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JSI Research & Training Institute Inc.

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**Sindh Reproductive, Maternal, Newborn and Child
Health: Current Status, Opportunities and Impact
of Integrated Primary Care Delivery**

July 2012

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Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Care
BCG	Bacillus Calmette Guerin
BHU	Basic Health Unit
BISP	Benazir Income Support Program
CBO	Community Based Organization
CBR	Crude Birth Rate
CDD	Control of Diarrheal Diseases
CDGK	City District Government Karachi
CHC	Community Health Centre
CHS	Community Health Sciences
CMAM	Community Management of Acute Malnourishment
CMW	Community Midwife
CPR	Contraceptive Prevalence Rate
DALY	Disability Adjusted Life Year
DDOH	District Department of Health
DHIS	District Health Information System
DHQ	District Headquarter Hospital
DHS	Demographic Health Survey
DOH	Department of Health
DOT	Direct Observation Therapy
DOTS	Directly Observed Treatment Short course
DPT	Diphtheria, Pertussis, and Tetanus
DSU	District Support Unit (PPHI)
EDOH	Executive District Officer Health
ENMOC	Emergency Neonatal & Maternal Obstetric Care
EPI	Expanded Programme of Immunization
FATA	Federally Administrative Tribal Areas
FBR	Federal Board of Revenue
FFS	Fertility and Family Survey
FLCF	First Level Care Facilities
FMO	Female Medical Officer
FP	Family Planning
FPAP	Family Planning Association of Pakistan
FSW	Female Sex Worker
FWC	Family Welfare Center
HCF	Health Care Facility
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HSSPU	Health Systems Strengthening and Policy Unit

IMCI	Integrated Management of Childhood Illnesses
IMNCI	Integrated Management of Neonatal and Childhood Illnesses
IMR	Infant Mortality Rate
ITN	Insecticide Treated Bed Nets
IYCF	Infant and Young Child Feeding
JPMC	Jinnah Post Graduate Medical Centre
KPK	Khyber Pakhtoon Khawa
LHS	Lady Health Supervisor
LHV	Lady Health Worker
LHW	Lady Health Worker
LLITN	Long Lasting Insecticide Treated Bed Nets
MDG	Millennium Development Goal
MICS	Multiple Indicator Cluster Survey
MIS	Management Information System
MMR	Maternal Mortality Ratio
MNCH	Maternal, Newborn and Child Health
MO	Medical Officer
MOH	Ministry of Health
MSW	Male Sex Worker
NCD	Non-Communicable Disease
NMR	Neonatal Mortality Rate
NNS	National Nutrition Survey
NPO	Non-Profit Organizations
NPP	Norway-Pakistan Partnership Initiative
NTT	Neonatal Tetanus Toxoid
OECD	Organization for Economic Cooperation and Development
OOP	Out of Pocket
OPV	Oral Polio Vaccine
ORS	Oral Re-hydration Salt
PC-1	Planning Commission – Proforma 1
PDHS	Pakistan Demographic Health Survey
PDOH	Provincial Department of Health
PFPS	Pakistan Fertility and Family Planning Survey
PHC	Primary Health Care
PHDC	Provincial Health Development Center
PIHS	Pakistan Integrated Household Survey
PIU	Programme Implementation Unit
PMDC	Pakistan Medical & Dental Council
PMR	Perinatal Mortality Rate
PMRC	Pakistan Medical Research Council
PNC	Postnatal Care
PPHI	Peoples' Primary Healthcare Initiative

PPP	Public-private Partnerships
PRHFPS	Pakistan Reproductive Health and Family Planning Survey
PSLM	Pakistan Social and Living Standards Measurement Survey
PSU	Program Support Unit (PPHI)
PWA	Patient Welfare Association
RHC	Rural Health Centre
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
TB	Tuberculosis
TFR	Total Fertility Rate
THQ	Taluka/Tehsil Headquarter Hospital
TPE	Third-Party Evaluation
UNICEF	United Nations Children's Fund
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
WHO	World Health Organization

Executive Summary

This report gives a background of the health status of Pakistan and Sindh in particular, with an overview of the overall health system and structure as well as the structure of Sindh public and private health sectors. It aims to show the current condition of Sindh reproductive, maternal, newborn and child health through health indicators and various programs operating in the province. The aim of this report is to analyse and indicate opportunities and impact of integrated primary care delivery at the point of care across all existing programs.

Background: Health Status in Pakistan

The first section gives an overview of Pakistan's health indicators and status and briefly explains the health system and structure. The health care system in Pakistan comprises both public and private health facilities. The public sector until recently was under the domain of the Ministry of Health. However, under the 18th amendment of the constitution of Pakistan, the Ministry of Health has been devolved in June 2011 and the functions of the ministry have been transferred to provincial health departments. The provinces are now responsible for developing their own strategies, programmes and interventions based on their local needs. The private health system now ranges from primary to tertiary care in both urban and rural areas. This sector provides varying levels of care through professional and paramedical health care workers.

The health care system and infrastructure of Pakistan can be simply described through primary, secondary and tertiary level care and facilities. The primary care includes Basic Health Units (BHUs) and Rural Health Centers (RHCs) ; secondary care including first and second referral facilities providing acute, ambulatory and inpatient care through Tehsil Headquarter Hospitals (THQs) and District Headquarter Hospitals (DHQs) and tertiary care comprising university referral and teaching hospitals. Besides these, social protection schemes like Bait-ul-Maal also exist. The primary health or first level care facilities (BHUs) are not functioning adequately and even the People's Primary Health Care Initiative launched to overcome these deficiencies have not been very successful especially in relation to maternal and child health.

The recent Pakistan Economic Survey of 2011-12 shows a growth rate of 2.03%. Pakistan is currently off-track for progress on MDG 4 because of under-five deaths (per 1000 live births) at 87 and infant mortality rate is 64 and behind progress in MDG 5 because maternal deaths are (per 100 000 live births) at 260 in 2010 from 276 in 2006-07.

Sindh description and health system (structure of the health system and facilities)

The second section gives a description of health status, healthcare system and structure of Sindh. Sindh is the second most populous province of Pakistan with, approximately 52% of population resides in rural areas and 48% residing in urban areas. Social indicators in urban Sindh are better than rural areas but there are increasing inequities due to thinning out of existing infrastructure and increasing rural-urban migration. Urban areas suffer from environmental pollution, urban slums, interethnic violence and emergencies due to crime and terrorism and special groups in need such as injectable drug users,

street children and homeless elderly. Comparing numbers from 2006-07 (PDHS), the Maternal Mortality Rate (MMR) in Sindh of 314 is much higher than national average of 276 (10). Maternal and child health service is particularly poor in rural areas because there is lack of functional basic and emergency facilities and staff and generally, people are unable to meet the out-of-pocket expenses for transport, drugs and services. Sindh has shown no reduction in Infant Mortality Rate of 81 deaths per 1000 live births over the last decade while Neonatal Mortality Rate, the major cause of infant deaths, has actually increased from 44 to 53 over the last decade. Immunization coverage is also low with existing BCG coverage at 76%, Measles at 51% and Polio 3 at 84%. Estimated prevalence of Hepatitis B and C is 2.5% and 5% in Sind. In the recent National Nutrition Survey 2011, Sindh appeared as the poorest and food deprived province as only 28% households were food secure and the rest 72% households were found to be food insecure of these 72%, 21.1% are were food insecure without hunger, 33.8% were food insecure with moderate hunger and 16.8% were food insecure with severe hunger.

In the Public health sector, the Minister, Secretary and Special Secretary (Public Health), and the DG Health form the upper strata of the DOH, while 4 Additional Secretaries, Directors of 9 Vertical Programs, Principals of Medical Colleges, M.S of 6 Teaching Hospitals and Head of Drug Control, Blood Transfusion, Nursing directorate and other Statuary bodies form the mid-level. The District Health System, including EDOHs, M.S of DHQs & THQs and in-charges of front-line facilities report to the district government. The district level healthcare services like the national healthcare system, are delivered through three main tiers; the lowest community level services is provided by the Primary / First Level Care Facilities (FLCFs); the Taluka/Tehsil Headquarters and District Headquarters Hospitals (THQs/DHQs) form the Secondary Level Care Facilities and the medical colleges/universities come under the category of Tertiary Care & Specialized Care Health Facilities.

The Private health sector of Sindh comprises a wide mix of providers including (i) hospitals, secondary care and individual practices; (ii) specialists, general practitioners, nurses, paramedics, homeopaths and hakims; (iii) for-profit and non-profit organizations; and iv) academia. Sindh has the largest concentration in Pakistan of individual practitioners, private sector medical and diagnostic facilities, health related NGOs and private medical, dental, public health and nursing colleges. It also has the highest concentration of organized private for-profit health sector and of non-profit sector in Pakistan. The private for-profit health sector in Sindh has 59% of all private sector hospitals in Pakistan being located in Karachi. The nonprofit sector is a mix of philanthropic medical sector, NGOs involved in primary health care, emergency services, advocacy/capacity building entities and leading non-profit private medical facilities including general hospitals, specialty centers for blood transfusion, ophthalmologic problems, kidney diseases, leprosy, mental illness, and drug detoxification.

Pakistan's Health system comprises of doctors, nurses and LHWs working from provincial to district level. In Sindh, 1500 medical doctors are produced annually by the public sector of which 63% are females and 37% are males. And approximately 1000 doctors are produced by the private sector. Training of nurses and female paramedics is supported by DOH, CDGK, MOH and private sector institutes. The general cadre forms the single

largest concentration of staff in the public sector but needs more effective training. Specialists are in short supply particularly in rural DHQs and paramedics are usually deployed in rural frontline posts compared to doctors but there are frequent complaints about sub-standard training of paramedics working in public sector. The major issues faced in human resource management across public health sector in Sindh are political placement of health officers/doctors, frequent transfers, inadequate training of health managers and insufficient monitoring resulting in heavy absenteeism and poor work performance.

Total public sector financial provision in Sindh amounts to 37.7% as compared to 32.2% in Pakistan and is inclusive of provincial government, district government, medical education, federal allocations and expenditure by military and autonomous agencies on health care. Sindh also has the highest expenditure for Social Security as compared to other provinces, probably due to the high concentration of salaried workers in the urban areas. Out-of-pocket (OOP) expenditure is incurred at both public and private sector facilities, with the poorer families in Sindh bearing a heavier burden for medical care costs. High OOP forms the major barrier for accessing emergency obstetric care and emergency neonatal services and a contributory factor to accessing pregnancy care and child preventive care check-ups. Based on data of last three years the spending on health in Sindh inclusive of federal, provincial and district allocations, after adjustment for purely educational schemes, is PKR 1412 per capita or USD 16.4. Overall spending per capita has been much lower in preceding years with three year mean of PKR 765 or USD 8.9. The present spending is due to sharp increases in provincial development and operational allocation in 2011-12 fiscal year. Majority of the allocation is towards operational budget with approximately 20-30% contributed towards development. Current allocation for 2011-2012 stands at PKR 44.5 million, with 37.6 million for operational budget and 6.9 million for development.

The most important and ambitious program on primary healthcare and family planning in Pakistan is the National Programme for Family Planning and Primary Health Care (NP-FP&PHC) “The Lady Health Workers’ Programme” (LHWP). The program is being implemented all over the country in phases, with an estimated cost of Rs. 77 000 million from 2010-2015. It is sponsored and executed by the Ministry of Health along with Provincial Health Departments and District Health Offices.

Sindh Health Indicators and Trends

Maternal health

While a drop in maternal mortality has been seen in Sindh from an estimated 349 in 2003 to 314 in 2006-07 however, it remains much higher than the national MMR of 276 in 2008 (uncertainty range 230-587). Rural Sindh has an MMR of 320 and this is due to extremely low coverage of MCH in rural Sindh with Thatta, Ghotki, Jacobabad, Tharparkar and Dadu have the lowest coverage of MCH services. Generally, urban indicators are comparatively superior with MMR of 177 and IMR of 50, however these aggregates mask inequities in low income dwellings where skilled attendance is of dubious quality.

Coverage of maternal services in Sindh remains sub-optimal with only two thirds of pregnant women receiving antenatal care, less than half delivering at a health facility while only a third receive post natal care. The reasons for low coverage in rural areas of Sindh differ according to the type of service, for instance of child illness and maternal obstetric complications, the most frequently cited reason is inability to afford out-of-pocket expenses incurred at both private and public health facilities, the other reason for non-utilization of services is poor functional services. In the case of promotive care such as prenatal services, normal delivery and postnatal care, low demand for service is most frequently reported followed by lack of female staff at public sector facilities and poor quality of services.

Child Health

Sindh's IMR of 81 deaths per 1000 live births (PDHS 2006-07) is extremely high compared to regional figures of IMR of 48 in India, 38 in Bangladesh and 14 in Sri Lanka, and is driven up by the high NMR of 53 neonatal deaths per live birth. Hence Sindh has failed to meet MDG Goal 4 of three quarter reduction in child mortality by 2015. Two thirds of infant deaths in Sindh take place in the neonatal period, mainly in the intra-partum and in the early neonatal period of first week of life and are a result of birth asphyxia, sepsis and prematurity. Pneumonia and childhood diarrhea are the major causes of death from late neonatal period to 1st year of life, even where ORS was given, Sindh shows the greatest percentage of diarrhea cases in children under five years of age especially in the rural areas of the province

Immunizations

The Hib vaccinations coverage for Sindh is 54.2% (NNS 2011) however there has been slow progress in routine immunization in Sindh over the last decade however progress remains less than expected. Even based on mother's recall, Sindh has low basic vaccination coverage with BCG vaccination (recall) at 81.6% and Measles coverage (recall) at 54.9%. Sindh in particular rural areas have very low immunization coverage. Overall in Sindh, only 46% of children aged 12-23 months are fully immunized, with urban areas at 64% and rural areas at 32% coverage

Nutrition

All three indicators of malnutrition including rates of underweight, stunted and wasted children still remain very high in Sindh than, while within Sindh there is a much higher percentage of malnourished children in rural areas (45%) compared to urban areas (30%). Risk factors associated with malnourished children are birth interval of less than 2 years, lack of exclusive breastfeeding and late weaning, contaminated water, father's occupation, and maternal education.

Micronutrient deficiencies in both women and children are endemic in Sindh as in rest of Pakistan and an emerging concern amongst elderly. The NNS 2011 data showed that a total of 24.6 % pregnant women had iron deficiency anemia were from Sindh. Similarly about 49.5% of pregnant women had Vitamin A deficiency from Sindh and 44.6% of pregnant women were zinc deficient. The prevalence of Severe Iron deficiency anemia

among index children is 2.6% and moderate anaemia 29.2% in Sindh. 56% index children were found vitamin A deficient in Pakistan and in Sindh child VAD cases 23.2% were severely deficient and high level of zinc deficiency in children in Sindh at 38.8%

TB

Pakistan is one of the 22 countries that still have endemic levels of TB, with an estimate of 353 cases/1000 population and a case load mainly amongst the poor. Exact population based figures for Pakistan and Sindh are not available, and a disease prevalence survey to provide these figures is presently underway. Under the TB Control Program TB Direct Observation Therapy (DOTs) has been rolled to public sector facilities in all the districts of Sindh, with a case detection rate (CDR) of 59% against a national target of 70% and treatment success rates of 87% against a target of 80%.

Malaria

There is a tendency for epidemic breakouts over a large area, particularly in Punjab and Sindh provinces.

Malaria is a disease that disproportionately affects the poorer sections of the population living in hot, humid, and remote areas that lack good health surveillance systems; consequently, morbidity and mortality in most instances go unreported. Each year about half a million people suffer from malaria.

The Pakistan Demographic and Health Survey 2006-07 shows that only 2 percent of children under age five slept under mosquito nets and one in 500 children used a treated net the night before the survey.

The proportion of children using any net is higher in Sindh (5 percent) and among the children living in the poorest households (4 percent). Sindh also shows the highest percentage of children with fever (35 percent) and a sub-optimal percentage of children taking anti-malarial drugs (4.6 percent). Sindh shows a high incidence of 27.1 percent of malaria among pregnant women but also a higher percentage of malaria treatment received by pregnant women (25%). According to the Malaria Control Program, the annual parasite incidence (API) of malaria, based on confirmed laboratory diagnosis was 1.5 cases per 100 population in Sindh in 2010 and has increased from 0.77 cases per 100 population in 2005. The increase in malaria has also coincided with outbreaks of dengue fever cases

HIV

Sindh has low prevalence of <1% of HIV but a concentrated epidemic in Injectable Drug Users with risk of spread to the general population. Of the total of 7547 reported HIV cases in Pakistan, 3936 are in Sindh, of these 81% are reported from Karachi.). Amongst the high risk groups, injectable drug users (IDUs) have the highest concentration of HIV ranging between 26-23%, followed by male sex workers (MSM) 7.5-2.9%, while female sex workers (FSWs) are at risk of HIV but do not have established HIV infection so far.

Current status of Health Programs in Sindh following devolution

MNCH Program

The MNCH program in Sindh has the objective of fully implementing WHO approved strategies regarding Maternal and Child Health at the PHC level by 2012. Its aim for the year 2012 is to reduce newborn mortality rate to less than 40 per 1000 live births; reduce infant mortality to less than 55 per 1000 live births and to reduce maternal mortality to 200 per 100,000 live births. This program does not have its own allocated human resources but is rather being implemented through the already existing workforce of other programs, mainly LHW LHV CMW vaccinators etc.

Norway-Pakistan Partnership Initiative (NPPI)

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. The program is being implemented in Jamshoro, Badin, Tharparkar, Umarnot, Nawabshah, Larkana, Kambar, Shikarpur, Ghotki and Kashmore. It is being supported by UNICEF, WHO and UNFPA and plans to use innovative and result based financing approaches to improve effectiveness and quality of MNCH care provision. The key activities include establishing an M&E section of the provincial MNCH cell to improve monitoring and promoting birth and death registration in the province.

Reproductive and Primary Health Care -RH and PHC (LHW Program)

The principal objectives of this program were to primarily train and increase the number and quality of Lady Health Workers to improve reproductive and primary health care in the province. The target was to decrease the proportion of poor performing LHWs and increase the number and coverage of LHWs in the province especially in rural areas and disadvantaged areas of larger cities. The provincial unit for FP and PHC is headed by a Provincial Coordinator along with a representative of the Health Department (B-18 or above); 2 Finance officers and a Logistics officer for PPIU and FPIU. Key activities include increasing contraceptive prevalence rate, number of fully immunized children; better quality care to pregnant women and organization of Health Week (with UNICEF) to increase awareness on reproductive and child health.

Family Welfare (Department) Program

This program was launched by the Family Welfare Department of Sindh to increase awareness in the community for population and family welfare. It established and implemented a Population Welfare Program and Family Welfare Centers and Services, which provide clinical and non-clinical contraception and advisory services at district levels. Vertical programs like this at the provincial level, are headed by program Manager along with an administrative officer and deputy managers for finance, technical assistance and monitoring and evaluation.

Malaria Control Program

The Malaria program was launched to aid the local population for a reliable diagnosis and early and effective treatment of malaria through standardized procedures and targeted interventions. It does have its own staff at district level. In addition they have the support of GFATM NGOs in 4 districts of Sindh- these districts and two more districts have been added for future projects of Global fund. Key activities include early and rapid diagnosis; use of Artemesinine based - Combination Therapy (ACT) for confirmed falciparum cases at the BHU level; provision of insecticide treated beds especially to most-at-risk groups of pregnant women and children under 5 years of age; internal residual spray (effective for three months) and training of medical and para- medical staff.

TB –DOTS Program

The DOTS strategy was implemented in Sindh in the year 2000 and all the districts were covered by DOTS in 2003. The Sindh government developed a strong TB control establishment at provincial, regional and district level, with in-built facilities for M&E, training and data analysis. The programs also aims at strengthening the laboratories network at peripheral, district, regional and provincial levels. The districts in Sindh where more than 10,000 cases have been detected are Karachi, Dadu, Hyderabad, ICD Kotri, Tharparkar, Khairpur, Umerkot and Sanghar. The main aim of the DOTS program was to cure patients and ensure quality treatment through close supervision. It has established TB clinics at district level and treatment centers at the level of RHCs and BHUs.

HIV AIDS Control Program

The program was initiated to reduce and control the incidence of HIV among Most at Risk Population (MARPs) especially Injecting Drug Users (IDUs) and Male Sex workers (Hijras/MSM). The main aim was to coordinate a multi-sectoral and sustainable response to HIV that is based on evidence, transparency and accountability; involving various line-ministries, the civil society and target beneficiaries. The program has doctors who have been appointed and trained locally, with the support of UNICEF and are working with public sector staff in CHK and Chandka. SACP has successfully established 5 HIV treatment centres in Sindh; 3 centres are present in the public sector (Karachi and Larkana), while 02 in the private sector at Karachi (Indus Hospital and AKUH). At present it has 46 STIs clinics functioning at District head quarter hospitals level. Male STIs clinic are located in Skin ward while Female STIs clinics are located in the Gynae ward of each hospital.

Expanded Program on Immunization (EPI/Polio)

The purpose of this program was to eradicate polio completely from the province by the end of the year 2010-11 and spread immunization coverage to all districts of Sindh by the year 2015. The program also envisaged a dramatic reduction in measles and control of other preventable disease (like typhoid, influenza, etc) by introduction of new vaccines and routine immunization for children. Its objective is to immunize children of 0-11 months against seven EPI target diseases and pregnant mothers against neo-natal tetanus; eliminate polio and reduce measles mortality. It has conducted special campaigns for

reduction in polio, measles and neonatal tetanus (NNT), including public awareness and mobilization. It has a well integrated surveillance system for polio and measles cases and quality treatment is ensured through increased monitoring and supervision

Hepatitis Program

The program is directed at reducing morbidity and mortality by Hepatitis through vaccinations, injection safety and infection control. The primary aim was to reduce the incidence and prevalence of Hepatitis B & C through diagnostic services throughout the province. The provides Hepatitis B vaccination targeted and at-risk population especially school-going children; the public health work force;; women in their reproductive age, HIV AIDS patients, etc. The program utilizes the existing district health working staff (LHW/vaccinators of EPI/LHV and other para-medical staff).

Nutrition Program

This program was implemented to enhance research and resource mobilization of nutrition intervention at all levels in the Sindh province. Its aim was to ensure better nutrition health and use of micro-nutrients in Sindh especially for identified groups suffering from under-nutrition. The program advocates and ensures availability of IYCF and CMAM services at all levels by coordinating between PHC and Secondary Healthcare units. The program is headed by a Provincial Nutrition manager along with two deputy program managers, an administrative officer and a finance manager.

Evidence-based Interventions for Major Causes of Maternal, Neonatal and Child Deaths and Current Health Programs in Sindh

From a broad range of possible interventions, there is now a consensus-based set of essential interventions for possible implementation in programs that most agencies are converging on. The table in this section shows the major causes of child and maternal death, the evidence-based interventions that are used to combat this mortality and the current programs that offer these interventions in Sindh.

The major causes of maternal deaths include hemorrhage, obstructed labour, infections, anemia, malaria, STIs and unsafe abortion. Major evidence-based interventions include family planning services/counseling; post-abortion care; treatment of pre-eclampsia and eclampsia; management of post-partum hemorrhage and preterm rupture of membranes; iron supplementation; provision of antimalarial drugs and insecticide treated bed nets and management and care of HIV and syphilis.

The major causes of neonatal and child births are infections, birth asphyxia, congenital anomalies, prematurity, pneumonia, malaria and diarrhea. And the major evidence based interventions here include tetanus immunization; promotion of early and exclusive breastfeeding; management of neonatal sepsis, meningitis and pneumonia; folic acid and Vitamin A supplementations and management of dysentery, diarrhea and malaria. Other less common interventions in Pakistan include Kangaroo mothercare for preterm babies; neonatal resuscitation and provision of meningococcal, pneumococcal vaccines.

The major programs providing relevant interventions for maternal and child morbidity and mortality in Sindh are the MNCH and the RH & PHC (LHW) program with some specific interventions delivered by the Family Planning, EPI, Malaria and NPPI program

Opportunities for integration at point of care / primary care settings

One approach to increase coverage and to take on broader initiatives through existing programs is to integrate service delivery at all levels. This has the potential of reaching more people through the same network and has potential in Pakistan because community level health care and basic health units are supported by a large cadre of trained Lady Health Workers and rural health centers are staffed by qualified medical and nursing staff

Integration of health-care services is happening across the globe, although the nature and processes related to the integration process are different in high and low/middle-income countries. In most countries, health programs are delivered independent of each other in a vertical fashion and are designed to target a specific disease or health problem. Although these programs ensure focused technical supervision and targeted delivery, however, many were also associated with duplication, inefficiency and service fragmentation. In contrast, integrated programs can provide economies of scale in terms of costs, human resources and might also be associated with improved client and consumer satisfaction.

Another limitation to these vertical programs is that they provide minimum guidance on how to deal with other health problems existing within the same community, especially as they pertain to MNCH. On the contrary, integrated delivery provides the opportunity to deliver a wider range of health services utilizing the same resources thus being more convenient and acceptable for the target population.

The first level of integration is the integrated delivery of services at community or household level and the second layer evaluates integration within various building blocks of the health system with interaction of the interrelated. It can be readily seen that both levels are important and inter-related. While one focuses on the organization of services and support structures within the health system to enable service delivery, the other principally relates to integration of service delivery at the point of care or household level in community settings as appropriate. For the existing programs operating in Sindh in particular, integration at service delivery level can be quite useful. Various programs can integrate intervention delivery and coverage especially for RMNCH related interventions and issues. This section talks about opportunities for integration at the primary care level and how service delivery can be integrated across current programs operating in Sindh.

