



Save the Children

**OPPORTUNITIES
FOR NEWBORN
SURVIVAL IN
PAKISTAN**

Saving Newborn Lives Initiative

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SURVIVAL IN PAKISTAN**

May 2009



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The Saving Newborn Lives Initiative, supported by the Bill & Melinda Gates Foundation, is a global initiative that aims to reduce newborn deaths and improve newborn survival in high-mortality countries. Saving Newborn Lives works with governments, local communities and partner agencies in developing countries to achieve neonatal mortality reduction through sustained high coverage of effective interventions. To date, the program has helped save the lives of millions of newborns, reaching more than 20 million mothers and babies with critical health services. Program partners include governments and communities in Ethiopia, Ghana, Malawi, Mali, Mozambique, Nigeria, South Africa, Tanzania, Uganda, Afghanistan, Bangladesh, India, Indonesia, Nepal, Pakistan, Vietnam, Bolivia and Guatemala.

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The Opportunities for Newborn Survival in Pakistan is a significant accomplishment as this comprehensive report highlights the newborn and maternal health situation in the country. However, this report was not possible without the support provided by Save the Children’s SNL team based in Washington D.C. We are especially thankful to Mr. Masee Bateman, Director of the SNL Program, Dr. Steve Wall, SNL Senior Research Advisor, and Ms. Ann Tinker, SNL Consultant, for reviewing the manuscript and providing technical inputs to help improve and refine the report.

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Dr. Amanullah Khan
Deputy Director Health
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FOREWORD

In the short while since the efforts of newborn health advocates have resulted in enhanced focus on newborn health in Pakistan, several developments have been witnessed and the area has also been the focus of international aid. Bilateral projects worth millions of dollars have been and are being implemented to address the issue of newborn health. Local stakeholders from private and public sectors have embarked upon programs directly or indirectly focusing on improving newborn survival. In order to support further development in this area a careful and up-to-date review of the situation is warranted. A structured analysis of newborn programs and projects is imperative in order to better understand the situation, ameliorate existing health services and help determine priorities for future action. This report 'Opportunities for Newborn Survival in Pakistan' is a major step in that direction.

The report describes and explains the epidemiological and social aspects of newborn health, including the big picture and an explanation of related factors. Building on a detailed account of the maternal and reproductive health status in the country, the determinants of newborn and maternal mortality have been carefully examined and presented in this report. Every effort has been made to take into account all of the available latest information. "What needs to be done?, the last chapter of the report summarizes key outcomes of the entire effort. It includes the analysis of secondary information as well as a comparison of existing programs, identifying both achievements and gaps. The report also (examines or presents?) donor funded programs which, along with the Ministry of Health, are striving to improve coverage of maternal, newborn and child health services, quality of care, meeting targets for Millennium Development Goals 4 and 5, better maternal health and child survival respectively. A synthesis of their comments along with the outcome of secondary data review has been presented to provide Pakistan specific information for future course of action.

In short, 'Opportunities for Newborn Survival in Pakistan' provides the most up-to-date, direct and evidenced-based knowledge about newborn health and related issues in Pakistan. The efforts of the authors and Save the Children are to be highly commended for producing out such a comprehensive document on maternal health and newborn survival. I am sure this effort will serve the needs of all who seek better understanding in order to make contributions in this field, and thereby will help improve the health of our mothers and their newborns.

Massee Bateman
Director
Saving Newborn Lives Program

ACRONYMS

ADB	Asian Development Bank
AKU	The Aga Khan University
APH	Ante-Partum Hemorrhage
ARI	Acute Respiratory Infection
BCC	Behaviour Change Communication
BCG	Bacille Calmet Guariene
BHU	Basic Health Unit
BMI	Body Mass Index
BRSP	Balochistan Rural Support Programme
BSMI	Balochistan Safe Motherhood Initiative
CBD	Community Based Distribution
CBI	Community Based Involvement
CBO	Community Based Organizations
CDR	Case Detection Rate
CIDA	Canadian International Development Agency
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CNS	Central Nervous System
CPR	Contraceptive Prevalence Rate
CPSP	College of Physician and Surgeons, Pakistan
DFID	Department for International Development
DHQ	District Headquarter Hospital
DHS	Demographic and Health Survey
DIC	Disseminated Intravascular Clotting
DOTS	Directly Observed Therapy, Short-Course
DPT3	Diphtheria Pertussis Tetanus
EMOC	Emergency Maternal Obstetric Care
ENC	Essential Newborn Care
EOC	Emergency Obstetric Care
EPI	Expanded Programme for Immunization
EXTRAMED	Is a healthcare IT consultancy and software development house
FALAH	Family Advancement for Life and Health
FANA	Federally Administered Northern Areas
FATA	Federal Administered Tribal Area
FLCF	First Level Care Facilities
FP	Family Planning
GBS	Group B Streptococcal
GDP	Gross Domestic Product
GFATM	Global Fund for AIDs, TB and Malaria
GLRA	German Leprosy and TB Relief Association
GOP	Government of Pakistan
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HEV	Hepatitis E Virus
HIE	Health Information Exchange
HMIS	Health Management Information System
HRD	Human Resource Development
ICPD	International Conference on Population and Development
IEC	Information, Education and Communication
IMCI	Integrated Management of Childhood Illness
IMPACT	Implementing AIDS Prevention and Care
IMR	Infant Mortality Rate
IRDS	Idiopathic Respiratory Distress Syndromes

ACRONYMS

IUATLD	International Union Against Tuberculosis and Lung Diseases
IUGR	Intra-Uterine Growth Retardation
JHPIEGO	John Hopkins Program for International Education in Gynecology and Obstetrics
JHU	Johns Hopkins University Center for Communication Program
JICA	Japanese International Cooperation Agency
JP	Joint UN Programming
JPMC	Jinnah Postgraduate Medical Center
JSI	John Snow Incorporated
KAB	Knowledge, Attitudes and Behaviors
LBW	Low Birth Weight
LHV	Lady Health Visitor
LHW	Lady Health Worker
MCH	Maternal Child Health
MCP	Malaria Control Program
MCWA	Maternal and Child Welfare Association
MDG	Millennium Developmental Goal
MEDLINE	Medical literature Analysis and Retrieval System Online
MEDLIPS	The College of Physicians and Surgeons Literature Review service
MIMS	Maternal and Infant Mortality Survey
MM	Maternal Mortality
MMR	Maternal Mortality Ratio
MNCH	Maternal Newborn and Child Health
MNH	Maternal and Newborn Health
MNT	Maternal and Neonatal Tetanus
MoH	Ministry of Health
MoPW	Ministry of Population Welfare
MSS	Marie Stopes Society
MTDF	Medium Term Development Framework
NACP	National AIDS Control Program
NATPOW	National Trust for Population Welfare
NCMH	National Committee on Maternal Health
NGO	Non-Governmental Organization
NHS	National Health Survey
NIPS	National Institute of Population Studies
NMR	Neonatal Mortality Rate
NNJ	Neonatal Jaundice
NNP	National Nutrition Programme
NNT	Neonatal Tetanus
NP-FPPHC	National Program for Family Planning and Primary Healthcare
NPPI	Norway Pakistan Partnership Initiative
NTP	National TB Program
NWFP	North West Frontier Province
OCPs	Oral Contraceptive Pills
PAIMAN	Pakistan Initiative for Mothers and Newborns
PAVHNA	Pakistan Voluntary Health and Nutrition Association
PD	Positive Deviance
PDHS	Pakistan Demographic and Health Survey
PHAPCP	Pakistan HIV/AIDS Prevention and Care Project
PHC	Primary Health Care
PIHS	Pakistan Integrated Household Survey
PIMS	Pakistan Institute of Medical Sciences
PLHA	People Living with HIV/AIDS

ACRONYMS

PMCH	People Medical College Hospital
PMR	Perinatal Mortality Rate
PMRC	Pakistan Medical Research Council
PNC	Post-Natal Care
PNM	Perinatal Mortality
PNMR	Perinatal Mortality Rate
PPAF	Pakistan Poverty Alleviation Fund
PPH	Post-Partum Hemorrhage
PRISM	Promoting Interventions in Safe Motherhood
PROM	Premature Rupture of Membranes
PRSP	Poverty Reduction Strategy Paper
PRSP	Punjab Rural Support Program
PSLSMS	Pakistan Social Living Standards Measurement Survey
PSMIP	Punjab Safe Motherhood Initiative Project
PUBMED	Service of the US National Library of Medicine
RBM	Roll Back Malaria
RDS	Respiratory Distress Syndrome
RH	Reproductive Health
SBA	Skilled Birth Attendants
SC	Save the Children
SGS	Second Generation Surveillance System
SMART	Safe Motherhood Applied Research and Training
SNL	Saving Newborn Lives
SOGP	Society of Obstetricians and Gynecologists, Pakistan
SRSP	Sarhad Rural Support Program
SRSP	Sindh Rural Support Program
STI	Sexually Transmitted Infections
SVD	Spontaneous Vaginal Deliveries
TBA	Traditional Birth Attendant
TFR	Total Fertility Rate
TSR	Treatment Success Rate
TT	Tetanus Toxoid
TT-2	2 doses of Tetanus Toxoid
U5MR	Under Five Mortality Rate
UN	United Nations
UNDP	United Nations Development Program
UNFPA	United Nations Fund for Population Activities
UNICEF	United Nations International Children's Education Fund
UR	Rupture of the Uterus
USAID	United States Agency for International Development
WFP	World Food Program
WHO	World Health Organization
WHP	Women's Health Project
WRLH	Women's Right to Life and Health Project

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CHAPTER I

MATERNAL AND REPRODUCTIVE HEALTH IN PAKISTAN

I. INTRODUCTION

Worldwide, over 500,000 women and girls die of complications related to pregnancy and childbirth each year. More than 99 percent of these deaths occur in developing countries such as Pakistan. For every woman or girl who dies as a result of pregnancy-related causes, between 20 and 30 more will develop short and long-term disabilities, such as obstetric fistula, a ruptured uterus, or pelvic inflammatory disease. One of the major underlying problems contributing to the high rate of maternal mortality is the generally poor educational and socio-economic standing of women in Pakistan.

Maternal mortality is a persistent tragedy that continues to confront and challenge the policy makers of Pakistan and is compounded by the fact that it is poorly understood and difficult to measure. The problem of maternal mortality can be understood within the context of the larger issue of women's health and health related development of the country. We reviewed the evidence base for information of maternal health in Pakistan with a special emphasis on recent developments, to better understand the determinants and outcomes of relevance to the continuum of maternal and newborn health. This situation analysis was undertaken within the framework of reviewing available research, programs and policies, identifying gaps in information and finally suggesting recommendations for improving maternal and newborn health.

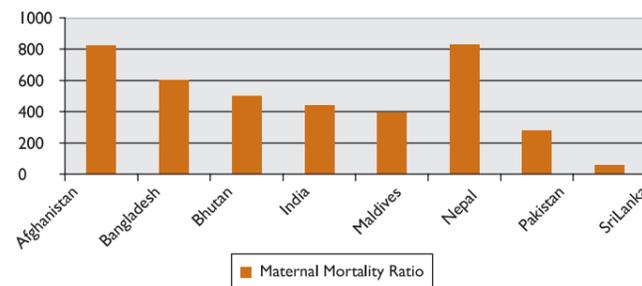
In this chapter we review the papers cited in MEDLINE, PUBMED, and CINAHL using a variety of specific search terms for maternal health. It also includes review of EXTRAMED and in particular, the College of Physicians and Surgeons Literature Review service, MEDLIPS. In addition to background papers we also reviewed and included data on maternal mortality of Pakistan from Maternal and Infant Mortality Survey (MIMS), hospital based studies and recent Pakistan Demographic Health Survey (PDHS) 2006-2007. This chapter also reviews evaluation of quality of care by different maternal health services in Pakistan.

2. DEMOGRAPHIC AND HEALTH INDICATORS

Maternal mortality is defined as “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of duration or site of pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes .”

Improving maternal health and reducing maternal mortality remains at the centre of national, regional and global health initiatives. The most recent estimate shows that worldwide, in 2005 alone, close to half a million women died of maternal causes. About 99 percent of the fatality took place in developing countries, and slightly more than half occurred in the sub-Saharan African region alone, followed by South Asia. Pakistan, in common with many other developing countries, has an unacceptably high maternal mortality rate (maternal deaths per 1,000 women) and maternal mortality ratio (maternal deaths per 100,000 live births).

Figure 1.1: Comparison of Maternal Morality Ratio in South Asia Region



Source: Bhutta, Z.A et al BMJ 2004;328:816-819

Currently, Pakistan has a population of 160 million approximately in which females make up 46 percent of total population with total fertility rate of 4.1. Women in reproductive age constitute 23 percent of Pakistan's population. Percentage of pregnant women who receive at least one ante-natal consultation has increased from 30 to 50 percent; the percentage of women receiving post-natal consultations has increased from 11 to 23 percent. Anemia among pregnant women has reduced to half during the last four decades, from 88 percent in 1965 to 36 percent in 2001-2002. Contraceptive prevalence rate (CPR) also improved from 12 percent in 1991 to the reported levels of 36 percent in 2006. Percentage of births attended by SBAs has shown some progress - increasing from 18 percent in 1999-2000 to

31 percent in 2003[1]. Nine percent of women between the ages of 15-19 have begun childbearing, 7 percent are already mothers and another 3 percent are pregnant with their first child [1].

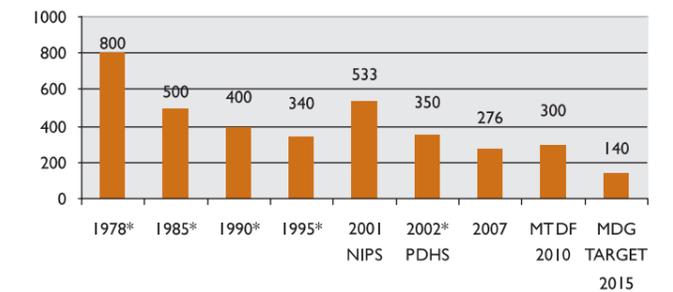
3. LEVELS AND TRENDS IN MATERNAL MORTALITY RATIO

Earlier reports like UNICEF's maternal mortality ratio (MMR) for Pakistan showed that during 1980-1990 period was 5 per 1,000 live births, in 1996 World Bank report did not mention MMR for Pakistan. The MMR in Pakistan is still not reliably quantified and estimated MMR range from 190 to 1700 death per 100,000 live births. According to the Planning Commission estimates, the maternal mortality ratio has increased from 350 in 2000-2001 to 400 per 100,000 live births in 2005. Reversing this trend, which falls short of the Poverty Reduction Strategy Paper (PRSP) target of 300 to 350 per 100,000 live births, will require a multifaceted approach to the health of women before, during and after pregnancy. The maternal mortality ratio as measured in the most recent Pakistan Demographic and Health Survey (PDHS) 2006-2007, National Institute of Population Studies (NIPS) is 276 maternal deaths per 100,000 live births. This is slightly lower than the generally accepted previous estimates of around 320 maternal deaths per 100,000 live births.

Community-based studies of maternal mortality have estimated large variations in MMR by urban and rural areas, provinces and more and less developed districts. Based on statistical models, the government has classified districts into low, medium and high

MMR categories (Ministry of Health, 2005). In general, Balochistan has the highest average MMR and Punjab has the lowest. The most important cause of the divergence is differences in access to emergency obstetric and neonatal care services. During 1989-1992 Maternal and Infant Mortality Survey (MIMS) conducted in three different regions of Pakistan showed that MMR in Karachi city was 280, in five districts of Balochistan 630 and in Hazara division of the North-West Frontier Province (NWFP) was 430 per 100,000 live births.

Figure 1.2: Trends of Maternal Mortality Rate in Pakistan



Source: *Government of Pakistan. Planning Commission, Islamabad, Pakistan. http://www.pakistan.gov.pk/ministries/plannin_ganddevelopment-ministr/ (accessed Oct.06).

Maternal mortality and morbidity is a major problem that has a significant impact on women's health status in Pakistan. It must be fully addressed if Millennium Development Goal-5 (MDG-5) to improve maternal health is to be achieved by 2015. Maternal mortality in most developed nations has now been reduced to as low as 5 to 20 per 100,000 live births while in the developing countries it still ranges from 50 to as high as 2000 per 100,000 live births. The main reasons for such high rate of maternal mortality are poor socio-economic

Table 1.1: Previous Sources of Data on the Maternal Mortality Ratio

Reference Period	Study/Source	Estimation Method	Geographical Coverage	Maternal Mortality Ratio
1990-1991	National Reproductive Health and Family Planning Survey 2001 (National Institute of Population Studies, 2002)	Indirect sisterhood method	Pakistan	533
1988-1993	Maternal and Infant Mortality Survey (MIMS) (Midhet et al., 1998)	Verbal autopsy	Selected rural districts of Balochistan and NWFP	392
2000	Estimates Developed by WHO, UNICEF and UNFPA, (Abou Zahr and Wardlaw, 2004)	Statistical modeling using country characteristics as independent variables	Pakistan	500
2000-2001	Maternal and Infant Mortality Survey (MIMS) (Midhet, 2001)	Statistical modeling using district characteristics as independent variables and projected into future	Pakistan	279
2005	Estimates Developed by WHO, UNICEF, UNFPA, and the World Bank (WHO, 2005)	Statistical modeling using country characteristics as independent variables	Pakistan	320

status, illiteracy, ignorance, apathy and also poor service availability and quality. According to MDG-5, Pakistan should have MMR of 140 or below by the year 2015. It is estimated that about 500 maternal deaths occur per 100,000 live births each year in Pakistan. Recent estimates (WHO and UNICEF) place the figures around 340/100,000 live births but in reality it may be higher because of under registration of deaths in country and absence of cause of death information [2, 3].

a) Community-based Estimates of Maternal Mortality Ratios

In Pakistan, the MMR cannot be assessed accurately as there is no reliable system of registering births and deaths. Because of the paucity of data on MMR and the desire to measure progress towards meeting the MDG-5 target, the need for a national study to estimate the MMR was felt among public health professionals and government circles for a long time. It was decided that the scope of PDHS 2006-2007 could be expanded to measure MMR using verbal autopsies. Besides estimating the MMR, the PDHS 2006-2007 provides valuable data on the causes and risk factors of maternal mortality, as well as on a number of process indicators, which will be of great help in program development and monitoring and evaluation. The recent estimates by PDHS shows that maternal mortality ratio in Pakistan is about 276 per 100,000 live births i.e. one in every 89 women in Pakistan will die of maternal causes during her lifetime [4]. The PDHS 2006-2007 also includes direct estimation of maternal mortality and its causes at the national level for the first time in Pakistan. This being the fifth survey of pregnancy related indicators, there is considerable trend information on reproductive health, fertility and family planning over the past one and a half decades.

The PDHS 2006-2007 was undertaken to address the monitoring and evaluation needs of maternal and child health and family planning programs. The aim is to provide reliable estimates of the MMR at the national level and a variety of other health and population indicators at national, urban-rural, and provincial levels. (In Pakistan 2.2 women died for every 1,000 women in the population while 2.8 men died for every 1,000 men in the population according to the most recent PDHS). With regard to patterns by residence, mortality rates are generally higher in rural areas than in urban areas. For example, rural women have steadily higher age-specific mortality rates than urban women, except at the extreme ages (15 to 19 and 45 to 49), when the urban and rural rates are very similar. Among men, mortality rates are higher in rural areas except at age groups 35

to 39 and 45 to 49, which is somewhat puzzling. Across provinces, mortality is highest for women in Balochistan, followed by Sindh, whereas for men, it is highest in Punjab and tends to be lowest in Balochistan.

Table 1.2: Adult Mortality by Province (PDHS 2006-2007)

	Sindh	Punjab	Balochistan	NWFP
Men	2.6	3.2	1.9	2.0
Women	2.6	2.0	3.4	1.8

* Number of deaths per thousand

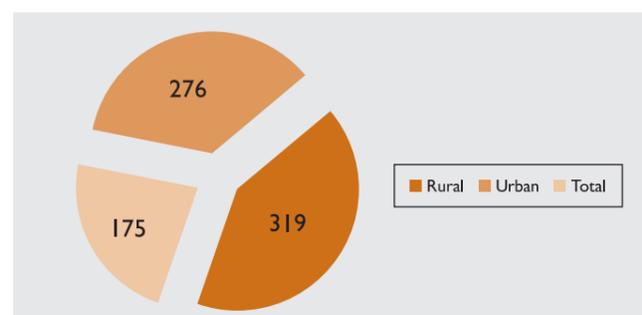
Estimates of MMR for Pakistan range from 204 to 4,740 maternal deaths/100,000 live births in different studies. Studies from hospitals and communities show a wide variation in MMRs. The ratio reported from hospitals varies between 17 in private tertiary hospital to 2,736 in a government tertiary hospital. In the community, the range is from 160 in Sindh to 673 in Khuzdar.

Table 1.3: Maternal Mortality Ratio by Provinces of Pakistan (PDHS 2006-2007)

	Balochistan	Punjab	Sindh	NWFP
MMR/100,000 births	785	227	314	314

According to recent PDHS the maternal mortality is 276/100,000 live births with 319 and 175 per 100,000 live births in rural and urban areas of Pakistan respectively.

Figure 1.3: Maternal Mortality Ratio by Residence (PDHS 2006-2007)



b) Hospital-based Estimates of Maternal Mortality Ratios

In the absence of the registration of vital events, major sources to determine maternal mortality ratio in Pakistan is hospital based data or household sample surveys. Since the ratios derived from hospital based data suffer from selection biases, they can not identify the correct extent

of the problem. Maternal mortality (MM) in Pakistan (another key determinant of neonatal outcome) has apparently not declined in the last 40 years, according to hospital data. Hospital-based studies of MM report much higher MMRs because of the selection bias (more high-risk pregnancies being referred to hospitals). The studies conducted in the large teaching hospitals in the public sector typically report MMRs that are exponentially higher than the community-based studies. Even among hospitals the figures vary greatly according to whether the hospital is in public or private sector and also in different cities. In a private tertiary hospital in Karachi the MMR was reported as 28 per 100,000 live births, whereas in public hospitals the MMR ranges from 225 in Lahore to 1,442 in Peshawar and 2,608 in Hyderabad. At Jinnah Postgraduate Medical Centre (JPMC) the MMR over ten year period (1981-1990) was reported as 710 per 100,000 live births. A community based survey carried out in eight squatter settlements of Karachi in 1989, the MIMS survey showed an MMR of 281. In the same survey figures reported from rural Balochistan were 289 in Pishin, 463 in Lasbela, 593 in Loralai and 673 in Khuzdar. Whereas, in rural NWFP these were 360 in Abbottabad and 523 in Mansehra. If Pakistan is to achieve the ambitious MDGs to reduce maternal mortality ratio by 75 percent (from 1990 levels) by the year 2015, it has to work very aggressively towards prevention. Table 1.2 shows the recent maternal mortality ratios in different cities and hospitals.

Table 1.4: Maternal Mortality Ratio 2002-2007

Author	Year of Reporting	Name of Hospital	MMR*
Lodhi, S.K[5]	2002	Lady Willington Hospital Lahore	519
Sami,S[6]	2002	Sandeman Hospital, Quetta	560
Safdar, S[7]	2002	Rural Area of District Hyderabad	6,89
Mussarat Jabeen[8]	2005	Women and Children Hospital DHQ, Kohat	191.3
Quddusi, H[9]	2005	Nishtar Hospital, Multan	593
Rehana Rahim[10]	2006	Lady Reading Hospital, Peshawar	1,311
Nabeela Hasan [11]	2007	Liaquat University Hospital, Hyderabad	1,543
Sultana A[3]	2007	Women and Children Hospital DHQ, Dera Ismail Khan	1,109

* Per 100,000 live births

4. MAJOR CAUSES OF MATERNAL MORTALITY

Complications of pregnancy and delivery are the leading causes of death and disability among women of childbearing age. Because most maternal deaths occur during delivery and during the postpartum period, emergency obstetric care, SBAs, postpartum care, and transportation to medical facilities, if complications arise, are all necessary components of strategies to reduce maternal mortality. These services are often particularly limited in rural areas, so special steps must be taken to increase the availability of services in those areas. Social, cultural, religious, and personal reasons support the persistence of some traditional practices that can negatively affect women's health outcomes, such as early marriage. Efforts to reduce maternal mortality and morbidity must address societal and cultural factors that affect women's health and their access to services.

In Pakistan each year over 5 million women become pregnant, out of these 0.7 million (15 percent of all pregnant women) are likely to experience some obstetrical and medical complications. Twenty percent of adult female deaths are attributed to maternal causes (complications during pregnancy, childbirth, and the six weeks post birth), with most women of age below 20 and above 40 dying of pregnancy related issues [4]. The specific causes of maternal mortality are multiple, inter-related, complex and almost always preventable. Complications of pregnancy and delivery are the leading causes of death and disability among women of childbearing age. Globally and in Pakistan the major causes of maternal mortality are hemorrhage, hypertension disorders, sepsis, obstructed labor and unsafe abortions.

Hemorrhages whether ante-partum (APH), postpartum (PPH), abortion or ectopic pregnancy related, remains one of the major killers of childbearing women all over the world. In Pakistan, audit into the causes of maternal mortality in public and private hospitals, points towards postpartum hemorrhage as the main cause of death after childbirth.

Direct maternal deaths constituted 86.17 percent, while indirect deaths were responsible for 13.82 percent [10]. Most common direct causes of maternal deaths are postpartum hemorrhage (27 percent), puerperal sepsis (14 percent), and Eclampsia/toxemia of pregnancy (10 percent) according to the recent demographic survey. Hemorrhage continues to be a major contributor of

maternal mortality. In Pakistan, audit into the causes of maternal mortality in public and private hospitals, points towards postpartum hemorrhage as the main cause of death after childbirth [3, 12].

of them are preventable by giving immediate treatment and resuscitative measures. In another report from Hyderabad the figures vary from 21 percent to 34 percent [11, 16].

Table 1.5: Maternal Deaths by Underlying Cause of Death in Different Studies (2002-2008)

Articles	DIRECT CAUSES (%)						INDIRECT CAUSES (%)		
	Hemor-rhage	Eclampsia	Sepsis	Obstructed Labor/ Rupture of Uterus	Abortion	Pulmonary Embolism	Severe anemia	Hepatitis	Heart Disease
Sultana A [3] Women and Children Hospital, DHQ, Dera Ismail Khan	57.5	16.74	5.35	13.9					
Quddusi H [9] Nishtar Hospital, Multan	35.4	23.03	14.04		6.2		10.1		
Farooq N[2] five districts of North West Frontier Province	21	18.6	13.3		11				
Begum S [13] Ayub Teaching Hospital, Abbottabad	34.6	30.7							
Nabila H [11] Liaquat University Hospital, Hyderabad	20.9	30.2	18.6	6.9		9.3	4.6	6.9	2.3
Rahim R [10] Lady Reading Hospital, Peshawar	42.16	24.63	9.7	10.44		7.8			
Shah N [14] Civil Hospital, Karachi	23.3	34.2	9.2	7.2	10.5		1.3	0.6	0.6

a) Postpartum Hemorrhage

Postpartum Hemorrhage (PPH) is one of the major causes of maternal mortality and morbidity worldwide. It is estimated that 600,000 to 800,000 women die in childbirth each year [15]. Hemorrhage whether ante partum (APH), postpartum (PPH), abortion or ectopic pregnancy related, remains one of the major killers of childbearing women all over the world. In Pakistan, audit into the causes of maternal mortality in public and private hospitals, points towards postpartum hemorrhage as the main cause of death after childbirth [12]. PPH is the blood loss of more than 500 ml following vaginal delivery and more than 1,000 ml following caesarean delivery. It is the leading direct cause of maternal mortality and morbidity in Pakistan being responsible for 21 to 31 percent of maternal mortality. A study conducted in Lady Willington Hospital in Lahore from 2002-2004 showed that most common cause of PPH is uterine atony in 54 percent of cases. It is more common in unbooked and multiparous women, similarly a study in Abbottabad showed 34.6 percent maternal deaths are due to hemorrhage. Most

Majority of patients (88.14 percent) died of direct causes. This favors the trend from other hospital studies where over 80 percent of deaths are from direct causes. More than half of our patients died of obstetrical hemorrhage, with postpartum hemorrhage (PPH) in 27.1 percent of cases. Hemorrhage accounts for 25 percent of all maternal deaths globally, with primary PPH representing the largest share of the cases i.e. 22 percent. In Pakistan obstetric hemorrhage has been shown to be the leading cause of maternal death [7, 8, 16, 18-20, 23, 24]. After primary PPH, relaxed uterus and rupture uterus were the other contributory factors of hemorrhage [8]. The result of the study in Bahawalpur revealed a number of associated risk factors for primary PPH and proved the relationship of its severity with increasing parity and duration of labor. Duration of labor had a significant relationship with PPH even in primipara [17].

b) Eclampsia and Hypertension

Eclampsia is still a major cause of maternal mortality worldwide. Eclampsia is an ongoing challenge for the

whole medical community, the root of which lies in the soil of illiteracy, poverty and poorly implemented health care system. The frequencies of eclampsia and hypertensive disorders are high in our country. Between 10-15 percent of maternal deaths are due to hypertensive disorders while 10 percent deaths are associated with eclampsia. A study from Peshawar showed that the frequency of eclampsia (1.65 percent) is considerably higher than in other countries such as in USA 0.028 percent, Finland 0.024 percent, Nigeria 1.32 percent, and UK 0.072 percent but comparable with different tertiary care hospitals of Pakistan (Civil Hospital Karachi 2 percent, Nishtar Hospital 1.8 percent, Faisalabad 1.7 percent). Another study from Abbottabad showed hypertensive disorders were responsible for 8 (30.7 percent) maternal deaths [13, 18].

Eclampsia was reported as the top leading cause of maternal death in a study conducted in Lahore where as a study conducted in Peshawar has shown eclampsia to be responsible for 48 percent of maternal mortality. The revised management of eclampsia in 1996 by Royal College of Obstetrician and Gynecologist has considerably improved the morbidity and mortality associated with eclampsia. Deaths from hypertensive disorders can be prevented by careful monitoring during pregnancy and by use of anticonvulsants like magnesium sulphate in cases of eclampsia [10].

c) Sepsis and Infections

Sepsis was responsible for 9.7 percent of deaths and was the third commonest cause of death. Accurate data of puerperal sepsis in Pakistan is not available, however according to PDHS puerperal sepsis causes 14 percent of maternal deaths. It is known that 40 to 45 percent spontaneous vaginal delivery (SVD) and 50 percent instrumental deliveries get infected when carried out by traditional birth attendants (TBAs), nurses, lady health visitors (LHV) and by female general practitioners. Two other studies have also shown it to be the third commonest cause of maternal mortality. Globally it accounts for 15 percent of maternal deaths. National figures for Pakistan are that sepsis is responsible for 15 percent of maternal deaths. Sepsis is often a consequence of poor hygiene during delivery or of untreated sexually transmitted disease. Such infections can be effectively prevented by careful attention to clean delivery and by early detection and management of infections by appropriate antibiotics [10].

Asymptomatic bacteriuria is a common infection during pregnancy having strong association with multiparity,

lower socioeconomic status and illiteracy. Bacteriuria was found to be a causative factor for preterm labor as 21.4 percent bacteriuric women compared with 4.9 percent non-bacteriuric women went into preterm labor ($p < 0.05$). Bacteriuria was found to increase the risk of symptomatic urinary tract infection (UTI) as 14.2 percent bacteriuric and 2.7 percent non-bacteriuric women developed cystitis ($p < 0.05$). Asymptomatic bacteriuria is a common infection during pregnancy and it increases the risk of symptomatic UTI and preterm birth [19].

A common postpartum morbidity reported is a vaginal infection resulting in uterine infections which may lead to other complications or become a threat to the life of the mother. The reported prevalence of vaginal infection was 5.1 percent. The ethnic groups of the study population were Pathan (37 percent), Mohajir (26 percent), Sindhi (20 percent), and Punjabi (17 percent). The estimated prevalence of perceived vaginal infection was 5.1 percent. Similar perceived prevalence of two percent and 3.9 percent have been reported in India and Sri Lanka respectively, while a cross-sectional study conducted by Fikree in 1998 reported a much higher prevalence of 16 percent [20].

d) Uterine Rupture

The most common cause of uterine rupture in a study by Bashir, A., et al was found to be multiparity and injudicious use of oxytocin by TBA in 35.7 percent cases and previous uterine surgery in 35.7 percent cases. Rupture of uterus was responsible for maternal death in 10.44 percent of cases; all the patients had received oxytocin by TBA or midwives at home. Twenty-five patients were still undelivered when presented or had delivered at home and presented with postpartum hemorrhage. Rupture of uterus is often a complication of prolonged or obstructed labor accounting for eight percent of maternal deaths. According to UNICEF and National Committee for Maternal Health (NCMH) ruptured uterus contributed to 10 percent of maternal deaths in Pakistan [10, 21].

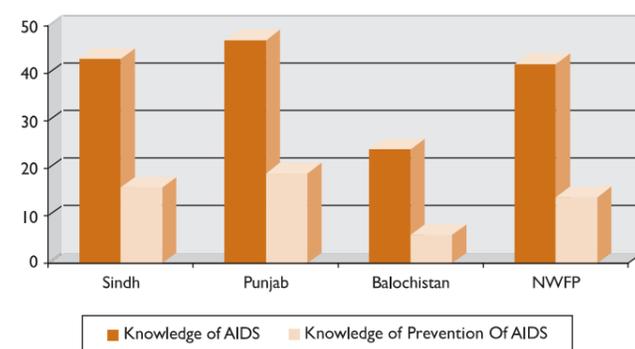
e) HIV and Maternal Health

The data collected in the recent PDHS shows that only 44 percent of ever-married women age 15 to 49 have heard about AIDS. Only 10 percent of women have heard of STIs other than HIV. Less than three percent can name any STI symptoms. About 20 percent of women know that HIV can be prevented by using condoms and 31 percent know that it is prevented by limiting sex to one uninfected partner. Less than half

of women know that AIDS can be passed from mother to child through breastfeeding. PDHS also showed that more than half of women had at least one injection in the 12 months before the survey, with an average of five injections per person. Eighty-six percent of women report that their last vaccine came from a new, unopened package [4].

Pakistan to a large extent has managed to remain relatively protected from the spread of AIDS to date. It is identified as a low-prevalence, high-risk country for the spread of HIV infection. By the end of 2000, a total of 1,549 HIV positive and 202 AIDS cases had been reported; by December 2002 the number had risen to 1,998. The male-to-female ratio was calculated as 7:1 (per 100,000) in reported HIV positive and AIDS cases. Studies looking at HIV infection among women seeking ante-natal care (ANC) reveals low rates which have only risen from 0 percent in 1994 to 0.2 percent in 1997 [22].

Figure 1.4: Knowledge of AIDS in Married Women of Pakistan by Province



Source: Pakistan Demographic and Health Survey 2006-7

f) Hepatitis and Others

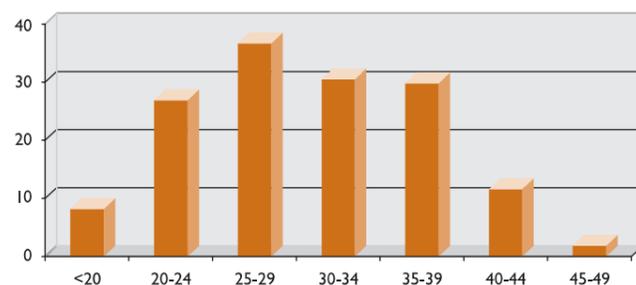
Of other medical disorders, hepatitis is also a significant cause of maternal deaths. Data on type of hepatitis is not available; though it is known that hepatitis E during pregnancy is associated with high maternal mortality. In a study conducted at Nawabshah [23] showed that mortality rate in women with hepatitis E is close to 50 percent while another study [24] proved the presence of HEV in pregnant women and confirmed that hepatitis E is endemic in Karachi. Ante-natal screening for hepatitis B and hepatitis C for every woman is also recommended. Hepatitis C infection has an estimated sero-prevalance of one to two percent in women of child bearing age and vertical transmission rate of five to 15 percent. About 5 percent of infants born to women who are positive for both hepatitis C antibody and hepatitis C RNA during pregnancy

acquire HCV infection [25, 26]. In a study it shows that Non-A, Non-B was the commonest cause (62 percent) followed by hepatitis B in 17 percent and hepatitis A in four percent cases. Eight women expired (case fatality rate 15 percent) with a high maternal mortality (62 percent) caused by NANB hepatitis. Perinatal mortality was 30 percent. Poor prognostic factors identified were lack of ANC, severity of jaundice, history of somnolence, gastrointestinal bleeding and a high grade of encephalopathy.

