration with Verbal Autopsy. In this case nationally representative information of the causes of death would be collected from a number of sites in the country using multi-stage probability sampling. The causes for hospital deaths should be taken from the hospital records assuming the standards as described above.
- The following conditions must be met in order to allow for a meaningful discussion on death certification and an improved causes of death statistics:
  - The Ministry of Health must consider the issue of improved causes of death statistics a priority to be stipulated as a policy. Good knowledge on causes of death is an essential tool for policy makers.
  - The MoH may have to consider the introduction of an incentive for performing death certification as it exists for treating patients, since both are meaningful medical services.

- At the same time, careful and systematic data collection can be made a criterion for performance evaluation.
- It is very encouraging that important next steps were already initiated, following the preparations by a working group in which also members of the NMMS core team participated. Two activities are of paramount importance: The first is the introduction of a new and improved Death Certificate in line with international standards. Suggestion for the section on causes and circumstances of death are provided as Annex 14. The second is the training of medical doctors - on the importance of death certification as an essential medical service, the accurate procedure of death certification, including the use of a checklist, and on ICD-10 terminology - which is indispensable for the purpose of standardisation.
- The training must be extended to medical doctors country wide, as in-service training, as a component of the new Family Practitioner System and as integral part of the basic training at medical school. In this way also the usually observed high turn-over of medical staff will not have a negative impact on the maintenance of good practices like high quality record keeping.
- Above all there is also a need for activities aimed at increasing the awareness among the general public on the importance of an accurate system of vital records.

#### **5.4 Recommendations on Measures to Reduce Maternal Deaths**

Looking at the tragic circumstances under which each one of the maternal deaths has occurred we have realised that measures must be taken to improve acceptance and in some places also accessibility for antenatal and obstetric care services. Families need to be able to recognize danger signs to ensure that care is sought promptly and from an appropriate facility. Useful information may be received from the current survey on health seeking behaviour which is carried out under the Reproductive Health Programme of the MoH. New community based approaches must be developed and implemented in each district of each province.

More efforts are also needed to reach women who do not want any more children, but who are not contracepting, with family planning services. This must be complemented by efforts to educate husbands who often play an important role in decisions about family planning.

Due to the described insufficient level of acceptance and accessibility many mothers died because they reached a health facility either not at all or too late. Yet also a good number of lives of mothers who died in a hospital could probably have been saved if situations had been managed more appropriately by the health staff.

Each one of these events was different and involved individual rather than systemic elements of misjudgement and/or mismanagement. This is why improving the situation on health facility level asks for a thorough evaluation of each of these events. This is not to accuse the persons involved but to fully understand the circumstances under which it happened so that lessons can be learnt. This important task of death audit should not be

restricted to maternal deaths but apply to all deaths which occur in hospitals. An *evaluation committee* should therefore be founded at each hospital.

As facilitation for this - in most hospitals - innovative approach the project team has prepared a comprehensive summary description of each pregnancy related death which occurred during the 12 months of data collection for all project province teams.

Apart from measures based on each hospitals individual findings and evaluation, steps to improve the management of maternal deaths at hospital level should focus on linkages between ante-natal, delivery and post-partum care. Standard protocols should be developed - or amended where existing - as integral components of pre-and in-service training as well as supervision in the public and the private health sector.

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# ANNEXES

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# ANNEX 1 – TERMS OF REFERENCES

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## Terms of Reference

### *Key Expert 1: Team Leader*

#### **Responsibility and duties**

The Team Leader is responsible for the correct technical implementation of the EU funded project Maternal Mortality Study with the identification number EUROPEAID/117577/C/SV/TR. He will represent the project on official occasions as meetings and conferences. The main place of work of the team leader is located in the project office in Ankara. He will establish close co-operation with the beneficiary the Ministry of Health in Ankara as well as to the authorities of the European Union in Turkey. He will ensure with all efforts the successful implementation of the project including the visibility of ICON-STITUT.

The project related work of the Team Leader will include specifically the following activities:

- To lead and co-ordinate the project in order to ensure the success of the project according to the envisaged outputs
- To lead and co-ordinate the project team and its activities in close coordination with all consortium partners;
- To liaise with the beneficiary at Ministry of Health and the Technical Assistance Team of the EU-funded programme for reproductive health, as well as with other relevant institutions such as the State Institute for Statistics;
- To liaise with other involved parties like the contracting authority EU-Delegation in Ankara;
- To plan the precise scope, terms of reference and timing of the involvement of the project key and non-key experts in close co-operation with the consortium partner HUIPS;
- To prepare the budget forecast for all project phases in close cooperation with all relevant consortium partners;
- To prepare a global and annual work plans to be submitted to the Steering Committee for approval. Annual work plans will be established on a six-monthly rolling basis;
- To ensure the implementation of the agreed work plans;
- To provide support as necessary for the smooth implementation of the subject areas of technical assistance inputs;
- To contribute as necessary to the work of the specialised inputs and ensure the timely provision of mission reports and/or documentation at the end of the subject areas missions;
- To ensure permanent progress monitoring of the project; including follow-up of the recommendations of the experts involved in the specialised inputs;
- To produce the inception report and regular six-monthly progress reports, which will include both the specific input of the advisory missions, a general overview of the

physical and financial progress in implementation, and the detailed work plan for the following reporting period. These reports will be submitted to the Steering Committee and the EC through its Representative Office;

- To produce a final report at the end of the project describing the evolution of the project and its achievements. The final report will also describe the prospects for sustainability and provide a chapter on lessons learnt and recommendations. The level of detail of this report should be such as to enable an independent evaluation of the results, both in quantitative and qualitative terms. The structure of the report has to be agreed upon with the beneficiary, the contracting authority and the ICON contract management in Köln.
- To produce monthly reports by the 10<sup>th</sup> of each month prior to each monthly monitoring meeting. The monthly report will describe progress achieved, problems arising and plans for the coming months. The report will be used to set the agenda for discussions at the monitoring meeting which will be attended by the Team Leader.
- To take all necessary measures to assure the visibility of the EC supported ICON project.
- Preparing for the Steering Committee meetings including draft agenda, reports, supporting documents, other related issues in close co-operation;
- To built up an internal monitoring system for the follow up of the project objectives, administrative tasks, use of resources and book keeping.
- The team leader has to inform the ICON contract management about the project progress directly (at least once a week). He has to communicate all project related problems immediately. He is committed to keep confidentiality on all project related information.

The Team Leader is responsible for the correct use of the local project budget. He will regularly prove it by means of the monitoring system including book keeping and the provision of the supporting documents like invoices, original receipts, travel documents etc. The financial reporting to ICON will be done on a monthly basis.

**Terms of Reference**  
***Key Expert 2: Principal Investigator***

The Principal Investigator will work with the project on an intermittent basis for a total of 132 working days. In the project team she will have main responsibility with the development of the research design, the development of the research instruments, training of province team members, supervision of the training of district coordinators as well as the supervision of data collection.

The following tasks are specified:

- Identification and analysis of existing information and data sources including the 2000 Turkey Census, the 2003 TDHS and other as relevant
- Lead the project team in the finalisation of the quantitative study methodology
- Assist in the preparation of model based estimation and qualitative study component
- Identification and development of survey instruments
- Design and supervise the pilot study
- Revise methodology and instruments according to the outcome of the pilot study
- Assist in organising regional kick-off meetings
- Assist in the identification and train Provincial Project Teams as trainers (TOT) and on verbal autopsy methodology
- Assist in the supervision of the training of District Coordinators
- Supervise the identification and training of primary informants
- (Assist in the) design of a quality control concept
- Assist in the supervision of the actual data collection and scrutinise the verbal autopsy reports
- Analyse NMMS data
- Assist in conducting national and regional workshops for the dissemination of study results
- Assist the team leader in the reporting by providing relevant sections for the Inception Report, the report on the pilot study, the 6-monthly progress reports and the Final Project Report.

**Terms of Reference**  
***Key Expert 3: Field Team Leader***

The Field Team Leader will be working with the National Maternal Mortality Study for a total of 18 months during the two years life span of the project. His main responsibility is the preparation and execution of the field survey including pilot testing of the research concept and tools.

The following tasks are specified:

- Together with the team leader coordinate and finalise the elaboration of the research protocol, which should include a detailed description of all research methods to be applied, the final version of the study sample, the work plans, staffing schedules, the logistics set-up and a monitoring concept
- Take major responsibility in organising and conducting the kick-off meetings to announce the initiation of the project
- Support other team members in the sampling procedure
- Together with other team members develop survey instruments and training materials
- Co-ordinate the development and implementation of a quality control concept
- Support the team leader in his negotiations with the Ministry of Health, Ministry of Interior and in the Steering committee meetings
- Co-ordinate preparation and execution of the pilot study
- Ensure all necessary amendments of the methodology as result of the pilot study
- Seek collaboration of provincial governors and provincial health offices
- Co-ordinate (and actively participate in) the selection of provincial project teams, their training, supervision and remuneration (as appropriate)
- Co-ordinate the supervision of the training of District Co-ordinators
- Together with other team members supervise the NMMS data collection activities and data entry and ensure the establishment of an appropriate data base
- Support the qualitative component of the study
- Take major responsibility in organising and conducting a national conference as well as two regional conferences on the results of the NMMS as well as a press conference
- Support the team leader in the production of the following reports by providing substantial contributions to these reports as far as the responsibilities of the field team leader are concerned: Inception report, pilot study report, quarterly reports to MoH, Steering Committee and EC as well as final report.
- Oversee the proper use of the HUIPS budget with the help of the project assistant, account for all expenditures and present monthly financial reports to the team leader
- All duties of the Field Team Leader will follow the main time schedule which is part of the main contract between the donor, the MoH and the consortium as well as the quarterly work plans which are prepared successively.

**Terms of Reference**  
***Key Expert 4: Statistics/Sampling Expert***

The Statistics/Sampling Expert will work with the project on an intermittent basis for a total of 6 months. In the project team he will have main responsibility with the development of the study sample, the supervision of data collection, data processing and evaluation as well as the training and supervision of the provincial team members and of the training of district coordinators.

The following tasks are specified:

- Lead the team in the finalisation of all sampling issues including the calculation of confidence intervals and standard errors
- Together with other team members carry out the identification of cemeteries, health facilities and households
- Support the team in the development of the survey instruments and training materials
- Together with the rest of the team prepare, conduct and evaluate a pilot study after which the survey concept will be amended accordingly
- Take part in the preparation and conduction of a national and several regional kick-off meetings
- Conduct trainings of trainers and supervise the provincial project teams
- Assist in the development and application of a feasible quality control concept and take main responsibility in assuring a high quality of data processing and analysis
- He will supervise the field staff and have overall responsibility in all issues of data collection and the entry of NMMS data into the computers of HUIPS in Ankara.
- He will also evaluate and further refine data from other sources which may be essential for determining maternal mortality (e.g. TDHS, census, vital registration and others as appropriate)
- He will be responsible for the comparison of aggregate and individual level data from different sources
- He will support the team in all major committee meetings
- He will prepare and submit to the team leader relevant sections for the following reports: Inception report, report on the pilot study, all quarterly reports and the final study report.
- All duties of the Statistics/Sampling Expert will follow the main time schedule which is part of the main contract between the donor, the MoH and the consortium as well as the quarterly work plans which are prepared successively.



# ANNEX 2 – DATA ON MATERNAL MORTALITY FOR TURKEY

Source	Method	Population	MMR per 100,000 (95%CL)	LTR: 1 in	MD/PRD	Births	FD	PMDF	Year of estimate
WHO, UNICEF & UNFPA, 2004	Model	National	70 (18-130)	480	1000	1,428,571	20,000	5	2000
WHO. 2001; Hill et al 2001	Model	National	55 (18-160)	570	780	1,418,181	19,500	4	1995
WHO 1996	Model	National	180	130	2900	1,611,111	NA	NA	1990
Turkish MoH, Başkent Univ. & School of Public Health, 2003	Population-based	National (n=12000)	24.4 <i>MMRate = 1.7</i>	NA	1	4097	151	0.7	2002-03
	Population-based;		132		115		928	12.4	
	Sisterhood survey	National (n=53280)	139	189	215		1713	12.6	1981
TURKSTAT 1993 Turkish Population Survey	Population-based;	National (n=17327)	144	167	314	NA	2849	10.7	1978
	Population-based	National (n=17327)	MMrate= 376	149	378	NS	5079	7.4	1974
	Population-based	Nevşehir province; Etimesgut & Cubuk districts, Ankara	208	NS	NS	NS	NS	NS	1974-75
Tezcan et al 1990	Population-based	Kahramanmaraş, South-eastern region	157554	NA	5	157554	96	5.2	1984-85
Derrişođlu 1988 unpublished, in WHO 1990	Population-based	Adıyaman, South-eastern region	<i>MMRate = 3.2</i>	NA	NS	NS	NS	NS	1986
Derrişođlu 1988 unpublished, in WHO 1990	Population-based	Etimesgut & Çubuk health training research areas	284	NS	NS	NS	NS	NS	1986
Derrişođlu 1985, in WHO 1990	Population-based	615 Hospitals in 53 of 81 provinces	91	NS	NS	NS	NS	NS	1973 or 1975-83
Akin, A. et al. (2000) and Biliker 2003	Facility-based	Ondokuz Mayıs University Hospital, Samsun	119	NA	37	31,051	NS	NS	1997-98
Malatyahođlu et al 2006	Facility-based	Ondokuz Mayıs University Hospital, Samsun	49	NA	323	656,446	6371	5.1	1998-2005
Yanık et al 1999	Facility-based	Ondokuz Mayıs University Hospital, Samsun	412	NA	27	6553	NA	NA	1978-97
			822.2	NA	87	10,584	NA	NA	1968-2004
			143.4		128	81731			1998-2004
			80.9		8	9892			1993-97
			29.3		3	10230			1988-92
			97.7		12	12281			1983-87
			86.8		15	17281			1978-82
			199.0		31	15581			1973-77
Bozkurt Özyüncü & Ayhan 2006	Facility – based	Hacettepe University Hospital	381.6	NA	36	9435	NA	NA	1968-72
			417.7	NA	23	5507	NA	NA	1968-72
			180						1988-92
Ayhan et al 1994	Facility-based	Hacettepe University Hospital	73.7	NA	117	59,993	NA	NA	1968-72
Ayhan et al 1990, n PUBMED	Facility-based	Hacettepe University Hospital	417.7	NA	(108)	59,993	NA	NA	-
Ayhan et al. 1989, in PUBMED	Facility-based	Hacettepe University Hospital	140	NA	NS	NS	NA	NA	1971-81
		Zekai Tahir Burak Women's Education & Research Hospital, Ankara	64.1	NA	13	20,291	NA	NA	1982-2001
Akar et al 2004	Facility-based	Cumhuriyet University Hospital, Sivas	40.4	NA	174	430,559	NA	NA	2001
Çetin et al 2003	Facility-based	Zübeyde Hanım Maternity Hospital, Cerrahpaşa University Hospital, İstanbul	11.6	NA	35	7424	NA	NA	1982
			85.1	NA	17	100,531	NA	NA	1992-2002
			471	NA	34	100,531	NA	NA	1983-92
			16.9						1991-92
Tuncer et al 1995	Facility-based	Zübeyde Hanım Maternity Hospital, Cerrahpaşa University Hospital, İstanbul	12.8	NA	17	100,531	NA	NA	1983-84
Aksu et al 1998	Facility-based	Cerrahpaşa University Hospital, İstanbul	22.6	NA	34	19,808	NA	NA	1991-96
Derrişođlu 1985 unpublished, in WHO 1990	Facility-based	Six Çubuk health centres	81	NA	NS	NS	NS	NS	1973-83
Biri, Öztürk, & Maral, 2002, in PUBMED	Facility-based	Ankara Hospitals	73 to 341	NS	NS	NS	NS	NS	or 1975-83
			NS	NS	58	NS	NS	NS	1997-2000

<sup>(\*)</sup>Figures in italics were calculated by the authors based on the original sources

NA = not available

NS= original not seen



# ANNEX 3 –LIST OF PERSONNEL

## Project Director

Prof. Dr. Sabahat Tezcan, *HUIPS*

## Technical Director

Assoc. Prof. Dr. İsmet Koç, *HUIPS*

## Key Experts

Dr. Rudolf Schumacher, *Team Leader, ICON*

Assoc. Prof. Dr. İsmet Koç, *Field Team Leader, HUIPS*

Dr. Oona Campbell, *Principal Investigator, ICON*

Dr. A. Sinan Türkyılmaz, *Statistician/Sampling Expert, HUIPS*

## Non-Key Experts

Assoc. Prof. Dr. Banu Ergöçmen, *HUIPS*

Assoc. Prof. Dr. Attila Hancıoğlu, *HUIPS*

Assoc. Prof. Dr. Turgay Ünalın, *HUIPS*

## Project Assistants

Pelin Çağatay, *ICON*

Arzu Baykara, *ICON*

## Quantitative Survey Coordinators

Assoc. Prof. Dr. İsmet Koç, *Survey Coordinator*

Kazım Tuğ, *Assistant Survey Coordinator*

## Quantitative Survey Field Coordinators

Kazım Tuğ (*Antalya, İstanbul, Tekirdağ, Sakarya, Erzurum, Ağrı, Bayburt*)

Yadigar Coşkun (*Adana, K. Maraş, Gaziantep, Nevşehir*)

İlknur Yüksel (*Diyarbakır, Batman, Van*)

H. Yaprak Civelek (*İzmir, Aydın, Burdur*)

Mehmet Ali Eryurt (*Bartın, Ordu, Giresun*)

Pelin Çağatay (*Ankara, Çankırı, Karaman*)

Sutay Yavuz (*İstanbul, Tekirdağ, Sakarya*)

Gürol Yağcıer (*Malatya, Sivas, Tokat*)

Erhan Özdemir (*Kütahya, Bursa, Balıkesir*)

Elif Kurtuluş (*Kütahya*)

Alanur Çavlin Bozbeyoğlu (*Bursa, Balıkesir*)

Ceren Topgül (*Erzurum, Ağrı, Bayburt*)

## Qualitative Survey Coordinators

Assoc. Prof. Dr. Banu Ergöçmen, *Survey Coordinator*

İlknur Yüksel, *Assistant Survey Coordinator*

## Qualitative Survey Interviewers

İlknur Yüksel, *HUIPS*

Yadigar Coşkun, *HUIPS*

Mehmet Ali Eryurt, *HUIPS*

Kazım Tuğ, *HUIPS*

Alanur Çavlin Bozbeyoğlu, *HUIPS*

## Data Entry and Data Processing

M. Ali Eryurt, *Office Data Entry Coordinator*

Kazım Tuğ, *Field Data Entry Coordinator*

Yadigar Coşkun, *Data Analyst*

Taner Cigeroğlu, *Programmer*

Tuğba Adalı, *Keyer*

Oktay Ünalın, *Keyer*

Özgür Yüce, *Keyer*

## Steering Committee Members

Prof. Dr. Sabahat Tezcan, *HUIPS Director*

Assoc. Prof. Dr. İsmet Koç, *HUIPS Head of Technical Demography*

Dr. Rudolf Schumacher, *Team Leader, ICON*

Dr. Mehmet Rifat Köse, *MoH MCH/FP General Director*

Figen Tunçkanat, *Delegation of European Commission to Turkey*

Tuncer Kocaman, *SPO Population Section*

Dr. İbrahim Açıkalın, *MoH MCH/FP Deputy General Director*

Dr. Levent Eker, *MoH General Directorate of Ministry of Health MCH/FP*

Ayşe Toprak, *Turkish Statistical Institute Head of Health Statistics Unit*

Hakan Sakallı, *MoI General Directorate of Population and Citizenship Affairs*

Hafize Zülüflü, *MoI General Directorate of Local Authorities*

Göksel Toker, *MoI General Directorate of Population and Citizenship Affairs*

Berrak Bora Başara, *MoH School of Public Health*

## Central Review Committee Members

Prof. Dr. Sabahat Tezcan, *Head of Central Review Committee*

Prof. Dr. Tekin Durukan, *Hacettepe University Faculty of Medicine, Gynaecologist and Obstetrician*

Prof. Dr. Hilal Özcebe, *Hacettepe University Faculty of Medicine, Public Health Expert*

Prof. Dr. Levent Akın, *Hacettepe University Faculty of Medicine, Public Health Expert*

Prof. Dr. Onur Karabacak, *Gazi University Faculty of Medicine, Gynaecologist and Obstetrician*

Assoc. Prof. Dr. Işıl Maral, *Gazi University Faculty of Medicine, Public Health Expert*

Assoc. Prof. Dr. Aydan Biri, *Gazi University Faculty of Medicine, Gynaecologist and Obstetrician*

Assoc. Prof. Dr. Sefa Kelekçi, *MoH Adana Research Hospital, Gynaecologist and Obstetrician*

Assoc. Prof. Dr. Seçil Özkan, *Gazi University Faculty of Medicine, Public Health Expert*

Dr. Utku Özcan, *MoH Zekai Tahir Burak Maternity Hospital, Gynaecologist and Obstetrician*

Dr. Levent Eker, *MoH General Directorate of Ministry of Health MCH/FP, Public Health Expert*

Dr. Murat Ekin, *MoH Zekai Tahir Burak Maternity Hospital, Gynaecologist and Obstetrician*

Dr. A. Okyar Erol, *MoH Etlik Maternity Hospital, Gynaecologist and Obstetrician*

## Pre-Review Committee Members

Dr. Rudolf Schumacher, *Head of Pre-Review Committee*

Dr. Alev Yücel, *MoH Ankara Health Directorate*

Dr. Meltem Şengelen, *Hacettepe University Oncology Hospital*

Dr. Nurten Çakmak, *MoH Çubuk State Hospital*

Dr. Aylin Sepici, *Gazi University Faculty of Medicine*

## Project Province Teams

### Adana

Dr. Mutlucan Karaman, *Project Province Coordinator*  
Dr. Ahu Demirci, *Project Province Doctor*  
Fulya Karaca, *Project Province Researcher*  
Dr. Sedat Gülümsek, *District Coordinator (Seyhan)*  
Dr. Süleyman Dilek, *District Coordinator (Seyhan)*  
Dr. Salih Kamışlıoğulları, *District Coordinator (Yüreğir)*  
Dr. Selim Soğancı, *District Coordinator (Aladağ)*  
Dr. Mehmet Ali Karyağ, *District Coordinator (Aladağ)*  
Dr. Teyfik Altınsoy, *District Coordinator (Ceyhan)*  
Dr. A. Okan Kum, *District Coordinator (Feke)*  
Dr. Savaş Kaya, *District Coordinator (Feke)*  
Dr. İbrahim Ethem Ağca, *District Coordinator (İmamoğlu)*  
Dr. Fahrettin Öz, *District Coordinator (Karaisali)*  
Dr. Kemal Ertsak, *District Coordinator (Karataş)*  
Dr. Zekeriya Eğri, *District Coordinator (Kozan)*  
Dr. Münevver Gün, *District Coordinator (Pozantı)*  
Dr. Ali Rıza Çiloğlu, *District Coordinator (Pozantı)*  
Dr. İrfan Aydın, *District Coordinator (Saimbeyli)*  
Dr. Ahmet Türkmen, *District Coordinator (Tufanbeyli)*  
Dr. Ali Uzun, *District Coordinator (Tufanbeyli)*  
Dr. Hasan Tatlı, *District Coordinator (Yumurtalık)*

### Ağrı

Dr. Harun Erkan Aytekin, *Project Province Coordinator*  
Doğan Aydın, *Project Province Coordinator*  
Dr. Hatice Yılmaz, *Project Province Coordinator*  
Dr. Özben Uluçer, *Project Province Doctor*  
Sevgi Berkalp, *Project Province Researcher*  
Doğan Aydın, *District Coordinator (Merkez)*  
Dr. Hatice Çalışkan, *District Coordinator (Diyadin)*  
Dr. Aytaç Kuş, *District Coordinator (Diyadin)*  
Dr. Eylem İnce, *District Coordinator (Doğubayazıt)*  
Dr. Pelin Çekiç, *District Coordinator (Eleşkirt)*  
Fehmi Altun, *District Coordinator (Eleşkirt)*  
Dr. Reşit Öztürk, *District Coordinator (Hamur)*  
Dr. Ülkü Başkaya, *District Coordinator (Patnos)*  
Dr. İbrahim Renkliçay, *District Coordinator (Patnos)*  
İsmail Kılıç, *District Coordinator (Patnos)*  
Dr. Mehmet Orhan, *District Coordinator (Taşlıçay)*  
Dr. Meryem Demirelli, *District Coordinator (Tutak)*