Intervention Packages Modeled for Sindh

This section shows a table that has specific intervention packages designed and recommended for Sindh and also shows which interventions are already being provided by existing programs. For Sindh reproductive, maternal, newborn and child care there are a set of eight intervention packages recommended with specific interventions described within each package. The modeled intervention packages pertain to (i) periconceptual and post abortion care, which includes safe abortion services and folic acid supplementation; (ii) expanded antenatal care package for syphilis treatment, tetanus toxoid, magnesium

sulphate for pre-eclampsia and screening for diabetes and fetal growth restriction; (iii) Childbirth and Immediate Newborn care includes antibiotics for PROM, antenatal corticosteroids, essential and immediate neonatal stimulation and care; active management of third stage labour, induction of labour beyond 41 weeks, basic and comprehensive emergency obstetric care; (iv) Postnatal care package for preventive postnatal care, thermal care, oral and injectable antibiotics for neonatal infections; (v) IMCI and community based child care package includes prevention of malaria through insecticide treated nets and spraying, ORS and zinc treatment for diarrhea and dysentery, oral antibiotics for pneumonia and exclusive breastfeeding for 6 months. This package also includes use of improved water connections at home and improved sanitation and hygiene; (vi) Expanded nutrition package to include Vitamin A, calcium, zinc supplementation along with protein energy and multiple micronutrient supplementation; (vii) Expanded immunization package to include Hib, measles and DPT vaccination and (viii) Future intervention package to include kangaroo mother care, rotavirus and pneumococcal vaccines.

The rest of the section shows how implementation of these packages can reduce and affect maternal and child mortality in urban and rural areas of Sindh.

Conclusions and Recommendations

As the situational analysis and modeling above indicates, there are enormous opportunity for increasing the efficiency of programs addressing MNCH and Nutrition in Sindh and an integrated framework for service delivery at primary care level. The following general recommendations may be of value in the planning process to facilitate integration and targeting for health programs and interventions in Sindh

1. There is an urgent need for the thorough review of all existing programs and interventions at primary care level in rural and urban Sindh by targeted populations and service providers. This analysis should provide the basis for assessment of congruency and opportunity for potential integration and coordination of services. The development of a **core services package** should be a priority and will depend upon an objective determination of a prioritized minimal evidence-based set of interventions. This would also mean de-prioritizing unnecessary activities and interventions and diversions of staff from their priority tasks.
2. The feasibility of “clubbing” key interventions into packages of services should be matched with existing services at district or sub-district level and a matrix developed of best opportunities for utilizing existing human resources. The recently conducted human resources survey in Sindh should provide an exact basis for this assessment, but needs to be done keeping functionality and assured presence of service providers in mind.
3. The issue of how best to integrate the governance issues of programs and departments is one that should be considered by the Sindh Ministry of Health and Planning and Development departments. This subject was not tackled in our review which focused on the service delivery aspect at primary care level. This review should however, encourage thinking along these lines and assessing if integration of programs can be achieved administratively. It should be noted that the

governments of Punjab and KP have already embarked upon integration of MNCH, LHW, Nutrition and RH-FP programs.

4. Since catching up on coverage is such a key issue, attention should be given to the utilization of innovative delivery platforms for scaling up evidence-based interventions across various programs and care providers. This could be achieved through platforms such as community support groups, especially women's groups (for advocacy and education), child and family health days or weeks to scale up key interventions and approaches to address financial barriers such as cash transfers and voucher schemes. The mix of interventions linked to the latter pilot scheme within the NPPI program should be re-assessed for effectiveness and acceptability.
5. The issue of targeting evidence-based interventions to those in maximal need is a priority and critical to reducing the equity gap in Sindh. It is not sufficient to merely target rural and urban populations and it is recommended that district maps be drawn to indicate populations at-risk or not covered. These should be targeted with the proposed packages as appropriate. The recent advances in Geographic Information Systems (GIS) technology will make this possible and could also develop district-based plans based on public sector and non-governmental programs and health care providers.
6. Finally, none of the above will work without robust monitoring and evaluation and it is recommended that a clear target for monitoring progress on key indicators be put in place. While this is traditionally achieved through household surveys (DHS and MICS), Sindh should strive to strengthen the MIS and HMIS systems for rapid and timely feedback at district level. This would allow for real time and timely planning obviating the need for modeling and projections.

SECTION 1: HEALTH STATUS IN PAKISTAN

Pakistan Health System and Structure:

Pakistan is the sixth most populous country in the world (1) and according to the Pakistan Economic Survey 2011-12, its population is estimated at 180.71 million. It has a population growth of around 2.03 percent per annum and life expectancy rate has increased from 65.8 years to 66.1 years for female and 63.9 years to 64.3 years for male in 2011-12. The health care system in Pakistan comprises both public and private health facilities. The public sector until recently was under the domain of the Ministry of Health. However, under the 18th amendment of the constitution of Pakistan, the Ministry of Health has been devolved in June 2011 and the functions of the ministry have been transferred to provincial health departments. The provinces are now responsible for developing their own strategies, programmes and interventions based on their local needs (2).

There is now a structure established with some responsibilities with the Ministries for inter-provincial coordination, some in the Ministry of Regulation and Services and some in the Cabinet Division. The newly formed Ministry for National Food Security and Research among other roles, is now responsible for economic coordination and planning in respect of food which was earlier distributed by Planning and Development Division, import and export of food grains and food stuff including quality control/assurance, availability and storage which was earlier under Commerce Division, Pakistan Agriculture Research

Council and other federal agriculture research organizations earlier under Scientific and Technological Research Division.

However, national planning in the health sector and cooperation with the provinces and international development partners is vested with the Planning and Development Division. All the vertical health programs have also been devolved to the provinces but some national health programmes will continue to be financed by the federal government in the post devolution scenario till 2014-15. These include the National Programs for Family Planning and Primary Health Care, Maternal and Child Health Programme, Expanded Program on Immunization, Prevention and Control of Blindness and National Control Programs for Malaria, TB and HIV/AIDS.

The private health system now stretches across the spectrum from primary to tertiary care and exists all over the country in both urban and rural areas. This sector provides varying levels of care and constitutes a diverse group of doctors, nurses, pharmacists, traditional healers and laboratory technicians. The services they provide include hospitals, nursing homes, and maternity clinics (2).

Through the public and private health care providers along with safety net arrangements (covering 0.5 million people), the total number of individuals covered for health stands at 41.73 million or 26.62% of the country's population. The remaining 73.38% of the population is not fully covered for health and predominantly seeks care by making out-of-pocket expenditures (3).

Conventionally, the State provides healthcare through a three-tiered healthcare delivery system and a range of public health interventions. The health care system at the primary level includes Basic Health Units (BHUs) and Rural Health Centers (RHCs); secondary care includes first and second referral facilities providing acute, ambulatory and inpatient care through Tehsil Headquarter Hospitals (THQs) and District Headquarter Hospitals (DHQs) and tertiary care comprise of teaching hospitals.

Although, taxation and out-of-pocket payments are the major modes of financing health within the country and donor contributions add to these (4). A comprehensive social protection system does not exist with limited social protection funds like Zakat and Bait-ul-Mal or the Employees Social Security scheme.

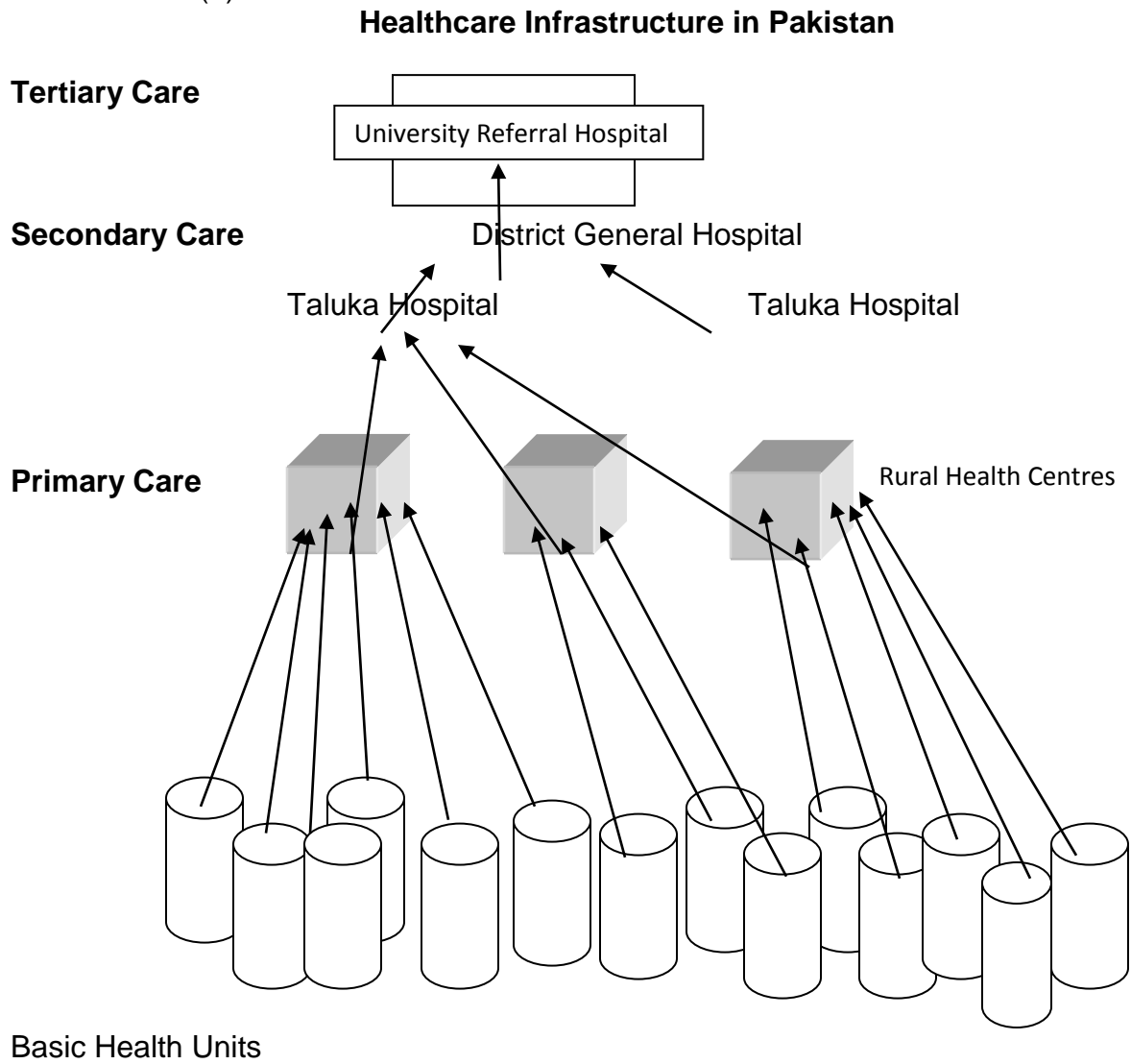
The physical infrastructure of PHC comprises many categories of service delivery outlets or BHUs and RHCs. Basic Health Units are also meant to deliver outreach services and serve as the implementation arm of the national public health programs. However, more than 30% First level care facilities are currently non-functional despite efforts to restructure management of BHUs (3).

People's Primary Health Care Initiative was launched to overcome the failure of many First Level Care Facilities in Pakistan to deliver PHC services through health facilities that were understaffed, poorly resourced and/or ineffectively managed. A Third Party Evaluation (5) in 2010 shows that districts where PPHI has been operating for the longest time (approximately 2 years since mid or end 2007 until January 2010) have achieved significant improvements in staffing, availability of drugs and equipment and physical

condition of facilities, including rehabilitation and repossession of dysfunctional BHUs. All these improvements are very encouraging but are nowhere near enough, particularly when population denominators are used to assess service coverage, a practice that was seldom used by either PPHI or DDOH district managers. When catchment population estimates were used by the TPE (Third Party Evaluation) it became apparent that utilization of essential MNCH services remains low and that for reproductive health services is simply abysmal, in both DDOH and PPHI BHUs. Therefore, the room for improvement is huge if MDGs 4 and 5 are to be achieved

Economic Survey 2011-12 shows that there are 972 public hospitals, 5374 BHUs, 584 RHCs and 909 Maternal and Child Health Centres in Pakistan. Besides doctors and nurses a wide network of community based female Lady Health Workers and Midwives provide preventive, maternal and child health and family planning services to population at the grass roots level. There are 149,201 registered doctors, around 11,000 registered nurses and Lady Health workers each and approximately 27,000 mid-wives (2).

The figure 1 below shows a simple summary of Pakistan's healthcare system and infrastructure (6):



Basic Health Units

Source: Maternal and Child Health in Pakistan, Challenges and Opportunities, 2004.

Sindh Public Health Sector (structure and facilities):

The Department of Health (DOH) in Sindh has previously had limited responsibility in the areas of policy formulation, strategic planning, monitoring, regulation and coordination with international development partners and private sector. The Minister, Secretary and Special Secretary (Public Health), and the DG Health form the upper strata of the DOH, while 4 Additional Secretaries, Directors of 9 Vertical Programs, Principals of Medical Colleges, M.S of 6 Teaching Hospitals and Head of Drug Control, Blood Transfusion, Nursing directorate and other Statuary bodies form the mid-level.

The District Health System, including EDOHs, M.S of DHQs &THQs and in-charges of front-line facilities report to the district government under the LGO 2001 but staff appointments of officers are controlled by the provincial DOH. Various statutory bodies and vertical programs are based in Karachi whereas Director General Health Services and remaining vertical/provincial programs are based in Hyderabad. There are 15195 beds, a little over 5000 nurses and approximately 12000 doctors available in public sector health facilities (8).

At the District level, healthcare services are delivered through three main tiers:

- Primary / First Level Care Facilities (FLCFs): This is the lowest tier and hence the facilities are closest to the community they serve.
- Secondary Level Care Facilities: These include Taluka/Tehsil Headquarters and District Headquarters Hospitals (THQs/DHQs) with additional specialties, staff positions and bed strength. These facilities serve up to 200,000 people.
- Tertiary Care & Specialized Care Health Facilities: The facilities under this category are either connected to a medical college / university or provide specialized care in usually one discipline only such as National Institute of Cardiovascular diseases.

Health Care Facilities of DOH Sindh (Table 1)

Type of Health Facility	Managed by (Reporting Relationship)		Total
	PPHI	EDO (H)	
First Level Care Health Facilities			
Basic Health Units (BHUs)	783	640	1423
Rural Health Centers (RHCs)	06	125	131
Mother & Child Health (MCH) Centers	39	32	71
Dispensaries	470	409	879
Others	92	21	113
Total	1509	1108	2617
Secondary Level Care Facilities			
Type Of Facility	Managed by Medical Superintendents with variation in powers vested to run the facility.		
District Headquarter Hospitals (DHQs)	18		
Taluka / Tehsil Headquarters Hospitals (THQHs)	44		
Major / Specialized Care Hospitals	27		
Total	89		
Tertiary Care Hospitals	9		
Grand Total	1607		

There are various vertical programs initiated by the Government along with many public-private strategic partnerships to address particular health challenges and issues. Some of these include the Maternal Newborn and Child Health Program (in collaboration with WHO, UNICEF, UNFPA and NPPI to reduce MNC morbidity and mortality); Sindh Aids Control Program; Provincial Nutrition Program; Provincial TB Control Program Sindh, etc. Most of these programs have shown visible success but only in limited and targeted areas especially due to financial constraints and recent downscaling of programs.

Sindh Private Health Sector (structure and facilities):

A recent report on Sindh's Health system, *Situational Analysis for Post Devolution Health Sector Strategy of Sindh Province* has done a comprehensive analysis of Sindh's Public and Private Health Systems, Pharmaceutical Sector, Health Care Financing, etc. Some of the relevant sections in this report draw on the summary statistics, findings and conclusions presented therein (8). The private health sector provides 78 percent of general consultation services in Sindh catering to all income groups. This is mainly due to availability of functional services and patients perception of better quality of care. The private sector overshadows the public sector for provision of care in urban areas and has a smaller but growing presence in rural areas. The section below describes the private health care system and facilities in detail (8).

It comprises a wide mix of providers including (i) hospitals, secondary care and individual practices; (ii) specialists, general practitioners, nurses, paramedics, homeopaths and hakims; (iii) for-profit and non-profit organizations; and iv) academia. Sindh has the largest concentration of individual practitioners, private sector medical and diagnostic facilities, health related NGOs and private medical, dental, public health and nursing colleges in Pakistan. Sindh has the largest concentration of organized private for-profit health sector as evidenced by 59% of all private sector hospitals in Pakistan being located in Karachi. District-wise distribution of private for-profit providers in the province shows that the highest concentration is seen in Karachi, followed by Hyderabad, Sukkur, Larkana and Nawabshah, with no documented presence in Naushero Feroze, Matiari and Jamshoro. For-profit private hospitals due to their high tariff rates mainly cater to the middle class population and are strategically situated in the elite areas of large cities. However, due to low quality of care at public sector hospitals there has been an increasing trend of low middle income groups to utilize private sector hospitals despite high costs. Private sector practices of GPs are the main recourse to primary health care for the general population including the poor due to lack of a functional primary health care system.

Area wise number of for-profit private hospitals in Karachi (Table 2)

Area	No. of for profit hospitals (n=360)
Defense Housing Authority	50
Clifton	20
Saddar	50
Tariq Road and Bahadurabad	60
Gulshan-e-Iqbal	80
Gulistan-e-Johar	50
Nazimabad	100
Korangi	50

Source: Health and Social Work - Private Sector Hospitals, IFC, NW Washington, DC 20433, USA, May 2011 (21)

Sindh also has the highest concentration of non-profit sector in Pakistan. The nonprofit sector is a mix of philanthropic medical sector, NGOs involved in primary health care, emergency services and advocacy/capacity building entities. The philanthropic medical sector is the most well established in Sindh with more than 20 medium to large entities offering medical or specialty services. The NGO sector targeting PHC and population related development work has 11 well established entities. The emergency network has fewer entities but probably the largest network with outreach across most areas of Sindh and Pakistan. Most non-profit hospitals, with some exceptions, are participating in preventive care programs such as Baby friendly Hospital Initiative (BFHI), EPI, Polio eradication SIAs, Polio eradication surveillance, etc.

Some of the leading non-profit private medical facilities of Pakistan are based in Karachi and include general hospitals and specialty centers for blood transfusion, ophthalmologic problems, kidney diseases, leprosy, mental illness, and drug detoxification. Philanthropic hospitals are financed by missionary organizations such as Karachi Adventist and Seven Day Hospital, family endowments such as Layton Rehmatullah Trust Hospital, citizen's endowments such Indus Hospital, charitable organizations such as Hilal e-Ahmer Centre and trust-based initiatives such as Liaquat National Hospital.

The private non-profit health sector provides some crucial and important medical facilities and contribution. These include (8):

Blood Transfusion Services/Blood Banks: Approximately 1.5 million blood bags are annually transfused in Pakistan having a ratio of 60: 40 for private and public sectors (STB, 1999). In Sindh, there are over 600 Blood Banks of which 450 (73%) are in the private mainly non-profit sector. At present, there are only 2 blood transfusion services in the country that meet international quality assurance (QA) requirements including 1 in the public sector - Jinnah Postgraduate Medical Center (JPMC) - and one in the private sector - the Aga Khan University Hospital (AKUH). Besides these, there are a number of private sector blood transfusion services including Hussein Foundation, Fatimid Foundation, Pakistan Red Crescent Society and Burhani Trust.

Ambulance Services: The private non-profit sector is the single sector active in ambulance services across Pakistan and these services have been initiated from urban Sindh. Edhi Foundation located in Karachi has raised the single largest fleet of ambulances, with a

nation-wide network of over four hundred ambulances equipped with communication systems covering the four provinces of the country. Chipa Welfare Association (CWA) in Karachi has at present 24 Chipa Centers and 73 ambulances providing free rescue operations in accidents, emergencies and disasters. Aman Foundation (AF) launched in 2009, has a fleet of 100 state-of-the-art ambulances and is the only ambulance service in Pakistan staffed with trained doctors and paramedics who meet international standards. Al-Mustafa Welfare Society (AMWS) is providing ambulance services in Karachi since 1983 and has expanded to Jacobabad, Sanghar, Shahdadpur, Ghotki in Sindh.

Sindh has the largest concentration of large professional NGOs working on PHC and population. These prominently include the Marie Stopes Society, PAVHNA and FPAP working on reproductive health and family planning; HANDS, Thardeep, HOPE and HELP working on PHC, WCH division AKU working on MNCH, AKHSP working on secondary maternal care and PHC services, and GSMP working on family planning, STIs and MCH.

There are only 4-5 Advocacy NGOs and are predominantly comprised of the Pakistan Medical Association, which advocates for health needs across the sector, and of gender focused organizations that also take up women' health as part of a larger gender agenda. Gender focused organizations include Aahung advocating for sexual and reproductive health, NMNCH working on maternal health, War against Rape (WAR) working on sexual violence, Women's Action Forum (WAF) providing a pressure group on women's issues and Aurat Foundation working on women's participation in political and governance processes.

Pakistan witnessed rapid increase in NGOs in the last two decades from an estimated 60,000 to 70,000 in 2001 to 100,000 in 2009 across all sectors(8). Of these 6% are in the health sector with 4% providing outpatient health services, immunizations, while inpatient hospital care is provided by 1-2%, however majority of those registered are small, inactive and lack capacity. Large professional structures are a handful and most have their base in Sindh. But the Private Health Sector is crucial in many other health-related activities. Private academic institutions produce nearly 50% of trained workforce in the province. The major bulk of research comes from the private sector; AKUH publishes approximately 400-500 health related publications in peer-reviewed, indexed, internationally recognized journals (HEC 2011) which in the health discipline is higher than any other university in Pakistan. Research as an established discipline is also well established in ZMU and BMU and stimulated research trend in public sector medical colleges.

Human Resources for Public Sector Health in Sindh

Pakistan's Health system comprises of doctors, nurses and LHWs working from provincial to district level. The numbers for registered healthcare workers is summarized in the table and the figure shows the major staff categories in health administration

Registered Medical, Paramedical Personnel and Expenditure On Health (Number) (Table 3)

Year	Registered Doctors	Registered Nurses	Registered Mid-wives	Registered Lady Health Visitors	Expenditure (Min. Rs)	
					Development	Non-Development
2011	149,201	10,958	27,153	11,510	26248.00	28873.00

Source: Pakistan Economic Survey 2011-12 (2)

Staff categories assisting in health administration / management (Figure 2)



Generally across Pakistan, there is a persistent over-production of medical doctors but paramedics, nurses, midwives and lady health workers are chronically under-produced. In Sindh, 1500 medical doctors are produced annually by the public sector of which 63% are females and 37% are males and approximately 1000 doctors are produced by the private sector.

Training of nurses and female paramedics is supported by DOH, CDGK, MOH and private sector institutes. Within the public sector, there are a total of 5 Public Health Schools for LHV training, 19 nursing schools, 1 nursing college and 13 schools for training of midwifery.

Details of Nurses and Paramedics Training (Table 4)

Category	Duration of Training	Numbers Produced					
		2008			2009		
		Male	Female	Total	Male	Female	Total
General Nursing	3 Years	987	690	1677	1204	842	2046
Community Midwives	18 Months	00	156	156	00	445	445
Nurse Midwives	1 Year	00	405	405	00	340	340
Pupil Midwives	1 Year	00	511	511	00	304	304
Lady Health Visitors	1 Year	00	181	181	00	184	184

Source: Sindh Nursing Examination Board, Karachi (22)

The Situation Analysis Report on Sindh health sector (8) shows that within the Department of Health, Sindh there are 10,908 officers in general cadre, 10,055 in specialist cadre, 79 in teaching cadre and 385 dental surgeons. There are a total of 2474 paramedics annually produced in Sindh. Institutes also offer a 2 year diploma course in various disciplines, with the exception of PHC courses that offer diploma after one year. There are 65 institutes all over Sindh from all sectors, public or private, offering one year certificate courses in 25 disciplines and diploma courses in 14 disciplines.

The general cadre forms the single largest concentration of staff in the public sector but needs more effective training. It has more staff appointed than allotted positions and ground absenteeism remains high. The incoming cadre is not exposed to pre-service or in-service management training and lack refresher clinical training.

Specialists are in short supply particularly in rural DHQs, while those posted even in Teaching Hospitals in rural districts often do not possess CPSP required qualifications of FCPS and therefore cannot function as teaching hubs for training of specialist cadre. There are a total of 2846 posts of specialist in various disciplines of which only 1055 are filled.

Paramedics are more easily deployed in rural frontline posts compared to doctors. There are at least 40 000 paramedics employed by the DOH. However, there are frequent complaints about sub-standard training of paramedics working in public sector. Paramedics, in all categories and both genders are mainly managed at district level. There is acute shortage of nurses, female paramedic staff and female doctors across urban and rural areas in Sindh. Even those available, especially nurses and female paramedics are poorly trained and therefore usually perform below potential. Conversely in large NGOs such as AKHSP frontline management of case is handled by well-trained LHVS and nurses and has resulted in documented decline in infant mortality and service coverage in MNCH.

The major issues faced in human resource management across public health sector in Sindh are political placement of health officers/doctors, frequent transfers, inadequate training of health managers and insufficient monitoring resulting in heavy absenteeism and poor work performance.