5. FACTORS DETERMINING MATERNAL MORBIDITY

Maternal and child health outcomes are greatly influenced by the quality of care during pregnancy, delivery, and after delivery. This is especially important under conditions of repeated childbearing by women who are in poor overall health. Over a ten year period (from 1996/7 to 2005/6), the percentage of pregnant women who received at least one ante-natal consultation has increased from 30 percent to 50 percent; the percentage of women receiving post-natal consultations has increased from 11 to 23 percent and the proportion of births attended by SBAs has increased from 18 percent to 31 percent. In addition one of the underlying established determinants of maternal mortality, anemia among pregnant women, has reduced to half during the last four decades, from 88 percent in 1965 to 36 percent in 2002. Contraceptive prevalence also improved in the last ten years from 12 percent in 1991 to the reported levels in 2001 which stood at 27.6 percent. There are also indications of increased utilization particularly of private sector health care facilities as is evidenced by increase in the percentage of post natal consultations from 35 percent in 1998-1999 to 46 percent in 2004-2005. However quality of service cannot be assessed objectively due to paucity of data in that area; nonetheless, anecdotal impressions indicate major gaps both within the public and private sectors [1, 27].

Figure 1.5: Pregnancy Related Mortality Rates by Age in Pakistan (PDHS 2006-2007)



**a) Poor Care Seeking
i) Ante-natal Care**

Ante-natal care is important for the health of mother and child. It refers to pregnancy-related health care checkups provided at a medical facility or at home. Ideally, prenatal care comprises at least three visits and includes monitoring the pregnancy for signs of complications; detection and treatment of pre-existing and concurrent problems of pregnancy such as anemia; provision of advice and counseling on preventive care, diet during pregnancy, and PCN; and encouragement of institutional delivery by trained health care personnel. Under the National Health Policy, prenatal care should include provision of iron supplements, folic acid supplements, two doses of tetanus vaccine, blood pressure measurement, and identification and treatment of reproductive tract and sexually transmitted infections.

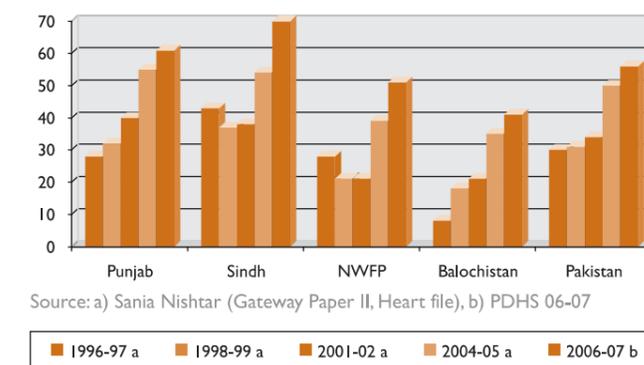
The Pakistan Integrated Household Survey (PIHS) 2001-2002 data indicate that the proportions of women receiving good maternal care have risen slowly since the 1980s, but these proportions remain far from adequate (World Bank, 2005). According to PIHS 2001-2002, only 35 percent of women in Pakistan reported receiving ANC during their most recent pregnancy, which represents only a 17 percent increase from the late 1980s. Coverage is particularly low in rural areas with only 26 percent of women accessing ANC. During their most recent pregnancy, 41 percent of women received tetanus toxoid (TT) immunization. Encouragingly, coverage expanded during the 1990s by 40 percent overall, and by 70 percent in rural areas. Improvements have been seen in relation to maternal health as is evidenced by comparisons of data from studies that have used the same instruments (PIHS 2001 and PLSMS 2005). According to the Reproductive Health and Family Planning (RH & FP) survey 2001-2002, 27 percent of women have at least one antenatal consultation. In Pakistan 27 percent women are utilizing ANC whereas in South Asia 52 percent and for the rest of the world the figure is 68 percent. ANC was availed mostly by the women living near the hospital. Most of them were self-referred. The system of orderly referral is non-existing. The concept of ANC is still not clear in the minds of consumers. Less than one-third of pregnant women receives ANC, with a large urban and rural difference: 17 percent of pregnant women in rural areas receive ANC, while 71 percent of women in major cities are able to take advantage of service [28, 29]. There has been a significant improvement over the past ten years in the proportion of mothers who receive prenatal

care from a skilled health provider, increasing from 33 percent in 1996 (Hakim et al., 1998) to 43 percent in 2001 (NIPS, 2001) to 44 percent in 2003 (NIPS, 2007a) to 61 percent in 2006-2007 [4].

Coverage and Trends

According to recent PDHS in Pakistan 31 percent of women went to their first post-natal care (PNC) visit during the first trimester of pregnancy, as recommended. Twenty-eight percent of women had four or more PNC visits, as recommended. Among those who did not receive PNC, 73 percent said it was “unnecessary” [4].

Figure 1.6: Provincial Comparison of the Percentage of Women Receiving Pre-natal Consultations (1996-2007)



Source: a) Sania Nishtar (Gateway Paper II, Heart file), b) PDHS 06-07

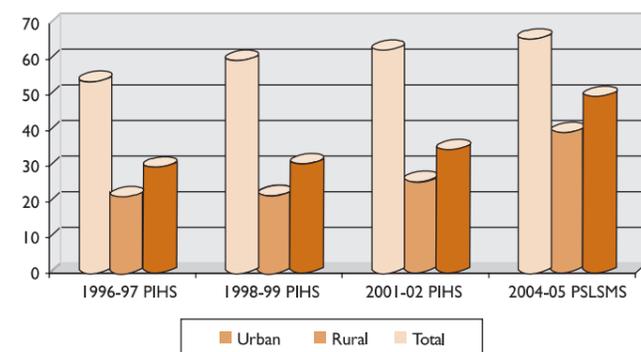
Components of Ante-natal Care

In Pakistan, it is recommended that every pregnant woman receive the following services: height and weight measurements, blood pressure measurement, iron tablets, TT immunization, and abdominal examination. In any ANC visit, a woman should be informed of the danger signs of pregnancy, have her weight measured, and provide blood and urine samples for testing. ANC can improve certain outcomes through the detection and management of possible complications. However, although ANC has not been shown to reduce rates of maternal mortality, it may improve birth weight. ANC can prevent, identify and treat iron deficiency anemia in a pregnant mother. Recent PDHS data showed that 43 percent took iron tablets or syrup during last pregnancy, 25 percent informed of signs of pregnancy complications, 80 percent had blood pressure measured and less than half of women had a urine or blood sample taken.

UNICEF and NCMH reports that in Pakistan less than 30 percent of the pregnant women have any ANC and 95 percent of home deliveries are conducted by

untrained and illiterate TBA and less than a quarter of the delivered women receive any post-natal care (PNC).

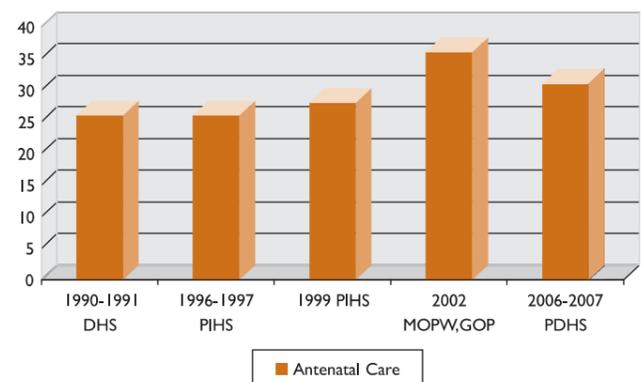
Figure 1.7: Ante-natal Care Utilization by Residence



Source: Sania Nishtar (Gateway Paper II, Heart file)

According to recent PDHS 61 percent of mothers receive ANC from skilled health providers, that is, from a doctor, nurse, midwife, or Lady Health Visitor. Only three percent of women receive ANC from a traditional birth attendant (dai). In addition, one percent of mothers receive ANC from a lady health worker (LHW), a hakim, or a dispenser or compounder. Thirty-five percent of women receive no ANC at all. Almost three-quarters of the mothers did not consider having a checkup to be necessary (73 percent).

Figure 1.8: Percent Women Aged 15 to 49 Years Attended at least Once by Skilled Health Provider During Pregnancy



The next most commonly cited reasons were that prenatal care costs too much (30 percent) and that they were not allowed by their families to go for any checkup (nine percent). Eight percent of women who did not get prenatal care said that the health facility was too far, and far fewer cited reasons such as unavailability of transport, no time to go for pre-natal checkups, no one to go with her to the health facility, and lack of

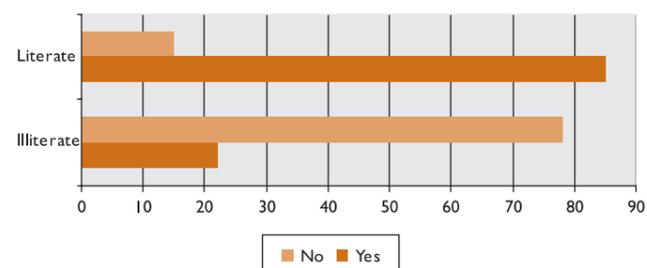
knowledge of where to go. Also common were reasons related to quality of service, such as service not good, long waiting times, and lack of female health staff.

Table 1.6: Percent of Women who Have Received any Pre-natal Care From Any Provider

Doctors	Nurse/ Midwife/ LHV	LHW	TBA/Dais	Hakim / Homeopathy	Other	No One
56	5	3	1	1	61	35

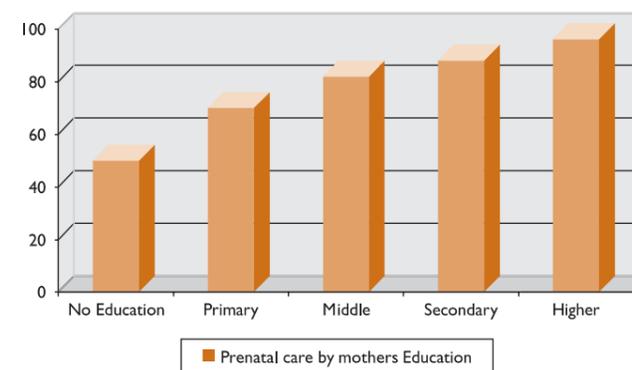
However in a study conducted in an urban settlement in Karachi showed that 33 percent of those who received ANC did so from untrained care providers specifically dais. Factors affecting utilization of ANC facilities is confounded by a number of factors including literacy levels, level of awareness regarding the importance of ANC, distance from the health care facility, socioeconomic conditions. In Pakistan, the adult literacy rate for males is 56.5 percent and for female is 32.6 percent. These rates are quite low when compared internationally [28, 29]. Only 16 percent of girls are enrolled for higher secondary school, with only seven percent enrolled in rural areas (compared with 33 percent of boys). Education is significantly associated with utilization of maternal health services: 22 percent of mothers with no education receive ANC while 85 percent of mothers with at least secondary education do so. In a study conducted in Rawalpindi in 2004 showed the comparison of utilization of ANC with literacy [28, 30]

Figure 1.9: Utilization of Ante-natal Care by Education of Wife [30]



The use of pre-natal care services from a skilled health provider is strongly related to the mother's level of education. The recent PDHS showed that 96 percent of women who have higher education utilize ANC facilities as compared to 50 percent of women with no education.

Figure 1.10: Percentage of Women who Received Ante-natal Care From a Skilled Professional by Education in Pakistan



Source: PDHS 2006-7

Statistically significant difference was found among women who received ANC as compared to those who did not in recognizing fever, persistent vomiting, dizziness and fainting as danger signs in pregnancy. Recognition of the danger signs in pregnancy and subsequently getting medical help can drastically affect maternal and newborn morbidity and mortality. In one of the studies carried out in rural Hyderabad, Pakistan, only 40 percent of the women could identify any of the danger signs of obstetric complications [31].

Ante-natal care utilization was significantly associated with the level of awareness regarding quantity of food utilization during pregnancy. Women who received ANC knew the importance of adequate intake of proteins, vegetables, fruits and milk during pregnancy. They also

knew that green leafy vegetables and organ meat were beneficial in preventing anemia. This is in accordance with another study in urban squatter settlement of Karachi [7]. Pregnant women receive 87 percent of the recommended calories and lactating women 74 percent (Pakistan, Federal Bureau of Statistics 1995). Protein intake for these women was around 85 percent of the recommended level. Malnourished mothers face potential complications in childbirth and a high likelihood of low-birth weight (LBW) babies [28].

Maternal Tetanus Immunization

Tetanus is a vaccine-preventable disease that causes an annual total of 309,000 deaths. Pakistan is one of the eight high burden countries which account for about 73 percent of neonatal tetanus deaths [18]. In most developing countries maternal TT vaccination is implemented as part of the routine vaccination program or implemented as a supplemental activity. However, large areas remain underserved due to logistic, cultural, economic or other reasons there are also variations in TT coverage even across the provinces of Pakistan. In a study conducted in Peshawar district of NWFP of Pakistan, 65 percent of women in urban areas were vaccinated, while in rural areas 60 percent were vaccinated [18].

Tetanus toxoid coverage among pregnant women in Pakistan is around 30 percent. The most recent PDHS indicates that 60 percent of births were protected against neonatal tetanus and of these 53 percent received two or more TT injections [4, 31]. Females in the urban area were older and had more knowledge

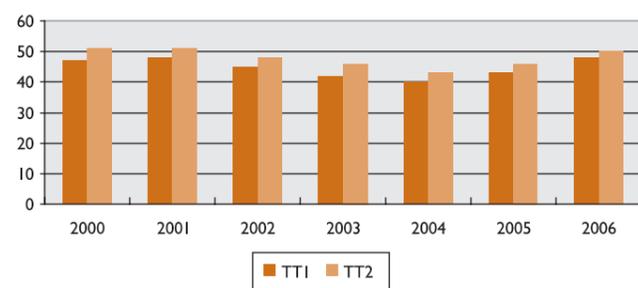
Table 1.7: Knowledge of Danger Signs During Pregnancy, Which Require Medical Attention

	Buner	Dadu	DG Khan	Jafferabad	Jehlum	Khanewal	Lasbela	Rawalpindi	Sukkur	Upper Dir	PDHS 2006-2007
Epigastric/Abdominal Pain	26.9	U 63.9 R 58.9	U 10.5 R 15.9	U 38.6 R 41.7	U 12.7 R 18.5	U 19.7 R 26.5	U 51.3 R 57.4	U 34.6 R 30.5	U 73.3 R 49.1	69.2	31
Blurred Vision	8.7	U 28.4 R 26.4	U 2.4 R 13.9	U 9.3 R 5.1	U 1.7 R 1.9	U 4.5	U 17.8 R 20.4	U 2.6 R 1.7	U 9.3 R 10.0	25.6	29
Swelling of Face	10.0	U 37.1 R 21.0	U 8.9 R 7.0	U 6.9 R 4.7	U 7.7 R 15.5	U 2.9 R 8.0	U 23.0 R 27.1	U 8.5 R 10.3	U 26.2 R 17.3	13.9	23
Vaginal Spotting	8.0	U 22.7 R 13.7	U 26.6 R 18.3	U 2.8 R 5.1	U 16.6 R 22.5	U 9.5 R 8.5	U 14.3 R 13.2	U 27.6 R 30.5	U 28.9 R 15.5	20.7	8
Fits	2.5	U 18.6 R 21.4	U 2.4 R 5.2	U 15.4 R 12.1	U 8.8 R 9.0	U 7.4 R 6.7	U 19.5 R 20.8	U 2.9 R 2.0	U 24.8 R 16.5	18.3	4

U= Urban R= Rural
Source: PAIMAN

regarding TT vaccination than females in the rural areas. More women in the urban areas had made ANC visits (79 percent) than those in rural area (50 percent)[18].

Figure 1.11: Percentage of Women Receiving Tetanus Toxoid Injection During Pregnancy (2000-2006)



Source: Sania Nishtar (Gateway Paper II, Heart file)

Table 1.8: Percentage of Women Taking Tetanus Toxoid in 10 Different Districts of Pakistan

District	No TT		One Shot		Two or More Shots	
	Rural	Urban	Rural	Urban	Rural	Urban
Burner		47.2		52.8		45.5
Dadu	65.5	35.2	34.8	64.8	29.7	57.1
Dg khan	43.6	14.3	56.5	85.7	48.9	65.3
Jafferabad	68.8	50.6	31.2	49.4	24.1	40.9
Jhelum	24.4	19.2	75.6	80.8	65	64.1
Khanewal	61.2	55.7	38.9	44.2	32.2	32.8
Lasbela	56.6	37.6	43.4	62.4	28	54.1
Rawalpindi	27.5	20.9	72.5	79.1	63.4	72.4
Upperdir		50		4		36
Sukkur	62.2	37.9	38.8	51.6	21.9	43.4

Source: PAIMAN

A cross-sectional survey at the Civil Hospital, Karachi showed that 81.3 percent females of reproductive age have inadequate knowledge, followed by incorrect knowledge 12.5 percent and no knowledge 26.3 percent [32]. The three key strategies for achieving maternal and neonatal tetanus (MNT) elimination recommended by WHO/UNICEF/UNFPA are: provision of at least two doses of tetanus toxoid (TT-2) to all pregnant women in high risk areas and three doses (TT-3) to all women of childbearing age; promotion of clean delivery services to all pregnant women; and ensuring effective surveillance for MNT [18].

ii) Attendance During Delivery

According to most recent PDHS less than two-fifths (39 percent) of births take place with the assistance of a skilled medical provider (doctor, nurse, midwife, or lady health visitor). Traditional birth attendants assist with more than half (52 percent) of deliveries, friends and relatives assist with seven percent of deliveries, and

Lady Health Workers assist with less than 1 percent of deliveries. Only a tiny fraction of births take place without any assistance at all. The percentage of births attended by SBAs has shown some progress – increasing from 18 percent in 1999-2000 to 31 percent in 2003 and to around 40 percent currently. While there has been an improvement in the number of women who give birth attended by a SBA, the figure falls dramatically short of the PRSP target for 2005-2006. Ensuring the attendance of a SBA, whether the delivery takes place at home or in a health facility, will greatly help to bring down the MMR, insofar as such health personnel are able to assist or refer when complications arise. Many families prefer the traditional practice of employing TBAs or dais to assist with deliveries. These TBAs/dais have vast experience but no formal training and therefore do not qualify as SBA. However, many families do not realize the impact a lack of training can have on childbirth, and chose to opt for TBAs over health professionals. One reason, which explains why some women still want to deliver at home, is that they are not able to make decisions independently. Often, women are dependant upon their husbands or in-laws when it comes to major decisions. Since women may not always be able to make their own decisions, they are often unable to seek medical care when they deem necessary, and usually do not make decisions such as those regarding the location of delivery. Therefore, while many women may like to get assistance from a SBA, most are unable to do so due to a lack of decision-making power.

Figure 1.12: Trend of Deliveries Assisted by Skilled and Trained Professionals in Pakistan



The recent PDHS showed that births in urban areas are twice as likely to be assisted by a skilled health provider (60 percent) than births in rural areas (30 percent). Births in the Sindh province are most likely to be attended by a skilled health provider (44 percent). There is a strong relationship between mother's education and delivery by a skilled health provider. Births to highly

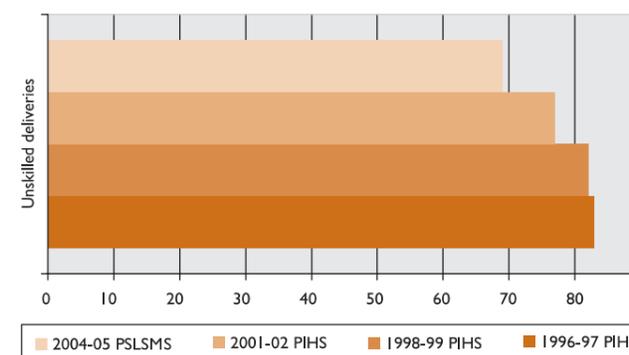
educated women are more than three times more likely (86 percent) as births to uneducated mothers (27 percent) to receive assistance from a skilled health provider. Similarly, assistance during delivery by a skilled health provider varies by women's economic status: births to women in the highest wealth quintile are much more likely to be assisted by a skilled health provider (77 percent) than births to women in the lowest wealth quintile (16 percent).

Table 1.9: Delivery Assisted by Skilled Professionals by Province of Pakistan

Punjab	Sindh	Baluchistan	NWFP
38	44	23	38

Maternal health services in Pakistan also depend primarily on TBAs and approximately 65 percent of all births occur at home [4]. By living and serving in a specific community throughout their entire lives, TBAs have gained the trust and faith of the locals. TBAs primarily provide services during delivery and during the first week of the child's life. Practices and beliefs surrounding maternal and newborn care are inadequate. Practices are often based on superstitious beliefs and do not conform with recognized medical practice [33].

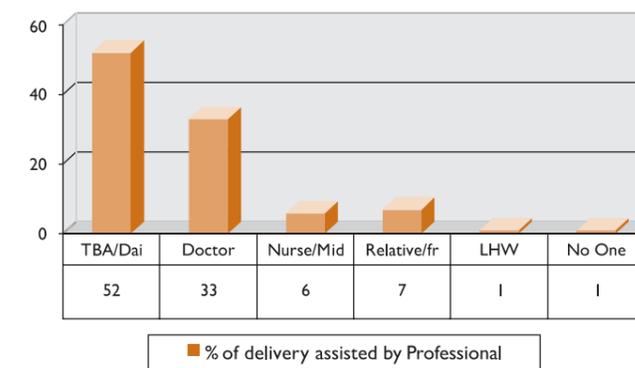
Figure 1.13: Percentage of Unskilled Deliveries in Pakistan



Study from Mardan showed that among hospital deliveries 80 percent were conducted by nurses, 20 percent by skilled dais and none by doctor. Among this cleanliness was kept in 33 percent, cord care 100 percent, thermal protection 83.3 percent, breast feeding initiation within an hour was noted in 66.6 percent, spontaneous breathing was 100 percent. All of the home based deliveries were conducted by unskilled birth attendants. Among these; cleanliness 16.6 percent, cord care 80 percent, thermal protection 100 percent, breast feeding within an hour 14 percent, spontaneous

breathing 100 percent. In both of these groups eye care was zero percent, and immunization was 100 percent. Both hospital practices and traditional ones neglected the basic principles of newborn cleanliness, early breast feeding, eye care and cord care [34]. More births still take place at home than in a hospital/medical facility in Pakistan. In terms of the rural-urban differential, 74 percent of all births in rural areas take place in the home, compared to 42.5 percent in urban areas. Childbirth at home is also linked with income levels. In urban areas, only 25.6 percent of births in the highest level of income take place at home, whereas 86.5 percent of births in the lowest income level take place at home. The proportion of births attended by skilled medical professionals in Pakistan is also alarmingly low.

Figure 1.14: Percent of Deliveries Assisted by Professionals



The reasons that women in rural areas most often cite for delivering at home included economic circumstances (70.2 percent), lack of a nearby facility (84.1 percent) and spousal or familial opposition to hospital delivery (64.8 percent). Amongst women living in urban areas, economic reasons were still widely prevalent (92.4 percent), as well as the occurrence of precipitous delivery (77.1 percent) and the rude or careless manner of hospital staff (90.5 percent).

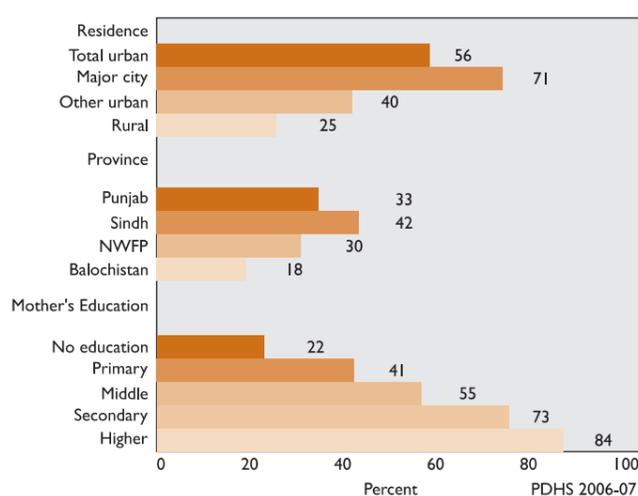
iii) Place of Delivery

Dearth of qualified female health providers has by and large curtailed women to seek appropriate and timely health care. In Pakistan, more than 80 percent of deliveries are performed by untrained or semi trained dais or traditional birth attendants (TBAs).

According to recent PDHS only 34 percent of births in Pakistan take place in a health facility: 11 percent are delivered in a public sector health facility and 23 percent in a private facility. Three out of five births (65

percent) take place at home. Delivery in a health facility is more common among mothers of first order births (48 percent) and mothers who have had at least four prenatal visits (70 percent). More than half (56 percent) of the children in urban areas are born in a health facility compared with 25 percent in rural areas. Delivery in a health facility also varies by provinces, being lowest in Balochistan (18 percent) and highest in Sindh (42 percent). There is a strong association between health facility delivery and mother's education and wealth quintile. The proportion of deliveries in a health facility is only 22 percent among births to uneducated mothers compared with 84 percent among births to mothers with higher education.

Figure 1.15: Percentage of Births Delivered at a Health Facility, by Residence, Province, and Mother's Education [4]

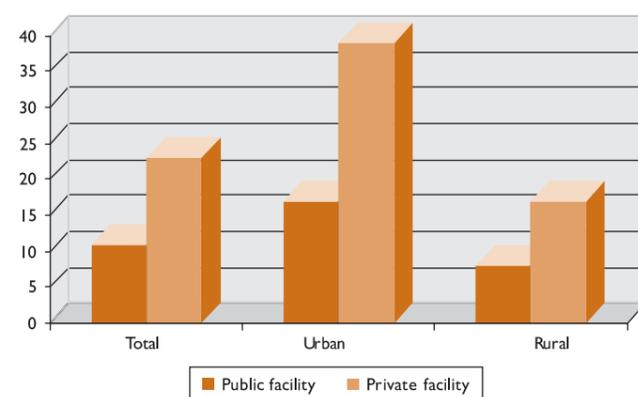


There are 9,846 primary health care facilities in Pakistan including 531 rural health centers, 5,171 basic health units, 856 maternal and child health centers and 4,635 dispensaries. Also there is active move towards increasing the role of private sector in providing health facilities. Current statistics indicate that there is one doctor per 1,529 persons (Economic study 2000-2001). However the distribution of these health care facilities is not uniform especially in rural areas and majority of them are concentrated in urban areas [13].

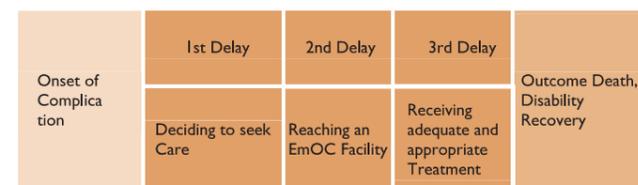
Recent PDHS data showed the main reasons for not delivering in a health facility, the majority of women (57 percent) believe it is not necessary to give birth in a health facility, while 38 percent say that it costs too much, seven percent mention that delivery in a facility is not customary, and 7 percent said that they did not deliver in a facility because it was too far away or that

there was no transportation. In addition, four percent of women mentioned that the facility was not open. Only six percent of women reported that their husbands or family did not allow them to deliver in a health facility. The remaining reasons—not enough time to get to the facility, lack of trust or poor quality of service, lack of a female provider available at the facility—are reported by a lower proportion of women. Belief that it is not necessary to deliver in a facility is the most common reason in both urban (58 percent) and rural areas (57 percent). The proportions of mothers who say they did not deliver in a health facility because their families did not allow them to go or because the facility was either not open or too far are highest in Balochistan and lowest in Punjab.

Figure 1.16: Comparison of Percent of Deliveries at Public and Private Facilities in Pakistan



iv) Deadly Delays



Delay in Deciding to Seek Care

Restrictions on women traveling to a facility do not disappear if a health facility is nearby, but they do become less stringent with proximity. A number of studies from Pakistan document similar patterns in women's health-seeking ability. Survey data from rural Pakistan depict the restrictions on travel to health facilities that women face. The majority of women report they are unable to go to a health facility unaccompanied. Indeed, for women and girls, having family members (especially male members) accompany

them to health facilities constitutes “social resources” that can greatly improve their utilization of health services. Access to doctors by unmarried girls tends to be even more circumscribed as they cannot go unaccompanied by their parents. Moreover, frequent visits to the doctor by girls has a negative effect on the family's reputation in the community. Another reason woman cannot quickly seek health care is that they are typically not empowered to make independent decisions: husbands and other male elders decide whether or not women may act on their perceived need for health care outside the home. An overwhelming majority of rural women reported the need for permission, typically from a male household member, to visit a health facility. Although women are typically the first to perceive their own and their children's health problems, they must first overcome successive hurdles of decision makers within the household, which can result in significant delays in seeking care and sometimes denial of permission altogether. Delays can be life-threatening for infants experiencing dehydration from diarrhea, and women experiencing complications while giving birth.

Table 1.10: Percentage of Rural Women Reporting Restricted Access to Health Facilities Delay in Reaching Emergency Obstetric Care (EmOC) Facility

Travel Time to the Facility	Cannot Go Alone		Need Permission	
	< 1 hour	≥ 1 hour	< 1 hour	≥ 1 hour
Hospital	65	78	81	91
Rural Health Center	49	74	66	89
Basic Health Unit	62	82	84	93
Dispensary	71	87	88	94
Private Hospital/Clinic	49	72	71	88
Private Doctor	61	87	85	94
Hakim	50	60	75	85
Homeopath	27	40	56	80
Pharmacy	61	67	78	86

Note: Cross-tabulations for women aged 15 to 29 from a question asking respondents if they could travel to the facility alone and whether they needed permission from someone in the household to go to the facility. Source: Pakistan Rural Household Survey (2001).

Delay in Reaching EMOC Facility

The death of the mother at the time of birth can usually be attributed to one or more of four main causes, namely hemorrhage, infection, eclampsia or obstructed labor. These are often compounded by what are commonly referred to as the ‘three delays’. The first delay is that many women do not seek professional care when they are pregnant, as is highlighted by the fact that only 50 percent of women who have given birth in the past three years have made at least one antenatal visit. Delay in recognizing a pregnancy complication is more

likely without counseling at such a visit. The second delay is often logistical in so far as transport is not always readily available to take women in labor to health centers and private clinics, which are more likely to be located in urban areas. And the third delay arises from the lack of adequately trained personnel, equipment and supplies, once these women have reached the health centre [27]. The first two delays relate directly to the issue of care encompassing factors in the family and community while third delay is connected with factors related to health facility and quality of care. Reducing the third delay, that is improving the quality and scope of care available at existing medical facilities, as well as accessibility of such facilities, will have the greatest impact in reducing needless maternal deaths [14]. Delays resulting from inappropriate maternal services (21 percent), access to health services (36 percent) and decision-making at the family level (34 percent) contributed largely to the deaths of 150 pregnant or recently delivered women who were brought dead to JPMC. Most of these women resided in communities within a distance of five to ten kilometers from this hospital [35].

In a study done by [13] the factors that cause delays including distance from hospital in relation to maternal mortality are discussed. Failure to take prompt action, delay in delivery, delay in transfer to intensive care unit (ICU), inadequate consultant (either anesthetic or obstetric or both) involvement and failure in fluid management leading to circulatory overload have also been reported.

Table 1.11: Causes of Delays in Relation to Maternal Mortality

Causes	Number of Respondents	Percent
Lack of Transport	8	37.7
Poverty and Inability to Afford Cost	7	26.9
Family Taboos	10	38.4
Ignorance About Health Care Facilities	1	3.8

Table 1.12: Distance from Hospital as a Cause for Delay

Kilometers	Number of Respondents	Percent
10 to 40	6	23.0
40 to 70	11	42.3
70 to 100	9	34.6

Most of the complications can be successfully treated if timely and quality emergency obstetric care (EmOC) is provided to them. Increasing the availability of EmOC has been recognized as a key intervention to reduce maternal mortality/morbidity. In addition to augmenting the role of SBAs and other targeted interventions aimed at bridging gaps at the level of 24 hours and seven days a week EmOC and referrals, it is also critical to address high fertility rates, malnutrition among women and children and the high incidence of communicable diseases such as acute respiratory infection (ARI), diarrhea and other communicable and vaccine-preventable diseases. The safe motherhood program has emphasized the importance of access to EmOC to manage the common causes of obstetric death: hemorrhage, obstructed labor, unsafe abortion, eclampsia and infection it is also understood that, with the exception of those related to unsafe induced abortion, few obstetric complications can be predicted or prevented. Furthermore, World Health Organization (WHO) estimates that for every 100 women who become pregnant, 15 will develop life-threatening complications, mostly around the time of birth. During the period 1990 to 2002, three national health policies (1990, 1997 and 2001) were announced in Pakistan. Though all policies and programs emphasized maternal health, safe motherhood, and availability of female staff, ensuring the provision of emergency obstetric care received inadequate emphasis.

Table I.13: Signal Functions of Essential Obstetrics Care at Facility Level

Basic EmOC	Comprehensive EmOC
Antibiotics (injectables) Oxytocics (injectables) Anticonvulsants (injectables) Manual Removal of Placenta Removal of Retained Products of Placenta Assisted Vaginal Delivery	All basic EmOC plus: Cesarean Section Blood Transfusion

Delay in Receiving Adequate and Appropriate Treatment
According to WHO recommendations, there should be at least one comprehensive and four basic EmOC facilities per 500,000 population. A situational analysis of 48 primary, secondary and tertiary referral facilities of Sindh showed severe deficiencies, primary referral facilities fail to meet comprehensive as well as basic EmOC services in the morning hours. In 24 hour, coverage for complicated deliveries was given by all tertiary and 89 percent in secondary facilities. To meet the WHO's minimum standards for the population of the selected districts in Punjab, at least 212 basic and 53 comprehensive facilities would be required. In the selected districts in NWFP, 64 basic and 16

comprehensive facilities providing EmOC would be required. In the study it was found that in Punjab only 16 (or 7.5 percent of the recommended number) and in NWFP only six (or 9.3 percent) health facilities provided the recommended basic EmOC services. No district had the recommended minimum basic EmOC facilities. Similarly, in Punjab only 31 (58.4 percent) and in NWFP only six (37.5 percent) health facilities provided comprehensive EmOC. Only two districts (Bahawalpur and Khanewal) met the recommended minimum comprehensive EmOC facilities. Combining data from both provinces shows that there were 0.33 basic EmOC and 0.56 comprehensive EmOC facilities for 500,000 population, far below the minimums (four and one, respectively) recommended by the WHO [36].