### Ankara

Dr. Deniz Çakmak, *Project Province Coordinator*  
Dr. Mehveç Çetin, *Project Province Doctor*  
Sevgi Balcı, *Project Province Researcher*  
Dr. Yurdagül Su, *District Coordinator (Altındağ)*  
Dr. Zerrin Fidan, *District Coordinator (Çankaya)*  
Dr. Ufuk Özdemir, *District Coordinator (Etimesgut)*  
Dr. Pervin Dere, *District Coordinator (Etimesgut)*  
Dr. Bülent Başköylü, *District Coordinator (Gölbaşı)*  
Dr. Muhterem Akbay, *District Coordinator (Keçiören)*  
Dr. Ediz Çetinağaç, *District Coordinator (Keçiören)*  
Dr. Ahmet Karaçakol, *District Coordinator (Keçiören)*  
Dr. Ahmet Emin Okuyucu, *District Coordinator (Keçiören)*  
Dr. Halil Ülgen, *District Coordinator (Abidinpaşa)*

Dr. Okan Demiralp, *District Coordinator (Gülveren)*  
Dr. Hatice Terin Aksoy, *District Coordinator (Gülveren)*  
Dr. Fatih Eroğlu, *District Coordinator (Sincan)*  
Dr. Mustafa Alptekin, *District Coordinator (Sincan)*  
Dr. Melek Aktaş, *District Coordinator (Yenimahalle)*  
Dr. Bekir Vural, *District Coordinator (Yenimahalle)*  
Dr. Mehmet Çakmak, *District Coordinator (Akyurt)*  
Dr. Özgehan Aydın, *District Coordinator (Akyurt)*  
Dr. İsmail H. Şenkal, *District Coordinator (Ayaş)*  
Dr. Soner Tektaş, *District Coordinator (Ayaş)*  
Dr. Mehmet İlhan Özilhan, *District Coordinator (Bala)*  
Dr. Harun Yalın, *District Coordinator (Bala)*  
Dr. Kerem Zeki Fikret, *District Coordinator (Beypazarı)*  
Dr. Erol Uzunoğlu, *District Coordinator (Beypazarı)*  
Dr. İsmail Doğan, *District Coordinator (Beypazarı)*  
Dr. Kerem Devrim Özkan, *District Coordinator (Çamlıdere)*  
Dr. Ali Dilek, *District Coordinator (Çamlıdere)*  
Dr. Köksal Ergün, *District Coordinator (Çubuk)*  
Dr. Derya Karakurt, *District Coordinator (Çubuk)*  
Dr. Hakan Kaya, *District Coordinator (Elmadağ)*  
Dr. Yakup Bilgiç, *District Coordinator (Elmadağ)*  
Dr. Hakan Sezen, *District Coordinator (Evren)*  
Dr. Salih Topcuoğlu, *District Coordinator (Evren)*  
Dr. Ömer Özgür Ceylan, *District Coordinator (Güdüllü)*  
Dr. Hakan Nezir, *District Coordinator (Güdüllü)*  
Dr. Burak Cengiz, *District Coordinator (Haymana)*  
Dr. Ali Alkan, *District Coordinator (Kalecik)*  
Dr. Cahide Demir, *District Coordinator (Kalecik)*  
Dr. Selami Cengiz, *District Coordinator (Kazan)*  
Dr. Makbule Doğan, *District Coordinator (Kazan)*  
Dr. İsmail Doğan, *District Coordinator (Haymana)*  
Erkan Çakıcı, *District Coordinator (Haymana)*  
Dr. Mediha Yalçın, *District Coordinator (Nallıhan)*  
Dr. Ayşen Ay, *District Coordinator (Nallıhan)*  
Dr. Murat Yücel, *District Coordinator (Polatlı)*  
Dr. Özlem Karayel, *District Coordinator (Polatlı)*  
Dr. Arzu Mumcu, *District Coordinator (Polatlı)*  
Dr. Taner Dalkılıç, *District Coordinator (Ş.Koçhisar)*  
Dr. İsrail Atasoy, *District Coordinator (Ş.Koçhisar)*

### Antalya

Dr. Bilge Uysal, *Project Province Coordinator*  
Dr. Perihan Özgüner, *Project Province Doctor*  
Hülya Arıgan (Nurse), *Project Province Researcher*  
Dr. Rahime Erbaş Yıldırım, *District Coordinator (Akseki)*  
Dr. Ayşe Hazırbulan, *District Coordinator (Akseki)*  
Dr. Ferda Menekşe, *District Coordinator (Alanya)*  
Dr. Gaye Kızdanoğlu, *District Coordinator (Elmalı)*  
Dr. Aylin Sadıklar, *District Coordinator (Finike)*  
Dr. Erdoğan Cengiz, *District Coordinator (Gazipaşa)*  
Dr. Uğur Öztürk, *District Coordinator (Gündoğmuş)*  
Dr. Cenk Tunç, *District Coordinator (İbradı)*  
Dr. Selçuk Tanrıku, *District Coordinator (Kale)*  
Dr. Halil İbrahim İstekli, *District Coordinator (Kale)*

Dr. Şakir Aktaş, *District Coordinator (Kaş)*  
Dr. Aylin Öztürk, *District Coordinator (Kemer)*  
Dr. Özgür Deniz Sadioğlu, *District Coordinator (Korkuteli)*  
Dr. Fatma Bucaklıoğlu, *District Coordinator (Korkuteli)*  
Dr. Serap Kandemir, *District Coordinator (Kumluca)*  
Dr. Duygu Şen, *District Coordinator (Manavgat)*  
Dr. Ertan Şahbaz, *District Coordinator (Serik)*

#### **Aydın**

Dr. Demet Meteöglü, *Project Province Coordinator*  
Dr. Muazzez Meydan, *Project Province Doctor*  
Dr. Perihan Özdemir, *Project Province Doctor*  
Sinem Çine, *Project Province Researcher*  
Dr. Muazzez Meydan, *District Coordinator (Merkez)*  
Dr. Nail Üstündağ, *District Coordinator (Bozdoğan)*  
Dr. Zafer Sapmaz, *District Coordinator (Buharkent)*  
Dr. Metin Şahin, *District Coordinator (Çine)*  
Dr. Erdal Ayaz, *District Coordinator (Didim)*  
Dr. Ali Yavaşoğlu, *District Coordinator (Germencik)*  
Dr. Hamza Bala, *District Coordinator (İncirliova)*  
Dr. Mehmet Acar, *District Coordinator (Karacasu)*  
Dr. Derya Kepe, *District Coordinator (Karpuzlu)*  
Dr. Taşkın Can, *District Coordinator (Koçarlı)*  
Dr. Ali Bulut, *District Coordinator (Köşk)*  
Dr. Şükrü Güngör, *District Coordinator (Kuşadası)*  
Dr. İsmail Ertin, *District Coordinator (Kuyucak)*  
Dr. Mehmet Yitim, *District Coordinator (Nazilli)*  
Dr. Hakan Tokgöz, *District Coordinator (Söke)*  
Dr. Osman Sezgen, *District Coordinator (Sultanhisar)*  
Dr. Çetin Çakıcı, *District Coordinator (Yenipazar)*

#### **Balıkesir**

Dr. Nimey Ünal, *Project Province Coordinator*  
Dr. Songül Kakıcı, *Project Province Doctor*  
Semra Yaren, *Project Province Researcher*  
Dr. Songül Kakıcı, *District Coordinator (Merkez)*  
Dr. Selçuk Türer, *District Coordinator (Ayvalık)*  
Dr. Semra Bayram, *District Coordinator (Balya)*  
Dr. Zafer Yılmaz, *District Coordinator (Bandırma)*  
Dr. Ali Keskin, *District Coordinator (Bigadiç)*  
Dr. Birgi Tuna, *District Coordinator (Burhaniye)*  
Sağ. Mem. Ruhi Bahar, *District Coordinator (Dursunbey)*  
Dr. Sabri Arpacıoğlu, *District Coordinator (Edremit)*  
Dr. Yasemin Baş, *District Coordinator (Erdek)*  
Dr. Faruk Tırpan, *District Coordinator (Gömeç)*  
Dr. Suat Koyun, *District Coordinator (Gönen)*  
Dr. Levent Fitöz, *District Coordinator (Havran)*  
Dr. Ömer Öder, *District Coordinator (İvrindi)*  
Dr. Bilgin Uzun, *District Coordinator (Kepsut)*  
Dr. Ramazan Şahin, *District Coordinator (Manyas)*  
Dr. Mehmet Oğuz Dildök, *District Coordinator (Marmara)*  
Dr. Önder Özcan, *District Coordinator (Savaştepe)*  
Sağ. Mem. İsmail Özdemir, *District Coordinator (Sındırgı)*  
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Dr. Emin Saçan, *District Coordinator (Gercüş)*  
Dr. Göksel Gündüz, *District Coordinator (Hasankeyf)*  
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Dr. İbrahim Yağız, *District Coordinator (Eyüp)*  
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Dr. Aslan Saçmal, *District Coordinator (Şarkışla)*  
Dr. Önder Karaman, *District Coordinator (Ulaş)*  
Dr. Gülezer Alaşalvar, *District Coordinator (Yıldızeli)*  
Dr. Hasan Yılmaz, *District Coordinator (Zara)*

### **Tekirdağ**

Dr. İlknur Mercanoğlu, *Project Province Coordinator*  
Dr. Zehra Doğramacıoğlu, *Project Province Coordinator*  
Dr. Şenol Özcan, *Project Province Doctor*  
Seda Şirin, *Project Province Researcher*  
Dr. İlknur Mercanoğlu, *District Coordinator (Merkez)*  
Dr. Nurcihan Başkent, *District Coordinator (Çerkezköy)*  
Dr. Veyis Gedikoğlu, *District Coordinator (Çorlu)*  
Dr. Alper Halogo, *District Coordinator (Hayrabolu)*  
Dr. Refet Çeviker, *District Coordinator (Malkara)*  
Dr. Tunca Aybar, *District Coordinator (Marmara Ereğlisi)*  
Dr. Mehtap Şen, *District Coordinator (Muratlı)*  
Dr. Muhteşem Bayraktar, *District Coordinator (Saray)*  
Dr. Ali Okutan, *District Coordinator (Şarköy)*

### **Tokat**

Dr. Kaya Yılmaz, *Project Province Coordinator*  
Dr. Harika Güneş, *Project Province Doctor*  
Melike Işiker, *Project Province Researcher*  
Dr. Kaya Yılmaz, *District Coordinator (Merkez)*  
Dr. Hasip Sapçı, *District Coordinator (Almus)*  
Dr. Erkut Karasu, *District Coordinator (Artova)*  
Dr. Sedat Akkan, *District Coordinator (Başçiftlik)*  
Dr. Faruk Kalkan, *District Coordinator (Erbaa)*  
Dr. Baki Baştürk, *District Coordinator (Niksar)*  
Dr. Zafer İpek, *District Coordinator (Pazar)*  
Dr. İzzet Mısırlı, *District Coordinator (Reşadiye)*  
Dr. H. İbrahim Çekmece, *District Coordinator (Sulusaray)*  
Dr. Yakup Kavaz, *District Coordinator (Turhal)*  
Dr. Fatih Sercandere, *District Coordinator (Yeşilyurt)*  
Dr. İhsan Canbolat, *District Coordinator (Zile)*

### **Van**

Dr. Berfin Özgökçe, *Project Province Coordinator*  
Dr. Leyla Çelik, *Project Province Doctor*  
Elif Çiçekdenk, *Project Province Researcher*  
Dr. Hazan Caner, *District Coordinator (Merkez)*  
Dr. Zeki Şenduryıldız, *District Coordinator (Bahcesaray)*  
Dr. Alper Can, *District Coordinator (Başkale)*  
Dr. İsmail Burak, *District Coordinator (Çaldıran)*  
Dr. Şükran Talaş, *District Coordinator (Çatak)*  
Dr. Ayhan Kaya, *District Coordinator (Edremit)*  
Dr. Can Turan, *District Coordinator (Erciş)*  
Dr. Kerim Keleş, *District Coordinator (Gevaş)*  
Dr. Göksel Saruhan, *District Coordinator (Gürpınar)*  
Dr. Nurettin Yüzkat, *District Coordinator (Muradiye)*  
Dr. Aytakin Esen, *District Coordinator (Özalp)*  
Dr. Ümran Akkoç, *District Coordinator (Saray)*



# ANNEX 4 – PILOT STUDY

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## **The set-up of the pre-test**

In the first Steering Committee Meeting held on 21 October 2004 it was decided to conduct a pilot study in Antalya between January-February 2005 in order to test the NMMS research design as well as forms and questionnaires to be used for data collection. The basic rationale underlying this choice for Antalya province was its seasonal characteristics during winter and the mix of greater municipality and rural status.

Following the Steering Committee's approval, the project team visited the Deputy Governor, the Province Health Director, the Head of MCH-FP Unit, and the Director of the Greater Municipality Cemetery to inform them about the project. The Kick-off Meeting on 21 December 2004 was attended by the Governor of Antalya. Training sessions for the Province Project Team, all District Coordinators as well as some District Health Group Leaders and district cemetery officials were held on 22 December 2004. The main content of the training was on roles and responsibilities and on how to train primary informants (i.e. cemetery officials and village headmen).

Through a letter signed by the Deputy Governor and the District Governors the municipal cemetery officials and the village headmen of all districts were invited to their district centres for training during the week starting from 3 January 2005. The trainings were conducted in predetermined training centres in groups of 20-25 persons. 97 % of invitees attended. Only 17 village headmen did not come.

During the training of primary informants standard training material was used which had been prepared by the Central Project Team. For primary informants handbooks had been developed explaining the reporting system and the rules about how to fill the forms. The training of primary informants was observed by HUIPS Coordinators who were all assigned to different districts and in some places also by the Central Project Team. At the end of the training data collection forms were distributed to the primary informants.

First experience with the training sessions were discussed in a plenary of all research assistants and the central team in Ankara. On 27.01.2005 the central project team went to Antalya for a mid-term evaluation meeting with province and district coordinators to discuss problems during training, implementation and first reporting phase and to propose solutions. On 17.02.2005 a final evaluation meeting was organized. In these meetings, province/district coordinators reported on the basis of a standard format the current situation on data collection activities in their districts, the problems they faced as well as suggestions.

On 08.02.2005 a focus group study was conducted in Antalya Province Health Directorate with randomly selected 9 headmen from the villages linked to the center on the

problems faced during the pilot study. In particular they discussed on the quality of the training they received, the appropriateness of the forms for data collection and the problems with the submission of the forms to the province/district coordinators. It was also discussed whether the screening question on pregnancy can or can't be asked.

### **Detailed experience during the pre-test**

This sub-section will describe in detail experience during the training, implementation and data reporting phases of the pre-test conducted in Antalya.

#### **Training phase**

In NMMS Antalya pre-test a two-phase training plan was implemented. During the first phase province project team and district coordinators were trained. In the second phase province project team and district coordinators trained the primary informants (village headmen and municipal cemetery officials). 13 out of 14 district coordinators attended the training of district coordinators organized by the central project team. The district coordinator who had not attended was trained separately by the province project team.

The basic problems district coordinators faced during the training of primary informants are as follows:

- There was a delay in sending the invitation letters to primary informants for the training. The basic reason for this delay was that the time allocated for training invitation was only 1 week and the district teams were also not able to cooperate with local administrators on time.
- District coordinators had difficulty sending the invitation letters signed by the deputy governor and district governors especially to the village headmen. They tried to make use of the gendarmerie and of health centres. Some district coordinators called the headmen via phone directly but had difficulties locating them in some places. In spite of all these difficulties 97 % of the primary informants attended the training.
- It was observed that the physical conditions of the training rooms used in the district centers were very partly insufficient. In some districts training had to be conducted under inappropriate conditions.
- Although it has been stressed that the primary informant training should be given to groups with 20-25 people maximum, in some districts the groups were composed of up to 50 people. It was observed that the efficiency was limited in districts with large training groups.
- Although participation rate of primary informants to the trainings was high, the motivation of some primary informants during training was very low and they also were reluctant to perform the tasks assigned to them. Lack of motivation was also observed among some district coordinator.

- The village headmen especially, declared that it was not their duty to collect burial information, i.e. they did not know their legal responsibilities. They insisted that this should be done by health centres or health houses.
- Some primary informants perceived the training method, the handbooks prepared for them and the training provided by the district coordinators above their educational level and complicated. Especially village headmen said that they could not fill the CBL and FBNF.
- Training the village headmen and municipal cemetery officials together created some problems. Less motivated village headmen negatively affected the motivation of municipal cemetery officials as well.
- Because there are no cemetery units in some of the municipalities it was observed that the persons they had sent to the training were not related with this issue.
- During the trainings no serious objection was expressed about the screening question on pregnancy. Some primary informants said that they would not experience any problem in asking this question since this study and the question forms had a legal background.

### **Implementation phase**

The implementation phase of NMMS Antalya pilot study comprised retrospective data collection from 01 Dec 2004 – 10 Jan 2005 as well as prospective data collection from 10 Jan - 10 Feb 2005. The problems faced during implementation were as follows:

- The basic problem faced during NMMS pilot study was the difficulty district coordinators experienced while trying to reach the village headmen who did not send their forms on time. District coordinators had difficulties reaching the village headmen by phone. Landlines could be called using the official phones of the health center the offices and homes of headmen could be called from the land lines of the health facilities district coordinators are working at. However, when the village headmen were not in his office they had to call him through his mobile phone, which was not possible from the land line of the health facility. This is why they had to use their own mobile phones. They were later on reimbursed for their telephone expenses from the project budget. However, in a 12-13 months long field study it may not be possible to reimburse the telephone expenses of all district coordinators.
- It was not possible to collect retrospective data (1 Dec 2004-10 Jan 2005) in most of the rural settlements and some municipalities, since burials had not been recorded. It is very likely that the information which has been collected may include errors due to memory recall factor, since they are not extracted from the records.
- Problems were experienced with primary informants in reproductive age female death cases about asking the pregnancy related screening question and recording the responses. Especially municipal cemetery officials preferred to leave this question blank. Taking these difficulties into account, the structure of the question in FBNF was changed by adding “don’t know” and “couldn’t be asked” options.
- A few cases where women were buried in Antalya but had died in a health facility or at home outside Antalya raised attention to the question of whether or not to include them in the pilot study. During pilot study, no household interviews and health facility record

reviews could be performed outside Antalya. However during main field study we would try as much as possible to find those places of maternal deaths in order not to miss one of the rare events.

- Another problem experienced during the implementation phase of the pilot study was that the village headmen in Antalya confused the special death records which they were already collecting for the MoH with the burial lists we asked them to collect under this project. Some headmen also confused the death and burial notification forms with the 3 part TURKSTAT deaths statistics forms.
- During December the forms from 38 % of the settlements, and during January the forms from 42 % of the settlements was not received by the province/district coordinators. When population size is taken into account the ratio of the settlements out of scope were 28 % and 12 % respectively.

### **Reporting phase**

- The major problem faced during reporting phase is that the village headmen especially, could not submit the forms they had filled to the province/district coordinators on time. Many village headmen said that the reporting centres (province or district coordinators) were too far away for them. They also said that they would prefer their next health centres to be the reporting centre. Although there is no routine communication between villages and health centers but since village headmen declared that they can more easily go to health centres because of geographical proximity we are now planning to include the health centres to the data collection system of NMMS. In this new system the role of the health centres will be limited to calling and reminding the headmen who are not delivering the forms.
- Another problem experienced during reporting phase is related with the above mentioned controlling mechanisms by the use of the phone. When the district coordinators wanted to call village headmen and municipal cemetery officials who did not submit the forms on time they couldn't reach them from their office phones. And since they cannot call mobile phones from their workplaces they tried to reach village headmen and municipal cemetery officials by using their private mobile phones. Therefore, it should be provided that at least the land lines used in the health system being used freely by the district coordinators in sampled provinces.
- Another problem is the high workload of district coordinators making it impossible for them to allocate sufficient time for checking the primary informants. District coordinators being able to set up a good team in the district did not complain about increased workload. However, district coordinators who could not establish a team in the district or who are the only doctor experienced difficulty in performing their tasks as district coordinators together with their other duties. Moreover, district coordinators who are not responsible doctors or who are responsible doctors but at the same time the only doctor in the settlement mentioned an income loss from the revolving fund because the additional work for the project hindered their poly-clinical services.

## **Coverage and completeness of data on female deaths**

The primary informants were expected to collect retrospective data on female deaths for December 2004 as well as prospective data for 10 Jan 2005-10 Feb 2005. For the period of December 62 % of settlements, for the period of January 58 % of settlements sent the forms to province/district coordinators. When the population size is taken into account, the coverage rate for settlement areas was 72 % and 88 % respectively.

For the period of December, the number of burial procedures obtained is 239, and for the period of January the number of burial procedures obtained is 373. 32 of these burials are female burials between 12-50 ages. During this period 18 health facility record reviews and 8 household interviews were conducted. 2 of the female deaths investigated were found out to be maternal deaths.

The overall reporting coverage for January was estimated as 88%. This is based on obtaining reports from 410 of 648 settlements covering 88% of the population. Reliance on prospective ascertainment was better than the retrospective results obtained for December (72%).

We also looked at coverage by urban and rural breakdown, and for municipal and village settlements within rural areas. For January coverage was 99% of the population for urban settlements and 68% for rural settlements. When rural settlements were divided into municipal and village settlements coverage rates were 66% and 53% respectively.

We checked the plausibility of the observed crude burial rate, which should approximate the crude death rate (CDR). Theoretical calculations for Turkey suggest the CDR should be between 4-6/1000. We observed an overall CDR of 3/1000, an urban CDR of 2.2/1000 and a rural CDR of 4.9/1000. The urban rural pattern is as expected but the level is lower than expected and we are concerned about this. This may be due to the relative development status of Antalya (10/81) or due to random error and chance fluctuation. Alternatively this may be because we are missing burials. We will investigate by comparing to TURKSTAT and MERNIS reports and by visiting specific cemeteries.

We also checked the plausibility of the percent of all deaths that are female deaths aged 12-50 (PFD). Theoretical calculations for Turkey suggest the PFD should be 6% (range 4.5-9.5%). We observed an overall PFD of 6.4% and a PFD in urban and rural areas of 7.7% and 5.1% respectively. All are within the expected range.

## **Pilot Conclusion**

We feel that these overall coverage rates (88%) are good, with excellent rates for urban areas (99%) and acceptable coverage for rural areas (68%). This is especially true given that this project has a development component and no population based death registration is available for rural areas.

We will nevertheless make efforts to improve the coverage in rural areas including better forms, better training, better supervision and monitoring, allowing more time for people to learn system, allowing more time for forms to return, involving the MoI to motivate village headmen, and planning refreshment training.

On the other hand, there is a risk that motivation will be lower in other provinces, or that participation will drop off rather than increase over time. If necessary, correction factors may be applied provided that settlements not reporting are an unbiased selection of all settlements.

The slightly low CDR suggests that we may be missing burials even though settlements are reporting (ie they are reporting no burials or fewer burials than actual). To attempt to remedy this we will increase supervision, improve communication, compare to MERNIS/TURKSTAT etc.

The PFD looks fine suggesting that where deaths are being reported, the age and sex are being correctly filled (or at least females in the relevant range are not being missed to a significant degree). We hope to maintain this.

In conclusion we propose to maintain our basic study design, with modifications as specified in this chapter below.

### **Pilot Experience with the data collection forms**

During pilot study, Cemetery Burial List (CBL) and Female Burial Notification Form (FBNF) was used which is explained in detail in Chapter 2. The forms (Annex 5 and Annex 6) were reviewed and restructured based on the information obtained during the training of primary informants and the data collection phase, as well as following the information from the mid-term and final evaluation meetings with district coordinators and the focus group study with the headmen.

The primary changes made after the pilot study were as follows:

- In CBL the boxes for information on month and year were separated from each other and relocated. In addition, a new place was added for the non-numeric or numeric expression of the month.
- Instead of highlighting the place for female burials between age 12-50 with in grey color it was now highlighted by using bold lines. The reason for this change is that the information written on the grey part could not be read when it was sent by fax.
- It is observed that primal informants always use white sheets for their other official works. Therefore, colors of the forms changed after pilot study: Yellow sheets were used for CBL and pink sheets were used for FBNF. It is also believed to be more helpful while calling the names of the forms; for instance saying *pink form* is more understandable and easy than saying FBNF.
- Taking into account that CBL is a double sided form, a phrase was added at the end of the first page saying “please continue with the next page while listing the burials”. At the end

of the back page “if more than 25 burials in a month, please make the first line number of the new form 26 and continue to record the burials” was added.