A brief comparison of Public & Private Human Resource Management (Table 5)

Criteria	Public	Private
Recruitment	Basic qualification only	Qualification with other merits like relevant experience academic achievements and references
Professional Development	Adhoc program specific, not accorded value for career enhancement	Continuous and valued for career enhancement
Assignment of tasks / Responsibility	Adhoc, routine, as and when needed irrespective of qualification, experience and / or integrity.	Objective, variable and multidisciplinary
Career enhancement / Seniority	Based on number of years spent in public service	Performance based
Annual Appraisal	Subject to personal likes and dislike of higher authority	Subject to performance / achievement of objectives
Moral values / Professional ethics	Accorded least or no value	Valued higher compared to public sector

Source: Situational Analysis for Post Devolution Health Sector Strategy of Sindh province (8)

Sindh Financial Allocations for Health and Family Planning

Pakistan spends 2.6% of GDP on health which is the lowest in south Asian countries with comparative spending of 7.4% in Afghanistan, 4.2% in India, 4% in Sri Lanka and 5.6% in China.

Total public sector provision in Sindh amounts to 37.7% as compared to 32.2% in Pakistan and is inclusive of provincial government, district government, medical education, federal allocations and expenditure by military and autonomous agencies on health care. Both provincial and district governments are the major sources of public sector funds in Sindh, with district share being the highest compared to other provinces. Sindh also has the highest expenditure for Social Security as compared to other provinces, probably due to the high concentration of salaried workers in the urban areas.

Out-of-pocket (OOP) expenditure is incurred at both public and private sector facilities, with the poorer families in Sindh bearing a heavier burden for medical care costs. World Bank analysis of HIES survey data shows that lowest income quintile spends about 7% of monthly household income on health care as compared to the average of 5.2% for households from higher quintile. Households in Sindh annually spend 53% of OOP on purchase of medicines and 43% on doctor's fee and hospitalization. High OOP forms the major barrier for accessing emergency obstetric care and emergency neonatal services and a contributory factor to accessing pregnancy care and child preventive care check-ups (11).

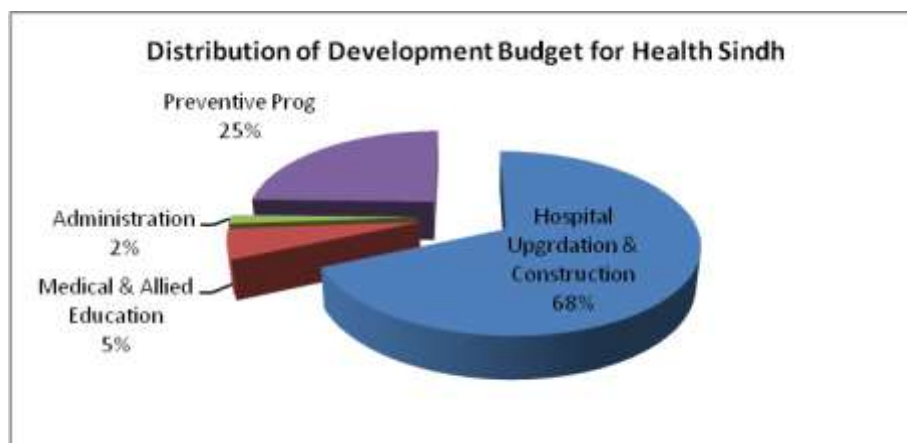
Based on data of last three years the spending on health in Sindh inclusive of federal, provincial and district allocations, after adjustment for purely educational schemes, is PKR 1412 per capita or USD 16.4. Of this federal Ministry of Health amount was 132 per capita in Sindh, provincial spending was PKR 1027 per capita, while districts spend a variable amount with an average of Rs.259 per capita.

Overall spending per capita has been much lower in preceding years with three year mean of PKR 765 or USD 8.9. The present spending is due to sharp increases in provincial development and operational allocation in 2011-12 fiscal year. In Sindh, an average of 6.4% of the provincial budget has been allocated to health in the recent years (range 4.2-8%), and after adjusting for inflation it is an average allocation of 5%. Majority of the allocation is towards operational budget with approximately 20-30% contributed towards development. Current allocation for 2011-2012 stands at PKR 44.5 million, with 37.6 million for operational budget and 6.9 million for development (8).

Health as Percentage of Total Provincial Budget (Table 6)

Growth in Provincial Allocation (in millions)				
Years	Total Provincial budget	Health	Share of health budget (nominal)	Share of health budget (real)
2008-09	182481	12588	6.9%	
2009-10	282732	16257	5.7%	5.1%
2010-11	388707	16336	4.2%	3.7%
2011-12	515268	44,543	8.6%	7.6%

Source: Public accounts data, Assumption: 10% annual inflation rate (Figure 3)



Although there is an extensive range of new financing mechanisms available for DOH there is limited recognition of range of options. Instances of new financing schemes in Sindh are few and have been mostly generated with donor support or hierarchal pressure as in the case of PPHI. The Norwegian Pakistan Partnership Initiative (NPPI) in partnership with Sindh MNCH program is promoting use of new financing mechanism to improve access to maternal and neonatal care in disadvantaged districts however despite initiation in 2008 has made slow progress so far.

A number of philanthropic supported ventures in public sector hospitals have mushroomed in urban areas of Sindh, particularly Karachi. These have made positive contribution to improving functionality of public sector services and reducing patient out of pocket expenditure on drugs and diagnostics. One such venture is supported by Tabba

Foundation for Gynecology Ward of JPMC for building and equipping of a new maternity ward at JPMC, hiring of management staff and contribution to non-salary operational expenses (8).

The most important and ambitious program on primary healthcare and family planning in Pakistan is the National Programme for Family Planning and Primary Health Care (NP-FP&PHC) “The Lady Health Workers’ Programme” (LHWP). The program is being implemented all over the country in phases, with an estimated cost of Rs. 77 000 million from 2010-2015. It is sponsored and executed by the Ministry of Health along with Provincial Health Departments and District Health Offices (12). The Table below shows the unit wise expenditure for each province in this phase:

**Program Implementation Units Wise Financial Phasing Jan 2010 to FY 2014-15
(Rupees in Million) (Table 7)**

Federal	Punjab	Sindh	KPK	Balochistan	AJK	Gilgit & Baltistan	FATA	ICT	Total (Rs Million)
14,033.46	31,454.95	13,111.21	9,117.08	4,858.89	1,938.38	976.98	1,368.93	241.04	77,100.9

Source: NP-FP & PHC Programme January 2010-June 2015 (12)

SECTION 2: HEALTH STATUS IN PAKISTAN

Pakistan Health Indicators:

As shown before, the population growth rate of Pakistan in 2011-12 is 2.03 percent (2). Although this is lower than the previous decade, such significantly increasing size of the population is well above replacement, available resources for MNCH and has huge implications for maternal and child health and services. Child and maternal health is an integral index of social development for any country because it reflects the status and access of health system and services

The most recent data on health performance of other South Asian countries suggest that Pakistan lags behind in infant mortality rate (at 63 per 1000 live births) and the under 5 years mortality rate (at 86.5 per 1000 live births). These indicators continue to remain high mainly on account of unhealthy dietary habits, water borne diseases, malnutrition and rapid population growth.

However, the average life expectancy at 66 years compares well with India, Nepal and Bangladesh (2)

Regional Human Development Indicator (Table 8)

Country	Life Expectancy 2011	Mortality Rate under 5 per 1000 2010	Infant Mortality Rate per 1000 2011	Population Growth Rate (%) 2011
Pakistan	65.99	86.5	63.26	2.03
India	66.80	62.7	47.57	1.34
China	74.68	18.4	16.06	0.49
Indonesia	71.33	35.3	27.95	1.07
Bangladesh	69.75	47.8	50.73	1.57
Sri Lanka	75.73	16.5	9.70	0.93
Malaysia	73.79	6.3	15.02	1.58
Nepal	66.16	49.5	44.54	1.60
Thailand	73.60	13.0	16.39	0.57
Philippines	71.66	29.4	19.34	1.90

Source: World Development Report 2011 from WHO report (7)

The WHO PMNCH 2011 Report (7) shows Pakistan to be off-track for progress on MDG 4 because of under-five deaths (per 1000 live births) at 87 and behind progress in MDG 5 because maternal deaths are (per 100 000 live births) at 260 in 2010 from 276 in 2006-07 (10).

Sindh Health Status:

Sindh is the second most populous province of Pakistan with the highest growth rate of 2.8% in the country and an estimated 42 million population, excluding estimated 3-4 million Afghan refugees. It has 23 districts, 160 towns and 1094 union councils and hosts the megacity of Karachi. Approximately 52% of the population resides in rural areas and 48% resides in urban areas. The population in Urban areas is also affected by high pace of in-migration from across the country. This makes the province vulnerable to socio-demographic challenges of both rural and urban populations.

Population and Demography (Table 9)

Indicators	Pakistan	Sindh	Sindh Rural	Sindh Urban
Projected population in millions (2011)	177.1	42.2	22	21
Average Annual Growth Rate (%)	2.03	2.80	2.8	2.6
Population density (persons per Sq Km)	222	299	-	-

Source: Pakistan Bureau of Statistics.(Estimated) Social Indicators of Pakistan 2011 (9)

Social indicators in urban Sindh are better than rural areas but there are increasing inequities due to thinning out of existing infrastructure and increasing rural-urban migration. Urban areas suffer from environmental pollution, urban slums, interethnic violence and emergencies due to crime and terrorism and special groups in need such as injectable drug users, street children and homeless elderly. More than 50 percent of urban population of Sindh lives in slums (26).

The Situational Analysis report (8) shows that 30 percent of households in Sindh do not have safe water supply and 50 percent do not have proper sanitation. In terms of socio-economic and health status, Karachi, Hyderabad and Sukkur are comparatively the most developed compared to the lowest developed areas of Thatta, Tharparkar, Jacobabad, Badin, Mirpurkhas, Kambar and Kashmore. The social indicators for the rural population of Sindh fall below the average for rural Pakistan. Total Fertility Rate is high at 4.5, female literacy level is only 12%, sex ratio is inverse at 114 showing gender discrimination in health status, proper sanitation is present in only 24% of population, safe water in only 64% and electricity in only 52% of households. Rural population has limited access to healthcare facilities and services due to long distances and transportation issues.

Key Social Indicators (Table 10)

Indicators	Pakistan	Pakistan Urban	Pakistan Rural	Sindh	Sindh Urban	Sindh Rural
Literacy rate	58	74	49	59	75	42
Female literacy rate	46	67	35	46	68	22
Households having improved drinking water	87	94	84	89	96	81
Households having flush toilet facility	66	96	51	62	95	26
Households having electricity	91	98	88	90	97	82
Housing units using Gas/Oil for cooking	35	82	11	50	90	9
Pucca housing units	28	59	11	37	70	3
Own housing units	86	76	91	84	75	93

Source: PSLM 2010-11 (20)

The Maternal Mortality Rate (MMR) in Sindh of 314 is much higher than national average of 276 (10). Maternal and child health service is particularly poor in rural areas because there is lack of functional basic and emergency facilities, lack of female staff and generally, people are unable to meet the out-of-pocket expenses for transport, drugs and services. Sindh has shown no reduction in Infant Mortality Rate of 81 deaths per 1000 live births over the last decade while Neonatal Mortality Rate, the major cause of infant deaths, has actually increased from 44 to 53 over the last decade (10).

Immunization coverage is also low with existing BCG coverage at 76%, Measles at 51% and Polio 3 at 84%. Gaps in coverage have led to reporting of as many as 32 polio cases in 2011, with Karachi metropolis having the highest concentration (10).

Estimated prevalence of Hepatitis B and C is 2.5% and 5% in Sindh. The DOH shows vaccination levels at 14-15% in Hyderabad and Naushero Feroze, between 10-7% in Sanghar, Khairpur and Umerkot and 6-0% in remaining districts. Sindh also has high levels of non-communicable diseases particularly in urban areas. Diabetes level is 16.5% in urban and 13.9% in rural areas. Ischemic heart disease accounts for the largest share of disease burden with 40% of adults > 40 years in urban Sindh being hypertensive of which only 3% are adequately controlled while mental health accounts for the next largest share with earlier data showing 34% of the adult population suffering from depression and indicative of significant rise due to inflation, crime and terrorism (8)

In the recent National Nutrition Survey 2011, Sindh appeared as the poorest and food deprived province as only 28% households were food secure and the rest 72% households were found to be food insecure. Of these 72%, 21.1% are were food insecure without hunger, 33.8% were food insecure with moderate hunger and 16.8% were food insecure with severe hunger.

There has been some reduction in fertility rate but this is majorly due to increased age of marriage for women as contraceptive prevalence remains low at 26.7% (10).

As shown before, private providers are the predominant providers of primary, secondary, diagnostic, pharmacy and ambulance health services in Sindh while public sector dominates in provision of tertiary care for low-income groups. The private sector is well entrenched in urban areas but not so much in rural areas. The rural areas have a well designed district health system but it is not utilized due to poee maintenance and resource shortages. Use of public sector health system is lower in Sindh at 22% compared to 29% in rest of the country

Percentage of households satisfied with government health services-national and provincial (Table 11)

	2001	2004
Punjab	23	28
Sindh	22	25
NWFP/(KPK)	27	24
Balochistan	17	23
Pakistan	23	27

Source: Health Indicators of Pakistan. Gateway Paper II (13)

Sindh Health Indicators

- **Maternal Health**

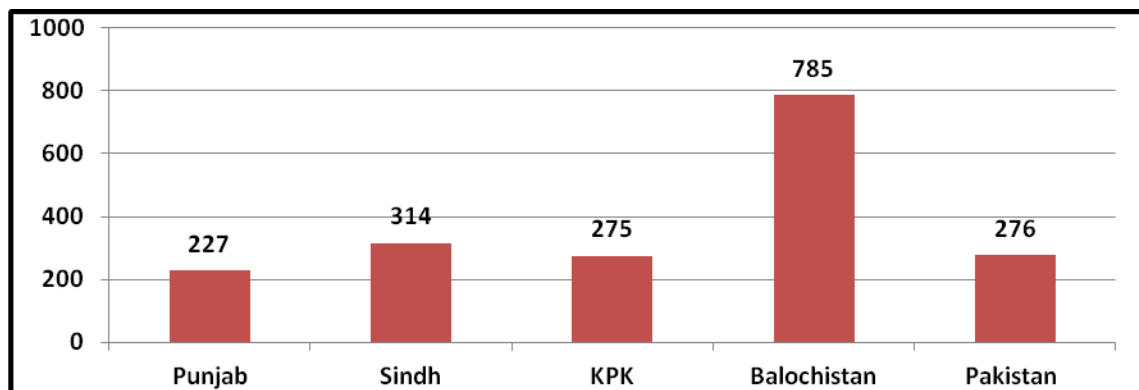
The maternal health indicators included in the Millennium Development Goals include *Maternal Mortality Ratio* and *Proportion of births attended by skilled personnel* under Target 6 of Goal 5 (13).

The maternal mortality ratio (MMR) measures the risk of death per pregnancy. MMR is believed to be the most sensitive indicator of women’s status in a society and of the quality and accessibility of maternal health services available to women (10).

The graph below shows the maternal mortality ratio and rate per 100, 000 deaths by province.

Balochistan has the highest ratio followed by Sindh, KPK and Punjab.

Provincial Maternal Mortality Ratios (Figure 4)

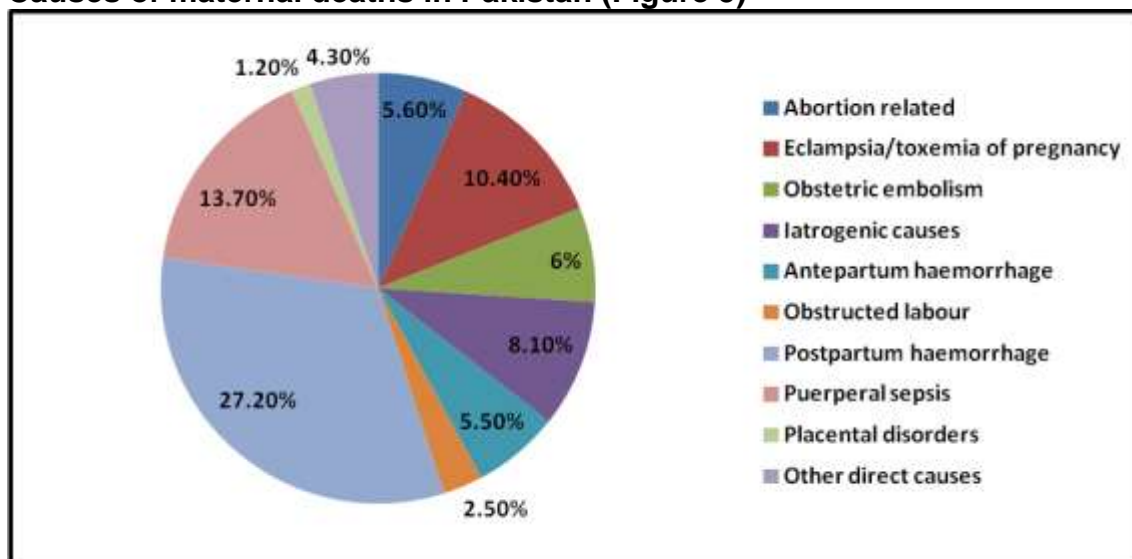


Source: PDHS 2006-07 (10)

Methodological issues notwithstanding, while a drop in maternal mortality has been seen in Sindh from an estimated 349 in 2003 to 314 in 2006-07 however, it remains much higher than the national MMR of 276 in 2008 (uncertainty range 230-587). Urban areas of Sindh have relatively lower maternal mortality. Rural Sindh probably has very high levels of maternal mortality compared to rural Punjab and KPK. Rural Sindh has an MMR of 320 and this is due to extremely low coverage of MCH in rural Sindh with Thatta, Ghotki, Jacobabad, Tharparkar and Dadu have the lowest coverage of MCH services. Generally, urban indicators are comparatively superior with MMR of 177 and IMR of 50, however these aggregates mask inequities in low income dwellings where skilled attendance is patchy and of dubious quality (8).

The global maternal causes of mortality are currently being revised and the existing categories may change. Based on the existing criteria and the audit findings from the last DHS survey, the leading causes of MMR are post-partum hemorrhage (27.2%), sepsis (13.7%) and eclampsia (10.4%) indicating need for skilled birth attendance and easy access to functional emergency obstetric services.

Causes of maternal deaths in Pakistan (Figure 5)



Source: PDHS 2006-07 (10)

Coverage of maternal services in Sindh remains sub-optimal with only two thirds of pregnant women receiving antenatal care, less than half delivering at a health facility while only a third receive post natal care (shown in the Table below). Although these figures are at par with poor performance nationally, the service performance trend in Sindh shows cause for alarm. Survey data show at best no change in institutional delivery levels and at worst a decline over the last decade (19) which has severe implications for maternal and neonatal mortality. Similarly there is no change in postnatal care visits with only ANC visits recording a positive increase (20).

Trends in Maternal and Child Care Coverage in Sindh (Table 12)

MCH Service Coverage (%)	Sindh 1998-99 (PIHS)	Sindh 2001-02 (PIHS)	Sindh 2003-04 (MICS)	Sindh 2006-07 (PDHS)	Sindh 2010-11 (PSLM)
ANC visit to skilled attendant	37	38	43	70	65
Institutional Delivery	-	-	49	42	47
PNC	-	-	35	59	34
Pregnant mothers immunized for TT-1	40	43	59	53	60
Children immunized for BCG	57	58	64	76	83
Children immunized for measles	39	46	-	51	77
Children immunized for Polio 3	-	-	-	84	70
Children given ORS during diarrhea	-	-	-	53	89

Source: Data sources included in each column (10), (18),(19),(20)

The reasons for low coverage in rural areas of Sindh differ according to the type of service. In case of acute illness, child illness and maternal obstetric complications, the most frequently cited reason is inability to afford out-of-pocket expenses incurred at both private and public health facilities on items such as drugs, diagnostics and transport. The other main reason cited for non-utilization of services is poor functional services. In the case of promotive care such as prenatal services, normal delivery and postnatal care, low demand for service is most frequently reported followed by lack of female staff at public sector facilities and poor quality of services. The table below summarizes the reasons for low usage of MCH services (8).

Barriers to MCH Service Utilization (Table 13)

PROMOTIVE CARE		
ANC	Deliveries	PNC
Low value Lack of female staff Poorly functional health facilities	Unaffordable out of pocket (OUP) payments Lack of female staff Poorly functional health facilities	Low value Lack of female staff Poorly functional health facilities
CLINICAL CARE		
Maternal Complications	Newborn Care	Acute Illness
Unaffordable OOP Lack of female staff Poorly functional health facilities	Unaffordable OOP Poorly functional health facilities	Unaffordable OOP Poorly functional health facilities

Source: NPPI-FFS, Aga Khan University (23)

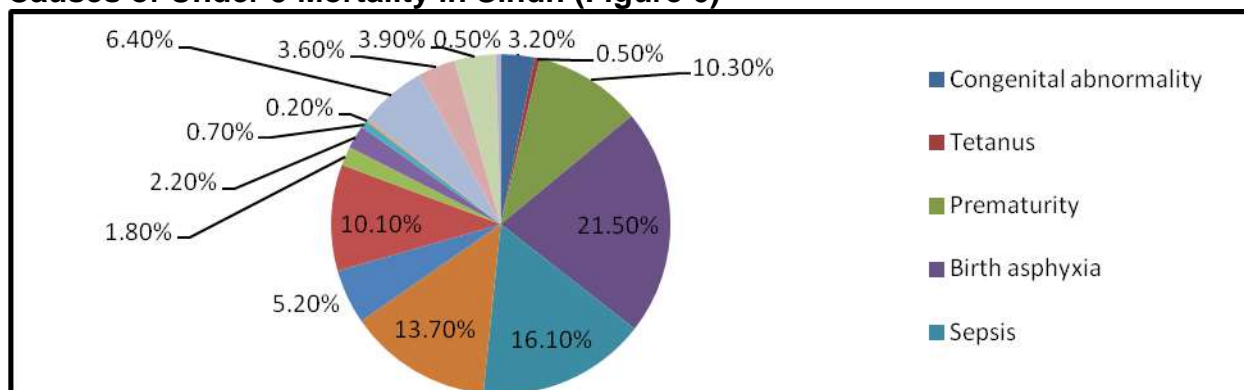
- **Child Health**

Infant and child mortality rates are regarded as indicators of Child Health in a society and as indices of the degree of poverty and deprivation of a population. Pakistan ranks high in terms of child mortality with respect to regional comparisons (2), with an Under-5 Mortality Rate of 87 (2010) and Infant mortality at 63.26 (2011).

Neonatal mortality (NMR) represents the probability of dying within the first month of life whereas infant mortality (IMR) represents the probability of dying before the first birthday (10). PDHS 2006-07 shows Sindh to have an IMR of 81 deaths per 1000 live births which is very high compared to regional estimates (India has an IMR of 48 and IMR of Bangladesh is 38). Although Sindh started with a lower burden of IMR and NMR two decades ago compared to national level, there has since been no change in IMR despite reduction at the national level and in two other provinces while NMR has actually increased from 44 to 53. Hence Sindh has failed to meet MDG Goal 4 of three quarter reduction in child mortality by 2015.

Two thirds of infant deaths in Sindh take place in the neonatal period, mainly in the intra-partum and in the early neonatal period of first week of life (14) and are a result of birth asphyxia, sepsis and prematurity (shown below)

Causes of Under 5 Mortality in Sindh (Figure 6)



Source: PDHS 2006-07 (10)

Prevention requires access to skilled birth attendance, functional emergency obstetric and neonatal services, and integration of routine newborn care at community level through LHWs.

Pneumonia and childhood diarrhea are the major causes of death from late neonatal period to 1st year of life, although they can be cost effectively managed at community level with zinc and ORS use for diarrhea and oral amoxicillin for management of severe pneumonia (15).

Even where ORS was given, Sindh shows the greatest percentage of diarrhea cases in children under five years of age especially in the rural areas of the province (20)

Children under 5 years suffering from diarrhoea in past 30 Days (Pakistan And Sindh) (Table 14)

	2004-05	2005-06	2006-07	2007-08	2008-09	2010-11
Urban Sindh	17	7	12	10	14	12
Rural Sindh	19	8	12	6	11	13
(Total) Sindh	18	8	12	7	12	12
(Total) Pakistan	16	12	11	12	10	11

Source: Pakistan Social and Living Standards Measurement Survey - PSLM-Pakistan Bureau of Statistics (20)

The table below shows **percentage of diarrhea cases in Sindh where ORS was given to child: (Table 15)**

	2004-05	2005-06	2006-07	2007-08	2008-09	2010-11
Urban Sindh	93	93	92	95.17	97	92
Rural Sindh	91	80.40	95	91.69	89	88
Total (Sindh)	92	85.06	94	93.41	93	89

Source: Pakistan Social and Living Standards Measurement Survey -PSLM (20)

- **Immunizations**

Pakistan is the first country in South Asia to have introduced HIB vaccinations, with a coverage of 54.2% seen in Sindh (NNS 2011) however there has been slow progress in routine immunization in Sindh over the last decade however progress remains less than expected.