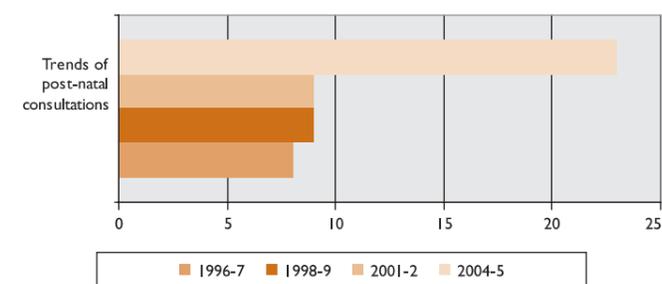
In Punjab, 83 percent of hospitals had the equipment needed to sterilize surgical instruments; in NWFP, only 50 percent of hospitals had such equipment. It is well known that improperly sterilized surgical instruments can cause infections (such as hepatitis, HIV, staphylococcus and streptococcus infections: mainly responsible for puerperal fever), further increasing the risk of morbidity and mortality in cases requiring surgical intervention. It is important for a resource-poor country such as Pakistan to direct efforts at increasing access to basic EmOC facilities and at upgrading existing basic EmOC facilities, because many obstetric complications can be resolved at the basic EmOC level. Transport is another key factor. We found that most hospitals in the study districts of Pakistan have no functional ambulances to transfer patients to a higher level of care. This further obstacle to timely care must also be addressed. Childbirth at home is common in Pakistan. Some women cannot or do not seek EmOC services or identify warning signs [36].

b) Post-natal Care

The post-partum period is the period immediately following delivery, and is a critical time for both the mother and the newborn. The importance of PNC especially beginning during the first 48 hours is often poorly recognized and undervalued. Post-natal care ensures that both mother and newborn are in good health, and monitors the recovery process of new mothers. To assess the extent of PNC utilization, mothers interviewed in the PDHS were asked whether they had received a health check after the delivery of their most recent birth in the five years preceding the survey, which showed that two-fifths (43 percent) of women received PNC for their last birth, making it far less common than prenatal care (65 percent). More

than one-fourth of women received PNC within four hours of delivery, six percent received care within the first 4 to 23 hours, seven percent of women received PNC two days after delivery, and three percent of women were seen three to 41 days after delivery. Almost three out of five women reported that they did not have any postnatal checkup. Differences by mother's age, birth order, place of residence, wealth quintile, and education are pronounced. Older mothers (age 35-49 years), mothers of children of higher birth order, rural women, women in the two lowest wealth quintiles, and mothers with no education are much less likely to have a postnatal checkup.

Figure I.17: Trends of Post-natal Consultations in Pakistan



Source: Heart file, Sania Nishtar (Gateway paper II)

The recent PDHS showed that in non-facility births 31 percent use safe delivery kits, 79 percent used an unboiled thread to tie the cord while 56 percent used a new razor blade to cut the cord. Survey conducted by PAIMAN compared the utilization of new blades in different districts of Pakistan.

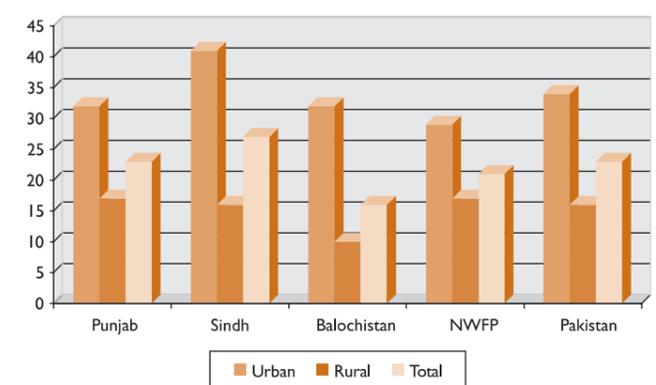
Table I.13: Percentage of Delivery Attendants who Reported Using new Blades for Cutting the Cord in 10 Districts of Pakistan

District	Rural	Urban
Burner		48.9
DG Khan	86.1	68.4
Jafferabad	90.3	95.4
Jehlum	68.2	41.7
Lasbela	84.8	91.2
Rawalpindi	47.2	28.6
Upper Dir		
Sukkar	95.2	89.1

It is estimated that 18,000 to 25,000 mothers die each year in Pakistan due to pregnancy related causes; of those nearly three-fourths of maternal deaths occurred during delivery and the postpartum period. These deaths are mostly preventable. The recent PDH survey shows that 43 percent of women receive PNC and

40 percent receive care within two days of delivery as recommended to prevent complications. A large number of maternal deaths occur during the 48 hours after birth (JHPIEGO, 2004). "In spite of the high risk associated with the postpartum period, women seem to know very little about health practices during this period" (JHPIEGO, 2004).

Figure I.18: Provincial Comparison of Percentage of Women Having Post-natal Consultations in year 2004-2005



The percentage of women receiving post-natal consultations has increased from 11 to 43 percent. The percentage of post-natal consultations from private sector healthcare facilities increased from 35 percent in 1998-1999 to 46 percent in 2004-2005. However, this can also be interpreted as a relative shift away from public sector service utilization [1].

c) Under Nutrition

Maternal under nutrition remain pervasive and damaging condition in low income countries like Pakistan. The nutritional status of a woman before and during and after pregnancy is important for a healthy pregnancy outcome for both mother and baby. The prevalence of malnutrition in Pakistan among lactating and pregnant mothers is no better than that in children. The National Nutrition Survey 1985-1987 reported that maternal malnutrition affected 34.2 percent of pregnant women who were severely underweight (BMI<19.0). As many as 48 percent of lactating women had a caloric intake of less than 70 percent of the recommended level. About 4.5 percent of pregnant and lactating women were anemic (Hb<11 gm/dl), while National Nutrition Survey 2001-2002 showed that 12.5 percent of non-pregnant and 16.1 percent of lactating mothers were malnourished (BMI<18.5).The clinical signs of vitamin A, zinc, and iron deficiency in mothers were 9.4 percent,41 percent and 48.7 percent respectively. The recent PDHS

showed that women in major urban areas are more likely (33 percent) to receive vitamin A supplements than those in rural areas (18 percent). At the provincial level, the percentage of women who reported receiving a postpartum vitamin A dose is highest in Sindh province (31 percent). With regard to educational level, women with no education (16 percent) are least likely to receive vitamin A doses during pregnancy. Overall, more than half of women (56 percent) do not take iron tablets or syrup during pregnancy. Sixty-two percent of women in rural areas, compared with 33 percent of women in major cities, do not take any iron supplements during pregnancy. Among provinces, 66 percent—the highest proportion—of women in Balochistan do not take any iron supplements during pregnancy. Mother's education and wealth index show a strong inverse relationship with the likelihood of not taking iron supplements during pregnancy. By education, 66 percent of uneducated women, compared with only 17 percent of those with higher than secondary education, reported that they did not take iron tablets or syrup during their last pregnancy. A similar pattern is seen for the proportion of women who take calcium tablets during pregnancy. Slightly over half (55 percent) of women said they had not taken any calcium supplements during the pregnancy leading to their most recent birth [4].

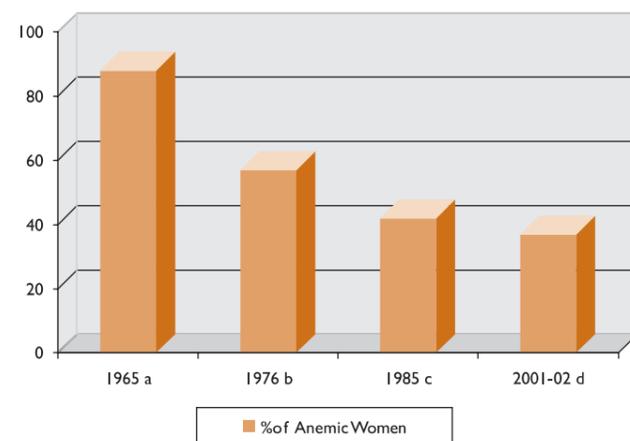
i) Anemia in Pregnancy

Anemia affects nearly half of all pregnant women in the world and is a risk factor for maternal morbidity and mortality. Anemia among pregnant women has reduced to half during the last four decades, from 88 percent in 1965 to 36 percent in 2001-2002 [1]. Prevalence of anemia (Hb<11gm/dl) in pregnant women in Pakistan was found to be 96 percent [37]. The same study found that 64 percent of the women had never used any haematinics. The prevalence of anemia was higher in rural areas than in urban areas, and more in women of child-bearing age than older women [31]. Pregnant women who are not anemic and relatively healthy have a better chance of survival in case of a problem during delivery. Iron deficiency anemia is thought to contribute directly or indirectly to nearly a quarter of the maternal deaths in the country. According to society of obstetrics and gynecology survey maternal deaths in thirty hospitals shows anemia per se to be responsible for three to four percent of cases.

Anemia was more common in women with lesser education, low socioeconomic group and increasing parity. Iron deficiency anemia was found in 72.7 percent of anemic women [38]. In a baseline survey (n=100) in all four provinces, few women (19 percent) increased

their intake of food during pregnancy.

Figure 1.19: Percentage of Women Having Anemia during Pregnancy from 1965-2002



a. Government of Pakistan. Nutritional Survey of West Pakistan, 1965-66, Islamabad, Pakistan: Planning Division; 1970.
 b. Government of Pakistan. Micro-Nutrient Survey, 1977. Islamabad, Pakistan: Planning Division; 1977.
 c. Government of Pakistan. National Nutrition Survey, 1985. Islamabad, Pakistan: Planning Commission and UNICEF; 1985.
 d. Government of Pakistan. National Nutrition Survey, 2001-02. Islamabad, Pakistan: Planning Commission and UNICEF; 2002.

Most either did not change their diet during pregnancy (41 percent) or ate less during pregnancy (37 percent) [39]. Fear of a difficult delivery or a large baby causes many women to limit their diets during pregnancy [40]. There is a perception among health care professionals in Pakistan that there is a phenomenon of “eating down” during pregnancy; however, this study was the only one we were able to find that supported this view. Many foods (eggs, meat, fish and some grains, fruits and vegetables) are restricted, as they are perceived to be “hot” and to cause vaginal bleeding. Iron supplements are also considered to be “hot”; hence compliance is likely to be sub-optimal. Both a qualitative study [41] (n=20) and a baseline survey (n=100) found that few women (25 percent) took iron supplements during their pregnancy and the majority of these started after the 6th month of pregnancy. Even worse, less than 10 percent of all lactating mothers took iron supplements. On the other hand, 30 percent of the women (n=100) stated that they would take iron supplements if so advised by a health care provider. Yet the barriers are many and include poverty, the belief that they did not need supplementation, inability to obtain the supplements due to lack of mobility outside the home, and the large number of doses required. Interestingly, less than five percent cited nausea or side effects as a reason for not

taking iron supplements in this study. According to the women, the health care providers from whom they obtained iron supplements rarely explained how or why to take them.

ii) Household Remedies

TBAs use medicines prepared and provided by the hakim. Butreeh, literally “32” in the Sindhi language, is a mixture of 32 herbal medicines used in raw resin or syrup forms; it is used for all kinds of illnesses during pregnancy, whether to induce contractions, to relieve false labor pain or to treat ante partum or postpartum hemorrhage. No specific postpartum care was provided to the women. However, rubri, a locally made concentrated milk product, was given for the first three days after delivery to the mothers because of its nutritional value [33].

Types of remedies used during pregnancy were desi ghee in milk (17 percent), lemon (17 percent), halwa with ginger (12 percent), pickle (12 percent), halwa with desi ghee, almonds, charo maghz (10 percent), halwa

with Bengal Kino (kamar kas) (10 percent), halwa with lotus seeds (seven percent), uncooked rice (six percent), clay (four percent), unripe mango (three percent) and tamarind (two percent). Most common reason for using the remedy was for better nourishment of mother (56 percent) where as in 34 percent it was used for relief of distaste, nausea and vomiting and in 17 percent it was used for nourishment of fetus as well as for mother. No side effects were reported. In 21 percent, dais or TBAs suggested remedies. In 18 percent it was advised by family members, in 13 percent it was self-prescribed, 6 percent friends advised it and in six percent it was advised by Hakims. Similarly the use of traditional remedy was higher in women living in rural areas as compared to women living in urban areas (25 percent versus 18 percent). The use of traditional dietary remedies was higher in uneducated women as compared to educated ones (43 percent versus 30 percent and the difference was highly significant ($p < 0.005$) [42].

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CHAPTER 2

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CHAPTER 2

NEWBORN HEALTH IN PAKISTAN

I. INTRODUCTION

The WHO estimates that over seven million infants annually die globally either before birth or in first few weeks of life, the vast majority in developing countries. Perinatal mortality is widely regarded as an extremely valuable tool to measure the quality of reproductive sources within and between countries. Every year, out

State of the World's Newborns 2001: Summary and Findings

- Neonatal mortality accounts for half (40 to 60 percent) of all infant mortality in Pakistan, 60 percent of neonatal deaths take place in the first week of life.
- Neonatal deaths account for almost two thirds of the infant mortality in Pakistan with the bulk of these deaths occurring in the first few days after birth.
- Stillbirths make up 25 to 50 percent of all perinatal deaths in Pakistan.
- The major causes of neonatal mortality in Pakistan include infections other than tetanus (21 to 43 percent), low-birth weight or prematurity (14 to 26 percent), tetanus (9 to 17 percent), birth asphyxia (8 to 28 percent) and congenital malformations (5 to 9 percent).
- NNT was responsible for almost 10 percent of all neonatal deaths.
- Some 25-30 percent of all births in Pakistan are LBW and account for a disproportionately high number of neonatal and infant deaths.
- In Pakistan, jaundice was responsible for 1.4 to 7.0 percent of all admissions, with a distressingly high rate (seven percent) of kernicterus noted at admission.
- The PDHS reported that almost 61 percent of all marriages are consanguineous.
- Rates of exclusive breastfeeding during the first month increased from less than 20 percent during the first month (1984-1987) to close to 90 percent (1995-1997).

of 5.3 million live births in Pakistan, 270,000 newborns die—a rate of neonatal mortality roughly ten times higher than in the United States. Sixty percent of these deaths occur during the first week of life. The perinatal mortality rate is five times higher in developing than in developed regions: 10 deaths per 1,000 total births in developed regions; 50 per 1,000 in developing regions and over 60 per 1,000 in least developed countries. In Pakistan under-5 mortality rate of 107, infant mortality rate (IMR) of 74.6, and neonatal mortality rate (NMR) of 43.1 are unacceptably high. Major underlying reason for these high rates includes high fertility rate, poor population control and poor health facilities especially pertinent to high risk pregnancies [1].

In 2001, Save the Children's Saving Newborn Lives Initiative commissioned a series called State of the World's Newborns. The State of World's Newborn: Pakistan was published in October 2001.

In this chapter, the focus is on neonatal mortality, i.e. deaths occurring during the first four weeks after birth. This chapter also addresses perinatal mortality, which includes both deaths in the first week of life and fetal deaths (stillbirths). As in the previous report (2001 Saving Newborn Lives (SNL) report) the main sources of data used are demographic and health surveys and vital registration data. A recent review of this data was undertaken to:

- Determine the burden of perinatal and neonatal morbidity and mortality in Pakistan.
- Assess the etiology and risk factors for perinatal morbidity and mortality in Pakistan from both community settings and hospital catchments populations.
- Assess the existing primary healthcare programs and policies addressing perinatal and early newborn care in Pakistan.
- Critical review and practical recommendations.

Given the major focus in Pakistan on achieving the MDG-4 on child mortality which is 40 per 100 live births, these data are critical in assessing the mid-term status of progress or lack thereof. While the focus is on the magnitude of neonatal and perinatal mortality, the accuracy and completeness of the data sources are discussed, and strengths and weaknesses of Pakistan are emphasized. For this chapter we reviewed all available reports and published and unpublished materials relating to the health status of Pakistan's newborns. We also included relevant community and facility based studies, as well as relevant routine health information and

special surveys. This chapter reports information on levels, trends, differentials, and causes of neonatal, post neonatal, infant, child, and under-five mortality.

2. CONCEPTS AND DEFINITIONS

In this chapter, age-specific mortality rates are defined as follows:

Child mortality: the probability of dying between the first and fifth birthday.

Under-5 Mortality: the probability of dying before the fifth birthday.

Infant Mortality Rate: number of infant deaths within the first year of life per 1,000 live births per year.

Perinatal Mortality Rate: number of fetal deaths of 20 weeks of gestation or more plus infant deaths within seven days of birth per 1,000 live births per year.

Neonatal Mortality Rate: number of deaths of infants within the first 28 days of life per 1,000 live births per year.

Early Neonatal Mortality Rate: number of deaths of infants within the first seven days of life per 1,000 live births per year.

Late Neonatal Mortality Rate: number of deaths of infants from eight days to 28 days of age per 1,000 live births per year.

Post Neonatal Mortality Rate: number of deaths of infants from 29 to 364 days of age per 1,000 live births per year.

Stillbirth or Fetal Death: is death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles.

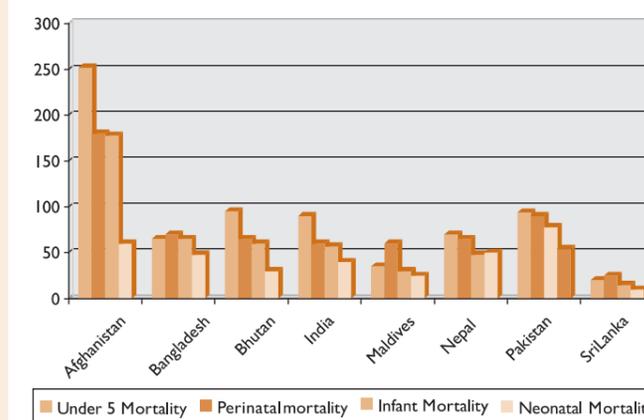
*All rates are expressed per 1,000 live births, except for child mortality, which is expressed per 1,000 children surviving to 12 months of age.

3. LEVELS AND TRENDS OF PAKISTANI NEWBORNS DEATH

The majority of neonatal deaths occur in Asia, which is where most children are born. The South-central Asia sub region alone contributes over 40 percent of global neonatal deaths. Pakistan has the second highest number of newborn deaths (270,000) and the fourth highest rate of neonatal mortality of all countries. Pakistan ranks high in terms of child mortality with respect to regional

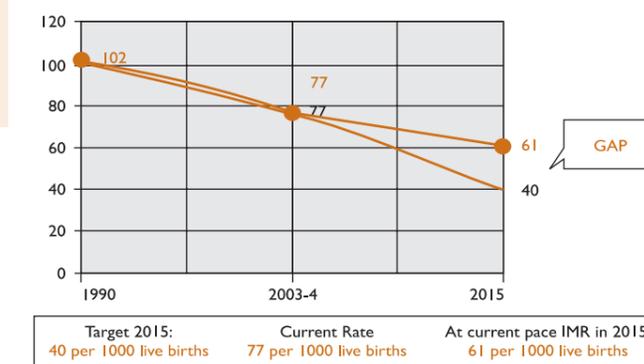
comparisons. One in every eleven children in Pakistan dies before reaching age five. Over half of these deaths occur during the first month of life. Perinatal mortality in Pakistan (96/1,000 live births) is high when compared to developed countries (UK 8, Japan 7), but comparable to developing countries in the region (India 70, Burma 57.2, Indonesia 30).

Figure 2.1: Regional Comparisons



Neonatal deaths represent an increasing proportion of infant deaths. As overall infant mortality has continued to decline since 1950, neonatal deaths have remained steady for the last 20 years—and now account for more than half of all infant mortality in the country. It would appear that any further success in reducing infant mortality in Pakistan would require better ways to safeguard the health and survival of newborns. The Government of Pakistan remains committed to achieving these targets, but significant additional resources and effort will be needed to deliver the substantial improvements in progress required.

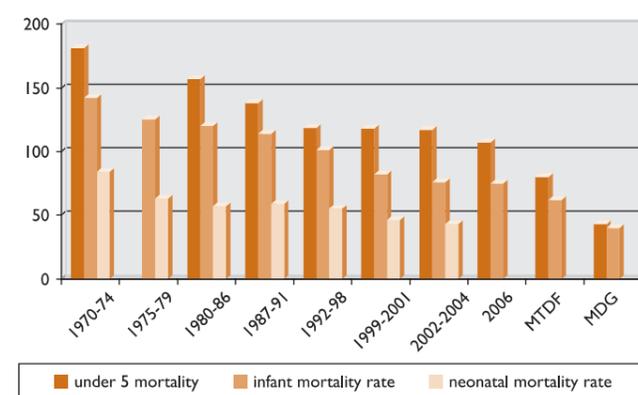
Figure 2.2: Progress Towards MDG-4 in Pakistan



The MDGs are the most widely ratified health and development targets in history. Nearly every nation has agreed to reach these eight interlinking goals addressing

poverty, hunger, education, and health by 2015. Multiple reports have been published, many commitments have been made – but are we making progress? Are fewer mothers and children dying? Is access to essential health care improving for the poor? The target of the fourth MDG is a two-thirds reduction in under-five mortality between 1990 and 2015. With a low starting point and slow progress during the 1990s in Pakistan it seemed difficult that many of the MDG targets will be reached. Steady progress has been made towards most of the MDGs in Pakistan since 2000 and over the years, Pakistan has made considerable progress in reducing its under-5 mortality and maternal mortality rates. IMR constitutes a large proportion of the under-5 mortality rate in Pakistan and it can be suggested that without seriously addressing factors affecting the infant mortality rate, it would be impossible to achieve the required target in reducing the under-5 mortality rate in Pakistan [2].

Figure 2.3: Trends in Pakistan 1970-2006



According to recent PDHS there is a decline in infant mortality in the late 1990s, but no appreciable change since 2003. Under-five mortality has declined from 117 in 1986-1990 to 94 in 2002-2006, a 20 percent decline in 16 years

Table 2.1: Infant and Under-5 Mortality Rates from Various Sources, Pakistan, 1990-1991 to 2006-2007

Survey and Approximate Calendar Period of Mortality Rate					
Rate	1990-1991 PDHS	1996-1997 PFFPS	2003 PDS	2005 PDS	2006-2007 PDHS
	1986-1990	1992-1996	2003	2005	2002-2006
Infant Mortality Rate	91	92	76	77	78
Under-5 Mortality Rate	117	111	n/a	n/a	94

n/a = Not applicable
 PFFPS = Pakistan Fertility and Family Planning Survey
 PDS = Pakistan Demographic Survey
 Sources: PDHS 1990-91: NIPS and Macro 1992; PFFPS 1996-97: Hakim et al., 1998; PDS 2005: FBS, 2007b

Progress has been made towards the target of reducing under-5 mortality rates by two thirds. The rate of change will need to be accelerated to meet the target, and the rates are still high compared to the rest of South Asia. Under-5 mortality in 2005 was 99 per 1,000 live births compared to 130 in 1990. The majority (80 percent) of deaths occur in the first year.

4. WHEN DO PAKISTANI NEWBORN'S DIE?

The birth of a baby should be a time of celebration. Yet during the entire human life span, the day of birth is the day of greatest risk of death. In Pakistan, according to 2006-2007 PDHS the proportion of neonatal deaths occurring in the first week of life is high (74 percent) and is higher than the proportion recorded in the 1990-1991 PDHS (62 percent). Although being newborn is not a disease, large numbers of children die soon after birth: many of them in the first four weeks of life (neonatal deaths), and most of those during the first week (early neonatal deaths). For every baby who dies in the first week after birth, another is born dead (fetal deaths or stillbirths). Causes and determinants of neonatal deaths and stillbirths differ from those causing and contributing to post neonatal and child deaths [3].

Table 2.2: Mortality According to the Age Group and Gender in all Age Groups who Died at Paediatrics Department PMCH Nawabshah in Year 2001

Age	Deaths	Percent of Admission in Age Group	Male	Female
Day 1	133	25.3	90	43
First Week	237	23.8	161	76
Neonates	309	21.1	207 (67%)	102 (33%)
Young Infants	325	20.6	219 (67.4%)	106 (32.6%)
Infants	435	18.1	285	150
1-5 Years	152	11.6	87	65
> 5 Years	62	11	34	28
All Age Groups	649	15.2	406 (62.5%)	243 (37.5%)

a) Perinatal and Neonatal Mortality

Perinatal Mortality Rate (PMR) 50-60/1,000 and Neonatal Mortality Rate (NMR) 50/1,000 of our country is one of the highest in the world [4]. There is a remarkable paucity of information related to perinatal mortality and morbidity in Pakistan and the information is neither collected nor recorded in the national database of indicators. Available information on the patterns of neonatal deaths and IMR in Pakistan indicate that while there has been steady decline in IMR, little has changed with regards to neonatal mortality.

During the PDHS, mothers were asked the age and the

cause of death of the babies born during the previous year. The analysis of their responses gave an estimated perinatal mortality rate of 92/1,000 births. The perinatal mortality rates reported from the recent cohort studies from Lahore and Sindh are 63/1,000 and 92/1,000 births, respectively [3]. Data from the Lahore study indicate that perinatal mortality is higher in socially deprived, poor populations living in rural areas or peri-urban slums than in the upper-middle class [3]. There has been gradual decline in the infant mortality during the last few decades with a very little impact on neonatal mortality. Fikree et al reported from community based study that the proportion of neonatal deaths rises as the infant mortality decreases [5].

Following table by PDHS 2006-2007 presents the number of stillbirths and early neonatal deaths and the perinatal mortality rate for the five-year period preceding the survey, by mother's age at birth, place of residence, mother's education, and wealth quintile in which results indicate that the perinatal mortality rate is 159 deaths per 1,000 pregnancies. Pregnancies of the youngest and oldest women are more likely to end in a perinatal death than are pregnancies of women age 20 to 39. Perinatal mortality rates are higher in urban than rural areas and they tend to increase with mother's education except among women with higher education. Rates also show an erratic pattern by wealth quintile.

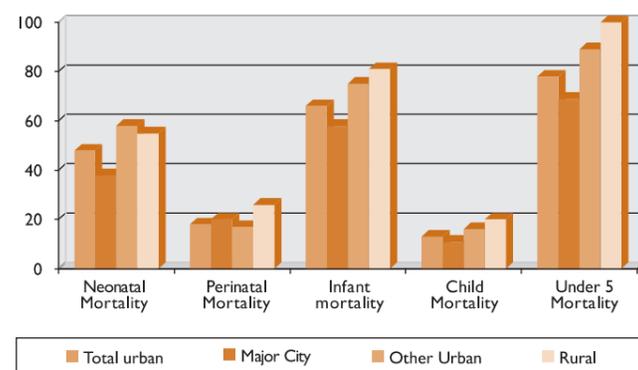
Table 2.3: Perinatal Mortality (PDHS)

Background Characteristics	Number of Stillbirths	Number of Early Neonatal Deaths	Perinatal Mortality Rate	Number of Pregnancies of 7+ Months Duration
Mother's Age at Birth (or current age for miscarriages)				
<20	170	56	197	1,145
20-29	648	216	145	5,947
30-39	393	80	161	2,935
40-49	85	10	228	418
Residence				
Total Urban	438	106	173	3,149
Major City	247	45	178	1,640
Other Urban	191	61	167	1,509
Rural	857	256	153	7,296
Mother Education				
No Education	829	254	158	6,838
Primary	188	49	154	1,542
Middle	88	18	169	624
Secondary	114	31	173	839
Higher	78	10	145	602
Wealth Quintile				
Lowest	245	89	138	2,412
Second	316	86	178	2,253
Middle	229	82	151	2,060
Fourth	246	53	158	1,897
Highest	260	52	171	1,822
Total	1,296	362	159	10,444

5. WHERE IN PAKISTAN DO NEWBORNS DIE?

Nearly 77 percent of the urban and 94 percent of the rural births in Pakistan occur at home. Perinatal and neonatal health is influenced by care practices in the communities, at the home level. A vast majority of neonatal deaths also occur at home, and very often the families do not seek medical help for the mother and the newborn during illness in the traditional 40 days of confinement [3]. Differentials by place of residence show that the under-5 mortality rate is 28 percent higher in rural areas than in urban areas (100 and 78 deaths per 1,000 live births, respectively). As might be expected, rates are lower in major cities than in other urban areas.

Figure 2.4: Neonatal, Post neonatal, Infant, Child, and Under-5 Mortality Rates 1996-2006 by Area of Residence



Extensive work done by Jalil et al from Lahore showed an overall perinatal mortality rate of 56/1,000 births with rates of 60, 75, 36 and 33 per 1,000 birth for the village, periurban, slum and upper middle class, which this and other studies have concentrated on determining the cause of high infant and perinatal mortality in Pakistan [6]. A wide provincial variation is seen in IMRs, with IMRs of 71, 104, 77 and 79 per 1,000 live births reported for Sindh, Balochistan, Punjab and NWFP, respectively [7], in comparison with recent PDHS data. The rates by province display considerable differentials. Surprisingly, all rates are lowest in Balochistan, followed by NWFP. This pattern is implausible, given that Balochistan is the least developed of the four provinces.

a) Perinatal Mortality at Hospital Level

Perinatal mortality is a sensitive indicator of quality of service provided to pregnant women and their newborns. According to WHO the number of perinatal deaths worldwide is greater than 7.6 million with 98 percent of these occurring in developing countries

[8]. While some estimates of perinatal mortality from community settings are available, there are no counting specific estimates of perinatal mortality for Pakistan. The best nationally representative information on NMRs can be derived from the PDHS which had a large nationally representative sampling frame.

An increased perinatal mortality was found in unbooked cases; these mothers did not receive regular ANC and were from low socioeconomic areas. A statistical significance was seen when the three different socioeconomic areas were compared regarding ANC and the outcome in terms of prenatal mortality. The perinatal mortality/1,000 total birth in the high, middle and low socioeconomic hospital was 16.6±23.62, 24.96±51.20, 80.42±177.78 respectively. Overall there were 224 perinatal deaths out of 4,957 birth in all three socioeconomic group in the area giving PNM of 45.18/1,000 total birth [6]. Data from Mayo Hospital, Lahore, Pakistan [9], also stress importance of intervention to reduce the neonatal mortality. In that study, mortality was 27 percent and again 45 percent were home-born by untrained persons. The trend in perinatal mortality rate has been static over the last 40 years at JPMC, Karachi due to low socio-economic status, poverty, malnutrition and lack of ANC and a large burden of referred cases [8]. The high perinatal mortality rate shown here is a reflection of inadequacy and inaccessibility of maternity services of our country and the poor socio-economic status and cultural pattern of the population. The overall perinatal mortality rate was 97.2/1,000 total births and still birth rate 73.4/1,000 total birth.

6. WHY DO PAKISTANI NEWBORNS DIE?

It is difficult to be precise about the causes of neonatal death in Pakistan since nearly 80 percent of births take place at home, while most of the available data comes from hospital statistics. Causes of death are highly correlated with age at death. Deaths during the neonatal period (first month of life) are almost entirely due to birth asphyxia, sepsis, or prematurity. Deaths in the post neonatal period are mostly due to diarrhoea or pneumonia, with sepsis being a far less common cause of death. The identified risk factors for fetal deaths were ante partum hemorrhage (30 percent), mismanaged labor (26 percent), prolonged rupture of membranes (26 percent) and gross congenital anomalies (16 percent) [10].

Table 2.4: Percent Distribution of Under-5 Deaths by Cause (weighted), According to Sex and Residence, Pakistan 2006-2007

Cause of Death	Sex		Residence		
	Male	Female	Urban	Rural	Total
Congenital Abnormalities	4.1	3.7	5.7	3.5	4.0
Tetanus	0.8	0.4	0.0	0.7	0.6
Prematurity	9.7	8.8	12.0	8.6	9.2
Birth Asphyxia	27.0	16.6	29.0	20.5	22.1
Sepsis	14.6	13.7	11.5	14.8	14.2
Pneumonia	11.8	15.1	10.0	14.1	13.3
Meningitis	3.5	4.5	2.3	4.4	4.0
Diarrhea	9.4	12.4	9.9	11.0	10.8
Accidents/Injuries	2.2	2.7	3.0	2.3	2.4
Measles	0.9	2.6	1.4	1.7	1.7
Malnutrition	0.8	0.9	0.2	1.0	0.8
Malignancies	0.2	0.0	0.0	0.1	0.1
Other causes	5.3	6.9	5.5	6.2	6.1
Unexplained Neonatal Deaths	5.3	5.5	3.9	5.7	5.4
Unexplained Post Neonatal Deaths	4.0	6.0	5.1	4.9	4.9
Causes not Classified	0.5	0.3	0.3	0.4	0.4
Total	100.0	100.0	100.0	100.0	100.0
Number of Deaths	1,561	1,380	571	2,372	2,943

During 2001 total of 4,255 children were admitted at PMCH Nawabshah, of these 2,359 (56.2 percent) were infants below one year, 1,458(34.2 percent) were neonates and further 118 were admitted in second month of life. Mortality rate was 20.6 percent in young infants. Neonatal deaths were 309 (21 percent of neonatal admissions), 67 percent males and 33 percent females. In infancy 30.5 percent deaths occurred on first day of life, 54.4 percent deaths in first week and 71 percent in four weeks (Neonates) of life. Only 5.8 percent deaths occurred in whole second month. 63.5 percent deaths occurred in young infants whose weight was less than 2.5 kilograms at admission. Two hundred and one (62 percent) deaths occurred within 24 hours of hospitalization (23 percent in first two hours of hospitalization) indicating critical condition at the time of admission and requiring advance neonatal intensive care. 59.2 percent were home deliveries. 22.5 percent birth asphyxia, 21.8 percent sepsis and disseminated intravascular clotting (DIC), 20.6 percent very LBW (IUGR and prematurity), 19.4 percent neonatal tetanus, 11.7 percent specific infections (septic meningitis,

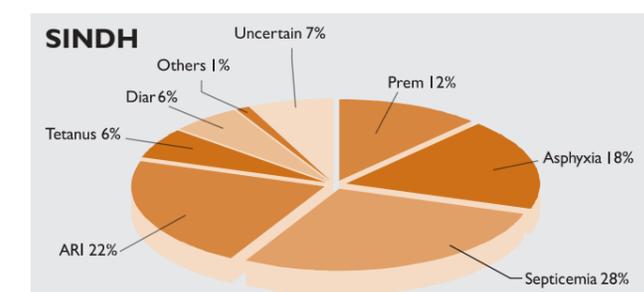
severe pneumonia and diarrhea) were main causes of death [11].

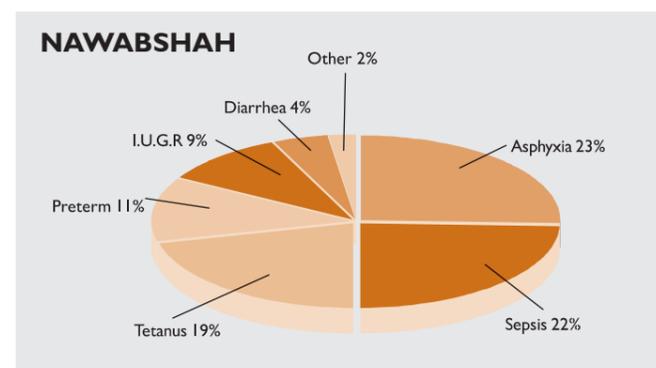
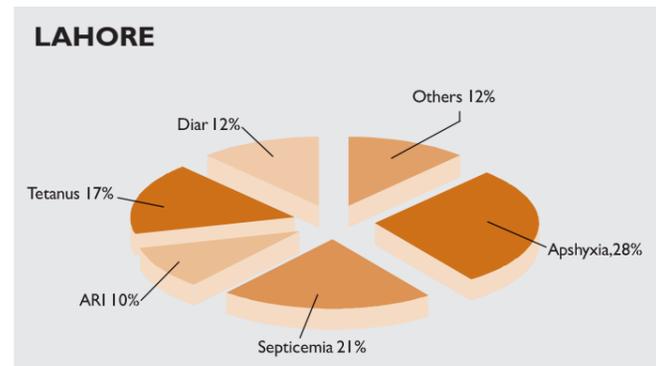
Study conducted at neonatal unit Rawalpindi General Hospital shows neonatal infection and birth asphyxia are the major causes of neonatal mortality 37 percent and 31 percent respectively, followed by idiopathic respiratory infections, meconium aspiration syndrome and congenital malformations. Perinatal deaths are largely the result of poor maternal health, low socio-economic status, lack of health awareness and inadequate care during ante partum, intrapartum and postpartum period.