- In order to prevent confusions the term Female Death Notification Form (FDNF) was renamed Female Burial Notification Form (FBNF) since NMMS is based on burials rather than death data.
- An additional item was added in the FBNF for the name of the father of the deceased woman. This will make it easier to track the patient file for health facility record review.
- In FBNF the skip for question No: 9 was deleted, instead of this a new phrase was inserted saying “IF SHE DID NOT DIE IN HEALTH FACILITY PLEASE LEAVE THIS PART BLANK”. In addition, to place of death question “PLEASE CIRCLE THE CODE OF PLACE OF DEATH” instruction was added.
- The question, aiming to learn whether or not the death of the woman was pregnancy related, was restructured and in addition to “yes” and “no” the options “don’t know” and “couldn’t be asked” were added. So options are provided in case this question couldn’t be asked or if the answer is not known as it was observed during the pilot study.

### **Pilot Experience with the Verbal autopsy instrument**

8 Woman Death Questionnaires were carried out in Antalya. All families were surprisingly welcoming, only in one case the team was asked to delay the visit for a couple of days. It showed that the presence of a medical doctor maybe good for getting access to a household, but is not necessary for conducting the Woman Death Questionnaire. It is also understood that the Woman Death Questionnaires interview can be held by a male researcher if he is well trained for it. The presence of an additional female interviewer is however preferable.

### **Pilot Experience with the Health Facility Record Review instrument**

In total 22 HFRRF were conducted. The PPD and the DCs did not experience major difficulties in understanding and using the questionnaire. Identifying patient files and extracting the necessary information was in all cases unproblematic. The procedure never exceeded 20 minutes. Only very few changes of the HFRRF Questionnaire were necessary. A major amendment was made to question 159. In contrast to the initial version the decision on whether an additional Woman Death Questionnaires would be necessary in order to finally establish the cause of death will now be left to the Review Committee because the DCs felt that it could otherwise undermine the good trust between them and the hospitals in their district.

### **Pilot Evaluation of qualitative information**

8 In-depth Interviews and one Focus Group Discussion (FGD) were conducted during the Antalya pre-test. Interviews were held with representatives of the Provincial Health Directorate, of the Local Government, municipal health departments, with cemetery officials

and Muhtars (village headmen)<sup>1</sup>. The Interviews were beneficial for understanding the administrative procedures of collecting death information and the related problems. Specific issues which were repeatedly mentioned comprised:

- The law which has included villages surrounding bigger cities into greater municipalities during recent years doesn't seem to be clear in all cases and administrative implementation has not always completed yet.
- Muhtars may be reluctant to keep accurate death records because they don't understand the need, they don't like paperwork and sanctions for non-performance, which do exist, are not enforced.
- Doctors who have to issue death certificates may often do so without physical inspection and/or examination of the corps because they are overburdened with many different duties.
- There is no communication between officials from different cemeteries which is considered essential for developing improved registration procedures.

### **Contacts with Other Institutions in a Seminar**

A seminar on “Project of Maternal Mortality and Relation with Turkish Health Statistics System” was organised in Antalya on 15–17 February 2005 by State Institute of Statistics (TURKSTAT) (Turkish Statistical Institute). Representatives from TURKSTAT, Ministry of Health, Hacettepe University Institute of Population Studies, ICON Institute and EC Delegation to Turkey participated in this seminar.

In a specific session of this meeting, project team of Antalya (province coordinator, province researcher) and the team leader of NMMS explained the aim and importance of the study. Then they made presentations on the arrangements of pilot study for Antalya and gave information on the preliminary results. This seminar became helpful to share the ongoing activities of pilot study and having feedback from representatives of different institutions.

### **Pilot Focus Group Discussion (FGD)**

The FGD which was conducted with a group of 9 Muhtars produced more important in-depth information in Antalya. Key outputs were:

- They didn't have problems during the invitation process for training. The way they were invited, the day of training and the training itself didn't create any problem for them
- The training is considered as beneficial.
- They don't have problem with filling the forms, the forms are understandable
- Implementation procedures seem to be easy.

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<sup>1</sup> Aynur Kara, *responsible from death statistics, Antalya Health Directorate, (Dec. 22, 2004)*, Remzi Sadi, *director of Local Government at the Governship (Dec. 23, 2004)*, Halil İbrahim Kaya, *civil servant for recording of deaths at Population District of Antalya (Dec. 23, 2004)*, Dr. Ergun Ekici, *Director of Health Department of Antalya Great Municipality (Dec. 24, 2004)*, Aşur İbat, *responsible from cemeteries of Antalya Great Municipality (Dec. 24, 2004)*, Ahmet Uysal, *Muhtar, Odaönü Manavgat (Jan. 7, 2005)*, Muhtar, *(Jan. 7, 2005)*, Dr. Mehmet Kalkan, *doctor of Manavgat Municipality (Jan 7, 2005)*.

- However they haven't read the written document (manual) that has been given to them.
- Complaints are about question 8 on the Women Burial Notification Form. They very clearly mentioned that asking such a question is not proper according to their traditions/customs and one of them mentioned the unpleasant approach that he had received upon asking this question. On the other side they say that the information question 8 wants to get is known in the village.
- Their main complaint is coming to the province, because they come to the province only to give these forms. They don't bring any other form to province. Coming to the province is a financial burden for them.
- However, they also mention that they would come whenever the government wants them to come.
- They prefer to give the forms to health centers because health centers are much closer to them.
- Bringing the forms to the health directorate in the province is considered to be a real burden especially if there is no death.



# **ANNEX 5 – CEMETERY BURIAL LIST**

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T.C. MINISTRY OF HEALTH



FORM: NMMS-01

CEMETERY BURIAL LIST (CBL)

Month:

Year:  2  0  0

Province:

District:

Sub-district:

Village:

Title of the person who filled the form:

Name-Surname: \_\_\_\_\_

TOTAL NUMBER OF BURIALS IN THE MONTH

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------

FEMALE BURIALS BETWEEN 12-50 AGES:

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------

\*Stillbirths will not be included into this list. \* The right part of the page with thick lines will only be used for female burials between the age range of 12-50.

\* If there is no death within the month only the upper part of the form will be filled and the total number of death will be indicated as "0000" and sent to the center.

LINE NO	Name-Surname	Gender Male: E Female: K	Age at Death (If younger than 12 monthswrite "0")	If Female Burials Between 12-50	
				The Address and Phone Number of the Family or Relatives of the Deceased Woman	
1				Home: _____	GSM: _____
2				Home: _____	GSM: _____
3				Home: _____	GSM: _____
4				Home: _____	GSM: _____
5				Home: _____	GSM: _____
6				Home: _____	GSM: _____
7				Home: _____	GSM: _____
8				Home: _____	GSM: _____
9				Home: _____	GSM: _____
10				Home: _____	GSM: _____

Please continue from the next page while listing the burials.



11				Home: _____ GSM: _____
12				Home: _____ GSM: _____
13				Home: _____ GSM: _____
14				Home: _____ GSM: _____
15				Home: _____ GSM: _____
16				Home: _____ GSM: _____
17				Home: _____ GSM: _____
18				Home: _____ GSM: _____
19				Home: _____ GSM: _____
20				Home: _____ GSM: _____
21				Home: _____ GSM: _____
22				Home: _____ GSM: _____
23				Home: _____ GSM: _____
24				Home: _____ GSM: _____
25				Home: _____ GSM: _____

If the number of burial in a month is more than 25, then start with 26 as the line number in the new form and continue to record the burials.

**ANNEX 6 –  
FEMALE BURIAL NOTIFICATION FORM**

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## T.C. MINISTRY OF HEALTH



## FEMALE BURIAL NOTIFICATION FORM

Fill only for female burials between 12-50 ages.

Name-Surname of the deceased woman: \_\_\_\_\_ MDL Line No:

Province:  District:

Sub-district:  Village:

1 Age at death  Name of her Father: \_\_\_\_\_

2 Date of Birth (day/month/year)   1 9

3 Date of Death (day/month/year)   2 0 0

4 Date of Burial (day/month/year)   2 0 0

5 Place of death Health Facility.....1  
(PLEASE CIRCLE THE CODE FOR Other (on way, another facility).....2  
PLACE OF DEATH) Home.....3  
Don't know .....8

6 If place of death is a health facility, give the full name of the health facility

(LEAVE BLANK IF SHE DID NOT DIE IN A HEALTH FACILITY)

7 Name-surname, full address and phone number of a relative of the deceased woman who can provide information. Home

GSM:

8 When the women died she was;

	Yes	No	Don't know	Not asked
Pregnant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Delivering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having induced abortion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having spontaneous abortion/miscarriage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In puerperium period (still in 42 days after the termination of pregnancy, induced abortion or miscarriage)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9 Cause of death \_\_\_\_\_  
\_\_\_\_\_

Title of the person who filled this form: \_\_\_\_\_  
Name-Surname: \_\_\_\_\_

**ANNEX 7 – HEALTH  
FACILITY RECORD REVIEW FORM**

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**T.C. MINISTRY OF HEALTH  
FEMALE DEATHS  
HEALTH FACILITY RECORD REVIEW FORM**

<i>INTRODUCTORY INFORMATION</i>			
PLACE OF BURIAL	PLACE OF DEATH		
PROVINCE _____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	PROVINCE _____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>		
DISTRICT _____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	DISTRICT _____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>		
SUB-DISTRICT _____ <input style="width: 20px; height: 20px;" type="text"/>	SUB-DISTRICT _____ <input style="width: 20px; height: 20px;" type="text"/>		
VILLAGE _____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	VILLAGE _____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>		
PLACE OF RESIDENCE OF THE DECEASED: _____ (PROVINCE/DISTRICT/SUB-DISTRICT/VILLAGE)			
NAME-SURNAME OF DECEASED WOMAN: _____	CBL LINE NO: <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>		
AGE AT DEATH	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	NAME OF THE DECEASED'S FATHER: _____	
DATE OF BIRTH (DAY/MONTH/YEAR)	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>
DATE OF DEATH (DAY/MONTH/YEAR)	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>
DATE OF BURIAL (DAY/MONTH/YEAR)	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>

<i>VISIT TO HEALTH FACILITY / INTERVIEW INFORMATION</i>		
EXACT NAME AND ADDRESS OF THE HEALTH FACILITY: _____ _____		
PATIENT FILE NO: _____		
DATE OF VISIT (DAY-MONTH)		<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>
NAME-SURNAME OF PROJECT PROVINCE DOCTOR/DISTRICT COORDINATOR AND CODE	_____	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>
RESULT CODES: 01 RECORD REVIEW COMPLETED 02 FILE/RECORD OF WOMAN NOT FOUND 03 HF AUTHORITIES REJECTED COOPERATION 96 OTHER _____ (SPECIFY)		<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>

PROVINCE PROJECT COORDINATOR	PROVINCE PROJECT RESEARCHER	DATA ENTRY STAFF (TO BE FILLED IN HUIPS)
_____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	_____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	_____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>
DAY-MONTH <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	DAY-MONTH <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	DAY-MONTH <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>

**A. WOMAN'S BACKGROUND**

<b>100</b>	Has she ever attended to school? <i>IF YES</i> what was her education level?	NO EDUCATION/NOT COMPLETED PRIMARY SCHOOL.....1 PRIMARY SCHOOL.....2 SECONDARY SCHOOL .....3 HIGH SCHOOL AND HIGHER.....4 DON'T KNOW.....8	
<b>101</b>	What was her marital status?	NEVER MARRIED.....1 MARRIED.....2 DIVORCED.....3 WIDOWED (HUSBAND DIED).....4 SEPERATED.....5 DON'T KNOW.....8	
<b>102</b>	Has she worked in any job in the last 12 months before her death?	YES.....1 NO.....2 DON'T KNOW.....8	

**B. INFORMATION ON PLACE OF DEATH:**

<b>103</b>	Was she dead when she arrived to the health facility?	YES..... .1 → 106 NO..... .2	
<b>104</b>	In which department/ward did she die?	_____ (DEPARTMENT/WARD)	
<b>105</b>	Who of the health staff attended the death? (POSITION, NAME-SURNAME)	1 _____ 2 _____ 3 _____	

**C. HISTORY OF THE DECEASED UP TO THE ADMISSION TO THE HEALTH FACILITY**

<b>106</b>	Where did she come from when she was admitted to the health facility? <i>IF SHE WAS REFERRED FROM A HEALTH FACILITY/HOSPITAL WRITE DOWN THE NAME OF IT</i> _____ (NAME OF THE HEALTH FACILITY/HOSPITAL)	FROM HOME .....01 → 106B REFERRAL FROM A HEALTH HOUSE .....02 HEALTH CENTER/MCHA/FP.....03 FROM PUBLIC HOSPITAL .....04 FROM PRIVATE HOSPITAL .....05 FROM ANOTHER HEALTH FACILITY.....06 CASUALTY FROM THE STREET .....07 DON'T KNOW .....98 → 106B	
<b>106A</b>	(If she had been referred from another health facility) What was the reason for referral?	_____ (SPECIFY)	
<b>106B</b>	When she was admitted to the health facility, was she pregnant or up to 42 days after termination of a pregnancy?	NEITHER PREGNANT NOR PUERPERAL.....01 → 153 PREGNANT BUT NOT IN LABOR .....02 → 113 IN LABOR .....03 SHE HAD SPONTANEOUS ABORTION.....04 → 113 SHE HAD SELF INDUCED ABORTION.....05 → 113 SHE HAD INDUCED ABORTION (MEDICAL).....06 → 110 UP TO 42 DAYS AFTER DELIVERY .....07 → 107 UP TO 42 DAYS AFTER SPONTANEOUS ABORTION .....08 → 113 UP TO 42 DAYS AFTER SELF-INDUCED ABORTION .....09 → 113 UP TO 42 DAYS AFTER (MED.) INDUCED ABORTION ...10 → 110 DON'T KNOW .....98 → 153	

106C	Since how many minutes/hours was she in labour?	MINUTE.....1 <input type="text"/> <input type="text"/> HOUR.....2 <input type="text"/> <input type="text"/> SHE WAS NOT IN LABOUR.....300 DON'T KNOW .....998	
<b>GO TO 113</b>			
107	Where did the delivery take place? (E.G. AT HOME, AS CASUALTY ON THE STREET, IN A HEALTH FACILITY, OTHER)	_____ 1 (SPECIFY) DON'T KNOW.....8	
108	Who was assisting the delivery? (E.G. A FAMILY MEMBER, A TBA, A MIDWIFE, WHICH OTHER HEALTH PERSONNEL, OTHER)	_____ 1 (SPECIFY) DON'T KNOW.....8	
109	Was the child on arrival alive or dead?	STILLBIRTH .....1 LIVE BIRTH (ALIVE) .....2 LIVE BIRTH (DEAD).....3 DON'T KNOW.....8	
<b>GO TO 113</b>			
110	Where was the abortion induced?	PRIVATE DOCTOR'S OFFICE.....1 HOSPITAL .....2 POLYCLINIC.....3 OTHER.....7 (SPECIFY) DON'T KNOW.....8	
111	Who induced the abortion? (e.g., HERSELF, A FAMILY MEMBER, FRIEND, TBA, HEALTH STAFF ETC.)	_____ 1 (SPECIFY) DON'T KNOW.....8	
112	What method was used to induce the abortion?	_____ (SPECIFY) DON'T KNOW.....8	
113	In which month/week of her pregnancy was she? <i>MARK ONLY ONE OF THE OPTIONS, INDICATING WEEK OR MONTH.</i>	WEEK.....1 <input type="text"/> <input type="text"/> MONTH.....2 <input type="text"/> <input type="text"/> DON'T KNOW .....998	
114	How many pregnancies did the deceased woman have in total?  <i>IF NONE, RECORD "00". IF DON'T KNOW, RECORD "98"</i>	TOTAL PREGNANCIES..... <input type="text"/> <input type="text"/>	

115	<p>How many <i>living</i> sons and daughters did she deliver?</p> <p><i>IF NONE, RECORD "00".</i> <i>IF DON'T KNOW, RECORD "98"</i></p>	<p>SONS ..... <input type="text"/> <input type="text"/></p> <p>DOUGHTERS ..... <input type="text"/> <input type="text"/></p> <p>TOTAL ..... <input type="text"/> <input type="text"/></p>	
116	<p>How many ectopic pregnancies, spontaneous abortions, induced abortions and still births did she have?</p> <p><i>IF NONE, RECORD "00".</i> <i>IF DON'T KNOW, RECORD "98"</i></p> <p><i>ATTENTION, ALSO INCLUDE THE PREGNANCY AT THE TIME OF DEATH.</i></p>	<p>ECTOPIC PREGNANCIES ..... <input type="text"/> <input type="text"/></p> <p>SPONTANEOUS ABORTIONS ..... <input type="text"/> <input type="text"/></p> <p>INDUCED ABORTIONS ..... <input type="text"/> <input type="text"/></p> <p>TOTAL ABORTIONS ..... <input type="text"/> <input type="text"/></p> <p>STILL BIRTHS ..... <input type="text"/> <input type="text"/></p>	
121	<p>During this pregnancy, did she attend ANC?</p>	<p>YES..... .1</p> <p>NO ..... .2</p> <p>DON'T KNOW..... .8</p>	<p>→ 125</p>
122	<p>Whom did she see/receive care?</p>	<p>HEALTH PROFESSIONAL</p> <p>DOCTOR..... A</p> <p>NURSE/MIDWIFE ..... B</p> <p>OTHER _____ U</p> <p>(SPECIFY)</p> <p>DON'T KNOW..... X</p>	
123	<p>When she first attended ANC during this pregnancy how many months was she pregnant?</p>	<p>MONTH .....1 <input type="text"/> <input type="text"/></p> <p>DON'T KNOW .....998</p>	
124	<p>How many times did she attend ANC during this pregnancy?</p>	<p>TIMES.....1 <input type="text"/> <input type="text"/></p> <p>DON'T KNOW .....998</p>	
125	<p>Did she have any complication during this pregnancy?</p>	<p>YES..... .1</p> <p>NO ..... .2</p> <p>DON'T KNOW..... .8</p>	<p>→ 127</p>

126	What kind of complication(s) did she have?  <i>PLEASE SPECIFY</i>	_____ _____ 1 DON'T KNOW..... 8	
127	Did she suffer from any pre-existing chronic/systemic illness? (e.g. HYPERTENSION, DIABETES, DISORDER OF THE THYROID GLAND, ETC)?	YES.....1 NO .....2 DON'T KNOW.....8	129
128	Which kind of pre-existing chronic/systemic illness did she have?  <i>PLEASE SPECIFY</i>	_____ _____ 1 DON'T KNOW..... 8	
129	What was the preliminary diagnosis on admission?  <i>PLEASE SPECIFY</i>	_____ _____ 1 DON'T KNOW.....8	

**D. HEALTH CONDITION PROGRESS OF THE WOMAN AFTER THE ADMISSION TO THE HEALTH FACILITY**

CHECK 106B: (106B=3)

SHE WAS DELIVERING WHEN SHE CAME TO THE HEALTH FACILITY

OTHER CONDITIONS  → 130A

130	How long ago was the woman hospitalized before delivery took place?  <i>MARK ONLY ONE OF THE OPTIONS BY INDICATING HOUR, DAY OR WEEK</i>	HOUR.....1 <input type="text"/> <input type="text"/> DAY.....2 <input type="text"/> <input type="text"/> WEEK.....3 <input type="text"/> <input type="text"/> DON'T KNOW .....998	
130A	How long was the woman hospitalized before death occurred?  <i>MARK ONLY ONE OF THE OPTIONS BY INDICATING HOUR, DAY OR WEEK</i>	HOUR.....1 <input type="text"/> <input type="text"/> DAY.....2 <input type="text"/> <input type="text"/> WEEK.....3 <input type="text"/> <input type="text"/> DON'T KNOW .....998	

131	Which other departments were consulted? <i>PLEASE SPECIFY.</i>	_____ _____ _____	
132	What was the outcome of the pregnancy? <i>RECORD ALL MENTIONED.</i>	NORMAL/VAGINAL .....A VACUUM EXTRACTION.....B FORCEPS.....C CAESAREAN SECTION.....D INDUCED ABORTION.....E SPONTANEOUS ABORTION.....F ECTOPIC PREGNANCY.....G	} → 147
132A		SINGLE.....H MULTIPLE.....J	
133	What was the condition (APGAR score) of the child? <i>IF APGAR SCORE WAS CALCULATED RECORD THIS SCORE.</i> <i>IF NOT WRITE DOWN THE CONDITION OF THE CHILD.</i>	STILL BIRTH.....100 APGAR SCORE.....2 <input type="text"/> <input type="text"/> _____ _____ _____ 300 DON'T KNOW.....998	
134	How long did the delivery take from the onset of labor pain? <i>MARK ONLY ONE OF THE OPTIONS BY INDICATING MINUTE OR HOUR.</i>	MINUTE.....1 <input type="text"/> <input type="text"/> HOUR.....2 <input type="text"/> <input type="text"/> DON'T KNOW.....998	
135	Were pharmaceuticals used to start or enforce contractions?	YES .....1 NO .....2 DON'T KNOW.....8	
136	Did the woman have any complications before, during or after the delivery?	YES .....1 NO .....2 DON'T KNOW.....8	} → 143
136A	What kind of a problem/complication was it?	_____ (SPECIFY)	
137	Was there an ante-partum hemorrhage? <i>(SEE GLOSSARY UNDER HEMORRHAGE)</i>	YES .....1 NO .....2 DON'T KNOW.....8	
138	Was there a post-partum hemorrhage? <i>(SEE GLOSSARY UNDER HEMORRHAGE)</i>	YES .....1 NO .....2 DON'T KNOW.....8	
139	Did she have signs of eclampsia? <i>(SEE GLOSSARY)</i>	YES .....1 NO .....2 DON'T KNOW.....8	
140	Did she have a 3 <sup>rd</sup> or 4 <sup>th</sup> degree vaginal tear? <i>(SEE GLOSSARY)</i>	YES .....1 NO .....2 DON'T KNOW.....8	

141	Was the placenta retained? <i>(SEE GLOSSARY)</i>	YES .....1 NO .....2 DON'T KNOW.....8	
142	Did she have signs of puerperal sepsis? <i>(SEE GLOSSARY)</i>	YES .....1 NO .....2 DON'T KNOW.....8	
143	<i>CHECK 132: (132=D)</i>  CESAREAN SECTION <input type="checkbox"/>	NOT CESAREAN SECTION <input type="checkbox"/>	147
144	What was the indication for the cesarean section? <i>PLEASE SPECIFY</i>	_____ _____ 1 DON'T KNOW..... 8	
145	Was there any complication during cesarean section (including anesthesia)?	YES .....1 NO .....2 DON'T KNOW.....8	147
146	What kind of a complication was it? <i>PLEASE SPECIFY</i>	_____ _____ 1 DON'T KNOW.....8	
147	How many blood transfusions did she receive? <i>PLEASE WRITE DOWN AS UNITS.</i>	BLOOD TRANSFUSIONS.....1 <input type="text"/> <input type="text"/> NONE .....000 DON'T KNOW.....998	
148	Was there any other complication before death occurred?	YES .....1 NO .....2 DON'T KNOW.....8	150
149	What kind of a problem was it? <i>PLEASE SPECIFY</i>	_____ _____ 1 DON'T KNOW.....8	

<b>149A</b>	<p><i>CHECK 106B: (106B=3 OR 106B=7)</i></p> <p>DURING LABOUR OR UP TO 42 DAYS AFTER DELIVERY</p> <p style="text-align: right;">OTHER CONDITIONS</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <input type="checkbox"/> ↓         </div> <div style="text-align: center;"> <input type="checkbox"/> →         </div> </div>	151	
<b>149B</b>	<p>Which other action - not mentioned so far - was taken to manage complications which occurred? (eg. MANUAL REMOVAL OF PLACENTA, ANTI-CONVULSANT DRUGS, ANTIBIOTICS ETC.)</p> <p><i>PLEASE SPECIFY</i></p>	<hr/> <hr/> 100  DON'T KNOW.....998	
<b>150</b>	<p>How long after delivery did death occur?</p> <p><i>MARK ONLY ONE OF THE OPTIONS BY INDICATING MINUTE, HOUR OR DAY.</i></p>	MINUTE.....1 <input type="checkbox"/> <input type="checkbox"/>  HOUR.....2 <input type="checkbox"/> <input type="checkbox"/>  DAY.....3 <input type="checkbox"/> <input type="checkbox"/>  DON'T KNOW.....988	
<b>151</b>	<p>What other development did eventually lead or contribute to the death?</p> <p><i>PLEASE SPECIFY</i></p>	<hr/> <hr/> 1 DON'T KNOW.....8	
<b>152</b>	<p>What was the most immediate event/complication before the woman's death? <i>(PLEASE DESCRIBE IF POSSIBLE)</i></p> <hr/> <hr/> <hr/>		
<b>153</b>	<p>What is the final diagnosis (from the patient file/ death certificate)? <i>(PLEASE WRITE)</i></p> <hr/> <hr/> <hr/>		
<b>154</b>	<p>Were the circumstances of the death discussed among the management of the HF/Hospital?</p>	YES .....1 NO .....2 DON'T KNOW.....8	156