Vaccination levels based on mother recall/ cards shows that at least a fourth of infants remain unimmunized for BCG, a half have not been covered for measles and at least 15% for Polio 3. However active immunity confirmed by independent surveys shows actual immunity to be nearly 20 percentage points lower than reported coverage. This probably accounts for high level of Polio cases in Sindh despite repeated immunization rounds. Of the Polio cases reported in Pakistan during 2011, there were 32 from Sindh, 73 from FATA and KP, and 63 from Baluchistan (16). Within Sindh, highest concentration of Polio cases is seen in Karachi and is majorly reported amongst Afghan/ Pashtoon settlers who are under covered for vaccination and also have higher refusals. Low performing areas for immunization include Ghotki, Tharparkar, Jacobabad, Nowshero Feroze, and Tando Muhammed Khan districts as well as localities within the Karachi metropolis.

Sindh has low basic vaccination coverage compared to even general rural immunization trends in Pakistan

Pakistan and Regional (Sindh) Immunization Trends by Source of Information (Mother's recall and vaccination card) (Table 16)

Region	BCG		Pentavalent		OPV		Measles	
	Recall	Card	Recall	Card	Recall	Card	Recall	Card
Pakistan	86.6	31.5	76.0	30.1	95.0	27.2	64.6	23.1
Urban	91.2	39.7	79.0	36.5	95.8	34.8	69.9	29.1
Rural	84.7	28.2	74.8	27.6	94.6	24.2	62.5	20.6
Sindh	81.6	19.0	54.2	16.7	94.5	15.6	54.9	14.3

Source: National Nutrition Survey 2011 (17)

Sindh in particular rural areas have very low immunization coverage. The table below show numbers from earlier years and urban areas generally show better immunization coverage that is at par with national figures but this is probably also concentrated to a few cities of Karachi, Hyderabad and Sukkur.

Percentage of fully immunized children aged 12-23 months based on record (Table 17)

	2004-05	2005-06	2006-07	2007-08	2008-09	2010-11
Urban Sindh	64	44	61	53	57	60
Rural Sindh	32	23	29	26	28	27
Total (Sindh)	46	32	42	36	40	40

Source: PSLM-Pakistan Bureau of Statistics (20)

• **Nutrition**

Nutritional status is the result of complex interactions between food consumption and overall health care practices. Poor nutritional status is one of the most important health and welfare problems facing Pakistan today and afflicts the most vulnerable groups: women and children (10).

Malnutrition is indirectly responsible for 35% of deaths in children in Pakistan. Sindh province remains the most food deprived amongst other provinces of Pakistan with 72% of population facing food insecurity (17).

Although underweight rates in children in both Sindh and Pakistan have declined over the last decade, there has been less change in rates of stunting and wasting, as shown in the table below. All three indicators of malnutrition including rates of underweight, stunted and wasted children still remain very high in Sindh, while within Sindh there is a much higher percentage of malnourished children in rural areas (45%) compared to urban areas (30%) (18). Risk factors associated with malnourished children are birth interval of less than 2 years, lack of exclusive breastfeeding and late weaning, contaminated water, father's occupation, and maternal education.

Prevalence of Malnutrition in Pakistan and Sindh (All children <5) (Table 18)

Areas	Underweight			Stunted			Wasted		
	NNS 1985-87	NNS 2001-02	NNS 2011	NNS 1985- 87	NNS 2001-02	NNS 2011	NNS 1985-87	NNS 2001- 02	NNS 2011
Pakistan	47.9	38.0	31.5	41.8	36.8	43.7	10.8	13.1	15.1
Sindh	-	49.4	39.8	47.9	44.2	47.3	10.8	18.2	19.4

Source: National Nutrition Survey 1985-87, 2001-02 & NNS 2011(17)

Feeding practices play a pivotal role in determining optimal development of infants. Poor breastfeeding and infant feeding practices have adverse consequences for the health and nutritional status of children, which in turn have consequences on the mental and physical development of the child.

NNS 2011 data revealed that 40.5 percent of mothers had initiated breast feeding within one hour of birth. The percentage was greater in rural (41.4%) than in urban areas (38.4%). This trend of early initiation of breast feeding was highest in FATA 79.5 percent, followed by KPK at 74.3 percent, then Balochistan at 63.4 percent and Gilgit 61.8 percent. Trends observed in Punjab (40.5%), Sindh (50.5%) and AJK (38.3%) differed. Survey analysis showed that 65 percent of mothers exclusively breastfed their children under-6 months and 78 percent continued breast feeding up to 12- 15 months. For Sindh, exclusive breastfeeding under 6 months is 68% while continued breastfeeding up to 12-15 months is 84% (17)

Micronutrient deficiencies in both women and children are endemic in Sindh as in rest of Pakistan and an emerging concern amongst elderly. The NNS 2011 data showed that a total of 25.9% pregnant women had iron deficiency anemia of which 25.6 % were from urban areas and 26.1% were from rural areas. When data was looked for provincial variance it was found that pregnant women who had IDA, 24.6 % were from Sindh. Similarly, among pregnant women across the country, 49.5% had Vitamin a deficiency in Sindh and 44.6% were Zinc deficient (shown in Table below). It was also revealed that 58.3% of pregnant women had Hypocalcaemia out of 50.4 % were from Sindh.

The prevalence of Severe Iron deficiency anemia among index children in Sindh was found to be 2.6% and moderate anaemia prevalence was 29.2%. 23.2 % of index children in Sindh were found to be severely Vitamin A deficient and 38.8% had high level of zinc deficiency (17).

Micronutrient Status - Pregnant Mothers and Children (Table 19)

Micronutrient Status	Pregnant Mothers		Child	
	Pakistan	Sindh	Pakistan	Sindh
Vitamin A deficiency	48.8	49.5	56	37.6
Iron Deficiency Anemia (severe + moderate)	25.9	24.6	33.4	31.8
Zinc Deficiency	48.3	44.6	36.5	38.8

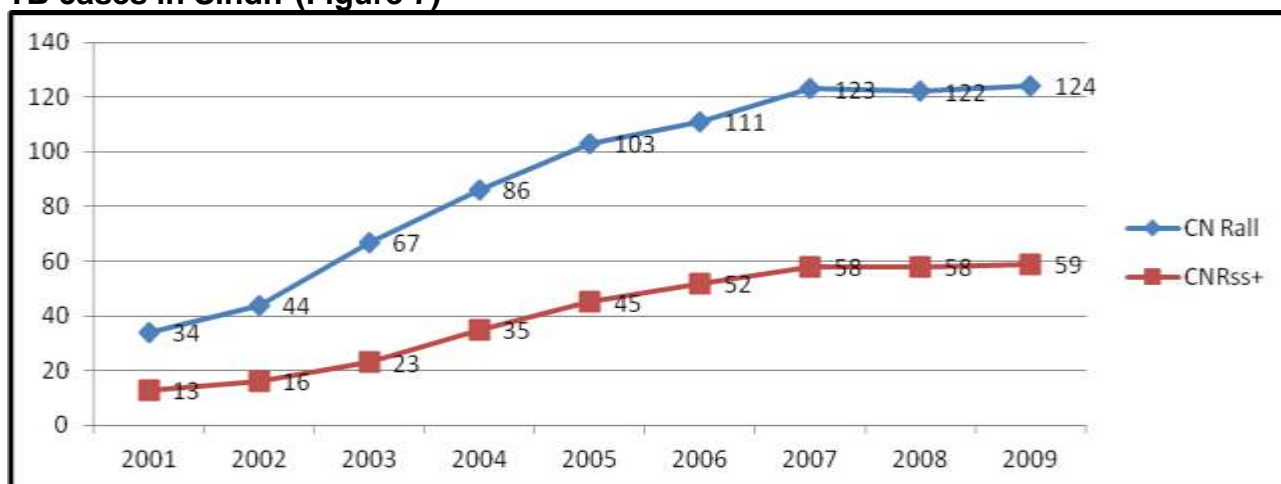
Source: NNS 2011 (17)

- **TB/HIV/Malaria**

Tuberculosis

Pakistan is one of the 22 countries that still has endemic levels of TB, with an estimate of 353 cases/1000 population and a case load mainly amongst the poor. Exact population based figures for Pakistan and Sindh are not available, and a disease prevalence survey to provide these figures is presently underway. Under the TB Control Program TB Direct Observation Therapy (DOTs) has been rolled to public sector facilities in all the districts of Sindh, with a case detection rate (CDR) of 59% against a national target of 70% and treatment success rates of 87% against a target of 80%. Outreach to private sector is still marginal, and is essential given that private sector is the care provider to 11% of population, with patients incurring a cost of Rs. 3060-3600 (2006 PKR) just for purchase of 2 month TB drug regimen, that are freely available in the TB Control Program (8).

TB cases in Sindh (Figure 7)



Source: TB control program (24)

Malaria

In Pakistan, malaria has been a major problem threatening the health of the people due to prevailing socioeconomic conditions and the epidemiological situation. The transmission pattern has been described as a combination of stable and unstable malaria with low to moderate endemicity. There is a tendency for epidemic breakouts over a large area, particularly in Punjab and Sindh provinces.

Malaria is a disease that disproportionately affects the poorer sections of the population living in hot, humid, and remote areas that lack good health surveillance systems; consequently, morbidity and mortality in most instances go unreported. Each year about half a million people suffer from malaria (10).

The Government of Pakistan recognizes children less than five years of age as a high-risk group and recommends that this group should be protected by sleeping under insecticide-treated nets (ITNs). The government has recently been trying to provide ITNs under the malaria control program, especially in the high prevalence areas. The Pakistan

Demographic and Health Survey 2006-07 shows that only 2 percent of children under age five slept under mosquito nets and one in 500 children used a treated net the night before the survey.

The table below shows the percentage of children under five years of age who slept under a mosquito net (treated or untreated). The proportion of children using any net is higher in Sindh (5 percent) and among the children living in the poorest households (4 percent). Sindh also shows the highest percentage of children with fever (35 percent) and a sub-optimal percentage of children taking anti-malarial drugs (4.6 percent).

Use of mosquito nets, prevalence and prompt treatment of fever for children under five years of age (Table 20)

	Percentage who slept under any net	Percentage who slept under an ever-treated net	Number of Children	Percentage with fever	Number of children	Percentage who took anti-malarial drugs	Number of children
Sindh	5.4	0.5	2,187	35.0	2085	4.6	730

Source: PDHS 2006-07 (10)

Nationally, only 1 percent of women age 15-49 and 2 percent of pregnant women were reported to have slept under a mosquito net. Pregnant women from Sindh and Balochistan provinces, those with no education, and those from poorer families are relatively more likely to use mosquito nets, though differences are small.

The table below shows the percentage of all women aged 15-49 who slept under any kind of net and those who slept under a treated net, and the percentage of pregnant women who slept under any net (10). It also shows the percentage of women aged 15-49 who suffered from malaria during pregnancy and received treatment

Use of mosquito nets by women and prevalence of malaria during pregnancy (Table 21)

	Percentage of all women age 15-49 who:			Percentage of pregnant women age 15-49 who:		Percentage of all women age 15-49 with a live birth in the five years preceding the survey, who during pregnancy suffered from malaria and who received treatment		
	Slept under any net	Slept under an ever-treated net	Number of women	Slept under any net	Number of women	Percentage who suffered from malaria	Percentage who received treatment	Number of women with a live birth in the five years preceding the survey
Sindh	3.9	0.6	3,708	5.3	298	27.1	24.9	1,404

Source: PDHS 2006-07 (10)

Sindh shows a high percentage of all women and pregnant women who slept under any (treated or untreated) net compared to national levels. On the other hand, it shows a high

incidence of 27.1 percent of malaria among pregnant women but also a higher percentage of malaria treatment received by pregnant women.

According to the Malaria Control Program, the annual parasite incidence (API) of malaria, based on confirmed laboratory diagnosis was 1.5 cases per 100 population in Sindh in 2010 and has increased from 0.77 cases per 100 population in 2005. The increase in malaria has also coincided with outbreaks of dengue fever cases. Last year, 11,024 confirmed cases of dengue fever were reported, with 400-500 in Sindh, while this year the number of cases has climbed to 12,466 in the country and 500-600 in Sindh. This underscores need for proper vector control strategy involving DOH as well as civic bodies, for implementation of cost effective measures such as insecticide infused bed nets, elimination of stagnant water pools, timely larvacidal sprays, early case detection, round the year epidemiological surveillance and community awareness on danger signs and prevention.

HIV

Sindh has low prevalence of <1% of HIV but a concentrated epidemic in Injectable Drug Users with risk of spread to the general population. Of the total of 7547 reported HIV cases in Pakistan, 3936 are in Sindh and of these 81% are reported from Karachi (shown in table below). Amongst the high risk groups, injectable drug users (IDUs) have the highest concentration of HIV ranging between 26-23%, followed by male sex workers (MSM) 7.5-2.9%, while female sex workers (FSWs) are at risk of HIV but do not have established HIV infection so far. Other risk groups include jail inmates, street children, fishermen, and long distance truck drivers. Targeted HIV prevention services in risk groups provided through NGOs contracted by the Sindh AIDS Control Program has resulted in increase in protective measures such as condom usage amongst MSWs and FSWs and disposal syringes by IDUs (8)

HIV/AIDS Cases in Sindh (Table 22)

HIV/AIDS Cases	Districts with highest number of cases	Districts with lowest number of cases
HIV Positive Cases	Karachi (3123) Larkana (193) Unknown (377)	Khairpur (1) Kashmor (1) Matiari (1)
AIDS Positive Cases	Karachi (43)	Khairpur (0) Kashmor (0) Matiyari (0)

Source: SACP, DOH (25)

The table below shows the percentage of ever-married women between the age of 15-49, who had ever heard of AIDS and had knowledge of HIV prevention methods. Sindh shows a relatively high percentage of awareness among women after Punjab.

Knowledge of AIDS and HIV prevention methods among women (Table 23)

	Percentage of ever-married women age 15-49 who have ever heard of AIDS		Percentage of ever-married women 15-49 who say HIV can be prevented by:				
	Has heard of AIDS	Number of Women	Using condoms	Limiting sexual intercourse to one uninfected partner	Using condoms and limiting sexual intercourse to one uninfected partner	Abstaining from sexual intercourse	Number of Women
Punjab	46.8	5,800	21.7	33.2	19.0	27.2	5800
Sindh	42.7	2,410	18.1	30.4	15.7	21.7	2410
KPK	42.4	1,351	16.2	28.5	14.1	17.9	1351
Balochistan	23.8	462	7.8	11.5	5.8	6.1	462

Source: PDHS 2006-07 (10)

SECTION 3: CURRENT STATUS OF HEALTH PROGRAMS IN SINDH FOLLOWING DEVOLUTION

MNCH Program:

The MNCH program in Sindh has the objective of fully implementing WHO approved strategies regarding Maternal and Child Health at the PHC level by 2012. Its aim for the year 2012 is to reduce newborn mortality rate to less than 40 per 1000 live births; reduce infant mortality to less than 55 per 1000 live births and to reduce maternal mortality to 200 per 100,000 live births. The table below summarizes the program's objectives and activities.

This program does not have its own allocated human resources but is rather being implemented through the already existing workforce of other programs, mainly LHW LHV CMW vaccinators etc. There were a number of trainings planned for the health workers in this program for this year, EmONC planned 2736 (conducted less than 40%); IMNCI planned 2184 (conducted around 60%); IMPAC planned 2184 (conducted less than 50%); ENC planned 540 (conducted less than 60%); Family planning counseling planned 2184 (conducted less than 40%) and Surgical planned: 540, (conducted less than 40%) **(Table 24)**

Objectives/ Targets	Activities	Indicators
<ul style="list-style-type: none"> • To fully implement WHO/MOH approved strategy in Pakistan regarding MNCH at PHC level by 2012 • To reduce new born mortality rate to less than 40/1000 live births by 2012 (Target 2015:40/1000) • To reduce IMR to less than 55/1000 live births by 2012 (Target 2015: 40/1000) • To reduce under 5 mortality to less than 65/1000 live births by 2012 (Target 2015: 45/1000) • To reduce Maternal mortality ratio to 200/100,000 live births by 2012 (Target 2015:140/100,000) <p>To increase the proportion of deliveries attended by skilled birth attendants at home or in health facilities to 90% by 2012 (Target 2015: > 90%)</p>	<ul style="list-style-type: none"> • Purchase of vehicles and furniture • Conducting training and seminars • Purchase of medicine as per requirement • Service delivery through NGOs • Program establishment for PIU almost complete • Program establishment for district MNCH cells almost complete <p>About 50% of the target for advocacy and demand creation has been achieved</p>	<p>Process Indicators (Internal/ 3rd Part Evaluations):</p> <ul style="list-style-type: none"> • 90% LHWs, by mid-2015, will have an average Performance Score of 65% • 90% of LHWs have been paid full salary in the last month • All registered households are regularly visited by the LHWs • 90% of LHWs receive a Supervisory visit by LHS once per month • All Supervisors have full-time access to a vehicle or getting their FTA • 80% of Infant deaths are verified by LHSs using Verbal Autopsy Reports form • 90% of Maternal Deaths are verified by DPTII using Verbal Autopsy Reports form • All PPIUs & DPIUs have current Annual Work plan prepared and available at office by the end of July every year • 13.90% of DPIUs utilize 80% of their LHWs allocation • All PPIUs & DPIUs are following agreed procedures for recruitment, monitoring, training, finance & logistics • 75% of LHWs have at least 10 Health Committees meetings conducted every year with minutes recorded.

Norway-Pakistan Partnership Initiative (NPPI):

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. The program is being implemented in Jamshoro, Badin, Tharparkar, Umarkot, Nawabshah, Larkana, Kambar, Shikarpur, Ghotki and Kashmore. It is being supported by UNICEF, WHO and UNFPA and plans to use innovative and result based financing approaches to improve effectiveness and quality of MNCH care provision. The important underlying principle for this initiative is to provide targeted and consistent support to improve health system efforts that will facilitate activities under national MNCH policies, plans and strategies.

The key activities include establishing an M&E section of the provincial MNCH cell to improve monitoring and promote birth and death registration in the province.

The program has till now trained healthcare staff on infection prevention from 5 District Head Quarter Hospitals, 25 Taluka Head Quarter Hospitals and Rural Health Centres. It

has also developed monitoring mechanism for implementation of infection prevention training. 6 trainings have been completed in Badin and Jamshoro with 120 healthcare providers trained. It has also trained community midwives, lady health workers and community health workers on community-based newborn care and improving quality of health education sessions. The first phase of training was held from 8-10 October at Dow University of Health Sciences, attended by 20 participants from 10 districts. Currently, NPPI has established a database for 5 Maternal, Newborn, Child Health training categories and trained the Sindh MNCH staff on the software. **(Table 25)**

Objectives/ Targets	Activities	Indicators
<ul style="list-style-type: none"> • Provide catalytic and strategic support to strengthening health system efforts aimed at accelerating activities under national MNCH policies and plans (e.g. human resources, referral system, etc) • Use of innovative and flexible result based financing approaches to improve effectiveness and productivity of MNCH care provision • To establish an M&E Section of provincial MNCH Cell and strengthening 	<ul style="list-style-type: none"> • Capacity Building of M&E personnel at provincial & target district level • Promoting Birth and Death registration • Program monitoring • Monitoring integrated MNCH Care made available through contracting • Monitoring improved governance and results based management • Monitoring Operational Research to improve future decision making related to increasing MNCH coverage and self care • Monitoring strengthened community based & outreach MNCH/FP care services • Monitoring voucher/incentive schemes implemented to increase demand & service utilization • Monitoring community networks for MNCH/FP advocacy & mobilization • Conducting behavior change communication & awareness raising program 	<p>Process Indicators: Integrated Maternal Newborn Child Health/Family Planning care through public private partnerships</p> <p>Contracting Out Basic Package of Maternal Newborn Child Health services:</p> <ul style="list-style-type: none"> • Contractors provide management support to public health staff, have no authority to hire & fire government staff • Recurrent operating costs are provided by government <p>Capacity building support to the public sector</p> <ul style="list-style-type: none"> • Support provided for planning, needs assessment, procurement of equipment for Essential Newborn Care to 5 District Head Quarter Hospitals, 30 Taluka Head Quarter hospitals • Trainings for IYCF completed in 10 districts 200 health care providers trained • Training of staff on infection prevention held from 5 District Head Quarter Hospitals, 25 Taluka Head Quarter Hospitals and Rural Health Centres;120 health care providers trained. • Training of Community Midwives, LHWs, Community Health Workers on community based newborn care <p>Improve governance and result based management</p> <ul style="list-style-type: none"> • Support to establish database for 5 Maternal, Newborn, Child Health training categories. • Training of Sindh MNCH staff on software • Provided technical support to Sindh MNCH Cell and National Program for PHC & RH at provincial and district <p>Operational & evaluation research conducted to produce knowledge and improved future decision making related to increasing MNCH coverage and improving self-care</p> <p>Progress:</p>

		<ul style="list-style-type: none"> • MNCH/FP self-care and care seeking behavior <p>Strengthened community based & Outreach Maternal Newborn Child Health /Family Planning Care services</p> <ul style="list-style-type: none"> • Mother and Child Week <p>Voucher/incentive schemes implemented to increase demand and service utilization</p> <p>Advocacy to build an investment case for Achieving Millennium Development Goals 4 & 5</p> <ul style="list-style-type: none"> • Community networks for MNCH/Family Planning advocacy and mobilization established • Behavior change communication and awareness raising program implemented
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Reproductive and Primary Health Care -RH and PHC (LHW Program):

The principal objectives of this program were to primarily train and increase the number and quality of Lady Health Workers to improve reproductive and primary health care in the province. The target was to decrease the proportion of poor performing LHWs and increase the number and coverage of LHWs in the province especially in rural areas and disadvantaged areas of larger cities. The lady health workers are given basic 3-month training with an additional 9-month on-the-job training and refresher courses every year. Although 23, 000 LHWs were deployed in actuality only about 13000 are working on the ground. Male and female teachers serve as community volunteers in areas where there are no lady health workers. Some services like supplies ORS, intra-venous fluids, vaccines and EPI are given by vaccinators of other programs like vaccinators of the EPI.

The provincial unit for FP and PHC is headed by a Provincial Coordinator along with a representative of the Health Department (B-18 or above); 2 Finance officers and a Logistics officer for PPIU and FPIU. Key activities include increasing contraceptive prevalence rate, number of fully immunized children; better quality care to pregnant women and organization of Health Week (with UNICEF) to increase awareness on reproductive and child health. Their main targets and activities are summarized in the table below.