Perinatal mortality rate has largely remained unchanged over the last 40 years at the premier referral and teaching institution of Karachi, due to higher patient influx and referral rate [8]. In a study conducted by Tariq et al showed that neonatal infections and birth asphyxia were two major causes of neonatal mortality (37 percent and 31 percent respectively), followed by idiopathic respiratory distress syndromes (IRDS), meconium aspiration syndrome (MAS) and congenital malformations. Sixty-eight percent of mortality was contributed by LBW, 74 percent of them being preterm suggesting high mortality among LBW-preterm infants.

Other less common contributory factors were maternal medical disease, complicated deliveries and multiple gestations. In another study conducted in Karachi a total of 1,984 neonates were admitted. Among them 62.1 percent were males, 17.54 percent were admitted within six hours of their life, and 51.36 percent within 72 hours of birth. The LBW accounted for 55.4 percent admissions. Neonatal infection was the major cause of admission (45.21 percent) comprising 30.64 percent cases of septicemia, 9.82 percent of pneumonia and 4.73 percent of meningitis. Other causes of admission were 18.85 percent birth asphyxia, 13.15 percent neonatal jaundice, 6.87 percent pre-term, 3.67 percent MAS, 2.21 percent hemorrhagic disease of newborn, 2.11 percent diarrhea and 1.05 percent hyaline membrane disease [12].

Figure 2.5: Cause-specific Neonatal Mortality in Urban and Rural Area of Pakistan





a) Still Births

Intrauterine death occurs either before onset of labor (ante-partum death) or during labor (intrapartum death). Fetuses may die intra utero, before onset of labor, because of pregnancy complications or maternal diseases; however, no special reason can be found for many ante-partum intrauterine deaths. Over half of all stillbirths occur in the ante partum period and 42 percent occur in the intrapartum period, most of which represent intrapartum asphyxia. Each year, 3.3 million stillbirths are reported, with 97 percent occurring in developing countries [13]. No good historical data on neonatal mortality and stillbirth rates are available for Pakistan. Pakistan, reported stillbirth rates vary from 36 per 1,000 to 70 or more per 1000 in some rural areas. In contrast, the WHO reports a Pakistani stillbirth rate of 22 per 1,000 birth [14]. One reason for the discrepancy among reports is that the lower limit of the gestational age or birth weight varies widely. Most of the methodologically sound available information on perinatal mortality in Pakistan is generated from hospital based studies. A multicentre survey of hospital based studies by the Society of Obstetricians and Gynecologists of Pakistan (SOGP) showed that overall perinatal mortality rate (PNMR) was 92/1,000 total births with the majority of deaths (72 percent) counted as stillbirths. Since many of the ante-partum stillbirths

are associated with ante partum hemorrhage and pre-eclampsia/eclampsia, they are potentially related to preventable disorders. No cause could be identified for 34 percent of stillbirths occurring in the ante-partum period indicating that a number of maternal health issues could contribute to the burden of stillbirths in Pakistan.

Table 2.5: Causes of Stillbirths According to PDHS 2006-2007

Percent Distribution of Stillbirths Identified in Households Since 2005, by Cause of Death, Pakistan 2006-2007	
Causes	Percentage
Congenital Abnormality	4.0
Ante-Partum Maternal Disorders	18.7
Ante-Partum Probable Fetal Problems	0.8
Intrapartum Asphyxia Related	21.1
Unexplained Ante Partum	33.5
Unexplained Intrapartum	20.9
Cause Could not be Classified	1.0
Total	100.0
Number of Stillbirths	1,285

Vital registration systems usually do not record and report stillbirths. Underreporting remains a problem, especially with regard to early deaths and stillbirths in particular. Data on stillbirths are less frequently available than data on deaths after birth, and are most prone to underreporting. The stillbirths in study by Jehan et al were commonly associated with ante partum hemorrhage (23 percent), intrapartum asphyxia (23 percent) and spontaneous preterm labor (18 percent), followed by maternal disease (eight percent). In Hyderabad, Pakistan stillbirths are a common adverse pregnancy outcome occurring in more than 3 percent of births. The risk factors appear similar to those seen in other geographic areas [15]. A cluster randomized trial in Pakistan found that training traditional birth attendants in basic delivery skills significantly reduced the stillbirth rates (50 per 1,000 in the intervention clusters vs. 71 per 1,000 in the control clusters) [16] Large prospective study of village and periurban slum based population around Lahore revealed a perinatal mortality rate of 67/1,000 total birth with still birth rate of 44 percent [8]. Based on these and other data [17], it appears that there are major differences in the timing of stillbirths between developed and developing countries, with a far greater percentage of stillbirths in developing countries occurring in the peripartum period.

b) Birth Asphyxia

Asphyxia is an insult to the fetus or newborn due to lack of oxygen or lack of perfusion to various organs. There are many reasons a baby may not be able to take in enough oxygen before, during, or just after birth. A

mother may have medical conditions that can lower her oxygen levels; there may be a problem with the placenta that prevents enough oxygen from circulating to the fetus; or the baby may be unable to breathe after delivery. Birth asphyxia is a serious clinical problem worldwide. Each year approximately four million babies are born asphyxiated, which results in one million deaths and an equal number of serious neurological sequelae, such as cerebral palsy, mental retardation, and epilepsy. Perinatal asphyxia is a global problem causing serious sequelae regarding morbidity and mortality. It is a leading factor contributing in perinatal and neonatal mortality which reflects social, educational and economical standards of a community. Evidence exists regarding the effectiveness of interventions to reduce deaths due to neonatal infections and improve survival of small babies in the community [18, 19]. Its incidence is very high in developing countries like Pakistan where health facilities are restricted to urban areas and only small population (21 percent) is getting benefits [20]. Jalil from Lahore community also cites birth asphyxia as the commonest cause of neonatal death, affecting 21.6 percent newborns with a case fatality rate of 65 percent. Chisty et al in a study of 295 babies with birth asphyxia at Lahore hospital found that CNS was involved in 100 percent cases, mean admission weight of 2.8 kilograms, mean gestational age of 39 weeks, 44 percent were born at home and 84 percent vaginally delivered [21].

In Pakistan the magnitude of the problem is reflected by the fact that mortality data from a large country based prospective study in Lahore showed that nearly 50 percent of all neonatal deaths in the first week were due to birth asphyxia [22]. Bhutta has reported that delivery conducted by TBA lead to increased mortality and morbidity due to birth asphyxia. In the recent Hala/ Matiari study in rural sindh province of Pakistan, perinatal mortality rate is reported to be 73. One thousand births with 65 percent still births. Majority (75 percent) were fresh stillbirths indicating birth asphyxia to be the cause of death [23]. The high rates of birth asphyxia are compounded by the fact that babies are generally born at home. Even if parents take their newborns to health facilities, most are not equipped to treat birth asphyxia due to lack of equipment and medication. Poor infrastructure, non availability of essential drugs and equipment, lack of proper referral facilities etc are major problem for effective neonatal care. The importance of trained available staff with adequate supervision for proper management and resuscitation can not be denied. So it is important to train people and paramedics about the early recognition and referral of asphyxiated

newborns with outcome which depends upon level and duration of neuronal insult at the time of birth, clinical presentations of HIE, involvement of other organs, stage of HIE and treatment modalities [24]. Bhutta concluded that of 4.5 million annual births in Pakistan 100,000 die as fresh stillbirths (mainly birth asphyxia) about 0.5 million suffer birth asphyxia of which 80,000 die and another 200,000 suffer post asphyxial neurological sequelae [25].

c) Infections

Infection is one of the major cause of neonatal mortality and morbidity. After the first week of life, infections are the main cause of neonatal death in many countries. These are mostly acquired either in hospital (nosocomial), or at home. Preterm infants are at greatest risk of becoming ill and dying. Harmful cord care practices cause neonatal tetanus if the mother is not protected by immunization; poor feeding practices cause diarrhea and poor growth; an unhygienic environment causes sepsis. Pneumonia is a common cause of morbidity and mortality in neonates. It is estimated that 1.9 million children die each year due to ARIs, and among those, neonatal pneumonia (counted among ARI cases and deaths) is a common cause of life threatening newborn infections. Annual numbers of pneumonia cases in developing countries were estimated as 174 million, with a global standardized pneumonia incidence as 0.3 episodes per child per year. Data about ARI in Pakistan is limited. it has been reported that about one third of the hospital beds in Pakistan are occupied by children with pneumonia and acute respiratory infections Study from Aga Khan university showed population based ARI proportionate mortality of 9 to 11 percent[26].

Infections and pre-maturity are the main causes of admission to neonatal unit, 28.92 percent and 26.50 percent respectively. Among the infections, sepsis was 26.03 percent pneumonia 1.71 percent and meningitis (1.18 percent). Neonatal Jaundice (NNJ) was the third commonest cause of admission (19.95 percent) followed by birth asphyxia (16.52 percent). Occurrence of serious neonatal infections can be reduced by conducting sterile and safe deliveries at homes [28]. Procedures performed in the neonatal unit which may have contributed to the nosocomial infections [29]:

1. Intravenous Cannulation n=100 (100 percent),
2. Umbilical Catheterization n=24 (24 percent),
3. Endotracheal Intubation n=15 (15 percent),
4. Nasogastric tube n=85 (85 percent).

Majority of these neonatal infections are due to home delivered babies conducted by TBAs under un-hygienic

conditions. As neonates are generally prone to infection and can quickly become septicaemic it is therefore very important to recognize subtle signs and symptoms of infection and resort to early neonatal septic screening.

d) Sepsis and Antimicrobial Resistance

In developing country like Pakistan the higher incidence leads to increased mortality and morbidity due to neonatal sepsis. This high incidence is mainly due to poor ante natal care and lack of trained staff to conduct deliveries. There is a strong association between maternal urinary tract infection, pyrexia, vaginal discharge and unclean vaginal examination during labor and early onset neonatal sepsis. In a recent study from Pakistan Institute of Medical Sciences [30], inadequate antenatal visits in even the low risk mothers have been found to be significantly associated with high chances of neonatal morbidity and mortality. Furthermore, the high percentage (up to 25 percent) of LBW deliveries in our country increases the risk of development of sepsis in these neonates. According to a community and facility based data, neonatal sepsis has significant contribution to the perinatal and neonatal mortality rates [5]. The hospital based data also indicate that 30 to 37 percent of neonatal deaths are due to sepsis in the neonatal units [31,32]. The higher proportion of low birth weight deliveries places these infants susceptible to the sepsis and its related mortality. Another factor contributing to high mortality in our setup is delay in reaching of the sick newborns at hospital [25].

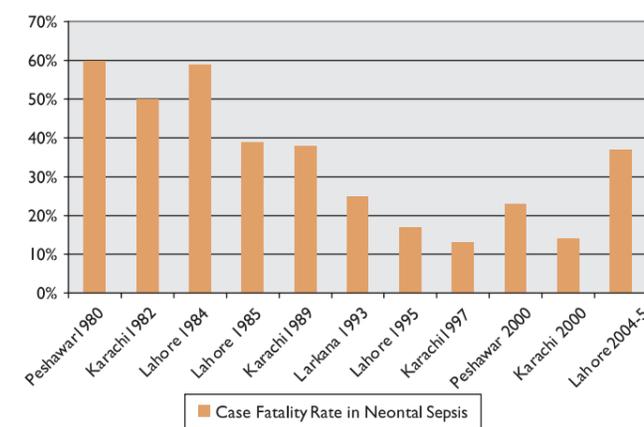
In our community the resources and services for advanced laboratory workup are inadequate. In such circumstances simple indicators that can help in early recognition and prompt referral of the high-risk cases of neonatal sepsis are lost. In his study Waseem et al [33] showed mortality rate of 37 percent which is in accordance with other data from different parts of the country [5]. Malik in a study reports that yield of blood culture is low (27 percent) even in presence of neonatal sepsis. Enterobacteriaceae gram negative bacilli (55 percent), Staph aureus (18 percent) and coagulase negative staphylococci (seven percent) are the main organisms to cause infections [34]. There is strong association between maternal urinary tract infection, pyrexia, vaginal discharge and unclean vaginal examination during labor and early onset neonatal sepsis [31].

Table 2.6: Bacterial Isolates in Neonates with Sepsis (%)

	Early Onset Sepsis	Late Onset Sepsis	Total
Rizwan W (2005) [35]			
E.Coli	34.37	33.33	
Pseudomonas	12.5	13.88	
Staph aureus	7.81	2.77	
Klebsiella	34.37	22.22	
Aurangzeb B (2003) [36]			
E.Coli	77.1	77.2	77.6
Pseudomonas	8.9	9	8.9
Staph aureus	4.4	9	5.9
Klebsiella	7.4	4.5	7.4
Maryam W (2003) [32]			
E.Coli	47.8	47.3	47.8
Pseudomonas	17.6	13.2	15.9
Staph aureus	5.6	16.6	9.9
Klebsiella	15.5	18.7	16.8

In Pakistan, pre-existing data on early and late onset sepsis has shown great diversity in the changing patterns of the organism and their sensitivity patterns. In a study conducted in Ghurki Trust Teaching Hospital, Lahore [35], showed that out of total of 100 cases, 64 belonged to early onset sepsis (EOS) and 36 belonged to late onset sepsis (LOS). Gram negative organisms were isolated from more than 80 percent of the cases. Escherichia coli (E. coli) was the commonest isolate (n=34), followed by Klebsiella (n=30) and Pseudomonas (n=13), involving both early and late onset groups. No isolate of group B streptococci (GBS) was found. Out of 34 isolates of E. coli, 14.7 percent (n=5), 17.6 percent (n=6), 41.17 percent (n=14), 61.76 percent (n=21), 79.4 percent (n=27) and 97.05 percent (n=33) were sensitive to ampicillin, gentamicin, cefotaxime, amikacin, ceftazidime and imipenem respectively. Klebsiella and Pseudomonas also showed a low sensitivity to ampicillin, gentamicin, and cefotaxime, while good sensitivity to amikacin, ceftazidime and imipenem. This finding is supported by 30 years data from different centers in Pakistan presented by Bhutta in 1996. In a recent study from Lahore the most frequently isolated organism was Klebsiella (n=23), followed by Pseudomonas sp. (n=13), E.coli (n=11), coagulase-negative Staphylococci (n=07), Staphylococcus aureus (n=06), non-hemolytic Streptococci (n=01) and Salmonella paratyphi (n=01). In comparison to other studies, resistance pattern seems to be increasing against commonly used agents for nosocomial infections like Amikacin, Ceftiazidime, Aztreonam and Ciprofloxacin. Co-amoxiclav, a time tested antibiotic, has shown good in-vitro sensitivity against both gram-positive and negative isolates. Similar has been the observation from an Indian study. Fortunately, resistance to carbapenams and glycopeptides is quite low compared to other reports [27].

Figure 2.6: Case Fatality Rate in Neonatal Sepsis (1980-2005)



Both the early and late onset sepsis has shown great diversity in the changing pattern of organism [37] and their sensitivity patterns. Similarly another study in Multan [38] showed that among the total 115 cases of clinically suspected neonatal sepsis, 62 (54 percent) had culture proven sepsis. Out of these 26 (42 percent) presented as early onset sepsis and 36 (58 percent) as late-onset sepsis. Among the bacteriological isolates, gram negative organisms (58 percent) were slightly more common in both early-onset and late-onset sepsis. Among the gram negative isolates E.coli (37 percent) was the commonest organism followed by Klebsiella (9.6 percent). Among the gram positive organisms Staphylococcus aureus (32 percent) was most frequent. All the microorganisms were resistant to ampicillin. E.coli was mostly sensitive to ceftriaxone (75 percent), ceftazidime (78 percent), meropenem (88 percent), imipenem (80 percent), and ciprofloxacin (52 percent). Staphylococcus aureus were more sensitive to ciprofloxacin (85 percent), meropenem (87 percent), imipenem (82 percent) as compared to cephalosporin and amino glycosides.

There is strong evidence that many of the common organisms causing neonatal sepsis are multi-drug resistant and that resistance to common antibiotics is on the rise. In one of the studies by Aurangzeb et al [36] the gram-negative organisms showed high degree of resistance to commonly used antibiotics, ampicillin (79.3 percent), amoxicillin (74.6 percent) and ceftazidime (71.6 percent), cefotaxime (55.2 percent) and comparatively low resistance to gentamicin (43.2 percent), tobramycin (34.3 percent), imipenem (23.6 percent), amikacin (22.3 percent), ofloxacin and ciprofloxacin (11.9 percent) respectively. Staphylococcus aureus showed almost the

same resistance to ampicillin, 75 percent.

e) Neonatal Tetanus

Neonatal tetanus (NNT) has been, and remains, a common cause of neonatal death most commonly in areas where there is lack of hygiene/cord care and in places where there is lack of maternal immunization. The majority of deaths from NNT occur between the seventh and tenth day of life. Through massive TT immunization efforts, NNT has been almost eliminated from many countries.

Overall, the percentage of pregnant women receiving tetanus immunization remains low (52 percent). Other infections such as diarrhea, acute respiratory infections, sepsis, and meningitis still represent potentially lethal problems for neonates. In spite of longstanding efforts to fight the disease, Pakistan currently has the third highest burden of death due to neonatal tetanus in the world. This is hardly surprising given that nearly 80 percent of newborn are born at home, often without the benefit of clean delivery practices and lack of maternal immunization. Most pregnant women receive inadequate ANC and lack skilled assistance at delivery. Only about half of all women of childbearing age show serological evidence of adequate immunization against tetanus. Consequently, in 1999 alone, tetanus killed nearly 22,000 newborns and countless mothers in Pakistan.

In Pakistan the magnitude of the disease and the risk factors vary across geographical regions within the country. Wrapping the neonate in sheep skins, use of straw as the delivery surface and application of ghee (clarified butter) to the umbilical stump have been identified as the risk factors in the northern areas of the country, while application of antimicrobials to the umbilical cord had a protective effect in the study from the province of Punjab. These findings suggest a diversity of birth practices enhance the risk of NNT in different regions of Pakistan and suggest different ways are needed to augment the effectiveness of the NNT elimination program. The NNT mortality rate was 23 per 1,000 live births in Lorali district of Balochistan community based survey. Low immunization coverage with TT (5 percent) and high prevalence of the deliveries assisted by untrained personnel (86 percent) under unhygienic conditions contribute to high mortality rate in the district. In comparison, in rural Punjab, Pakistan the estimated NNT mortality is 11.6 per 1,000 [40].

Ali et al has stated that incidence of neonatal tetanus in Pakistan is decreasing and case fatality rate is about 42

percent [42]. Unfortunately ratio of tetanus vaccination which is most effective measure to reduce tetanus mortality is very low (up to 40 percent) in Pakistan and tetanus is still killing large number of newborns.

f) Pre-maturity and Low Birth Weight

Low birth weight (LBW) has long been debated as one of the causes of neonatal deaths. It is associated with the death of many newborn infants, but is not considered a direct cause. Around 15 percent of newborn infants weigh less than 2,500 g, the proportion ranging from six percent in developed countries to more than 30 percent in some parts of the world. Successive reports over the last few decades from the WHO and UNICEF estimates that almost 25 percent of all births in Pakistan are LBW [38]. The main “culprit” is preterm birth and the complications stemming from it, rather than low birth weight per se [14]. Knowledge about risk factors for occurrence of LBW babies specific to Pakistani population is of critical importance because it is a major factor responsible for neonatal death as it has been reported in 40.02 percent cases from Karachi [8].

In Pakistan 25 percent of newborns are born low birth weight and contributing significantly to newborn deaths but this relationship is not well documented as compared to studies abroad where high fatality (70 to 80 percent) is attributed to low birth weight, both prematurity and IUGR [11]. The robust data on LBW as a direct risk factor for neonatal mortality are available from Gilgit in the Northern Areas where Marsh et al found this to be an underlying cause in 21 percent of all neonatal deaths. These causes include home deliveries, poor maternal health, low socioeconomic status, high fertility rate and high incidence of LBW. The incidence of LBW in Pakistan is estimated to be around 19 percent. Approximately one-quarter of all Pakistani newborns are LBW, and studies show that between half and three-quarters of all neonatal deaths occur among LBW babies. To illustrate a consecutive sample of very LBW births (< 1500g birth weight) at the AKUMC in Karachi indicates that almost 60 percent of such infants also exhibited features of intrauterine growth retardation (Bhutta et al., observations 1999). In a study by Umber et al [43] showed that in Lahore out of 3,315 deliveries, 135 babies were LBW (4.08 percent). Afzal et al in his study showed neonatal sepsis is the commonest cause of death in LBW babies followed by RDS and birth asphyxia.

Table 2.7: Causes of Death of Low-birth Weight Babies in a Tertiary Care Nursery in Peshawar, Pakistan

Condition	Number	Percentage
Neonatal Sepsis	420	65.22
Birth Asphyxia	110	17.08
RDS	61	9.47
Neonatal Jaundice	23	3.57
Neonatal Seizures	8	1.24
Congenital Heart Disease	6	0.93
Meconium Aspiration	4	0.62
Collodion Babies	3	0.46
Encephalocoele	2	0.31
Hemorrhagic Disease of Newborn	2	0.31
Apnea	2	0.31
Esophageal Atresia	2	0.31
Sever Anemia	1	0.15
Total	644	100

According to WHO estimates 11 percent babies are born LBW and these rates are six fold higher in developing countries. In a recent study from Islamabad, Jamal et al has reported 40 percent of LBW in high risk pregnancies [31]. Bhutta has also reported more than 25 percent of LBW ratio in full term deliveries while Civil Hospital Karachi, LBW constitute on average about 25 percent of admissions. LBW babies constitute about 44.26 percent of total admissions into the neonatal unit which is higher as compared to the other reports from Pakistan.

Various studies have shown that lower social class is associated with an increased risk of various adverse pregnancy outcomes including perinatal mortality, premature birth and LBW [44]. This increased incidence is largely explained by associated adverse factors like lack of education, repeated pregnancies, hard physical work, inadequate ANC, multiparity, early marriages and inadequate dietary intake during pregnancy along with low income [45, 46]. In a novel evaluation of socio-cultural factors underlying IUGR, Arif et al described a close association of a composite of factors, such as poor education, lack of economic empowerment, caring environment and lack of education with IUGR [47].

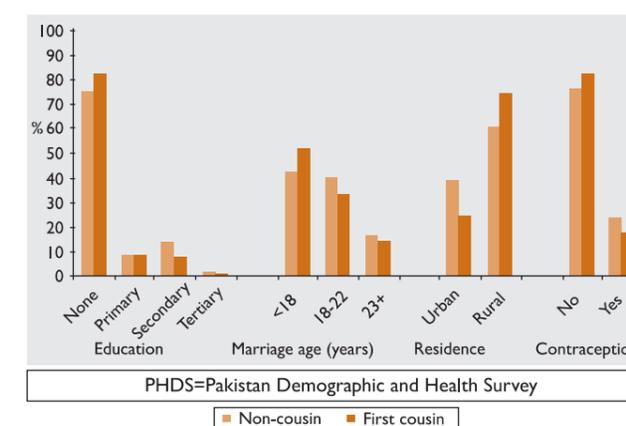
Under nutrition in pregnant women of low socioeconomic status is associated with delivery of LBW infant. An improvement in nutritional status and maternal weight may have a positive effect on birth outcome [48]. Major determinants of LBW were found to be pre-term labor, PROM and IUGR. Other causes of LBW babies were either constitutional or intra-uterine

death or congenital abnormalities. Moreover, the data suggest a close correlation between low birth weight and maternal malnutrition and with the social and economic status of mothers, especially the lack of education and empowerment [47].

g) Consanguinity and Congenital Malformations

Congenital abnormalities are an important cause of perinatal mortality. In Pakistan, about six to nine percent perinatal deaths are attributed to congenital malformations. At the multivariate level, adjusted mean fertility was found to be lower among women in the first-cousin unions in the Pakistani demographic and health survey (DHS) data, while for the Indian DHS, adjusted mean fertility levels were similar in the first-cousin and non-consanguineous marriages in the PDHS analyses, consanguinity was found to be associated with a number of direct and indirect determinants of fertility, including lower maternal education, lower maternal age at marriage, lower contraceptive use, and rural residence. The association between consanguinity and fertility was assessed reviewing published literature and analyzing DHS data from Pakistan [49]. The PDHS reported that almost 61 percent of all marriages are consanguineous. Although reports indicate an association, few studies have indicated a link with hereditary disorders or increased risk of congenital malformations.

Figure 2.7: Association Between Consanguinity and Demographic Factors (PDHS)



The birth cohort in Lahore had a consanguinity rate of 46 percent and a high incidence of congenital malformations and birth defects (22.4 percent versus 13 percent from a Pakistani population in Birmingham). The only significant associated risk factor for congenital anomalies found by Fouzia et al [50] was prevalence of consanguineous marriage. This in comparison to

other reports shows association of 49 percent and 54 percent. But it is in contrast to a study from Aga Khan University Hospital, which claimed only 18.2 percent cases associated with consanguinity, which does not correlate with other studies [51]. A study from Rawalpindi depicted 40 percent prevalence of congenital anomalies in related parents as compared to 26 percent in non-related parents [52]. The relationship of consanguinity and higher infant mortality in Pakistan has also been highlighted recently from the Lahore cohort data, indicating that the mortality rates were significantly higher in consanguineous marriages [53]. Given the high rates of consanguinity in our population, it is important to highlight the dearth of nationally representative information in this area. This is a preventable and definite associated risk factor which can be resolved by creating awareness and providing marital and genetic counseling, by creating awareness among the studied population regarding the avoidance of consanguineous marriage, pre conception use of folic acid supplementation, screening of high risk cases and early prenatal detection by routine use of ultrasonography around 16 to 20 weeks and offering termination of pregnancy in cases of lethal anomalies, the perinatal morbidity and mortality can indirectly be reduced.

7. NEWBORN CARE PRACTICES IN PAKISTAN

a) Recognition of Danger Signs and Treatments

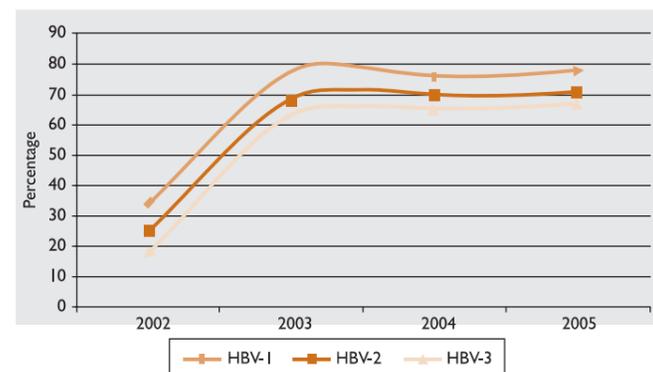
The most shrouded area in newborn care, perhaps, is what happens in the first week after birth. There is limited information about what happens to the baby immediately after it is delivered while the delivery of the placenta is awaited, nor is it clear how much time elapses between delivery of the baby and cutting of the cord. Other areas where we have found hardly any information include eye care, skin care, ear care, bathing and massaging of the newborn. It is also not clear whether danger symptoms and signs seen in neonates are widely recognized at the community level. We lack information on health seeking behaviors, including home treatments and remedies. Certain newborn care practices are also believed to contribute to high neonatal mortality. While more studies need to be done in the community, it is known that cord cutting and cord care practices are unhygienic and contribute to tetanus and other infections. A community survey in Sindh found that most women did not recognize the danger signs of common infant conditions and that no particular attempt is made to monitor the newborn's temperature. A total of 51 centers in Lahore were surveyed in a study by

Javaid et al [54]. Out of them 36 were private clinics, 11 private hospitals and four MCH centers. These centers were run by doctors (65 percent), LHVs (23 percent) and nurses (six percent), mid wife, dai, dispenser (two percent) each. Most of these centers did not have all the required resuscitation equipment, for instance the space for resuscitation was available with 50 percent, warmers were present 24 percent, blankets 60 percent, bulb sucker 49 percent, electric suction machine 31 percent, oxygen 51 percent, bag and mask 20 percent and intubation equipment 16 percent were available. The referral transportation was not available in 75 percent. Regarding training level of the personnel present at the time of delivery 80 percent did not have any newborn resuscitation training, and out of the rest, only eight personnel knew how to intubate the newborn.

b) Immunization

Pakistan is a developing country with a population of 150 million and estimated IMR of 80/1000 live births. The Expanded Programme for Immunization (EPI) coverage is 80 percent for BCG, 65 percent for DPT3 and polio3 and a mere 67 percent for measles (10). The TT coverage of pregnant women is 56 percent to 57 percent, which is quite low. Tetanus neonatorum is prevalent in Pakistan mostly in the rural areas due to low TT coverage, the practice of cow-dung application on the umbilical cord of newborns and wrapping them in sheepskin wraps. In a verbal autopsy study conducted in two provinces of Pakistan, the three main causes of infant deaths were reported as diarrhoea syndrome (21.6 percent), tetanus (11.7 percent) and acute respiratory infections (11.6 percent). The causes of missing or low vaccination rates in Pakistan which are reported includes mother being busy, laziness of parents, minor illnesses in children, absence of vaccinators, inconvenient EPI centers, poor quality care, fear of side effects and lack of faith in immunization program.

Figure 2.8: Percentage of the Total Target Population of Children Aged 0 to 11 Months Covered by Hepatitis B Vaccination in Pakistan (2002-2005)



Source: Gateway papers 2, Heart file Foundation

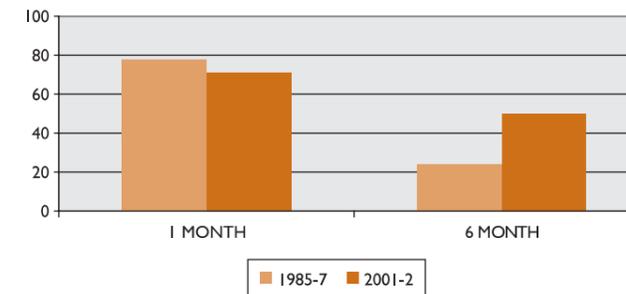
A study conducted in NWFP province of Pakistan reported only 65 percent of under three year olds as fully immunized. The reasons for non-compliance with the EPI schedule were: mother too busy, absence of vaccinator and inconvenient places being utilized as EPI centers [55]. A baseline study done in four regions of Pakistan showed EPI coverage of 48 percent [56]. Fasih et al reported EPI coverage of 26.5 percent by age two years in Karachi, Pakistan [57]. In a study in Karachi reasons for not getting the child appropriately vaccinated were investigated by Siddiqui et al showed that about 37 percent of the mothers complained about the facility being far off, 6 percent blamed the absence of mobile teams, 13.7 percent had improper knowledge of EPI schedule and 10 percent complained about non-availability of vaccine at the center. There were 39 instances of conscious refusal to vaccination (33.3 percent). Out of these mothers 31 percent perceived vaccination as unnecessary, 25.6 percent reported child sickness on the due date, 25.6 percent thought that vaccine makes their child sick and 10 percent considered their child too weak to receive vaccination [58].

c) Breastfeeding and Weaning

Feeding and complementary feeding practices during infancy are the determinants of growth and development. Successful infant feeding needs cooperation between mother and her baby beginning with the initial feeding experience and continuing throughout the child period of dependency. Breastfeeding is important not only for the optimal growth and development but has also protective role in decreasing the incidence and severity of infectious diseases including diarrhea, respiratory tract infections, necrotizing entero-colitis, otitis media, urinary tract infection and late onset sepsis in preterm. Exclusive breastfeeding is defined as infant consumption of human milk with no supplementation of any type except for vitamins or medicine and it is sufficient to meet the demand of growing infant till six months of age. After that the caloric requirements are no longer met by breast milk alone, hence, complementary food, rich in iron should be introduced gradually beginning around six months of age and continuation of breastfeeding is recommended. In our part of the world, lack of knowledge and awareness about feeding infant together with influences of various cultural beliefs and food taboos interfere with the feeding of infants leading to malnutrition with high incidence of infant morbidity and mortality [59]. Prelacteal feeding of tea, honey, water and ghutti is a common, deep-rooted tradition for first two to three days while colostrum is considered

thick stale and discarded. The practice of extensive supplementation beginning in early months of life is also common leading to high illness rate and malnutrition of infants. Complementary feeding is defective due to ignorance, lack of awareness and influences of baseless beliefs created by family's friends or neighbors [60].

Figure 2.9: Percentage of Exclusively Breastfed Children (1985-2002) [7]



Duration	1985-1987			2001-2002		
	Urban	Rural	Total	Urban	Rural	Total
1 month	72.2	80.6	76.9	75	72.2	73.1
6 month	25.5	21.1	22.9	45.8	51.0	50.0

Breastfeeding, though prevalent, is rarely exclusive and often not sustained during the crucial first month. While many women initiate breastfeeding within the first 24 hours after birth, it is usually not the first feed for infants (honey is the preferred choice). A study in Lahore found that only nine percent of infants were still being exclusively breastfed at one month. On the whole, rural women seem to breastfeed more consistently than urban women. Colostrum, or first milk, is traditionally discarded and even regarded as harmful among many women (though more recent data from Karachi and Jhelum suggest this attitude may be changing). In general, the risk factors contributing to high neonatal mortality in Pakistan are:

1. The high percentage of home deliveries unattended by skilled care,
2. A birth interval of less than 24 months,
3. Pregnancy order greater than six, and
4. Maternal or paternal illiteracy.

In a study from Hyderabad, Sindh, it was shown that the practice of pre-lacteal feeding of honey, water, butter, ghutti and tea was observed in 79 percent of infants and it was the major reason for delay in breast feeding for two to three days. Colostrum was discarded by 71 percent of mothers. Most of the mothers preferred mother's milk to feed their baby. Out of 84 cases who received breastfeeding, 25 (29.76 percent) mothers

introduced supplementary milk at two to four weeks. This figure raised up to 37 (44.04 percent) before four months and at six months to 51 (60.71 percent) [60].

Table 2.8: Infant Age and Feeding Type (n=100)

Age	EBF*	NBF**	Supplemented
At Birth	84 (84%)	16 (16%)	-
1 Month (n=84)	59 (70.23%)		25 (29.76%)
<4 Months (n=84)	47 (55.95%)		37 (44%)
6 Months (n=84)	33 (39.28%)		51 (60.71%)

*Exclusive breastfeeding ** Not breastfeeding

One of the largest community-based surveys on care practices was conducted in 37 sites covering Sindh province [61]. More than 27,000 respondents were questioned on child-care practices, representing a population of 30 million with nearly equal representation from rural and urban areas. These data indicated that while 98.5 percent babies were breastfed initially, 19 percent of newborn infants received breast milk only after the first 24 hours. Data from Lahore revealed that only about nine percent babies were exclusively breastfed at one month, with progressive decline by the third month [62]. In a study by Agha et al when mothers were asked about best food and best milk for a child in the initial four to six months, 516 (79.8 percent) and 636 (98.3 percent) suggested mother's milk as best food and best milk, respectively. Similarly, 570 (88.1 percent) thought that weaning should be initiated at four to six months and 211 (32.6 percent) thought that the child should be exclusively breastfed for an initial four to six months. When asked about effects of additional feed in first four to six months of child, 152 (23.5 percent) thought that it had bad effects on a child's health. Furthermore, 134 (20.7 percent) exclusively breastfed their last child and 532 (82.2 percent) initiated weaning after four months. Among mothers who did not breastfeed exclusively, 292 (45.1 percent) gave water, 216 (33.4 percent) gave butter and 141 (21.8 percent) gave 'ghutti' as additional feed during first four to six months [63].

Breast feeding prevalence was low in educated, urban and high socioeconomic class women [64]. Although majority of women knew general benefits of breast feeding and danger of bottle feeding, a number of beliefs were widely held and would tend to interfere with determination to promote colostrum feeding and exclusive breast feeding. Gender based behavior was also pre-dominant in the study [65]. The problem of

lack of breastfeeding is particularly notable in urban settings. Nagra and Gilani had earlier indicated that only 63 percent women in the higher socio-economic strata and 68 percent in the lower strata breast-fed exclusively after birth. Ashraf et al also indicated that until the age of four months, 52 percent mothers from upper middle class in Lahore gave predominantly formula-feeds compared to 1.6 percent in the villages. Findings from a large private maternity hospital serving the upper middle class population of Peshawar revealed that only 53 percent of the mothers considered colostrum as beneficial for the newborn infant, and 89 percent had introduced formula feeds within four weeks of birth.