**ANNEX 8 – FEMALE DEATHS**  
**QUESTION FORM/QUESTIONNAIRE**

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**T.C. MINISTRY OF HEALTH  
FEMALE DEATHS  
QUESTION FORM/QUESTIONNAIRE**

<b>IDENTIFICATION</b>	
<p>NAME OF THE HOUSEHOLD HEAD/ THE RELATIVE WHO NOTIFIED THE DEATH</p> <p>NAME AND SURNAME OF THE DECEASED</p> <p>PLACE OF RESIDENCE - URBAN (1) RURAL (2)..... <input type="checkbox"/></p> <p>PHONE _____ / _____</p>	<p>PROVINCE _____ <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/></p>
	<p>DISTRICT _____ <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/></p>
	<p>SUB-DISTRICT _____ <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/></p>
	<p>VILLAGE _____ <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/></p>
	<p>QUARTER _____</p>
	<p>STREET _____ NO _____</p>

<b>VISIT / INTERVIEW INFORMATION</b>				
	1	2	3	LAST VISIT
DATE (DAY-MONTH)	__ __	__ __	__ __	<input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-right: 5px;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/>
PROVINCE PROJECT RESEARCHER	_____	_____	_____	<input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-right: 5px;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/>
RESULT (*)	__	__	__	<input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-right: 5px;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/>
NEXT DAY-MONTH INTERVIEW HOUR	__ __	__ __		TOTAL NUMBER VISITS <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/>

<b>(*) RESULT CODES</b>	
<p>01 QUESTIONNAIRE COMPLETED</p> <p>02 NONE OF THE HOUSEHOLD MEMBERS PRESENT AT HOME OR NO ELIGIBLE MEMBER PRESENT AT HOME</p> <p>03 WRONG ADDRESS</p> <p>04 POSTPONED</p> <p>05 THE PERSON TO BE INTERVIEWED REFUSED</p>	<p>06 DWELLING VACANT/ ADDRESS NOT A DWELLING</p> <p>08 DWELLING NOT FOUND</p> <p>09 INTERVIEW PARTIALLY COMPLETED</p> <p>10 NO PERSON COULD BE DETERMINED TO MAKE INTERVIEW</p> <p>96 OTHER _____ (SPECIFY)</p>

<b>PROVINCE PROJECT COORDINATOR</b>	<b>PROVINCE PROJECT DOCTOR/ DISTRICT COORDINATOR</b>	<b>KEYER</b>
<p>_____ <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/></p> <p>DAY-MONTH <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-right: 5px;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-right: 5px;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-right: 5px;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/></p>	<p>_____ <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/></p> <p>DAY-MONTH <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-right: 5px;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-right: 5px;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-right: 5px;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/></p>	<p>_____ <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/></p> <p>DAY-MONTH <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-right: 5px;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-right: 5px;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-right: 5px;" type="text"/> <input style="width: 20px; height: 20px; border: 1px solid black; display: inline-block; vertical-align: middle; margin-left: 5px;" type="text"/></p>

## SECTION IA INTRODUCTION AND DETERMINATION OF THE RESPONDENT

<b>100</b>	RECORD HOUR	HOUR – MINUTE.....	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>
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Hello! My name is \_\_\_\_\_. I am coming from ..... Health Directorate. We are conducting a study on the cause of female deaths. We are sorry for your loss, we learned that ..... passed away. We want to ask some questions about the deceased. We need someone who can help us and answer our questions. Please could you tell us the name of the person who can answer our questions best? Who else? **PUT THE NAME OF THE PERSON YOU INTERVIEWED AT THE BEGINNING OF THE LIST. THEN LIST THE INDIVIDUALS WHO CAN GIVE INFORMATION ABOUT THE DECEASED WOMAN.**

	<b>101</b>	<b>102</b>	<b>103</b>	<b>104</b>	<b>105</b>	<b>106</b>
		Relation- ship to the Deceased	Was ..... with ..... (deceased) during her last illness?	Was .....with ..... (deceased) during her death?	Is .... resident of this household?	<i>FOR INDIVIDUALS WHO HAVE KNOWLEDGE ABOUT CAUSE OF DEATH AND LAST ILLNESS INDICATE THE RELATIVITY OF THEIR LEVEL OF KNOWLEDGE WITH 1,2,3. IN THIS COLUMN. SAME NUMBER CAN BE USED FOR 2 PERSONS HAVING THE SAME LEVEL OF KNOWLEDGE*</i>
LINE NO	NAME OF THE PERSON	<i>USED THE CODE LIST</i>				<i>1:VERY GOOD 2:INTERMEDIATE 3: NO INFORMATION</i>
01		<input style="width: 20px; height: 20px;" type="text"/>	YES..... .1 NO..... .2 NO ILLNESS..... .3 DON'T KNOW..... .7	YES..... .1 NO..... .2	YES..... .1 NO..... .2	1      2      3
02		<input style="width: 20px; height: 20px;" type="text"/>	YES..... .1 NO..... .2 NO ILLNESS..... .3 DON'T KNOW..... .7	YES..... .1 NO..... .2	YES..... .1 NO..... .2	1      2      3
03		<input style="width: 20px; height: 20px;" type="text"/>	YES..... .1 NO..... .2 NO ILLNESS..... .3 DON'T KNOW..... .7	YES..... .1 NO..... .2	YES..... .1 NO..... .2	1      2      3
04		<input style="width: 20px; height: 20px;" type="text"/>	YES..... .1 NO..... .2 NO ILLNESS..... .3 DON'T KNOW..... .7	YES..... .1 NO..... .2	YES..... .1 NO..... .2	1      2      3
05		<input style="width: 20px; height: 20px;" type="text"/>	YES..... .1 NO..... .2 NO ILLNESS..... .3 DON'T KNOW..... .7	YES..... .1 NO..... .2	YES..... .1 NO..... .2	1      2      3
06		<input style="width: 20px; height: 20px;" type="text"/>	YES..... .1 NO..... .2 NO ILLNESS..... .3 DON'T KNOW..... .7	YES..... .1 NO..... .2	YES..... .1 NO..... .2	1      2      3

<b>FOR 102- CODES FOR RELATIONSHIP TO THE DECEASED</b>				
<b>01</b> HUSBAND	<b>04</b> MOTHER-IN-LAW	<b>07</b> ELTÍ (SISTER-IN-LAW)	<b>10</b> DOUGHTER	<b>13</b> GRANDFATHER
<b>02</b> MOTHER	<b>05</b> SISTER-IN-LAW	<b>08</b> BROTHER	<b>11</b> SON	<b>97</b> OTHER _____
<b>03</b> SISTER	<b>06</b> FATHER	<b>09</b> BROTHER'S WIFE	<b>12</b> GRANDMOTHER	(SPECIFY)

*CHOSE A PERSON WHO YOU BELIEVE CAN PROVIDE THE MOST USEFUL INFORMATION ABOUT THE DECEASED AND HER ILLNESS, AND HAVE THE INTERVIEW WITH THIS PERSON*

<b>107</b>	PERSON SELECTED FOR THE INTERVIEW LINE NO:	<input style="width: 20px; height: 20px;" type="text"/>	AGE:	<input style="width: 20px; height: 20px;" type="text"/>	GENDER:    MALE..... .1 FEMALE..... .2
	IF THE PERSON SELECTED FOR THE INTERVIEW IS NOT LIVING IN THE SAME HOUSEHOLD OF THE DECEASED, FOR INTERVIEW WRITE DOWN THE EXACT ADDRESS AND PHONE NUMBER. <b>ADDRESS AND PHONE:</b>				

**SECTION IB. INFORMED CONSENT**

*IF YOU CONTINUE TO HAVE THE INTERVIEW WITH THE SAME PERSON:*

The interview will last 45 minutes. You are not required to participate in the interview but your participation and answers to our questions will help us in preventing female deaths occurring in our country. All your responses will be confidential and they will be used only for scientific purposes and for the improvement of health services. It was told us that you are the best person who can provide information on the personal characteristics and death of ..... Therefore, we would like to talk to you. Do you accept?

<b>108A</b>	ACCEPTING.....1
	REFUSING.....2

**SIGNITURE OF THE RESPONDENT:** .....

*IF YOU ARE GOING TO CONTINUE TO THE INTERVIEW WITH ANOTHER PERSON:*

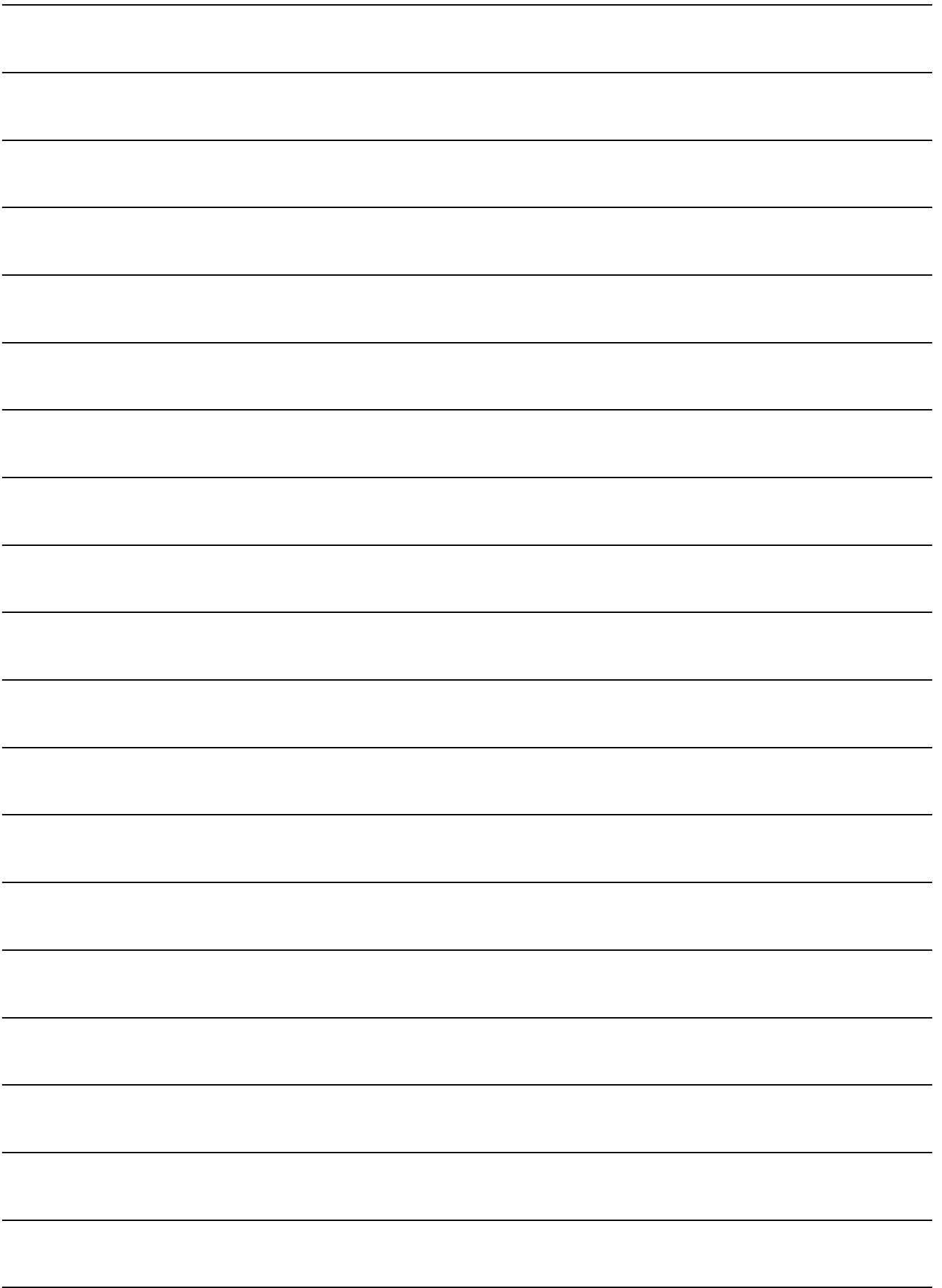
Hello! My name is \_\_\_\_\_. I am coming from .....Health Directorate. We are conducting a study on the cause of female deaths. We are sorry for your loss, we learned that ..... passed away. We want to talk to you and ask some questions about the deceased.

The interview will last 45 minutes. You are not required to participate in the interview but your participation and answers to our questions will help us in preventing female deaths occurring in our country. All your responses will be confidential and they will be used only for scientific purposes and for the improvement of health services. It was told us that you are the best person who can provide information on the personal characteristics and death of ..... Therefore, we would like to talk to you. Do you accept?

<b>108A</b>	ACCEPTING.....1
	REFUSING.....2

**SIGNITURE OF THE RESPONDENT:** .....





## SECTION 2A. DETAILS RELATED TO DEATH

200	What is the date of death of the deceased? (DAY/MONTH/YEAR)	DAY ..... <input type="text"/> <input type="text"/> MONTH..... <input type="text"/> <input type="text"/> YEAR ..... <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
201	How old was she exactly when she died? What was her completed age?  <u>AGE MUST BE DETERMINED!</u>	COMPLETED AGE..... <input type="text"/> <input type="text"/>	
<p><b>ATTENTION!</b></p> <p><i>IF THE DECEASED WAS YOUNGER THAN 12 OR OLDER THAN 50 WHEN SHE DIED, THEN PROBE THE INCONSISTENCY WITH THE FBNF AND MAKE THE NECESARRY CORRECTIONS .</i></p> <p><i>IF NOT A FEMALE DEATH BETWEEN 12-50 AGES, FINISH THE INTERVIEW.</i></p>			
202	Did she have any illness/health problem leading to her death?	YES .....1 NO .....2	→ 209A
203	For how long was she ill before she died?  IF THE ANSWER IS 30 DAYS AND LESS, NOTE IT AS DAY. IF MORE THAN 12 MONTHS, NOTE IT AS YEAR	DAY .....1 <input type="text"/> <input type="text"/> MONTH.....2 <input type="text"/> <input type="text"/> YEAR .....3 <input type="text"/> <input type="text"/>	
204	Has she ever been hospitalized due to the illness leading to her death?	YES .....1 NO .....2 DON'T KNOW.....8	→ 206
205	How many times?	TIMES ..... <input type="text"/> <input type="text"/>	
206	Has she ever been operated due to the illness leading to her death?	YES .....1 NO .....2 DON'T KNOW.....8	→ 209A
207	What was her last operation?	_____ (OPERATION)	

<p><b>208</b></p>	<p>How many months before she died was her last operation?</p> <p><i>IF THE ANSWER IS 30 DAYS AND LESS, NOTE IT AS DAY. IF MORE THAN 12 MONTHS, NOTE IT AS YEAR.</i></p>	<p>DAY .....1 <input type="text"/> <input type="text"/></p> <p>MONTH.....2 <input type="text"/> <input type="text"/></p> <p>YEAR .....3 <input type="text"/> <input type="text"/></p>	
<p><b>209A</b></p>	<p>What was the place of death? In which province and district did she die?</p>	<p>NAME AND CODE OF THE PROVINCE _____ <input type="text"/> <input type="text"/></p> <p>NAME OF THE DISTRICT _____</p>	
<p><b>209B</b></p>	<p>Where did she die?</p>	<p>HOSPITAL/ANOTHER HEALTH FACILITY .....1</p> <p>HOME .....2</p> <p>OTHER .....7 → 211</p> <p>(SPECIFY)</p>	
<p><b>210</b></p>	<p>What is the name of the hospital/health facility she died in?</p>	<p>_____</p> <p>(NAME OF HEALTH FACILITY)</p>	
<p><b>211</b></p>	<p>Did any health staff explain you or any other relative of the deceased why .....died?</p>	<p>YES .....1 → 212B</p> <p>NO .....2</p> <p>DON'T KNOW.....8</p>	
<p><b>212A</b></p>	<p>Do you know the the casue(s) of her death /the illness leading to her death?</p>	<p>YES .....1</p> <p>NO .....2 → 213</p>	
<p><b>212B</b></p>	<p>What was her cause of death?</p> <p><i>IF MORE THAN ONE CAUSE OF DEATH IS SPECIFIED, LIST ALL MENTIONED.</i></p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	

Now I would like to ask some questions about the general health conditions of the deceased?

Have you ever been told by a doctor or nurse that the deceased had any of the following illnesses?

	YES	NO	DON'T KNOW
A Hypertension .....	1	2	8
B Diabetes.....	1	2	8
C Heart Disease.....	1	2	8
D Epilepsy.....	1	2	8
E Tuberculosis.....	1	2	8
F Asthma.....	1	2	8
G Anaemia.....	1	2	8
H Jaundice (Hepatitis).....	1	2	8
I Cancer			
_____ 1	2	8	
(SPECIFY)			
J Other chronic illnesses			
_____ 1	2	8	
(SPECIFY)			

## SECTION 2B. DETERMINATION OF PREGNANCY

214	Has she ever become pregnant?	YES .....1 NO .....2 DON'T KNOW .....8	→ 400
215	Was ..... pregnant when she died?	YES .....1 NO .....2 DON'T KNOW .....8	→ 216A
215A	For how many months was she pregnant when she died?	<div style="text-align: center;"> <input type="text"/> <input type="text"/>            MONTH         </div>	
216A	Did she die during abortion or within 42 days following the abortion?	YES .....1 NO .....2 DON'T KNOW .....8	→ 217A
216B	For how many months was she pregnant when she died?	<div style="text-align: center;"> <input type="text"/> <input type="text"/>            MONTH         </div>	
216C	How many days after the termination of the pregnancy did she die?  <i>WRITE "00" IF SHE DIED THE SAME DAY.</i>	<div style="text-align: center;"> <input type="text"/> <input type="text"/>            DAY         </div>	
<i>GO TO 229</i>			

217A	Did she die when she was having a miscarriage or within 42 days following the miscarriage?	YES .....1 NO .....2 DON'T KNOW .....8	→ 218A
217B	For how many months was she pregnant when she died?	<div style="text-align: center;"> <input type="text"/> <input type="text"/>            MONTH         </div>	
217C	How many days after the termination of the pregnancy did she die?  <i>WRITE "00" IF SHE DIED THE SAME DAY.</i>	<div style="text-align: center;"> <input type="text"/> <input type="text"/>            DAY         </div>	
<i>GO TO 231</i>			

218A	Did she die during labour pains, during delivery or within 24 hours following the delivery?	YES .....1 NO .....2 DON'T KNOW .....8	→ 220A
218B	For how many months was she pregnant when she died ?  <i>ATTENTION: IF LESS THAN 6 MONTHS IS INDICATED CONSIDER WHETHER IT IS MISCARRIAGE OR NOT. IF IT HAPPENED DURING MISCARRIAGE GO BACK TO THE 217A AND MAKE THE NECESSARY CORRECTIONS.</i>	<div style="text-align: center;"> <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/>          MONTH       </div>	
219	Did she die before or after labour pains started?	BEFORE .....1 AFTER .....2 DON'T KNOW .....8	

**GO TO 223**

220A	Did death happen within puerperium period?	YES .....1 NO .....2 DON'T KNOW .....8	→ 222
220B	At which day of puerperium was she when she died?  <i>WRITE "00" IF SHE DIED THE SAME DAY.</i>	<div style="text-align: center;"> <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/>          DAY       </div>	
221	At which month of the pregnancy did delivery take place?	<div style="text-align: center;"> <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/>          MONTH       </div>	

**GO TO 223**

222	CHECK 215 AND 215A:	PREGNANT AND PREGNANT FOR MORE THAN 6 MONTHS WHEN SHE DIED <input style="width: 20px; height: 15px; border: 1px solid black;" type="checkbox"/> → 223  PREGNANT AND PREGNANT FOR LESS THAN 6 MONTHS WHEN SHE DIED <input style="width: 20px; height: 15px; border: 1px solid black;" type="checkbox"/> → 300  NOT PREGNANT WHEN SHE DIED <input style="width: 20px; height: 15px; border: 1px solid black;" type="checkbox"/> → 400	
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223	Which part of the baby came first out during birth- head, buttocks or other ?	DELIVERY DID NOT OCCUR .....1 → 300 CESAREAN .....2 HEAD .....3 HIP .....4 ARM .....5  OTHER _____ 7 (SPECIFY) DON'T KNOW .....8	
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224	Was it a single or multiple birth?	DELIVERY DID NOT OCCUR.....1 SINGLE.....2 MULTIPLE.....3 DON'T KNOW.....8	→ 300 → 228A
225	Was the baby alive when he/she was born?	BORN ALIVE STILL LIVING.....1 BORN ALIVE BUT THEN DIED.....2 STILLBIRTH.....3 DON'T KNOW.....8	→ 227 → 227
226	Babies age at death ? (WRITE AS DAY OR MONTH)	DAY ..... 1 MONTH .....	<input type="text"/> <input type="text"/>
227	Gender of the baby?	MALE .....1 FEMALE.....2 DON'T KNOW.....8	→ 300

228A	FOR EACH CHILD ASK THE QUESTIONS SEPARATELY.  BIRTH ORDER OF CHILDREN IS NOT IMPORTANT. .	1. CHILD	2. CHILD	3. CHILD
228B	Was the baby alive when he/she was born?	BORN ALIVE STILL LIVING.....1 228D ← BORN ALIVE THEN DIED.....2 STILL BIRTH.....3 228D ← DON'T KNOW.....8	BORN ALIVE STILL LIVING .....1 228D ← BORN ALIVE THEN DIED .....2 STILL BIRTH .....3 228D ← DON'T KNOW.....8	BORN ALIVE STILL LIVING .....1 228D ← BORN ALIVE THEN DIED .....2 STILL BIRTH .....3 228D ← DON'T KNOW.....8
228C	Babies age at death? (WRITE AS DAY OR MONTH)	DAY ..... 1 MONTH .....	DAY ..... 1 MONTH .....	DAY ..... 1 MONTH .....
228D	Gender of the baby?	MALE .....1 FEMALE.....2 DON'T KNOW.....8	MALE .....1 FEMALE.....2 DON'T KNOW.....8	MALE .....1 FEMALE.....2 DON'T KNOW.....8
		TO GET INFO ABOUT 2ND CHILD GO BACK TO 228B AND ASK THE QUESTIONS FOR THE 2ND CHILD	TO GET INFO ABOUT 3RD CHILD GO BACK TO 228B AND ASK THE QUESTIONS FOR THE 3RD CHILD  IF NOT MORE THAN 2 CHILDREN GO TO 300.	IF MORE THAN 3 CHILDREN USE ADDITIONAL QUESTION FORM AND NOTE THE INFO ABOUT THE 3RD CHILD TO THAT FORM.  IF NOT MORE THAN 3 CHILDREN GO TO 300.