They procure their commodities (drugs and medicines) through PPRA rules (a national committee for procurement headed by Federal Director General (Health), all Provincial DGHS /their representatives and National Coordinator as Secretary). This committee is responsible for annual procurement of essential drugs / non-drug items. The procurement is based on the requirements indicated by the province. Efforts are made to procure essential drugs in special packing and by placing orders in strip/blister packing or monthly dosage supplies. **(Table 26)**

Objectives/ Targets	Activities	Indicators
<ul style="list-style-type: none"> • To reduce the proportion of poor performing LHWs (scoring 25% or below) from existing 25 percent to less than 10 percent • To phase-wise expand coverage by increasing the average population registered by LHWs (1000/LHW) in covered areas as well as reaching out to uncovered areas • Increase overall numbers of LHWs in the country to 130,000 by 2015 • For new recruitments, special focus on disadvantaged areas (rural areas and disadvantaged urban slums) by deploying about 10,000 LHWs in these areas eg. peri-urban areas of the cities like Hyderabad, Karachi and Sukkur, Larkana • Strengthening program accountability & governance Principal sources for verification of performance will be the "Independent" Program, evaluations and national surveys like PDS, PIHS,etc 	<ul style="list-style-type: none"> • Increase in Contraceptive Prevalence Rate from existing 34 % to 48% • Increase in coverage of fully immunized children aged 12-23 months from 68% to above 90% • Increase in TT-2 immunization coverage amongst pregnant female from 64% to 80% • Increase in proportion of pregnant women receiving antenatal care by SBA (at least one visit) from 76% to 90% & at least 5 ANC by SBA from 29% to 42% • Increase in births assisted by skilled birth attendant from existing 48% to 60% • Increase in postnatal visits within 24 hours (of home deliveries only) from existing 10% to above 60% • Increase in Exclusive Breast Feeding from existing 49% to 65% • Organisation of Health week supported by UNICEF for public awareness activities; immunization & de-worming for children, tetanus toxoid vaccination & counseling of pregnant mothers • Training of Lady Health Workers & community volunteers to reinforce health and hygiene messages • Supplies of ORS & intra-venous fluids along with vaccines and EPI • Distribution of 'mosque leaflets' to religious leaders to disseminate the information and hygiene awareness • Mobilization of village committees for an enhanced sanitation drive • Refresher training of facility staff on IMNCI management of diarrhea and counseling skills 	<p>Process indicators:</p> <ul style="list-style-type: none"> • No. of supervisors selected/trained • No of LHW deployed in the district • No of LHW training workshops conducted • % of functional vehicles used by the supervisors • % of population covered by the LHW in rural area • % of population covered by the LHW in urban area • % of FLCF involved in the activities of program • % of reports submitted by LHW • % of reports submitted by the health facility <p>Output indicators:</p> <ul style="list-style-type: none"> • Contraceptive Prevalence Rate • Number of Condoms distributed by LHWs • Number of contraceptive cycles distributed by LHWs. • Number of Injectable Contraceptives distributed by LHWs. • Number of Women visited for Antenatal Care per worker per month. • Number of post natal visits within 24 hours of home deliveries per worker per month. • Number of Children weighed per worker per month • % of Low Birth Weighed Babies • % of Children fully Immunized • TT coverage among pregnant women • Number of ORS packets distributed by LHWs • Number of ARI cases/LHW/ month • Number of Diarrhea cases/LHW/ month • Total Number of TB suspect cases referred • Number of functional health committees

Family Welfare (Department) Program:

This program was launched by the Family Welfare Department of Sindh to increase awareness in the community for population and family welfare. It established and

implemented a Population Welfare Program and Family Welfare Centers and Services, which provide clinical and non-clinical contraception and advisory services at district levels. Vertical programs like this at the provincial level, are headed by program Manager along with an administrative officer and deputy managers for finance, technical assistance and monitoring and evaluation. **(Table 27)**

Objectives/ Targets	Activities	Indicators
<ul style="list-style-type: none"> • To provide family planning services to control population growth • To develop a Population Welfare Program • To establish Family Welfare Centres and Services 	<ul style="list-style-type: none"> • Coordination of Population Welfare Program with other National building departments at district and local levels. • Family Welfare Service, clinical and non-clinical contraception through Family Welfare Centres and the Reproductive Health Services Establishment particularly for rural areas. • Implementation of publicity and communication strategy. • Population Welfare motivational services and establishment of contact with the clients at all levels. • Promotion of community involvement and active participation in Population Welfare Program. • Supply of contraceptive and medicines to the clients through the network of community distribution points, and other agencies involved in the program. • Setting up Advisory Management Committees at Family Welfare Centre level and Population Welfare Councils at District and Provincials levels 	<p>National Indicators</p> <ul style="list-style-type: none"> • Comprehensive FP services for females and males • Maternal health care, including safe motherhood • Prevention and management of RTIs/STIs and HIV/AIDS • Management of RH-related issues of adolescents and elderly women • Management of RH-related issues of men • Management of infertility <p>Provider:</p> <ul style="list-style-type: none"> • Good counselling skills • Courtesy and confidentiality • discuss/instructions for preventing pregnancy and STIs/RTIs, HIV/AIDS and hepatitis through proper use of barrier methods • performance of clinical procedures according to guidelines <p>Facility:</p> <ul style="list-style-type: none"> • Has all approved contraceptive methods available, minimum stock of 3 months • Has basic equipment (gloves, sterilizing equipment, water supply, etc) • Ensure privacy and flexibility to local-level changes • Adequate storage of contraceptives and medicines • Follow standard clinical guidelines • Comfortable waiting area and minimum waiting time

Malaria Control Program:

The Malaria program was launched to aid the local population for a reliable diagnosis and early and effective treatment of malaria through standardized procedures and targeted interventions. It does have its own staff at district level. In addition they have the support of GFATM NGOs in 4 districts of Sindh- these districts and two more districts have been added for future projects of Global fund. The staff was trained by National roll back malaria program and degree program were offered by Health Services Academy at Islamabad. The main emphasis was to improve early diagnosis prompt treatment practices and to reduce unnecessary use of anti-malarial drugs particularly the Artemesinine mono – therapies. Special interventions delivered include use of Artemesinine based - Combination

Therapy (ACT) for confirmed falciparum cases at the BHU level; provision of insecticide treated beds especially to most-at-risk groups of pregnant women and children under 5 years of age. **(Table 28)**

Objectives/ Targets	Activities	Indicators
<ul style="list-style-type: none"> • To support and facilitate districts for enhanced access of Malaria related services • To help population at risk obtain access to reliable diagnosis and effective treatment of malaria through development and implementation of standardized policies and guidelines, capacity building and appropriate IEC/BCC interventions. <p>National targets (2008-2013):</p> <ul style="list-style-type: none"> • Incidence of confirmed Malaria will be brought below one case per 1000 population by the year 2011. • Proportion of Falciparum Malaria cases will be reduced to 10% by 2011 • Hospital based severe Malaria case mortality rate reduced to below 10% • 70% of pregnant women and 80% of children in high risk Union Councils will be using LLINs by 2011 • By 2008, annual routine IRS campaign will cover 80% of households in target Union Councils. • 80% of public sector health care providers offering diagnosis & treatment will be trained in case management. 	<ul style="list-style-type: none"> • Early Diagnostic facility: including microscopic diagnosis and Rapid diagnosis test • Proper treatment: with effective ACT artimesinine combination Therapy • IRS, internal residual spray (effective for three months) • Provision of LLINS • Operational research • Training of medical and para- medical staff • Train and establish epidemic preparation procedures and response 	<p>National six key Roll Back Malaria (RBM) elements.</p> <ol style="list-style-type: none"> 1) Early diagnosis and prompt treatment. 2) Multiple prevention 3) Improved detection and response to epidemic 4) Developing viable partnership with national and international partners 5) National commitment 6) Intensive and comprehensive public education activities to enhance public awareness of malaria, treatments and prevention <p>Key Indicators (National)</p> <ul style="list-style-type: none"> • Annual Parasite Incidences (API). Number of cases/1000 population per year. • Annual falciparum Incidences (AFI) • Blood Examination Rate (BER) • Slide Positivity rate (SPR) <p>Malaria control strategy indicators (National)</p> <ul style="list-style-type: none"> • Early diagnosis and rapid treatment • Multiple prevention • Early detection and response to epidemics • Effective behavior change communication (BCC) • Partnerships with international and national government and NGO's • Focused operational research

TB –DOTS Program:

The DOTS strategy was implemented in Sindh in the year 2000 and all the districts were covered by DOTS in 2003. The program has registered approximately 250,000 TB cases during last nine years of implementation of program. The districts in Sindh where more than 10,000 cases have been detected are Karachi, Dadu, Hyderabad, ICD Kotri, Tharparkar, Khairpur, Umerkot and Sanghar.

The main aim of the DOTS program was to cure patients and ensure quality treatment through close supervision. The Sindh government developed a strong TB control establishment at provincial, regional and district level, with in-built facilities for M&E, training and data analysis. The programs also aims at strengthening the laboratories

network at peripheral, district, regional and provincial levels. Its local procurement of drugs and medicines is through the provincial department following PPRA rules. It also receives support from the NTP and large number of development partners like GFATM, STOP TB etc

The program is using the existing health care system. They have established TB clinics at district level and treatment centers at the level of RHCs and BHUs. The program emphasizes human resource development in various aspects of the DOTS strategy so that health personnel including managers, medical officers, laboratory technicians, paramedical staff and Lady Health Workers are properly trained. These trainings are either a fresh training or refreshers training for already trained health personnel. **(Table 29)**

Objectives/ Targets	Activities	Indicators																
<ul style="list-style-type: none"> • To enhance and sustain a case detection rate of TB patients to more than 70% of the estimated incidence of new sputum smear positive cases in the province • To increase and sustain a cure/treatment success rate of more than 85% of all diagnosed new sputum smear positive tuberculosis cases • To implement all the six components of Stop-TB strategy at district levels level that include: <ul style="list-style-type: none"> ○ Pursuing high-quality DOTS expansion ○ Addressing TB/HIV, MDR TB,etc ○ Contributing to health system strengthening ○ Engaging all care providers (public-public and public-private mix) ○ Empowering people with TB and communities (advocacy, communication and social mobilization) ○ Promoting research • By achieve the above targets, the incidence of TB would start reversing and deaths due to tuberculosis will be reduced to 50% by the year 2015 as per Millennium Development Goals 	<ul style="list-style-type: none"> • Sustaining current services provided through TB-DOTS • Implementing the six components of Stop-TB strategy at the district level • Sustaining TB DOTS services in the PHC system at the district & grass roots level for affordable and accessible services • Continuous technical & logistic support to districts for sustainability of the program • Expanding the program by involving health institutions of other sectors, tertiary hospitals NGOs and the private sector. • Ensuring the use of DOTS standardized system of recording and reporting all over the province through public & private sector care providers • Monitoring & supervision of the program at all levels, including quarterly cohort analysis • Ensuring continuous supply of anti-tuberculosis drugs by allocating sufficient funds & streamlining the existing procurement system at the provincial & district levels • Implementing social mobilization activities to increase awareness about TB &its prevention • Strengthening the peripheral, district, regional & provincial laboratory network 	<p>Key indicators of progress (National):</p> <ul style="list-style-type: none"> • Incidence of TB per 100,000 population • Case notification per 100,000 per year • Case detection rate new smear • Case notification rate new smear • Treatment success <p>The DOTS strategy was implemented in Sindh in year 2000 and all the districts were covered by DOTS in 2003. The program has registered approximately 250,000 TB cases during last nine years of implementation of program. The districts from where, more than 10,000 cases have been detected are:</p> <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">Karachi</td> <td style="text-align: right;">72420</td> </tr> <tr> <td>Dadu</td> <td style="text-align: right;">16831</td> </tr> <tr> <td>Hyderabad</td> <td style="text-align: right;">14692</td> </tr> <tr> <td>ICD Kotri</td> <td style="text-align: right;">14624</td> </tr> <tr> <td>Tharparkar</td> <td style="text-align: right;">12133</td> </tr> <tr> <td>Khairpur</td> <td style="text-align: right;">11428</td> </tr> <tr> <td>Umerkot</td> <td style="text-align: right;">10553</td> </tr> <tr> <td>Sanghar</td> <td style="text-align: right;">10496</td> </tr> </table>	Karachi	72420	Dadu	16831	Hyderabad	14692	ICD Kotri	14624	Tharparkar	12133	Khairpur	11428	Umerkot	10553	Sanghar	10496
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HIV/ AIDS Control Program:

The program was initiated to reduce and control the incidence of HIV among Most at Risk Population (MARPs) especially Injecting Drug Users (IDUs) and Male Sex workers (Hijras/MSM). The main aim was to coordinate a multi-sectoral and sustainable response to HIV that is based on evidence, transparency and accountability; involving various line-ministries, the civil society and target beneficiaries (i.e. PLHIV and MARPs).

The program has doctors who have been appointed and trained locally, with the support of UNICEF. They are working with public sector staff already working in CHK and Chandka. The program is mostly run by skin specialist in some places and skin medical officers in others

SACP has successfully established 05 HIV treatment centres in Sindh; 3 centres are present in the public sector (Karachi and Larkana), while 02 in the private sector at Karachi (Indus Hospital and AKUH). Up to now, 1244 HIV Positive people are registered with HIV/AIDS Treatment Center in Sindh, out of which 430 are getting Anti-Retroviral after going through all diagnostic process including CD4 and Viral load from SIUT. This number is near about 27 % of the total cases registered all over Pakistan, in the treatment centres Medicines and some vaccines are being procured by the program by following SPRA rules and are provided through GFATM and UNICEF. In most cases, it arranged its own procurement but receives support from donors as well.

At present it has 46 STIs clinics functioning at District head quarter hospitals level. Male STIs clinic are located in Skin ward while Female STIs clinics are located in the Gynae ward of each hospital. The clinics are not labelled to avoid discrimination and have an internal as well as external referral system from family physicians/private practitioners, NGOs firms working on HIV/AIDS Prevention, etc. It also has 21 Voluntary Counselling and Testing Centres, providing screening facilities for suspected low risk and high risk groups. They also have an Information Resource Centre and a Provincial Reference Laboratory.

The major objectives and activities in the program's mandate are summarised below; **(Table 30)**

Objectives/ Targets	Activities	Indicators
<ul style="list-style-type: none"> • To control the incidence of HIV among Most at Risk Population (MARPs) especially Injecting Drug Users (IDUs) and Male Sex workers (Hijras/MSM). • To implement time-tested tools of prevention to contain the concentrated epidemic and halt the progress in MARPs • To reduce and reverse the level of stigmatization of people living with HIV; by a creating supportive system and easy 	Interventions (both community and facility based activities) <ul style="list-style-type: none"> • Targeted Interventions for most-at-risk and bridge groups • HIV Care and Support • STI Control • Voluntary Counselling and Testing (VCT) 	<ul style="list-style-type: none"> • Number of newly found HIV positive patients (data coming through PPTCT centers) • Patients given treatment to prevent vertical transmission • Number of cases treated • No of new cases reported (through monthly reports) • Passive surveillance : number of new cases reported through its network of STIs treatment centers • Referral lab • Blood banks
	Advocacy, Communication & Social Mobilization <ul style="list-style-type: none"> • Advocacy 	

<p>access to medical and social services</p> <ul style="list-style-type: none"> To coordinate a multi-sectoral and sustainable response to HIV that is based on evidence, transparency and accountability; involving various line-ministries, the civil society and target beneficiaries (i.e. PLHIV and MARPs) <p>Identify the gaps for future resource mobilization and integration from development partners like GFATM, for long term sustainability of programs and interventions</p>	<ul style="list-style-type: none"> Communication and Stigma Reduction Campaign Social mobilization <p>Governance & Institutional Framework of Response</p> <ul style="list-style-type: none"> Governance Capacity Building The Provincial Reference Laboratory Program Management Surveillance Monitoring & Evaluation of HIV Response 	<ul style="list-style-type: none"> NGOs working for the program or in the field of HIV Active surveillance: four rounds till now done through CIDA funded project <ul style="list-style-type: none"> Initiation of ART in babies born to HIV infected mother Comprehensive care of children infected with or exposed to HIV
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Expanded Program on Immunization (EPI/Polio):

The purpose of this program was to eradicate polio completely from the province by the end of the year 2010-11 and spread immunization coverage to all districts of Sindh by the year 2015. The program also envisaged a dramatic reduction in measles and control of other preventable disease (like typhoid, influenza, etc) by introduction of new vaccines and routine immunization for children. It has conducted special campaigns for reduction in polio, measles and neonatal tetanus (NNT), including public awareness and mobilization. It has a well integrated surveillance system for polio and measles cases and quality treatment is ensured through increased monitoring and supervision

The program is being implemented through a cadre of vaccinators/LHV and LHW. Individuals have been recruited specifically for polio campaigns, currently even teachers have been asked to participate. These vaccinators are regularly trained for polio as well as for Vitamin A and tetanus injections (**Table 31**)

Objectives/ Targets	Activities	Indicators
<ul style="list-style-type: none"> To immunize children of 0-11 months against seven EPI target diseases and pregnant mothers against neo-natal tetanus. Yearly target is around 5.5 million children (0-11 months) and 6 million pregnant women Increase routine immunization coverage by 100% by 2015 in every district Reach zero polio by the end of year 2010-11 Elimination of Neo-natal tetanus by 2015 Reduction of measles mortality by 90% by 2010 as compared to 2000 level. Reduce Diphtheria, pertussis ,HiBB, Hepatitis & child hood 	<ul style="list-style-type: none"> Routine immunization of all the children under 2years of age Polio eradication Provision of vitamin A supplements Tetanus toxoid to all the women of child bearing age and provision of the TT dose to pregnant Routine Immunization schedule: BCG and OPV 0 dose are given at birth, DPT, HepB and OPV at 6, 10 and 14 weeks and measles vaccine at the age of 9 months. The pregnant ladies and child bearing age ladies are provided immunization against 	<p>Immunization against seven killer diseases;</p> <p>Childhood tuberculosis</p> <p>Poliomyelitis</p> <p>Diphtheria</p> <p>Pertussis</p> <p>Neonatal tetanus</p> <p>Measles</p> <p>Hepatitis B</p> <ul style="list-style-type: none"> Planning, finance, implementation and administration at provincial level Collection of vaccines/syringes/needles from the Federal EPI Cell for further distribution to the districts Repair and maintenance of cold chain equipment Monitoring, evaluation and reporting Supervision at all EPI service delivery level

<p>TB</p> <ul style="list-style-type: none"> • Control of other preventable disease (like typhoid, influenza, etc) by introduction of new vaccines when they become available in routine immunization for children < 1 year • Addition of Vitamin –A supplementary during NIDs, SNIDs & routine programs with UNICEF and other donors • Increase safety of injections used for all EPI vaccines through the use of auto disposable/auto-lock syringes • Implement efficient surveillance system for detection and control of polio or Acute Flaccid Paralysis (AFP) and Measles in the Province 	<p>TT (TT 1 at first contact, TT 2 at least 4 weeks after 1st dose, TT 3 at least 6 months after 2nd dose, TT 4 at least 1 year after 3rd dose and TT 5 at least one year after 4th dose)</p>	<ul style="list-style-type: none"> • Training of all EPI workers except Mid-level Managers • Repair and maintenance of vehicles including the provision of POL • Personnel and management
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Hepatitis Control Program:

The program is directed at reducing morbidity and mortality by Hepatitis through vaccinations, injection safety and infection control. The primary aim was to reduce the incidence and prevalence of Hepatitis B & C through diagnostic services throughout the province. The provides Hepatitis B vaccination targeted and at-risk population especially school-going children; the public health work force; jail inmates; women in their reproductive age, Injection Drug Users, HIV AIDS patients, etc. The table below shows the main targets and activities of this program.

The program utilizes the existing district health working staff (LHW/vaccinators of EPI/LHV and other para-medical staff). Relevant people are periodically trained at various levels (**Table 32**)

Objectives/ Targets	Activities	Indicators
<ul style="list-style-type: none"> • To reduce the incidence and prevalence of Hepatitis B & C • Vaccination of school-going children for Hepatitis B • Diagnosis and treatment of patients of Hepatitis C • To prevent new transmission of Hepatitis B & C infection • To reduce morbidity and mortality through hepatitis by Hepatitis B vaccination, injection safety, infection control & limited case management for poor deserving patients • To organize diagnostic services for Hepatitis B & C 	<ul style="list-style-type: none"> • Universal Hepatitis B vaccination for all Health Care Workers in the public sector • Universal vaccination for all students of medical, nursing & paramedical institutions in public sector • Universal coverage of Hepatitis B vaccination for women in their reproductive age (15-45 years), in hyper endemic areas of the country • Hepatitis B vaccination of secondary school-going children in endemic districts 	<p>Input Indicators:</p> <ul style="list-style-type: none"> • Sterilizations, hospital waste safe disposal services both hardware & software in placed up to district level • Hepatitis B vaccines, Lab. Consumables, Kits & other diagnostics available and fully operationalized to deliver the services of diagnosis and treatment to the affected population. • Public and private sector blood banks provided with technical assistance for safe blood transfusion practices. • Adequate and timely available allocation both human & financial • District Laboratory & blood banks

<p>throughout the province</p> <ul style="list-style-type: none"> • To strengthen the existing infrastructure and support system at provincial & district level for effective implementation of preventive programs • To devise a National Strategic Framework to combat Hepatitis for all provinces 	<p>throughout the country</p> <ul style="list-style-type: none"> • Vaccination of other high-risk groups in which virus transmission is high i.e. Injection Drug Users, Hepatitis C Patients, Contacts of Hepatitis B Reactive people, HIV/AIDS patients, Hemophiliacs & Thalassemics, Convicted Prison Inmates and patients put on Chronic Renal Dialysis • 80% coverage would be achieved in all above mentioned high-risk groups at the end of the program 	<p>properly equipped for Hepatitis screening and diagnosis</p> <p>Processes Indicators: (Performance measurement at District level)</p> <ul style="list-style-type: none"> • (Enough space for running a)Hepatitis Clinic and Hepatitis Pathology Laboratory • Number of Viral Hepatitis Control Committee formulated and fortnightly meetings held till date • Quantification of cold storage space present • Required monitoring forms by provincial and federal offices are being filled
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Nutrition Program:

This program was implemented to enhance research and resource mobilization of nutrition intervention at all levels in the Sindh province. Its aim was to ensure better nutrition health and use of micro-nutrients in Sindh especially for identified groups suffering from under-nutrition. The program advocates and ensures availability of IYCF and CMAM services at all levels by coordinating between PHC and Secondary Healthcare units.

The program is headed by a Provincial Nutrition manager along with two deputy program managers, an administrative officer and a finance manager. The Deputy Program Manager-Technical supervises a Nutritionist, Field program officers and the Logistics officer. The Deputy Program manager-M&E co-ordinates and handles the Epidemiologist, Data Analysts and IT Assistants. Like other programs, it has further staff like drivers, guards, cashiers, etc. The program does not have any special staff to implement the program on ground and relies on the district health workers of various programs like MNCH, LHW, etc. **(Table 33)**

Objectives/ Targets	Activities	Indicators
<ul style="list-style-type: none"> • Ensuring availability of IYCF and CMAM services to 70% of the target population of Sindh, in a phased approach by 2014-15 • Increased use of multi-micronutrients in Sindh by 2014-15 • Strengthen institutional capacity and resource mobilization for effective implementation, research and evaluation of nutrition interventions at all levels 	<ul style="list-style-type: none"> • Advocacy for IYCF and CMAM strategies • Setting up systems for initiating IYCF and CMAM services • Capacity building of health workforce for delivering IYCF and CMAM services • Procurement and supply of RUTF, sprinkles and related medicine • Supporting and monitoring districts in their interventions • Strengthening coordination between LHW, PHC and Secondary Health Care Facilities • Facilitating third party evaluation of interventions • Providing technical assistance to districts in scaling up the interventions 	<p>National Nutrition program indicators:</p> <ul style="list-style-type: none"> • Reduce Low Birth Weight Babies from 25 to 20 percent • Reduce malnutrition(preschool): <ul style="list-style-type: none"> ○ Moderate 38% to 30% ○ Severe 13 %to 5% • Iron Deficiency Anemia (Hb Level) <ul style="list-style-type: none"> ○ Mothers from 25% to 15% ○ Children < 5 years from 35% to 20% • Increase Mass Awareness for: <ul style="list-style-type: none"> ○ Mothers exclusively Breastfeeding (six months) from 59% to 75% ○ Introducing complementary foods at 6 months from 62% to 80% • Maternal nutritional status: <ul style="list-style-type: none"> ○ Under weight mothers (non-pregnant) 12% to 8% ○ Underweight mothers (lactating) 13% to 9% • Household consumption of Iodized salt 25% to 50% • Mothers getting calories less than recommended allowance 5% to 30% • Vitamin A deficiency in <ul style="list-style-type: none"> ○ Women 6% to 4% ○ Children 12% to 4%

SECTION 4: EVIDENCE BASED INTERVENTIONS & CURRENT HEALTH SECTOR PROGRAMS IN SINDH

There has been considerable progress in developing and implementing evidence-based interventions globally. From a broad range of possible interventions, there is now a consensus-based set of essential interventions for possible implementation in programs that most agencies are converging on (89). The table below shows the major causes of child and maternal death, the evidence-based interventions that are used to combat this mortality and the current programs that offer these interventions in Sindh.