Mean weaning age of children was 4.95 ± 1.19 months postpartum, with 79 percent children weaning between four to six. Commercially prepared food supplements, rice, fruits and biscuits were major solid food administered during weaning age. Main sources of information for mothers about breastfeeding and weaning were previous experience (69.6 percent) and informal support (17.4 percent) while formal support accounted for only 13 percent cases. A significant difference was found between mean Body Mass Index (BMI) of partially weaned and completely weaned children ($p < 0.02$) [66].

To illustrate, there has been an increase in rates of exclusive breastfeeding in the urban and peri-urban field sites of the Department of Community and Preventive Paediatrics in Lahore following the introduction of domiciliary visits with counseling on optimal breastfeeding practices [67]. Rates of exclusive breastfeeding have increased from less than 20 percent during the first month (1984-1987) to close to 90 percent (1995-1997). These data highlight the potential for improving community attitudes and practices in this important area.

Table 2.9: Patterns of Breastfeeding in Different Districts of Pakistan (PAIMAN)

	Percent of Females who Gave Colostrum		Percent of Women who Gave Anything Except Breast Milk Within Three Days of Birth	
	Rural	Urban	Rural	Urban
Buner		72.3		85.7
Dadu		39.5		59.2
DG Khan	61.1	76.7	66.9	76.7
Jafferabad	73.2	69.8	43.6	61.7
Jehlum	82.6	78.9	54.9	64.8
Khanewal	56.6	75.5	70.9	81.1
Lasbela	86.3	93	37.7	22.8
Rawalpindi	76.2	80.3	40.6	61.5
Upper Dir				
Sukkar	50.6	81.4	47.3	34.8

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CHAPTER 3
DETERMINANTS OF
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CHAPTER 3 DETERMINANTS OF MATERNAL AND NEWBORN HEALTH

I. INTRODUCTION

The State shall provide basic necessities of life, such as food, clothing, housing, education and medical relief for all citizens, irrespective of sex, caste, creed or race, as are permanently or temporarily unable to earn their livelihood on account of infirmity, sickness or unemployment.

~ Article 38(d) of the Constitution of Pakistan

Pakistan has lagged behind from its neighbors and other low-income countries in terms of health and population outcomes. Total life expectancy is 61 years with 64 years for males and 66 years for females. Adult literacy rates have increased to 43 percent with adult female literacy of 28 percent. Women in reproductive age constitute 23 percent of total population. The sex ratio in Pakistan is adverse to women, 106:100. Population growth rate is 2.13 percent annually with total fertility rate of 4.1. Maternal mortality rate ranges from 350 to 400. One of the major reasons of high maternal mortality is poor access to prenatal care (28 percent) and dearth of trained attendants at birth (20 percent). Low-birth weight infants account for 19 percent and of all pregnant women, 57 percent are immunized for tetanus [1].

There is a clear dichotomy of the health care system in Pakistan; public sector financed by the state and private sector working independently for profit. Government of Pakistan spends less than one percent on health care, even lower than Bangladesh and Sri Lanka. For 66 percent living in the rural part of the country, poverty along with illiteracy, low status of women and inadequate water and sanitation facilities had remarkably slowed down the progress in health indicators. The low social status of women results in a toll of unacceptable and preventable maternal deaths, one of the highest in south Asia. This certainly has severe repercussions on health in particular, and self-respect in general, of the women and their children. In countries of the region, women suffering from an illness report less frequently for health care seeking as compared to men [2]. Besides reproductive health issues, an important reason for higher rate of consultation might be a perpetuating ill health, generalized weakness, depression and anxiety

due to domestic and sexual violence [3]. In the National Health Survey (NHS), little difference is observed in terms of health service utilization by economic status. This negligible difference in trends of utilization of health services between rural and urban population does not reflect that both strata of population enjoy the same health status. Though rural poor have more needs, yet they actually lack quality services and need based treatments. The distance separating patients from the nearest health facility has been remarked as an important barrier to use, particularly in rural areas [4].

Women's health and socioeconomic status is fundamental to development. Initiatives were taken in year 2000 to work towards achieving the MDG by year 2015, the specific objectives of MDGs are to eradicate extreme poverty and hunger, achieve universal primary education, promote gender equity and empower women, reduce child mortality, improve maternal health, control infectious diseases, ensure environmental sustainability and develop a global partnership for development. Despite recent improvements in women's health and reproductive outcomes and decline in fertility to less than five births per woman, maternal mortality and under-five mortality remain high in Pakistan. These poor health outcomes can be attributed partly to very low rates of utilization of maternal and child health services [5]. In short, Pakistan is faced with multiple, and interconnected, challenges in its quest to achieve the MDGs. Some of these challenges relate specifically to the health care system, while others relate to the economy and the society (and culture) generally. The reproductive health's of women is closely intertwined with basic issues of social status, access to education, empowerment, and fertility, and without tackling these issues other measures are at best perfunctory. Issues such as gender imbalances in health and education as well as humane governance have been highlighted in several influential reports from south Asia, but the findings of these reports have not been translated into action through national or regional programs [6].

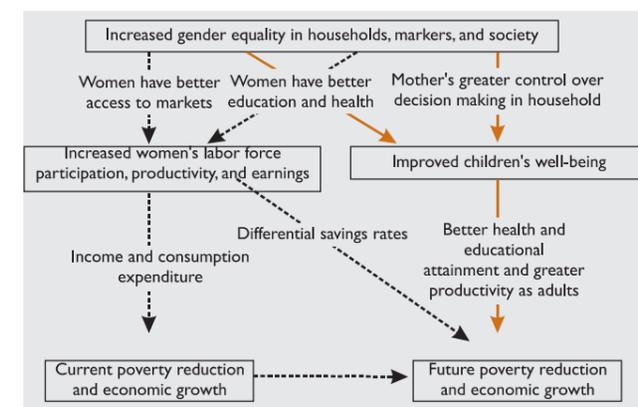
2. POVERTY AND WEALTH ASSESTS

Pakistani women are trapped in a web of dependency and subordination due to their low social, economic, and political status in society. The majority of women suffer from all forms of poverty. In order to change women's position and societal view of their inferiority, structural changes need to be brought about in the social and economic order that shape our social world. Poverty is rampant in the rural areas of Pakistan, where people

are in a state of deprivation with regard to incomes, clothing, housing, healthcare, education, sanitary facilities and human rights. Poverty is widespread in Pakistan, and is predominantly a rural phenomenon.

The poor in Pakistan are not only deprived of financial resources, they also lack access to basic needs such as education, health, clean drinking water and proper sanitation. Limited access to education, health and nutrition undermines their capabilities, limits their ability to secure gainful employment, and results in income poverty and social exclusion, while also making them vulnerable to exogenous shocks. Low women's status is perpetuated from one generation to the next, via preferences for boys, higher rates of female infant mortality, less health seeking behavior for girls, less food given to girls, and lower educational investments in girls. In Pakistan, women typically do not own land and, when they do, they typically do not control it. Women in Pakistan have a lower status than in the other countries of South and East Asia, and a lower status than in most other countries in the world. Low female education levels are associated with higher levels of household poverty. Put more positively, increases in female status and female education have been estimated to account for 50 percent of the reduction in child malnutrition rates over the past 25 years.

Figure 3.1 Increased Gender Equality in Households, Markets and Society



Source: world Bank 2007a: 109.

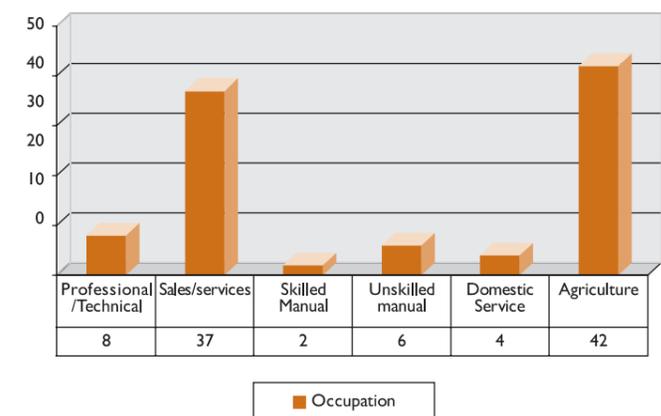
In developing countries like Pakistan, human development indices are in fact largely dependent on women's health and socioeconomic status and the intrahousehold status of women is related to food security, particularly of children [7]. According to the most recent PDHS in Pakistan most rich households are in urban areas, while the poorest households are

more often in rural areas. The highest proportions of the poorest people live in Balochistan and Sindh (34 percent and 29 percent in the lowest quintile), and the largest proportion of wealthy households are in Sindh and Punjab (23 percent and 21 percent in the highest quintile, respectively). Twenty six percent of women are currently employed.

Table 3.1: Socioeconomic Status (PDHS 2006-2007)

	Poorest	Second	Middle	Fourth	Richest
Total Urban	3%	6%	16%	29%	46%
Major City	<1%	2%	9%	29%	60%
Other Urban	6%	12%	25%	29%	48%
Rural	29%	27%	22%	15%	7%

Figure 3.2: Percent Distribution of Occupations of Women Employed in the Twelve Months Preceding the Survey (PDHS 2006-2007)



The number of female-headed households is growing in Pakistan. The Socio-Economic Survey of Pakistan reports that less than five percent of women head households. Mothers' employment appeared to have negative and significant impact on the quality of child care, since a woman's labor participation reduces her ability to care. It is empirically evident that women's employment increases household income but the results of present study show that mothers' employment is negatively related to child-care quality. Care quality decreases in the sense that children may be neglected in terms of deprivation of hygienic food, breast-feeding, supplementary feeding and provision of immunization at a proper time according to their age by employed mothers. With regard to Pakistan's progress, rising poverty and disparities are to be addressed on urgent

basis if MDGs targets are to be achieved by 2015. Additionally high maternal and under five mortality must be contained which have reached an alarming level. Better education and health facilities, with concerted efforts to alleviate poverty and hunger, can guarantee Pakistan's progress towards achieving MDGs in near future.

Household possessions are perhaps one of the most effective ways of determining the socioeconomic level of a household. Often, it is easier to obtain information on household possessions than to ask for details about the household income, which respondents may be less willing to provide for various reasons. The presence of durable goods in the household, such as a radio, television, telephone, refrigerator, motorcycle, and

private car is another indicator of the household's socioeconomic status.

Figure 3.3: Household Possessions in Urban and Rural Areas of Pakistan (PDHS 2006-2007)

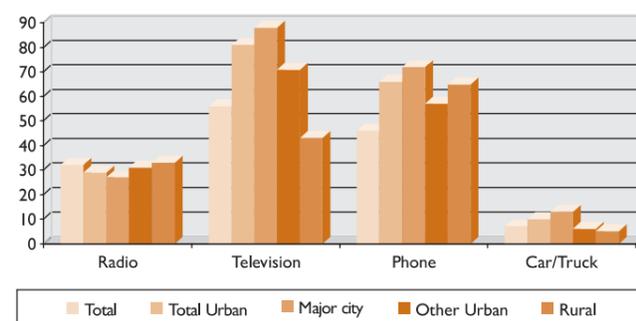


Table 3.2: Percentage of Household Possessions in ten Different Districts of Pakistan (PAIMAN)

	Buner	Dadu	DG Khan	Jafferabad	Jehlum	Khanewal	Lasbela	Rawalpindi	Sukkur	Upper Dir
Electric Iron	48.1	52.9	60.5	45.6	89.8	72.7	31.9	92.2	70.6	66.6
Electric Fan	70.3	78.4	81.1	85.1	96.6	84.3	44.9	96.3	90.2	62.0
Sewing Machine	41.9	40.6	52.5	38.8	79.1	67.9	32.0	79.2	64.4	57.1
Radio	46.7	41.7	41.6	47.0	56.8	53.6	31.0	59.3	53.0	57.6
TV	20.0	45.3	41.1	44.4	69.6	44.4	23.2	79.2	59.0	18.0
Telephone	27.5	20.0	28.2	17.1	48.6	29.9	13.6	70.8	37.1	38.5
VCR/VCD/DVD	8.4	14.8	8.8	17.0	17.7	10.3	7.1	26.4	16.5	4.5
Refrigerator	22.5	19.1	25.1	18.3	52.9	24.6	11.1	64.7	35.7	18.0
Air Cooler	3.6	4.5	18.1	10.4	19.8	12.4	0.6	23.1	9.1	2.4
Air Conditioner	0.5	4.3	2.7	3.9	3.9	2.5	1.4	8.3	7.5	1.4
Computer	3.4	3.5	5.1	3.3	7.9	3.2	1.9	19.2	6.5	3.2
Bicycle	6.9	18.7	44.3	35.2	37.7	60.	9.6	26.7	24.9	1.3
Motorcycle	3.7	13.0	20.9	15.4	14.7	18.7	9.7	20.1	22.4	1.1
Car/Jeep	6.4	3.9	1.8	4.8	3.5	1.8	3.4	12.9	3.2	6.4
Tractor/Truck	3.3	2.2	3.4	9.1	2.3	4.8	2.0	1.5	2.6	1.8
Owned Agriculture Land	50.6	36.8	39.7	30.7	36.4	34.2	37.3	33.1	25.9	64.9
Agriculture Land Major Source of Income	34.4	30.5	14.9	29.4	14.1	24.3	21.3	10.5	16.0	11.5

3. LITERACY AND EDUCATION

The level of education obtained by a woman can be a good indicator of her status in society as well as the independent decision-making power available to her. It is assumed that the higher the level of education obtained by a woman, the more say she has in matters concerning her health and that of her children. In regards to maternal health, a higher literacy rate in women can result in an increased use of contraceptives, higher awareness of complications during and after pregnancy, a strong understanding of neonatal and newborn health, and finally a more complete understanding of safe birth practices. Pakistan today has 41 million adult illiterates and more are being added every year. Less than 50 percent of the girls in the 10 to 14 year age group in the rural areas are in school, and over 30 percent of all children will never go to school. In Pakistan, majority of women are uneducated and the proportion of uneducated women is considerably high in rural than urban areas. As expected, there exists an inverse relationship between incidence of child deaths and mothers education. An urban-rural comparison shows that while acquisition of primary or less education by mothers in urban areas brings substantive decrease in the incidence of child mortality, rural women with the same level of education do not produce much change in child mortality. Yet, it was noticed that rural women who have acquired higher education do bring a visible downward change in child mortality [8].

Primary school enrolment rates have improved recently. There are now 3 million more children in primary school compared to 2001. In 2005/06 53 percent of five to nine year olds were in primary school, up from 42 percent in 2001. Poor quality of education, resulting in poor educational outcomes, remains a key constraint to progress. This is still low compared to South Asia as a whole, where net primary enrolment is 86 percent. In Pakistan although the enrolment ratio between female and male at the primary education level is 59 percent (females) to 77 percent (males) only two percent of the females reach the position of senior officials, legislators and managers, as compared to 98 percent of the males in similar conditions. Female education is widely found to be one of the most powerful predictors of maternal and child health outcomes. It is associated with better domestic management of health. Access to all levels of education is crucial to empowering women and girls to participate in economic, social and political life of their societies. Education unlocks a woman's potential, and is accompanied by improvements in health, nutrition,

and well-being of their families. Among other things, educated mothers are more likely to be exposed to information from a wider range of sources, and to be better able to process the information received. Nearly 50 million Pakistanis - half the adult population - cannot read. Female literacy (approximately 42 percent) is much lower than male literacy (approximately 65 percent); this disparity is more pronounced in rural areas, where 31 percent of women are literate. 30 percent of men and 52 percent of women have never been to school. (PDHS 2006-2007). Female literacy rates are particularly low. Just over a third of adult females are literate, compared to nearly two thirds of adult men.

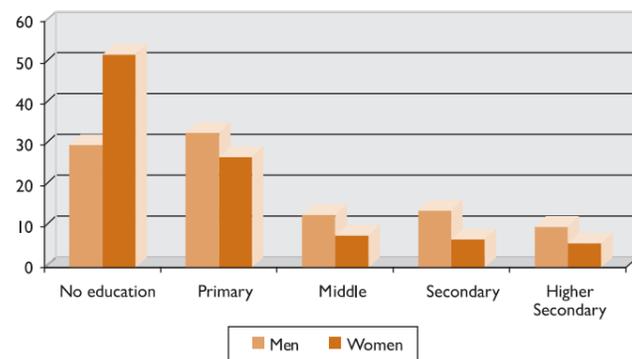
Table 3.3: Female Literacy Rate Expressed as Percent (1981-2005)

	1981	1995-1996	1996-1997	1998-1999	2001-2002	2004-2005
Urban	37	49	50	56	56	62
Punjab	37	50	21	58	60	66
Sindh	42	53	54	58	54	62
NWFP	22	31	34	40	41	47
Balochistan	19	23	27	39	36	42
Rural	7	16	17	20	21	29
Punjab	9	20	21	24	26	35
Sindh	5	10	12	15	14	18
NWFP	4	11	13	16	16	23
Balochistan	2	8	5	12	11	13
Pakistan	16	26	28	31	32	40
Punjab	17	29	30	34	36	4
Sindh	22	31	33	335	31	41
NWFP	6	14	17	20	20	26
Balochistan	4	11	9	15	15	19

Source: Sania Nishtar gateway paper 2

The main factors that keep children uneducated are limited access to education, teacher absenteeism, low quality of education, poverty, corporal punishment and a high student-to-teacher ratio. Despite improvements in economic conditions after recent reforms, there are still broad discrepancies in social standing between men and women. Illiteracy is high among women and girls. In rural areas 22 per cent of girls above 10 have completed primary schooling, compared to 47 per cent of boys. Pakistan's illiteracy rate, particularly among women, is much higher than its neighbors. Moreover, illiteracy among women varies greatly within the country; in rural Balochistan, for example, women's illiteracy rate is estimated to be 98 percent [9].

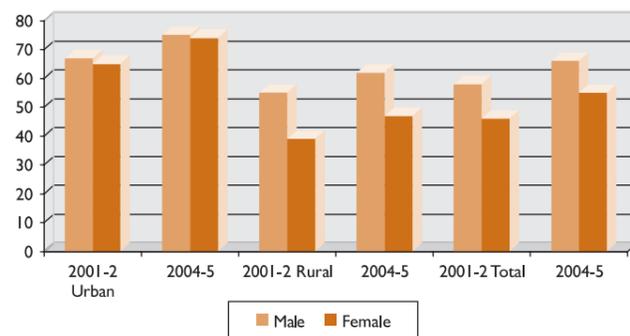
Figure 3.4: Attainment of Education at Household Level (PDHS 2006-2007)



Pakistan's education indicators are the worst in South Asia - the fact that the education index in Nepal and Bangladesh, two countries with significantly lower per capita incomes than Pakistan, is 10 to 20 percent higher than Pakistan is a clear indicator of the low priority accorded to education in Pakistan's development policies. Pakistan's public sector spending on education and health, at barely 2.1 percent of gross domestic product (GDP), is significantly lower than that of other countries in the region. Pakistan is also one of the few countries in the world where the number of illiterate people continues to increase with each passing year.

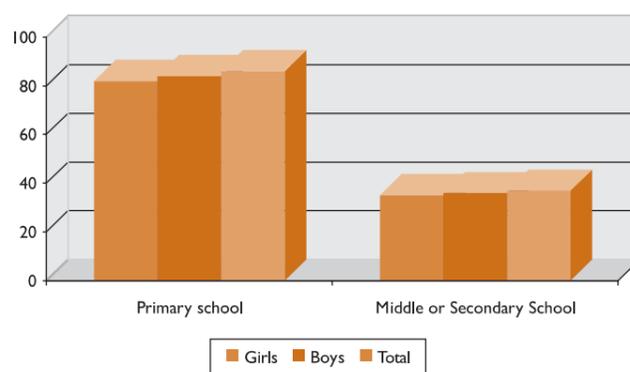
The number of illiterate persons in Pakistan has risen from 28 million in 1972 to an approximate figure of 46 million at present. To blame is a steadily increasing school drop out rate. At present, Pakistan is amongst three countries in Asia that have literacy rates that are under 40 per cent. In the South Asian region, Pakistan is at the bottom of the education ranking of countries, with an adult illiteracy rate of about 56 per cent and the lowest net primary enrolment rate in South Asia at 46 per cent. Gender differentials in schooling remain large, particularly in rural Pakistan. Using the PIHS, we find that one-third of rural communities do not have a public primary school for girls as compared to only 15 percent for boys. Schools also locate in larger, more central and wealthier villages. Private schools do not (yet) appear to increase school access, though they may well increase schooling quality in well served areas [10].

Figure 3.5: Primary Net Enrollment Rate (Age Six to Ten Years)



Education of a female child is either not initiated, or if initiated, she has the right to complete her primary levels only. Educating girls has repeatedly shown to increase their self-esteem, and to increase their influence over their own lives and family and community decisions, to lower fertility, to improve maternal and child health, and to help in decreasing environmental degradation. Despite the advantages, considerable resistance still exists against educating girls in developing countries. Believing that boys who start school will complete their education, acquire employment, and earn wages to contribute to the well being of the family, parents encourage boys to attend school and girls to remain at home to help with housework and raising younger siblings [11].

Figure 3.6: School Attendance



Literacy results in fewer higher order births, with considerable differences between women having below primary level education and those with five or more years of schooling. Female education is also related strongly and inversely to infant mortality. However, poverty may be an over-riding negative factor, as analysis of the infant mortality rates of different states shows that while the IMR decreases with increasing female education.

The relationship between female literacy and infant mortality has been found to hold good in Pakistan the mechanisms whereby women's education results in lower child mortality have been the subject of some speculation. As child health and survival are enhanced by better hygiene, improved nutrition and feeding practices (of the child as well as of the mother) and timely medical intervention, education may improve women's practice of any of these. Schooling may enable women to take independent decisions and act on them. Clearly, the effects of women's education on their own nutritional status and on that of their children is exerted through their roles as providers of household health and nutrition care.

4. WATER AND SANITATION

"I often refer to it as 'Health 101', which means that once we can secure access to clean water and to adequate sanitation facilities for all people, irrespective of the difference in their living conditions, a huge battle against all kinds of diseases will be won."

~ Lee Jong-wook, Director-General, World Health Organization

Despite a small decline in access to safe water over recent years, Pakistan is still on track to halve the population without access to improved water and sanitation by 2015.

- In 2005/06 66% had access to a tap or hand water pump and 60% had access to a flush toilet.
- The broader picture on ensuring environmental sustainability is mixed. Various environmental initiatives were started in the 1990s but came after years of environmental neglect.

The quality of water used by the households is recognized as an important factor for the incidence of morbidity and mortality in children. In Pakistan, water borne diseases account for substantial number of deaths [8]. Provision of safe drinking water, adequate sanitation and personal hygiene are vital for the sustainable environmental conditions and reducing the incidence of diarrhea, malaria, trachoma, hepatitis A and B and morbidity levels.

As of 2005, approximately 38.5 million people lacked access to safe drinking water source and approximately 50.7 million people lacked access to improved sanitation in Pakistan. By year 2015, if this trend continues, 52.8 million people will be deprived of safe drinking water

and 43.2 million people will have no access to adequate sanitation facilities in Pakistan. Poor water and sanitation pose serious public health threats to the Pakistani population, contributing to the spread of diseases and child malnutrition.

The mortality rate for children under the age of five in Pakistan is 94 deaths per 1,000 live births. Water and sanitation related diseases are responsible for 60 percent of child deaths in Pakistan, with diarrhea estimated to kill 230,000 children under the age of five each year. According to the recent PDHS 89 percent of total urban households have water on premises, 78 percent of rural households have water on premises. Nine percent of rural households and four percent of urban households require 30 minutes or longer (roundtrip) to obtain drinking water. Over 40 per cent of Pakistanis lack basic sanitation and about 60 per cent of rural dwellers do not have access to a latrine. The numbers above mask significant variations in access to sanitation facilities and safe drinking water on the basis of location of household (rural urban, and province) and income level. PIHS 2001-2002 reports that for 22 per cent of households with a water tap in the house, 53 per cent are in urban areas and only eight per cent in rural households. Nearly half the households depend on hand pumps for their water supply, of which 56 per cent are rural households and 22 per cent are urban ones.

In rural areas of Pakistan, 19 per cent of the population depends on dug wells and river/streams for their water supply as opposed to two per cent of urban households. On the provincial level, higher urbanization of Punjab seems to have resulted in even the rural areas of Punjab relying more on motor pumps for water pumping than any other province. Moreover, much of the population does not follow basic hygiene practices such as washing their hands with soap after using a latrine. As a result, water and sanitation related diseases spread and pose a major threat to the survival and development of children in Pakistan. Every year, an estimated 70,000 children under five die as a result of water, sanitation and hygiene related diseases, such as diarrhea, which amounts to about 17 per cent of the total deaths of children under five globally, not including neonatal deaths. Similarly 78 percent of urban households and 36 percent of rural households have an improved sanitation facility.

Figure 3.7: Sources of Drinking Water

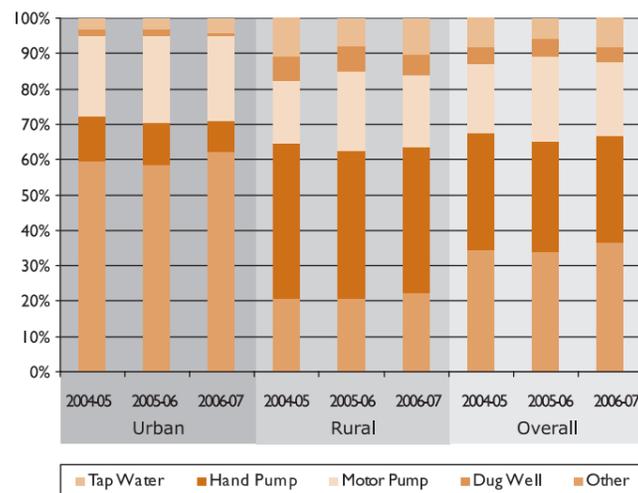
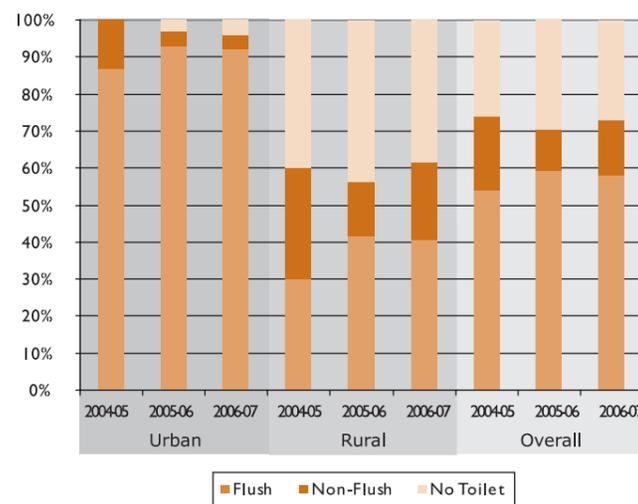


Figure 3.8: Sanitation Facilities



Type of Toilet used by the Household by Province and Region (Percentage)

	2001-02 PIHS			2004-05 PSLM			2004-05 PSLM (Redefined)		
	Urban	Rural	Overall	Urban	Rural	Overall	Urban	Rural	Overall
Punjab									
Flush	91	31	48	91	43	66	91	43	66
Non-Flush	2	2	2	2	7	5	1	3.5	2.5
No Toilet	7	68	50	7	50	30	-	-	-
Sindh									
Flush	91	17	48	88	17	51	88	17	51
Non-Flush	7	34	23	7	56	32	3.5	28	16
No Toilet	3	49	30	5	27	16	-	-	-
NWFP									
Flush	73	26	33	81	32	48	81	32	48
Non-Flush	23	38	36	13	36	28	6.5	28	14
No Toilet	4	36	31	6	32	24	-	-	-
Balochistan									
Flush	56	5	13	63	7	23	63	7	23
Non-Flush	38	39	39	33	48	44	16.5	24	22
No Toilet	7	57	48	4	45	33	-	-	-

Source: PSLM 2004-05; Table 4.8

Moreover, the leading cause of deaths in infant and children up to age 10 years age as well as mortality rate of 136 per 1,000 live births due to diarrhea is reported while every fifth citizen suffers from illness and disease caused by polluted water. Along with the source of drinking water, toilet facilities are a major indicator of a household's socioeconomic status and therefore the level of hygiene, sanitation and comfort available to an expectant or new mother, along with her newborn children. The type of toilet facility a household has access to directly reflect the quality of sanitation, which has a more direct affect on mortality than does socioeconomic status.

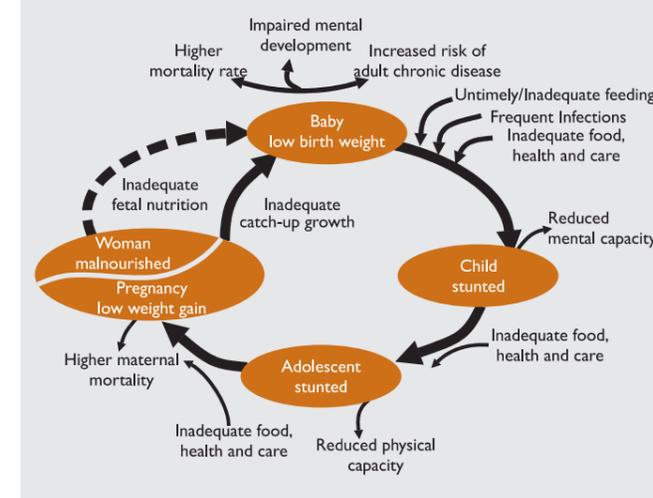
Households lacking hygienic toilet facilities have a higher risk of disease and infection, which in turn puts the health of newborn children, as well as their mothers, at risk. Eighty-nine per cent of urban and 26 per cent of rural households have access to flush toilets. Rural areas of Punjab are the most deprived where 68 per cent of households do not have access to any toilets. Only 14 per cent of Pakistani households have access to underground drains (45 per cent urban and one per cent rural), and 49 per cent of households (66 per cent of which are rural) have no access to any type of drainage system.

Table 3.4: Percentage of Type of Toilet Facility Used by Household Members (PAIMAN)

	Flush to Sewerage	Flush to Septic Tank	Flush to Open Drain	Raised Latrine	Pit Latrine	In Fields
Buner	4.3	24.3	1.4	17.6	14.6	35.2
Dadu	3.1	8.1	2.2	27.5	22.9	28.2
DG Khan	10.8	35.0	14.9	1.2	0.3	37.0
Jafferabad	0.1	7.4	2.6	6.6	19.8	63.4
Jhelum	18.2	42.7	0.2	0.2	9.9	28.7
Khanewal	7.0	59.5	3.9	0.5	1.6	27.5
Lasbela	8.6	28.7	8.2	0.4	3.5	50.7
Rawalpindi	44.6	37.2	3.4	0.5	2.0	11.5
Sukkur	15.4	15.9	16.8	3.2	18.0	27.0
Upper Dir	6.7	2.1	2.8	3.2	29.2	27.3

5. FOOD INSECURITY AND NUTRITION

Undernutrition: An Intergenerational legacy Poor Nutrition Throughout the Life Cycle



Source: Adapted from reference the ACC/SCN-Appointed Commission on the Nutrition Challenges of the 21st Century.

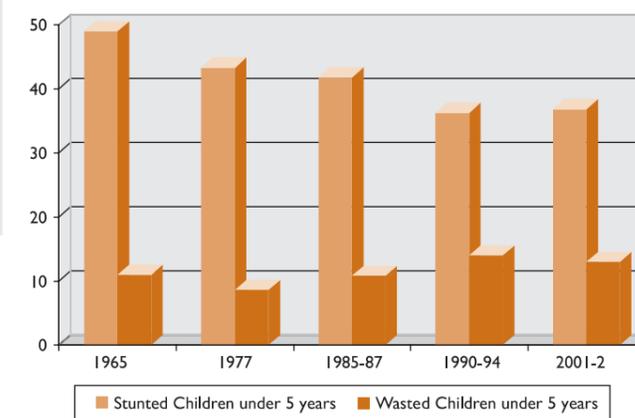
Good nutrition status for children and adolescent girls is fundamental for attaining many of the MDGs. Despite this, donors and governments under-invest in interventions to improve nutrition. In developing countries, growth in urban poverty, food insecurity, and malnutrition and a shift in their concentration from rural to urban areas will accompany urbanization [12].

Although large scale food shortages and famines are now uncommon, rates of maternal malnutrition in the region are among the highest in the world. These are reflected as overt malnutrition with low body mass index as well as widespread sub-clinical micronutrient deficiencies [13]. Maternal malnutrition has also been shown to be associated with fetal malnutrition, and estimates of intrauterine growth retardation in the region range from 25 percent to 50 percent. High rates of maternal malnutrition and LBW may also underlie the high burden of non-communicable diseases in adult life, such as coronary artery disease, hypertension, and diabetes. The nutritional status of children is a good indicator of the overall wellbeing of the society and reflects food security as well as existing healthcare and environmental conditions.

In Pakistan it is estimated that nearly 40 to 50 percent of children under age of five are stunted [6]. Household food insecurity has been identified as a possible underlying determinant of malnutrition.

Pakistan National Nutrition Survey 2001-2002 reported a prevalence of stunting of nearly 24 percent among children between ages of six and 23 months [14]. According to Pakistan National Health Survey, the prevalence of stunting among children under-5 was nearly 40 percent in household where all of the adult women are illiterate, but it decreased to 25 percent when at least one adult woman had completed at least 10 years of schooling [15].

Figure 3.9: Percentage of Stunted and Wasted Children Under-5 Years of Age From 1965-2002 in Pakistan



Source: Gateway paper 2 by Sania Nishtar

At present, 37 countries throughout every region of the world are experiencing localized food insecurity, lack of access to food, or shortfalls in food production or supplies. In Pakistan some assessment of household food security has been done of rural households but very little information is available on food security status of urban households. No assessment of food insecurity has been done yet on the basis of qualitative measures. The results of a study [12] show that food insecurity is highly prevalent (81 percent) among very low and low income households of the district central of Karachi. This observation is very important in terms of revising the assumption that people living in large cities like Karachi are not likely to go hungry. Particularly low income families residing in 'pucca' houses are not considered to be food insecure, only those living in slums are considered to be worthy of attention by various NGO's.

Over the last six decades, since its creation in 1947, Pakistan has made commendable progress in many economic and development indicators. Unfortunately the social indicators have not moved forward at the same pace, in particular, the nutritional status of mothers and children has remained largely unchanged

for the last 20 to 30 years. Despite self sufficiency in per capita calorie production and availability, macronutrient and micronutrient deficiencies continue to be serious health problems. This enormous burden of malnutrition and under nutrition is potentially preventable. Simple inexpensive tools like proper training of medical and nursing staff have been shown to make a significant difference in the perinatal and neonatal mortality rates [16].

Estimated total number of malnourished children in Pakistan was around a million, during 1990-2000, with iron and anemia deficiency being most prevalent; in fact one third of pregnant women in Pakistan are malnourished, giving birth to LBW babies (25 percent of all live births) [17]. It is generally assumed that rural households are more food insecure but the observations made in this study show that the lower income urban households in Pakistan are probably much more at risk of food insecurity than average rural households. Alderman et al [18] studied a representative sample of rural households from all the provinces of Pakistan and on the basis of per capita calorie availability, concluded that on average rural families were food secure throughout the year. In an earlier study [19] conducted in Karachi it was observed that children from higher and middle income group had better nutritional status than those from low income group did. In a review of relevant literature from Pakistan, Bharmal [20] also, identified unawareness of the mother about healthy behaviors, lack of decision- making power of women as possible causes of malnutrition. Low food intake during pregnancy is correlated with LBW infants; food taboos deprive women of protein and iron sources and in many cases women make a conscious decision to limit intake for fear of a large fetus resulting in obstructed labor and obstetric complications.