229	What kind of a way was used use to have/induce abortion?	HAD INDUCED ABORTION.....1 BY TAKING DRUG/INJECTION.....2 BY COMPRESSING THE ABDOMEN.....3 BY PUTING SOMETHING IN TO THE UTERUS.....4  OTHER.....7 (SPECIFY) DON'T KNOW .....8	→ 231
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### SECTION 3. PREGNANCY VERBAL AUTOPSY QUESTIONS

<b>300</b>	<p><i>CHECK 215A., 216A, 217A, 218A AND 220A:</i></p> <p>SHE WAS PREGNANT, HAVING INDUCED ABORTION OR MISCARRIAGE, DELIVERING OR IN PUERPERIUM PERIOD WHEN SHE DIED</p>	NONE	400
	<input type="checkbox"/>	<input type="checkbox"/>	
<b>303</b>	Did she have swelling ankles?	YES .....1 NO .....2 BİLMİYOR.....8	
<b>304</b>	Did she have swelling hands?	YES .....1 NO .....2 DON'T KNOW.....8	
<b>305</b>	Puffiness in her face?	YES .....1 NO .....2 DON'T KNOW.....8	
<b>306</b>	Blurred vision?	YES .....1 NO .....2 DON'T KNOW.....8	
<b>306A</b>	Any convulsions in her entire body or any part of her body?	YES .....1 NO .....2 DON'T KNOW.....8	
<b>307</b>	Was her blood pressure measured?	YES .....1 NO .....2 DON'T KNOW.....8	
<b>308</b>	Was her blood pressure high?	YES .....1 NO .....2 DON'T KNOW.....8	
<b>309</b>	Did she have bleedig in her vagina before the termination of her pregnancy?	YES .....1 NO .....2 DON'T KNOW.....8	
<b>310</b>	How long did her bleeding last?	LESS THAN 1 DAY.....1 BETWEEN 1 TO 7 DAYS.....2 BETWEEN 1 WEEK TO 1 MONTH.....3 MORE THAN 1 MONTH.....4 DON'T KNOW.....8	
<b>310A</b>	How much was her bleeding? Was it too heavy, as much as menstrual bleeding; less than menstrual bleeding?	HEAVY .....1 LIKE MENSTRUAL BLEEDING.....2 LESS THAN MENSTRUAL BLEEDING.....3 DON'T KNOW.....8	
<b>311</b>	Was she having pain while bleeding?	YES .....1 NO .....2 DON'T KNOW.....8	
<b>312</b>	Was she having sharp pain in her abdomen during pregnancy?	YES .....1 NO .....2 DON'T KNOW.....8	

313	<p>CHECK 216A, 217A, 218A AND 220A:</p> <p>HAVING MISCARRIAGE/ SPONTANEOUS OR INDUCED ABORTION WHEN SHE DIED</p>	<p>DELIVERING OR IN PUERPERIUM WHEN SHE DIED</p>	
<p>314 Did death occur suddenly during pregnancy?</p>		<p>YES .....1 NO .....2 DON'T KNOW.....8</p>	
<p>GO TO 400</p>			
315	<p>Did she have bleeding during delivery?</p>	<p>YES .....1 NO .....2 DON'T KNOW.....8</p>	<p>319</p>
316	<p>Was it a heavy bleeding?</p>	<p>YES .....1 NO .....2 DON'T KNOW.....8</p>	
318	<p>Did her bleeding start before delivery?</p>	<p>YES .....1 NO .....2 DON'T KNOW.....8</p>	
319	<p>Did she take a drug used to start labour pains?</p>	<p>YES .....1 NO .....2 DON'T KNOW.....8</p>	
320	<p>How long did her labour pains last?</p>	<p>HOUR .....1 <input type="text"/> <input type="text"/></p> <p>OTHER (IF HOUR NOT INDICATED) ..... 997 DON'T KNOW..... 998</p>	
322	<p>Was she given a drug used to make labour pains stronger?</p>	<p>YES .....1 NO .....2 DON'T KNOW.....8</p>	
323	<p>Any difficulty during delivery?</p>	<p>YES .....1 NO .....2 DON'T KNOW.....8</p>	
324	<p>Did the placenta come out?</p>	<p>YES .....1 NO .....2 DON'T KNOW.....8</p>	<p>327</p>
325	<p>Bebğin eşinin (plasentanın) tümü mü yoksa bir kısmı mı gelmişti?</p>	<p>COMPLETELY .....1 PARTIALLY.....2 DON'T KNOW.....8</p>	
326	<p>Did the placenta come out completely or only partially?</p>	<p>IMMEDIATELY.....1 WITHIN FIRST 30 MINUTES.....2 30 MINUTES- 1 HOUR.....3 MORE THAN 1 HOUR.....4 DON'T KNOW.....8</p>	

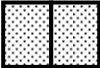
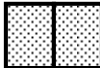
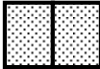

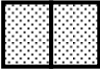
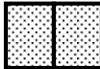
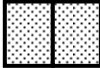

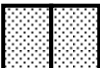



327	Did she have heavy bleeding within 42 days after delivery?	DURING DELIVERY.....0 YES .....1 NO .....2 DON'T KNOW.....8	→ 400
328	Did she had a foul smelling vaginal discharge within 42 days after delivery?	YES .....1 NO .....2 DON'T KNOW.....8	
329	Did she have high fever within 42 days after delivery?	YES .....1 NO .....2 DON'T KNOW.....8	
329A	? Was she having sharp pain in her lower abdomen within 42 days after delivery?	YES .....1 NO .....2 DON'T KNOW.....8	
330	Did she have pain in her legs after delivery?	YES .....1 NO .....2 DON'T KNOW.....8	→ 400
330A	Was the reason of her pain the swelled leg?  <i>IF THERE IS SWELLING IN BOTH OF HER LEGS CIRCLE "NO".</i>	YES .....1 NO .....2 DON'T KNOW.....8	

# SECTION 4. ADULT VERBAL AUTOPSY

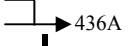
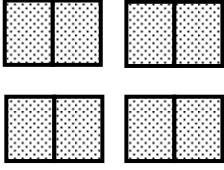
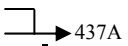
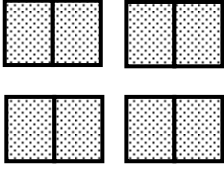
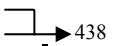
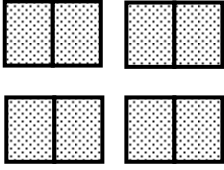
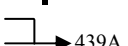
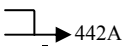
<b>400</b>	Did the deceased experience any assault/homicide, car accident, falling, fire, gas poisoning or another event?  (IF YES): What happened to her?  <i>IF THE ANSWER IS EITHER FALLING, FIRE, OR GAS POISONING PROBE WHETHER IT IS SUICIDE OR NOT.</i>	NO.....0 → 403 ASSAULT/HOMICIDE.....1 CAR ACCIDENT.....2 FALLING.....3 FIRE.....4 GAS POISONING.....5  OTHER _____ 7 (SPECIFY) DON'T KNOW.....8 → 403
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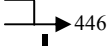
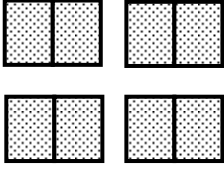

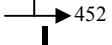
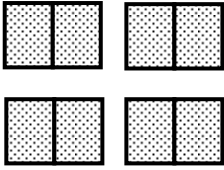
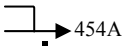
**GO TO 489**

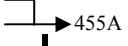
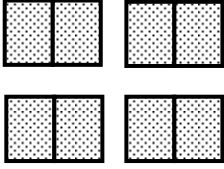
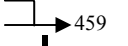
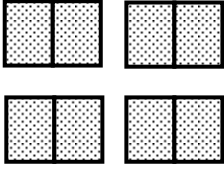

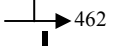
<b>403</b>	Do you think that she committed suicide?	YES .....1 → 489 NO .....2 DON'T KNOW.....8
<b>404A</b>	Did she have high fever during the last illness before her death?	YES .....1 NO .....2 DON'T KNOW.....8 → 407A
<b>404B</b>	How long before her death did high fever start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____
<b>407A</b>	Did she have cough during her last illness?	YES .....1 NO .....2 DON'T KNOW.....8 → 408A
<b>407B</b>	How long before her death did cough start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____
<b>408</b>	Was there blood with cough?	YES .....1 NO .....2 DON'T KNOW.....8
<b>408A</b>	Was she expectorating/producing sputum?	YES .....1 NO .....2 DON'T KNOW.....8 → 410A
<b>408B</b>	How long before her death did she start expectorating/producing sputum and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____
<b>409</b>	Was there blood with sputum?	YES .....1 NO .....2 DON'T KNOW.....8

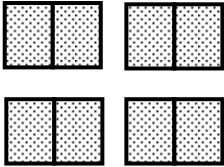
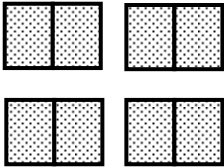
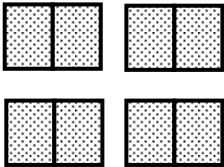
410A	Did she have shortness of breath or difficulty in breathing or during her last illness?	YES .....1 NO .....2 DON'T KNOW.....8	→ 417A
410B	How long before her death did difficulty in breathing start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____    Stop _____  	
411	Was her breathing difficulty continuous or on and off?	CONTINUOUS .....1 EVERY 1- 2 DAYS .....2 AT NIGHT ONLY .....3  OTHER _____ 7 (SPECIFY) DON'T KNOW.....8	
412	Did she have wheezing while breathing?	YES .....1 NO .....2 DON'T KNOW.....8	
413	Did she become/get breathless even doing simple work?	YES .....1 NO .....2 DON'T KNOW.....8	
415	Did she have pain in her chest while breathing?	YES .....1 NO .....2 DON'T KNOW.....8	
417A	Did she have chest pain other than breathing?	YES .....1 NO .....2 DON'T KNOW.....8	→ 421A
417B	How long before her death did chest pain start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____    Stop _____  	
418	Was the pain mild, moderate or intense/severe?	MILD.....1 MODERATE.....2 INTENSE/SEVERE.....3 DON'T KNOW .....8	
421A	Did she have pain in her abdomen?	YES .....1 NO .....2 DON'T KNOW.....8	→ 425
421B	How long before her death did abdomen pain start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____    Stop _____  	
422	Where exactly was the pain located?	LOWER ABDOMEN .....1 UPPER ABDOMEN .....2 ALL OVER THE ABDOMEN.....3  OTHER _____ 7 (SPECIFY) DON'T KNOW.....8	



435A	Did she have swelling around her ankles?	YES .....1 NO .....2 DON'T KNOW.....8	
435B	How long before her death did the swelling around her ankles start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____	
436A	Did she have puffiness/swelling on her face?	YES .....1 NO .....2 DON'T KNOW.....8	
436B	How long before her death did the swelling on her face start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____	
437A	Did she have swellings in the neck?	YES .....1 NO .....2 DON'T KNOW.....8	
437B	How long before her death did the swellings in her neck start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____	
438	Did she have any other swelling on different parts the body?	YES .....1 NO .....2 DON'T KNOW.....8	
438A	Where exactly were the swellings? Anywhere else?  <i>RECORD ALL MENTIONED</i>	HEAD.....A      LOWER BACK.....J MOUTH.....B      HIP.....K UPPER ARM.....C      GENITALS.....L LOWER ARM.....D      THIGH.....M ARMPIT.....E      LEGS.....N HANDS.....F      FEETS.....O CHEST.....G      BREAST.....P INGUINAL.....H      OTHER.....U UPPER BACK.....I	
439A	Were there any ulcers in her body?	YES .....1 NO .....2 DON'T KNOW.....8	
439B	Where was the ulcer wound? Anywhere else?  <i>RECORD ALL MENTIONED</i>	HEAD.....A      LOWER BACK.....J MOUTH.....B      HIP.....K UPPER ARM.....C      GENITALS.....L LOWER ARM.....D      THIGH.....M ARMPIT.....E      LEGS.....N HANDS.....F      FEETS.....O CHEST.....G      BREAST.....P INGUINAL.....H      OTHER.....U UPPER BACK.....I	

442A	Did she have diarrhoea?	YES .....1 NO .....2 DON'T KNOW .....8	
442B	How long before her death did diarrhoea start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____	
443	Was the diarrhoea continuous or on and off?	CONTINUOUS.....1 ON AND OFF.....2 DON'T KNOW.....8	
444	When the diarrhoea was severe, how many times in a day did she defecate/pass stool?	  NUMBER OF TOILET VISITS PER DAY (Don't know "98")	
445	How did the stool look like?	WATERY .....1 LOOSE BUT NOT WATERY .....2 DON'T KNOW .....8	
446	Was there blood in the stool?	YES .....1 NO .....2 DON'T KNOW .....8	
447	Was she able to defecate before her death?	YAPABİLİYORDU.....1 YAPAMIYORDU.....2 DON'T KNOW .....8	
449	What was the colour of urine?	PRIMROSE YELLOW.....1 DARK YELLOW.....2 BROWN.....3 BLOOD STAINED.....4 DON'T KNOW .....8	
450A	Was there any change in the number of urination in a day?	YES .....1 NO .....2 DON'T KNOW .....8	
450B	How long before her death did change in number of urination start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____	
451	Was the number of daily urination more than normal or was she unable to urinate?	MORE.....1 LESS.....2 NOT URINATING.....3 DON'T KNOW.....8	
452	Did she have difficulty while urinating?	YES .....1 NO .....2 DON'T KNOW .....8	
453	Did she have a burning sensation while urinating?	YES .....1 NO .....2 DON'T KNOW .....8	

454A	Did she have irregular bleeding (vaginal bleeding)?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	
454B	How long before her death did irregular bleeding start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____	
455A	Did she have nausea?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	
455B	How long before her death did nausea start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____	
457	How many times a day did she vomit when the nausea was intense?	  NO OF VOMITS PER DAY (Bilmiyor: "98")	
458	What did the vomitus look like?	WATERY FLUID ..... 1 YELLOWISH FLUID ..... 2 BROWN ..... 3 BLOODY ..... 4  OTHER _____ 7 (SPECIFY) DON'T KNOW ..... 8	
459	Days and weeks before her death had she lost weight?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	
460	Was this a severe loss of weight?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	
462	Did she have difficulty in opening her mouth?	YES, HAVING DIFFICULTY ..... 1 NO DIFFICULTY ..... 2 DON'T KNOW ..... 8	
463A	Did she have difficulty in swallowing?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	
464A	Did she have stiff neck right before her death?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	

465A	Did she have fits right before her death?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	→ 470
466	Could you describe the fits?	REPETITIVE JERKING OF WHOLE BODY ..... 1  OTHER _____ _____ 7 (SPECIFY) DON'T KNOW ..... 8	
469	Was she having those kinds of fits before?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	
470	Was she normal/ conscious, mentally confused or unconscious before her death?	NORMAL ..... 1 CONFUSED ..... 2 UNCONSCIOUS ..... 3  OTHER _____ 7 (SPECIFY) DON'T KNOW ..... 8	→ 475A        → 475A
471	How did this problem/ loss of consciousness start, suddenly, rapidly within a day, or slowly over few days?	SUDDENLY ..... 1 RAPIDLY WITHIN A DAY ..... 2 SLOWLY OVER FEW DAYS ..... 3 DON'T KNOW ..... 8	
475A	Was her whole body rigid/stif?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	→ 476A
475B	How long before her death did rigidity/stiffness in whole body start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____	
476A	Did she have paralysis?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	→ 477A
476B	How long before her death did state of paralysis start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____	
477A	Any impairment in her speech?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	→ 478
477B	How long before her death did speech impairment start, and stop?  <i>RECORD THE ANSWER AS IT IS SAID. IF DATE WAS INDICATED NOTE IT DOWN AND DO NOT MAKE ANY CALCULATION.</i>	Start _____  Stop _____	
478	Did she have sore eyes?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	

479	Was the white of her eyes yellow?	YES .....1 NO .....2 DON'T KNOW.....8	
480	Did her face look pale or anemic?	YES .....1 NO .....2 DON'T KNOW.....8	
481	Did her palms look pale?	YES .....1 NO .....2 DON'T KNOW.....8	

489	<i>CHECK 215, 216A, 217A, 218A AND 220A:</i>		
DEATH RELATED WITH PREGNANCY OR DELIVERY <input type="checkbox"/>		DEATH NOT RELATED WITH PREGNANCY OR DELIVERY <input type="checkbox"/>	→ 600
<input type="checkbox"/> ↓ 500			





	<p>(NAME OF THE PLACE)</p>	<p><b>PRIVATE SECTOR</b>  PRIVATE HOSP ..... 21  PRIVATE POLYCLINIC..... 22  PRIVATE DOCTOR’S OFFICE..... 23  PRIVATE NURSE/MIDWIFE (HEALTH CABINET)..... 24  OTHER _____ 29  (SPECIFY)  UNIVERSITY HOSPITAL ..... 31  VOLUNATRY ORG./FOUNDATION HOSP./CLINIC..... 41  OTHER _____ 97  (SPECIFY)  DON’T KNOW ..... 98</p>	
<p>513</p>	<p>What was the last place she went?</p> <p>(NAME OF THE PLACE)</p>	<p><b>PUBLIC SECTOR</b>  GOVERNMENT/SAMPLE HOSP..... 11  MATERNITY HOUSE ..... 12  MCH/FP CENTER..... 13  HEALTH CENTER ..... 14  HEALTH HOUSE ..... 15  SSK HOSPITAL/DISPANSERY ..... 16  OTHER _____ 19  (SPECIFY)  <b>PRIVATE SECTOR</b>  PRIVATE HOSP ..... 21  PRIVATE POLYCLINIC..... 22  PRIVATE DOCTOR’S OFFICE..... 23  PRIVATE NURSE/MIDWIFE (HEALTH CABINET)..... 24  OTHER _____ 29  (SPECIFY)  UNIVERSITY HOSPITAL ..... 31  VOLUNATRY ORG./FOUNDATION HOSP./CLINIC..... 41  OTHER _____ 97  (SPECIFY)  DON’T KNOW ..... 98</p>	

514	<b>ATTENTION</b> <b>ASK THE QUESTIONS BETWEEN 515 AND 526 FOR THE LAST FACILITY WHERE TREATMENT WAS RECEIVED (QUESTION 513)</b>		
515	Did death occur in .....?	YES .....1 NO .....2 DON'T KNOW .....8	→ 517A
516	How much later did she die after they arrived there?  <i>IF LESS THAN ONE HOUR RECORD AS MINUTE, IF LESS THAN 1 DAY RECORD AS HOUR.</i>	MINUTE .....1 <input type="text"/> <input type="text"/>  HOUR .....2 <input type="text"/> <input type="text"/>  DAY .....3 <input type="text"/> <input type="text"/>  DON'T KNOW .....998	
517A	Was the place she received treatment at the same settlement she lived in?	YES .....1 NO .....2 DON'T KNOW .....8	
517B	How far away was the place she received treatment from the place she lived in?	AT THE SAME STREET, OR QUARTER/DISTRICT..... 1 AT A CLOSE QUARTER .....2 AT A DISTANT QUARTER.....3 AT A CLOSE SETTLEMENT.....4 AT A DISTANT SETTLEMENT.....5 DON'T KNOW .....8	
518	How has she gone to .....?	VIA AMBULANCE.....1 VIA PRIVATE CAR.....2 VIA BUS/DOLMUŞ .....3 VIA TAXİ.....4  OTHER _____ 7 (SPECIFY) DON'T KNOW .....8	
519	How long did it take to go to.....?  <i>IF LESS THAN AN HOUR RECORD AS MINUTE.</i>	MINUTE .....1 <input type="text"/> <input type="text"/>  HOUR .....2 <input type="text"/> <input type="text"/>  DON'T KNOW .....998	
520	Did she have difficulty finding a vehicle?	YES.....1 NO.....2 DON'T KNOW .....8	
521	How much later has she been examined after she arrived the last place that she received treatment?  <i>IF LESS THAN AN HOUR RECORD AS MINUTE.</i>	MINUTE .....1 <input type="text"/> <input type="text"/>  HOUR .....2 <input type="text"/> <input type="text"/>  DON'T KNOW .....998	



**SECTION 5B. PREGNANCY, ANC AND DELIVERY**

530	Was there any live birth before the pregnancy/delivery she died?	YES.....1 NO.....2 →	533						
531	At which month and year did the last live birth occur before the pregnancy/delivery at the time of her death?  <i>YEAR MUST BE RECORDED.</i>	MONTH ..... <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table>  YEAR ..... <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table>							

		PREGNANCY OR DELIVERY AT TIME OF DEATH	PREVIOUS LIVE BIRTH (SINCE JANUARY 1998)
533	<i>CHECK QUESTIONS 215,216A,217A,218A AND 220A</i>	NAME _____  <input type="checkbox"/> NO DELIVERY (SPONTANEOUS/INDUCED ABORTION) <input type="checkbox"/> HAD DELIVERY (STILLBIRTH/LIVE BIRTH)	NAME _____
534	When ..... was pregnant did she see anyone for antenatal care during her pregnancy in order to get information and assistance?  (IF YES) Whom did she see?  Anyone else?  <i>PROBE THESE PERSONS AND MARK/RECORD ALL PERSONS SEEN</i>	<b>HEALTH STAFF/PROFESSIONAL</b> DOCTOR .....A MIDWIFE/NURSE .....B  <b>OTHER PERSONS</b> TRAD. MIDWIFE/GRAN..... D  OTHER _____ U (SPECIFY)  NO ONE..... Y 536 ←  DON'T KNOW..... X	<b>HEALTH STAFF/PROFESSIONAL</b> DOCTOR .....A MIDWIFE/NURSE .....B  <b>OTHER PERSONS</b> TRAD. MIDWIFE/GRAN..... D  OTHER _____ U (SPECIFY)  NO ONE..... Y 536 ←  DON'T KNOW..... X
535	Where did she go?  Any other?  <i>RECORD ALL MENTIONED.</i>  _____ (NAME OF PLACE: PREGNANCY OR DELIVERY AT TIME OF DEATH)        _____ (NAME OF PLACE: PREVIOUS LIVE BIRTH)	<b>PUBLIC SECTOR</b> GOVERNMENT/SAMPLE HOSP..... A MATERNITY HOUSE .....B MCHFP CENTER..... C HEALTH CENTER .....D HEALTH HOUSE .....E SSK HOSPITAL/DISPANSERY ..... F  OTHER _____ G (SPECIFY)  <b>PRIVATE SECTOR</b> PRIVATE HOSP ..... H PRIVATE POLYCLINIC .....I PRIVATE DOCTOR'S OFFICE.....J PRIVATE NURSE/MIDWIFE (HEALTH CABINET) ..... K  OTHER _____ M (SPECIFY)  UNIVERSITY HOSPITAL ..... N  VOLUNATRY ORGANIZATION/ FOUNDATION HOSPITAL/CLINIC... O  OTHER _____ U (SPECIFY)  DON'T KNOW..... X	<b>PUBLIC SECTOR</b> GOVERNMENT/SAMPLE HOSP..... A MATERNITY HOUSE .....B MCHFP CENTER..... C HEALTH CENTER .....D HEALTH HOUSE .....E SSK HOSPITAL/DISPANSERY ..... F  OTHER _____ G (SPECIFY)  <b>PRIVATE SECTOR</b> PRIVATE HOSP ..... H PRIVATE POLYCLINIC .....I PRIVATE DOCTOR'S OFFICE.....J PRIVATE NURSE/MIDWIFE (HEALTH CABINET) ..... K  OTHER _____ M (SPECIFY)  UNIVERSITY HOSPITAL ..... N  VOLUNATRY ORGANIZATION/ FOUNDATION HOSPITAL/CLINIC... O  OTHER _____ U (SPECIFY)  DON'T KNOW..... X
		<i>SKIP TO 537</i>	<i>SKIP TO 537</i>

		PREGNANCY OR DELIVERY AT TIME OF DEATH NAME _____	PREVIOUS LIVE BIRTH (SINCE JANUARY 1998) NAME _____
536	During her pregnancy with ..... why did she not receive antenatal care?  <i>RECORD ALL MENTIONED.</i>	NO PROBLEM..... A NO HEALTH FACILITY IN PROXIMITY..... B DISTRUST TO HF/ ITS STAFF..... C DIFFICULTY BENEFITING FROM THE HF..... D CUSTOMS/TRADITIONS..... E FINANCIAL PROBLEMS..... F POOR SERVICE OUALITY..... G DON'T KNOW WHERE TO GO..... H DIED/HAPPENED SUDDENLY..... I  OTHER _____ U (SPECIFY)  DON'T KNOW ..... X	NO PROBLEM..... A NO HEALTH FACILITY IN PROXIMITY..... B DISTRUST TO HF/ ITS STAFF..... C DIFFICULTY BENEFITING FROM THE HF..... D CUSTOMS/TRADITIONS..... E FINANCIAL PROBLEMS..... F POOR SERVICE OUALITY..... G DON'T KNOW WHERE TO GO..... H DIED/HAPPENED SUDDENLY..... I  OTHER _____ U (SPECIFY)  DON'T KNOW ..... X
		<i>SKIP TO 544</i>	<i>SKIP TO 544</i>
537	How many months pregnant was she with .....when she went first time to the person(s) you mentioned before?	MONTH..... <input type="text"/> <input type="text"/>  DON'T KNOW ..... 98	MONTH..... <input type="text"/> <input type="text"/>  DON'T KNOW ..... 98
538	During her pregnancy with ..... when she went for the first time for antenatal care did she go because there was a problem or was it an ordinary check-up for her pregnancy?	THERE WAS A PROBLEM..... 1 ORDINARY CONTROL/CARE..... 2 540 ←  OTHER _____ 7 (SPECIFY)  DON'T KNOW ..... 8 540 ←	THERE WAS A PROBLEM..... 1 ORDINARY CONTROL/CARE..... 2 540 ←  OTHER _____ 7 (SPECIFY)  DON'T KNOW ..... 8 540 ←
539	What was the problem?	_____ (SPECIFY)	_____ (SPECIFY)
540	How many times did she see this person (s) during her pregnancy with ..... regarding antenatal care?	NO. OF TIMES..... <input type="text"/> <input type="text"/>  DON'T KNOW ..... 98	NO. OF TIMES..... <input type="text"/> <input type="text"/>  DON'T KNOW ..... 98
541	How many months pregnant was she with ..... when she recieved antenatal care for the last time?	MONTH..... <input type="text"/> <input type="text"/>  DON'T KNOW ..... 98	MONTH..... <input type="text"/> <input type="text"/>  DON'T KNOW ..... 98





## SECTION 6. ADULTH DEATH SERVICE USE

600	Has she gone to any health facility for treatment? (IF YES) How many different places did she go?	YES.....1 <input type="checkbox"/> <input type="checkbox"/> NO.....200 DON'T KNOW .....998	700
601	What was the first health facility she went?  _____ (NAME OF THE PLACE)	<b>PUBLIC SECTOR</b> GOVERNMENT/SAMPLE HOSP.....11 MATERNITY HOUSE .....12 MCH/FP CENTER.....13 HEALTH CENTER .....14 HEALTH HOUSE .....15 SSK HOSPITAL/DISPANSERY .....16  OTHER .....19 (SPECIFY)  <b>PRIVATE SECTOR</b> PRIVATE HOSP .....21 PRIVATE POLYCLINIC.....22 PRIVATE DOCTOR'S OFFICE.....23 PRIVATE NURSE/MIDWIFE (HEALTH CABINET).....24  OTHER .....29 (SPECIFY)  UNIVERSITY HOSPITAL .....31 VOLUNATRY ORG./FOUNDATION HOSP./CLINIC.....41 OTHER .....97 (SPECIFY)  DON'T KNOW .....98	
602	What was the reason to chose this facility?  _____ (SPECIFY)		
603	Was she satisfied with the service she recieved there?	YES .....1 NO .....2 DON'T KNOW .....8	605 605
604	Why was she not satisfied with this service?  _____ (SPECIFY)		
605	How did the treatment end up? (What was the outcome of the treatment)  _____ (SPECIFY)		

606	Did she go to another health facility?	YES .....1 NO .....2 DON'T KNOW .....8	→ 612
607	What was the last health facility she went to?  <hr/> (NAME OF THE PLACE)	<b>PUBLIC SECTOR</b> GOVERNMENT/SAMPLE HOSP .....11 MATERNITY HOUSE .....12 MCH/FP CENTER .....13 HEALTH CENTER .....14 HEALTH HOUSE .....15 SSK HOSPITAL/DISPENSARY .....16  OTHER .....19 (SPECIFY)  <b>PRIVATE SECTOR</b> PRIVATE HOSP .....21 PRIVATE POLYCLINIC .....22 PRIVATE DOCTOR'S OFFICE .....23 PRIVATE NURSE/MIDWIFE (HEALTH CABINET) .....24  OTHER .....29 (SPECIFY)  UNIVERSITY HOSPITAL .....31 VOLUNATRY ORG./FOUNDATION HOSP./CLINIC .....41 OTHER .....97 (SPECIFY)  DON'T KNOW .....98	
608	What was the reason to chose this facility?  <hr/> (SPECIFY)		
609	Was she satisfied with the service she recieved there?	YES .....1 NO .....2 DON'T KNOW .....8	→ 611 → 611
610	Why was she not satisfied with this service?  <hr/> (SPECIFY)		
611	How did the treatment end up? (What was the outcome of the treatment)  <hr/> (SPECIFY)		
612	<i>CHECK 600</i>  <i>(IF APPLIED TO ONE HEALTH FACILITY ONLY)</i> Why didn't she receive treatment at another facility?  <i>(IF APPLIED MORE THAN ONE HEALTH FACILITY)</i> Why did she go to another health facility for treatment?	<hr/> (SPECIFY)	

## SECTION 7. DECEASED WOMAN'S BACKGROUND

700	<p>Has she ever attended to school?</p> <p>IF YES what was her education level?</p>	<p>NO EDUCATION/NOT COMPLETED PRIM. SCHOOL .....1          PRIMARY SCHOOL .....2          SECONDARY SCHOOL .....3          HIGH SCHOOL AND HIGHER .....4          DON'T KNOW .....8</p>	
703A	<p>Where did she live for most of the time until she was 12 years old?</p> <p>_____</p> <p>(NAME OF PLACE)</p> <p>Was it a province centre, district centre, a subdistrict or village ? Or did she live abroad?</p>	<p>PLACE OF DEATH.....0 → 704A          PROVINCE CENTRE.....1          DISTRICT CENTRE .....2          SUBDISTRICT .....3          ABROAD .....4          DON'T KNOW .....8 → 704A</p>	704A
703B	<p>In which province is this place now?</p> <p><i>RECORD THE NAME AND CODE OF THE PROVINCE.</i></p>	<p>NAME OF PROVINCE _____ <input type="text"/></p>	
704A	<p>Where did she live before her death?</p> <p>_____</p> <p>(NAME OF PLACE)</p> <p>Was it a province centre, district centre, a subdistrict or village ? Or did she live abroad?</p>	<p>PLACE OF DEATH.....0 → 705          PROVINCE CENTRE.....1          DISTRICT CENTRE .....2          SUBDISTRICT .....3          ABROAD .....4          DON'T KNOW .....8 → 705</p>	705
704B	<p>In which province is this place now?</p> <p><i>RECORD THE NAME AND CODE OF THE PROVINCE.</i></p>	<p>NAME OF PROVINCE _____ <input type="text"/></p>	
705	<p>What was her mother tongue?</p> <p><i>RECORD ONLY ONE RESPONSE.</i></p>	<p>TURKISH .....01          KURDISH .....02          ARABIC .....03          GREEK,ARMENIAN, HEBREW (LADINO) .....04          CIRCASSIAN, GEORGIAN, LAZ LANGUAGE .....05          RUSSIAN, BULGARIAN, RUMANIAN, SERBIAN .....06          ENGLISH, GERMAN, FRENCH .....07          OTHER _____ 97          (SPECIFY)          DON'T KNOW .....98</p>	
706A	<p>Now I would like to ask you some questions about her work situation?</p> <p>Has she worked in any job in the last 12 months other than housework, with or without any income?</p>	<p>YES.....1 → 710          NO.....2          DON'T KNOW.....8</p>	710
706B	<p>As you know some women sell small things, sell goods at the market place, work on the family farm or business with or without being paid, do some needlework at home, look after children, work as housemaids etc. Please answer taking these kinds of work into account.</p> <p>Has she worked in a job like that in the last 12 months other than housework, with or without any income?</p>	<p>YES.....1          NO.....2          DON'T KNOW.....8</p>	

710	CHECK 214 IF BECAME PREGNANT <input type="checkbox"/>	IF DID NOT BECOME PREGNANT <input type="checkbox"/>	737
711	Now I would like to ask about the births she has had. Has she ever given birth? <input type="checkbox"/>	YES.....1 NO.....2	718
712	Did she have any sons or daughters to whom she has given birth who are living with her?	YES .....1 NO .....2	714
713	How many sons were living with her? And how many daughters were living with her?  <i>IF NONE, RECORD "00".</i>	SONS ..... <input type="text"/> <input type="text"/> DAUGHTERS ..... <input type="text"/> <input type="text"/>	
714	Did she have any sons or daughters to whom she has given birth who are alive but did not live with her?	YES .....1 NO .....2	716
715	How many sons did not live with her? How many daughters did not live with her?  <i>IF NONE, RECORD "00".</i>	SONS..... <input type="text"/> <input type="text"/> DAUGHTERS..... <input type="text"/> <input type="text"/>	
716	Has she ever given birth to a boy or a girl who was born alive but died later?  <i>IF NO, PROBE BEFORE RECORDING:</i> It could be a baby who lived for a very short time such as few hours, or few days after birth.	YES .....1 NO .....2	718
717	In total, how many boys of her have died? And how many girls have died?  <i>IF NONE, RECORD "00"</i>	DEAD MALE CHILDREN..... <input type="text"/> <input type="text"/> DEAD FEMALE CHILDREN..... <input type="text"/> <input type="text"/>	

718	CHECK THE NUMBERS IN 713,715,AND 71, ADD THEM AND WRITE DOWN IF NO RECORD "00"	TOTAL ..... <input type="text"/> <input type="text"/>	
719	CHECK 718: Just to make sure that I have this right: She has had in TOTAL _____ live births during her life. Is this true? YES <input type="checkbox"/> NO <input type="checkbox"/> → PROBE AND CORRECT 711-718 AND CONTINUE		
720	Did she had any miscarriage?	YES .....1 NO .....2 → 722	
721	In total, how many miscarriages has she had?	NUMBER OF MISCARRIAGES..... <input type="text"/> <input type="text"/>	
722	Has she ever had an induced abortion or has she ever induced a miscarriage?	YES .....1 NO .....2 → 724	
723	In total, how many induced abortions has she had?	NUMBER OF INDUCED ABORTIONS..... <input type="text"/> <input type="text"/>	
724	Has she ever had a stillbirth?	YES .....1 NO .....2 → 726	
725	In total, how many still births has she had?	NUMBER OF STILLBIRTH..... <input type="text"/> <input type="text"/>	
726	TAKE INTO ACCOUNT THE INFORMATION PROVIDED BELOW AND ENSURE THAT THE TOTAL NUMBER OF COMPLETED PREGNANCIES ARE CORRECT  TOTAL NUMBER OF PREGNANCIES ENDING IN MISCARRIAGES, INDUCED ABORTIONS OR STILL BIRTHS: SUM THE ANSWERS TO 721, 723 AND 725 _____  TOTAL NUMBER OF LIVE BIRTHS (CHECK 718) + _____  TOTAL NUMBER OF COMPLETED PREGNANCIES..... <input type="text"/> <input type="text"/>		
727	CHECK 726: Just to make sure that I have this right. She has had in TOTAL _____ completed pregnancies. Is that correct? YES <input type="checkbox"/> NO <input type="checkbox"/> → PROBE AND CORRECT 711-726 AND CONTINUE.		
728	Has she ever had an ectopic pregnancy?	YES .....1 NO .....2 DON'T KNOW.....8 → 730	
729	In total, how many ectopic pregnancies has she had?	NUMBER OF ECTOPIC PREGNANCIES..... <input type="text"/> <input type="text"/>	

730	<p>CHECK 215, 216A, 217A, 218A AND 220A:</p> <p>DEATH RELATED TO PREGNANCY OR DELIVERY</p>	<p>DEATH NOT RELATED TO PREGNANCY OR DELIVERY</p>	737
731	<p>Was she or her husband doing something or using any method to delay or avoid getting pregnant before the pregnancy that led to her death?</p>	<p>YES .....1  NO .....2  DON'T KNOW.....8</p>	734
732	<p>Which method were they using?</p> <p><i>IF MORE THAN ONE METHOD RECORD THE ONE WHICH IS MOST TOP.</i></p>	<p>TUBAL LIGATION.....01  MALE STERILIZATION.....02  PILL .....03  IUD.....04  INJECTABLES.....05  IMPLANT/NORPLANT.....06  CONDOM.....07  FEMALE CONDOM.....08  DIAPHRAGM/FOAM/JELLY.....09  LACTATIONAL AMEN. METHOD.....10  RHYTHM.....11  WITHDRAWAL.....12</p> <p>OTHER _____ 97  (SPECIFY)</p> <p>DON'T KNOW.....98</p>	
733A	<p>Did they stop using the method or did she become pregnant while using the method?</p>	<p>STOPPED USING METHOD.....1  BECAME PREG. WHILE USING.....2  DON'T KNOW.....8</p>	734
733B	<p>Why did they stop using this method?</p>	<p>WANTED TO GET PREGNANT.....1  PROBLEMS WITH THE METHOD.....2</p> <p>OTHER _____ 7  (SPECIFY)</p> <p>DON'T KNOW.....8</p>	
734	<p>Did she want to become pregnant, did she want to wait until later, or did she not want to have any more children at all?</p>	<p>THEN.....1  LATER.....2  NOT AT ALL.....3  DON'T KNOW.....8</p>	737
735	<p>You said that she wanted the last pregnancy. Did she want to become pregnant earlier?</p>	<p>YES .....1  NO .....2  DON'T KNOW .....8</p>	
736	<p>When she learned that she is pregnant, was it a big or small problem for her, or wasn't it a problem at all?</p>	<p>BIG PROBLEM.....1  SMALL PROBLEM.....2  NOT A PROBLEM.....3  DON'T KNOW.....8</p>	
737	<p>Has she ever married?</p> <p><i>ACCEPT THOSE LIVING TOGETHER AS BEING MARRIED.</i></p>	<p>YES.....1  NO.....2</p>	742
738	<p>What was her marital status when she died?</p> <p><i>ACCEPT THOSE LIVING TOGETHER AS BEING MARRIED.</i></p>	<p>STILL MARRIED.....1  WIDOWED.....2  DIVORCED .....3  LIVING SEPARATELY.....4</p>	742



743B	Did this health insurance belong to herself, or was she using her husbands or other family members insurance?	HERSELF.....1 HER HUSBAND.....2 FAMILY MEMBERS.....3 DON'T KNOW.....8 .....	
744	Has she had an ID Card?	YES .....1 NO .....2 DON'T KNOW.....8 .....	
746A	<i>RECORD THE ENDING HOUR</i>	HOUR – MINUTE..... <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
746B	<i>WAS THE INTERVIEW INTERRUPTED?</i>  <i>IF YES, HOW MANY MINUTES APPROXIMATELY?</i>	NO .....000  MINUTE .....1 <input type="text"/> <input type="text"/>	
747	<i>I asked you several questions about someone you lost and who is close to you. How did you feel while talking on that issue?</i>  <i>RECORD EXACTLY RESPONDENT'S WORDS AND CIRCLE THE APPROPRIATE OPTION. .</i>  ..... ..... ..... ..... ..... ..... ..... .....	GOOD/BETTER ..... 1 BAD/WORSE..... 2 SAME/NO DIFFERENCE..... 3	
748	<i>IN YOUR OPINION, HOW DID THE RELATIVE OF THE DECEASED FEEL BY TALKING ABOUT HER DEATH?</i>	GOOD/BETTER ..... 1 BAD/WORSE..... 2 SAME/NO DIFFERENCE..... 3	
<i>SAY THANK YOU AND GO BACK TO THE COVER PAGE IN ORDER TO FINALIZE THE QUESTIONNAIRE.</i>			



**AGE -YEAR OF BIRTH TABLE**

<b>YEAR OF DEATH 2005</b>		
<b>AGE</b>	<b>YEAR OF BIRTH</b>	
	<b>HAS NOT HAD BIRTHDAY IN 2005</b>	<b>HAS ALREADY HAD BIRTHDAY IN 2005</b>
	<b>DOES NOT KNOW</b>	
12	1992	1993
13	1991	1992
14	1990	1991
15	1989	1990
16	1988	1989
17	1987	1988
18	1986	1987
19	1985	1986
20	1984	1985
21	1983	1984
22	1982	1983
23	1981	1982
24	1980	1981
25	1979	1980
26	1978	1979
27	1977	1978
28	1976	1977
29	1975	1976
30	1974	1975
31	1973	1974
32	1972	1973
33	1971	1972
34	1970	1971
35	1969	1970
36	1968	1969
37	1967	1968
38	1966	1967
39	1965	1966
40	1964	1965
41	1963	1964
42	1962	1963
43	1961	1962
44	1960	1961
45	1959	1960
46	1958	1959
47	1957	1958
48	1956	1957
49	1955	1956
50	1954	1955
51	1953	1954
52	1952	1953
53	1951	1952
54	1950	1951
55	1949	1950

<b>YEAR OF DEATH 2006</b>		
<b>AGE</b>	<b>YEAR OF BIRTH</b>	
	<b>HAS NOT HAD BIRTHDAY IN 2006</b>	<b>HAS ALREADY HAD BIRTHDAY IN 2006</b>
	<b>DOES NOT KNOW</b>	
12	1993	1994
13	1992	1993
14	1991	1992
15	1990	1991
16	1989	1990
17	1988	1989
18	1987	1988
19	1986	1987
20	1985	1986
21	1984	1985
22	1983	1984
23	1982	1983
24	1981	1982
25	1980	1981
26	1979	1980
27	1978	1979
28	1977	1978
29	1976	1977
30	1975	1976
31	1974	1975
32	1973	1974
33	1972	1973
34	1971	1972
35	1970	1971
36	1969	1970
37	1968	1969
38	1967	1968
39	1966	1967
40	1965	1966
41	1964	1965
42	1963	1964
43	1962	1963
44	1961	1962
45	1960	1961
46	1959	1960
47	1958	1959
48	1957	1958
49	1956	1957
50	1955	1956
51	1954	1955
52	1953	1954
53	1952	1953
54	1951	1952
55	1950	1951

**PROVINCE TRAFFIC CODES**

01 ADANA	21 DİYARBAKIR	41 KOCAELİ	61 TRABZON
02 ADIYAMAN	22 EDİRNE	42 KONYA	62 TUNCELİ
03 AFYON	23 ELAZIĞ	43 KÜTAHYA	63 ŞANLIURFA
04 AĞRI	24 ERZİNCAN	44 MALATYA	64 UŞAK
05 AMASYA	25 ERZURUM	45 MANİSA	65 VAN
06 ANKARA	26 ESKİŞEHİR	46 K.MARAŞ	66 YOZGAT
07 ANTALYA	27 GAZİANTEP	47 MARDİN	67 ZONGULDAK
08 ARTVİN	28 GİRESUN	48 MUĞLA	68 AKSARAY
09 AYDIN	29 GÜMÜŞHANE	49 MUŞ	69 BAYBURT
10 BALIKESİR	30 HAKKARİ	50 NEVŞEHİR	70 KARAMAN
11 BİLECİK	31 HATAY	51 NİĞDE	71 KIRIKKALE
12 BİNGÖL	32 ISPARTA	52 ORDU	72 BATMAN
13 BİTLİS	33 İÇEL	53 RİZE	73 ŞIRNAK
14 BOLU	34 İSTANBUL	54 SAKARYA	74 BARTIN
15 BURDUR	35 İZMİR	55 SAMSUN	75 ARDAHAN
16 BURSA	36 KARS	56 SİİRT	76 IĞDIR
17 ÇANAKKALE	37 KASTAMONU	57 SİNOP	77 YALOVA
18 ÇANKIRI	38 KAYSERİ	58 SİVAS	78 KARABÜK
19 ÇORUM	39 KIRKLARELİ	59 TEKİRDAĞ	79 KİLİS
20 DENİZLİ	40 KIRŞEHİR	60 TOKAT	80 OSMANİYE
90 ABROAD			81 DÜZCE

CONVERSION OF YEARS OF BIRTH FROM RUMI  
CALENDAR TO GREGORIAN CALENDAR YEARS:

RUMI YEARS + 584 = GREGORIAN YEAR



**ANNEX 9A – CENTRAL REVIEW COMMITTEE  
EVALUATION FORM FOR MATERNAL DEATHS**

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## NMMS-Central Review Committee Evaluation Form (for Maternal Deaths)

- Please carefully assess the VA Questionnaire and the HFRR Form to arrive at the causes of death and at the risk factors involved with this case of pregnancy related death.
- Ticking of multiple answers is possible
- **This is a confidential inquiry: Stress and maintain confidentiality even among yourselves**

A	<b>IDENTIFICATION (fill)</b>		
1	DATE OF BURIAL (DAY/MONTH/YEAR)	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>
2	PLACE OF BURIAL	2a	
	PROVINCE _____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	CBL LINE NO: <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	
	DISTRICT _____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>		
	SUB-DISTRICT _____ <input style="width: 20px; height: 20px;" type="text"/>		
	VILLAGE _____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>		
3	<b>Name</b> of the deceased woman		
3a	<b>Age</b> of deceased woman		
		<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	
4	<b>VA Questionnaire - Date received</b> (day-month-year)		
5	<b>HFRR Form - Date received</b> (day-month-year)		
6	<b>Date of evaluation report</b> (day-month-year)		

B	<b>QUALITY RATING OF VA/HFRRF (circle)</b>		
7	<b>Quality</b> of the VA/HFRRF is excellent, satisfactory, poor?	Excellent .....	1
		Satisfactory .....	2
		Poor .....	3
8	<b>In case of poor HFRRF, need for additional VA?</b>	Yes .....	1
		No .....	2

C	<b>HISTORY OF THE DECEASED</b>			
9a	Pregnant or 42 days after delivery or termination of pregnancy at time of death (circle)	<b>yes</b>	<b>no</b>	<b>don't know</b>
<i>If not pregnant when death occurred nor 42 days after delivery or termination of pregnancy please continue with section H!</i>				





- You may select multiple (more than one) causes of death (for example, a woman may die with obstructed labour and ruptured uterus)
- \*)Please use ICD 10 terminology

<b>D</b>	<b>CAUSES OF DEATH (tick)</b>			
<b>D1</b>	<b>DIRECT MATERNAL CAUSES</b> (Death of a woman while pregnant or within 42 days of termination of the pregnancy, irrespective of the duration and the site of the pregnancy from any cause related to the pregnancy or its management)			
	<b>Early Pregnancy deaths</b>	<b>No</b>	<b>Certain cause</b>	<b>Possible cause</b>
13	Due to spontaneous abortion (O03)			
	Due to induced abortion			
14	Self-induced (O05)			
15	With medical indication (O04)			
16	Due to undefined/unspecified abortion (O06)			
17	Due to ectopic pregnancy (O00)			
18	Due to hemorrhage (O20.9)			
19	Due to other defined early pregnancy cause (O08) ( <i>specify*</i> )			
20	Due to unknown early pregnancy cause			
	<b>Oedema, Proteinuria and Hypertensive Disorders</b>			
21	Hypertension with significant proteinuria – Preeclampsia (O14)			
22	Hypertension + Proteinuria with convulsions –Eclampsia (O15)			
23	Unspecified maternal hypertension (O16)			
	<b>Antepartum Haemorrhage (APH)</b>			
24	APH with coagulation defect (O46.0)			
25	APH without coagulation defect (O46.8)			
26	Due to Abruptio Placentae (premature separation of p) (O45)			
27	Due to Placenta Previa (O44.0)			
28	APH of unknown reason (O46.8)			
	<b>Intrapartum Haemorrhage (IPH)</b>			
29	Excessive IPH with coagulation defect (O67.0)			
30	Excessive IPH without coagulation defect (O67.8)			
	<b>Postpartum Haemorrhage (PPH)</b>			
31	PPH with coagulation defect (O72.3)			
32	PPH without coagulation defect (O72.0)			
33	PPH due to atonic uterus (O72.1)			
34	PPH due to Obstetric Trauma (perineal, vaginal, cervical laceration) (O70, O71)			
35	PPH due to Retained Placenta (O72.2)			
36	PPH of unknown reason (O72)			
	<b>Ante-, intra-, postpartum death due to other causes</b>			
37	Ruptured uterus (O71.1)			
38	Obstructed labour ( <i>if possible specify reason*</i> ) (O64)			
39	Caesarean section (O82)			
39a	Caesarean section elective (O82.0)			
39b	Caesarean section emergency (O82.1)			

		No	Certain cause	Possible cause
39c	Caesarean section hysterectomy (O82.2)			
40	Complication of Anaesthesia (O74)			
41	Embolism (O88)			
42	Shock (O75.1)			
43	Renal failure (O75.8)			
44	Cardiac arrest/failure (O75.8)			
44a	Other complications of obstetric surgery and procedures (O75.4)			
45	Other late pregnancy death ( <i>specify*</i> ) (O75.8)			
<b>Pregnancy related infections</b>				
46	Infection following abortion or ectopic (O08.0)			
46a	Amnioninfection (O41.1)			
46b	Other infection during labour (O75.3)			
47	Puerperal sepsis (O85)			
48	Other puerperal infections (e.g. infection of obstetric surgical wound, infection of the breast) ( <i>specify*</i> ) (O86)			
<b>Other direct causes</b>				
49	Other direct cause(s) ( <i>specify*</i> ) (O26.8, O75.9) e.g. renal disease			

<b>D2</b>	<b>OTHER CAUSES OF DEATH (O99)</b>				
<b>/3</b>		No	Certain cause	Possible cause	Aggravated by pregnancy
	Death due to diseases of the blood and blood-forming organs (incl. immunological disorders) (D50-89):				
50	Anaemia (not caused by acute haemorrhage) (O99.1)				
51	Other ( <i>specify*</i> ) (D50-89)				
	Death due to diseases of the circulatory system (I00-99):				
52	Ischaemic heart disease (I20-25)				
53	Rheumatic heart disease – acute and chronic (I00-05)				
54	Hypertensive disease (I10-15)				
55	Venous complications (I80)				
56	Other disease of the circulatory system ( <i>specify*</i> ) (O99.4, I95)				
57	Death due to diseases of the respiratory system ( <i>specify*</i> ) (J00-99, O99.5)				
	Death due to diseases of the digestive system (K00-93):				
58	Hepatitis (B15-19, O99.6, O98.4)				

		No	Certain cause	Possible cause	Aggravated by pregnancy
59	Others ( <i>specify*</i> ) (K00-93):				
	Endocrine, nutritional and metabolic diseases (99.2):				
60	Diabetes (E10-14, O24)				
61	Other endocrine, nutritional or metabolic diseases, incl. malnutrition ( <i>specify*</i> ) (E00-90):				
62	Diseases of the nervous system (e.g. epilepsy) ( <i>specify*</i> ) (G00-99, O99.3)				
63	Mental and behavioural disorder ( <i>specify*</i> ) (F00-99, O99.3))				
64	Infectious and parasitic diseases not mentioned yet ( <i>specify*</i> , e.g. <i>Malaria</i> ) (A00-B99)				
65	Diseases of the genitourinary system not directly pregnancy related ( <i>specify*</i> ) (N00-99):				
66	Neoplasm ( <i>specify*</i> ) (C00-48):				
67	Homicide (Murder)				
68	Suicide				
69	Injury ( <i>specify*</i> ) (S00-T98):				
70	Poisoning ( <i>specify*</i> ) (T36-65):				
72	Burns				
73	Road Traffic Accident				
74	Falls				
75	Drowning				
80	Other causes of death ( <i>specify</i> )				

<b>D4 UNKNOWN CAUSE OF DEATH</b>	
81	Cause of death cannot be determined

<b>D5</b>	<b>RISK FACTORS</b> ( <i>Biomedical and sub-standard care factors which may have contributed to the maternal death</i> )				
	<b>Individual biomedical risk factors</b>	<b>No</b>	<b>Certain</b>	<b>Possible</b>	<b>Don't know</b>
82	e.g. smoking, obesity, age, parity etc. ( <i>specify</i> )				
<b>Household and community factors (Sub-standard care 1)</b>					
83	Unwanted pregnancy but not using contraceptives				
84	Delay in recognising problem				
85	Delay in seeking care				
86	No antenatal care				
<b>Health service provider factors (Sub-standard care 2)</b>					
87	Poor quality antenatal care				
	<b>1<sup>st</sup> Medical Provider:</b>				
88	Midwife failed to diagnose				
89	Midwife failed to manage				
90	GP failed to diagnose				
91	GP failed to manage				
92	Obstetrician team failed to diagnose				
93	Obstetrician team failed to manage				
94	Provider failed to refer				
	<b>2<sup>nd</sup> Medical Provider (<i>for referred cases</i>):</b>				
95	Obstetrician/medical team failed to diagnose				
96	Obstetrician/medical team failed to manage				
<b>Health service supply factors (Sub-standard care 3)</b>					
97	Lack of surgical staff				
98	Lack of anaesthetic staff				
99	Lack of nursing staff				
100	Lack of blood				
101	Lack of drugs (e.g. antibiotics, oxytocin)				
102	Lack of equipment				
103	Lack of medical supplies (e.g. oxygen, tubes)				
104	Operating theatre not available				
105	Lack of back-up facilities (e.g. pathology, biochemistry, ultrasound, radiology services)				
106	Lack of anaesthetic facilities				
107	Lack of transportation between home and health facility				
107a	Lack of transportation between health facilities				
108	Long distance to nearest hospital				
108a	Health service communication breakdown				
<b>Other risk factors</b>					
109	( <i>Specify</i> )				

<b>E PREGNANCY RELATION OF THE WOMAN'S DEATH</b>				
<p><b>Death by direct maternal causes:</b>  <i>Death of a woman while pregnant or within 42 days of termination of the pregnancy, irrespective of the duration and the site of the pregnancy from any cause related to the pregnancy or its management</i></p> <p><b>Death by indirect maternal causes:</b>  <i>Death of a woman while pregnant or within 42 days of termination of the pregnancy, irrespective of the duration and the site of the pregnancy from any cause aggravated by the pregnancy or its management</i></p> <p><b>Death due to co-incident causes:</b>  <i>Death of a woman while pregnant or within 42 days of termination of the pregnancy, irrespective of the duration and the site of the pregnancy from accidental or incidental causes not related to the pregnancy or its management</i></p>				
110	Pregnancy related death ( <i>circle</i> )	Yes	No	Not sure
111	By direct maternal cause	Yes	No	Not sure
112	By indirect maternal cause	Yes	No	Not sure
113	By co-incident cause	Yes	No	Not sure

<b>F SUB-STANDARD CARE</b>				
114	Death due to sub-standard care?	Yes	No	Not sure

<b>G QUESTIONS ABOUT THE PREGNANCY OUTCOME (fetus/child) (<i>circle</i>)</b>		
115	Abortion.....	1
	Ectopic.....	2
	Stillbirth.....	3
	Delivered alive.....	4
	APGAR Status (if available).....	5
	Delivered alive then died.....	6
	Delivered alive then became sick.....	7
	Delivered alive & still well.....	8
	Not known.....	

<b>H</b>		<b>CAUSE(S) OF DEATH (fill)</b>	
		<i>Enter the <u>chain of events</u> – diseases, injuries, complications – that directly caused the death. DO NOT enter terminal events such as cardiac arrest without showing the aetiology. DO NOT use abbreviations. Enter only one cause on one line.</i>	<b>Approximate interval between onset and death (answer if possible)</b>
120	i	<b>IMMEDIATE CAUSE</b> (Final disease or condition resulting in death)	(a) e.g. <u>cardiac arrest</u>
			due to (or as a consequence of)
121	ii	<b>UNDERLYING CAUSES</b> (Sequentially list conditions - diseases or injuries - , if any, giving rise to the above cause, stating the <b>underlying condition that initiated the events resulting in death last</b> )	(b1) e.g. <u>hypovolemic shock</u>
			(b2) if any e.g. <u>head trauma</u>
			due to (or as a consequence of)
			(c1) e.g. <u>intra-abdominal bleeding</u>
			(c2) if any
			due to (or as a consequence of)
			(d1) e.g. <u>premature separation of placenta</u>
			(d2) if any
122	iii	<b>Other significant biomedical conditions contributing to death</b> but not resulting in the causes above	e.g. <u>Pre-existing anemia</u>
123	iv	<b>Significant sub-standard care factors contributing to death</b> (see D5)	e.g. <u>delay in seeking care or lack of blood for transfusions</u>



**To be filled by the Review Committee!**

<b>I</b>		<b>CAUSE(S) OF DEATH (fill)</b>		
		<i>Enter the <u>chain of events</u> – diseases, injuries, complications – that directly caused the death. DO NOT enter terminal events such as cardiac arrest without showing the aetiology. DO NOT use abbreviations. Enter only one cause on one line.</i>		<b>Approximate interval between onset and death (answer if possible)</b>
123	I	<b>IMMEDIATE CAUSE</b> ( <i>Final disease or condition resulting in death</i> )	(a) e.g. <u>cardiac arrest</u>	
			due to (or as a consequence of)	
124	II	<b>UNDERLYING CAUSES</b> ( <i>Sequentially list conditions - diseases or injuries - , if any, giving rise to the above cause, stating the <b>underlying condition that initiated the events resulting in death last</b></i> )	(b1) e.g. <i>hypovolemic shock</i>	
			(b2) if any e.g. <i>head trauma</i>	
			due to (or as a consequence of)	
			(c1) e.g. <i>intra-abdominal bleeding</i>	
			(c2) if any	
			due to (or as a consequence of)	
			(d1) e.g. <i>premature separation of placenta</i>	
			(d2) if any	
125	iii	<b>Other significant biomedical conditions contributing to death</b> but not resulting in the causes above	e.g. <i>Pre-existing anemia</i>	
126	iv	<b>Significant sub-standard care factors contributing to death</b> ( <i>see D5</i> )	e.g. <i>delay in seeking care or lack of blood for transfusions</i>	



**ANNEX 9B – CENTRAL REVIEW COMMITTEE  
EVALUATION FORM FOR FEMALE DEATHS**

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# NMMS-Central Review Committee Evaluation Form (for Female Deaths)

- Please carefully assess the VA Questionnaire and the HFRR Form to arrive at the causes of death and at the risk factors involved with this case of pregnancy related death.
- Ticking of multiple answers is possible
- **This is a confidential inquiry: Stress and maintain confidentiality even among yourselves**

A	IDENTIFICATION <i>(fill)</i>			
1	DATE OF BURIAL (DAY/MONTH/YEAR)	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>
2	PLACE OF BURIAL PROVINCE _____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> DISTRICT _____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> SUB-DISTRICT _____ <input style="width: 20px; height: 20px;" type="text"/> VILLAGE _____ <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	2a  CBL LINE NO: <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>		
3	<b>Name</b> of the deceased woman			
3a	<b>Age</b> of deceased woman			
4	<b>VA Questionnaire - Date received</b> <i>(day-month-year)</i>			
5	<b>HFRR Form - Date received</b> <i>(day-month-year)</i>			
6	<b>Date of evaluation report</b> <i>(day-month-year)</i>			

B	QUALITY RATING OF VA/HFRRF <i>(circle)</i>		
7	<b>Quality</b> of the VA/HFRRF is excellent, satisfactory, poor?	Excellent .....	1
		Satisfactory .....	2
		Poor .....	3
8	<b>In case of poor HFRRF, need for additional VA?</b>	Yes .....	1
		No .....	2

C	HISTORY OF THE DECEASED			
9a	Pregnant or 42 days after delivery or termination of pregnancy at time of death <i>(circle)</i>	<b>yes</b>	<b>no</b>	<b>don't know</b>
<b><i>If not pregnant when death occurred nor 42 days after delivery or termination of pregnancy please continue with section H!</i></b>				

<b>H</b>		<b>CAUSE(S) OF DEATH</b> <i>(fill)</i>	
		<i>Enter the chain of events – diseases, injuries, complications – that directly caused the death. DO NOT enter terminal events such as cardiac arrest without showing the aetiology. DO NOT use abbreviations. Enter only one cause on one line.</i>	<b>Approximate interval between onset and death</b> <i>(answer if possible)</i>
120	i	<b>IMMEDIATE CAUSE</b> <i>(Final disease or condition resulting in death)</i>	<b>(a)</b> <i>e.g. cardiac arrest</i>
			due to (or as a consequence of)
121	ii	<b>UNDERLYING CAUSES</b> <i>(Sequentially list conditions - diseases or injuries - , if any, giving rise to the above cause, stating the underlying condition that initiated the events resulting in death last</i>	<b>(b1)</b> <i>e.g. hypovolemic shock</i>
			<b>(b2)</b> <i>if any e.g. head trauma</i>
			due to (or as a consequence of)
			<b>(c1)</b> <i>e.g. intra-abdominal bleeding</i>
			<b>(c2)</b> <i>if any</i>
			due to (or as a consequence of)
			<b>(d1)</b> <i>e.g. premature separation of placenta</i>
		<b>(d2)</b> <i>if any</i>	
122	iii	<b>Other significant biomedical conditions contributing to death</b> but not resulting in the causes above	<i>e.g. Pre-existing anemia</i>
123	iv	<b>Significant sub-standard care factors contributing to death</b> <i>(see D5)</i>	<i>e.g. delay in seeking care or lack of blood for transfusions</i>

**General Comments of Pre-review Committee:**

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**Names and signatures of Pre-review committee members who reviewed case:**

	<b>Name</b>	<b>Signature</b>
1	.....	.....
2	.....	.....

# ANNEX 10 – IN-DEPTH INTERVIEW GUIDELINES

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## IN-DEPTH INTERVIEW GUIDELINE-1 (GENERAL DIRECTORATE OF POPULATION AND CITIZENSHIP AFFAIRS)

### Introduction and permission to tape recording

#### 1. PERSONAL HISTORY AND JOB EXPERIENCE

- Personal identification (age, education, marital status etc.)
- Previous posts (briefly)
- Employment period in the institution, positions occupied and since when?
- Satisfied with his/her job in the institute?

#### 2. INTRA AND INTERINSTITUTIONAL RELATIONSHIPS

##### *General Directorate*

- Brief information about Mernis project (date, start date, prospective changes etc. )
- Number and the quality of the general directorate staff (are they enough? are there any experts having the knowledge of demography? How good is the staff motivation? what is the manager profile? etc.)
- Experiences that they had with the institutions in contact, such as SIS, General Staff and tax departments (data flow, accuracy and lack of the data)
- Attitude of general directorate towards human resource planning and coordination at general directorate
- In-service training as regards general directorate staff and trainings for increasing motivation

##### **Province and District Directorate of Population**

- Number and the quality of province and district directorate staff
- Communication with province and district directorate of population (frequency, quality?)
- Problems on data reporting from province and district (lack of reporting and inaccurate reporting)
- Problems reported by province and district directorates (if yes, what kind of problems?)
- Trainings or meetings as regards province and districts

#### 3. CONDITION OF THE CURRENT REGISTRATION SYSTEM

- Theoretical and practical issues related to the existing registration system
- Sufficiency of laws and regulations (if there exists a complaint about that issue, any attempts to change?)
- Practical problem areas (if any?)
- Data quality, evaluation of data (any changes observed concerning the number of female, male, child and infant deaths?)
- Solutions developed for practical problems
- Source of incomplete reporting
- Suggestions for improving Mernis system

## **IN-DEPTH INTERVIEW GUIDELINE-2 (MINISTRY OF HEALTH)**

### **Introduction and permission to tape recording**

#### **1. PERSONAL HISTORY AND JOB EXPERIENCE**

- Personal identification (age, education, marital status etc.)
- Previous posts (briefly)
- Employment period in the institution, positions occupied and since when?
- Satisfied with his/her job in the institute?

#### **2. INTRA AND INTERINSTITUTIONAL RELATIONSHIPS**

##### ***General Directorate***

- Brief information about the registration system of Ministry of Health (ETFs, prospective changes etc.)
- Number and the quality of the staff in charge of registration of MoH (How good is the staff motivation? what is the manager profile? etc.)
- Experiences about the communication with provinces (data flow, accuracy and lack of the data)
- Attitude of general directorate towards human resource planning, coordination at general directorate, in-service training and trainings for increasing motivation
- Expectations of the Ministry for Maternal Mortality (especially the relationship with Ministry of Interior)

##### ***Health Directorates***

- Number and the quality of Health Directorate staff and the relationship with General Directorate
- Problems on data reporting from health directorates (lack of reporting and inaccurate reporting)
- Problems reported by health directorates (if yes, what kind of problems?)
- Trainings or meetings as regards health directorate staff

#### **3. CONDITION OF THE CURRENT REGISTRATION SYSTEM**

- Theoretical and practical issues related to the existing registration system
- Sufficiency of laws and regulations (if there exists a complaint about that issue, any attempts to change?, benefits of family doctor, the effects of unifying SKK and other institutions)
- Data quality, evaluation of data (any changes observed concerning the number of female, male, child and infant deaths?)
- Solutions developed for practical problems and source of incomplete reporting
- Benefits of new implications about causes of death
- Sensitivity level of MoH related to the causes of death
- Responsible people for issuing death certificate (especially the sensitivity of doctors in hospitals to that subject, sufficiency of doctors, attitude of doctors etc.)
- Suggestions for improving the registration system of MoH

## **IN-DEPTH INTERVIEW GUIDELINE-3 (TURKSTAT)**

### **Introduction and permission to tape recording**

#### **1. PERSONAL HISTORY AND JOB EXPERIENCE**

- Personal identification (age, education, marital status etc.)
- Previous posts (briefly)
- Employment period in the institution, positions occupied and since when?
- Satisfied with his/her job in the institute?

#### **2. INTRA AND INTERINSTITUTIONAL RELATIONSHIPS**

- Brief information about death statistics compiled by SIS until now
- Legal alterations, expenctations that can occur due to TUIK
- Number and the quality of the staff at TUIK in charge of death statistics and manager profile (differences due to new law)
- Number and quality of staff at district offices
- Relationship between TUIK and the institutions in contact as regards death statistics (Moh, MoI, Gendarmerie, National Security Directorate etc.)
- Attitude of TUIK towards human resource planning, coordination at the Institute and district offices, in-service training and trainings for increasing motivation

#### **3. CONDITION OF THE CURRENT REGISTRATION SYSTEM**

- Theoretical and practical issues related to death statistics compiled and published by TUIK
- Suggestions and opinions related to the new law and regulations
- Data quality, evaluation of data (any changes observed concerning the number of female, male, child and infant deaths?)
- Point of view as regards the death statistics
- Sensitivity level of TUIK related to the death statistics and causes of death of MoH and MoI (Responsible people for issuing death certificate)
- Suggestions for improving death statistics of TUIK
- Problems on death data collected from 2000 General Population Census and sharing of them

## **IN-DEPTH INTERVIEW GUIDELINE-4 (MUHTAR)**

### **Introduction and permission to tape recording**

#### **1. PERSONAL HISTORY AND JOB EXPERIENCE**

- Personal identification (age, education, marital status etc.)
- Period of being a muhtar
- Works done before and while being a muhtar
- Satisfaction from being muhtar and willingness to continue

#### **2. RESPONSIBILITY OF MUHTARS**

- Main responsibility areas of muhtars
- Procedure for reporting, especially for death reporting
- Issuing death certificate and reporting to MERNİS
- Condition of the village cemetery
- Any changes observed as regards the reporting of deaths? (female, male, child)
- Problems related to MERNİS

#### **3. MATERNAL MORTALITY PROJECT**

- Problems confronted at the beginning of the maternal mortality project (training, filling the forms, submitting the forms)
- Experiences that they had with the villagers related to the maternal mortality project (positive, negative)
- Problems confronted with the institutions relating the maternal mortality project (Health Directorate, kaimakam, gendarmerie)
- Overall evaluation of maternal mortality project (positive and negative aspects)
- Any changes in their thoughts about reporting of deaths after the project?

## **IN-DEPTH INTERVIEW GUIDELINE-5 CEMETERY OFFICIALS**

### **Introduction and permission to tape recording**

#### **1. PERSONAL HISTORY AND JOB EXPERIENCE**

- Personal identification (age, education, marital status etc.)
- Previous posts in brief
- Employment period in the current position, positions occupied and job description
- Satisfaction from being a cemetery official

#### **2. RESPONSIBILITY OF CEMETERY OFFICIAL**

- Brief information about the cemetery, number and quality of staff (staff who washing the dead body, staff digging the grave)
- Cemetery registration (responsible staff, computer system etc.)
- Unauthorized burials and night burials
- Differences between female, male and child death certification
- Relations of the cemetery official with the visitors and the ones coming for burial

#### **3. MATERNAL MORTALITY PROJECT**

- Problems confronted at the beginning of the maternal mortality project (training, filling the forms, submitting the forms)
- Problems confronted with the institutions relating the maternal mortality project (Health Directorate, kaimakam, gendarmerie)
- Overall evaluation of maternal mortality project (positive and negative aspects)
- Any changes in their thoughts about reporting of deaths after the project?

## **IN-DEPTH INTERVIEW GUIDELINE-6 (KAIMAKAM)**

### **Introduction and permission to tape recording**

#### **1. PERSONAL HISTORY AND JOB EXPERIENCE**

- Personal identification (age, education, marital status etc.)
- Previous posts in brief
- Employment period in the current position, positions occupied and job description
- Satisfaction level from the job

#### **2. RELATIONS WITH DISTRICT UNITS**

- General information about the district where there is a kaimakam (major problems of the district etc.)
- Human resource planning of the local administration in the district, number and quality of staff
- Relationship between the local administration and muhktars, topics of trainings concerning muhktars and frequency of the trainings
- Relationship between local administration and municipality (especially the problem areas)
- Relations with District Health Group (especially the problem areas)

#### **3. CONDITION OF THE CURRENT REGISTRATION SYSTEM**

- Theoretical and practical issues related to the existing registration system
- Sufficiency of laws and regulations (approach of MoI towards that subject)
- Solutions developed for practical problems and source of incomplete reporting
- Benefits of new implications about causes of death
- Sensitivity level of MoI related to the causes of death (compulsory bookkeeping of muhktars and cemetery officials, letters sent under the scope of project concerning that subject)
- Problems confronted in the district as regards the issuing of death certificate (responsible people, the sensitivity of doctors in hospitals to that subject, sufficiency of doctors, attitude of doctors etc.)
- Attempts of MoI to improve the registration system

#### **4. MATERNAL MORTALITY PROJECT**

- Expectations of MoI from maternal mortality project (especially the relations with MoH)
- Problems confronted at the beginning of the maternal mortality project (attendance at the training, irregular reporting)
- Problems confronted with the institutions relating the maternal mortality project (Health Directorate, gendarmerie)
- Overall evaluation of maternal mortality project (positive and negative aspects)
- Any changes in their thoughts about reporting of deaths after the project? (in terms of muhktars and cemetery officials)

## **IN-DEPTH INTERVIEW GUIDELINE-7 FAMILY**

### **Introduction and permission to tape recording**

#### **1. PERSONAL HISTORY AND CONDITION OF DISEASE**

- Personal identification (age, education, marital status etc.)
- A brief history of the spouse's disease
- Where and when did you apply for treatment?
- What was the approach of the health staff like?
- What did you do for burial after you had learned about the death? Did anybody direct you?
- Who gave the death certificate and when?



# **ANNEX 11 – BRIEF REPORT ON PRIMARY INFORMANT TRAININGS**

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**T.C. Ministry of Health  
Reproductive Health Programme of Turkey  
National Maternal Mortality Study  
Brief Report on Primary Informant Trainings and  
Data Collection Activities of June  
15 July 2005**

NMMS Province project teams (province project coordinator, province project doctor and province project researcher) were trained during 5 regional meetings. After the training of province project teams, province project teams trained district coordinators in all districts of the 28 provinces. The last 3 weeks of May was arranged for the completion of the training of primary informants by province and district project teams. Data collection activities of NMMS started on 1 June 2005 and still continues. HUIPS supervisors paid supervision visits to provinces during the end of May and the beginning of July.

Primary informant trainings conducted in 28 provinces were mainly completed in the given time period or exceeded the prescribed period. However, primary informant trainings conducted in some provinces could not be completed in the given period, and are still not complete at the date of 15 July 2005.

With the self-sacrificing work of province and district project teams, primary informant trainings were completed in 94 % of the settlements covered by NMMS. Since almost all the settlements in which trainings are not completed are rural areas, rural data collection activities and rural data production can be hindered unless the trainings are completed as soon as possible. This could also make analysis for some sub-regions impossible. The first months are very important for the data collection phase of NMMS. If a good follow-up and surveillance system could be established, on later months the coverage of the study could increase and reach to 100 %. With a strict follow-up and surveillance during the pilot study conducted in Antalya, the coverage increased quickly and reach to 100 % level today.

Some province project teams perceive NMMS as a study conducted by Hacettepe University instead of MoH. Therefore, General Directorate of MCH/FP should regularly be in contact with Province Health Directors and Province Project Teams, and emphasise that NMMS is MoH's study.

Village headmen and cemetery officials play a major role during data collection phase. In some provinces village headmen and cemetery officials have not been informed enough about NMMS activities. Some of the village headmen who were informed, are not supporting the training and in turn data collection activities properly. Therefore, a closer collaboration is necessary with MoI in order to overcome these problems.

According to NMMS principles province project teams should submit a monthly report to MoH MCH/FP General Directorate and Hacettepe University Institute of Population Studies. However, some province project teams have concerns about this issue. Since the reports that the province project teams have to send every month include the project activities conducted in their province, the problems they face and the state of the province budget, they are very important to follow the project activities on provincial basis. Therefore, the province project teams should be directed to send their comprehensive monthly reports to relevant authorities on time.

In project provinces, necessary activities for data collection and data entry keep going on. Therefore, return rates on provincial basis are still not clear. The table below shows the last status of the project provinces in terms of primary informant trainings and summarizes the problems faced during data collection phase.

**Last status of the project provinces in terms of primary informant trainings and the problems faced during data collection phase**

Line no	Project Province	General Percentage	Explanation
1	Bursa	100,0	Trainings were completed after June,1 2005. Some district coordinators do not attach enough importance to the study. In addition, there are difficulties in terms of cooperating with municipalities.
2	Sakarya	100,0	Trainings were completed after June,1 2005. Province team and district coordinators are working in harmony with each other. However, some village headmen and municipalities are not willing to work in cooperation. Furthermore, mainly in central districts some municipalities are not able to control the cemeteries under their responsibilities.
3	Tekirdağ	100,0	Trainings were completed after June,1 2005. Province team and district coordinators are working in harmony with each other.
4	Giresun	100,0	Trainings were completed after June,1 2005. The turnover rate among district coordinators is too high, this in turn hinders project activities. Therefore, the newly assigned district coordinators should be trained immediately. Due to scattered settlements and "backyard cemeteries", data collection activities are getting more difficult.
5	Bartın	100,0	Trainings were completed on time. Province team and district coordinators are working in harmony with each other. With the attempts of Bartın province project team and cooperation with governorship, a "burial book" was prepared and distributed to all settlements.
6	Balıkesir	100,0	Trainings were completed after June,1 2005. Lack of coordination was observed between province project team and district coordinators during data collection period. In addition, director of provincial local administration was not willing to cooperate with province project team.
7	Burdur	100,0	Trainings were completed on time. Province team and district coordinators are working in harmony with each other.

Line no	Project Province	General Percentage	Explanation
8	Bayburt	100,0	Trainings were completed on time. Province project coordinator and province project doctor resigned from their jobs. New people were assigned yet. These changes greatly affected data collection and data flow control activities. In addition, province project researcher wants to quit due to family reasons.
9	Tokat	100,0	Trainings were completed on time. Province team and district coordinators are working in harmony with each other.
10	İstanbul	100,0	Trainings were completed on time. Province team and district coordinators are working in harmony with each other. Results of June 2005 has already been sent to us. Since number of burials and so female burials is high, the workload of province and district project teams will be much more compared to other provinces.
11	Nevşehir	100,0	Trainings were completed on time. Province team and district coordinators are working in harmony with each other.
12	Aydın	100,0	Trainings were completed on time. Province team and district coordinators are working in harmony with each other.
13	Çankırı	100,0	Trainings were completed on time. Province team and district coordinators are working in harmony with each other.
14	Erzurum	100,0	Trainings were completed on time. Province team and district coordinators are working in harmony with each other. Since the quality of health services is high compared to surrounding provinces, number of female deaths occurred in Erzurum but buried in neighbour provinces is high also. This increases the workload of Erzurum province project team.
15	İzmir	100,0	Trainings were completed on time. Province team and district coordinators are working in harmony with each other.
16	Antalya	100,0	Training were completed during pilot phase. Data flow from 646 settlement of Antalya keeps going on. We expect the PPR, who is a staff of health directorate, to be more responsive while conducting verbal autopsies.
17	Karaman	99,0	Province project coordinator does not show enough interest in NMMS. Furthermore, the cooperation between district coordinators and municipalities is not in the required level. In Kazımkarabekir 80 % of trainings could have been completed.
18	K. Maraş	99,0	Province team and district coordinators are working in harmony with each other. Because the PPR is working in a separate place than the other project team members, this is creating communication problems. In Çağlayancerit, Nurhak, Afşin, Andırın and Türkoğlu the trainings are still not completed.
19	Ordu	94,0	High turnover rate among district coordinators hinders project activities. For this reason, the newly assigned district coordinators should be trained immediately. Due to scattered settlements and “backyard cemeteries”, data collection activities are getting more difficult. Also, in some of the districts primary informant trainings have still not been completed.
20	Adana	98,0	In Kozan only 60% of the trainings have been completed. In districts other than Seyhan, İmamoğlu, Pozantı and Saimbeyli trainings could not have been completed.

Line no	Project Province	General Percentage	Explanation
21	Gaziantep	95,0	Province team and the district coordinators are working in harmony with each other. However, because of village headmen there are serious problems in primary informant trainings in Şahinbey, Oğuzeli and Yavuzeli districts.
22	Ağrı	81,0	Province team and the district coordinators are working in harmony with each other. Since some of the district coordinators do not cooperate enough with local administrators in their districts, there are some problems in terms of participation to the trainings and progress of data collection activities. District coordinators stated that the problems arose mainly because of the muhktars. As a result of these problems, there are serious training shortage in Merkez, Patnos, Tutak, Diyadin, Eleşkirt and Hamur districts.
23	Batman	83,2	Province project coordinator is not interested in NMMS activities. Therefore, province project team and the district coordinators are not working in harmony. Province project coordinator and province project doctor went on leave at the same time. As a result, in Kozluk 60 %, in Gecüş 71 % and in Center 92% of the trainings have been completed. In center and in districts there are serious problems on side of the municipalities in keeping records. Therefore, in settlements where there is no cemetery official, headmen of the neighbourhoods were trained.
24	Kütahya	95,0	Province team and the district coordinators are working in harmony with each other. But the district coordinator in Simav is not putting enough effort for this harmonious work. Only 83 % of the trainings have been completed in Simav. There are also problems in terms of primary informant trainings in Gediz, Emet and Pazarlar.
25	Sivas	92,0	Province project coordinator is stating that his/her workload is too much and so he/she is not paying enough attention to NMMS. Province project doctor wants to depart from Sivas and working with low motivation. Therefore, it will be useful to assign a second doctor who can share the workload of the PPC and PPD. Furthermore, some district coordinators abstain from doing the project activities. Because of this reason, there are serious training shortage in Kangal, Şarkışla, Ulaş, Gürün, Hafik, Doğanşar and İmralı.
26	Ankara	87,0	There is no adequate cooperation between province project team and DCs. Some DCs (Polatlı ve Haymana) are claiming to take out/exclude their districts form NMMS. Another problem observed in Ankara is that NMMS is viewed as a study of HUIPS rather than MoH. Province Health Directorate, in cooperation with Directorate of Province Local Administrations has printed “burial book” for every settlement. There are serious training shortage in terms of village headmen in Akyurt, Ayaş, Beypazarı, Haymana, Kızılcahamam, Polatlı, Sincan and Şereflikoçhisar.

Line no	Project Province	General Percentage	Explanation
27	Van	68,9	Province team and the district coordinators are working in harmony with each other. Since some of the district coordinators do not cooperate enough with local administrators in their districts, there are some problems in terms of participation to the trainings and progress of data collection activities. District coordinators stated that the problems arose mainly because of the muhktars. As a result of these problems, trainings have not been completed in Başkale, Erciş ve Gevaş, Çatak, Muradiye, Bahçesaray and Özalp.
28	Diyarbakır	68,7	Province project coordinator is not allocating enough time for NMMS activities. Because the PPC will work outside Diyarbakır for a 6-months period, director of MCH/FP division will be in charge as PPC. However, the director of MCH/FP division is stating that he does not have positive thoughts about NMMS. Another problem observed in Diyarbakır is that NMMS is viewed as a study of HUIPS rather than MoH. In Diyarbakır except Dicle and Koacaköy, the trainings have still not been completed. As a result of these problems, there are serious training shortage in terms of village headmen in Çınar, Çüngüş, Merkez, Ergani, Kulp, Lice, Hazro, Bismil, Çermik and Silvan.
29	Malatya	85,0	Province team and the district coordinators are working in harmony with each other. Although province team and the district coordinators have done lot of correspondence in cooperation with local administrators in order to invite primary informants to trainings, primary informants, especially village headmen were unwilling to attend the training. Therefore, there are serious training shortage in Merkez, Arapgir, Doğanyol, Pötürge, Kulancak, Darende, Hekimhan and Yeşilyurt.
Total		94,0	



# ANNEX 12 – THE DATE AND PLACE OF QUALITATIVE INTERVIEWS

## The Date and Place of In-Depth Interviews

	Province		Date of interview
Focus group with PPR	Ankara	Center	10.03.2006
Focus group with doctors	Ankara	Center	17.03.2006
<b>ANKARA</b>			
In-depth interview with SIS	Ankara	Center	11.04.2006
In-depth interview with SIS	Ankara	Center	11.04.2006
In-depth interview with MOI	Ankara	Center	31.03.2006
In-depth interview with MOI	Ankara	Center	14.04.2006
In-depth interview with MOH	Ankara	Center	05.04.2006
In-depth interview with muhtar	Ankara	Periphery	17.04.2006
In-depth interview with muhtar	Ankara	Periphery	20.04.2006
In-depth interview with muhtar	Ankara	Periphery	24.04.2006
In-depth interview with cemetery official	Ankara	Center	18.04.2006
In-depth interview with cemetery official	Ankara	Periphery	19.04.2006
In-depth interview with kaymakam	Ankara	Periphery	15.05.2006
In- depth interview with kaymakam	Ankara	Periphery	08.05.2006
<b>DİYARBAKIR</b>			
In- depth interview with muhtar	Diyarbakır	Center	02.05.2006
In- depth interview with muhtar	Diyarbakır	Periphery	03.05.2006
In- depth interview with muhtar	Diyarbakır	Periphery	03.05.2006
In-depth interview with cemetery official	Diyarbakır	Center	02.05.2006
In-depth interview with cemetery official	Diyarbakır	Periphery	04.05.2006
In-depth interview with a family	Diyarbakır	Center	05.05.2006
<b>KAYSERİ</b>			
In-depth interview with muhtar	Kayseri	Center	10.05.2006
In-depth interview with muhtar	Kayseri	Periphery	10.05.2006
In-depth interview with muhtar	Kayseri	Periphery	11.05.2006
In-dept interview with muhtar	Kayseri	Periphery	11.05.2006
In-depth interview with cemetery official	Kayseri	Center	11.05.2006
In-depth interview with cemetery official	Kayseri	Periphery	09.05.2006
In-depth interview with a family	Kayseri	Center	09.05.2006



# ANNEX 13 – BENNETT AND HORIUCHI MORTALITY TECHNIQUE

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Bennett and Horiuchi technique is developed for estimating under-registration of deaths. The technique estimates the completeness of death registration above a certain age  $x$  during an intercensal period, based on population distributions from two consecutive censuses. Age  $x$  is the age above which the degree of completeness of death registration can be assumed to be uniform; it is usually age of 5 years. This technique also provides a set of adjusted death rates by age, as well as estimated life expectancies for age 5 years and above during the intercensal period.

Bennett and Horiuchi technique uses the number of registered deaths and population growth rate factors for each age group to estimate the expected population at each age. A comparison of the expected population with the population enumerated in the censuses provides the degree of completeness of death registration. In this method, completeness of death registration is essentially estimated by using the growth-rate-transformed registered deaths to generate an independent estimate of the average intercensal population at an age above  $x$ ; the ratio of this figure to that calculated from the two observed censuses provides an estimate of completeness of death registration above age  $x$ . The technique, therefore, provides a series of estimates of completeness of death registration due to the possibility of varying  $x$  from age 5 through the maximum age.

There are a number of assumptions in applying this technique. If the population was not exposed to migration during the intercensal period, if both censuses have the same degree of completeness, if age misreporting occurs only after age 50 years and if the degree of completeness of death registration is uniform above age 5 years, this technique will provide an almost constant set of figures for completeness of death registration. Variance from a "constant" set of figures indicates that one or more of the above conditions does not hold.

This technique has some advantages compared to similar techniques. Firstly, the technique does not assume that the population is stable. Secondly, the results may be used to evaluate the base information used in the beginning. For example, if the estimated degree of completeness at different ages is similar, the base information may be considered consistent. If the estimates of completeness differ considerably from age to age, then the base information may contain errors or may not meet the assumptions of the technique.

Bennett and Horiuchi Mortality Technique also has some limitations. Regarding the zero migration assumption, in fact, migration has an effect on the estimation of completeness of death registration. If there has been immigration, the result will indicate a better degree of completeness than is actually true. On the other hand, if there has been outmigration, then the result will indicate that the death registration is less complete than it actually is. Additionally, the technique is also sensitive to different degrees of enumeration in the two consecutive censuses. Relative underenumeration in the first census (or overenumeration the second) would raise the estimated degree of completeness of death registration while relative

overenumeration in the first census (or underenumeration in the second) would reduce the estimated degree of completeness of death registration. Finally, this technique does not evaluate the completeness of registration of deaths under age 5 years. The results should be carefully handled because infant and child deaths have a higher degree of underregistration than deaths at other ages.

The computer program BENHR in the United Nations MORTPAK makes the calculations to estimate the completeness of death registration. The program calculates the median of the series of estimates and assumes this median is the best estimate of death registration completeness. This best estimate is then used to calculate an adjusted set of age-specific death rates and life expectancies for ages 5 and above.

The method requires a preliminary estimate of life expectancy for the oldest age entered for the population age distribution. This life expectancy is estimated within the computer program using a set of regression equations which relate life expectancy at age x to the ratio of registered deaths for age group 60 and over to registered deaths for age group 5 and over. These regressions were estimated from a set of data points simulated from stable populations generated from male and female model life tables from the United Nations General Pattern with life expectancy at birth varying from 35 years to 75 years, at one-year intervals, in conjunction with intrinsic growth rates varying from .015 to .035, at intervals of .005. The regression equations are

$$\begin{aligned}
 e(60) &= 9.345 + 12.403 D_{60+}/D_{5+} \\
 e(65) &= 7.535 + 10.072 D_{60+}/D_{5+} \\
 e(70) &= 6.049 + 7.918 D_{60+}/D_{5+} \\
 e(75) &= 4.890 + 5.965 D_{60+}/D_{5+} \\
 e(80) &= 4.060 + 4.162 D_{60+}/D_{5+} \\
 e(85) &= 3.379 + 2.836 D_{60+}/D_{5+}
 \end{aligned}$$

where  $e(x)$  is life expectancy at age x, and  $D_{60+}/D_{5+}$  is the ratio of intercensal registered deaths for age group 60+ to age group 5+.

**ANNEX 14 – ASSUMPTIONS USED IN THE  
PROJECTION OF NUMBER OF FEMALES AND BIRTHS**

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## Assumptions used in the projection of number of females and births

	Total Fertility Rate							Life Expectancy at Birth														Net Migration		Percent Urban Population						
								Male							Female							Male	Female							
	2000	2001	2002	2003	2004	2005	2006	2000	2001	2002	2003	2004	2005	2006	2000	2001	2002	2003	2004	2005	2006	2000	2000	2000	2001	2002	2003	2004	2005	2006
ADANA	2.68	2.65	2.62	2.59	2.56	2.53	2.50	61.1	61.2	61.4	61.6	61.8	61.9	62.1	65.7	65.9	66.1	66.3	66.5	66.7	66.9	-5,372	-2,727	75.3	76.0	76.7	77.5	78.2	79.0	79.7
AĞRI	5.49	5.42	5.34	5.27	5.19	5.12	5.04	57.8	57.9	58.1	58.3	58.5	58.6	58.8	61.3	61.5	61.7	61.9	62.1	62.3	62.5	-2,848	-2,394	44.7	46.3	47.9	49.4	51.0	52.6	54.1
ANKARA	1.90	1.85	1.79	1.74	1.68	1.63	1.58	61.2	61.3	61.5	61.7	61.9	62.0	62.2	70.8	71.0	71.2	71.4	71.6	71.8	72.0	8,668	9,511	88.7	88.9	89.1	89.3	89.6	89.8	90.0
ANTALYA	1.93	1.90	1.87	1.84	1.81	1.78	1.75	68.1	68.2	68.4	68.6	68.8	68.9	69.1	72.5	72.7	72.9	73.1	73.3	73.5	73.7	9,797	8,294	62.9	64.1	65.2	66.3	68.6	68.6	69.7
AYDIN	2.12	2.11	2.10	2.08	2.07	2.06	2.05	69.7	69.8	70.0	70.2	70.4	70.5	70.7	73.9	74.1	74.3	74.5	74.7	74.9	75.1	2,094	2,217	48.9	49.6	50.3	51.0	51.7	52.4	53.1
BALIKESİR	1.95	1.94	1.93	1.91	1.90	1.89	1.88	69.8	69.9	70.1	70.3	70.5	70.6	70.8	73.5	73.7	73.9	74.1	74.3	74.5	74.7	686	275	54.4	55.4	56.5	57.6	58.6	59.7	60.7
BURDUR	2.12	2.09	2.06	2.03	2.00	1.97	1.94	62.6	62.7	62.9	63.1	63.3	63.4	63.6	66.0	66.2	66.4	66.6	66.8	67.0	67.2	-524	-551	40.7	41.1	41.5	41.9	42.2	42.6	43.0
BURSA	1.98	1.97	1.96	1.94	1.93	1.92	1.91	71.6	71.7	71.9	72.1	72.3	72.4	72.6	77.0	77.2	77.4	77.6	77.8	78.0	78.2	8,114	8,951	78.8	79.6	80.3	81.1	81.9	82.6	83.4
ÇANKIRI	2.27	2.22	2.16	2.11	2.05	2.00	1.95	62.7	62.8	63.0	63.2	63.4	63.5	63.7	65.2	65.4	65.6	65.8	66.0	66.2	66.4	-150	-745	37.3	39.0	40.7	42.5	44.2	45.9	47.6
DIYARBAKIR	4.51	4.44	4.36	4.29	4.21	4.14	4.06	65.1	65.2	65.4	65.6	65.8	65.9	66.1	69.3	69.5	69.7	69.9	70.1	70.3	70.5	-5,753	-3,959	64.3	65.6	66.9	68.1	69.4	70.6	71.9
ERZURUM	3.51	3.44	3.36	3.29	3.21	3.14	3.06	60.3	60.4	60.6	60.8	61.0	61.1	61.3	62.5	62.7	62.9	63.1	63.3	63.5	63.7	-5,075	-4,224	53.7	55.0	56.3	57.7	59.0	60.4	61.7
GAZİANTEP	3.83	3.76	3.68	3.61	3.53	3.46	3.38	66.9	67.0	67.2	67.4	67.6	67.7	67.9	71.3	71.5	71.7	71.9	72.1	72.3	72.5	-118	818	77.6	78.4	79.2	80.0	80.8	81.6	82.4
GİRESUN	2.31	2.18	2.06	1.93	1.81	1.68	1.55	61.4	61.5	61.7	61.9	62.1	62.2	62.4	65.7	65.9	66.1	66.3	66.5	66.7	66.9	-450	-720	44.6	45.7	46.7	47.8	48.8	49.9	50.9
İSTANBUL	1.97	1.96	1.95	1.93	1.92	1.91	1.90	69.0	69.1	69.3	69.5	69.7	69.8	70.0	74.2	74.4	74.6	74.8	75.0	75.2	75.4	39,698	41,789	97.1	97.3	97.4	97.6	97.7	97.8	98.0
İZMİR	1.75	1.74	1.73	1.71	1.70	1.69	1.68	69.0	69.1	69.3	69.5	69.7	69.8	70.0	73.7	73.9	74.1	74.3	74.5	74.7	74.9	11,541	12,534	82.9	83.3	83.8	84.2	84.7	85.1	85.6
KÜTAHYA	2.19	2.14	2.08	2.03	1.97	1.92	1.87	63.3	63.4	63.6	63.8	64.0	64.1	64.3	69.0	69.2	69.4	69.6	69.8	70.0	70.2	243	-455	42.8	43.4	44.0	44.7	45.3	45.9	46.6
MALATYA	2.56	2.49	2.41	2.34	2.26	2.19	2.11	63.3	63.4	63.6	63.8	64.0	64.1	64.3	67.4	67.6	67.8	68.0	68.2	68.4	68.6	-1,722	-1,642	59.6	60.5	61.4	62.4	63.3	64.2	65.1
K.MARAŞ	3.54	3.51	3.48	3.45	3.42	3.39	3.36	57.6	57.7	57.9	58.1	58.3	58.4	58.6	61.4	61.6	61.8	62.0	62.2	62.4	62.6	-2,869	-2,237	51.1	52.0	52.8	53.6	54.4	55.2	56.0
NEVŞEHİR	2.55	2.50	2.44	2.39	2.33	2.28	2.23	62.9	63.0	63.2	63.4	63.6	63.7	63.9	64.4	64.6	64.8	65.0	65.2	65.4	65.6	-221	-170	34.0	34.9	35.7	36.6	37.4	38.3	39.1
ORDU	2.81	2.68	2.56	2.43	2.31	2.18	2.05	63.8	63.9	64.1	64.3	64.5	64.6	64.8	67.3	67.5	67.7	67.9	68.1	68.3	68.5	-4,270	-3,122	42.9	43.8	44.7	45.6	46.5	47.3	48.2
SAKARYA	2.23	2.22	2.21	2.19	2.18	2.17	2.16	71.5	71.6	71.8	72.0	72.2	72.3	72.5	77.0	77.2	77.4	77.6	77.8	78.0	78.2	-994	-2,185	58.0	58.7	59.4	60.1	60.8	61.5	62.2
SİVAS	2.76	2.71	2.65	2.60	2.54	2.49	2.44	64.1	64.2	64.4	64.6	64.8	64.9	65.1	68.7	68.9	69.1	69.3	69.5	69.7	69.9	-3,470	-3,655	50.6	51.3	52.0	52.8	53.5	54.2	55.0
TEKİRDAĞ	1.83	1.82	1.81	1.79	1.78	1.77	1.76	60.5	60.6	60.8	61.0	61.2	61.3	61.5	64.7	64.9	65.1	65.3	65.5	65.7	65.9	5,951	4,316	65.1	66.2	67.3	68.4	69.5	70.6	71.7
TOKAT	3.06	3.05	3.04	3.02	3.01	3.00	2.99	61.6	61.7	61.9	62.1	62.3	62.4	62.6	65.5	65.7	65.9	66.1	66.3	66.5	66.7	-3,918	-3,517	44.5	45.0	45.6	46.2	47.3	47.3	47.9
VAN	6.00	5.93	5.85	5.78	5.70	5.63	5.55	62.5	62.6	62.8	63.0	63.2	63.3	63.5	63.0	63.2	63.4	63.6	63.8	64.0	64.2	-4,443	-2,027	50.0	51.6	53.1	54.6	56.2	57.7	59.2
BAYBURT	3.29	3.22	3.14	3.07	2.99	2.92	2.84	63.3	63.4	63.6	63.8	64.0	64.1	64.3	67.8	68.0	68.2	68.4	68.6	68.8	69.0	-547	-525	33.2	33.3	33.5	33.7	33.9	34.1	34.2
KARAMAN	2.77	2.72	2.66	2.61	2.55	2.50	2.45	57.4	57.5	57.7	57.9	58.1	58.2	58.4	61.9	62.1	62.3	62.5	62.7	62.9	63.1	-334	-220	49.7	50.6	51.5	52.3	53.2	54.1	55.0
BATMAN	5.27	5.20	5.12	5.05	4.97	4.90	4.82	60.0	60.1	60.3	60.5	60.7	60.8	61.0	64.3	64.5	64.7	64.9	65.1	65.3	65.5	-2,115	-1,491	59.9	61.0	62.1	63.1	64.2	65.3	66.3
BARTIN	2.11	1.98	1.86	1.73	1.61	1.48	1.35	62.1	62.2	62.4	62.6	62.8	62.9	63.1	68.6	68.8	69.0	69.2	69.4	69.6	69.8	-1,680	-1,451	19.5	20.1	20.7	21.3	21.9	22.5	23.1

# ANNEX 15 – DEATH CERTIFICATE

<b>Death Certificate</b>		
<p>Enter the <u>chain/sequence of events</u> – diseases, injuries, complications – that caused the death. Use ICD 10 terminology! Do not use abbreviations! Enter only one cause on one line!</p>		<p><b>Approximate interval between onset and death</b> (answer if possible)</p>
<p><b>FINAL OR IMMEDIATE CONDITION/ DISEASE RESULTING IN DEATH</b> If only ‘cardio-pulmonar arrest’ can be established without any other known aetiology, please enter ‘<u>unknown cause</u>’</p>	<p><b>1.</b> Example a: <u>hypovolemic shock</u> or Example b: <u>brain damage</u></p>	
	due to (or as a consequence of)	
<p><b>UNDERLYING CAUSES</b> Sequentially list conditions - diseases or injuries - , if any, giving rise to the above cause, stating the <b>underlying condition that initiated the events resulting in death last</b></p>	<p><b>2a.</b> For example a: happened as a consequence of a <u>premature separation of placenta</u> or For example b: as a consequence of an <u>epidural haematome</u></p>	
	<p><b>2b.</b> For example a: happened as a consequence of a <u>blunt abdominal trauma</u> or For example b: as a consequence of a <u>head injury</u></p>	
	<p><b>2c.</b> For example a: as a consequence of a <u>road traffic accident</u> or For example b: as a consequence of a <u>road traffic accident</u></p>	
<p>Other <b>significant biomedical conditions contributing to death</b> but not resulting in the causes above</p>	e.g. <i>Pre-existing anemia or hypertension</i>	
<p><b>Significant sub-standard care factors contributing to death</b></p>	e.g. <i>delay in seeking care or lack of blood for transfusions</i>	
<p><b>Kind of death</b></p>	<i>Illness, Accident, Suicide, Murder, Natural Disaster</i>	
<p><b>Pregnancy status</b></p>	<i>pregnant, within 42 days after pregnancy, within one year after pregnancy, not pregnant</i>	