Table- Evidence-based Interventions for Major Causes of Maternal, Neonatal and Child Deaths and Delivery platforms (Table 34)

Major causes of death	Evidence-based Interventions	Current Programs providing relevant Interventions	Current status and indicators
Unsafe abortion	Family planning (27-28)	MNCH & NPPI Program Family Planning Program	73.3% of married women (age 15-49) in Sindh do not use any methods of contraception. 22% use any modern method of contraception, of which 9% use sterilization and 7% use condoms

Major causes of death	Evidence-based Interventions	Current Programs providing relevant Interventions	Current status and indicators
			61.1% of married women (age 15-49) have never heard or saw a family planning message on the radio or TV and only 25 percent of women in Sindh were visited by a fieldworker or LHW who discussed family planning (10)
	Provision of post abortion care (30)	MNCH Program Family Planning Program	MNCH and RH programs emphasize increase in pre and postnatal care of pregnant women but no mention of abortion care or services. Postnatal care coverage in Sindh is very low at 32%; in urban areas it is even lower at 29% and in rural areas it is 34% No guidelines on post-abortion care in the LHW program
	Prevention and treatment of Eclampsia (31-33)	(Only present in main hospitals of urban areas in Sindh) MNCH Program RH&PHC (LHW)Program Family Planning Program MNCH Program	Magnesium Sulphate injections are provided in RHCs and referral hospitals; supply is variable as is use
Obstructed labor	Partograph use (34)	Not present in any program currently	
Hemorrhage	Management of post-partum hemorrhage (35,36) a) uterine massage b) uterotonics	MNCH & NPPI RH&PHC Program (largely through promotion of referrals)	Overall in Sindh, delivery by a skilled birth attendant is 44% and rural areas it is as low as 32.2% The percentage of births assisted by a SBA has increased somewhat overall by 30%. Impact pf
Infections	Antibiotics for management of preterm rupture of membranes (37)	MNCH & NPPI RH&PHC Program Family Planning Program	No guidelines or effective coverage in rural areas. Variable coverage in public sector facilities in districts
Indirect causes (anemia, malaria etc.)	Iron supplementation during pregnancy (40,41)	RH & PHC(LHW) program MNCH program Family Planning Program	The LHW program has achieved a 20% increase in proportion of pregnant women receiving one antenatal care by SBAs & 42% increase in 4 ANC by SBAs The MNCH program also provides prenatal and postnatal care as well Data shows that ANC 4 or more visits in Sindh overall is 33.5 % and in rural areas it is 21.4%

Major causes of death	Evidence-based Interventions	Current Programs providing relevant Interventions	Current status and indicators
			<p>PDHS 2006-07 shows, 45% of women in Sindh never took iron tablets or syrup during the last pregnancy. NNS 2011, shows that knowledge of mothers about iron in Sindh is 24% and iron deficiency in pregnant mothers is 25% and in non-pregnant women it is 23% (10)</p>
	<p>Prophylactic antimalarials for preventing malaria in pregnancy (42,43)</p> <p>Provision and promotion of use of Insecticide Treated Nets for preventing malaria in pregnancy (44)</p>	<p>MNCH Program</p> <p>MNCH Program</p> <p>RH & PHC(LHW) program</p> <p>Malaria (Control) program</p>	<p>The Malaria Program provides WHOPEs approved long-lasting insecticide treated bed nets free of cost to pregnant women and children under 5 in various districts of Sindh. However, there is no indicator of frequency of such interventions and their intended effect on target population</p> <p>PDHS 2006-07, shows that only 16% households in Sindh own at least one type of any mosquito net but there is no ownership or usage of insecticide-treated mosquito nets (ITNs). Of the 27.1% of pregnant women (age 15-49) suffering from malaria, 24.9% received treatment but only 5.3% of the pregnant women in Sindh a net of any kind (10)</p>
	<p>Prevention and management of Sexually Transmitted Infections (STIs), including HIV for prevention of Mother to Child Transmission (PMTCT) of HIV and syphilis (45,46)</p>	<p>MNCH Program</p> <p>RH & PHC(LHW) program</p> <p>HIV AIDS Program</p> <p>Family Planning Program</p>	<p>Syphilis detection and treatment is not present in any program</p> <p>The RH Program is using the SACP facility for this purpose</p> <p>The HIV AIDS program in Sindh provides interventions (both community and facility based activities) to Most-at-risk groups for HIV care and STI support through its clinics at all DHQ and THQ hospitals</p> <p>The Family Welfare Department of Sindh has a Population Welfare Program and Family Welfare Services that provides clinical and non-clinical contraception through its centres, particularly in rural areas.</p>
<p>Neonatal Infections</p>	<p>Tetanus immunization in</p>	<p>RH /PHC(LHW) and MNCH Program <i>through the</i></p>	<p>Overall in Sindh, tetanus toxoid immunization is low at 58.3%;</p>

Major causes of death	Evidence-based Interventions	Current Programs providing relevant Interventions	Current status and indicators
	<p>pregnancy (38,39) (for preventing neonatal Tetanus)</p>	<p>EPI/Polio Program Family Planning Program</p>	<p>coverage for rural/ lowest income quintile is 41.2% and among the highest income quintile it only goes up to 76.7% The RH program has a wide network of Lady Health Workers covering rural and peri-urban areas of Sindh and it hold a mass Health Week in support with UNICEF-but tetanus toxoid vaccination for pregnant women and children is only mentioned in this week. TT-2 coverage in pregnant women is said to be 80% under the program</p> <p>RH & PHC program states that it has achieved 25% increase in TT coverage of pregnant mothers but fails to mention the locations and frequency of TT immunization for pregnant women esp. in rural areas.</p>
	<p>Promotion and provision of hygienic cord and skin care (47)</p>	<p>MNCH Program Family Planning Program RH&PHC (LHW) Program</p>	<p>The MNCH, RH/LHW and FP Program provide cord clamp and scissors for health facilities. Clean birth kits are only provided by MNCH and FP programs.</p>
	<p>Promotion and support for early initiation and exclusive Breastfeeding (within the first hour) (48-51)</p>	<p>MNCH Program Family Planning Program RH&PHC (LHW) Program</p>	<p>In the specific interventions delivered by RH/LHW program, in the areas it covers, shows a 18-50% increase in early initiation of breast feeding immediately after birth. and up to six months of age.</p>
	<p>Case management of neonatal sepsis, meningitis and pneumonia (52-56)</p>	<p>MNCH Program</p>	<p>Case management of pneumonia (oral antibiotics) in Sindh overall is 41.1% and in rural areas it is 38.1%</p>
<p>Birth asphyxia and injuries</p>	<p>Neonatal resuscitation with bag and mask for babies who do not breathe at birth (57-59)</p>	<p>MNCH Program (only in main hospitals of urban areas in Sindh)</p>	
<p>Congenital anomalies</p>	<p>Folic acid fortification and/or supplementation to prevent Neural Tube Defects (60,61)</p>		<p>Zero coverage periconceptually</p>

Major causes of death	Evidence-based Interventions	Current Programs providing relevant Interventions	Current status and indicators
	Prevention and management of syphilis (46)	Not present in any program currently HIV/AIDS program provides STI support and treatment	The MNCH,NPPI and RH/LHW Program provide HIV/AIDs counseling and referral services and but not for syphilis. Condoms and contraceptives are provided by RH/LHW program and Family Planning Programs
Prematurity	Extra support for feeding the small and preterm baby (62)	Nil (does not exist presently)	
	Kangaroo mother care for preterm and for < 2000g babies (63,64)	Nil (does not exist presently)	
	Prophylactic and therapeutic use of surfactant to prevent respiratory distress syndrome in preterm babies (65)	Nil (does not exist presently)	
	Continuous positive airway pressure (CPAP) to manage pre-term babies with respiratory distress syndrome (66)	Nil (does not exist presently)	
Childhood pneumonia	Promote and provide <i>H.influenzae</i>, meningococcal, pneumococcal Vaccines (67)		EPI/Polio Program has a mandate to increase routine immunization coverage by 100% by 2015 in every district of Sindh. It provides routine immunization to children under 2 years of age
	Case management of childhood pneumonia (68)	MNCH Program	MNCH program provides case management of neonatal sepsis, meningitis and pneumonia
	Vitamin A as part of treatment for measles-associated pneumonia for children above 6 months (69,70)	EPI/Polio Program (only in main hospital facilities in Sindh)	The program has a mandate to increase immunization coverage and reduce measles in every district of Sindh by the year 2015. It shows special campaigns for held for polio and measles and addition of Vitamin A supplements

Major causes of death	Evidence-based Interventions	Current Programs providing relevant Interventions	Current status and indicators
			Measles vaccine coverage for Sindh overall is 50.7% and in rural areas it is 34%. Polio immunization in urban Sindh is 81% and in rural Sindh it is 78.1%
	Vitamin A as part of treatment for non-measles associated pneumonia for children above 6 months (68, 71-74)	EPI/Polio Program (only in main hospital facilities in Sindh)	
Childhood diarrhea	Acute watery diarrhea (75-81) Dysentery (82,83)	RH & PHC (LHW) Program	Supplies of ORS and intravenous fluids along with vaccines is provided. ORS provision coverage in Sindh overall is only 54%
	Promote and provide rotavirus vaccines (84,85)	Nil (does not exist presently)	
Childhood malaria	Provision and promotion of use of insecticide treated bed nets for children (42,86)	Malaria (Control) Program	Statistics mentioned in the program show that 80% of mortality due to malaria occurs in pregnant women and children under 5. This program in Sindh is providing WHOPES approved long lasting insecticide treated beds to these at-risk groups
	Case management of childhood Malaria (87)	MNCH Program RH/LHW Program	The MNCH program has a mandate to reduce IMR (55/1000 live births) and under 5 mortality to less than 65/1000 live births by 2012 and it also has a Malaria control program and provides insecticide treated beds
HIV infection	Comprehensive care of children infected or exposed to HIV infection (45,88)	MNCH Program HIV AIDS Program	The MNCH program provides care and support to pregnant mothers and children till under 5 years of age and provides HIV counseling and referral services The HIV AIDS Program also provides intervention for HIV care and support of affected people. It has treatment centres in public and private health sectors of Sindh

SECTION 5: OPPORTUNITIES FOR INTEGRATION AT POINT OF CARE / PRIMARY CARE SETTINGS

There is increasing global interest in integration of health-care services and increasing efficiency and coverage using every available strategy. Integration is happening across the globe, although the nature and processes related to the integration process are different across high and low/middle-income countries. An analysis of the effectiveness of integration is thus complex, as the nature and level of integration varies according to interventions. In current health systems both integrated and non-integrated programs frequently co-exist, indicative of the potential benefits of both the approaches.

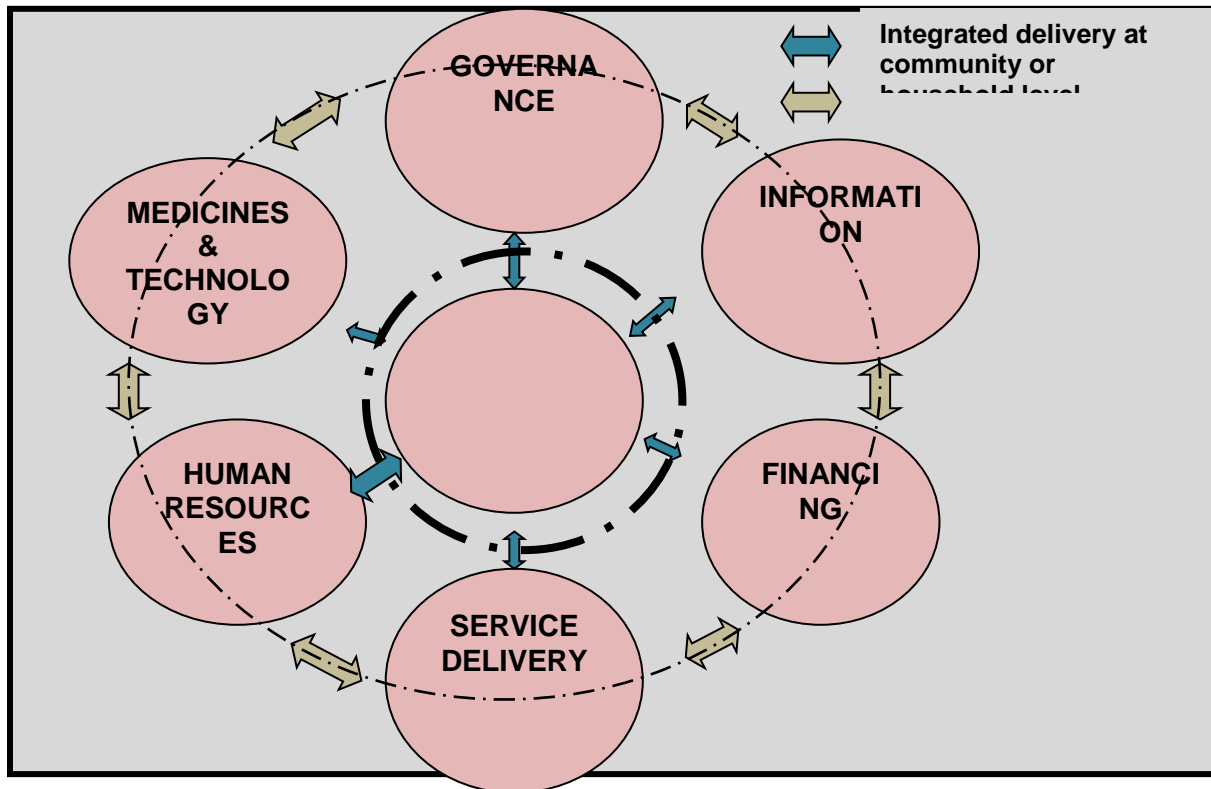
In most countries, health programs are delivered independent of each other in a vertical fashion and are designed to target a specific disease or health problem. Such vertical programs receive enthusiastic donor and health ministry support. Most vertical programs enjoy a separate budget and management streams with autonomy from the conventional health care delivery system. Although these programs ensure focused technical supervision and targeted delivery, however, many were also associated with duplication, inefficiency and service fragmentation. In contrast, integrated programs can provide economies of scale in terms of costs, human resources and might also be associated with improved client and consumer satisfaction. Another limitation to these vertical programs is that they provide minimum guidance on how to deal with other health problems existing within the same community, especially as they pertain to MNCH. On the contrary, integrated delivery provides the opportunity to deliver a wider range of health services utilizing the same resources thus being more convenient and acceptable for the target population. In theory integrated service delivery strategies at house hold level can be efficient in reaching a large number of recipients across the continuum of care and bridging the access and health service utilization gaps of geographically and socio-economically marginalized populations. However, there are concerns that such approaches can also hamper the primary program itself and overburden existing staff (90).

There are many existing definitions of integration. A functional definition of integration by Kodner & Spreeuwenberg (91) states, "Integration is a coherent set of methods and models on the funding, administrative, organizational, service delivery and clinical levels designed to create connectivity, alignment and collaboration within and between the cure and care sectors." For the purposes of Pakistan, integration can be described as, "a set of processes that combines and coordinates the inputs, service delivery, organizational policies and management with a common broad goal of achieving improved access and quality of care, simultaneously decreasing healthcare inequities."

For any health system, there are building blocks that provide a basic structure around which the complex relationships that underpin integration can be understood and evaluated. The Figure below shows these blocks and a principal focus on two levels of integration (incorporated within the WHO framework). The first level of integration is the integrated delivery of services at community or household level through a range of strategies, frequently using common pathways of community based multi-purpose health workers. The second layer evaluates integration within various building blocks of the health system with interaction of the interrelated factors including Governance, Information, Financing, Service Delivery, Human Resources, Medicines and Appropriate

Technology (including mhealth and ehealth). It can be readily seen that both levels are important and inter-related. While one focuses on the organization of services and support structures within the health system to enable service delivery, the other principally relates to integration of service delivery at the point of care or household level in community settings as appropriate. Given the huge burden of morbidity and mortality in community settings, reaching those in maximum need at community level is a key to achieving equitable access and care. However, while the latter is an important target, there needs to be clear linkages to health facilities with facilitation of referral as needed (90).

Two levels of integration in health systems (Figure 8)



Source: Integration and Equity for Maternal, Newborn, Child, Reproductive Health and Nutrition (90)

For the existing programs operating in Sindh in particular, integration at service delivery level can be quite useful. Various programs can integrate intervention delivery and coverage.

The table below provides a snap shot of current interventions that exist in Sindh and the possibility for inclusion of additional evidence based interventions as feasible. One approach to increase coverage and to take on broader initiatives through existing programs is to integrate service delivery at all levels and to utilize all possible missed opportunities. Of the possible interventions and delivery platforms, scaling up community delivery strategies using existing cadres of workers in community and outreach settings has the greatest potential to reach those in need. In particular this strategy has the potential of reaching a large number of people in Sindh because community level health care and basic health units are supported by a large cadre of trained Lady Health Workers

and rural health centers are staffed by qualified medical and nursing staff including dispensers and technicians (90) **(Table 35)**

Key Interventions	MNCH	NPPI	RH&PH C (LHW)	Family Planning	Malaria	TB DOTS	HIV/ AIDS	EPI/ Polio	Hepa titis
Adolescents & Pre-Pregnancy									
Family planning	X	X		X					
Prevent and manage Sexually Transmitted illnesses including Mother-to-Child Transmission of HIV and syphilis	X		X	X			X		
Pregnancy									
Management of unintended pregnancy Availability and provision of safe abortion care when indicated			X						
Provision of post abortion care	X			X					
Appropriate antenatal care package:									
Screening for maternal illnesses									
Screening for hypertensive disorders of pregnancy									
Screening for anaemia									
Iron and folic acid to prevent maternal anaemia									
Tetanus immunization									
Counselling on family planning, birth and emergency preparedness									
Prevention and management of HIV, including with antiretrovirals	X		X	X				X	
Prevent and manage malaria with insecticide treated nets and antimalarial medicine	X		X	X			X		
Smoking cessation	X		X		X				
Reduce malpresentation at term with External Cephalic Version									
Prevention of pre-eclampsia									
Calcium to prevent hypertension									
Low dose aspirin to prevent hypertension									
Magnesium Sulphate for eclampsia	X		X	X					
Induction of labour to manage prelabour rupture of membranes at term									
Antibiotics for preterm prelabour rupture of membranes	X	X	X	X					
Corticosteroids to prevent respiratory distress syndrome in newborns	X (urban areas)								
Child Health									
Induction of labour for prolonged									

Key Interventions	MNCH	NPPI	RH&PH C (LHW)	Family Planning	Malari a	TB DOTS	HIV/ AIDS	EPI/ Polio	Hepa titis
pregnancy									
Prophylactic uterotonics to prevent postpartum haemorrhage									
Active management of third stage of labour to prevent postpartum haemorrhage									
Management of postpartum haemorrhage (e.g. uterotonics, uterine massage)	X	X	X						
Caesarean section for maternal/foetal indication									
Prophylactic antibiotics for caesarean section									
Postnatal (mother)									
Family planning	X		X	X					
Prevent and treat maternal anaemia									
Detect and manage postpartum sepsis									
Screen and initiate or continue antiretroviral therapy for HIV	X		X						
Postnatal (newborn)									
Immediate thermal care									
Initiation of exclusive breastfeeding (within first hour)	X		X	X					
Hygienic cord and skin care	X		X	X					
Neonatal resuscitation with bag and mask (professional health worker)	X (urban areas)								
Case management of neonatal sepsis, meningitis and pneumonia	X (urban areas)								
Kangaroo mother care for preterm and for less than 2000g babies									
Management of newborns with jaundice									
Surfactant to prevent respiratory distress syndrome in preterm babies									
Continuous positive airway pressure (CPAP) to manage babies with respiratory distress syndrome									
Extra support for feeding small and preterm babies									
Presumptive antibiotic therapy for newborns at risk of bacterial infections	X			X					
Infancy and Childhood									
Exclusive breastfeeding for 6 months	X		X	X					

Key Interventions	MNCH	NPPI	RH&PH C (LHW)	Family Planning	Malari a	TB DOTS	HIV/ AIDS	EPI/ Polio	Hepa titis
Continued breastfeeding and complementary feeding from 6 months									
Prevention and case management of childhood malaria	X		X		X				
Vitamin A supplementation from 6 months of age								X	
Comprehensive care of children infected with or exposed to HIV	X						X		
Routine immunization and H. influenzae, meningococcal, pneumococcal and rotavirus vaccines									
Management of severe acute malnutrition									
Case management of childhood pneumonia	X								
Case management of diarrhoea			X						
Cross-cutting community strategies									
Home visits for women and children across the continuum of care									

The LHW and MNCH program in Sindh have utilized the EPI/Polio workers for maternal tetanus immunizations. The same example can be replicated, for instance, the LHW program has a mandate to increase immunization coverage, contraceptive prevalence and antenatal care. It can collaborate with EPI/Polio program to not only provide polio vaccination and Vitamin A supplementation to children and women but also distribute ORS, micronutrient supplementation and minerals like calcium and zinc. The Malaria program has its own staff working at district level and the MNCH, Family Planning and LHW program can use this workforce to provide insecticide treated beds, antibiotics and larvicidal drugs.

These three programs can develop a partnership with the HIV AIDS program where women and children will be given special attention and treatment at its STI clinics including provision of oral or surgical contraception, treatment of syphilis and help in advocacy and stigma reduction; in turn the MNCH and LHW program can extend efforts for comprehensive care of children infected or exposed to HIV infection. And this partnership can only be sustainable and cost-effective if health workers are trained in a joint effort.

The EPI/Polio program has an ambitious mandate to increase routine immunization coverage by 100% in 2015; to reduce measles, diphtheria, pertussis, Hib, Hepatitis and childhood TB and control other preventable diseases like typhoid and influenza. For some initiatives like TB and Hepatitis it can integrate interventions with the TB-DOTS and Hepatitis programs in Sindh through the existing health workers working in particular areas. For others, it can collaborate with MNCH and RH&PHC program and together they can increase interventions of different areas like childhood measles, dysentery, typhoid and pneumonia by training the LHW and community-based staff there jointly to address these diseases.

The LHW, MNCH and Family Planning Program can integrate interventions, training and use of Lady Health Workers and community based health workers to provide comprehensive obstetric care, pre and post natal care including active management of 3rd stage of labor; neonatal resuscitation; preventive postnatal care (healthy practices and illness detection); provision of oral or injectable antibiotics for neonatal infection and combine efforts for future interventions like thermal care and kangaroo mother care. For integration at service delivery level, the major stakeholder in reproductive, maternal and child health in Sindh, need to collaborate and train LHWs through a comprehensive system of basic, advanced and refresher training. The training program should be designed in such a manner so as to address the wide range of issues in MNCH and use resources for each from different programs across the board.

The scenarios indicated above relate to routine services which may be difficult given day to day workload of these cadres of workers. However, there is no reason why their interventions and joint activities cannot come together in special activities such as regular child health and family health days in rural and community settings. These Health “Melas” are an extremely attractive platform to increase community engagement, awareness and promote demand creation for services and commodities. They also provide opportunities for rapid scale up and bridging gaps in vaccinations, nutrition interventions and practices such as ITN use. Women’s groups can also be utilized for integration of family planning and birth preparedness messages with a focus on optimizing pregnancy outcomes.

One of the most glaring gaps in public health presently relates to the health of adolescent girls and young women. There is great potential for health education including screening for deficiencies and illnesses. Integration of reproductive, maternal and child health services could also bring this group of beneficiaries into the mainstream with benefits in health outcomes.

SECTION 6: What difference could these integrated Intervention Packages make for Sindh?

In addition to the obvious efficiencies, gains in coverage and community acceptance, a major question posed is tangible health benefits. What possible efficiencies and benefits could this expansion of packages of care and scaling up of integrated delivery bring for women and children in Sindh? Could this be a mechanism for reaching the poor especially those in the poorest socioeconomic quintiles and living in geographically marginalized populations?

To address this question, we modeled a range of options and intervention impact using the Lives Saved Tool (*LiST*) especially modified and adapted for Sindh using local coverage data and program options for implementation. The *LiST* tool assesses the impact of interventions based on estimates of effectiveness derived from the *Lancet* series on Child Survival (92), Neonatal Survival (93), the Nutrition (94) and Stillbirth series (95) and updated recently (96, 97) (link www.jhsph.edu/iip/list). The model and latest evidence based interventions were linked to cause-specific maternal, fetal, newborn and child mortality estimates for Sindh across a range of socioeconomic quintiles, providing estimates of lives saved by interventions at various levels of coverage.

We assessed the impact of systematically increasing coverage of various evidence based interventions on reducing the burden of maternal, fetal, newborn and child deaths using the *LiST* tool. We specifically focused on scaling up interventions and delivery platforms for maternal, newborn care and case management of diarrhea and pneumonia with demonstrated potential for reaching the poor and difficult to reach populations as assessed by location (urban/rural) and across socio-economic quintiles.

The table below shows the intervention packages specifically designed and recommended for Sindh. The last two columns show which programs are already providing these interventions (and at what level) along with the health workers responsible for service delivery. This gives a clear idea of how service delivery of various maternal and child health morbidity and mortality factors can be integrated through a basic network of trained health workers.