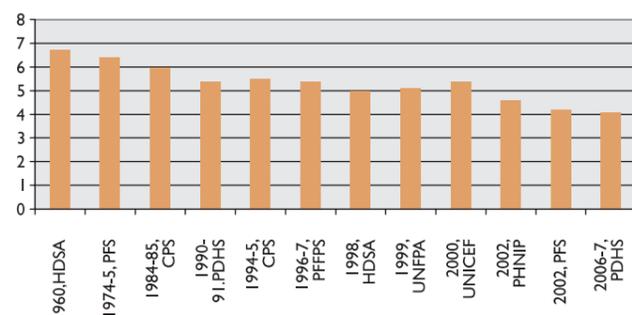
Gender differentials are established and perpetuated by women themselves at the breastfeeding and supplementation stages; female children are weaned earlier than males, and are given less supplementary food and health care, resulting in significantly higher mortality rates for female children from one to five years. Inadequate dietary intakes for female infants and children are precursors of the inferior social status they enjoy throughout their life cycle. Early marriage means early childbearing which adversely affects not only women's nutritional status but also her education and employment opportunities. Correlates of age at marriage include literacy, per capita income, urbanization and non-agricultural work; agricultural work has a

negative correlation with age at marriage in the sense that early marriage and agricultural work carry a double indemnity of high energy expenditure and frequent childbearing. Rapid childbearing is a known correlate of high infant mortality and child loss itself shortens the intervals between pregnancies, which in turn depletes the nutritional status of the mother. The compound effects of inferior education and employment added to early marriage, are increased by closely spaced births and elevated maternal and infant mortality.

6. FAMILY PLANNING AND CONTRACEPTION

The total fertility rate (TFR) in 1990-1991 was 5.4 lifetime births per woman, compared with TFRs of 6.0 in 1985, 6.5 in 1980, and 6.3 in 1975. However, the decline appear to have been substantial only among educated women and those living in urban areas [21]. In spite of many changes that has been done in respect to health care the country still lags far behind other countries of similar economic status. With 137 million inhabitants, Pakistan is the world's seventh most populous nation. According to United Nations projections, the population will grow to 285 million by 2050, at which time Pakistan will rank as the world's fourth largest country. The main reason for this huge projected increase and the rise in relative ranking is the slow pace of fertility decline. The level of childbearing started to fall in the 1980s, from about seven births per woman; for the period 1995 to 2000 it was estimated to be 5.0 births per woman, a value considerably higher than for other countries in the region (3.1 for India, 4.4 for Nepal, 3.1 for Bangladesh) [22]. Such high fertility rates are unsafe for both women and infants, as the risk of maternal and infant mortality rises with increased fertility.

Figure 3.10: Trends in Total Fertility Rate in Pakistan



Fertility decline in Pakistan finally began in the late 1980's and has proceeded rapidly at least through 2000, the most important evidence of fertility decline comes from the PDS, according to which at current fertility levels, a

woman in Pakistan will have an average of 4.1 children in her lifetime. Fertility rate also decreases further as the education level goes higher, as it is around 2.3 in women who had higher secondary education as compared to 4.8 in women with no education. TFR is also lower in women who belong to wealthier families as compared to poorer households which is 3.0 and 5.8 respectively [23]. It is encouraging that fertility and the population growth rate in Pakistan have finally begun to decline, but it should be pointed out that the fall in the growth rate since the late 1980's has only cancelled out the rise that occurred over the preceding decades.

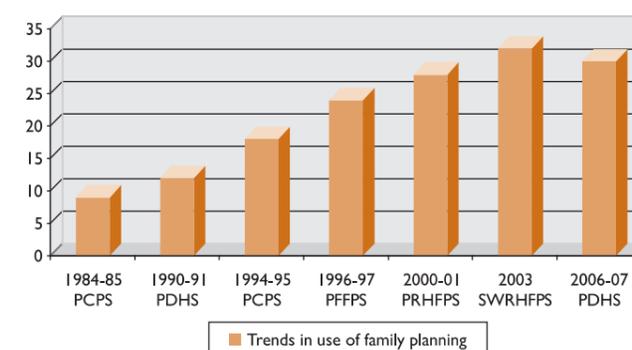
Table 3.5: Total Fertility Rate by Province

	Sindh	Punjab	Balochistan	NWFP
PDHS 2006-2007	4.3	3.9	4.1	4.3
PDS 2000	4.3	4.3	4.6	4.5

Family planning is an important issue for many developing countries worldwide, including South Asia. In Pakistan, despite a governmental program supporting family planning and despite the improvements over the last few decades, total fertility rate remains high (4.8 in 2000) and current contraception use remains relatively low (20 percent in 2000). In 2004, Pakistan had lower contraception use than most other Muslim countries. Marriage and childbearing affect women's nutritional status directly, as well as indirectly through associated socio-cultural norms and practices. They also affect women's education and employment, which exert considerable influence on household nutrition.

The 2007 Pakistan Demographic and Health Survey Preliminary Report indicates that almost 50 percent of families who have one child want to wait for two or more years before having the next child.

Figure 3.11: Percentage of Married Women Using any Method in Pakistan (PDHS 2006-2007)



Early marriage is another factor creating adversities for the female gender. Multiple pregnancies, prolonged breast-feeding, and usual household chores, never let a woman come out of the morbid state. A study on maternal risk factors showed that early pregnancy had put the adolescent mothers at stake for unwanted pregnancy and obstetric complications. In Pakistan there is lack of exposure of women to modern health facilities.

This is particularly true in rural areas where the government health facilities are under staffed and ill-equipped to provide obstetric care. At the district level where peripheral health facilities are relatively better staffed, women may have more opportunities to be exposed to government health services. It is estimated that only 12 percent of rural women receive prenatal care from trained provider. However 23 percent of women living within the walking distance of a peripheral health facility reported that they visited the facility at least once during pregnancy [24].

In Pakistan, contraceptive prevalence rate (CPR) also improved from 12 percent in 1991 to the reported levels of 36 percent in 2006, yet majority of women are unaware of different contraceptive methods available and induction of abortion is prohibited by law except to save the life of mother. Under the circumstances, many women facing problem of an unwanted pregnancy do resort to induced abortion usually by an unskilled person resulting in serious complications [25, 26].

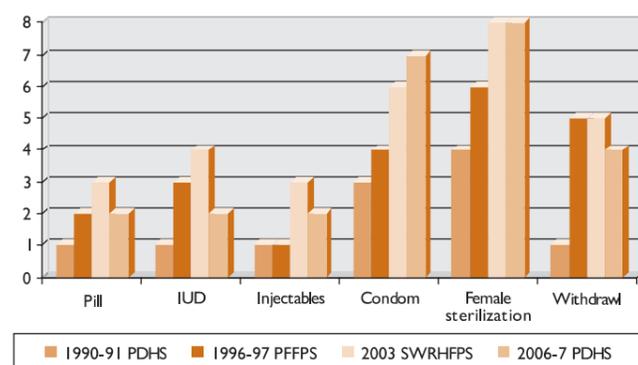
Table 3.6: Percent Use of Modern Method of Contraception by Residence, Education and Province (PDHS 2006-2007)

By Residence	Total	Total Urban	Major City	Other Urban	Rural
	22	30	33	26	18
By Education	No Education	Primary	Middle	Secondary	Higher
	19	26	27	26	31
By Province	Sindh	Punjab	Balochistan	NWFP	
	22	23	13	19	

Many women are unaware of the different types of contraceptives that may be used to delay or prevent pregnancy. As women do not always have full control over the number of children they want to have, contraception is an important tool that helps give women that freedom of choice. According to recent PDHS survey 96 percent of all women know at least one modern method of contraception. Sixty-four percent can name a traditional method of contraception. The modern contraceptive prevalence rate among married

women is two percent. Thirty percent use any method. Knowledge of modern contraception varied by method with 92 percent of the respondents aware of OCPs, 68 percent are familiar with condoms and 89 percent with progesterone injections. In comparison, the 2006-2007 PDHS reported that 22 percent of national sample, 30 percent of urban and 18 percent of rural sample uses modern method of contraception. Women in urban areas, and those with higher education, are more likely to use contraceptive methods. Forty-three percent of married women do not intend to use family planning in the future.

Figure 3.12: Trends in the Use of Family Planning (PDHS 2006-2007)



Among the correlates of age at marriage, female literacy is paramount, while other factors such as 'general' literacy, per capita income, level of urbanization, non-agricultural employment and mass media, are also important. At the state-level, women's participation in agriculture has a negative correlation with female age at marriage because higher participation rates are indicative of more "traditional" communities. Early marriage is tantamount to early childbearing because young married women are under considerable societal and familial pressure to "prove" their fertility [27]. Sixty-two percent of children in Pakistan fall into a high-risk category, with 38 percent in a single high-risk category and 24 percent in a multiple high-risk category. A higher risk is associated with births to mothers aged less than 18 years under the single high-risk category (relative risk of 1.8). In general, risk ratios are higher for children in a multiple high-risk category than children in a single high-risk category. The highest risk (2.2) is associated with births to mothers under age 18 that occur less than 24 months after a prior birth; however, less than one percent of births fall into this multiple high-risk category. Eleven percent of births in Pakistan occur after a short birth interval to mothers who have had three or more births, with these children 50 percent more likely to die in early childhood as children who are not in any high-risk category.

Table 3.7: High-risk Fertility Behavior

Risk Category	Births in the 5 years Preceding the survey		Percentage of Currently Married Women ¹
	Percentage of Births	Risk Ratio	
Not in any High-risk Category	20.5	1.00	19.0 ^a
Unavoidable Risk Category			
First-order Births Between Ages 18 and 34 Years	18.0	1.34	9.6
Single High-Risk Category			
Mother's Age <18	3.1	1.78	1.1
Mother's Age >34	0.8	1.13	4.5
Birth Interval <24 Months	12.1	1.14	10.2
Birth Order >3	21.6	0.99	13.8
Subtotal	37.7	1.11	29.6
Multiple High-risk Categories			
Age <18 and Birth Interval <24 Months ²	0.5	(2.24)	0.2
Age >34 and Birth Interval <24 Months	0.1	*	0.2
Age >34 and Birth Order >3	9.3	0.89	27.2
Age >34 and Birth Interval <24 Months and Birth Order >3	2.6	1.68	3.9
Birth Interval <24 Months and Birth Order >3	11.3	1.51	10.3
Subtotal	23.8	1.30	41.8
In any Avoidable High-Risk Category	61.5	1.18	71.4
Total	100.0	na	100.0
Number Of Births/Women	9,121	na	9,556

Note: The risk ratio is the ratio of the proportion dead among births in a specific high-risk category to the proportion dead among births not in any high-risk category. Ratios based on 25-49 unweighted cases are shown in parentheses while those based on fewer than 25 unweighted cases have been suppressed (*). na = Not applicable

¹ Women are assigned to risk categories according to the status they would have at the birth of a child if they were to conceive at the time of the survey: current age less than 17 years and 3 months or older than 34 years and 2 months, latest birth less than 15 months ago, or latest birth being of order 3 or higher.

² Includes the category age <18 and birth order >3

³ Includes sterilized women

Neonatal morbidity and mortality can be reduced by proper interventions i.e. screening and proper management of risk pregnancies [28]. It is a well established fact that infant and child mortality varies by the length of the preceding birth interval. The length of birth interval has a significant correlation with a child's chances of survival, with short birth intervals considerably reducing the chances of survival. As the birth interval gets longer, the mortality risk is reduced considerably. Children born less than two years after a prior sibling suffer a substantially higher risk of death than children with intervals of two or more years.

7. SOCIAL ISSUES AND WOMEN EMPOWERMENT

Pakistani women face social constraints in managing their own health and that of their children, although they are largely responsible for domestic management of health: preventing disease by good health and hygiene practices; recognizing illness early and providing home care; seeking medical care when needed; and interpreting and implementing medical instructions. In order to take effective care of their own and their children's health, women need to be well-informed and to be able to act quickly on their perceptions. Rural women and girls face the most stringent restrictions on mobility if they have to cross the settlement boundary to reach a health care provider. Another reason why women cannot quickly seek health care is that they are typically not empowered to make independent decisions: husbands and other male elders decide whether or not women may act on their perceived need for health care outside the home [5].

Empowerment by definition is "a process by which the powerless get greater control over circumstances in terms of both ideology and resources" [29]. The values of culture determine the role of women in its society and this phenomenon is global. World wide women play a vital role in raising children, caring for household members and running the home, in addition to their roles in the world outside the home. Situation of women in the world in general and in Asian countries like India, Pakistan, Bangladesh, and Nepal in particular, is not very satisfactory. In most of the Asian countries, the culture of patriarchy is deeply entrenched and gender biases are perpetuated by men and women as a part of the social order. Women empowerment through compulsory girls' education would be the most effective strategy to prepare them for a recommended age of marriage, planned and delayed pregnancy, and better motherhood [11]. There is rampant poverty, unemployment, ill health,

violence, widespread exclusion and discrimination in all walks of life. Even the basic minimum needs are not being sufficiently met. The women's access to health and education in almost all these countries is inadequate and discriminating. A complex web of cultural, social, and economic factors interacts to accord the women a low status. These factors and many more intersect with rigidly defined and enforced gender roles to create a vicious circle of discrimination and deprivation. And that is possibly the reason why the Asian women are still struggling for achieving the goals of women empowerment and development. However, the efforts of these countries to ensure equality, justice and empowerment have certainly made impact towards promotion of over all quality of life of women in terms of health, education, and employment apart from ending violence against them. Women are always considered subordinate to men, therefore they have a minimal say in matters related to marriage, pregnancy and family size.

In terms of United Nations Development Programme (UNDP) gender empowerment measurement, Pakistan lies 100th out of 102 countries which show that Pakistan has a long way to go with regard to promotion of gender equality and women empowerment. There are wide gender gaps which inhibit efforts to ensure gender parity. The country is off track with regard to ratio of girls' to boys' secondary enrolment which stands at 0.7 percent. It is also lagging behind in another MDG gender indicator: of women's share of paid non-agricultural employment which is only 10 percent. Sri Lanka has 40 percent, India's 18 percent and Nepal's 15 percent. The low social status of women results in a toll of unacceptable and preventable maternal deaths, one of the highest in South Asia. This certainly has severe repercussions on health in particular, and self-respect in general, of the women and their children. In countries of the region, women suffering from an illness report less frequently for health care seeking as compared to men [30]. Having a subjugated position in the family, women and children need to seek the permission of head of the household or the men in the family to visit health services [31]. The poor social status of women and lack of empowerment contribute greatly to lack of fertility regulation and burgeoning population growth rates [13]. It is high time we should invest in women's health and in the health of the future generations by taking good care of the girl child. Indeed girls who develop healthily, confidently, and are strong are more apt to have a safe motherhood and nurture their own children so they can reach their full potential. The deprivation this gender faces result in death, if not death,

poor health throughout life puts them at a greater risk during pregnancy and childbirth. Finally, it influences a girl's mental ability to manage motherhood. Moreover, it reduces self-esteem, which in turn renders them reluctant to demand improvements in maternal care [11]. Perhaps the biggest challenge facing Pakistan is improving the social status of women. It is universally recognized that this is a prerequisite for bringing about any positive change in the under-5 mortality rate and, in the long run, to significantly lower the maternal mortality ratio [9]. Nutritional deficit in women, especially during pregnancy, so prevalent in Pakistan is also a reflection of the low status of women in the country. Obviously the most ominous sign of women's low social status in Pakistan is the all pervasive violence against them in the country that are mostly justified on the basis of either religion or culture. Gender inequities can restrict women's access to health services in a variety of ways. Traditions in the family play a fundamental

role in developing a girl's physical, social and mental health status. Cultural values are embedded deeply in the family traditions making her access to health care limited and most of the time dependent on the family's decision [32]. Barriers imposed by the community play a primary role in opposing women's empowerment, resulting in poor health indicators. Disregarding girl's education restricting the decision making powers and the mobility of women and misinterpreting religious teachings are some of the many community instituted barriers. For example, a woman in labor may be unable to seek help if a male member of the family is absent. Support from the community in minimal or absent and social support systems are lacking. Such a situation can lead to the death of the mother or the child or to future morbidity [33]. Another factor inhibiting women empowerment and better health status is lack of support from husband's family.

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CHAPTER 4

CURRENT PROGRAMS ON MATERNAL AND NEWBORN HEALTH

I. INTRODUCTION

Pakistan is not only a signatory to the 1978 Alma Ata commitments but it is also obligated to make efforts to achieve the health and other goals identified and set in the MDGs 2000. MDG health related targets for Pakistan, to be achieved by 2015, are as follows: IMR to be reduced to 40, under-5 mortality to be reduced to 42, proportion of fully immunized children (12 to 23 months) to be raised to 90 percent, MMR to be reduced to 85, proportion of birth attended by skilled person to be 90 per cent, and contraceptive prevalence rate to be raised up to 90 percent. In Pakistan, each year, about 25,000 women die due to complications of pregnancy or childbirth, and at least 300,000 infants (including 160,000 neonates) die in their first year of life. High levels of maternal, neonatal and perinatal mortality are attributed to high fertility rates, lack of appropriate prenatal care, lack of skilled birth attendance, low levels of female literacy, malnutrition among women of reproductive ages, and lack of access to emergency obstetric and newborn care (EmOC).

The federal ministry of health (MoH) and provincial departments of health (DoH) are implementing a number of health interventions, which focus on addressing the challenges of maternal and child health. Pakistan has an extensive public health infrastructure, which consist of a network of more than 12,000 first level health care facilities and a range of disease-specific vertical public health programs. Most of the program based interventions are led by the federal government with implementation arms at the provincial and district levels. Some of the programs described are disease-specific such as the respective programmes on HIV/AIDS, malaria, tuberculosis, noncommunicable diseases and hepatitis. Others are specific to the lifecycle domain which include maternal and child health, the National Program for Family Planning and Primary Health Care, and National EPI program. This chapter describes the stakeholders that may advocate for or improve maternal and newborn health in Pakistan and their current linkages with each other, including the public sector (federal and provincial) and private groups (NGOs). We focus on current and planned programmatic responses

and policies that have an impact on newborn and maternal health. Finally, we characterize the priorities, plans, and activities of key NGOs, international organizations and bilateral donors.

2. NATIONAL PROGRAMMES

Pakistan has an extensive public health infrastructure, which consist of a network of more than 12,000 first level health care facilities and a range of disease-specific vertical public health programs. Most of the program based interventions are led by the federal government with implementation arms at the provincial and district levels. Some of the programs described are disease-specific such as the respective programs on HIV/AIDS, malaria, tuberculosis, non communicable diseases and hepatitis. Others are specific to the lifecycle domain which include maternal and child health, the National Programme for Family Planning and Primary Health Care, and National EPI programme.

a) National Programme on Family Planning and Primary Health Care

The program was launched in 1994 as the Prime Minister's Programme for Family Planning and Primary Health Care. Its name was changed to the National Programme for Family Planning and Primary Health Care (NP-FPPHC) in 2001. This program focuses on delivering essential primary healthcare services to the communities at doorstep through female community health workers, thus creating a link between the health system and the grassroots level, providing services to women who for cultural reasons cannot leave their homes. Ninety thousand female community-based health workers deliver preventive, maternal and child health and family planning services to women and children covering about 55 percent of the total population mainly in rural areas. LHW's attempt to bridge the gap between health facilities and the communities; after undergoing three months in house full time training and 12 months field cum class room training, each is attached to a first level care facilities (FLCF) from which they receive training and medical supplies; LHW's are supervised by a cadre of mobile female supervisors. Government of Pakistan being a signatory to Alma Ata Declaration 1978 showed its commitment and launched the Programme for Family Planning and Primary Health Care through the ministry of health in 1994. The total cost of the current PC-I (2003-2008) is Rs. 21.533 billion.

The program has had a positive impact on outcomes such as immunization coverage, prenatal care, and

attendance at delivery and contraceptive prevalence even after correcting for living in slightly better off areas with easier access to health facilities. The third evaluation in 2001/2002 showed that immunization coverage was 56 percent in LHW covered areas as compared to 38 percent in non LHW covered areas; similarly CPR in areas covered by LHW's was 30 percent as compared to 21 percent in non LHW areas. Since the last evaluation the program has been expanded from 38,000 to 90,000 LHW's and a follow up evaluation is underway.

Table 4.1: Programme Progress Indicators (as per 2005-2006 Annual Report)

Indicators	National	LHW's
Maternal Mortality Ratio	340	180
Infant Mortality Rate	77.9	50
Contraceptive Prevalence Rate	36%	38%
Tetanus Toxoid Vaccination (TT-2)	51%	57%
Ante-natal Care	43%	49%
Skilled Birth Attendance	31%	55%

b) National AIDS Control Programme

Pakistan is a signatory to the MDGs; Goal-6 of which states that Pakistan will "halt and begin to reverse the spread of HIV/AIDS" by the year 2015. The primary objective of National AIDS Control Programme (NACP) is to seek such a halt and reversal. To contextualize the project seeks to contain the epidemic among the most at risk group where it has established and prevent it from establishing among the bridge groups and the general population. Presently NACP and its provincial counterparts (Provincial AIDS Control Programs in Punjab, Sindh, Balochistan, NWFP and AJK) are implementing the interventions throughout the country. The principal components of the NACP are: (i) the interventions for target groups; (ii) HIV prevention for general public; (iii) prevention of HIV transmission through blood and blood products and; (iv) capacity building and program management. In addition, the NACP with Canadian support has established HIV and AIDS Second Generation Surveillance System (SGS) to track HIV epidemic in Pakistan. The reported cases of HIV are about 4000 HIV, and around 1,400 AIDS patients have been registered with AIDS treatment centers across the country since 1987. Out of these AIDS cases, 500 are on antiretroviral therapy and are also receiving treatment for AIDS related infections i.e. opportunistic infections and tuberculosis etc. Preventive Measures to halt the HIV epidemic are under implementation since 2003 and considerable achievement has been made since the adoption of preventive measures. HIV/AIDS prevalence is low among the general population (<0.05 percent), but is increasing rapidly in

high-risk groups. The United Nation categories Pakistan as a high-risk country for the spread of HIV/AIDS

c) National Tuberculosis Control Program

The National Tuberculosis (NTB) Control Program is responsible for overall tuberculosis (TB) control activities in the country i.e. policy guideline, technical support, coordination, monitoring and evaluation, and research. Where as the Provincial TB Control Programs are responsible for the actual care delivery process including program planning, training of care provides, case detection, case management, monitoring and supervision. The overall objective of NTP is to reduce mortality, morbidity and disease transmission so that TB is no longer a public health problem. The national targets are in line with the MDGs i.e. to cure 85 percent of detected new cases of sputum smear positive pulmonary TB and to detect 70 percent of estimated cases once 85 percent cure rate is achieved. A steady progress has been made from 2000 onwards to improve the case detection and treatment success rates. The commitment resulted in rapid expansion of the directly observed therapy (DOTS) strategy from 2000 to 2005, reaching DOTS-all-over in May 2005. Since then free diagnostic and treatment facilities for TB patients are available all over the country within the public sector health care delivery network. Presently, more than 1,200 diagnostic facilities and more than 5,000 treatment facilities are available throughout the country. NTP has treated more than 800,000 TB patients since 2001 and 234,100 TB cases were treated through the DOTS strategy last year. Case detection rate (CDR) has increased from seven percent in 2001 to 69 percent in 2007; whereas treatment success rate (TSR) has increased from 77 percent in 2001 to 87 percent. Pakistan has the 6th highest burden of TB disease in the world; although DOTS case detection and cure rates have improved significantly since 2000, and are on track to meet WHO targets for 2010.

d) Malaria Control Program

In Pakistan, malaria has been a major public health problem, threatening the health of the people due to prevailing socio-economic conditions and epidemiological situation. The transmission has been described as a combination of stable and unstable malaria with low to moderate endemicity. There is a tendency for epidemic break-outs of Malaria over a large area, particularly in Punjab and Sindh. The disease is now emerging as a prominent health problem in Balochistan and Federally Administered Tribal Areas, particularly along the international border. Malaria is the disease that inevitably

affects the poor segments of the population living in hot and humid far flung areas. These areas also lack good health care facilities and functioning diseases surveillance system, thus morbidity and mortality in most of the instances go unreported. Each year about half a million people suffer from malaria. Malaria control was initiated in Pakistan in 1950's and has passed through several evolutionary phases. In 1975, a malaria control strategy was adopted with provincial commitment to implementation and in 1998; Pakistan joined the global Roll Back Malaria (RBM) initiative. This led to the development of a five year RBM project in 2001 as part of which efforts were intensified in the 28 high –risk districts. More recently, a strategic plan for 2005-2010 based on the RBM strategy has been developed and a number of steps have been taken for its implementation. The program has shown process level success.

e) National Maternal Neonatal and Child Health Program

The National Maternal, Neonatal and Child Health (MNCH) Program aims to improve the maternal and child health indicators in the country in line with our International obligations regarding MDGs. The goal of the National MNCH Program is to reduce maternal, neonatal and child deaths and illnesses by improving their health status, particularly of the poor and the marginalized. The key objectives are to improve the accessibility of high quality and effective reproductive health (RH) services for all, particularly the poor and the marginalized, through development and implementation of a sustainable MNCH program at all levels of healthcare delivery system. The areas of focus in this program are strengthening the public health facilities (DHQs, THQs RHCs and in BHUs residents of LHWs) with regards to enhanced incentives for Human resource, provision of essential equipment, capacity building through trainings and availability of essential medicines with regards to providing comprehensive EmOC services. The program has been launched with following objectives in line with our international obligations with regard to the MDGs:

- To reduce the under-5 mortality rate to less than 65 per 1,000 live births by the year 2011 (MDG target for 2015:45/1,000)
- To reduce the newborn mortality rate to less than 40 per 1,000 live births by the year 2011 (MDG target for 2015: 25/1,000)
- To reduce the infant mortality rate to less than 55 per 1,000 live births by the year 2011 (MDG target for 2015:40/1,000)
- To reduce maternal mortality ratio to 200 per

100,000 live births by the year 2011 (MDG target for 2015: 140/100,000)

- To increase the proportion of deliveries attended by skilled birth attendants at home or in health facilities to 90 percent (MDG target for 2015:> 90 percent)
- Increase in contraceptive prevalence rate from 36 percent (2005) to 51 percent in 2010 and 55 percent in 2015

Pakistan faces significant challenges on maternal and neonatal health with low levels of skilled birth attendance, low antenatal and PNC coverage; low contraceptive use, high neonatal and infant mortality. The impact of the program will be assessed over time.

Table 4.2: Maternal Newborn and Child Health Program Budget

Program Budget	
Total Cost of the Program	Rs. 19,994.871 million
GoP Share	Rs. 12,404.871 million
DFID's Contribution	
Financial Support	Rs. 7,590.00 million
In Addition for Technical Assistance, Advocacy and Research	Rs. 2,310.00 million
Provincial / Regional Allocations	
Federal	Rs. 1639.63 million
Punjab	Rs. 8088.62 million
Sindh	Rs. 3246.47 million
NWFP	Rs. 2770.92 million
Balochistan	Rs. 2642.94 million
AJK	Rs. 698.39 million
FATA	Rs. 434.48 million
NA	Rs. 473.42 million

f) The Expanded Programme for Immunization

The program provides immunization coverage against vaccine-preventable diseases for five million children less than one year of age and pregnant women annually besides undertaking periodic immunization campaigns for other target groups. Over the last few years, the program has been organizing six to 10 nationwide supplementary immunization activities for polio with an average coverage of more than 97 percent during 2007 covering about 30 million children in each round at a cost of about US \$ 60 million per annum. The

program is credited with increasing the percentage of fully immunized children aged 12 to 23 months from 44 percent in 1995 to 76 percent in 2006-2007. In addition, women receiving TT during pregnancy has increased from 24 percent in 1995-1996 to 56 percent in 2006-2007. The program has led to a decrease in polio cases from more than 1,803 in 1993 to 32 in 2007; however, transmission of polio virus still persists and Pakistan still stands as one of the four polio endemic countries of the world.

g) The National Nutrition Programme

The National Nutrition Programme implements the national food fortification program (universal salt iodization, addition of vitamin A to edible ghee and fortification of wheat with iron and folic acid), and is mandated with the enforcement of the protection of Breast Feeding and Child Nutrition Ordinance. The exact contribution of the nutrition interventions is difficult to ascertain except for increasing vitamin A coverage as the program interventions mostly financed with external resources have been implemented intermittently. Pakistan continues to face nutrition challenges with the number of children stunted, underweight and wasted has remained relatively stalled at 36.8 percent, 38 percent and 13 percent, respectively and low coverage of micro nutrients e.g. use of iodized

salt remains low at 17 percent. These are indicative of the challenges the program faces in terms of its interdependence on the social determinants of health.

The following comparative nutritional status indicators are available to the National Nutrition Programme in targeting specific population groups and prioritizing its related activities:

Table 4.3: Nutritional Status Indicators

Indicator	PC-1/ NNS 1985-1987	Human Condition Report 2002	NNS 2001-2002
Low Birth Weight% (Less than 2500 gm)	25%	30%	
Wasting % (Low Weight for Height)	15.3%	11.7%	11.6%
Stunting % (Low Height for Age)	46.3%	61.9%	31%
Under Weight % (Low Weight for Age)	51.5%	44.6%	41.5%
Anemia (Children)	42%	42%	50.9%
Anemia (Women)	45%	60%	29.4%
Iron Deficiency Anemia (Children)			35.6%
Iron Deficiency Anemia (Women)		-	25.5%
Vitamin A deficiency (Children) (Serum Retinol Level)	-		12.5%
Vitamin A deficiency (Mothers) (Serum Retinol Level)			5.9%

Table 4.4: Current Government of Pakistan Programs with Components for Maternal, Newborn and Child Health and Survival

Program	Year Started	Main Objectives	Funding	Milestones	Gaps
National Programme on Family Planning and Primary Health Care a.k.a. "LHW Program"	1994	Provide basic health care to the rural communities at their doorstep. Bridge the gap between rural communities and static health services.	Funding for the LHW Program comes from the federal health budget.	In the 13 years since its inception, the program has been highly successful and has played a pivotal role in bringing down the under-5 and maternal mortality rates. According to current estimates, 96,000 LHW have been recruited and trained, covering a population of more than 50 million. This translates into 50 to 60 percent coverage, among the rural population, of community-based maternal and child health services offered through the LHW.	The main drawback of the LHW program is its charter to cater to rural populations only. This leaves out the often poorer urban slum dwellers, i.e. no LHW is active in urban squatter settlements. Other areas where female literacy is close to zero are also left uncovered, as there is no woman available who can meet the eligibility criteria to be trained as a lady health worker.
Population Welfare Program	1965	Provide reproductive healthcare services to the population. Create demand for and facilitate the supply of contraceptives.	Most of funding comes from the federal health budget. But some NGOs also contribute commodities and expertise to the program.	Over its 40 years, the program has been successful in bringing down the crude birth rate from around 45 per thousand to approximately 26 per thousand today.	Even though it is one of the oldest programs in the world, religious and cultural norms, as well as low literacy among women have been major impediments to the success of the program. Only 28 percent of women of reproductive age use contraception, most of them in urban areas.
Malaria Control Program	2001	Surveillance and control of malaria. Maintain a malaria information resource center which receives monthly morbidity reports from all districts.	Funding comes from the federal health budget and Global Fund for AIDS, TB and Malaria (GFATM)	Use of integrated vector control approaches Distribution of bed nets to pregnant mothers and children under-5 in 24 high risk districts Public awareness campaign for prevention and control of malaria.	Private sector data is not captured by the program leading to underestimation of the disease burden.

HIV/AIDS Control Programme		Control HIV/AIDS spread by creating awareness for safe behavior increased availability of services to prevent and treat STIs. Ensure safe blood transfusion services. Enhance capacity in public and private sectors. Establishment of treatment centers for HIV/AIDS patients.	Funding comes from the federal health budget and GFATM	Free treatment provided to HIV/AIDS patients in some districts of the country.	High risk populations are not being targeted. Hence, the prevalence of the disease has skyrocketed in these groups over the past 2 years. Social and religious taboos related to STIs hinder BCC strategies for prevention. The same prevent people from seeking care and treatment.
Expanded Programme on Immunization	1979	Protect children by immunizing them against measles, polio, DPT, childhood TB, and neonatal tetanus by vaccinating pregnant mothers.	Funding comes from the federal health budget.	The program has been instrumental in increasing the immunization coverage for these diseases, and the near eradication of the polio virus. Since 2002, hepatitis-B vaccine has also been included in EPI.	Immunization coverage, especially in rural areas is still dismally low leading increased child mortality and morbidity.
Maternal, Neonatal, and Child Health Program	2006	Improve the accessibility of effective maternal and neonatal health services. Reduce USMR to less than 65 per 1,000 live births. Reduce the NMR to less than 40 per 1,000 live births.	Funding comes from the federal health budget.	No milestones achieved as yet.	The program will focus on the rural areas just as the LHW program does; once again leaving the vulnerable urban slums uncovered.
Punjab Rural Support Program ²	1997	Help alleviate poverty and to this end enhance household income, empower and dis-empower and improve quality of life of the poor in the rural Punjab.	Government of Punjab	PRSP has introduced a habit of saving in rural men and women, from 1998-2007 communities have saved rupees 77.37 million which are deposited in their bank accounts for emergent needs. PRSP disbursed Rs. 952.64 million as credit for establishment or expansion of micro enterprises to 81 to 695 beneficiaries.	
Sindh Rural Support Program ³		To promote sustainable development in Sindh through community participation to reduce poverty. SRSP in its development programs gives importance to disadvantaged social groups and women such as haris (sharecroppers), small landowners and wage earners.	<ul style="list-style-type: none"> - Government of Sindh - Government of Pakistan - Action Aid - UNICEF - Pakistan Poverty Alleviation Fund - DTCE - UNDP - TVO - NCHD - BP Pakistan - Nippon Koei - Orangi Pilot Project - ASF - SIDA 		
Balochistan Rural Support Program ⁴	1991	The Balochistan Rural Support Programme (BRSP) is a non-profit organization, working in the geographically largest, and population wise smallest province of Pakistan. BRSP is focusing predominantly in the northern districts of Balochistan and one district in the south. The intense demand in various parts of the province for expansion of BRSP's programs is an encouraging indicator of its widespread acceptance by the rural poor, as well as of the enormous development potential that remains untapped.	Pakistan Poverty Alleviation Fund (PPAF).	Major programme components of BRSP include social mobilization, human resource development, credit and savings programme, enterprise development, community infrastructure schemes, basic health and girl's community based schools. BRSP's development programs are based on the principle of diminishing external financial support in conjunction with strengthening village organizations as the indigenous long-term vehicles for improving the quality of life of the disadvantaged rural population, especially women.	
Sarhad Rural Support Program ⁵	1989	Objective of replicating the "rural support	SRSP is registered as a non-profit, non-	In the last 14 years, SRSP has created an outreach to men and women	

		programme" approach to sustainable livelihoods and poverty alleviation, which had been successfully demonstrated in the northern mountain regions, to parts of the NWFP. The rural support programme approach emphasizes the need to address the issues of poverty at a scale, the need for working closely with the government to attain this objective and focuses on bringing all stakeholders on board to ensure ownership for the process of change that it catalysis.	government organization.	households. The total of 198,913 members in 11 districts involving 250 union councils are part of the building-up of the social capital. This social capital, after passing through varying stages of capacity building, is maturing and is making inroads as representatives into apex level institutions. There are many union, tehsil and district level bodies, which represent men and women community organizations at the grass roots, and are linked to the devolved governments and other donors for sustainable development.
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3. FOREIGN DONOR AGENCIES SUPPORTED PROGRAMS

NGOs are seen as major actors in the development sector; the many success stories of Pakistani NGOs, specifically in the development sector, are significant. However, a large number still remain poorly organized and require continuous support to exist. In general government policy has not been restrictive, major funding agencies like ADB, World Bank, JICA, CIDA, UNDP and DFID have increasingly demanded the involvement of NGOs and the private sector in the development process.

a) United States Agency for International Development

i) Pakistan Initiative for Mothers and Newborns
The Pakistan Initiative for Mothers and Newborns (PAIMAN) is a five-year program funded by the United States Agency for International Development (USAID). PAIMAN works with the Government of Pakistan on the implementation of the full spectrum of interventions necessary to address mother and newborn health, focusing on ten districts throughout Pakistan. At the outset of this project JSI, and the PAIMAN partners met with various stakeholders [MoH, provincial health departments, other donors and projects involved in maternal and newborn health (MNH)] to discuss PAIMAN's vision and strategies. From these discussions, a draft strategic framework was developed, which was translated into a work plan. While this framework guides the program's intervention planning, it is flexible enough to adapt to the major contextual changes and implementation issues that will occur. PAIMAN revisits this strategic framework on a yearly basis, at the occasion of our work plan formulation. PAIMAN is working to reduce maternal, newborn, and child

mortality in Pakistan, through viable and demonstrable initiatives and capacity-building of existing programs and structures within health systems and communities, to ensure improvements and strengthen links in the continuum of health care for women from the home to the hospital.

ii) Improved Child Health Project in FATA

USAID's three-year Improved Child Health in FATA program is delivering a health package for children under the age of five, covering inoculation, prevention and treatment of respiratory infections and diarrhea, and newborn care and nutrition services. Through the program, USAID trains health care providers, improves community knowledge and attitudes towards child health and helps improve access to quality health services across all seven agencies and six Frontier Regions. In addition, 174 agency-based LHWs have received training for better identification of child health illnesses at the community level. Community members have learned to convey messages regarding child health and its importance in 143 sensitization meetings. At seven tertiary care hospitals, the project has established staff learning centers and has improved medical stores, including child play areas in the hospital compounds. Improvements to child and infant wards along with upgrading of first-level care.

b) The United Nations Children's Fund (Maternal and Child Health Program)

UNICEF Country Programme 2004-2008 has been extended to 2010 to align with five year Government of Pakistan, Medium Term Development Framework. In the years 2009-2010, the Maternal and Child Health Programme of UNICEF will focus on supporting Pakistan to achieve MDGs one, four and five which appear to be most difficult to achieve for Pakistan. The programme will make all efforts to support the operationalisation

and monitoring and evaluation of the 2007 MNCH policy. Eradication of polio continues to be a key goal together with achieving universal immunization against measles and other vaccine preventable diseases. The main partners for programme implementation will be WHO and UNFPA, together with the MoH.

c) Joint United Nation Programme

Pakistan is one of the pilot countries for Joint United Nation (UN) programming. The UN system can provide a harmonized response to support the government efforts for achieving goals of maternal, newborn and child survival. It presents as an opportunity for improving linkages between various national programs of LHW, EPI, Nutrition and Ministry of Population Welfare. The MNCH component in the one UN joint programme on Health and Population focuses on 18 disadvantaged districts to strengthen the implementation of National MNCH Programme and provide innovative approaches to address challenges of remote areas and poor service delivery infrastructure. The MNCH component will be launched in two districts in NWFP, Punjab and Balochistan provinces; one each in AJK and FANA; and 10 most vulnerable districts in Sindh province. There is an increasing thrust on engaging not for profit and none government organization (NGO) sectors and addressing demand side issues by a comprehensive community mobilization and Behaviour Change Communication activities. This component will benefit a total population of about 23 million with 3.5 million children under five and 0.7 million pregnant women per year.

The JP MNCH component has a goal of significantly meeting the MNCH and family planning and reproductive health needs of the population, especially the poor and the underserved by 2010. The programme outcomes include implementation of strategies for integrated MNCH and family planning and reproductive health services, improving community demand and participation and inter-sectoral linkages and improving nutrition status especially of infants, young children and child bearing and lactating women. UNICEF, WHO, UNFPA and WFP are the participating agencies in the MNCH JP component. These agencies will commit 80 percent of their resources to this programme. The Government of Norway has also pledged its support to the joint programme through Norway Pakistan Partnership Initiative (NPPI) in 10 districts of Sindh. The implementing partners will be Ministries of Health and Population Welfare, professional societies and NGOs.

d) United Nations Population Fund

According to the United Nations Population Fund’s (UNFPA) Sixth Country Program, assistance will be delivered through three subprograms focusing on reproductive health (RH), population and development strategies, and advocacy. The RH subprogram aims at improving the quality and increasing the use of RH information and services, particularly in the rural areas and among younger couples; enhancing institutional capacity to manage and implement RH programs; and increasing the involvement of men in matters pertaining to RH and responsible parenthood. In collaboration with UNFPA, the MoH has launched its first ever research project to test a package of health services interventions for reducing maternal mortality in rural areas, this project is called promoting interventions in safe motherhood (PRISM) and aims at training senior LHW’s in midwifery techniques along with other community based interventions and strengthening of obstetric care services at the district and tehsil hospital and primary health facilities.

e) Pakistan Voluntary Health and Nutrition Association

Pakistan Voluntary Health and Nutrition Association (PAVHNA) established in 1979 is the umbrella for a consortium of twenty eight local NGOs and community based organizations (CBOs) throughout Pakistan. Since 1991, PAVHNA has been one of the pioneer organizations in implementing the community based distribution (CBD) project in different communities. Currently it is working with seventeen local NGOs/ CBOs to implement the community based reproductive health project in three provinces of Pakistan covering a population of 2.3 million. The most important aspect of this partnership is PAVHNA’s role in capacity building of NGOs in technical, financial and programmatic detail of RH projects.

f) Asia Foundation

Balochistan Safe Motherhood Initiative (BSMI) is an operations research study of the Asia Foundation, which has developed and tested a package of community-based interventions to reduce maternal mortality in the Khuzdar, Balochistan. Preliminary results suggest that providing focused health education to women and husbands, training dais in recognizing and referring obstetric emergencies, and setting up transport and telecommunication systems can significantly reduce perinatal, neonatal and maternal mortality.

g) Saving Newborn Lives (Save the Children)

Saving Newborn Lives, supported by the Bill & Melinda Gates Foundation, is a 15-year global initiative to

improve the health and survival of newborns in the developing world. Saving Newborn Lives works with governments, local communities and partner agencies in developing countries to make progress toward real and lasting change in newborn health. It also play an important role in helping the Government of Pakistan, NGOs and international agencies address the problems of maternal and newborn health. Saving Newborn Lives is a key component of Every Mother/Every Child, Save the Children’s global effort to improve the well-being of mothers and children in developing countries. Through this effort, Save the Children is helping to ensure that every mother has access to education, adequate nutrition, maternal and child health care, and economic opportunities so that she and her children can survive and thrive.

h) Positive Deviance

Positive Deviance (PD) is working in the rural district of Haripur, Pakistan, to improve practices surrounding pregnancy, delivery and the neonatal period. Positive Deviance has allowed Saving Newborn Lives (SNL) to mobilize communities for behavior change, identify people who are able to carry out positive practices, and to identify pre-existing enablers of positive behaviors. In June 2002, community norms surrounding pregnancy and delivery were determined through a baseline

survey (of 84 women who had delivered in the last nine months) and focus discussions with mothers, fathers, parents-in law, and traditional birth attendants. In addition a Positive Deviance inquiry was done with 18 mothers whom, in the survey, had reported uncommon successful practices.

From 2002 to 2004, under its SNL initiative, Save the Children piloted the use of the Positive Deviance approach to improve maternal and newborn care in six villages. The impact of the pilot project which lasted less than a year in each village, resulted in the following change in practices regarding maternal and newborn care:

- A significant increase in prenatal check-up (two or more ANC visits) by pregnant women (from 44.7 percent to 62.5 percent)
- An increase in delivery preparedness by the family with saving money (from 45.4 percent to 62.3 percent) and arranging for transport (from 22.3 percent to 48.1 percent)
- Increase in percentage of deliveries attended by SBAs (from 34 percent to 46.8 percent)
- Increase in the use of a new blade to cut the cord (from 19 percent to 33 percent)
- Dramatic decrease of use of pre lactate (gutti) (from 70.4 percent to 25 percent)

Table 4.5: Current Foreign Donor Agency and NGOs’ Supported Programs with Components for Maternal, Newborn and Child Health and Survival

Program	Year started	Main objectives	Funding	Objectives / Milestones
USAIDA) Pakistan Initiative for Mothers and Newborns (PAIMAN).	2003	Build the capacity of the existing health system and fostering a community-based approach to ensure a continuum of care for mothers and newborns To reduce the neonatal mortality rate/increase in proportion of live births assisted by SBA.6	Funding for the program come from USAID	Up until January 2006, PAIMAN had spent US\$ 2.9 million on various activities aimed at improving maternal and newborn health in the 10 districts.7,8 Most of these funds were spent on strengthening the existing health systems infrastructure to provide comprehensive EmOC and promoting the use of clean delivery kits during at-home births.
b) Improved Child Health in FATA	2006	Over the next three years, the program will reach more than 1.61 million adults and more than 246,000 young children in FATA. Through the program, USAID trains health care providers, improves community knowledge and attitudes towards child health and helps improve access to quality health services across all seven agencies.	USAID; Save the Children Foundation (implementing partner).	The program moves prevention and care services for children out to the community through “child health days,” which are events designed to build long-term links between community members and their local health facilities Through 697 child health days, the project provided 131,068 children (63,931 boys and 67,137 girls) with medical care, vaccinations and nutritional support. The numbers of children that benefited from specific services were 72,864 treated for acute respiratory infection (ARI), 9,437 for diarrheal diseases, 7,864 for malnutrition, 11,000 provided essential newborn care (ENC), and 29,903 vaccinated against diseases. The program also strengthens agency headquarters hospitals, local health facilities, and agency health management teams that are working to achieve visible improvements. To date, 522 health providers have received training in newborn and child health care and are now better prepared to deliver high-quality health services.

DFID	The current Country Assistance Plan was implemented in 2005	Increased incomes for the poor; improved delivery of education and health and population services to the poor. ⁷	Funding for the programs under the DFID banner comes from the British government.	Disbursement of £37.5 million from DFID's £60 million support to Pakistan's National Health and Population Welfare Facility. US\$10 million to Pakistan's Polio Eradication Program. £2.75 million in support to the Devolution Trust for Community Empowerment to help create an enabling environment for citizen participation and community empowerment in all union councils of Pakistan, with special focus on empowerment of women. Continuation of support to some of the poorest and most marginalized communities in Pakistan by extending £1.3 million to provide basic health care near the Line of Control in Neelum Valley, an area also affected by the earthquake. An additional £8.9 million has been allocated in support of micro finance programs. The Kashf Foundation manages a micro finance scheme for women and has helped 50,000 women during the last 3 years.
UNICEF		Improve child health Advocate for rights for children	Funding for the different programs under the UNICEF umbrella comes from the United Nations.	In 2005, four million children received measles immunizations and vitamin A supplements. A massive polio-eradication campaign has reduced the number of cases to a couple of dozen every year. UNICEF's advocacy efforts have also been successful in convincing the Pakistani government to allocate nearly US\$90 million for water and sanitation projects over the next five years. Sixty-one medical facilities have been upgraded to treat women with obstetric complications, and thus save maternal and newborn lives. A national nutrition strategy has also been approved by the Ministry of Health under UNICEF auspices, to improve the nutritional status of women and children ¹⁰
UNFPA	Seventh and current Country Program started in 2004	Help couples achieve their desired family size Improve maternal health	Funding for the different programs under the UNFPA umbrella comes from the United Nations.	UNFPA's assistance is currently concentrated in ten districts, where the emphasis is on the provision of family planning services. At the provincial and federal level, the Fund's activities are directed towards planners and policy makers, as leading advocates for ICPD, ensuring that population-related issues, including reproductive health and gender are part of the federal government's poverty reduction strategies. ¹¹
Green star ¹²	1991	To improve the quality of life among people throughout Pakistan by increasing access to and use of health products, services and information, particularly in the lower socio-economic population groups	<ul style="list-style-type: none"> PSI Government (MoPW, MoH) Donors (USAID, DFID, UNFPA , Packard, KfW) Implementing Partners (PAVHNA, Population Council, Save the Children.) 	<p>GSMP's vision is to deliver high quality, affordable and integrated FP/RH services on a nationwide scale, for this purpose a network of Green star (Subz-Sitara) franchise was launched in 1995 to complement the condom social marketing program and is now recognized as one of the largest private sector RH social franchise networks in the world. This model was designed to address the following circumstances in Pakistan:</p> <ul style="list-style-type: none"> Significant FP/RH needs Limited public sector capacity to respond to these needs Underutilized private sector capacity to provide FP/RH services Low levels of FP/RH knowledge and skills among private sector health workers, and absence of continuing education opportunities <p>At the end of the fiscal year 2005-06, more than 16,000 private health care providers including over 3,000 lady doctors, and above 13,000 other health care providers including male doctors, paramedics, general practitioners from other medical disciplines such as homeopathy and eastern medicine and pharmacists are registered on GSMP health care providers network. Green star Social Marketing is a consortium partner for the Pakistan Initiative for Mothers and Newborns (PAIMAN) a five-year project, funded by the United States Agency for International Development (USAID). Green star is responsible for introducing innovative private sector approaches to the program including public- private partnerships. Green star has also established auxiliary linkages with local blood banks and transporters in PAIMAN districts to provide timely and affordable services during deliveries. Having achieved significant progress in building the country's network of private "trustworthy family planning service providers," in 2005 Green star launched a broader network of private "family healthcare providers" under the brand name "Good Life." The Good Life portfolio addresses a broader spectrum of family health needs – including Maternal and Child Health issues such as Safe Water, Nutrition, Malaria, and Infectious Diseases such as HIV and TB.</p>
Marie Stopes Society (MSS) ¹³	1990	Offer services regarding Family planning; health screening; HIV/ STIs; maternal health; primary health care; post abortion care; refugees/IDPs; social marketing; young people; advocacy	District Government in Sukkur, OMV and Shell (tri-partite agreement) UK Department for International Development (DFID); European Community; The David & Lucile Packard Foundation; The Ernest Kleinwort Charitable Trust; Direct Relief International; US private institutions	The LHW Programme – 20 percent of the LHW's referrals are directed to MSS centers for services GFATM – MSS has been identified/selected by the MoH to work in partnership with local CBOs and NGOs to provide Voluntary Counseling and Testing services for HIV/AIDS and STDs. MSS together with the Khairpur local district government has up graded the Thari Mirwah Taluka Rural Health Centre to a 24-hour obstetric unit. Shell Pakistan – supports two MSS centers (Multan and Peshawar) – an evidence of their commitment towards corporate social responsibility and to MSS' cause of providing reproductive health services to the people in Pakistan. OMV - an Austrian energy exploration company - and MSS have started work together on a project to provide safe motherhood services to the Salehpat and Milano (Sindh) communities and their surrounding scattered clusters of populations. MSS is running of the mother and child health center in Salehpat where basic emergency obstetric care services and cesarean sections will be provided and referrals made to the nearby Sukkur hospital for tertiary care. The project involves the cooperation of the local government. MSS has piloted integration of HIV/AIDS and family planning services in two of its service delivery centers in Hyderabad and Gujranwala, respectively.

				The service entails identification of 'high risk behaviors' amongst the general population visiting the centres and referral for voluntary counseling and testing services. The initiative reaffirms MSS' commitment of providing accessible comprehensive reproductive health care.
PAVHNA	1979	PAVHNA (Pakistan Voluntary Health and Nutrition Association) is an umbrella body with over 40 NGOs and CBOs (small community based organizations) as its members, working in the development field in Pakistan		PAVHNA was originally set up with the objective of improving the nutritional and related health and socio-economic status of the most disadvantaged sector of society - women and children. PAVHNA is responsible for PAIMAN's community mobilization activities in the Sindh districts.
Save the Children (Save newborn lives initiative) ¹⁴		Saving Newborn Lives, Save the Children's newborn health program is an 11-year project to reduce newborn deaths and improve newborn survival in high-mortality countries. The program currently works with partners, governments and communities in Ethiopia, Ghana, Malawi, Mali, Mozambique, Nigeria, South Africa, Tanzania, Uganda, Afghanistan, Bangladesh, India, Indonesia, Nepal, Pakistan, Vietnam, Bolivia and Guatemala.	Bill and Malinda Gates Foundation	Save the Children (SC) works in districts which have some of the lowest education statistics, including Batagram in North West Frontier Province and Killa Saifullah in Balochistan. SC has also helped open schools that have been closed, initiate school repair and construction projects and have trained and mobilized school management committees to implement over 1,400 school improvement projects. Large-scale initiatives define SC's health portfolio. SC mobilizes communities to address local health needs and build the capacity of health care providers. The multi-year Saving Newborn Lives program, seeks to reduce child mortality while developing and promoting replicable, sustainable child health strategies. Through the Pakistan Initiative for Mothers and Newborns project (PAIMAN), we are building the capacity of health providers in ten districts and mobilizing communities in six districts. And through a new project in the remote Federally Administered Tribal Areas (FATA), SC is improving child health services by strengthening providers of care and raising local awareness for the need for child health care. In partnership with Asasah, a local micro-finance institution, Save the Children provides poor families with access to microfinance services and ensures that credit is given directly to the female head of the household, allowing her greater say in the family's finances.
Positive Deviance Initiative ¹⁵	2000	Positive Deviance (PD) is working in the rural district of Hairpur Pakistan to improve practices surrounding pregnancy, delivery and the neonatal period. Positive Deviance has allowed Saving Newborn Lives (SNL) to mobilize communities for behavior change, identify people who are able to carry out positive practices, and to identify pre-existing enablers of positive behaviors. Save the Children (SC) has applied the PD approach to developing and implementing programs designed to improve health outcomes in other countries, including Bolivia, Egypt, Ethiopia, Haiti, Mali, Mozambique, Myanmar, Nepal, and Pakistan. Positive Deviance initiative in Hairpur had the following objectives:	Saving Newborn lives initiative	<p>From 2002 to 2004, under its SNL initiative, Save the Children piloted the use of the Positive Deviance Approach to improve maternal and newborn care in six villages. The impact of the pilot project which lasted less than a year in each village, resulted in the following change in practices regarding maternal and newborn care:</p> <ul style="list-style-type: none"> A significant increase in prenatal check-up (two or more antenatal care visits) by pregnant women (from 44.7% to 62.5%) An increase in delivery preparedness by the family with saving money (from 45.4% to 62.3%) and arranging for transport (from 22.3% to 48.1%) Increase in percentage of deliveries attended by skilled birth attendants (from 34% to 46.8%) Increase in the use of a new blade to cut the cord from 19% to 33%. Dramatic decrease of use of prelactate (ghutti) from 70.4% to 25% <p>More importantly, through the community mobilization process, the husbands' role and attitude towards maternal and newborn care underwent a radical change as well as mothers-in-laws, resulting in a new openness about maternal and newborn care issues and the community's ability to address them in a sustainable way</p>

TB DOTS	2001	The National Strategic Plan envisions countrywide DOTS coverage by 2005 and steady progress is being made toward this goal. The government is implementing the DOTS programme mainly through the public sector infrastructure, though the national strategic framework considers the private sector to be a major partner in TB control. The Ministry of Health began implementing Directly Observed Therapy, Short-Course (DOTS) in 1995, with Balochistan as a pilot province. Between 2000 and 2004, DOTS coverage increased in Pakistan from 9 to 79%. As the DOTS program expands, the quality of treatment must also improve. Treatment success was just 75% in the 2003 cohort, but a high proportion of patients were not subject to follow-up. The steep rise in the number of TB cases reported each year since 2000 represents improved case registration under DOTS. Despite progress over the past five years, the case detection rate for Pakistan was estimated to be only 27% in 2004, well below the target of 70%. In 2001, the government declared TB a national emergency, which led to a TB budget increase from \$1.65 million in 2001 to \$26 million in 2006. In addition, the National TB Control Program (NTP) has received a \$1.5 million grant from the Global TB Drug Facility	The MoH has established an IACC (NICC) with WHO and IUATLD as principal technical collaborators. CIDA, DFID, GLRA, JICA, and the Aga Khan Foundation support DOTS implementation and expansion. Major international funding partners are the World Bank, DFID, CIDA, GLRA, JICA, USAID, EU, and others funding SAPP II. The GDF provides anti-TB drugs, and Pakistan has been awarded a GFATM grant to strengthen public-private partnerships.	The NTP budget for the fiscal year 2003 (from 1 July) is US\$ 5.9 million. The government will provide US\$ 2.6 million of the required funding with additional support coming from USAID. The NTP does not expect a funding gap for 2003. In 2003, Pakistan was awarded two grants from the GFATM for TB control activities. The first will support core DOTS expansion efforts coordinated by the Ministry of Health. The second project is a NGO-led initiative designed to stimulate public-private collaboration for further DOTS expansion. While neither of these grants has been disbursed, the total budgets for the first 2 years are US\$ 2.3 million and US\$ 6.8 million respectively. Government contributions to TB control that are not included in the NTP budget are estimated at US\$ 2.2 million, bringing total TB control costs to US\$ 8.1 million. Fifty-nine percent of the total costs are funded by the government. USAID's assistance and the support of other partners for the NTP have contributed to the following improvements in TB control in Pakistan: <ul style="list-style-type: none"> • Attained 100% DOTS population coverage in May 2005 by expanding DOTS activities in the public primary health care network • Increased the treatment success rate to 82% in 2005, close to the global target of 85%, with a doubling of detected TB cases from 73,497 in 2003 to 141,741 in 2005 • Supported the development and utilization of technical guidelines for TB control • Supported the laboratory network and initiated external quality assurance guidelines • Collaborated with ongoing programs, particularly the Lady Health Worker program, in sharing technical resources.
Hope (Health Oriented Preventive Education)		NGO (non-governmental organization) based in Karachi, Pakistan working towards Community Development, comprising of professionals (Doctors, Social workers, Educationists) as well as grass-root workers.	Donors: <ul style="list-style-type: none"> • Provision of Safe - Drinking water - Centre for Diseases Control (CDC), Atlanta and Procter and Gamble. • Measles Surveillance Project - UNICEF • Vitamin A Supplementation Programme - UNICEF • Home - Schools and MCH Center - SSGA - Embassy of Japan. • Community Health Center - Mujahid Colony - Consulate of Germany. • Multipurpose Community Center in Zia Colony - Embassy of Japan. • Women Health Project: Asia Foundation 	HOPE in collaboration with Asia Foundation has embarked upon a project to improve women's health in the peri urban and rural areas adjacent to Karachi. The area comprises of a population of 100,000 in small squatter settlements of villages. The area extends from Drassano Channo to Thatta to Dhabeji to Gadap to Kathore. Basic infrastructures including health facilities are minimal. This project is a prototype of the Balochistan Safe Motherhood Initiative (BSMI) in Sindh. HOPE is working at the community level involving women groups, Traditional Birth Attendants and Lady Health Workers. HOPE is also working on all its sites to promote Family Planning. Community motivation involves breaking the barriers at the community level to promote FP. HOPE is also improving health awareness on HIV/AIDS. This is done in collaboration with community youth. In addition, an ongoing project with Nagoya University, Japan comprises of HIV testing in mothers, pregnant women and drug users.
Population Council (Safe Motherhood Applied Research and Training Project in Pakistan)	2002-2006	SMART Project Objectives: <ul style="list-style-type: none"> • To empower women to take decisions and make choices regarding their own reproductive health and to provide knowledge on safe motherhood issues including nutrition, prenatal care, obstetric danger signs, safe delivery practices and family planning. • To mobilize and organize community resources to facilitate better utilization of existing reproductive health services particularly emergency obstetric care. 	Funded by European Union.	The findings from this project are encouraging in terms of improving understanding about which interventions might improve the three delays that women facing obstetric emergencies experience in the Pakistan. The overall results suggest that the community-based interventions do have a demonstrable positive effect on maternal and neonatal health behaviors and outcomes. In a relatively short period of time of three years, the project results suggest that addressing all three delays is the best approach to addressing the problem of maternal and neonatal mortality and morbidity in Pakistan. There are several main outcomes to highlight in terms of results. The first is that the data shows a statistically significant decline in perinatal mortality concentrated in the CBI+HSI intervention site. The second is that the LHW trainings seem to have had positive effects on women's knowledge, and dai training has had positive effects on their knowledge and practice. Third, attendance in the support groups is associated with improved knowledge and

		<ul style="list-style-type: none"> • To improve the quality, availability, and accessibility of reproductive health services • To introduce a behavioral change in the manner providers assess the needs of their clients and through a process of enforced information exchange meet their identified needs. • The principal objective of the SMART project was to test the hypothesis that reducing the first, second, and third delays, through a concerted effort, is significantly more effective than reducing just the third delay alone. 		<p>practice in several areas. Knowledge of danger signs during pregnancy and the neonatal period, based on unprompted response, suggests an improvement in knowledge in the CBI+HSI site. Finally, changes in behavior, based on the KAB (knowledge, attitudes and behaviors) survey results, suggest that addressing all three delays is the best approach to addressing the problem of maternal and neonatal mortality and morbidity in Pakistan. There are several main outcomes to highlight in terms of results. The first is that the data shows a statistically significant decline in perinatal mortality concentrated in the CBI+HSI intervention site. The second is that the LHW trainings seem to have had positive effects on women's knowledge, and dai training has had positive effects on their knowledge and practice. Third, attendance in the support groups is associated with improved knowledge and practice in several areas. Knowledge of danger signs during pregnancy and the neonatal period, based on unprompted response, suggests an improvement in knowledge in the CBI+HSI site. Finally, changes in behavior, based on the KAB (knowledge, attitudes and behaviors) survey results, demonstrate some improvement in skilled birth attendance, the use of clean delivery kits, and early initiation of breastfeeding in the CBI+HSI site.</p> <p>The SMART project succeeded in implementing a community level project in the CBI+HSI area of considerable intensity, with particular focus on community education and training of community providers, i.e., dais and LHW's.</p>
Asia Foundation (Balochistan Safe Motherhood Initiative)		Aimed to develop and test community based interventions to reduce maternal morbidity and mortality in rural Khuzdarin Balochistan.		Balochistan Safe Motherhood Initiative (BSMI) Tested community-based interventions to reduce maternal and neonatal mortality in the remote rural district of Balochistan. The project developed a set of community-based programs that included education to increase awareness of maternal and neonatal health among families and communities; training for traditional birth attendants in safe delivery and in early recognition of danger signs of maternal and neonatal complications; and the organization of communities to establish transportation and telecommunication systems to facilitate early transfer of emergencies to hospitals. Baseline and follow-up surveys demonstrated that the project significantly improved maternal and child health.
Norway-Pakistan Partnership Initiative (NPPI) ¹⁶		The aim of the Norway-Pakistan Partnership Initiative (NPPI) is to provide catalytic support towards the implementation of national, provincial and district plans to improve the maternal newborn, and child health (MNCH) of poor and socially excluded people in Pakistan. The purpose is to increase provision of and access to MNCH interventions for the poor and socially excluded in Sindh Province, as well as to raise demand and utilization for those services. Some important underlying principles are: <ul style="list-style-type: none"> • Provide catalytic and strategic support to strengthening health systems efforts (e.g. human resources, referral system, etc) aimed at accelerating activities under national MNCH policies, plans and strategies. • Use of innovative and flexible result based financing approaches to improve effectiveness and productivity of quality MNCH care provisions and increase demand and utilization of care. 	The Norwegian government will provide a grant of (NOK) 250 million (approximately USD 50 million) for the five year period 2008-2012, that is NOK 50 million a year (USD 10 million).	Building on the first mission to Islamabad conducted during 27-30 April 2006 and discussions held between Prime Ministers of Norway and Pakistan in Islamabad in December 2005, as well as during President of Pakistan's visit to Norway in January 2006, it has now been decided to develop and implement the Country Partnership Programme (NPPI) that will commence in full in 2008. Following these meetings several visits and dialogues have taken place between Norway and Pakistan since the development of the Norway Pakistan Partnership Initiative (NPPI) Platform for Dialogue in February 2007. This proposal builds on and incorporates recommendations made by partners in Pakistan during a Logical Framework Approach workshop held in Islamabad from 23-25 May 2007. This proposal also incorporates recommendations made by an external appraisal team hired by the Norwegian Embassy as well as recommendations made during further deliberations at a drafting workshop in Karachi on 26-28 May 2008, where stakeholders from the federal, provincial and district government were present together with UNFPA, UNICEF and WHO colleagues, with members of the Norwegian Embassy and a Norad team.
Punjab safe motherhood initiative project	Started in October 2004	PSMIP is intended to reduce maternal mortality in Sheikhupura district through a set of interventions in 16 selected public health facilities: 12 BHUs, two RHCs, one THQ and DHQ Sheikhupura.	The health department, Government of Punjab, approved PC-I (ADP Scheme No 1032 Grant No 36-Development), amounting to Rs 19.070 million, for 3 years in 2004 (averaging just over Rs 6 million a year). In 2005, PC-I was revised up to the amount of Rs 19.873 million over four years (averaging under Rs 5 million a year). The Punjab Safe Motherhood Initiative Project is a project of the Government of the Punjab (GoPn). Its collaborating partners are: <ul style="list-style-type: none"> • United Nations International 	<p>Overall objective: To contribute towards the reduction of maternal mortality ratio in district Sheikhupura</p> <p>Specific objectives:</p> <ul style="list-style-type: none"> • To increase awareness about pregnancy and the needs of pregnant women • To improve access to health services and facilities • To provide healthcare services, especially emergency obstetric care (EmOC), at the doorstep by providing trained manpower and improving management systems at DHQ/THQ hospitals, RHCs and BHUs in district Sheikhupura • To build an integrated referral network from primary to secondary to tertiary care health services • To offer training opportunities for undergraduate and postgraduate medical professionals as a part of community based medical education

Children's Fund (UNICEF)	<ul style="list-style-type: none"> To enhance skills of healthcare providers (doctors, LHVs, LHWs, TBAs, medical technicians, etc) in early detection of high-risk cases and their timely referral to next level of healthcare To orientate key community stakeholders in Safe Motherhood Interventions through community meetings at the village or mohallah level To raise awareness through radio, press, TV and interpersonal communication
• King Edward Medical University (KEMU), Lahore	
• Lady Willington Hospital (LWH), Lahore	
• Jahandad Society for Community Development (JSCD)	

4. HEALTH EXPENDITURE

Pakistan has the lowest health investment in Asia and one of the lowest in the world. The combined public and private expenditure on health is 2.34 percent of GDP, of which public sector only contributes 0.83 percent. The World Bank has estimated that the per

capita cost of minimal package of essential public health and clinical services is approximately US \$ 21 per capita. Pakistan is currently spending about US \$11 on health. The vast private sector represents about 60 percent of the total health expenditure in the country.

Table 4.7: Maternal and Neonatal Health Programs/ Activities Supported by Major Donor Agencies

Donor Agency	Federal		Provincial	
	Name of Program/Supported Activities	Amount of Funding (USD)	Name of Program/Supported Activities	Amount of Funding (USD)
DFID	MNCH	126 million	MNCH	Punjab: 134.36 m Sindh: 53.93 million NWFP: 46.03 million Balochistan: 43.90 m AJK: 11.60 million
GoP	MNCH	206.061 million	MNCH	
NORAD	MNCH	40 million	MNCH	For Sindh only
UNFPA	MNCH	4.58 million		
UNICEF	Newborn Care	0.3 million		
USAID	Newborn Health	81 million		

Table 4.6: Yearly Allocations by Development Partners for Maternal and Child Health and Primary Care Services; Amount in US Dollars (in Millions)

Development Partners	Maternal and Child Health	Medical Services and Primary Healthcare
ADB	5.80	-
CIDA	1.17	0.04
DFID	-	15.13
UNAIDS	-	0.05
UNDP	-	0.13
UNFPA	0.68	0.52
UNICEF	9.73	-
USAID	14.01	39.89
World Bank	-	23.00
WHO	-	0.02
GAVI	40.48	-
GFTAM	-	-
German Bilateral Aid	-	0.54
Packard Foundation	-	-
Total	71.884	80.945

RECOMMENDED NOTES

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CHAPTER 5

WHAT NEEDS TO BE
DONE?

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CHAPTER 5

WHAT NEEDS TO BE DONE?

I. INTRODUCTION

Like other South Asian countries, Pakistan has made progress during the last 57 years in improving its health indicators. But the progress has been slower compared to other countries. High levels of poverty, income inequality, illiteracy, and poor health status of most Pakistanis tell the story. Pakistanis - based on gender, geographic location, income level, class and social status - face extreme disparities in access to basic infrastructure, health and education services, and even in access to justice. Pakistan's programmatic efforts for better maternal and neonatal health have come a long way but still have far to go. While favorable policies are common in the developing world, implementation typically lags behind. Pakistan needs to ensure that wise intentions are translated into high quality, accessible services and programs at the local level. In some aspects there are large disparities in the access to services

between rural and urban populations. In addition to challenges that are impeding the contribution to the continuing high level of maternal mortality such as the lack of emergency obstetric care and trained personnel particularly in rural areas, there are other constraints that effect the provision of family planning information and services. Addressing these will require that young married women have the knowledge and means to be able to delay the birth of their first child and space their subsequent children and that all women of child bearing age are able to easily access the family planning method of their choice. Achieving universal access to reproductive health will, therefore require efforts to improve motivation and communication, support new family size norms and provide women with the information on the advantages of child spacing and improve availability of quality services. Such measures should be promoted with the religious, social and cultural norms of the country and taking into account those population groups that are at particular risk, including adolescent girls and those living in remote rural and tribal areas. Within the health sector Pakistan's expenditure on health, as a percentage of gross domestic product (GDP), is lower than other developing countries. The quality of care provided, especially at the primary level and in rural areas, is also quite poor. Government policy, over the entire history, has not been able to address these grievances.

Table 5.1: Summary of Public Sector Programs

	MNCH	NPPI	UNICEF	PAIMAN	DFID	UNFPA
Districts working in		10 (SINDH)	22	22		10
Summary	As an outcome of the forum the Islamabad Declaration on MNCH strategic framework was unanimously adopted on 2 April 2005 by all stake holders including the provinces and the development partners. All the partners pledged to align their activities in the field of MNCH for integration. DFID as an active member of the Technical Advisory Group and otherwise was one of the leading supporters of the program. After an exhaustive consultative process with the provinces and districts spanning over a period of more than one year the MCH Cell was able to bring out a consensus	NPPI support will provide catalytic and strategic support to the implementation of the National MNCH programme, specifically focusing in ten rural under-served districts in Sindh. The initiative will also complement the national LHW program as well as the Nutrition programs. The selected districts within NPPI were selected on the basis of their prevailing high MMR, NMR and Under five child mortality rates (selection of districts has been made on the basis of latest MICS survey conducted in Sindh) as well as poorly functioning health systems. The initiative will be	The Maternal and Child Health Care programme will adopt the following implementation strategies: Advocacy for investing in MNCH for achieving MDGs 1,4,5 & 6 and operational research on conditional cash transfers, using vouchers to promote health care service utilization and result based financing. Implementation of the maternal and neonatal care health(MNCH) component will happen through up-gradation of DHQs in target districts for emergency newborn care, strengthening of THQs, RHCs and	The Pakistan Initiative for Mothers and Newborns (PAIMAN) is a five-year project funded by the United States Agency for International Development (USAID). PAIMAN is committed to assisting the Government of Pakistan (GoP) in its attempt to implement the full spectrum of interventions necessary to address maternal and neonatal health (MNH) issues. The consortium is led by John Snow Incorporated (JSI), with partners from Pakistani and international organizations including Aga Khan University, Contech, Greenstar Social Marketing, and Johns	DFID is the single largest donor in the health sector - approximately £30 million a year. We have given £83.55 million (2003-08) to the National Health and Population Welfare Facility, and provided £20.2 million to the World Health Organization polio eradication programme since 2004. We plan to invest up to £230 million in the health sector over next five years, including £90 million to the National Maternal, Newborn and Child Health programme DFID is increasing its support to the education sector by £250 million. This will help the government	UNFPA assistance to Pakistan began in 1970. Its support contributed to enhancing the capacity of medical and health care providers of the government and NGOs to deliver family planning services and the provision and management of contraceptive commodities. The goal of the seventh and current Country Programme (2004-2008) is to improve the reproductive health status of the people of Pakistan, and is specially focused on helping couples achieve their desired family size while also improving maternal health.

document PC-I on National MNCH Program. National MNCH Program will essentially be implemented in 134 districts through their respective provinces. It will also be implemented in AJK, Northern areas, FANA and FATA. National MNCH Program aims at strengthening, upgrading and integrating ongoing interventions and introducing new strategies. The overarching goal of the program is to improve accessibility of quality MNCH services through development and implementation of an integrated and sustainable MNCH program at all levels of the health care delivery system. The program aims at functional integration of the ongoing maternal programs i.e. National Program for Family Planning, Primary Health Care, EPI, Nutrition, and National AIDS Control Programme. The salient feature of this program is that it adds on to what is already being done to achieve the MDGs and as such act as a catalyst to assist the ongoing initiative to fulfill the health related MDGs. The aim is not to displace or replace the current resources available for MNCH but to fill in the resource gaps where ever possible without duplicating inputs or activities. Priority Areas of the National MNCH Program Comprehensive and integrated MNCH services at the district level. Community-based skilled Birth Attendants. Comprehensive Family planning Services at the Health Facilities. Advocacy and demand creation. Management and organizational reform. Monitoring and Evaluation Framework. Expected Outputs (2006-2011) Improved access to

strategic to ensure universal coverage of key evidence based MNCH interventions and implementing key innovations that can be scaled up and replicated in other districts and provinces of Pakistan. NPPI contribution is critical to the successful implementation of existing national plans considering it will strengthen the management, planning and monitoring capacity of provincial and district governments.

The goal of NPPI is to reduce maternal, newborn and under-five mortality in 10 selected districts in Sindh Province in Pakistan. The expected **outcomes** of NPPI is to attain the above goals by

- Increased coverage of quality MNCH/FP service.
- Improved MNCH/FP self care and care-seeking behaviour among families and communities.

BHUs for essential newborn care, community based newborn care through LHWs, CMWs and community volunteers, scaling up of mother and child weeks, establishment of community transportation funds, participatory community based communication interventions and the activation of village health committees and women groups. The programme will also focus on improving key emergency obstetric and neonatal care facilities, including capacity building for management, and support to the planning, development, resourcing, operationalisation and review process of the MNCH policy at the sub-national levels. Along with service interventions, the demand side for health services within communities will be strengthened.

Operational research for home based newborn care will be initiated in 2 districts in Punjab and another study will be carried out in 4 districts of Sindh to reduce maternal anaemia and low birth weight amongst the newborn babies.

Communication for development will be one of the main strategies to increase community involvement and ownership and improve awareness and demand for maternal, newborn and child health services.

Strategies to achieve infant and young child nutrition results will focus on improving knowledge and practices of mothers and caregivers on Infant and Young Child Feeding and supporting maternal nutrition to prevent anaemia and low

Hopkins University Center for Communication Program (JHU), PAVHNA, Population Council and Save the Children USA. USAID has provided a grant to implement PAIMAN in 10 districts of Pakistan's four provinces. These districts are: Rawalpindi, Jhelum, Khanewal, and DG Khan in Punjab; Dadu and Sukkur in Sindh; Jafferabad and Lasbela in Balochistan; and Upper Dir and Buner in the North West Frontier Province. The goal of the project is to reduce maternal, newborn and child mortality in Pakistan. The five major strategic objectives are to:

- 1) Increase awareness and promote positive maternal and neonatal health behaviors.
- 2) Increase access (including essential obstetric care) to and community involvement in maternal and child health services, while ensuring that services are successfully delivered through health and ancillary health services.
- 3) Improve service quality in both the public and private sectors, particularly related to the management of obstetrical complications.
- 4) Increase the capacity of Maternal and Newborn Health (MNH) managers and care providers.
- 5) Improve the management and integration of services at all levels.

Various donors, including WHO, USAID, DFID, UNICEF and UNFPA, have committed to invest in maternal and child health and to develop joint strategic frameworks in collaboration with the GOP. The PAIMAN team has therefore approached and consulted these development partners. Several meetings were held with the DFID design team to examine how the two MNH projects can complement each

to expand access, improve quality and strengthen the governance of basic education, as well as provide vocational training and skills development.

DFID supports the government - at all levels: federal, provincial and district - to become more effective, with better standards for managing resources across national government and in the provinces to ensure that services are delivered well. Some 30 million people will be reached through our work with civil society to strengthen awareness of rights, hold government to account and improve services for the poor.

DFID is supporting programmes to improve livelihoods and employment opportunities for the poor, to ensure that the benefits of recent high economic growth reach all groups in the country. In particular, we support the Kashf microfinance programme to increase women's incomes and are proposing a £50 million Financial Inclusion Programme, which will aim to increase the number of borrowers from 1 million to 5 million.

Increased accessibility of high-quality reproductive health services, including family planning, for men, women and youth

Output indicators:

- Percentage of service delivery points using the STI syndromic approach
- Percentage of stock outs of reproductive health commodities
- Number of comprehensive obstetric care facilities per 50,000 population
- Percentage of health service units providing family planning services
- Number of staff trained in gender-sensitive reproductive health issues, including counseling
- Number of family-friendly facilities
- Percentage of men in the community accessing reproductive health services, including family planning
- Written protocols for maternal and child health, family planning, STIs and primary health care available and adhered to by staff of service delivery points.

Output 2: Strengthened support and commitment for improved reproductive health behavior of men, women, and youth
Output indicators:

- Percentage of men, women and youth supportive of reproductive health care services
- Increased knowledge at the community level among men, women and youth about reproductive health issues, needs and requirements
- Number of NGOs and community-based organizations participating in and supporting reproductive health and family planning services
- Number of parastatal companies implementing reproductive health and family planning

<p>high quality MCH and FP services Family planning services in all health outlets 10,000 community skilled birth attendants Provision of comprehensive EmOC services in 275 hospitals Provision of basic EmOC services in 550 health facilities 15,000 health facility staff trained and practicing IMNCI guidelines Provision of 24/7 child referral services in THQ and DHQ hospitals 80 percent of the health facilities are well equipped and have essential drugs. Increased demand and utilization of MCH services especially by the poor. Building strategic partnerships to enhance the role of NGOs and private sector. Evidence based Program management and capacity building.</p>			<p>birth weight through communication for behaviour change by emergency obstetric care personnel, community based health workers and village health committees. NGOs and mass media will equally be used as catalysts for triggering awareness and action.</p> <p>Develop strategy for the management of acute malnutrition and expand interventions in areas hit by natural disasters, conflicts and food crisis.</p> <p>The development and implementation of a strategy to increase salt iodisation focusing on large-scale producers and consumers will be supported.</p> <p>In order to further improve immunisation levels, a particular focus on community demand for immunisation will be implemented.</p> <p>In order to support the expected key result on increasing knowledge and awareness and practice levels for health promotion, the institutionalization of "child health weeks"/"mother and child weeks" will be expanded that combine accelerated service delivery with the communication of key health-seeking and sanitation/hygiene behaviour-oriented messages for school children and child caregivers for one week in selected districts every year.</p> <p>The strategy to strengthen the PPTCT component will include development of guidelines and operational protocols and increasing access to HIV counselling and testing for most at risk and highly vulnerable women, particularly strengthening linkages with NGOs in urban</p>	<p>other. UNICEF and WHO have expressed interest in working closely with PAIMAN, particularly in expanding the programmatic scope of the project to include child health.</p>		<p>comprehensive services</p> <ul style="list-style-type: none"> • Number of trained and skilled behavior change communication experts and social mobilizers <p>Output 3: Improved management systems and practices for service delivery</p> <p><u>Output indicators:</u></p> <ul style="list-style-type: none"> • Number of district management teams trained in managerial techniques and social mobilization • Number of management tools developed and utilized at federal, provincial and district levels • Number of staff trained in supportive supervision • Number of standard operating procedures implemented and monitored
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			<p>areas.</p> <p>Support federal and provincial government in preparation of emergency preparedness and response plans.</p> <p>Each of the four provinces presents unique challenges and opportunities for programme implementation. In the NWFP, the situation of IDPs, ongoing emergencies, technical assistance provided by key donors need to be considered. In Punjab, health sector reform initiatives and DFID and ADB assistance present opportunities for partnerships. Balochistan faces continuous challenge of natural disasters and an unstable security situation. CIDA is providing support to strengthen MNCH services in three districts (Quetta, Pishin, Kalat) which will be a boost to try innovative approaches. In Sindh, the programme will gradually phase out of the existing six districts and implement a joint UN Programme in additional 10 districts, with the MNCH component being supported by Norway.</p>			
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2. ONGOING MATERNAL AND NEWBORN INTERVENTIONS

An analysis of existing interventions using government and organizational reports by authors revealed that there is a wide array of maternal and newborn health intervention being reported within the country. In

general these interventions have been operationalized with a maternal health prospective. As summarized in the tables 5.2 and 5.3, while the primary objective for a large number of these outcomes is to improve maternal and reproductive health, they all have the potential of impacting favorably on perinatal health outcomes.

Table 5.2: Maternal and Newborn Current Interventions

Maternal Interventions	NP-FPPHC (LHW) Program	BHU/RHC Facility Based Care	Malaria Control Program	MNCH	MoP W	HIV/AIDS Control Program	Expanded Program on Immunization	National Nutrition Program
Promotion of reproductive health and family planning	√	√		√	√			
Seeking skilled care for child birth	√	√		√				
Tetanus toxoid	√			√			√	
Iron folate administration	√	√		√				√
Screening of UTI and UTI management		√		√				
Hypertension screening and treatment for severe hypertension	√	√		√				
Basic obstetric care	√			√				
Emergency obstetric care				√				
Neonatal Interventions								
Immediate breastfeeding	√	√		√				√
Exclusive breastfeeding	√	√		√				√
Tetanus toxoid immunization	√						√	
Routine post-natal care and care of LBWV infants	√	√		√				√
Cord care and clean delivery kit	√			√				
Antenatal steroids								
Neonatal resuscitation	√	√		√				
Antibiotics for PPRM				√				
EPI [including new vaccines Hib, pneumococcal and anti-rabies vaccine (ARV)]							√	
Injectible antibiotics for sepsis				√				
Oral antibiotics for pneumonia						√		

Table 5.3: Key Interventions

Community	Delivery Mode	Program
Family planning (birth spacing)	LHW/CHW	LHW
Exclusive breastfeeding education/promotion support strategies		
Extra care of LBW infants (swaddling, thermal care and early breastfeeding)		
Home-based pneumonia management		
Outreach		
Ante-natal care	LHW/CHW	LHW
Iron-folate supplementation		LHW/EPI
Tetanus toxoid		
IPT for malaria during pregnancy	No current program	
Skilled attendant at delivery	CMW	MNCH
Newborn resuscitation		
Facility		

Skilled attendant at delivery	At health facility	MNCH
Corticosteroids for preterm labor		
Emergency obstetric care (impacting newborn outcomes e.g. asphyxia, sepsis etc.)		
Newborn resuscitation		

Maternal and neonatal interventions are delivered in “packages” according to mode or place of service delivery, this is the way most interventions are integrated and delivered in health systems. The interventions considered above can be slotted in one of these three service delivery modes: outreach, family and community, and facility-based clinical care. There are eight basic maternal interventions that can be delivered by a variety of national programmes being operated at a national level, and they can be delivered via community based, outreach and facility modes. Eleven basic neonatal interventions have been considered. The LHW programme incorporates six of these eight maternal interventions while the MNCH programme considers all maternal interventions and delivers it by the three modes of community based, outreach and facility, described above. The EPI deals only with the immunization part of the maternal interventions i.e. the tetanus toxoid administration whereas the NNP deals with iron and folate supplementations. In the neonatal interventions the programmes operating who deliver care are the same as maternal programmes. The LHW programme again incorporates six of the 11 neonatal interventions followed by MNCH programme which delivers seven of the 11 neonatal interventions. Currently dais are most likely to be present at birth;

however, their contribution to improving neonatal care and outcome is not being addressed. It is envisaged that eventually all births will be attended by trained health care providers; however, which cadre(s) will fulfill this role is not clear. Currently, it is beyond the scope of LHWs, though they are trained to recognize complications of delivery. LHWs and other trained female health professionals are scarce, especially in rural areas where the greatest burden of neonatal morbidity and mortality falls. It is not clear how a transition will be made from the current situation, where dais are the major provider of delivery care, to the stated objective of each birth being attended by a trained health care professional. Furthermore, it has not been clearly stated what the goal is regarding the location of delivery. That is, should all deliveries be conducted at a facility or is it acceptable to have normal deliveries conducted at home by a skilled birth attendant who is linked with functioning referral systems providing EOC?

The tables 5.4 and 5.5 explicitly describe what is needed at a domiciliary level and at a BHU/RHC level to improve maternal and child interventions delivery status. It describes what is currently operational, what improvements can be made in each interventions and how those improvements can be made.

Table 5.4: Domiciliary or Home Package of Care

Type of Intervention	What Exists Presently?	What is Needed?	How?
Ante-natal care during pregnancy	Standard care (number of visits not specified in the current program)	Three visits as per WHO protocol	Linking LHWs with BHUs BHU/RHC/MHC centre as focal point for antenatal care
Intermittent preventive treatment for malaria or Bed nets	Not specified in malaria control program	Implementation in malaria endemic areas	Introduction in LHW program in endemic areas
Iron-folate or MMN administration	Iron folate (poor BCC strategies)	Iron folate availability and community education	Social marketing Iron-folate availability community BCC strategies
Newborn resuscitation	Nothing except awareness	Basic resuscitation training	- Family education in prevention strategies - Improved training of LHWs and linking LHWs with TBAs or community Midwives when available
Immediate newborn care including care of the LBW infant	- Basic newborn care included but exposure, practical training and interventions are limited - Especially unclear what to do if referral is refused or not possible	Improved and focused curricular content standardized training materials (IEC and videos) “Incentives” for early newborn assessment and care (early postnatal visit within 24 hours)	- Linking LHWs with TBAs - Incentives for early newborn care, weighing and referral - Performance targets

Care of the sick newborn infant (Recognition, Stabilization and Referral)	Basic concepts around local infections, diarrhea and ARI only	Add elements of early indicators of sepsis, better training materials	Improved training, video demonstrations and inclusion in performance indicators
Domiciliary care when referral refused or not possible	None	Home administration of antibiotics	Try as a pilot project first and evaluate impact in an effectiveness setting
Encouraging micronutrient intake in vulnerable groups (mothers and infants) iodize salt and vitamin A	Minimal emphasis		<ul style="list-style-type: none"> - Strong BCC strategy re iodized salt intake and vitamin A intake - Availability of vitamin A and iodized salt

The dai or TBA has been recognized as a potentially important resource person in the quest for improved reproductive health delivery birth in relation to maternal as well as newborn care. Although TBAs can possibly fill the gaps in the short term for domiciliary births and care, there is a strong support for the development of a suitable cadre of trained birth attendants as community midwives. Yet given the fact that the LHWs are trained and required to provide ANC, a synergistic model of working in tandem with the TBAs might work.

For delivery care, the lack of information is in the realm of knowledge of danger signs and care seeking behavior in the event that delivery does not progress normally. Information regarding who decides about delivery care, the choice of location and resources expended also remain elusive. Furthermore, there is no operations research that demonstrates how safe natal care can be made widely available, i.e. how can we ensure that each delivery is attended by a skilled person who knows when, how, and where to refer the patient as needed? Clearly the objective to get a trained birth attendant for every domiciliary birth will take some time to materialize; in the interim, novel opportunities of working with TBAs and LHWs for improved natal and PCN of the mother and newborn must be developed and formally evaluated. Family education is important in about decision making for speedy referral of an obstetric emergency to an appropriate healthcare provider and facility.

Improved screening and care of newborns including early postnatal visit within 24 hours at domiciliary level should be given importance and can be done by training and linking LHWs with TBA as well as with BHU/RHC. Recognition of these interventions as playing a role in perinatal health field is important since there are integral links between maternal, perinatal, and infant health outcomes. Given the large number of deliveries that are carried out at home there is a lack of simple models of home-based essential newborn care that can reduce morbidity and mortality. The contribution of birth asphyxia to perinatal mortality as well as long-term morbidity is well established; however, models of

domiciliary or primary care resuscitation methodologies and aftercare for this problem have been neither described nor tested. Similarly, there is a pressing need to develop, test, and evaluate community-based models providing special care for LBW newborns and care for newborns with danger signs, especially for presumed serious infection.

3. HEALTH SYSTEM PACKAGE

Physical infrastructure of the health delivery system in rural Pakistan is probably one of the best in the region. There is at least one basic health unit (BHU) in each union council covering around 15,000 population and each BHU is to provide basic curative and preventive services. Four or five BHUs are attached to one RHC covering around 100,000 populations. Though structurally strong, the health sector remains functionally weak. The services are free of cost but not easily accessible. Most facilities even in urban centres lack the facilities of having a pediatrician on call for high risk pregnancies. Lack of functioning blood bank facilities of 24 hours, lack of protocols in the obstetrics units and extreme shortage of essential supplies and equipment, must be addressed for improving the quality of ANC and EmOC services. There is also a lack of training in recognizing the danger signs that may indicate tetanus, sepsis, conjunctivitis, jaundice, or congenital malformations or to care for the LBW infant. Clear guidelines for early newborn referrals at all levels of the health care delivery system (i.e., when, where and how to refer?) are also absent. Standard service delivery protocols are also absent from public health delivery facilities. There are multiple deficiencies in the availability of simple, necessary equipment at various levels of health care facilities. On the other hand, equipment may be present that is either inappropriate for the level of the facility (i.e., the staff are not trained to use it), or is unable to be maintained.

Table 5.5: Health System Package of Care (Basic Health Units/Rural Health Centers and Above)

Type of Intervention	What Exists Presently?	What is Needed?	How?
Improved ANC	Traditional ANC	Improved cost-effective WHO recommended model (including calcium and low dose aspirin)	<ul style="list-style-type: none"> - Training of health system staff and development of standard protocol - Improving quality of services (availability of skb, investigations and drugs)
Improved emergency obstetric and reproductive health care	Dysfunctional and limited facilities for EMOC	Effective and quality blood transfusion services	<ul style="list-style-type: none"> - Effective transport linkages - Trained staff - Well equipped EMOC services and audit systems
Newborn resuscitation and immediate care	Very limited equipment (in < 10 percent facilities) and negligible staff training in newborn resuscitation	<ul style="list-style-type: none"> - Training modules - Equipment (ambu bags, mennequins for training) 	Mandatory training for all staff involved in delivery services and providing them with adequate equipment
Care of the very LBW and preterm infants (referral if necessary)	<ul style="list-style-type: none"> - Very limited training - Basic equipment (oxygen monitoring systems, infusion pumps lacking) 	<ul style="list-style-type: none"> - Training modules in low cost and appropriate management - Provision of basic drugs and equipment 	All BHUs and RHCs to be equipped for first level sick newborn care and stabilization
Stabilization, care and referral of sick newborn infants with sepsis/pneumonia	No management strategies or staff training	<ul style="list-style-type: none"> - Staff training - Basic equipment (pulse oxymeters, infusion pumps, incubator or heated cot) - Appropriate drugs for newborn care 	<ul style="list-style-type: none"> - Concerted program with graded newborn and young infant care between RHC, THQ hospitals and DHQ hospitals - Trained medical and nursing staff availability
Care of serious illnesses such as diarrhea, pneumonia and severe malnutrition	Training under IMCI in a few pilot districts	Up-scaling of program and training of health system staff	<ul style="list-style-type: none"> - IMCI or syndromic management training of health system staff (including neonatal or nIMCI) - Shortened training for health staff in IMCI - Introduction of revised and updated management protocols
Governance Issues			

4. WHAT WILL BE THE IMPACT OF THESE INTERVENTIONS?

Primary health care (PHC) has featured prominently as a development concept within the health sector in Pakistan; however investments in publicly financed services have not led to the desired health gains. High levels of maternal mortality and morbidity in Pakistan are a direct result of the interplay between varieties of factors: low status of women in society; poor nutrition; a significant proportion of high risk pregnancies (such as those to grand multiparous women); poor access to health services; poverty and illiteracy. Women's health can not be improved without addressing each of these issues.

Existing and ongoing interventions and programs in the safe motherhood are fragmented and disorganized and their impact on maternal mortality is doubtful. What is needed is a strong political commitment. Governments, international agencies, NGOs and other funders need to make concerted efforts to safe guard maternal health

and the social and economic benefits it provides, by: Reallocating investment in health care to support the most cost effective interventions;

1. Investing in maternal healthcare services and making them available especially in poor rural areas
2. Strengthening the capacity of community health centres and district hospitals to provide needed care, especially for obstetrics complications, through staff training and provision of equipment;
3. Working with private providers to expand and improve safe motherhood services, for example by mandating the insurance policies include such care;
4. Encouraging for profit providers to provide free or low cost care to those who can't afford to pay;
5. Supporting NGOs and voluntary organizations that may be able to mobilize private and community support for delivering services to under serve or disadvantage women.

The impact of ongoing interventions on maternal and child health are summarized in table 5.6.

Table 5.6: Estimated Annual need for Maternal and Neonatal Survival Intervention in Pakistan

	Potential Impact of Intervention (Deaths Averted)	Population at Risk	Annual Need	Current Coverage	Unit Cost Up To 80 Percent Coverage (PKR)
Supportive strategies					
Family Planning (birth spacing)	N/A	All women 15-49 yrs	38,648,000	28%	89
Antenatal					
Effective ante-natal care	10-20%	All births	4,872,600	36%	442
Iron-folate supplementation		All births	4,872,600	25%	54
Tetanus toxoid immunization		All births	4,872,600	57%	77
IPT malaria during pregnancy		All births x incidence of malaria (0.08%)	389,808	0%	11
Intrapartum					
Skilled attendant at delivery	20-30%	All births	4,872,600	31%	400
Corticosteroids for preterm labor	25-50%	15% of all births	730,890	2%	3,699
Emergency obstetric care	10-15%	15% of all births	487,260	20%	40,000
Neonatal					
Newborn resuscitation ^a	5-20%	5% of all births	243,630	10%	142 in community; 4,000 at facility.
Exclusive breastfeeding	1-10%	All births	4,872,600	16%	142
Extra care of LBW infants	20-40%	21.5% of all births	1,047,609	31%	142
Home based pneumonia management	10-35%	4% of all births	194,904	7%	157

^a 25% delivered in the community and 75% delivered at facility.

Strong and sustained government commitment, partnerships among nations, NGOs and multinationals institutions and well targeted investments can save millions of lives. There is also need to devise and test

alternative intervention packages to identify and evaluate the most suitable and cost effective strategy for reducing maternal mortality [1].

Table 5.7: Maternal Interventions with Current Coverage Rates

Maternal Interventions	Current Coverage in Pakistan	Death Averted at Pragmatic Coverage	Death Averted at 99% Coverage
Promotion of reproductive health and family planning	25%	8.1%	24%
Basic 4 visit ante-natal care package including Seeking skilled care for child birth (in community) but including breech detection, twins and abnormal lie	61% 39%	2.7% 0%	11.2% 0%
Tetanus toxoid	60%	0%	0%
Iron folate administration	43%	0.4%	0.8%
Screening of UTI and UTI management	10%	1.1%	5.0%
Hypertension screening and treatment for severe hypertension	10%	1.2%	5.4%
Enhanced ANC package Aspirin Calcium	5% 0%	1.2% 0.2% 0.8%	4.1% 1.5% 2.7%
Antibiotics for preterm rupture of membranes and suspected chorioamnionitis and post abortion care	10%	1.3%	5.9%
Basic obstetric care (clean delivery)	31%	2.0%	7.2%
Basic obstetric care (active management of third stage of labor, including misoprostol, oxytocics, ergotamine and manual removal of the placenta) also included Dand C for post abortion care	25%	5.2%	15.4%
Basic obstetric care for eclampsia (Magnesium Sulphate)	0	0.8%	2.7%
Emergency obstetric care (including blood transfusion and LSCS)	15%	3.7%	20.6%
ITN/IPT in pregnancy in malaria endemic areas	7%	0.6%	2.4%

Table 5.8: Cause Specific Maternal Deaths Prevented with and without Lower Segment Caesarian Section (LSCS) Capacity at Pragmatic and 99 Percent Target Coverage

Cause of Maternal Death	Proportion of Death by Cause	With LSCS		Without LSCS	
		Death Averted at Pragmatic Coverage	Death Averted at 99% Coverage	Death Averted at Pragmatic Coverage	Death Averted at 99% Coverage
Antepartum hemorrhage	5.0%	5%	29%	0.0%	0.0%
Postpartum hemorrhage	27.0%	23%	72%	18.0%	54.0%
Abortion	6.0%	10%	34%	10.0%	34.0%
Obstructed labour	9.0%	10%	57%	0.0%	0.0%
Hypertensive disorders	9.0%	31%	83%	31.0%	83.5%
Infections	12.0%	13%	87%	31.0%	87.0%
Anemia	13.0%	7%	51%	7.4%	24.0%
Other	19.0%	0%	0%	0.0%	0.0%
All cause mortality(prevented alone by family planning)		8%	24%	8.1%	24.0%
Total		23.1%	63.9%	20.0%	52.5%

It is clear in the long run, improving the educational, socio-cultural and economic status of mothers is the best option of improving maternal and perinatal health. Several recommendations can be made in order to improve the status of perinatal health in Pakistan. These include increased investments for perinatal care and integration of existing maternal and perinatal/early newborn care interventions in Pakistan. Of the existing interventions that may impact on perinatal outcomes, the ones that merit urgent attention include improved ANC and maternal nutrition, universal maternal tetanus immunization coverage and effective screening for high risk pregnancies and referral strategies. Improving quality of care for perinatal services in the health system is another priority without which care seeking will not improve. It is therefore imperative that basic training be

imparted to staff for perinatal care at all primary care level facilities. Innovative approaches for community based perinatal and newborn care include training LHW a community health worker in an integrated program of perinatal and newborn care. Given the enormous burden of birth asphyxia, this should include the training of TBAs and midwives in immediate neonatal care and resuscitation as well as the training of physicians especially obstetricians and primary care physicians, in perinatal and immediate neonatal care, and resuscitation. Given the increasing and important role of the private sector in healthcare delivery in Pakistan, there is the need for integration of the public and private sectors for perinatal care, including training of private midwives, TBAs and physicians as well as the development of public private referral services for perinatal care.

Table 5.9: Neonatal Interventions with Current Coverage Rates

Neonatal Interventions	Current Coverage in Pakistan	Death Averted at Pragmatic Coverage	Death Averted at 99% Coverage
Immediate breastfeeding	30%	1.4%	3.3%
Exclusive breastfeeding	30%	1.3%	3.1%
Periconceptual folic acid suppl.	20%	0.1%	0.2%
Tetanus toxoid immunization	80%	0.6%	0.6%
Routine post-natal care and care of LBW infants	22%	1.5%	4.1%
Antibiotics for PPROM	50%	0.2%	0.4%
Cord care and clean delivery kit	31%	0.8%	1.5%
Antenatal steroids	10%	1.1%	4.8%
Neonatal resuscitation	25%	4.4%	13.1%
Emergency obstetric care	20%	3.8%	10.1%
Emergency neonatal care (for prematurity, post asphyxial care)	23%	1.5%	4.2%
Kangaroo mother care (KMC) separate from care of LBW infants	0%	0.9%	2.9%
Oral antibiotics for pneumonia	27%	0.7%	2.0%
Injectable antibiotics for sepsis	27%	4.0%	12.4%

One of the most important issues in relation to child survival interventions is determination of target populations and time period. In turn these interventions also need to focus on promotion on equity and thus rural populations and deprived districts. It is also important to highlight that peri-urban populations may be even more deprived than rural populations in terms of access and inequity of care. Thus within the target districts the targeting and outcome evaluation of MCH interventions needs to keep an equity focus. The World

Development Report (2003) makes the following cogent points with regards to providing health services:

1. Household behaviors can be changed and improved (even in the short term)
2. Community organizations are best placed to provide services close to poor households
3. Even governments with limited capacity can provide these essential services
4. Individual centered care is most challenging and difficult.

Table 5.10: Cause Specific Neonatal Deaths Prevented at Pragmatic and 99 Percent Target Coverage

Cause	Proportion of Death by Cause	Death Averted	
		Death Averted at Pragmatic Coverage	Death Averted at 99% Coverage
Preterm	17.0%	23%	61%
Asphyxia	40.0%	20%	51.7%
Sepsis	20.0%	35%	77.3%
Pneumonia	6.0%	16%	42.9%
Meningitis	1.0%	0%	0.0%
Diarrhea	1.0%	12%	27.8%
Congenital	3.0%	2%	6.4%
Tetanus	1.0%	67%	84.1%
Unexplained	9.0%	0%	0.0%
Other	2.0%	0%	0.0%
Total		21%	50%

Pakistan has recently formulated a new health agenda for the year 2010-2011 on the basis of the Ten Year Perspective Plan 2001 and National Health Policy 2001. National Health Policy 2001 mentions priority shift from curative to preventive and from urban to rural sector, with more focus on the health of mother and child. It aims at increasing the accessibility, affordability, and acceptability of health services by general population. The focus is on the primary and secondary tiers of health sectors in contrast to tertiary level healthcare.

The key focus of the government is on reducing infant and maternal mortality, enhancing reproductive health choices, reducing preventable diseases and encouraging preventive medicine. These objectives are to be achieved through more aggressive vertical programs, especially the LHW Pogram. The policymakers believe that these instruments offer the most effective way of achieving the maximum impact.

5. HOW COST EFFECTIVE WILL THESE INTERVENTIONS BE?

Pakistan has been investing insufficiently with public health expenditure in general and maternal and child health in particular as compared to other low-income

countries. As a proportion of GDP, Pakistan public expenditure declined from around 0.7 percent in 1990's decreasing to 0.5 percent in early 2000s due to macroeconomic difficulties. Despite quadrupling of total public expenditures since the mid 1980's, in real terms, public health expenditures have remained constant on a per capita basis. In recent years, Pakistan has mainly financed community based outreach program for provision of MNH and FP services with the development partner's investment in provision and expansion of social marketing programs in urban and peri-urban areas and enhancing availability of emergency obstetrical care in selected districts. Over the past two decades, there has been a downward trend in the infant and child mortality rates in Pakistan (child mortality has been reduced from 130 in 1990 to 97 per 1,000 in 2006 and infant mortality has been reduced from 100 in 1990 to 78 in 2006 [2]). But neonatal mortality rates have remained stagnant over the past two decades at approximately 55 per 1,000 live births. Today, 500,000 children under the age of 5 die every year in Pakistan. Of these, 50-55 percent die in the first four weeks of life, i.e. the neonatal period. Efforts have been made to estimate the impact and cost of scaling up the coverage of the newborn and child survival interventions at a global and regional level [3, 9]. The methods used to estimate the impact and

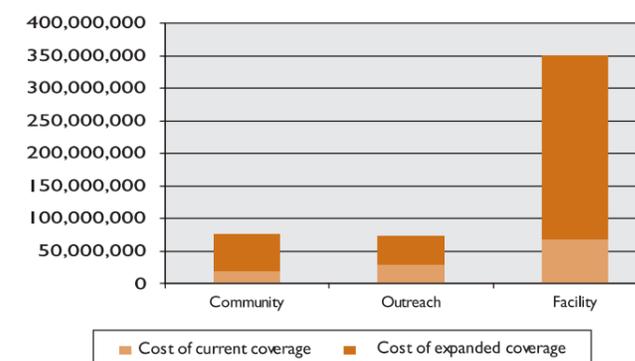
cost of scaling up evidence based interventions were as described in the Lancet Neonatal Survival Series II [4], but with several modifications to accommodate the current situation and infrastructure limitations in Pakistan.

Annual budgets and reports of the various maternal and child health federal programs were used to estimate the current expenditure (US \$ 115.2 million) on maternal and neonatal health and survival as well as the costs of scaling up the coverage of these evidence-based neonatal survival interventions to 90 percent. Of the additional expenditure required, delivery of community-based care (family planning, exclusive breastfeeding, extra care of LBW babies, home-based pneumonia case management) and outreach care (ANC package, IPT for malaria, skilled birth attendance, newborn resuscitation in the community) account for 15 percent and 12 percent of the total.

Analyses of the evidence base for efficacy and effectiveness of interventions, cost-effectiveness, and the potential to avert neonatal deaths if implemented at increased coverage indicate that feasible, highly cost effective interventions are available that could avert up to 72 percent of neonatal deaths. These interventions can be packaged according to service delivery modes and provided to populations in need in a complementary way within health systems. Family-community care has similar costs to outreach but greater potential effect. Outreach and family-community care could also work together to link communities with health facilities, and lay a foundation for improved care seeking and demand

for clinical care, which are essential for the effect of clinical care services to be fully realized. Effect at the family-community level might also be increased through more comprehensive community case management of illnesses in newborn babies, such as neonatal sepsis and birth asphyxia effectively taking more clinical care into the home and community. Questions remain, however, about the feasibility and effectiveness of such approaches, which are especially relevant for settings with very poor health-systems development [4].

Estimated current expenditure by service delivery category and additional expenditure required to increase coverage to 90%



Annual current and expanded running costs and neonatal deaths averted resulting from increased coverage (from current to 90 percent coverage) of neonatal survival interventions by place of service delivery are summarized in following table.

Table 5.11: Averting Neonatal Deaths by Additional Budgetary Allocations

Intervention group	Current costs (US\$)	Additional costs (US\$)	Deaths averted ^a	Deaths averted
Community-based	19.1 million	56.1 million	8,000—26,000	3—10%
Outreach	28.3 million	44.6 million	45,400—79,400	17—30%
Facility-based	67.8 million	283.4 million	10,900—25,800	4—10%
All	115.2 million	384.1 million	64,300—131,200	24—49%

^aRange based on low to high effectiveness

Given the current situation in Pakistan, the 12 maternal and neonatal survival interventions were scaled-up to 99 percent coverage in four phases. Phase one included all community and facility-based interventions achieving 50 percent coverage. Except for ANC and maternal TT

immunization, which are assumed to achieve 70 percent coverage, the target coverage for all other outreach interventions is also assumed to be 50 percent in phase one.

During phase two, all community and facility-based interventions are assumed to have achieved 70 percent coverage. As ANC and TT immunization achieved 70 percent coverage during phase one, target coverage for these two interventions during phase two is assumed to be 90 percent. For all other outreach interventions, the target coverage is 70 percent.

The target coverage for all community and facility-based interventions during phase three is presumed to be 90

percent. Target coverage for all outreach interventions, with the exception of ANC and TT immunization, is also assumed to be 90 percent. The target coverage for ANC and TT immunization during phase three is 99 percent. During phase four, all community, outreach and facility-based interventions are assumed to have achieved 99 percent coverage. Costs were then summed up for all four phases, and the impact of these interventions, at different coverage levels, was estimated.

Table 5.12: Expanded Costs and Neonatal Deaths Averted During Different Phases of Coverage Expansion

Intervention Group	Phase 1		Phase 2		Phase 3		Phase 4	
	Additional Costs (US\$)	Deaths Averted	Additional Costs (US \$)	Deaths Averted	Additional Costs (US \$)	Deaths averted	Additional Costs (US \$)	Deaths Averted
Community Based	17.6 million	1.4 - 5.6%	32.3 million	2.3 - 7.8%	56.1 million	3 - 9.5%	107.2 million	3.3 - 10.2%
Outreach	20.8 million	7.7 - 14.1%	37.0 million	13 - 23.3%	74.3 million	17.5 - 30.7%	52.2 million	19.3 - 33.5%
Facility-Based	127.3 million	2.4 - 6.3%	205.4 million	3.3 - 8.1%	283.4 million	4 - 9.5%	637.1 million	4.4 - 10.1%
All	165.8 million	11.5 - 25.9%	274.7 million	18.6 - 39.3%	413.8 million	24.5 - 49.8%	796.5 million	26.9 - 53.7%

END NOTES

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