Table- Intervention Packages Modeled for Sindh (Table 36)

Packages	Interventions within Package	Interventions Present in the System	Who delivers - Human Resources (Workers= MOs, Midwives, LHWs Professional health workers = nurses, doctors)
1-Periconceptual and post abortion care	Safe abortion services	Only present in large hospitals of urban areas in Sindh	Professional health workers in urban and rural areas
	Post abortion case management	MNCH Program RH&PHC (LHW)Program Family Planning Program	LHWs
	Folic acid supplementation or fortification	Not present in any program periconceptually	
	Syphilis detection and treatment	Not present in any program except in some hospitals (mainly urban)	
	Tetanus toxoid	RH&PHC (LHW) and MNCH Program through the EPI/Polio Program Family Planning Program	All health workers
	MgSO4 management of pre-eclampsia	MNCH Program RH&PHC (LHW) Program Family Planning Program	Professional health workers
	Diabetes screening and	Not present in any program	

Packages	Interventions within Package	Interventions Present in the System	Who delivers - Human Resources (Workers= MOs, Midwives, LHWs Professional health workers = nurses, doctors)
	management		
	Screening for fetal growth restriction and appropriate management	Not present in any program	
	Antibiotics for PРоM	Only present in large hospitals of urban areas in Sindh Family Planning Program	For urban areas: Professional Health Workers For rural areas: LHWs & LHSs
	Essential care for all women and immediate essential newborn care	MNCH & NPPI Program RH&PHC (LHW)Program	
	Clean birth practices at home	RH&PHC (LHW)Program	
	Antenatal corticosteroids for preterm labor	Only present in large hospitals of urban areas in Sindh MNCH program	
	Basic emergency obstetric care (clinic)	MNCH Program RH&PHC (LHW) Program	
	Comprehensive emergency obstetric care	Only present in large hospitals of urban areas in Sindh MNCH Program	

Packages	Interventions within Package	Interventions Present in the System	Who delivers - Human Resources (Workers= MOs, Midwives, LHWs Professional health workers = nurses, doctors)
	Immediate assessment and neonatal stimulation	MNCH Program RH&PHC (LHW)Program	
	Neonatal resuscitation	Only present in large hospitals of urban areas in Sindh MNCH Program	
	Active management of 3rd stage of labor	Only present in large hospitals of urban areas in Sindh MNCH Program	
	MgSO ₄ management of eclampsia	Only present in large hospitals of urban areas in Sindh MNCH Program RH&PHC (LHW)Program Family Planning Program	
	Induction of labour to prevent births at or beyond 41 completed weeks	Only present in large hospital of urban areas in Sindh	
	Preventive postnatal care (healthy practices and illness detection)	NPPI program	For urban areas: Professional Health Workers
	Thermal care	Present in very few hospitals in urban areas of Sindh	For rural areas: LHWs & LHSs
	Oral antibiotics:	Only present in large	

Packages	Interventions within Package	Interventions Present in the System	Who delivers - Human Resources (Workers= MOs, Midwives, LHWs Professional health workers = nurses, doctors)
	case management of severe neonatal infection	hospitals of urban areas in Sindh MNCH Program Family Planning Program	
	Injectable antibiotics: case management of severe neonatal infection	Only present in large hospitals of urban areas in Sindh MNCH Program Family Planning Program	
	Full supportive care: case management of severe neonatal infection	Only present in large hospitals of urban areas in Sindh	
	Use of improved water source within 30 minutes Use of water connection in the home Improved sanitation - Utilization of latrines or toilets Hand washing with soap Hygienic disposal of children's stools	Present in a few areas of Urban and Rural Sindh	All health workers
	Insecticide treated materials or indoor residual spraying	Only present in large hospitals of urban areas in Sindh Malaria (Control) program; MNCH Program	All health workers

Packages	Interventions within Package	Interventions Present in the System	Who delivers - Human Resources (Workers= MOs, Midwives, LHWs Professional health workers = nurses, doctors)
		RH&PHC (LHW)Program	
	ORS Zinc treatment of diarrhea Antibiotics for dysentery	RH&PHC (LHW)Program	All health workers
	Case management of pneumonia (oral antibiotics)	Only present in large hospitals of urban areas in Sindh MNCH provides guidelines for case management of neonatal and young infant pneumonia but with co-trimoxazole	Professional health workers
	Exclusive breastfeeding till 6 month	Only present in large hospitals of urban areas in Sindh MNCH Program RH&PHC (LHW)Program Family Planning Program	All health workers but mainly professional health workers in urban areas
	Calcium supplementation Protein energy Supplementation Multiple micronutrient supplementation	Not present in any program at the moment	

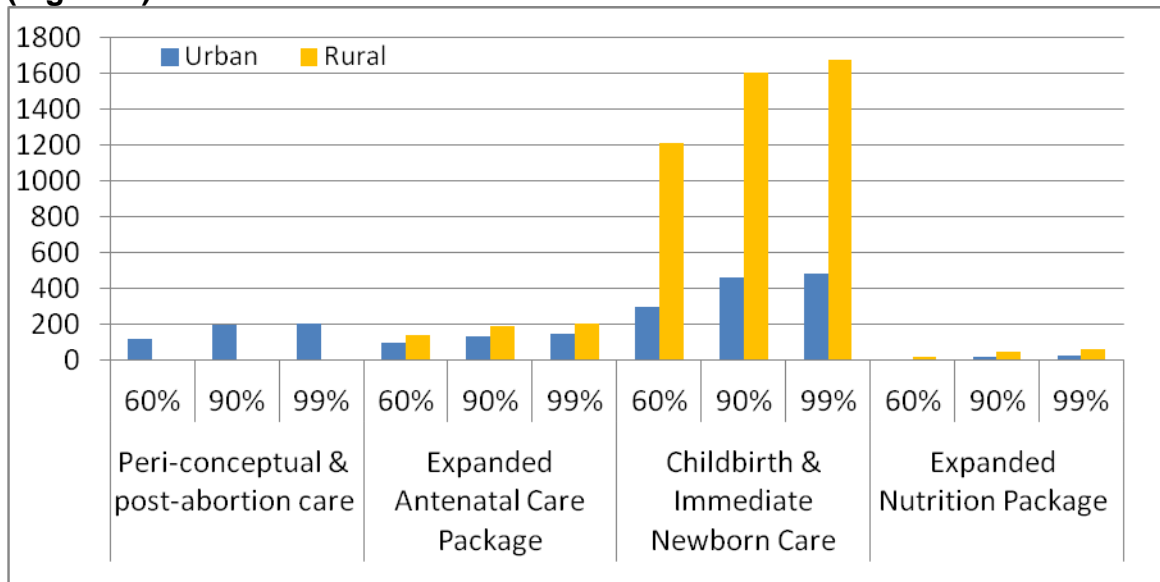
Packages	Interventions within Package	Interventions Present in the System	Who delivers - Human Resources (Workers= MOs, Midwives, LHWs Professional health workers = nurses, doctors)
	Zinc supplementation		
	Vitamin A supplementation Vitamin A for measles treatment	Only present in large hospitals of urban areas in Sindh EPI/Polio Program	All health workers
	Hib vaccine Measles vaccine DPT vaccination	For all these vaccines: EPI/Polio Program	All health workers
	Kangaroo mother care Rotavirus vaccine Pneumococcal vaccine	Not present in any program at the moment	

The **Periconceptual and post abortion care package** recommended for Sindh includes safe abortion services; post abortion case management and folic acid supplementation or fortification as interventions to be provided in urban areas of Sindh. The MNCH Program; RH&PHC(LHW) Program provide pre and post natal care and information/counseling services to pregnant women and emphasize increase in pre and postnatal care but there is no mention of abortion care or services in their mandate and guidelines. Postnatal care coverage in Sindh is very low at 32%; in urban areas it is even lower at 29% and in rural areas it is 34% .The number of lady health workers on ground, esp. in rural areas is low and they are not given professional training to handle post abortion care. The present set up of government policies do not allow abortion unless some medical back ground is available.

Only the Family Planning program has medications for induced abortion (mifepristone, misoprostol); vacuum aspiration equipment; uterotonics (misoprostol, oxytocin) and surgical procedures when required. MNCH and RH program do not provide any of these

facilities or interventions in primary care settings. The figures below indicate that scaling up these interventions especially the childbirth and newborn care packages could impact outcomes substantially especially among the poor. A lot more needs to be done in periconceptual and post-abortion care especially in rural areas and should be done. Our modeling exercise shows clearly that service delivery integration within the existing programs, at least in the rural areas at primary care level, can avert many maternal deaths.

Maternal Deaths Averted by Packages by Urban and Rural populations in Sindh (Figure 9)



The **Expanded Antenatal Care package** modeled for Sindh includes syphilis detection and treatment; tetanus toxoid; magnesium sulphate for management of pre-eclampsia; diabetes screening/ management and screening for fetal growth restriction and its appropriate management. All three programs -MNCH program; RH&PHC program and the Family Planning program- provide magnesium sulphate for treatment of pre-eclampsia and eclampsia but at secondary referral facilities which could delay the receipt of these lifesaving interventions. The MNCH and HIV/AIDS programs also provide HIV/AIDS counseling and referral but there is no indication of the level of training and delivery of health worker for these interventions and services and there is no syphilis treatment available. Moreover on ground evidence shows that STI management in MNCH program is not happening in realities and the facility in Karachi and Larkana provide only PMTCT and not syphilis care. It is especially notable that syphilis treatment with three doses of injectable penicillin is highly effective but the key bottlenecks are detection and prompt therapy.

The RH Program is using the SACP facility for this purpose. The Family Welfare Department of Sindh has a Population Welfare Program and Family Welfare Services that provides clinical and non-clinical contraception through its centres, particularly in rural areas. But this program does not have an explicit mandate on prevention and management of STI or HIV and no clear linkages with the HIV/AIDS program.

The HIV AIDS program in Sindh provides interventions (both community and facility based activities) to Most-at-risk groups for HIV care and STI support through its clinics at all DHQ and THQ hospitals. In this program, the emphasis is on general prevention of HIV and stigmatization for males and females but specifically mother to child transmission and awareness is not targeted. The HIV/AIDS program does not provide psychosocial support or nutritional support to infected people or treatment of syphilis.

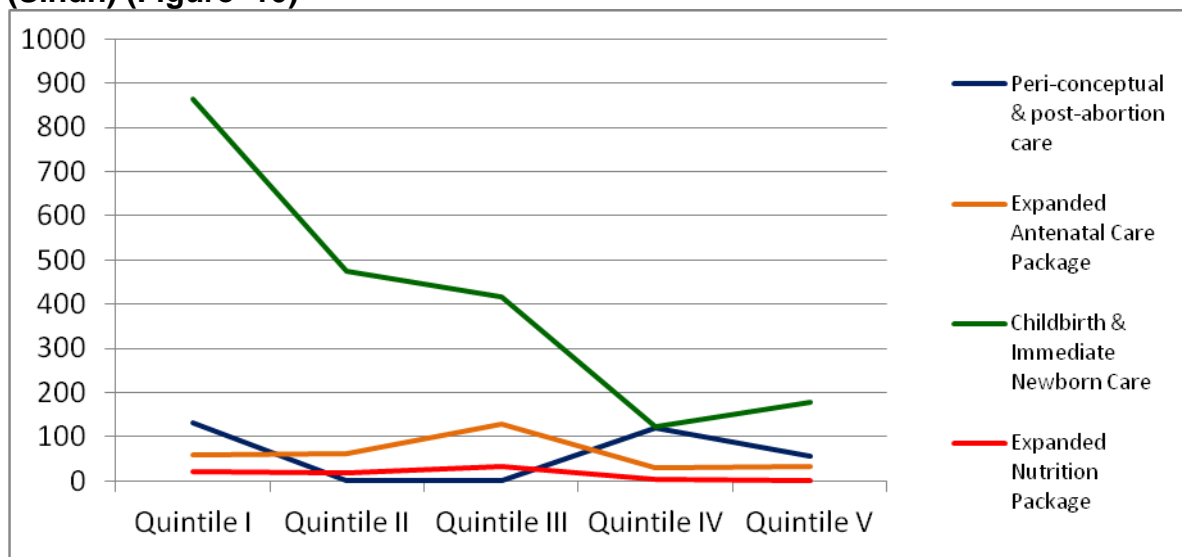
The HIV AIDS Program also provides intervention for HIV care and support of affected people and it has treatment centres in public and private health sectors of Sindh. So this program can broaden its mandate to provide comprehensive care to children infected or exposed to HIV infection and to target syphilis and its treatment especially for women and integrate these services in the already existing structure. The MNCH program also provides care and support to pregnant mothers and children till under 5 years of age and provides HIV counseling and referral services. So these two programs can integrate services and resources to prevent and raise awareness about HIV and syphilis and provide treatment and care to infected people especially women and children.

The EPI/Polio program holds special campaigns to eradicate polio, measles and neonatal Tetanus (NNT). It provides Tetanus toxoid to all the women of child bearing age and TT dose to pregnant women, but there are no indicators of the frequency and effectiveness of the program. The Family Planning program; RH&PHC (LHW) and MNCH programs provide tetanus immunization in pregnancy for preventing neonatal tetanus through the EPI/Polio Program as well. The RH & PHC program states that it has achieved 25% increase in TT coverage of pregnant mothers. The RH program has a wide network of Lady Health Workers covering rural and periurban areas of Sindh and it hold a mass Health Week in support with UNICEF-but tetanus toxoid vaccination for pregnant women and children is only mentioned in this week. TT-2 coverage in pregnant women is said to be 80% under the program. Overall in Sindh, tetanus toxoid immunization is low at 58.3%; coverage for rural/ lowest income quintile is 41.2% and for highest income quintile it goes up to 76.7%. DPT vaccination coverage in rural areas of Sindh is 34.5% and tetanus immunization is 48.2%. There are major gaps in frequency and implementation of tetanus immunization through these current programs. Since the EPI program has a mandate to increase routine immunizations coverage by 100% in every district of Sindh by 2015, the above mentioned programs can integrate their LHWs and other workers to provide tetanus and other immunizations to all districts together.

Lady Health Workers are trained and work for all programs mentioned above but none of them have guidelines or interventions for diabetes screening/ management and screening for fetal growth restriction and its appropriate management. These interventions are particularly required in Sindh for antenatal care and can be very easily integrated in the existing mandate and resources of the Family Planning Program; the MNCH program and the LHW program. Evidence shows that ANC 4 or more visits in Sindh overall is 33.5% and in rural areas it is low at 21.4% (in fact the coverage among the poorest quintile is only 14.4% visits whereas the richest quintile have 72.8% coverage).

The graphs below show that increased interventions and coverage to address antenatal care can cause tremendous improvements especially in the lower income quintiles and substantially reduce the number of maternal deaths in rural areas.

Maternal Deaths Averted by Packages across SES Quintiles at 90% coverage (Sindh) (Figure 10)

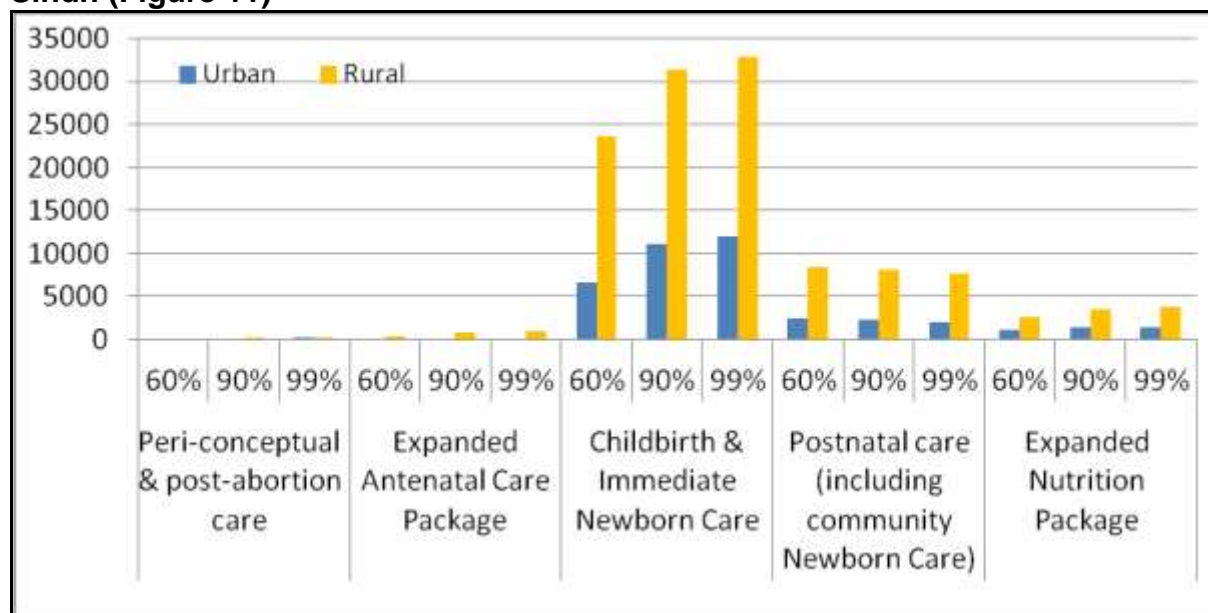


If the existing programs were to integrate services, they could cover a greater proportion of people in rural areas and provide antenatal care to more districts instead of only urban areas. As indicated above, antenatal care and interventions do avert maternal deaths especially in the rural areas of Sindh but that a lot more can be done to reduce maternal mortality through integration of programs and increasing coverage particularly for syphilis and diabetic treatment and management.

Childbirth, Immediate Newborn & Post-natal care Package: Among interventions recommended for childbirth, postnatal and immediate newborn care (including community newborn care), the MNCH & NPPI programs; the RH&PHC (LHW) program and the Family Planning program all provide antibiotics (Erythromycin) for management of preterm rupture of membranes. The MNCH and Family Planning programs also provide oral antibiotics for case management of severe neonatal infections. The LHW and MNCH program also provide essential care for all women, basic emergency obstetric care and immediate essential newborn care. ORS and intravenous fluids along with vaccines are supplied by the RH & PHC (LHW) program but distributed by the vaccinators of the EPI program and not by LHWs.

These are the programs that are primarily responsible for interventions for childbirth, newborn and postnatal care but they do not cover all essential interventions required and the interventions they do provide separately are not enough. For instance, ORS provision coverage in Sindh overall is only 54% and is only supplied by the LHW program and distributed by EPI vaccinators. The MNCH and Family Planning programs can also integrate a similar strategy with vaccine programs like the EPI/polio program across Sindh to provide ORS, zinc tablets and antibiotics to combat acute watery diarrhea and dysentery in children. Similarly, these programs can jointly create awareness and promote clean birth practices at home; the percentage of clean home deliveries in Sindh is only 24.2%. All these programs can also include injectable antibiotic and full supportive care to manage severe neonatal infections and substantially decrease childhood mortality as the graphs below show clearly.

Neonatal Deaths Averted by Packages delivered in Urban and Rural populations of Sindh (Figure 11)



Currently, the programs in Sindh do not extend comprehensive emergency obstetric care to all and the current intervention mix does not include antenatal corticosteroids for preterm labor, active management of 3rd stage of labor and induction of labour to prevent births at or beyond 41 completed weeks. If these services and interventions are added to the existing systems along with training of LHWs to emphasize clean birth practices at home and immediate assessment and stimulation, neonatal and maternal deaths in Sindh urban and rural areas can be brought down significantly. Further evidence-based interventions for these programs should also include facilities for neonatal resuscitation, provision of thermal care and injectable antibiotics for management of neonatal infections. The figure below shows the significant impact of childbirth and immediate newborn care on reduction of maternal deaths across income quintiles. But it is clearly evident that interventions and expansion of coverage is required in lower income quintiles especially in childbirth and immediate newborn care.

Integrated management of childhood illnesses (IMCI) and community based child care package: The IMCI and community case management interventions package modeled for Sindh has several evidence-based interventions, not all covered by the current programs. Only malaria control, pneumonia management and breast feeding is primarily handled by the existing programs and community case management of diarrhea with ORS and zinc has poor coverage and no treatment is provided for severe pneumonia in domiciliary settings when referral is not possible.

Insecticide treated nets/materials are promoted and distributed by the Malaria (Control) Program in Sindh. Statistics mentioned in the program show that 80% of mortality due to malaria occurs in pregnant women and children under 5. This program is providing WHOPEs approved long lasting insecticide treated beds to at-risk groups. The program emphasizes early diagnosis and treatment; epidemic response/preparation and behavior change communication. But the program shows no indicators for the areas covered, frequency and effectiveness of distribution and promotion of antimalarial drugs and

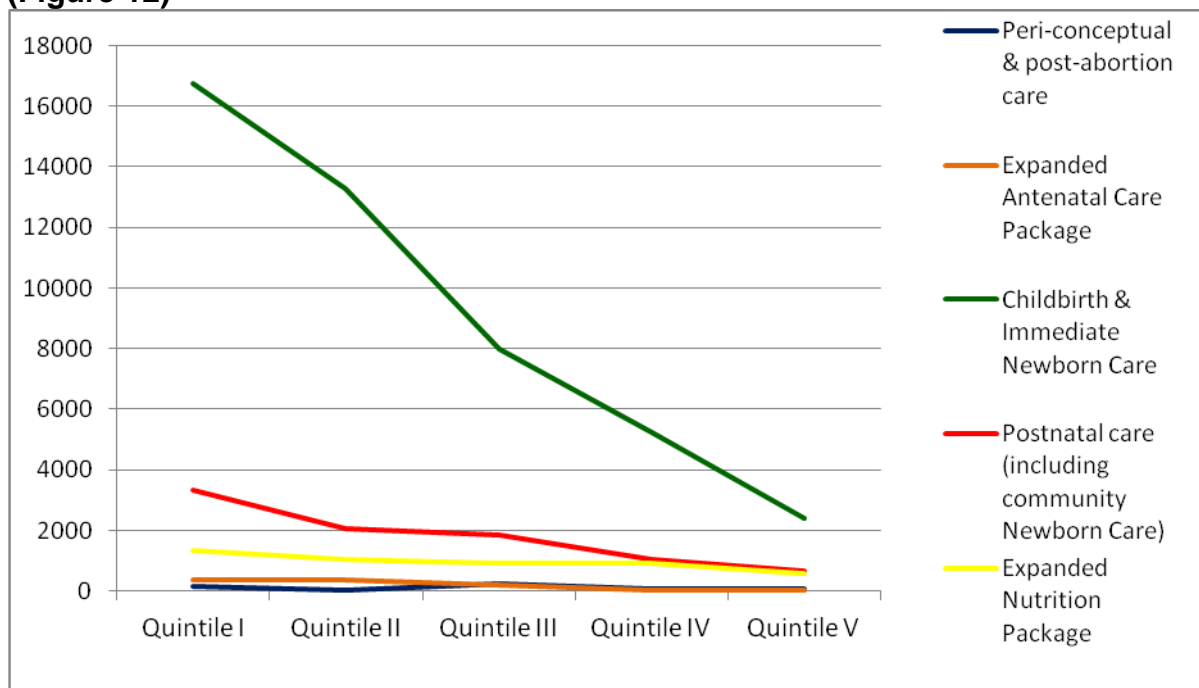
insecticide treated beds. The distribution of long-acting insecticide treated bed nets, internal residual spray, fogging and larvicidal drugs are provided through the field staff that is on the pay roll of the health system. The MNCH Program & LHW programs also provide insecticide treated bed nets to at-risk people and they also have a Malaria control program. These programs can integrate their mission against malaria with Malaria (control) program in Sindh. They can use combined resources to promote community awareness and use of anti-malarial drugs

Diagnosis, testing, slide making and reading centers are managed by the regular staff and lab technicians from the Malaria program but wherever such staff is not available the technical staff of the health system is used for the purpose. And in some centers they do have outreach workers as well. Artemisinin combination therapy (ACT) is essentially being provided by doctors but if LHWs are trained they can take up this responsibility as well. Awareness of malaria is mostly promoted by doctors and field staff of the program. To increase awareness the Malaria (control) program needs to design dissemination material for community-based counseling, education and use of anti-malarial drugs. These materials can also be used by other programs like the MNCH program that have a malaria control mandate. Moreover, the program needs to have a frequent and comprehensive system to retrain health workers as the current workers were trained sometime back through the National roll back malaria program in the provinces. Health workers for malaria can also be sent for refresher courses or advanced skills to the National Institute of Malaria at Lahore.

Promotion and support for early initiation and exclusive Breastfeeding (within the first hour till 6 months) is primarily done through the MNCH, Family Planning and the LHW programs. In the areas that it covers, the LHW program demonstrates 50% increase in early initiation of breast feeding immediately after birth. It also shows an increase in exclusive breast feeding up to six months of age. But the specific methods of counseling and frequency of services by health workers to target population is not specified by any of the programs. The MNCH program also provides case management of neonatal sepsis, meningitis and pneumonia. The EPI/Polio program provides routine immunization but does not indicate use of oral antibiotics for case management pneumonia. Given that childhood pneumonia and diarrhea are the most important killers of children in Sindh beyond the neonatal period, considerable attention must be given to improved case management in community settings. The LHW program in particular should scale up optimal management of diarrhea diseases and pneumonia in community settings in circumstances where referral to public sector facilities may not be feasible. It is important to note that Sindh has also had a demonstration project on both at district level and shown that LHWs can manage severe pneumonia in home settings with satisfactory outcomes, at par with care provided by private practitioners in the area (Soofi et al, Lancet 2012).

Postnatal care, including community born newborn care does contribute to a decrease in neonatal deaths across all income quintiles but the existing programs need to incorporate more interventions specifically for Sindh like provision of water connection facilities, emphasis on hygiene and sanitation and case management of dysentery and pneumonia through antibiotics.

Neonatal Deaths Averted by Packages across Quintiles at 90% coverage (Sindh) (Figure 12)

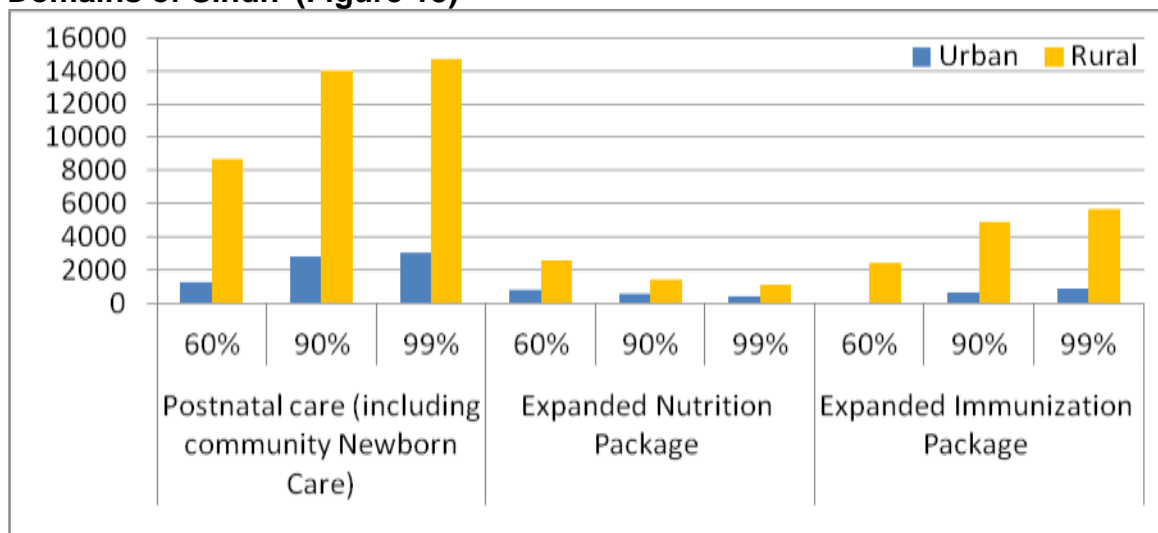


A word about preventive strategies; for community based child care, all programs operating in Sindh should have robust materials for dissemination through different media platforms for community education and prevention of illnesses through environmental health, hygiene and sanitation. They should provide interventions for use of improved water source (within 30 minutes), use of water connection in the home and particularly improved sanitation through utilization of latrines or toilets. This is because use of water connection in rural areas of Sindh is 67% and for the first income quintile it is as low as 42.1%. Excreta disposal (latrine/toilet) in Sindh overall is 49.4%; in urban areas it is higher at 85.3% but in rural areas it is shockingly low at 17.9%- the difference is stark in income quintiles with lowest quintile having a 5.6 % intervention coverage of sanitation through improved latrines/toilets and the uppermost quintile has a 99.4% coverage. The Family Planning, LHW and MNCH programs should particularly target and provide awareness to mothers in rural areas to use soap for hand washing and hygienically dispose of children's stools

Expanded immunization and nutrition package: This combined package being recommended for Sindh includes interventions including Hib vaccine; measles vaccine and DPT vaccination along with various vitamin and micronutrient supplementation. The EPI/Polio program has a broad mandate that includes provision of these vaccines and Vitamin A supplementation for measles treatment. Integrated action on immunization and vaccination coverage is extremely important since measles vaccine coverage in rural areas of Sindh is 34% (urban areas=61.5%); DPT vaccination coverage in rural areas is 34.5% (urban= 60.3%) and even polio coverage is not at full level (rural areas=78.1%; urban= 81%). The EPI/Polio programs can promote and provide preventive and promotive information on key childhood vaccines and their preventive potential by integrating services through the LHW, MNCH and even the Family Planning Programs.

The MNCH program does mention nutrition advice/counseling for child growth and monitoring in its interventions package but does not specify any direct vitamin and minerals supplementation. Calcium supplementation during pregnancy in Sindh is only 53.8% with urban areas at 66.7% and rural areas at 45.4%. The recent National Nutrition Survey 2011 shows Sindh as the most food insecure province and so there needs to be concerted efforts to promote intervention and supplementation of calcium; zinc; vitamin A and protein energy along with other multiple micronutrient supplementation. The graphs clearly show that intervention packages in nutrition and immunization are direly needed in Sindh and can make a great impact on childhood mortality by reducing post-neonatal deaths.

Post-Neonatal (1-59 months) Deaths Averted by Packages by Urban and Rural Domains of Sindh (Figure 13)



Future promising interventions:-Further and future interventions proposed for Sindh include Kangaroo mother care and provision of rotavirus and pneumococcal vaccines. At the moment only EPI/Polio program provides extended immunization coverage and it can easily include these vaccinations in its already existing mandate and network. The pneumococcal conjugate vaccine has been introduced in Pakistan in March 2012 with support from GAVI and a pilot roll out in Punjab. Hence one can be reasonably confident that these interventions may also be available to children in need in Sindh by 2013.

Many of these programs/ strategies use the existing healthcare system at all levels and the existing work force or paramedical staff of other programs. For example, the MNCH program is using the LHW, LHV, CMW vaccinators, etc. The LHW and MNCH program use the EPI vaccinators to provide immunizations and ORS to the local communities. If these programs integrate workforce, then they can train many health professionals and provide interventions to more areas. For instance, the NPPI Program has many public private partnerships to train Community Midwives, Lady Health Workers and Community Health Workers and many programs can collaborate to train their health workers as well. The NPPI program provides technical support to establish a database for 5 Maternal, Newborn and Child Health categories and trains the Sindh MNCH and LHW program staff to use the software at provincial and district levels. The LHW and MNCH program can broaden its mandate to use the workforce of Malaria control program to target women and children with insecticide treated bet nets and anti-malarial drugs or it only has HIV/AIDS

counseling and referral so it can develop a partnership with the HIV AIDS program in Sindh to use their treatment centers for care of women and children infected with HIV or syphilis. These programs can help the health workers of the TB-Dots program and the Sindh Nutrition program in the provision of interventions and development of materials for dissemination to targeted women and children especially on the rural areas.

The NPPI program has established networks for MNCH and Family Planning advocacy and mobilization. It also produces materials for community awareness about MNCH issues, danger sign and best practices. Other programs can help in the distribution and add nutrition advice, sanitation practices, use of bed nets to prevent malaria and use of ORS and zinc for dysentery, etc.

SECTION 7: Conclusions & Recommendations

As the situational analysis and modeling above indicates, there are enormous opportunity for increasing the efficiency of programs addressing MNCH and Nutrition in Sindh and an integrated framework for service delivery at primary care level. While recognizing that these programs are a relic of the pre-devolution scenario, the imperative of developing an efficient and equity-focused health program in Sindh provides an opportunity for undertaking a thorough review of strategies. Globally there is much support presently for integration of strategies across the continuum of care as well as health systems and care providers. There is also the need for linking these programs in health to those related to social safety nets and education.

The following general recommendations may be of value in the planning process to facilitate integration and targeting for health programs and interventions in Sindh

1. There is an urgent need for the thorough review of all existing programs and interventions at primary care level in rural and urban Sindh by targeted populations and service providers. This analysis should provide the basis for assessment of congruency and opportunity for potential integration and coordination of services. The development of a **core services package** should be a priority and will depend upon an objective determination of a prioritized minimal evidence-based set of interventions. This would also mean de-prioritizing unnecessary activities and interventions and diversions of staff from their priority tasks.
2. The feasibility of “clubbing” key interventions into packages of services should be matched with existing services at district or sub-district level and a matrix developed of best opportunities for utilizing existing human resources. The recently conducted human resources survey in Sindh should provide an exact basis for this assessment, but needs to be done keeping functionality and assured presence of service providers in mind.
3. The issue of how best to integrate the governance issues of programs and departments is one that should be considered by the Sindh Ministry of Health and Planning and Development departments. This subject was not tackled in our review which focused on the service delivery aspect at primary care level. This review should however, encourage thinking along these lines and assessing if integration of programs can be achieved administratively. It should be noted that the

governments of Punjab and KP have already embarked upon integration of MNCH, LHW, Nutrition and RH-FP programs.

4. Since catching up on coverage is such a key issue, attention should be given to the utilization of innovative delivery platforms for scaling up evidence-based interventions across various programs and care providers. This could be achieved through platforms such as community support groups, especially women's groups (for advocacy and education), child and family health days or weeks to scale up key interventions and approaches to address financial barriers such as cash transfers and voucher schemes. The mix of interventions linked to the latter pilot scheme within the NPPI program should be re-assessed for effectiveness and acceptability.
5. The issue of targeting evidence-based interventions to those in maximal need is a priority and critical to reducing the equity gap in Sindh. It is not sufficient to merely target rural and urban populations and it is recommended that district maps be drawn to indicate populations at-risk or not covered. These should be targeted with the proposed packages as appropriate. The recent advances in Geographic Information Systems (GIS) technology will make this possible and could also develop district-based plans based on public sector and non-governmental programs and health care providers.
6. Finally, none of the above will work without robust monitoring and evaluation and it is recommended that a clear target for monitoring progress on key indicators be put in place. While this is traditionally achieved through household surveys (DHS and MICS), Sindh should strive to strengthen the MIS and HMIS systems for rapid and timely feedback at district level. This would allow for real time and timely planning obviating the need for modeling and projections.

References:

1. Population Projections of Pakistan, 1998-2023. Planning and Development Division, Government of Pakistan.
2. Pakistan Economic Survey 2011-12:Chapter11 Health and Nutrition. Islamabad: Government of Pakistan, Finance Division, Economic Adviser's Wing; 2012
3. Nishtar, Sania. Choked pipes: reforming Pakistan's mixed health system. Karachi: Oxford University Press; 2010.
4. Nishtar, Sania. The Gateway paper: health system in pakistan – a way forward. Islamabad: Pakistan's Health Policy Forum and Heartfile; 2006. 3-4.
5. Martinez, Javier et al. Third-Party Evaluation of the PPHI in Pakistan: Findings, Conclusions and Recommendations. TRF in coordination with HSSPU; April 2010
6. Bhutta, ZA et al. Maternal and child health in Pakistan- challenges and opportunities: perinatal & newborn care in Pakistan: seeing the unseen! Karachi: Oxford University Press; 2004. 33.
7. WHO. Analysing commitments to advance the global strategy for women's and children's health: The PMNCH Report 2011. Geneva: The Partnership for Maternal, Newborn and Child Health; 2011.54
8. Zaidi, Shehla et al. Situational Analysis for Post Devolution Health Sector Strategy of Sindh Province. Karachi: 2011
9. "Population" Social Indicators of Pakistan 2011. Pakistan Bureau of Statistics; Statistics Division, Government of Pakistan. Available from: <http://www.pbs.gov.pk/content/social-indicators-pakistan-2011-6th-edition-0>
10. Pakistan Demographic and Health Survey 2006-07. Islamabad: National Institute of Population Studies (NIPS) and Macro International Inc.; 2007.
11. Zaidi et al. Financial Barriers to MNCH: New evidence from rural Sindh, Presented at national MNCH conference, Health Services Academy. Islamabad: December 2010.
12. PC-1: National Programme for Family Planning and Primary Health Care (NP-FP&PHC) "The Lady Health Workers Programme January 2010-June 2015." Ministry of Health, Government of Pakistan; 2010
13. Nishtar, Sania. Gateway paper II: Health Indicators of Pakistan. Islamabad: Heartfile; 2007. 3-27.
14. Bhutta ZA, Yakoob MY, Lawn JE et al. Stillbirths: what difference can we make and at what cost? *The Lancet*; 2011. 377(9776):1523-38
15. Bhutta ZA, Sheila M Bird, et al. Therapeutic effects of oral zinc in acute and persistent diarrhea in children in developing countries: pooled analysis of randomized controlled trials. *American Journal of Clinical Nutrition*; 2000. Vol. 72, No. 6, 1516-1522
16. Owais et al. Does improving maternal knowledge of vaccines impact infant immunization rates? A community based randomized-controlled trial in Karachi, Pakistan. *BMC Public Health*; 2011. 11:239.
17. NNS, National Nutrition Survey 1985-87, 2001-02, 2011
18. Multiple Indicator Survey (MICS) Sindh 2003-04. Islamabad: Federal Bureau of Statistics, Government of Pakistan.
19. PIHS, Pakistan Integrated Household Survey, 1995-96, 1996-97, 1998-99, 2001-02

20. PSLM, Pakistan Social and Living Standards Measurement Survey 2004-5, 2005-06, 2006-07, 2007-08, 2008-09 & 2010-11. Pakistan Bureau of Statistics
21. Health and Social Work- Private Sector Hospitals, IFC/World bank Group 2121 Pennsylvania Avenue, NW Washington, DC 20433, USA. May 2011
22. Sindh Nursing Examination Board, Karachi
23. NPPI-FFS 2009: Report on Result Based Financial Mechanisms for Improving Maternal, Newborn and Child Health Outputs: Feasibility Study for 10 NPPI Districts. Department of Health Sindh, National MNCH Programme, One UN and Aga Khan University. May 2009
24. Tuberculosis Control Program 2009
25. Sindh AIDS Control Programme. Department of Health
26. Sindh Sanitation Strategy June 2008. Available from <http://202.83.164.25/wps/wcm/connect/1354e5804189d3a695fb9f71b08de1d3/Draft+Sindh+Sanitation+Strategy+June+18+2008.pdf?MOD=AJPERES&CACHEID=1354e5804189d3a695fb9f71b08de1d3&CACHEID=1354e5804189d3a695fb9f71b08de1d3>.
27. Conde-Agudelo A, Rosas-Bermúdez A, Kafury-Goeta AC. Birth spacing and risk of adverse perinatal outcomes. *JAMA: the journal of the American Medical Association*. 2006;295(15):1809.
28. Conde-Agudelo A, Belizan JM, Breman R, Brockman SC, Rosas-Bermudez A. Effect of the interpregnancy interval after an abortion on maternal and perinatal health in Latin America. *International Journal of Gynecology & Obstetrics*. 2005;89:S34-S40.
29. Conde-Agudelo A, Rosas-Bermúdez A, Kafury-Goeta AC. Effects of birth spacing on maternal health: a systematic review. *American Journal of Obstetrics and Gynecology*. 2007;196(4):297-308.
30. World Health Organization. Safe abortion: technical and policy guidance for health systems. Geneva: WHO; 2003.
31. Jabeen M, Yakoob MY, Imdad A, Bhutta ZA. Impact of interventions to prevent and manage preeclampsia and eclampsia on stillbirths. *BMC Public Health*. 2011;11(Suppl 3):S6.
32. Duley L, Henderson-Smart DJ, Chou D. Magnesium sulphate versus phenytoin for eclampsia. *Cochrane Database of Systematic Reviews*. 2010; Issue 12. Art. No.: CD000127.
33. Duley L, Henderson-Smart DJ, Walker GJ, Chou D. Magnesium sulphate versus diazepam for eclampsia. *Cochrane Database of Systematic Reviews*. 2010; Issue 10. Art. No.: CD000128.
34. Lavender T, Hart A, Smyth R. Effect of partogram use on outcomes for women in spontaneous labour at term. *Cochrane Database of Systematic Reviews*. 2008; Issue 4. Art. No.: CD005461.
35. Gülmezoglu AM, Forna F, Villar J, Hofmeyr GJ. Prostaglandins for preventing postpartum haemorrhage. *Cochrane Database of Systematic Reviews*. 2007; Issue 3. Art. No.: CD000494.
36. Mousa HA, Alfirevic Z. Treatment for primary postpartum haemorrhage. *Cochrane Database of Systematic Reviews*. 2007; Issue 1. Art. No.: CD003249.
37. Cousens S, Blencowe H, Gravett M, Lawn JE. Antibiotics for pre-term pre-labour rupture of membranes: prevention of neonatal deaths due to complications of pre-term birth and infection. *International Journal of Epidemiology*. 2010;39:i134-i143.

38. Demicheli V, Barale A, Rivetti A. Vaccines for women to prevent neonatal tetanus. *Cochrane Database of Systematic Reviews*. 2005; Issue 4. Art. No.: CD002959.
39. Blencowe H, Lawn J, Vandelaer J, Roper M, Cousens S. Tetanus toxoid immunization to reduce mortality from neonatal tetanus. *International Journal of Epidemiology*. 2010;39(suppl 1):i102-i109.
40. Peña-Rosas JP, Viteri FE. Effects and safety of preventive oral iron or iron+ folic acid supplementation for women during pregnancy. *Cochrane Database of Systematic Reviews*. 2009; Issue 4. Art. No.: CD005462.
41. Yakoob MY, Bhutta Z. Effect of routine iron supplementation with or without folic acid on anemia during pregnancy. *BMC Public Health*. 2011;11(Suppl 3):S21.
42. Eisele TP, Larsen D, Steketee RW. Protective efficacy of interventions for preventing malaria mortality in children in Plasmodium falciparum endemic areas. *International Journal of Epidemiology*. 2010;39(suppl 1):i88-i101.
43. Garner P, Gülmezoglu AM. Drugs for preventing malaria in pregnant women. *Cochrane Database of Systematic Reviews*. 2006; Issue 4. Art. No. : CD000169.
44. Gamble C, Ekwaru JP, Ter Kuile FO. Insecticide-treated nets for preventing malaria in pregnancy. *Cochrane Database of Systematic Reviews*. 2006; Issue 2. Art. No.: CD003755.
45. Siegfried N, van der Merwe L, Brocklehurst P, Sint TT. Antiretrovirals for reducing the risk of mother-to-child transmission of HIV infection. *Cochrane Database of Systematic Reviews*. 2011; Issue 7. Art. No.: CD003510.
46. Ng BE, Butler LM, Horvath T, Rutherford GW. Population-based biomedical sexually transmitted infection control interventions for reducing HIV infection. *Cochrane Database of Systematic Reviews*. 2011; Issue 3. Art. No.: CD001220.
47. Zupan J, Garner P, Omari AA. Topical umbilical cord care at birth. *Cochrane Database for Systematic Reviews*. 2004; Issue 3. Art. No.: CD001057.
48. Imdad A, Yakoob MY, Bhutta ZA. Effect of breastfeeding promotion interventions on breastfeeding rates, with special focus on developing countries. *BMC Public Health*. 2011;11((Suppl 3)):S24.
49. Dyson L, McCormick FM, Renfrew MJ. Interventions for promoting the initiation of breastfeeding. *Cochrane Database of Systematic Reviews*. 2005; Issue 2. Art. No.: CD001688.
50. Lewin S, Munabi-Babigumira S, Glenton C, et al. Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases. *Cochrane Database of Systematic Reviews*. 2010; Issue 3. Art. No.: CD004015.
51. Lassi ZS, Haider BA, Bhutta ZA. Community-based intervention packages for reducing maternal and neonatal morbidity and mortality and improving neonatal outcomes. *Cochrane Database of Systematic Reviews*. 2010; Issue 11. Art. No.: CD007754.
52. Sazawal S, Black RE. Effect of pneumonia case management on mortality in neonates, infants, and preschool children: a meta-analysis of community based trials. *Lancet Infect Dis*. 2003;3:547-556.
53. Anita Z, Hammad G, Sana S, et al. Effect of case management on neonatal mortality due to sepsis and pneumonia. *BMC Public Health*. 2011;11(Suppl 3):S13.
54. Gordon A, Jeffery HE. Antibiotic regimens for suspected late onset sepsis in newborn infants. *Cochrane Database of Systematic Reviews*. 2005; Issue 3. Art. No.: CD004501.

55. Mtitimila EI, Cooke RWI. Antibiotic regimens for suspected early neonatal sepsis. *Cochrane Database of Systematic Reviews*. 2004; Issue 4. Art. No.: CD004495.
56. Bhutta ZA, Zaidi AKM, Thaver D, Humayun Q, Ali S, Darmstadt GL. Management of newborn infections in primary care settings: a review of the evidence and implications for policy? *The Pediatric Infectious Disease Journal*. 2009;28(1):S22-s30.
57. O'Donnell C, Davis P, Morley C. Positive end-expiratory pressure for resuscitation of newborn infants at birth. *Cochrane Database of Systematic Reviews*. 2004; Issue 3. Art. No.: CD004341.
58. Grein AJ, Weiner GM. Laryngeal mask airway versus bag-mask ventilation or endotracheal intubation for neonatal resuscitation. *Cochrane Database of Systematic Reviews*. 2005; Issue 2. Art. No.: CD003314.
59. Ziino AJA, Davies MW, Davis PG. Epinephrine for the resuscitation of apparently stillborn or extremely bradycardic newborn infants (Review). *Cochrane Database of Systematic Reviews*. 2002; Issue 3. Art. No. : CD003849.
60. De-Regil LM, Fernández-Gaxiola AC, Dowswell T, Peña-Rosas JP. Effects and safety of periconceptional folate supplementation for preventing birth defects. *Cochrane Database of Systematic Reviews*. 2010 Issue 10. Art. No. : CD007950.
61. Blencowe H, Cousens S, Modell B, Lawn J. Folic acid to reduce neonatal mortality from neural tube disorders. *International journal of epidemiology*. 2010;39(suppl 1):i110-i121.
62. Edmond K, Bahl R. Optimal feeding of low-birth-weight infants. Geneva: World Health Organization; 2006.
63. Lawn JE, Mwansa-Kambafwile J, Horta BL, Barros FC, Cousens S. 'Kangaroo mother care' to prevent neonatal deaths due to preterm birth complications. *International Journal of Epidemiology*. 2010;39(suppl 1):i144-i154.
64. Conde-Agudelo A, Belizán JM, Diaz-Rossello J. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. *Cochrane Database for Systematic Reviews*. 2011; Issue 3. Art. No.: CD002771.
65. Soll R. Synthetic surfactant for respiratory distress syndrome in preterm infants. *Cochrane Database of Systematic Reviews*. 1998; Issue 3. Art. No.: CD001149.
66. Greenough A, Dimitriou G, Prendergast M, Milner AD. Synchronized mechanical ventilation for respiratory support in newborn infants. *Cochrane Database for Systematic Reviews*. 2008; Issue 3. Art. No.: CD000456.
67. Theodoratou E, Johnson S, Jhass A, et al. The effect of Haemophilus influenzae type b and pneumococcal conjugate vaccines on childhood pneumonia incidence, severe morbidity and mortality. *International Journal of Epidemiology*. 2010;39(suppl 1):i172-i185.
68. Theodoratou E, Al-Jilaihawi S, Woodward F, et al. The effect of case management on childhood pneumonia mortality in developing countries. *International Journal of Epidemiology*. 2010;39::i155-i171.
69. Fawzi WW, Chalmers TC, Herrera MG, Mosteller F. Vitamin A supplementation and child mortality. A meta-analysis. *JAMA*. 1993;269(7):898-903.
70. Sudfeld CR, Navar AM, Halsey NA. Effectiveness of measles vaccination and vitamin A treatment. *International Journal of Epidemiology*. 2010;39(suppl 1):i48-i55.
71. Brown N, Roberts C. Vitamin A for acute respiratory infection in developing countries: a meta-analysis. *Acta Paediatrica*. 2004;93(11):1437-1442.

72. Wu T, Ni J, Wei J. Vitamin A for non-measles pneumonia in children. *Cochrane Database for Systematic Reviews*. 2005; Issue 3. Art. No.: CD003700.
73. Grotto I, Mimouni M, Gdalevich M, Mimouni D. Vitamin A supplementation and childhood morbidity from diarrhea and respiratory infections: a meta-analysis. *Journal of Pediatric*. 2003;142(3):297-304.
74. Chen H, Zhuo Q, Yuan W, Wang J, Wu T. Vitamin A for preventing acute lower respiratory tract infections in children up to seven years of age. *Cochrane Database of Systematic Reviews*. 2008; Issue 1. Art. No.: CD006090.
75. Yakoob MY, Theodoratou E, Jabeen A, et al. Preventive zinc supplementation in developing countries: impact on mortality and morbidity due to diarrhea, pneumonia and malaria. *BMC Public Health*. 2011;11(Suppl 3):S23.
76. Lazzarini M, Ronfani L. Oral zinc for treating diarrhoea in children. *Cochrane Database of Systematic Reviews*. 2008; Issue 3. Art. No.: CD005436.
77. Gregorio GV, Gonzales MLM, Dans LF, Martinez EG. Polymer-based oral rehydration solution for treating acute watery diarrhoea. *Cochrane Database of Systematic Reviews*. 2009; Issue 2. Art. No.: CD006519.
78. Hahn S, Kim Y, Garner P. Reduced osmolarity oral rehydration solution for treating dehydration caused by acute diarrhoea in children. *Cochrane Database of Systematic Reviews*. 2002; Issue 1. Art. No.: CD002847.
79. Hartling L, Bellemare S, Wiebe N, Russell KF, Klassen TP, Craig WR. Oral versus intravenous rehydration for treating dehydration due to gastroenteritis in children. *Cochrane Database of Systematic Reviews*. 2006; Issue 3. Art. No.: CD004390.
80. Munos MK, Fischer-Walker CL, Black RE. The effect of rotavirus vaccine on diarrhoea mortality. *International Journal of Epidemiology*. 2010;39:i56-i62.
81. Walker CLF, Black RE. Zinc for the treatment of diarrhoea: effect on diarrhoea morbidity, mortality and incidence of future episodes. *International Journal of Epidemiology*. 2010;39(suppl 1):i63-i69.
82. Traa BS, Fischer Walker CL, Munos M, Black RE. Antibiotics for the treatment of dysentery in children. *International Journal of Epidemiology*. 2010;39:i70-i74.
83. Christopher PR, David KV, John SM, Sankarapandian V. Antibiotic therapy for Shigella dysentery. *Cochrane Database for Systematic Reviews*. 2010; Issue 8. Art. No.: CD006784.
84. Soares-Weiser K, Goldberg E, Tamimi G, Pitan OC, Leibovici L. Rotavirus vaccine for preventing diarrhoea. *Cochrane Database of Systematic Reviews*. 2004; Issue 1. Art. No.: CD002848.
85. Soares-Weiser K, Macle hose H, Ben-Aharon I, Goldberg E, Pitan F, Cunliffe N. Vaccines for preventing rotavirus diarrhoea: vaccines in use. *Cochrane Database for Systematic Reviews*. 2010; Issue 5. Art. No.: CD008521.
86. Lengeler C. Insecticide-treated bed nets and curtains for preventing malaria. *Cochrane Database of Systematic Reviews*. 2004.
87. Thwing J, Eisele T, Steketee R. Protective efficacy of malaria case management and intermittent preventive treatment for preventing malaria mortality in children: a systematic review for the Lives Saved Tool. *BMC Public Health*. 2011;11(Suppl 3):S14.
88. Chetty T, Naidu KK, Newell ML. *A systematic review of HIV-free survival by feeding practices From birth to 18 months*: World Health Organization 2010.
89. A Global Review of the Key Interventions Related to Reproductive, Maternal, Newborn and Child Health (RMNCH): Essential Interventions, Commodities and

- Guidelines. Geneva, Switzerland: The Partnership for Maternal, Newborn & Child Health (PMNCH); 2011
90. Zulfiqar A Bhutta, Rehana A Salam, Jai K Das and Zohra S Lassi. Integration and Equity for Maternal, Newborn, Child, Reproductive Health and Nutrition: The Why, What and How? A Systematic Review. 2011. Unpublished document, Bill & Melinda Gates Foundation.
 91. Kodner DL, Spreeuwenberg C. Integrated care: meaning, logic, applications, and implications—a discussion paper. *International Journal of Integrated Care*. 2002; 2.
 92. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS; Bellagio Child Survival Study Group. How many child deaths can we prevent this year? *Lancet*. 2003;362:65-71
 93. Darmstadt GL, Bhutta ZA, Cousens S, Adam T, Walker N, de Bernis L; Lancet Neonatal Survival Steering Team. Evidence-based, cost-effective interventions: how many newborn babies can we save? *Lancet*. 2005;365:977-88
 94. Bhutta ZA, Ahmed T, Black RE, Cousens S, Dewey K, Giugliani E, Haider BA, Kirkwood B, Morris SS, Sachdev HP, Shekar M; Maternal and Child Undernutrition Study Group. What works? Interventions for maternal and child undernutrition and survival. *Lancet*. 2008;371:417-40.
 95. Bhutta ZA, Yakoob MY, Lawn JE, Rizvi A, Friberg IK, Weissman E, Buchmann E, Goldenberg RL; Lancet's Stillbirths Series steering committee. Stillbirths: what difference can we make and at what cost? *Lancet*. 2011;377:1523-38
 96. Boschi-Pinto C, Young M, Black RE. The Child Health Epidemiology Reference Group reviews of the effectiveness of interventions to reduce maternal, neonatal and child mortality. *Int J Epidemiol*. 2010 Apr;39 Suppl 1:i3-6
 97. Fox MJ, Martorell R, van den Broek N, Walker N. Assumptions and methods in the Lives Saved Tool (LiST). Introduction. *BMC Public Health*. 2011 Apr 13;11 Suppl 3: