# The Routine Health Information System in Punjab Province, Pakistan Exploring the Potential for Integrating Health Information Systems for Family Planning Data

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# **The Routine Health Information System in Punjab Province, Pakistan** Exploring the Potential for Integrating Health Information Systems for Family Planning Data

Mudasir Mustafa, MPhil Sociology

MEASURE Evaluation Carolina Population Center University of North Carolina at Chapel Hill 123 West Franklin Street, Suite 330 Chapel Hill, North Carolina 27516 Phone: +1 919-445-9350 | Fax: +1 919-445-9353 Email: measure@unc.edu www.measureevaluation.org This publication was produced with the support of the United States Agency for International Development (USAID) under the terms of MEASURE Evaluation cooperative agreement AID-OAA-L-14-00004. MEASURE Evaluation is implemented by the Carolina Population Center, University of North Carolina at Chapel Hill in partnership with ICF International; John Snow, Inc.; Management Sciences for Health; Palladium; and Tulane University. Views expressed are not necessarily those of USAID or the United States government. WP-18-210





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# **ABBREVIATIONS**

CCCIS	Client-Centered Clinic Information System
CHIS	community health information system
cLMIS	Contraceptive Logistic Management Information System
CNIC	computerized national identity card
DHIS	District Health Information System
DoH	Department of Health
FP	family planning
FPAP	Family Planning Association of Pakistan
FWC	family welfare center
FWW	family welfare worker
HMIS	health management information system
IUCD	intrauterine contraceptive device
KII	key informant interview
LHV	lady health visitor
LHW	lady health worker
MIS	management information system
MoH	Ministry of Health
MoNHSR&C	Ministry of National Health Services, Regulations and Coordination
MR	monthly report
NGO	nongovernmental organization
PWD	Population Welfare Department
PWMP	Population Welfare Management Program
RHIS	routine health information system
SWOC	strengths, weaknesses, opportunities, and challenges
TRF	Technical Resource Facility
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development

# **EXECUTIVE SUMMARY**

Background: Globally, a health management information system (HMIS) includes both routine and nonroutine health data. A routine health information system (RHIS) generates data at regular intervals (no longer than a year) that have been collected at the public and private health facilities and institutions, as well as at community-level healthcare posts and clinics (MEASURE Evaluation, 2017). In developed countries, the RHIS exists in its true essence having both a facility-based and a community-based health information system (CHIS), yet the situation is different in developing countries, such as Pakistan. In Punjab, Pakistan, the HMIS is fragmented as there are more than 20 different HMISs, which use dedicated vertical channels. Among these, three systems gather and transmit information related to family planning (FP)/reproductive health: the District Health Information System (DHIS), the Lady Health Workers-Management Information System (LHW-MIS), and the Contraceptive Logistic Management Information System (cLMIS) which is combined with the Population Welfare Management Program-Management Information System (PWMP-MIS). In addition, nongovernmental organizations (NGOs) have their own HMIS, and there are separate HMISs for countless private hospitals and clinics. Gaps exist in the current RHIS, specifically about reproductive health data from different sources, whether public, private, community or facility-based. These data are not integrated and consolidated into the national HMIS and therefore are not used for decision making.

**Objectives:** The objective of the study was to review the RHIS in Punjab province of Pakistan and explore the potential for integrating community-level data into the national HMIS, particularly FP data, collected by public or private, for-profit, and not-for-profit organizations.

**Methods:** The study used both primary and secondary data. Primary data were collected through key informant interviews (KIIs), identified purposively and through snowball sampling technique. Secondary data were gathered through document review including reports, articles, and statistical data.

**Findings:** Community-based FP data are not fully integrated with RHIS. Some effort has been made to integrate FP data through Contraceptive Performance Report by the Pakistan Bureau of Statistics and the cLMIS, which is an integrated system where data from the DHIS, LHW–MIS, Population Welfare Department (PWD), and influential NGOs are presented and compiled in one form. There is potential for organizing CHIS with RHIS, yet structural barriers exist. For example, there is potential for integration between LHW–MIS and DHIS as they come under the province's Department of Health (DoH), but it is difficult to integrate data between the DoH and PWD, as PWD has a separate administration and ministry. Nevertheless, though the cLMIS has provided a platform for including data from all public and private entities, several NGOs and public departments do not regularly report their data. In addition, there are several data quality issues in the RHIS which should be addressed before integration occurs, such as: fake entries; incomplete information; dissatisfaction about numbers and types of FP indicators; inaccurate data; duplication of data and services; overreporting; poor feedback mechanisms; and the way reports are consolidated. These issues must be tackled along with integration of CHIS into the RHIS.

**Recommendations:** To facilitate integration of CHIS with RHIS, the study suggests several recommendations. These include shifting the paradigm from an individual-level healthcare approach to a family-centered approach; promoting a culture and system of inter-organizational information sharing; sensitizing decision-makers about the benefits of interlinking the community-level data streams with RHIS; strengthening the computerized national identity card (CNIC)-based data entry; developing a single dashboard with core FP indicators; and expanding FP indicators beyond commodity-based indicators to psychosocial and behavioral indicators to understand the uptake, switching, and dropping of modern FP methods.

# INTRODUCTION

Globally, an HMIS is defined as "... a combination of vital and health statistical data from multiple sources, used to derive information about the health needs, health resources, costs, use of health services, and outcomes of use by the population of a specified jurisdiction" (Nsubuga, 2001). It is acknowledged that an HIS cannot exist by itself; it is a functional entity within the framework of a comprehensive health system that offers integrated health services, including curative, rehabilitative, preventive, and promotive health services (Sauerborn and Lippeveld, 2000). An HMIS includes both a routine and a non-routine health information system. The RHIS is often referred to as a facility-based health information system, while the non-routine RHIS includes population or health unit-based surveys, population census, and rapid assessment procedures. The RHIS is also called a "… health facility and community information systems, which generate data at regular intervals (no longer than a year) that have been collected at public and private health facilities and institutions, as well as at community-level healthcare posts and clinics" (MEASURE Evaluation, 2017). In developed countries, the RHIS exists in its true essence having both a facility-based system and a CHIS, yet the situation is different in developing countries such as Pakistan.

In developed countries (e.g., Canada) and some developing countries (e.g., Malawi, Tanzania) there is a single, integrated CHIS (Neudorf & Muhajarine, 1998; Shidende, 2005; Galimoto, 2007). In Ethiopia, the Ministry of Health (MoH) introduced a CHIS to capture basic health and health-related information by health extension workers at the household and individual level. The CHIS collects data on basic demographic characteristics, health service delivery, and utilization based on the health extension package. This is done by using a family folder, which is a family-centered tool designed for health extension workers to manage and monitor their work in educating households and delivering an integrated package of promotive, preventive, and basic curative health services (MoH, 2012).

In Pakistan, health is a provincial responsibility with the federal government coordinating among provinces, formulating overarching national health strategies and policies, and helping the provinces to implement donor-assisted vertical programs. In the provinces, the health sector follows the administrative structure, with the MoH, Administrative Secretaries, and Director General of Health Services at the top, while in each district there is an Executive Director Health Officer and a Deputy District Health Officer at the tehsil or subdistrict level (GOP, 2013).

Punjab province, with an estimated population of over 100 million, is administratively divided into 36 districts. It has an extensive publicly- and privately-managed healthcare delivery network in all districts. The former is organized in the following four tiers (Punjab Devolved Social Services Programme [PDSSP], n.d.):

- 1. Outreach and community-based services with a focus on immunization, sanitation, malaria control, maternal and child health, and FP;
- 2. Primary or first level care facilities, including basic health units and rural health centers, with the latter having diagnostic and in-patient care;
- 3. Secondary health care facilities, such as tehsil headquarter hospitals and district headquarter hospitals for in-patient and out-patient care; and
- 4. Tertiary care hospitals, also serving as a teaching facility located in the major cities providing specialized care.

In addition, the private health sector is comprised of individual clinics or small office-based practices of general practitioners, medium and large hospitals, laboratories, and pharmacies.

Public sector health facilities report to the DHIS, while about five percent of private sector facilities report data and have practices that could be termed an HMIS. DHIS, which replaced HMIS, is fully-computerized in 10% of the public-sector health facilities and partially-computerized in 62% of other public facilities (Technical Resource Facility [TRF], 2012). Almost all public facilities (92%) report to the Executive District Officer–Health, with 93% reporting monthly (TRF, 2012). Though regular reporting is good, data for most indicators are not gathered correctly and there is no feedback system from the DHIS to the reporting facilities (TRF, 2012).

The first formal RHIS in Pakistan titled as HMIS was established in 1992 with the support from the United States Agency for International Development (USAID). The HMIS covered information from first-level healthcare facilities only (i.e., basic health units and rural health centers). After a devolution of power in

2001, a discussion began about revamping the HMIS and bringing secondary-level healthcare facilities (i.e., tehsil headquarter hospitals and district headquarter hospitals) into the information net. Consequently, DHIS was launched in 2006. DHIS provides data for district planning, implementation and monitoring of major indicators of disease patterns, preventive services, and physical resources. For this study, however, we will focus on data related to FP.

Overall, Punjab's HMIS is fragmented as there are more than 20 different HMISs collecting data from health facilities and households. All use dedicated vertical channels (see Figure 1 below, and Table 4 in Appendix A). Among these, three systems gather and transmit information related to FP/reproductive health: DHIS, LHW–MIS, and cLMIS.



### Figure 1. Health information systems in Pakistan

Gaps exist in the current RHIS, specifically with reproductive health data from different sources, whether public, private, community-, or facility-based, as the data is not integrated or consolidated in one platform or portal. In addition, anecdotal evidence suggests that the quality of DHIS data is questionable, especially regarding its completeness, correctness, and timeliness. Because of the functional gap between community and facility, community-based health workers do not provide full coverage of services and thus submit only partial data when reporting to the RHIS. Therefore, uptake of data from communities by RHIS is inadequate. Sociocultural and religious barriers further expand the gap in the quality and adequacy of data. As a result, information generated through the RHIS is seldom utilized in decision-making at different levels.

### Conceptual Framework of the Study

A conceptual framework was developed to guide the study (Figure 2). The key information for decision making (data from the DHIS, LHW–MIS, and PWD–MIS), once integrated from facilities and various public and private sources at the community level (LHWs), constitutes evidence for action. This, ideally, will trigger the increased availability of FP commodities and potentially increased utilization of reproductive health services, ultimately leading to a reduced fertility rate and better health for all.

Source: http://nhsrc.pk/





### Background: History of FP in Pakistan

In 1953, the Family Planning Association of Pakistan (FPAP), with the help of voluntary organizations, introduced FP activities in family norms through advocacy and facilitation. Yet, the private sector was unable to reach the whole population. In the first five-year plan (1955–60), FP services were provided with government funding which carried over into the second five-year plan. In the beginning, FP services were delivered through each province's Department of Health (DoH). In 1964, an assessment of the FP program exposed that FP services were not reaching the target population because the respective DoHs were overloaded with the population's other health care needs. Thus, the third five-year plan (1965–70) witnessed the creation of an independent, national administrative division to build the country's FP service delivery network and implement information, education, and communication activities at mass scale. In 1965, under the auspices of the Ministry of Health and Social Welfare, an autonomous body called the Family Planning Council was formed.

After the departure of East Pakistan (now known as Bangladesh) from the country in 1971, the passé between 1971 and 1978 was a manifestation of Pakistan's lack of an FP plan. After the transformation of political administration in the country, the FP program suffered from severe disparagement from political leaders and religious forces, which led to the postponement of all FP program activities by the year 1979. Operational aspects of the program were adversely affected through the cessation of FP activities.

In 1980, the population division was transferred from the Directives of State Ministry to the Planning and Economic Development Ministry. With this restructuring, the focus was on maternal and child health care alongside FP services. In its new structure, field operations and provision of FP services were relocated to the provincial governments, while decisions regarding finances and policy-making remained part of the federal government mandate. For the first time in Pakistan's FP history, the government's policy added community development to broaden its foundation. In the sixth five-year plan (1983–1988), field activities were designed in a provincial context as the structure of NGOs was established under the NGO Coordinating Council. The introduction of social marketing programs for contraceptives helped expand nonclinical service delivery to the private sector. However, the program was weakened during this time due to the reluctance of political leaders to take the lead and protests by religious forces.

In the early 90s, FP programming saw a turning point through strong and explicit support from the incumbent government leading to the creation of the Ministry of Population Welfare on June 27, 1990. For effective implementation and monitoring of the Population Welfare Program, an inter-ministerial

committee was established with the of Ministries of Health, Education, Planning and Development, Population Welfare, and Information. In 1992, the National Trust for Population Welfare replaced the NGO Coordinating Council to further reinforce the participation of NGOs in Population Welfare Program activities. To enhance program coverage in the rural sphere, the Ministry of Population Welfare launched the village-based FP Worker Program in 1993. Similarly, the FP and Primary Health Care Program was initiated under the Federal MoH. Urban slums and rural areas witnessed provision of FP and basic health services through recruitment and training of LHWs. In 1994, the scope of FP in Pakistan was widened, and the right to reproductive health as a prerogative was made a fundamental constituent of the program in the wake of the International Conference on Population and Development in Cairo.

The promulgation of *Transfer of Population Welfare Program (Field Activities) (Amendment) Ordinance, 2001* declared all employees of the Population Welfare Program as civil servants of the corresponding provincial governments in July 25, 2001. A year later, the Population Policy of Pakistan was launched. With the decline in fertility and mortality rates and the realization of a demographic transition, population policy set visionary targets for achieving population stabilization by the end of 2020. Due to the quality of its service delivery, the Ministry of Population Welfare received ISO 9001:2000 Certification in recognition of international quality standards and protocols. In 2010, the Ministry of Population Welfare's services and functions were devolved to the provinces under the 18<sup>th</sup> Amendment, at which time the PWD was established. In January 2017, Punjab province approved the first Provincial Population Policy.

### Study Objective and Research Questions

The main objective of the study was to explore the potential for integrating RHISs for FP data collected from the facility level and the community level by both public and NGO sectors in Punjab province of Pakistan. The research sought to answer the following questions:

- 1. How is community-based FP data generated and transmitted into an MIS?
- 2. What is the quality of FP data generated at the community level and the facility level?
- 3. What strategies could strengthen FP data collection and reporting and improve data quality?
- 4. What are the strengths and weaknesses of public-sector MISs regarding FP data?
- 5. How can community-based FP data integrate with facility-based data to produce evidence for decision making?

By reviewing the status of the current health information system in Punjab province of Pakistan, this study will identify the gaps and explore the potential for organizing community-level data, which includes reproductive health data from community-level workers and other organizations—public or private, for-profit and not-for-profit. The findings of the study will contribute to evidence-based decision-making regarding FP/reproductive health services.

# METHODS

### Setting

The study was conducted in the province of Punjab, Pakistan. This province has 36 districts with a total area of 205,344 square kilometers. Punjab's healthcare sector has an extensive network of publicly- and privately-managed health structures. The province's public-sector healthcare delivery has 34 district headquarters and 88 tehsil headquarters, which contain 293 rural health centers and 2,456 basic health units. Under the LHW program, 48,000 LHWs are working throughout the province. The PWD has been providing services through its 117 tehsil population welfare offices, 119 family health centres, 28 mobile service units, and 1,900 family health clinics. In addition, there are thousands of private healthcare facilities including NGO- and privately-run clinics.

### **Study Design**

### Data Collection

The study used both primary and secondary data. The conceptual framework (Figure 2) provided a scheme for data collection and management. Primary data were collected through KIIs identified purposively through snow-ball sampling technique. To recruit research participants, a stakeholder mapping was conducted to identify potential key informants who were associated with and had knowledge and experience with working in DHIS, LHW–MIS, and PWD–MIS.

The initial plan was to conduct brainstorming sessions with selected key informants to determine their strengths, weaknesses, opportunities, and threats. However, during the stakeholder mapping the key stakeholders suggested changing the analysis to strengths, weaknesses, opportunities, and challenges (SWOC), as organizations usually face challenges rather than threats. The stakeholders also suggested conducting the analysis through KIIs and literature review rather than brainstorming sessions. One of the core reasons they highlighted for this change was the busy schedule of key informants, making it difficult to gather the core participants twice (once for the SWOC and then for the dissemination workshop). The key stakeholders suggested gathering feedback on the SWOC during the dissemination workshop. Thus, the researchers followed this strategy.

Secondary data were gathered through document review, including reports, articles, and statistical data. A matrix of the literature reviewed was prepared to ensure the quality and completeness of the review process and to organize the information in one place for subsequent analysis (Appendix B).

An interview guide was developed based on the research questions. The 22 guided questions were developed in English, then translated into Urdu. The pilot test of the KII guide was conducted with two participants working in the PWD and DHIS departments in Sheikhupura district, Punjab. These participants were excluded in the final KIIs. The purpose of pilot testing was to check the validity of the tool as well as evaluate the study design and fieldwork arrangements. We used the lessons learned from this exercise to finalize the study design, KII guide, and logistical arrangements.

### Training of Study Team

The study's principle investigator organized an orientation session for the research team. An overview of qualitative research methods was provided with a focus on in-depth interviewing, review of documents (secondary data source), and the importance of following guidelines for ethical research.

### Data Collection Procedure and Field Experience

A total of 16 KIIs were conducted with key informants from the following departments: five from LHW– MIS, four from PWD, three from Rahnuma–FPAP, two from DHIS, one from the United Nations Population Fund (UNFPA), and one from the United Nations Children Fund (UNICEF) health program. Though the plan was to conduct 30 interviews with public sector departments at the district and provincial levels (i.e., 10 each with DHIS, LHW, and PWD), during the process of conducting the interviews study participants suggested broadening the reach and conducting KIIs with national-level individuals from Rahnuma–FPAP, UNFPA, and UNICEF. Further interviewing was stopped when a saturation point was achieved. From the research team's detailed literature review, we learned about the organizations' structures, so it was unnecessary to gather this information from the key informants. Furthermore, common strengths and weaknesses were identified by study participants in all departments. Thus, after 16 interviews we identified information redundancy.

The team members (two to three) conducted two KIIs per day that took approximately five to six hours per day, including travel time. The interviews were all conducted in person and lasted an average of 40 to 50 minutes. At one point the team visited a study participant three times in the DHIS department because the person was well-versed in other health departments and was able to verify the researchers' analysis.

### **Data Analysis**

The study yielded textual data, which were analyzed manually. During the process of verbatim translation of the KIIs, the colloquial style of language, pauses, and quotes of the participants were included in the transcriptions. For instance, during one interview, on asking about integration of information among all public-sector MIS, the interviewer laughed and said, "If you want to know about it, please stop the recording and then listen to me. Actually, people perceive that integration hits 'tekydari' (Urdu for authority) of departments." This quote was retained in its entirety for the transcription phase.

The second stage entailed manual data analysis by initiating the coding and category assignment. All the data reduction techniques, including selecting, focusing, simplifying, abstracting, and transforming were considered during data cleaning and generating themes from the data. Both inductive as well as deductive code development were used. Deductive codes were derived from the available review of literature and inductive codes were developed directly from the collected data. The research team analyzed the entire coded and categorized data to identify and remove discrepancies.

At the third stage, after analyzing the collected data, inductive themes were developed. Salient study findings were discussed in light of the themes derived from the collected data and secondary sources.

### **Ethical Considerations**

The study received ethical approval from the office of the Dean of Faulty of Behavioral and Social Sciences, University of the Punjab, Lahore, Pakistan. Informed consent was received from each participant prior to commencing the interview. All research participants were briefed about the nature, scope, and objectives of the study. Ten out of 16 study participants requested confidentiality and anonymity; therefore, none of the participants' identities have been shared.

# RESULTS

In this section, the analysis of KIIs and literature review are presented by seven major themes:

- 1. Key providers of FP methods and services
- 2. Structure of the public-sector information system for FP
- 3. Structure of the NGO-sector information system for FP
- 4. Key informants' understanding of FP data captured at the community level
- 5. SWOC analysis of public-sector FP programs/departments
- 6. Common issues in all public MISs
- 7. Current practices with or vision for integration of FP information

Evidence from the literature review has been cited to validate the information provided by the study participants. Three third party validation reports, one on each program/system (DHIS, LHW, and PWD), were used in this study.

### Key Providers of FP Methods and Services

As shown in Figure 3, there are two main public-sector providers of FP methods and services: the DoH (which has the DHIS and LHW–MIS), and PWD (which has the cLMIS & PWMP). The private providers are divided into two tiers: NGOs and private hospitals or clinics. The main NGOS—Rahnuma–FPAP, Marie Stopes Society, and Greenstar Social Marketing—each have their own MIS. The thousands of private hospitals and clinics, which maintain data in their own MISs, are not integrated with any public-sector MIS.

### Figure 3. Providers of family planning



### Structure of the Public-Sector Information System for FP

### Structure of the DHIS in Pakistan

The DHIS is a mechanism for recording and reporting information for services provided at public first-level care facilities (basic health units) and secondary-level health care facilities (tehsil and district headquarters hospitals). The DHIS provides baseline data for planning, implementation, and monitoring of major indicators for diseases, preventive services, and physical resources at the district and provincial levels. The DoH has been working to improve the DHIS and will soon launch the District Health Information Software known as DHIS 2. Thus, all references to DHIS pertain to Punjab's own health information system.

At all tiers, including the basic, secondary, and tertiary health units, FP data is recorded by healthcare providers known as lady health visitors (LHVs) on the DHIS monthly report (DHIS–MR) in sections II, VII, and IX. The data collected is listed in Table 1.

Section II	Section VII	Section IX	
Total visits	Total FP visits	Condom pieces	Number of
for FP	Depot-Medroxyprogesterone Acetate injections	Intrauterine contraceptive device (IUCD)	method users
	Projestine-only pills	Tubal ligation	
	Combined oral contraceptive pills	Vasectomy	
	Norethisterone Enanathate injection	Implants	

### Table 1. Family planning data in the DHIS-MR

The data are first manually recorded on the printed DHIS–MR form and then entered electronically into the DHIS. The LHVs record FP information daily in an FP register. The LHVs calculate the cumulative figures at the end of each month and fill in the DHIS–MR by hand. The DHIS forms are sent to their respective district MIS cells (offices) where the computer operators manually enter the information from the LHVs into the DHIS software. The information becomes readily accessible for the provincial MIS cell/office to scrutinize and examine in detail (DHIS, 2014) (see Figure 4).

### Figure 4. Reporting mechanism in DHIS

	Department of Health
Name of MIS	District Health Information System
Data entry at provincial level	Provincial MIS cell
Data entry at district level	DHIS cell at district level
Data compilation by:	Lady Health Visitor
Data collected by:	LHVs at public first- and second-level health facilities

The provincial MIS cell/office publishes an annual DHIS report, highlighting the health situation at the provincial, division, and district levels. The annual report depicts the trend analysis for the year with the data presented in graphs and tabular form. The annual report does not present associations or relationships between different indictors or variables.

### Structure of the LHW-MIS

In 1994, the government of Pakistan introduced the National Program on Primary Health Care and Family Planning, commonly known as the LHW Program. This community-based program was initiated to provide universal health coverage (Islam, Malik, & Basaria, 2002). Currently more than 100,000 women are working as LHWs in all districts in Pakistan, delivering 22 core tasks (see Appendix C). These include registering and educating all eligible couples in the catchment population about FP methods; distributing pills and condoms; and providing injectable contraceptives to eligible women (Sarfraz & Hamid, 2016). The LHWs used nine instruments to collect the required information. These include: an area map, community chart, family register, curative care and FP register, referral slip, LHW diary, mother and child health card, monthly report for LHWs, and monthly report for health center (Mahmood & Naz, 2012). Each LHW serves a target population through monthly home visits. One LHW is responsible for approximately 1,000 people, or 150 homes, and visits five to seven houses daily.

The LHW program's own comprehensive MIS, the LHW–MIS, records data on all primary healthcare activities and logistics. Once information is entered into the LHW–MIS, it is available to all tiers—i.e., it is available at the district, provincial, and federal levels.



### Figure 5. Reporting mechanism in LHW-MIS

The LHWs collect and gather FP information for the LHW–MIS according to a predefined set of indicators (TRF, 2012). The LHWs record data in their LHW diary.

1.	No. of registered eligible couples	2.	No. of total users of female sterilization
3.	No. of couples started on any FP	4.	No. of total users of other modern methods
	method this month		
5.	No. of current users given follow-up	6.	No. of total users of traditional methods
7.	No. of total users of modern methods	8.	No. of couples referred to health facility/FP center
9.	No. of total users of condoms	10.	No. of clients provided condoms
			(male or female condom) by LHW
11.	No. of total users of pills	12.	No. of clients provided pills (all types) by LHW
13.	No. of total users of injectables	14.	No. of clients provided injectable by LHW
15.	No. of total users of IUCD		

### Table 2. Family planning indicators used for LHW-MIS reporting

The lady health supervisor compiles all the reports received from LHWs under her supervision (around 15–20 LHWs) into one report, called a first level healthcare facility monthly report. The supervisor then submits the manual reports to the district program implementation units. All lady health supervisors convene a meeting with their respective district program implementation unit within 10 days of the start of the month. The district program implementation unit enters the data from the first level healthcare facility report in the LHW–MIS to make district monthly reports. These reports are compiled into a provincial monthly report. The numbers in the provincial report are often cross-verified with the district report.

### Structure of the cLMIS

The objectives of the PWD are to ensure universal access to FP methods, increase the contraceptive prevalence rate, and reduce population growth and the total fertility rate (PWD, 2013). The PWD executes FP activities through family health clinics, mobile service units, family welfare centers, and social mobilizers/male mobilisers (PWD, Manual on Supervision, Monitoring and Evaluation, 2013).



### Figure 6. Reporting mechanism in the Population Welfare Department

When the PWD was established in 2010, it used a paper-based logistics information system. However, this system was unable to accurately track and report the status of contraceptive stock at all levels of the supply chain from the central warehouse to the district. The Ministry of National Health Services, Regulations and Coordination (MoNHSR&C) decided to replace the paper-based system with an electronic system. The USAID-funded DELIVER Project was tasked with providing technical assistance to MoNHSR&C to strengthen the logistics system by introducing a computerized MIS. Hence, the first public sector's computerized, web-based Logistic Management Information System (LMIS) was launched in 2011. This system records information on contraceptives, Tuberculosis, and vaccines.

The contraceptive component is called cLMIS. The objective of the cLMIS is to provide central, district, and service delivery-level stock sufficiency, consumption, inventory management, storage, and distribution data for publicly-offered FP products and select NGO FP commodities. It supports the formulation of contraceptive supply chain policy, procurement, financing, inventory management, and stock monitoring (PWD, 2017). The cLMIS presents data on the contraceptives listed in Table 3.

Contraceptive pills	Progestin-only	
	Emergency contraception	
	Combined oral contraceptives	
Injectables	Depo-Provera (12 weeks)	
	Sayana Press (13 weeks	
	Noristerat (8 weeks)	
Implants	Jadelle	
	Norplant	
IUCD	Copper-T-380A	
Syringes	Disposable 5ml	
	Multi-load	

### Table 3. List of family planning commodities recorded in the cLMIS

Other than cLMIS, the PWD's own MIS is called the PWMP–MIS, which has the same indicators as cLMIS. The PWMP–MIS was established in 2015 by the PWD to manage information from the family welfare centers (FWC).

The data in the cLMIS and PWMP–MIS is accessible to employees at all tiers of the PWD. The general public can view basic statistics on contraceptives by logging into the cLMIS as a guest. However, members of the general public cannot view any statistics of PWMP–MIS as it is only accessible to PWD staff. In cLMIS, four basic types of graphs can be viewed: consumption; central warehouse and distribution stock on hand; stockouts versus over stock; and couple years of protection. In the PWMP–MIS, the FWC information includes: FWC performance, social mobiliser performance, FWC monitoring, and social mobiliser monitoring.

At the community level, the PWD has a FWC with one family welfare worker (FWW) and two family welfare assistants. The FWW is in charge of the center and is responsible for data-keeping. In addition to the FWWs, the other workers in their respective centers/clinics must also submit a monthly performance report to the district population office where computer operators enter the information into the cLMIS and PWMP–MIS.

### Structure of the MIS for NGOs Working in FP

There are three main NGOs in Pakistan that provide FP services. Each NGO developed its own MIS to record and report progress on FP indicators, as shown in Figure 7.

Figure 7. Flow of data in NGOs providing family planning



### Structure of Rahnuma-FPAP

The Family Planning Association of Pakistan was founded in 1953 and is the largest FP and reproductive health service provider in Pakistan. Recently it renamed itself Rahnuma, which means a guide (for development and prosperity), so it is officially known as Rahnuma–FPAP. The organization implements various programs to increase access to quality and affordable FP and reproductive healthcare for women, men, young girls, and boys in Pakistan. Through its family health hospitals, family health clinics, and reproductive health extension program, it provides services for FP, reproductive health, safe motherhood, child survival, and management of sexually transmitted diseases.

The family health hospitals operate throughout Pakistan and work as first referral health facilities. These hospitals link to the community by providing services at the doorstep through extension service programs such as the reproductive health extension program, and act as resource and training centers for building the capacity of the service providers in the family health clinics.

Rahnuma–FPAP has its own MIS called the Client-Centered Clinic Information System (CCCIS). At the family health hospitals, data is collected by LHVs who have been hired and trained by Rahnuma–FPAP (versus the LHVs who are recruited to work at basic health units). Data is recorded on printed forms (templates) against a predefined set of questions or indicators on registers and sent to Rahnuma–FPAP's district or regional office for verification. After verification, the data is entered into the computer-based CCCIS by a monitoring and evaluation person. At this point the data is readily accessible at all district and regional offices. The CCCIS has a built-in system that presents the information in graphical and tabular form. Rahnuma–FPAP shares details about consumption of FP commodities to the PWD to upload into the cLMIS.

### Marie Stopes Society-Pakistan

Marie Stopes Society started providing comprehensive reproductive health services in Pakistan in the 1990s. The organization operates across a large proportion of the country, making their services available to more than 70 million people. It provides a wide range of FP and reproductive health services and products through Behtar Zindigi centers, Suraj social franchise centers, maternal and child health centers, field-based health educators, reproductive health private providers, and outreach services/sites. Trained staff provide FP and reproductive health counselling to both men and women.

Data on the specific FP indicators is sent by the clinic and outreach service units to the private district regional office monthly, where it is entered into Marie Stopes Society's MIS, the Client Information System. Marie Stopes Society is supposed to provide details about FP indicators to the cLMIS monthly. However, since July 2017, there is no record in the cLMIS dashboard from Marie Stopes Society's MIS.

### Greenstar Social Marketing

Greenstar is one of the eminent private sector providers of reproductive health services in the country. It works through the private sector and with the Government of Pakistan, empowering healthier choices and improving access to affordable, high-quality health products and services, including FP and reproductive healthcare. The FP program is organized through a network of 18,000 doctors, LHVs, and midwives who offer clinical, nonsurgical FP services. Network doctors with access to an operating theater provide surgical contraception procedures. Community health workers distribute referral tokens to women in the community to use for services at franchisee clinics. The tokens are then collected at the points of service delivery and tracked by the community health worker supervisors.

Monthly reproductive health services records are maintained by the LHVs, community health workers, and private doctors. FP data is entered into the Greenstar–MIS at the district level. From here data is accessible to the Greenstar head office and is reported to the cLMIS.

### **Understanding the CHIS**

When key informants were asked if the current health information system reflects community health information, most of the participants confused the MISs used to collect community-level data with community-based provision of healthcare services. The analysis revealed that the participants consider community-level data collection to be synonymous with a CHIS. Few participants replied that the RHIS is not a CHIS, but that NGOs and the LHW program have been generating data directly from the communities rather than health facilities.

The LHW program participants reported that the LHWs provide services to all family members, as an integrated package of preventive primary healthcare services. Yet, there are issues with recording information on the LHWs' monitoring forms because there is no provision for recording healthcare service statistics on all family members.

One of the participants from the DHIS reported that data was generated from community members in all cases. Either the data was collected directly from households or at facilities. The issue is to record and report the information against one allocated "Khandaan Number" (family number) that should be unique. Although the CNIC has a family number, none of the community healthcare workers utilize this number. They usually generate a family number on their own; thus, in the same community an FWW and LHW might use different numbers to record the same family. This makes it difficult to cross-verify information from different departments. As a result, as one study participant commented:

"The issue of duplication of data arise and if the average use of commodities of all departments would be calculated then the given number would be more than the average number of eligible couples in one community."

The participant further added, that although there is potential to organize CHIS with RHIS, "Yahan RHIS theak sai sambala nai ja rahaa. CHIS kaisy hugaa. (Translation: "Here it is difficult to manage and integrate already-existing RHIS. How will the CHIS be managed?)" Another participant, while sharing the same point of view, further commented:

"CHIS is difficult to implement in Pakistan due to high illiteracy rate, as people will always be reluctant to get the registration of all their family members. Look, birth registration in Pakistan is not 100 percent birth record. How people will let all their family members, particularly the females, be registered?"

Two participants (one from PWD and one from LHW–MIS) expressed that such types of systems could be functional in Western countries, yet it is not workable in Pakistan. The participants from all departments agreed that the MIS in Pakistan did not maintain any "family folder" or recorded the details of all family members with one "family number".

A few participants understood the benefits of community-level data collection systems and shared that if we have information of all family members in one place, it would be easy to assess the health needs of the family as well to understand the factors of disease if there was a record of the family history. In addition, one participant added that availability of the family record at one place could ease the process of initiating many other healthcare services such as health insurance and medical allowance.

Policies are often based on data provided by public departments. Data provided by public sector MISs reflects what is happening at the facility level and usually does not present the community situation. Such information is included in the data collected through the LHW program and by NGOs. As one study participant stated:

"The information which is generated at community level/facility level can be used for decision-making in more productive way as compared to RHIS according to demands and requirements to the community."

The participant further added that provision of timely information directly from the community would facilitate the assessment of people's health needs and help with future planning for FP.

Some participants believed that the data generated at the community level was relatively more authentic than facility-level data and should be integrated with RHIS (referring to the DHIS and cLMIS). Another participant added that this comprehensive and authentic information could help to review previous policies and make better ones for upcoming years to improve the efficiency of the health information system.

### SWOC Analysis of Public-Sector HISs

### SWOC Analysis of the DHIS

The SWOC analysis of the DHIS revealed that its major strength was the system's core focus on monitoring healthcare delivery services provided by the public sector at first-level healthcare and secondary healthcare facilities. Data collected on all pre-defined major indicators of maternal and child health across Punjab is fed into the DHIS. Regarding FP data, one of the participants commented that although the team has been trained to ensure the completeness and accuracy of all indicators, the DoH only scrutinizes the data it deems a priority. Thus, although the DHIS form includes FP indicators, less attention has been paid to ensuring the quality of FP information since provision of FP services was no longer considered the core mandate of the DoH after the establishment of the PWD. Because the DHIS is under the DoH, DHIS staff also pay less attention to these indicators.

As integration with other MISs is one of the core objectives of the DHIS, the integration of data from other healthcare departments, private facilities, and systems could be possible. One of the potential challenges of managing the DHIS is the scarcity of human resources, as it does not have its own data collection team; they rely primarily on LHVs who work under the DoH. The key points of SWOC are described in Table 4.

### SWOC Analysis of LHW-MIS

One study participant observed a core strength of the LHW Program:

'LHW program is the only one which is functional with family-centered approach and LHWs are providing integrated preventative and curative health services to their neighbors."

The "peer status" of the LHWs enables them to provide primary healthcare services to the families more effectively than outsiders. The key informants from other public departments and NGOs also appreciated this strength of the LHW-program along with its coverage.

### Table 4. SWOC analyses

	Factors	DHIS	LHW- MIS	PWD PWMP & cLMIS
	Availability of MIS	✓	✓	✓
	Collects data from all 36 of Punjab's districts	✓		✓
	Monthly reporting	~	✓	
	Collects data on all core maternal and child health indicators, including FP	~	~	~
hs	Directly linked to the community and functional as a family-		✓	
ŋgt	Near 50,000 community workers in part of Puniab		✓	✓
Irei	Area/population allocation to one community worker		✓	✓
SI	Covers more than 60% of Punjab's population		✓	
	Regular spot checks or field monitoring		✓	
	Core focus on FP and reproductive health service provision			✓
	Monitors and collects data on performance indicators		✓	✓
	Trained staff	✓	✓	✓
	Dashboard for reporting logistic information on FP commodities			✓
	No system of maintaining individual record in MIS	✓	✓	✓
	Inaccurate data	✓	✓	✓
	Less focus on FP in initial years	✓		
	Duplication of data and services	✓	✓	✓
	Incomplete information	✓	✓	
ses	Overreporting	✓	✓	✓
les	Political pressure to meet targets (leads to overreporting)	✓	✓	✓
akr	Consolidated reporting style	✓	✓	✓
Wea	Focus of MIS is on FP commodities, rather than on performance indicators	~	~	~
	No mechanism to check data accuracy during data entry	✓		
	No mechanism to check client dropout	✓	✓	
	Inadequate skills set and referral mechanism	✓	✓	
	Unnecessary column in daily register	✓	✓	
	Focus on FP with FP2020	✓	✓	✓
ties	Has possibility to integrate data with all sub-departments and vertical programs under the DoH	~		
in	Vision of integration as a core objective	✓		✓
ort	Use of tablet computers at the facility level for reporting (pilot			✓
dd	project); if successful, program can be scaled-up			
0	Already in-built integrated dashboard showing information of FP	~		✓
	commodities,			
	Few qualified staff	✓	✓	✓
	Overaged staff		✓	
	No new recruitment of LHWs in vacant positions for last few		✓	
es	years			
ng	Does not have its own data collectors	~		
alle	Political pressure to meet the numbers			✓
ha	Less qualified staff	<ul> <li>✓</li> </ul>	<b>√</b>	<b>√</b>
0	Less technologically equipped staff	~	V	✓
	Under-utilization of data	<b>√</b>	~	
	Poor mechanism for accessing information from other public and private stakeholders	V		V

### SWOC Analysis of the cLMIS

The PWD came into existence with the objective to control overpopulation by increasing uptake of FP and comprehensive reproductive health services. The PWD mainly uses cLMIS, while also using PWMP–MIS to record and maintain data. All other MISs present information on different maternal and child health indicators, while the cLMIS only presents information on FP commodities. It does not capture information on FP services such as counselling and referrals. A strength of the PWD it its operational structure creating a community-centered approach. Although the PWD has fewer community health workers than the LHW

program, like the LHWs, FWWs are recruited from the same community as the people they're serving. Considering this, one of the participants from PWD commented that PWD data is collected by the community members (i.e., FWWs) thus, it could be stated that the services provided by PWD are "by the community and for the community." Another participant claimed:

"Data collected by PWD is more reliable than other public MISs due to existing mechanism of monitoring the PWD, however, it need to be strengthen more."

One of the respondents highlighted that the cLMIS provides easy access to accurate data on stocks, which helps district managers forecast the demand and supply of FP commodities. The findings align with the final evaluation report of Deliver LMIS illustrating that the "cLMIS helped managers maintain adequate months of supply at each point in the supply chain (either through improved forecasting or by facilitating transfers from surplus to deficit service delivery points) and thus helps prevent stock-outs" (USAID, 2016).

Few participants highlighted the issue of overreporting due to political pressure to meet set targets. Like other departments, the PWD presents the aggregated number of users and does not maintain individual records online, even though it is interested in doing so. Recently, the PWD launched a pilot project (in progress) in one district in Punjab with the aim of receiving online data directly from the LHVs rather than from the district level.

### Data Quality Issues in Public MISs

### Fake Entries

When asked about quality and validity of collected data, DHIS and LHW–MIS staff highlighted the issue of fake reporting. One of the reasons pointed out by them was the "unachievable targets" set for FP and "interlink between high reporting and employees' performance" (employees being the LHVs, LHWs, and FWWs who provide services to community members and record consumption of FP commodities). One participant shared:

"It is claimed that there are no targets in the countries where USAID projects are being implemented, however, the reality is different as the government sets estimates, which are interchangeably use as targets by some higher-ups."

Thus, to show high performance, some LHVs and LHWs report artificially high numbers of FP users and FP consumption. Some LHWs and LHVs falsify the information by copying the data from previous reports and entering it into new reports.

As the DHIS does not have a mechanism to obtain exact information about stock on-hand, it is not possible to verify consumption of FP commodities and check if the data is fake. The key informants from NGOs confirmed that sometimes employees of NGOs and the public sector inflate the number of users to gain financial benefits by selling the FP commodities at retail shops or small pharmacy shops.

As per the LHW–MIS assessment report (2012), over one-third of the LHWs (35%) reported false numbers or did not report on women's contraceptive use, while 25% of LHWs did not record any information about current contraceptive status.

A few participants from the PWD denied that such activity in their program exists due to rigorous monitoring and evaluation. Nevertheless, a PWD key informant revealed that fake entries were an issue; FWWs falsified data to save their jobs by showing 100 percent coverage due to political pressure to achieve set targets.

### Incomplete Information

The study participants from all sectors highlighted the issue of incomplete FP information for the following reasons: community workers (LHWs and LHVs) are overburdened; forms are complicated and long; there's more of a focus on other indicators, such as maternal and child health indicators; and regular monitoring and timely feedback are lacking.

The LHW–MIS Assessment Report (2012) asserts that around one-quarter of lady health supervisors reported data incompletely, while the majority of the LHWs did not report the numbers for few FP indicators in monthly reports. The most incomplete reporting was for the indicators, "number of users provided a condom," "injectables by the LHW," and "number of couples referred to a health facility by an LHW." This might be due to the laborious effort that is required to count the numbers from the list of FP users (from the LHW diary) and fill in the monthly report.

The key informants from the PWD explained that data incompleteness was associated with manual data entry and subsequent manual-to-online transmission of data. Considering this issue, the PWD has launched a pilot project in Kasur (from July 2016 to June 2018) providing tablets with data entry software linking the cLMIS to community workers. The community workers directly enter the information on a daily basis. The form cannot be submitted until all the required information is completed. This system will not only help in decreasing the reporting level, but also in increasing data reporting and quality.

### Dissatisfaction about Breadth of FP Indicators

When asked whether the predefined set of indicators, on which data was being collected, presents the full FP situation of a community, the participants from PWD pointed out that current MISs do not include all relevant indicators for FP, with most focusing on capturing the magnitude of FP (increase in FP users and consumption of commodities). The cLMIS tracks stocks of FP commodities, but does not report on client behavior, such as the reasons for dropouts or method switching. For instance, if a client stops using an FP method when she experiences a negative side effect (e.g., pain, or bleeding), it leads to an increase in the dropout rate, which is reflected as poor FP performance of the district or province. However, if reasons for discontinuation (or switching) can be noted on the data collection forms, then the data can be used to take appropriate measures.

The study participants from DHIS expressed reservations about the approach increasing uptake of FP. One participant shared:

"Counselling is very important with regard to adoption of any FP method, though LHWs and social mobilisers have been raising awareness about FP in communities, yet raising awareness and providing counseling of couples are two different poles."

Another participant commented:

"Couples should be counselled by some trained persons such as psychologist using some standard approach such as GATHER."

### Inaccurate Data

Inaccurate data was highlighted by study participants from all sectors. One participant shared:

"There is space to write the number against an indicator, but instead of writing the numbers, the LHW/LHV only tick marked the indicators which reflect yes, she worked on it."

This finding is consistent with the LHW–MIS Assessment Report (2012), which revealed that none of the LHWs accurately reported all 15 FP indicators in the monthly report; the FP indicators reported correctly ranged from two to eight. In addition, only 20% of the lady health supervisors correctly completed information for all 15 FP indicators.

Participants also reported the issue of wrong information, which is revealed during monitoring visits. Ten percent of the DHIS data is validated by comparing the information from clients with the information recorded in registers. Data validation revealed data that had been incorrectly filled-in by the LHVs and lady health supervisors, particularly for the indicator "source of awareness or previous knowledge on a disease." The participants from the PWD and LHW program reported the same issue. The findings were in line with the LHW–MIS Assessment Report (2012). When women were asked where they obtained their FP method the last time, around 37% of the LHWs incorrectly reported the response, or did not record the method source.

### Duplication of Data and Services

A key informant commented:

"Duplication of data may lead to overreporting and become a source of wastage of money and time, while duplication of services is wastages of resources and money."

Unfortunately, the healthcare system has both types of duplication. One of the participants from DHIS reported the issue of duplication of data by commenting:

"Duplication is evident as the online system only maintains aggregated number of information and compares these numbers for cross-verification of information with other departments to assess the magnitude of FP at community."

None of the MISs maintain individual client records online, which prevents cross-referencing and lends itself to duplication of information. If a woman received services at a facility, an LHV entered her data. However, that client may also have received home-based services from an LHW, who tracked the visit. Both the LHV and LHW recorded information for the same woman in two different forms and reported data on the same client in their separate data capturing systems, DHIS and LHW–MIS, respectively. When this data comes at district level, the client is double-counted, which distorts the actual picture of FP use in the community, tehsil, and district. There is no mechanism to record both community-based and facility-based services for each client. In other words, the MISs are currently designed with services as the main point of reference and not the clients.

There was a slight difference in opinion between the study participants from the PWD and other stakeholders. The participants pointed out that there was no chance of duplication of data from a single client because of the system of tracing clients using color-coded slips. When a community worker refers a client to a family welfare center, s/he gives them a slip; yellow for referrals from the family health workers (under the PWD) and pink for referrals issued by LHWs (under the DoH). At the facility, the client gives the provider their referral slip and a client record is generated, so there is less chance that the data for that person is entered twice.

Although this system may work for referrals, it does not address the duplication of records for clients who receive services or methods in different domains (community and facility) or from different sectors (public and private). Nevertheless, two other participants reported duplication of services and commented:

"There is an issue of demarcation. A number of organizations [have] been working in the same area, which leads to duplication of services. Whereas, there are other areas where no organization is present."

One of the participants from PWD commented:

"The PWMP–MIS has the same indicators as the cLMIS. This creates duplication of effort and duplication of services. The staff of PWD report and enter the same information twice (at both systems, cLMIS and PWMP–MIS). So, I often think, why is the government doing this? Why an integrated information system cannot be enacted?"

A participant from DHIS pointed out that that they have only one person at the district level manually transferring data from the submitted printed forms into the computer system. S/he enters hundreds of different types of forms received from different departments and vertical programs at the district. The participants from the PWD and LHW programs also reported the same situation. In addition, the LHW–MIS and DHIS have the same indicators, leading to duplication of efforts, as the data entry operators must fill-in the same kind of information twice.

### Overreporting

Participants from all sectors, including government departments and NGOs, highlighted the issue of overreporting. One of the participants commented:

"If you consolidate the number of adoption of FP commodities reported by all private and government departments, you will find that the number of consumption or adoption of FP commodities is more than the number of women of reproductive age."

One of the participants said that they experienced this situation twice, once with immunization data and another time with FP indicators. In both cases, overreporting occurred because of duplication of services, double-counting of individual information, and fake reporting to meet targets.

This situation depicts a manipulation of data. As per the LHW–MIS Assessment Report (2012), the proportion of overreporting was reportedly higher than the proportion of underreporting for all 15 FP indicators in the LHW–MIS, particularly for indicators: "number of total users of modern methods;" and "number of current users given follow up." It leads to over-estimates of current FP users, by method. The report also stated that a high proportion of LHWs did not provide data for specific FP indicators in their monthly reports, yet the lady health supervisors reported data for those indicators in their monthly first level care facility reports. A participant who interacts with the LHW–MIS reported the same situation and commented:

"Currently the data is entered LHS [lady health supervisor]-wise, but for improving the quality of the data, it is under discussion to introduce the online system for LHWs to enter the information directly through using tablets where we enter data LHW-wise."

### Poor Quality of Data and Feedback Mechanism

The participants from DHIS indicated that the current data monitoring mechanism is based on internal monitoring, in which facility-level data on specific indicators is verified from paper-based client records. Hence, there is no mechanism to objectively and systematically cross-verify the issues related to fake entries and incomplete information, particularly with data from community-based services. The participants highlighted the need for external validation by introducing third party monitoring and evaluation to improve data quality.

Although the participants of DHIS reported that a built-in mechanism of feedback reporting existed, supervisors' hectic routines made it tough to give timely feedback to LHVs. This finding is aligned with the Health Facility Assessment Report (2012), which asserted that supervisory visits were reported by most of the facilities, yet the feedback from supervisors was not common practice. An additional challenge is that monitoring officers sometimes complete the monitoring tasks from their offices rather than visiting the field to cross-verify. This is due to budget constraints, unavailability of transportations and other logistics, and lack of priority placed on improving data quality.

A few participants of PWD appreciated the inclusion of both program-level and performance indicators. They reported that PWD's client-centered system helps the validation process. For instance, PWD's "slip system" contains basic client information such as complete address, FP method adopted, and date of visits at the facility. At the time of service, one copy of the slip is given to the client and one is retained for record, while the third copy is dispatched to the Planning, Monitoring and Evaluation wing through the district office. Such a system facilitates the validation process and encourages the staff to report accurately. Nevertheless, some participants claim the PWD monitoring system is too rigorous, redundant, and laborious, sometimes prompting employees to skip some sections in order to fill in all required monitoring forms each month.

### Consolidating Reporting Style

The data that is entered into the online system at the district level in all three public sectors has been aggregated from the health facility or community. The individual client record is maintained at the facility level in paper form. Hence, the individual-level records are not accessible online at the district and provincial levels.

### **Current Practices with or Vision for Integration of FP Information**

The participants noted that an effort was made to integrate all FP-related information, but it could not be materialized in its true sense, so integration efforts were stopped. This happened due to the rigid structures of different departments. For example, one of the respondents commented that DHIS and PWD did not want their "tekydari" (Urdu for authority) to devolve and come under each other's administration because it

might threaten their authority. Nevertheless, a few efforts to integrate information systems have materialized in Punjab.

### Contraceptive Performance Report by Pakistan Bureau of Statistics

The Pakistan Bureau of Statistics has produced six annual contraceptive performance reports since 2011 (Pakistan Bureau of Statistics, 2016). The main objectives of the report are to assess method-wise, outletwise, and province- or sector-wise contraceptive performance in terms of couple-years of protection; provide a basis for estimating annual contraceptive requirements and distribution in the country; and calculate the contraceptive prevalence rate for assessing the country's contraceptive strategy. In the first five issues, the Pakistan Bureau of Statistics presented contraceptive data from the PWD and popular NGOs (i.e., Rahnuma–FPAP, Marie Stopes Society, and Greenstar Social Marketing). However, the 2016 issue debuted contributions from the DoH (including data from the DHIS and LHW–MIS).

### Data Integration in the cLMIS

One participant from the PWD said that the cLMIS was an integrated system where data from DHIS, LHW–MIS, PWD, and popular FP NGOs were compiled in form CLR–6. The CLR–6 form is used to assess supply and demand of FP commodities for all departments. At the end of every month, each department fills in the form and sends it to the PWD. PWD staff enter the FP commodity information listed in Table 3 into the cLMIS.

The participants said that private facilities and NGOs were working (service provision and intercoordination) in a much better way and giving better FP results compared to government departments because they have their own MIS system to gather and enter data. NGOs are reluctant to share their data with government departments and only do so when the government exerts pressure. A participant confirmed this and commented:

"NGOs do not share their data with government department except CLR–6 which is collected by PWD, yet the PWD is also facing challenges to update data of NGOs on monthly basis due to non-cooperation of NGOs."

### Launching DHIS 2

The DoH has taken the initiative to upgrade the DHIS by launching DHIS 2, an open-source software platform for the collection, validation, analysis, and presentation of health data. For this, meetings are underway for designing and planning for DHIS 2 in Pakistan. Although draft terms of reference have been completed, it will take more than six months to publicly announce the roll-out of DHIS 2. The main functions of DHIS 2 will be the integration of information from the MISs of the DoH's three sub-departments: LHW–MIS, the Expanded Program on Immunization, and DHIS. The integration of different MISs within the government is facilitated by sharing the same web server. The changes that will be introduced with DHIS 2 include entering data daily rather than monthly and having facility-level in-charges (such as LHVs, or lady health supervisors) enter the information instead of computer operators at the district level. The daily information sharing will encourage government officials to be more responsive to providing health services, particularly with disease patterns.

### Integrating Public Sector and Private Sector Data

The key informants felt it will be challenging for the DoH to integrate the MISs from multiple sectors, such as public, private, and NGO. Integration of information from all tiers of the healthcare system and funding streams is difficult due to scarcity of resources and funds. Technical issues also make it prohibitive. For example, the PWD has a separate ministry, administration, and secretary apart from the DoH, making it difficult to share and maintain data. However, the DoH shares FP data with the PWD by uploading it into their cLMIS. The DoH has been trying to upload to the DHIS all three of the PWD's MISs (for contraceptives, vaccines, and tuberculosis). In this regard, the work of integrating FP data has started. Nevertheless, receiving data from NGOs who are hesitant to share it with government departments is a perpetual challenge. Moreover, a number of private facilities are not legally registered, so it is difficult to collect information from them as well.

The participants commented that as a first step, the government has been trying to integrate different MISs and remove duplication of efforts. If successful, the integration with private sectors could be a possible next step requiring comprehensive efforts at the national level.

### The Punjab Health Sector Plan 2018

The Punjab Health Sector Plan 2018<sup>1</sup> was developed to provide "a comprehensive, timely, accurate and functional information foundation developed for health policy and planning decisions." It envisions linking the community- and facility-based information systems; linking private sector facilities with a provincial-level information system; building the capacity of district health managers to use information; and establishing a comprehensive integrated disease surveillance system at the provincial and district levels. It plans to do this through the following activities outlined in Table 5.

<b>Goal:</b> A comprehensive, timely, accurate, and functional information foundation developed for health policy and planning decisions				
Objectives Activities				
Community-based information system strengthened and integrated with facility-based information system	<ul> <li>Institute a mechanism for community-based workers to register all health-related events, specifically neonatal, infant, childhood, and maternal deaths</li> <li>Conduct feasibility study for integration of DHIS and community- based MIS considering the functional integration and development of information technology linkages at district/provincial levels</li> </ul>			
Private sector health facilities linked with provincial-level information system	<ul> <li>Link private facilities with provincial-level information systems for priority infectious disease notification</li> <li>Validate quality of information collected through quality assurance activities of Punjab Healthcare Commission</li> </ul>			
Capacity building of district health managers on use of information through support of Provincial and District Health Development Centres	<ul> <li>Based on a training needs assessment, institute a regular training program on use of information by district health managers</li> <li>Through technical assistance, build the capacity of the Provincial and District Health Development Centres to conduct training programs</li> </ul>			
Comprehensive integrated disease surveillance system at provincial and district level established	<ul> <li>Establish an integrated disease surveillance system at the provincial and district levels by incorporating a disease early warning system and other existing systems in the surveillance system</li> <li>Build capacity of relevant staff on recording and reporting of diseases enlisted in the surveillance system and disease early warning system</li> </ul>			

### Table 5. Punjab Health Sector Plan, 2018

<sup>&</sup>lt;sup>1</sup> http://www.pndpunjab.gov.pk/system/files/Punjab\_Health\_Sector\_Plan\_2018\_0.pdf

# DISCUSSION

The purpose of this study was to review the RHIS in Punjab province of Pakistan and to explore the potential for integrating health information systems for FP data. The review of RHIS delineated critical issues in current RHIS such as fake entries; incomplete information; dissatisfaction with FP indicators; inaccurate data; duplication of data and services; overreporting; not reporting; poor feedback mechanisms; and consolidating reporting styles. These data quality issues in the RHIS should be addressed prior to integrating different MISs.

The Health Facility Assessment Report (2012) stated that lack of trained staff was a barrier to providing reproductive health and FP services. This contributes to data quality issues. The findings from this study are aligned with the Health Facility Assessment Report. The DoH has been updating its policies for the last few years and FP services have emerged as one of the DoH's core concerns. Consequently, the team at DHIS will presumably become more vigilant in ensuring the completeness and accuracy of FP data.

Neither the LHWs nor lady health supervisors report against all the FP indicators in monthly reports, which may be because the supervisors and LHWs do not give importance to FP indicators. This might also be due to the laborious effort that is required to tally the number of FP users (from the LHW diary) and fill in the monthly report. Nevertheless, the LHWs program is only one program in Pakistan which has been providing services partially using a family-centered approach. The LHWs work like a bridge between the formal health system and their community. However, in recent years, the DoH capped this program and banned new recruitment of LHWs. This decision may pose a potential challenge to the LHW program's ability to provide effective services to the community.

Although the PWD took the initiative to gather and present FP data from all public and private MISs, the PWD has been facing challenges with receiving data regularly. The main reasons are a culture of "non-cooperation" with other departments as compliance is seen as reducing one's authority. These findings are consistent with the final evaluation report of the DELIVER project, which asserted that the cLMIS was successful in removing 26 percent of duplicate records. This figure is alarming as it shows 74 percent of the system is still reporting duplicate services (USAID, 2016). To avoid the duplication of services by DoH and PWD, a joint mapping exercise is needed to demarcate service areas.

The study found dissatisfaction with FP indicators by key informants in both the public (PWD, DoH) and private sectors (NGO). None of the data collection forms in any of the departments contain indicators for number of couples seen, number of counselled couples, average time spent for FP counselling, number of FP follow-up visits by couples or by counsellor, and number of couples who adopted FP as a result of counselling. In addition, the reasons for dropping, switching, or not adopting an FP method are not noted. Such information facilitates planning for policymakers to devise more effective FP strategies or propose alternatives in the community.

The study found no mechanism to record both community- and facility-based services for each client. In other words, the MISs are currently designed with services as the main point of reference and not the client. This has serious implications for the decision-making process and in making national policy. Efforts are being made to revamp the MIS by integrating the DHIS and cLMIS, but due to the autonomy of both departments, this will not be possible until there is organizational restructuring. Nevertheless, the executive staff of both departments have recently planned for data integration on different indicators and the launch of DHIS 2 is a good step in this regard. Another example is that the government recently started keeping individual records for epidemic diseases, which are accessible up to the provincial level. It is hoped that the government will begin the process of maintaining individual records for other areas such as FP.

As for a CHIS, we found that such a system does not exist in Pakistan. The study's key informants found it a valuable concept and suggested different strategies to launch a CHIS in Pakistan. It is not impossible to implement a CHIS considering a precedent has been set for this—recently the government of Pakistan successfully launched a polio campaign as well as a dengue campaign registering information about family members. Therefore, it may be said that if there is political will, then a CHIS could be implemented in Pakistan. Since the current system is already managing several fragmented MISs (e.g., EPI, LHW–MIS, DHIS, cLMIS), the current system has the potential to manage a CHIS. Thus, if using a family-centered approach is properly planned, then it will not be difficult to execute.

# RECOMMENDATIONS

### **Overarching Recommendations**

We developed three overarching recommendations to improve the HMIS in Punjab province and the country overall.

### Shift the Paradigm from an Individual-Level Healthcare Approach to a Family-Centered Approach

The current healthcare system in Pakistan is not based on a family-centered healthcare delivery approach; rather it focuses on individual members. For instance, if a family/household has six members (mother, father, two children, and two grandparents), their data is not available in a central location to assess the health needs of one family. The immunization team records vaccination data for children, which is stored in one place. LHVs record FP data for parents, which is stored elsewhere. Families are not tracked as a unit in the different healthcare departments, though there is potential to record the data of one family by allocating one number. With the CNICs, each Pakistani was allocated a unique "family number," yet community healthcare workers do not use it to maintain records, rather they generate new client numbers. This leads to fragmented data not only in terms of family records, but also with data in different healthcare areas. Using a centralized, family-centered approach would make it easier to triangulate and integrate information by removing duplicate records. In addition, if healthcare services are provided using "family folders" (which stores health data for all family members in one place), it would improve service delivery by offering a holistic approach to healthcare.

### Promote a Culture of Interorganizational Information Sharing Systems

An interorganizational information sharing system should be introduced to remove duplication of information. Though the government has taken different initiatives to do this, such as the PWD providing space to upload data from other departments or organizations into the cLMIS and encouraging departments and organizations to share their data with PWD, this does not occur on a regular basis. The DoH has been discussing providing space on the DHIS dashboard to track data from other organizations and a debate to disseminate data with other provinces has been ongoing. Nevertheless, key informants speculated that implementation will take years as there is lack of cooperation and a culture of interorganizational information sharing. Therefore, the government must develop a robust mechanism for creating a culture of cooperation to assess the healthcare needs of the population and measure the progress of healthcare departments across Pakistan.

### Sensitize Healthcare Officials on the Benefits of Integrating Community-Level Data into the RHIS

Study findings highlighted that most of the key informants did not know what a CHIS is. Some confused the CHIS with simple community-level data collection. Therefore, there is a need to raise awareness among officials who manage health information about CHIS, what it entails, and its significance so they can work to integrate data to make better healthcare decisions for communities.

### **Specific Recommendations**

This section presents a set of specific recommendations to improve HMIS for FP.

### Record Data Using CNICs

To remove duplication of data and services, individual-level information must be recorded and maintained against the CNIC. One way to do this is to replace consolidated numbers in monthly health facility reports with individual-level records using a client's CNIC number. As FP is a sensitive issue in Pakistan, data entry through CNIC may be introduced as optional initially, during a pilot phase, and then implemented as essential data collection in a later scale-up phase. This strategy is very cost-effective and easy to adopt. It will entail a minimal change in the current MIS, while removing several discrepancies.

The second strategy is to revamp the data entry system by replacing paper-based manual entry at the first level with electronic data entry by providing tablets to those who record data (such as LHWs, FWW, and

LHVs). Using electronic data entry with an internet connection enables the service provider to use a client's CNIC to immediately access their health record from a centralized MIS database. While more expensive, this strategy has a myriad of benefits, such as making routine data immediately accessible, assessing patterns of FP uptake, and, if all health-related data is entered into this system, helping to assess disease patterns.

### Reinforce One Dashboard with Common FP Indicators

A long-term strategy is to develop one dashboard with standardized, common FP indicators to be tracked by all public and private FP service providers. The dashboard with graphic user interface should have the ability to be embedded in any organization's web portal or software. Each organization will enter the information at once on common indicators to be automatically updated in the main RHIS website or database. This will empower each organization by granting equal rights to the software/dashboard. It may encourage new FP service providers to maintain their records and will make it possible to track FP services and use across districts and time. This strategy could be adopted by the PWD as it already has a dashboard (PWMP–MIS, similar to cLMIS) to record and maintain data on FP commodities as well as by DHIS, which is solely working on data management.

### Expand FP Data Collection Beyond Commodity-Based Data

The findings revealed that FP indicators are usually commodity-based. Information about counselling and awareness are either ignored or not recorded. A standardized set of FP indicators which comprehensively presents consumption of FP commodities, along with the reasons for uptake or dropped FP methods, will provide information for planning and implementing effective interventions.

## CONCLUSION

The aim of the project was to review the current RHIS in Punjab province of Pakistan and to explore the potential for FP data integration from the community and between the public and private sector.

The findings suggest that community-based FP data is not fully integrated with the RHIS. Some efforts have been made to integrate FP information, such as the Contraceptive Performance Report developed by the Pakistan Bureau of Statistics, which reports FP data from the public and NGO sectors, and the cLMIS, which is an integrated MIS with FP commodity data from DHIS, LHW–MIS, PWD, and popular NGOs using a standardized form. Despite efforts at integration, private health facilities, NGOs, and government departments (i.e., DoH and PWD) are utilizing separate MISs, which are mostly vertical with minimal integration. The PWD, being the main supplier of FP services, is the only department to launch a platform for integration of information, while the DoH is still in the planning phase.

The government of Punjab has more than 20 HMISs, with data collected from health facilities and households. There is potential for integrating the CHIS with RHIS once structural barriers are addressed. For example, LHW–MIS and DHIS can be integrated as they are both under the DoH, but it will be more difficult to develop an integrated system between DoH and PWD, as PWD falls under a separate administration and ministry. Nevertheless, the study found that there is consensus among the participants that there are several data quality issues in the RHIS which should be addressed in parallel to data integration.

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# Appendix A. Health Information System in Pakistan

Name of Information System	Custodian	Status
1. DHIS	MIS Section Director General Health Services	Functional, online
2. LHW MIS	LHWs Program	Functional, partly online
3. MNCH MIS	MNCH Program	Functional, online
4. Expanded Program for Immunization (EPI) MIS	EPI	Functional, manual
5. TB Control Program MIS	TB Control Program	Functional
6. Human Resource MIS	Health Secretariat (ASE)	Functional, online
7. Key Performance Indicators System	MIS Section Director General Health Services	Functional, online
8. Nutrition Information System	LHWs Program/MNCH Program/RMNCH Program	Partially functional
9. Vacancy position system	Policy and Strategic Planning Unit (PSPU)	Partially functional
10. E Monitoring System (Health Watch)	Policy and Strategic Planning Unit / Punjab Information and Technology Board	Partially functional
11. Malaria Program MIS	Malaria Control Program	Functional, manual
12. E-Monitoring System for Community Based Workers	LHWs Program	Partially functional
13. Monitoring and Evaluation Assistants Reporting System	PSPU	Partially functional
14. Citizen feedback model	CM Secretariat	Functional
15. Finance/PEFRA/Budgets	Finance Dept	Functional
16. Roadmap	Special Monitoring Unit, Punjab	Partial dashboards
17. Vaccinator tracking/E- Vaccine	PITB /EPI	Functional
18. Disease Early Warning System	WHO	Shifted to DSS
19. Disease Surveillance System	PITB	
20. Polio Surveillance System	WHO	
21. Nutrition Surveillance System	WHO	Redundant

# Appendix B. Literature Review Matrix

#	Reference	Objectives	Methods & Finding
1.	TRF. (2012). Health Facility Assessment – Punjab Provincial Report. Technical Resource Facility. Retrieved from http://www.trfpakistan.or g/LinkClick.aspx?fileticket =dj9LBJTtdxl%3D&tabid=2 618	The first national health facility assessment (HFA) was conducted from October 2010 to May 2011covering all the provinces and regions of Pakistan as part of the implementation of the monitoring and evaluation (M&E) framework of the national maternal newborn and child health programme (NMNCHP). Study Setting: Punjab	<ul> <li>Methods: The Punjab HFA report synthesizes the findings of 36 district level assessments, covering 902 health facilities assessed in the Punjab province. Thirty-four district headquarter (DHQH) hospitals and 84 tehsil headquarter (THQH) hospitals, were assessed for the provision of 24/7 comprehensive emergency obstetric and newborn care (EmONC) services. 291 rural health centres (RHCs) were assessed for the availability of 8/6 preventive MNCH services.</li> <li>Findings: Regarding the availability of 8/6 preventive MNCH services.</li> <li>Findings: Regarding the availability of 8/6 preventive MNCH services.</li> <li>Findings: regarding the availability of at the facilities, like WMOs at RHCs and specialists including gynecologists, anesthetists and pediatricians at SHC hospitals. Findings related management basics,</li> <li>Work coordination among the facility staff.</li> <li>The majority of the facilities reported supervisory visits, the receipt of their feedback was not a common practice.</li> </ul> Analysis revealed that in 32 BHUs had neither doctor nor a LHV posted. From 493 BHUs, 339 had a doct, and 436 has LHV. 91 out of 493 had less than 25% of family planning commodities, 50 have between 25 to 50% of FP commodities. <ul> <li>Condition of Human resource was better in RHCs, however the status of availability of commodities was little bit same.</li> <li>In THOHs, the LHV were present in only 39% of facilities, 15 out of 84 facilities has less than 25% FP commodities.</li> <li>The location of these health facilities had created security concerns for the live-in staff. Staff shortages were also attributed to low pay scales and the lack of performance based incentives.</li> <li>The lack of precognition and performance-based incentives were also described by a respondent as a source of discouragement in the implementation of plans. It was highlighted that the lack of prevention of years.</li> </ul>

2.	USAID. (2016). Deliver Logistics Management Information System; Final Evaluation Report. United States Agency for International Development (USAID). Retrieved from http://pdf.usaid.gov/pdf_ docs/PA00MK1K.pdf	<ul> <li>The evaluation focuses exclusively on the LMIS component of the DELIVER project and answers four questions:</li> <li>1. To what extent has the project been successful in meeting its three major objectives for the LMIS activity?</li> <li>2. In particular, to what extent has trained staff used training to address supply chain gaps or issues?</li> <li>3. To what extent is the staff using data for decision- making?</li> <li>Study Setting: Pakistan</li> </ul>	<ul> <li>Methods: Document review, LMIS online dashboard, In-depth Interview of managers, group discussion with LHWs</li> <li>Findings: The cLMIS and vLMIS have improved the operation and performance of their respective supply chains. Trends in indicators of supply chain performance, i.e., reporting rates, consumption, wastage rates, and vaccine coverage, have increased significantly in project-supported provinces relative to other provinces.</li> <li>For cLMIS, managers, data entry operators (DEOs), and other supply chain actors explained that better record keeping improved the timeliness and accuracy of data on stocks and consumption. However, most managers and DEOs are using the LMIS for decision-making, although they differ in the way they access the information.</li> <li>The knowledge and skills necessary to use the cLMIS are essential to its sustainability. To ascertain the skill level of the managers and DEOs who were trained to use the cLMIS. The data are difficult to interpret and probably reflect how individuals access to the cLMIS and much higher rates of hard copy access than DEOs.</li> <li>One also implied that the cLMIS helped reduce pilferage. As a district manager for PWD explained: "cLMIS has [a] very positive effect on supply chain management. Before cLMIS manual reporting was done, which was not [an] accurate and reliable system, [the] storekeeper was managing [the] stock register manually and it was easy to change any record (enter any bogus entry) at any time. Now as we are entering data on [an] online system, it helps us in maintaining [the] quality and accuracy of the data. Facility staff self-pick their stock from [the] district store."—District Manager, PWD</li> </ul>
3.	PWD. (2013). Manual on supervision, monitoring and evaluation (Population Welfare Programme). Population Welfare Department. Retrieved from <u>http://www.pwd.punjab.</u> gov.pk/sites/pwd.pitb.go v.pk/files/Monitoring%20M annual.pdf	The objectives are to ensure universal access to family planning methods, increase contraceptive prevalence rate, reduce population growth, and reduce total fertility rate. Study Setting: Pakistan	Methods: The manual was prepared by a committee of officers from the Health Secretariat and the field which was constituted for this important and arduous task. A consultative process was initiated to seek guidance and help to revise the manual to meet the need of the day, with the specific task of uniform pattern of monitoring. Findings: Previously named as the RHS-A Centres, the Family Health Clinics (FHCs) are one of the major clinical components of the Population Welfare Programme, housed in departmental buildings and based in teaching hospitals, all DHQ hospitals, and selected THQ hospitals. These clinics provide a cafeteria style choice of the full range of services identified in the National RH Services Package. The comprehensive family planning (FP) services include contraceptive surgery (CS) facilities for both females and males as outdoor procedure with safe and effective backup medical support and long-term client follow-up along with temporary contraceptive methods for birth spacing.

			Family Health Mobile Units (FHMUs): They are located at the tehsil level and provide services to a population of about 30,000 people in a tehsil or 5,000 couples scattered in 15–20 villages by holding 10–12 camps regularly in a month. At present, 117 FHMUs are functioning in Punjab. <u>Social Mobilizer</u> : The Social Mobilizer is placed at the Union Council Level and is the focal point for the Population Welfare grass-roots programme. They are responsible for interaction with local community leaders, male teachers, shopkeepers, religious leaders, (Imam Masjid), and CBOs for advocacy and promoting the objectives of the programme.
4.	PDSSP. (2008). Minimum Services Delivery Standards for Primary and Secondary Health Care in Punjab. Punjab Devolved Social Services Programme. Retrieved from http://www.phc.org.pk/d ownloads/MSDS%20Primar y%20and%20Secondary% 20Healthcare-PDSSP- 2008.pdf	<ul> <li>To:</li> <li>Develop MSDS for primary and secondary health care levels</li> <li>Develop an action plan for the implementation of MSDS</li> <li>Develop complementary documents of standard operating procedures (SOPs) and standardized medical procedures</li> <li>(SMPs).</li> </ul> Study Setting: Punjab	<ul> <li>Methods: International and national literature was reviewed, along with assessment visits to different departments. Four health facilities (DHQH, THQH, RHC, and BHU), based on the HMIS report, were visited to observe the availability of standard services.</li> <li>Findings: The public sector health delivery system is composed of four tiers: (i) outreach and community-based activities, which focus on immunization, sanitation, malaria control, maternal and child health, and family planning; (ii) The primary care facilities include basic health units (BHUs) and rural health centres (RHCs) mainly for preventive and outpatient care; (iii) the secondary health care facilities of Tehsil Headquarters Hospital (THQH) and District Headquarters Hospital (DHQH) for inpatient and outpatient care; and (iv) tertiary care hospitals located in the major cities for more specialized care. The private health services sector facilities include maternal and child health centres (maternity homes), dispensaries, and diagnostic laboratories. Well-organized management information is the backbone of any organization.</li> <li>The Health Management Information System (HMIS) was developed in the early 1990s, with the objectives of helping to inform decision-making at all levels of management and planning timely interventions for any forthcoming episode or reoccurrence of a disease. Both BHUs and RHCs have standard HMIS reporting instruments and plans for submission of reports to the EDO office. Currently, HMIS is covering only OPDs of THQ and DHQ hospitals. Both hospitals are also following the old system of sending an annual abstract report to EDO-H, which in turn is sent to the HMIS cell in the Director General of Health Service's (DGHS) office.</li> <li>Instruments used for reporting are standardized. The BHU is located at Union Council and serves a catchment population of up to 25,000. Services provided at BHU are promotive, preventive, curative, and referral. Outreach/community-based services are part of the package provided</li></ul>

5.	PSB. (2017). Contraceptive Performance Report (2015–2016). Government of Pakistan, Statistics Division, Pakistan Bureau of Statistics. Retrived from; http://www.pbs.gov.pk/sit es/default/files//social_sta tistics/contraceptive_perf ormance_reports/Final%2 OReport%20April%2C%202 017%28Final%29.pdf	Pakistan Bureau of Statistics is the prime official agency of Pakistan, responsible for the collection, compilation, and timely dissemination of reliable statistical information to the policymakers, planners, and researchers. This organization publishes a variety of data, primary as well as secondary, especially on economic and social aspects of the country. <b>Study Setting:</b> Pakistan	<ul> <li>Methods: In this report, a comparison of contraceptive performance for the year 2015–16, in terms of Couple Year of Protection (CYP), within the last year 2014–15, at the national and provincial level, in respect of Population Welfare Departments, Departments of Health (Health Facility), LHWs, and NGO(s), is presented to measure the growth.</li> <li>Pakistan initiated the Family Planning Programme in the private sector in 1953, and in the 1960s in the public sector by making it a part of state policy in 1966. Institutional arrangements for the programme attained the status of an independent ministry on 12 June, 1990.</li> <li>Findings: It is observed that contraceptive performance of PWDs, in terms of CYP, has decreased by 10.4%, if compared with the previous year, while contraceptive performance of DoH (HF), has increased by 2.4%, when compared with the previous year. Moreover, contribution of LHWs in family planning service delivery has decreased by 8.5% when compared with the previous year (2014–15).</li> <li>In the case of private providers, performance of three eminent NGO(s) (Rahnuma FPAP, Marie Stopes Society (MSS), and Greenstar Social Marketing (GSM)) has been reflected in the report, wherein MSS and GSM have shown significant progress of 13.4% and 16.1%, respectively, and Rahnuma FPAP has depicted marginal decline (1.0%) in contraceptive performance during the year 2015–16 as compared to 2014–15.</li> <li>Another indicator of family planning, contraceptive prevalence rate on the basis of modern contraceptive methods (mCPR), computed by estimating users for each method, during the year 2015–16 has increased by 8.6%, as compared to the previous year.</li> </ul>
6.	JICA. (2007). The Study on Improvement of Management Information System in Health sector in the Islamic Republic of Pakistan. Japan International Cooperations Agency (JICA). Retrieved from http://open_jicareport.jic a.go.jp/pdf/11846748.pdf	Overall objective of the study is to formulate a national action plan for the improvement of management information systems (MIS) in the health sector to respond to the information needs at each level of public health service management. Study Setting: Pakistan	<ul> <li>Methods: The study has been devised in a phased manner. As a first step, a situational analysis has been completed which has produced a number of findings. Based on these findings, the study team aims to design technical, behavioral, and organizational interventions for the improvement of information systems.</li> <li>Findings: At the macro level there are: <ul> <li>Structural constraints, such as lack of telecommunications capacity</li> <li>Insufficient quantities of appropriate human resources present very real obstacles to timely and complete reporting of information.</li> <li>The internal organization and culture of the health system also matters</li> <li>The behavioral aspects of performance are often the most difficult to identify and confront in a meaningful way <ul> <li>They involve intangible concepts such as motivation, attitudes, and hierarchy, and explain the way in which health workers collect and use data (or fail to do so)</li> </ul> </li> </ul></li></ul>

			The LHW–MIS is designed to generate community-based information on important demographic, mortality, morbidity, and service-related indicators and, therefore, is supposed to reflect the actual situation in the community. The LHW program in collaboration with UNFPA has developed a computer program. The facility code used by LHW program is the same as the NHMIS HID codes. This was intended to provide a common key for analyzing HMIS data and LHW–MIS data. However, code and facility names from the field sometimes do not match with the information provided by HID at NHMIS. All reports are transmitted from LHWs to the FLCF, then to the district, province, and ultimately to the federal level.
			The LHW supervisor prepares a monthly tour program indicating places and names of the LHWs to be visited on certain dates. This planning is done with the help of the LHWs' tour plans submitted every month. The LHW visit plan indicates the household numbers that would be visited by certain dates. During the field visit, the LHW supervisor uses a supervisory checklist to check the LHW's performance. After filling the checklist, the supervisor assesses the performance of the workers and decides on the action to be taken according to the performance score. In addition to these district level supervisory and monitoring activities, the Field Program Officers (FPO) from the Provincial PIU also carry out monthly visits. FPO is assigned to 2–4 districts and spends 20 days in the field. Every month s/he meets with 24–48 LHWs, visits 24 LHW supervisors, and 12 FCLFs.
			Although the LHW programme has its own information system, it needs to refer to HMIS-FLCF for injection contraceptives and IUDs. Use of information depends upon people having the required knowledge and skills to collect and analyze data, motivation, and problem-solving skills. However, contextual factors such as support from superiors, and organizational values such as emphasis on evidence for decision-making, transparency, and merit also affect individual motivation in using information.
7.	DGHS. (2015). DHIS Annual Report 2015. MIS Cell Directorate General Health. Retrieved from http://dghs.punjab.gov.p k/system/files/DHIS%20An nual%20Report%202015.p df	The intention of this report, and those in the future, is to speak to aspects of health in the population, as well as to a specific issue or theme. It will serve to define key public health issues of the day and consider how they can be approached. Study Setting: Punjab	<ul> <li>Methods: The raw data on a prescribed format from public healthcare facilities is received on a monthly basis in District MIS Cells where it is entered into DHIS software in every district of Punjab. This data is scrutinized and examined in detail by the Provincial MIS cell after electronic transmission by District MIS Cells.</li> <li>Findings: Public health sector government initiated a nationally standardized data generation system at all levels called the Health Management Information System (DHIS) in the early 1990s. This system has been modified to the District Health Information System (DHIS) in 2006. The DHIS now has a much wider scope than the old HMIS. The upgraded version of DHIS was implemented at district levels in 2009, but as this implementation was supposed to be carried out by the provincial health departments its timeframe varied from province to province.</li> </ul>

			The District Health Information System (DHIS) is a mechanism of data collection, transmission, processing, analysis, and information feedback to the first level care facilities and secondary level health care facilities. DHIS provides baseline data for district planning implementation and monitoring on major indicators of disease patterns, preventive services, and physical resources. The revised system, unlike the previous system, would gather and collate information from secondary level hospitals (DHQs) and Tehsil Headquarter Hospitals (THQs)).
8.	DGHS. (2013). Annual Report Health Department 2013–14. MIS Cell Directorate General Health. Retrieved from https://www.google.com. pk/url?sa=t&rct=j&q=&esr C=s&source=web&cd=1& cad=rja&uact=8&ved=0a hUKEwij5svl6JPRAhWBuho KHdFBDvMQFggaMAA&ur I=http%3A%2F%2Fpspu2.pi tb.gov.pk%2Fsystem%2Ffil es%2FAnnualh%2520Healt h%2520Report%2520Punja b%25202013- 14_2.pdf&usg=AFQjCNGU hSH0Zlc_xl3NQ- R2wIOCkvag9Q&sig2=p- a1dHy3Gg_w6fYXgS- VkA&bvm=bv.142059868, d.d2s	This report elaborates on the performance/activities of the Health Department for the fiscal year 2013–14 and is the first such report of its kind. The information provided through this report will also be of particular relevance to donors and development partners whose contributions in various initiatives have been of critical value in improving the status of health services delivery. It will also be of immense value to planners, managers, and researchers for developing policies and aligning priorities <b>Study Setting:</b> Punjab	<ul> <li>Findings: Lack of centralized data on services and human resources was a major limiting factor of this narrative on the Health Department. Monthly review meetings are held in the DGHS where the EDOHs of all districts are invited to attend and see how their district has performed.</li> <li>However, analysis of data and feedback to districts is still not a well-integrated activity.</li> <li>An integrated monitoring and evaluation system for performance monitoring is an initiative which has replaced the conventional administrative appraisal system (of individuals and service outlets) with a modern and results-oriented system based on objective measurement of performance through a predefined set of key performance indicators (KPI).</li> <li>KPI is an online integrated M&amp;E system accessible to and by health managers at provincial and district levels. The desktop DHIS system has been converted into an online system. These KPIs are sourced to existing routine information systems and databases including the District Health Information System and Management Information System (MIS) of vertical programmes.</li> <li>Currently, the KPIs have been defined for the provincial Director General Health Services (DGHS), Executive District Officers (Health), District/Tehsil Head Quarter hospitals (DHQ/THQ), and Medical Superintendent (MS) levels.</li> <li>Monitoring and evaluation mechanisms have been modernized in the province and DHIS data is being reported on in an online system.</li> <li>Strategies like introduction of the CMW cadre, as well as strengthening and capacity building of the LHWs, have been extremely successful interventions that have reached out to the most vulnerable populations within communities.</li> <li>Integration of the National Program for Family Planning and Primary Healthcare (Lady Health Worker Program), MNCH, and the Nutrition programme under single management will further augment the activities of the individual programs to work in a cohesive and coordinated manner.</li> </ul>

			One LHW is targeting 1,000 people. The lady health supervisor (LHS) is recruited to support the LHW and ensure quality of performance, One LHS supervises about 20–25 LHWs. She is provided with a vehicle to allow her mobility to perform her tasks. However, there have been reports of insufficient POL allowance which is hindering field supervision. Nevertheless, the majority of LHWs in Punjab have received at least one visit from their supervisor in the past month and have attended a monthly meeting at the health facility in the past two months.
9.	NIPS. (2007). Status of Women, Reproductive Health and Family Planning Survey. National Institute of Population Studies Islamabad (NIPS).	The main purpose of the survey is to provide policymakers and programme managers with detailed information on indicators of fertility, family planning, reproductive health of women, status of women, fertility preferences, and desire for children. <b>Study Setting</b> : Pakistan	<ul> <li>Methods: Reproductive Health and Family Planning Survey (SWRHFPS) is a nationally representative survey of 8,718 ever married women age 15–49.</li> <li>Findings: There is widespread disparity between women's knowledge and use of contraceptives in Pakistan. While 96 percent of currently married women report knowing of at least one method of contraception, only 42 percent have ever used a method, and only 32 percent are currently doing so. Twenty-five percent are currently using a modern method and nearly 7 percent use a traditional method. The two most commonly used methods are female sterilization (7.5 percent) and the condom (6.4 percent). Despite the low level of contraceptive use, the gain over time has been significant.</li> <li>The public sector plays a major role in providing family planning services. About 64 percent users of modern methods from a government source, compared with 36 percent who obtain their methods from a government source, were supplied primarily through the social marketing programme.</li> </ul>
10.	Mahmood, A., & Naz, S. S. (2012). Assessment of management information system (MIS) of National Program for Family Planning and Primary Health Care [LHW Program].Population Council, Islamabad.	The aim is to strengthen the routine LHW-MIS in the districts so that it can contribute to the improvement of the district health system by providing reliable evidence. Further, based on the findings of the current assessment, the district's managers/decision- makers should be able to continuously improve the LHW-MIS through applying a problem-solving approach. <b>Study Setting:</b> Pakistan	<ul> <li>Methods: Based on a random sample of 154 LHWs from 9 BHUs of 4 districts across three provinces of Pakistan: Jhelum and D.G. Khan (Punjab), Marana (KPK), and Sukkur (Sindh). The data were collected from three difference sources: Women in the community (LHW's clients), LHW, and from LHS. Client-level information was collected to validate the information, provided by the clients, with the LHW's records. Whereas data collected from the rest of the sources were used to assess the accuracy of data transferring from records to reports and the completeness of the reports.</li> <li>Findings: Results show that: <ul> <li>A substantial majority of the LHWs (between 90 to 97 percent LHWs) have maintained the basic MIS tools (LHW diary, family register, curative care register, and monthly report). However, most of the LHWs did not have the MCH card, referral slips, and area maps.</li> <li>Less than half of the LHWs had the LHW basic equipment available to them, with an exception of the LHW kit bag (86 percent).</li> </ul> </li> <li>The comparison of LHW-level recording and reporting of the key indicators shows that: <ul> <li>Data completeness was high; however, the accuracy of the indicators was low.</li> <li>Data incompleteness was higher in recording of these indicators as compared to reporting.</li> <li>The main reason for the incompleteness of the indicators is the unavailability of MIS tools to the LHWs.</li> </ul> </li> </ul>

			The comparison of LHS and LHW level monthly reporting shows that the proportion of completeness was higher in the family planning related indicators as compared to the maternal and child health indicators.
			The most accurate reporting was of the indicators: "number of total registered eligible couples" (78 percent), "number of users of traditional methods" (77 percent), and the "number of meetings with VHC" (92 percent). The proportion of overreporting was higher than the proportion of underreporting for all the indicators that depict the number of current users of different family planning methods.
			Moreover, each LHW also prepares a detailed monthly report containing information about indicators of maternal and child health, FP utility, and basic curative care of her own community. Hence, both the meticulous record keeping and management Information system tools allow the LHWs to keep track of individuals to proactively provide services.
11.	TRF. (2010). Assessment of Quality of Training of Community Midwives in Paskitan. Technical Resource Facility. Retrieved from http://pspu.punjab.gov.p k/system/files/Assessment %20of%20the%20Quality% 20of%20Training%20of%20 Community%20Midwives %20in%20Pakistan.pdf.	Study aimed to acknowledge the strengths, identify gaps, and make feasible recommendations to make the training appropriate and relevant to the scope of work of CMWs. Study Setting: Pakistan	<b>Methods:</b> Province-wise quota sampling was done to select 13 CMW schools and health facilities attached to them. Assessment methods used included: desk review of relevant reports—internal evaluation documents, publications, course materials, curriculum, and manuals for CMW training; key informant interviews of 10 federal and district stakeholders involved in the CMW training—representatives of development partners, Pakistan Nursing Council and MNCH; semi-structured in-depth interviews of national and provincial Nursing Examination Boards (from four provinces), principals of CMW training schools, theory tutors and clinical trainers (13 of each category); and structured interviews of 56 CMW graduates using a structured interview questionnaire and observational structured examination checklists. In addition, the schools and their affiliated health facilities were observed against standardized observational checklists to assess the eligibility of the school and the clinical facility to be used for CMW training in terms of adequacy of resources, including infrastructure, human resources, supplies, logistics, equipment, and drugs.
			<b>Findings</b> : The assessment of the CMW training process revealed that the PNC-approved training curriculum and manuals were available. However, facility-based clinical trainers had not seen them and theory teachers lacked capacity to translate these into teaching activities; for example, academic calendars and session plans were missing. Community rotations lacked structure and organization. There is no coordination between the CMW school and other clinical training institutions such as hospitals, health facilities, and the district health system. Supervision and monitoring was unrealistic; a school-based faculty member signed the students clinical log books. Log books were neither verified nor given weight-age as an entry requirement for the final exam; more than 50% of students had not conducted the required number of deliveries (10 deliveries) to qualify for entry to the final exam. Assessment of capability and competency of CMWs showed that 73% of the CMWs were practicing though; of these 98% were either freelance or employed by the private sector and 43% had not conducted a delivery in the previous three months.

12.	Majrooh, M. A., Hasnain, S., Akram, J., Siddiqui, A., & Memon, Z. A. (2014). Coverage and quality of antenatal care provided at primary health care facilities in the 'Punjab' province of 'Pakistan.' PloS one, 9(11), e113390.	<ol> <li>To assess the proportion of expected pregnancies enrolled for ANC services in the catchment areas of PHC health facilities.</li> <li>To assess the proportion of the enrolled clients coming for follow-up ANC visits.</li> <li>To assess the quality of the ANC services delivery process in terms of assessment, treatment, and counseling of the clients.</li> <li>To explore and identify the causes of low coverage and quality of services at managerial, provider, and client level.</li> <li>Study Setting: Punjab</li> </ol>	<ul> <li>Methods: Quantitative and qualitative methods were used to collect data. Using multistage sampling technique nine-out-of-thirty-six districts were selected and 19 primary health care facilities of the public sector (17 basic health units and two rural health centers were randomly selected from each district. Focus group discussions and in-depth interviews were conducted with clients, providers, and health managers.</li> <li>Findings: Results show that the overall enrollment for antenatal checkup was 55.9% and drop-out was 32.9% in subsequent visits. The quality of services regarding assessment, treatment, and counseling was extremely poor.</li> <li>The reasons for low coverage and quality were: <ul> <li>The distant location of facilities, deficiency of facility resources, indifferent attitude and non-availability of the staff.</li> <li>Lack of client awareness about importance of antenatal care</li> <li>Self-empowerment for decision-making to seek care were also responsible for low coverage</li> </ul> </li> </ul>
13.	PWD. (2015). Punjab Health Sector Plan 2018; Building a Healthier Punjab. Planning and Development Department Government of Punjab. Retrieved from http://www.pndpunjab.g ov.pk/system/files/Punjab Health Sector Plan 2018 _0.pdf	<ul> <li>Health sector stream to include health, population welfare, and water and sanitation sub-sectors</li> <li>Efforts to achieve related MDG targets by 2015, but not later than 2018</li> <li>Critical governance and institutional measures outlined</li> <li>Budgetary allocations in MTDF to follow strategy guidelines</li> <li>Sector plan activities to be geared towards achieving 8% growth target</li> <li>Study Setting: Punjab</li> </ul>	<ul> <li>Methods: This document provides the framework into the Punjab Growth Strategy 2018, and the latter provides clear direction and broad parameters that are to be followed by the sector plan. It also includes the health sub-sector, population welfare department, water and sanitation and policy direction in Punjab Growth Strategy, and a short-term implementation plan related to indicators and performance monitoring by the health department.</li> <li>Methods: DGHS Report – Collection Frequency: Annual (Performance Indicators: 5.2% of vertical programmes integrated with provincial MIS cell targets: 100%. Collection Methods: MIS report Collection Frequency: Annual (Performance Indicators: 5.2% of vertical programmes integrated with provincial MIS cell targets: 100%. Collection Methods: MIS report Collection Frequency: Annual) (Performance Indicators: 5.3% of private sector hospitals and healthcare facilities regularly reporting using PHIS targets: 90% Collection Methods: MIS Report Collection Frequency: Annual) (Performance Indicators: 5.4% Number of districts preparing annual health plans of actions considering the health issues emerging from the information system. Targets: 36 Collection Methods: DoH Report. Collection Frequency: Annual )</li> <li>Finding: [Sub-total: Policy Strategy by 2018: 1– Shifting focus to Primary &amp; Secondary Health Care and from non-communicable to infectious diseases to reduce the burden of disease (Key programs in MTDF: Integrated Reproductive Maternal New Born &amp; Child Health (RMNCH) &amp; Nutrition Program) (Timeline: year 2018, cost in millions 9,592).]</li> </ul>

			[Sub-total improving management of the health system, through delegation of duties from provincial to lower levels and sharing of responsibilities through public-private partnership—such as contracting—in or outsourcing BHUs to private sector. (Key programs in MTDF: Performance Management System in Health Department Timeline: 2014–15 cost: 8.] [Sub-total: Creating a health information system to allow community-based workers and both public and private facilities to enter data, leading to a disease surveillance system. Using PITB's successful Dengue Surveillance System as a model. Key Programs in MTDF: Strengthening of Health Management Information System in Punjab Timeline: 2014–16, cost 85] Results Indicators and Performance Monitoring Matrix – Health Department (Result statements: 5. A comprehensive, timely, accurate, and functional information foundation for health policy and planning decisions. Performance indicators: (5.1 An integrated Disease Surveillance System established at provincial and district levels. Targets: 100% collection].
14.	Carton, T. W., & Agha, S. (2011). Changes in contraceptive use and method mix in Pakistan: 1990–91 to 2006–07. Health policy and planning, 27(2), 166–174.	Objective is to determine whether the influence of the determinants of family planning use in Pakistan changed between 1990-91 and 2006-07 and if these changes were associated with changes in the method mix. Study Setting: Punjab	<ul> <li>Methods: Data from the Pakistan Demographic and Health Surveys (PDHS) of 1990–91 and 2006–07 were used in the analyses. Data on 5,184 married, non-pregnant, fecund women in 1990–91 and 8041 married, non-pregnant, fecund women in 2006–07 were used. Logistic regression analysis was used to identify factors associated with the use of any contraceptive method and whether the influence of these factors changed between the survey years.</li> <li>Findings: The effects of urban/rural residence, wealth, and education on contraceptive use changed between 1990–91 and 2006–07. Differentials in contraceptive use by residence, wealth, and education declined and were accompanied by changes in the method mix. In rural areas and among lesseducated women, the contribution of traditional methods to the method mix increased. Among the poorest women, the method mix shifted towards traditional methods and condoms.</li> <li>There was little knowledge on analysis at the time of collecting data and there is continuing weakness in the quality of family planning service delivery.</li> <li>Contraceptive use differentials in Pakistani women have declined between rural and urban areas, between less-educated and more-educated women, and between poor and non-poor women.</li> <li>Rural, less-educated and poorer women have increased their use of traditional contraceptive methods in particular. Delivery of high quality family planning services needs to be increased in rural areas and in low-income urban areas to increase demand for modern contraceptive methods.</li> </ul>

15.	Sultan, M., Cleland, J. G., & Ali, M. M. (2002). Assessment of a new approach to family planning services in rural Pakistan. American journal of public health, 92(7), 1168–1172.	The government of Pakistan started a new approach to the delivery of contraceptive services by training literate married women to provide doorstep advice and supplies in their own and neighboring communities. This report assesses whether this community-based approach is starting to have an impact on contraceptive use in rural areas. Study Setting: Punjab	<ul> <li>Methods: A clustered nationally representative survey was used to collect data on contraceptive use and access to services in each cluster. Two-level logistic regression was applied to assess the effects of service access, after potential confounders were taken into account.</li> <li>Findings: Married women living within 5 km of two community-based workers were significantly more likely to be using a modern, reversible method of contraception than those with no access (odds ratio=1.74; 95% confidence interval=1.11, 2.71).</li> <li>Accessing a health or family planning center in a nearby village or town is logistically complex because, typically, the husband, mother-in-law, or another adult family member must be persuaded to act as an escort, thereby preserving the family's izzat, or honor.</li> <li>The provision of family planning services is part of the package and lady health workers are supplied with oral contraceptives and condoms.</li> <li>FP data was generated and transmitted into a CHIS clinic-based approached. In a population as large and rapidly growing as Pakistan's, the design of effective family planning services is an issue of both national and international importance. The key to success in many countries has been to expand information and services beyond the restrictions of a clinic-based approach.</li> </ul>
16.	Mumtaz, Z., Salway, S., Nykiforuk, C., Bhatti, A., Ataullahjan, A., & Ayyalasomayajula, B. (2013). The role of social geography on Lady Health Workers' mobility and effectiveness in Pakistan. Social science & medicine, 91, 48–57.	This study explores whether and how these sociocultural factors also impact LHWs' home-visit rates. A mixed- method study was conducted across 21 villages in one district of Punjab in 2009–2010. Social mapping exercises with 21 LHWs were used to identify and survey 803 women of reproductive age. Study Setting: Punjab	<ul> <li>Methods: In-depth interviews were conducted with 21 LHWs and 27 community members. In-depth interviews were conducted with community members selected across the 21 villages. We adopted a maximal variability sampling approach ensuring that we included both women and men, respondents of varied ages and socioeconomic groups. The respondents were approached when the survey team was conducting the door-to-door surveys.</li> <li>Findings: The findings suggest that LHW performance is constrained by both gender and biradari/caste-based hierarchies. Further, since LHWs tended to be poor and low caste, and at the same time preferentially visited co-members of their extended family who are likely to share similar socioeconomic circumstances, the program may be differentially providing healthcare services to poorer households, albeit through an unintended route.</li> <li>The study illustrates the way in which LHW visitation and service delivery practices are influenced by the social distance between the LHW and the women she is intended to serve.</li> <li>The qualitative findings drew attention to the poor, low-caste status of the majority of the LHWs and their tendency to avoid visiting better-off, higher-caste households due to both the cultural restrictions on entering 'outside space' and the active rejection of their services by women in these households.</li> </ul>

			Meanwhile, the quantitative survey highlighted the significantly lower visitation rates among women who did not share biradari membership with their LHW. Since biradaris comprise (almost exclusively) individuals of the same caste, caste and socioeconomic hierarchies are closely interlinked. The LHW was accessible every day of the week at all hours and usually lived within walking distance—this meant that women and children could easily access healthcare.
17.	Haq, Z., Iqbal, Z., & Rahman, A. (2008). Job stress among community health workers: a multi- method study from Pakistan. International journal of mental health systems, 2(1), 15.	An attempt was made to understand factors which might be responsible for below-optimal performance of LHWs. <b>Study Setting:</b> Punjab	<ul> <li>Methods: Conducted a multi-method study to investigate the aforementioned issues. All LHWs from one typical rural sub-district in Rawalpindi were surveyed. Focus group discussions with a sub-set of these workers were also conducted.</li> <li>Findings: About one-quarter of the LHWs were found to have significant occupational stress. Factors associated with stress included having low socioeconomic status and having to travel long distances for work. Inconsistent medical supplies, inadequate stipends, lack of career structure, and not being equipped to communicate effectively with families were the main factors for job dissatisfaction among these workers. Three variables had a statistically significant effect on the LHW, resulting in job stress. These included having to travel 2 km or more every day to perform her job, living a distance of 3 km or more away from the BHU, and having a family income of PKR 4,000 per month or less. Overall, the absence of career advancement was a source of moderate to very high pressure in 53% of the respondents.</li> <li>Improvement in remuneration, better administration of supplies, and a structured career path should be ensured for better performance of community health workers. In addition, communication skills learning should be an essential part of their training program.</li> <li>Abusive hierarchical management structure, disrespect from male colleagues, lack of sensitivity to women's gender-based cultural constraints, conflict between domestic and work responsibility, and poor infrastructural support were the important problems faced by female primary health care workers, which were identified from a study conducted in 1998 when the program was only four years old.</li> </ul>
18.	Hafeez, A., Mohamud, B. K., Shiekh, M. R., Shah, S. A. I., & Jooma, R. (2011). Lady health workers programme in Pakistan: challenges, achievements and the way forward. JPMA: Journal of the Pakistan Medical Association, 61(3), 210.	Objective of this study was to assess the contribution of the LHWP in enhancing coverage and access of healthcare services as well as towards improvement of health indicators. Study Setting: Punjab	<ul> <li>Methods: A descriptive study was carried out over a period of one year (2007–08). A detailed desk review of project documents, interaction with relevant stakeholders, performance validation, and extensive feedback from the community were collected.</li> <li>Findings: A critical analysis was carried out by the authors systematically to bring out salient features in the two domains in order to reach perceptible conclusions.</li> <li>The LHW program has led to development of a very well-placed cadre that links first level care facilities to the community thus improving the delivery of primary healthcare services.</li> <li>However, despite its success and the trust it has earned from the community, there are certain areas which need special attention, these include poor support from suboptimal functional health facilities, financial constraints, and political interference leading to management issues.</li> </ul>

			<ul> <li>Weaknesses that need to be addressed include:</li> <li>Irregular supply of drugs</li> <li>Delayed disbursement of remuneration</li> <li>Poor district health system referral support</li> <li>No response to LHWs' expectations for higher financial compensation</li> <li>Career development</li> </ul>
19.	Oxford Policy Management. (2009). Lady Health Worker Programme External Evaluatoin of National Program for Family Plannig and Primary Health Care. Retrieved from http://www.opml.co.uk/sit es/default/files/Lady%20H ealth%20Worker%20Progr amme%20- %204th%20Evaluation%20- %20Summary%20of%20Re sults.pdf	Objective of this study was to create an efficient ongoing supply system in order to assure the regular delivery to the LHW of essential drugs, vaccines, and family planning materials that are fit for purpose. Study Setting: Pakistan	<ul> <li>Methods: The evaluation tools included: a nationwide sample quantitative survey (based on the questionnaires of the 3rd evaluation to ensure comparability of results): a qualitative study to supplement the quantitative survey; financial analysis: stakeholder interviews and meetings: and document reviews. An LHW should visit all her households at least once a month. Almost half of the LHWs reported working seven days in the week prior to the survey.</li> <li>Evaluation results show that the supply system for medicines is performing poorly. The program did not succeed in achieving its performance targets. There are a significant number of LHWs who have been without various medicines for over two months. In addition, there is a shortage of non-drug items. The regular supply of drugs and contraceptives logistics management system 41 is important for the performance of the LHW. The main causes of lack of supply are management of procurement and the level of funding. Service delivery has improved overall. The LHWs are delivering more services on almost every one of the 10 measures that make up the performance score for delivering preventive and promotive services. The program did not succeed in achieving its performance targets. There were a significant number of LHWs who have been without various medicines for over two months. In addition, there is a shortage of non-drug items. The regular supply of drugs and contraceptives is important for the performance of the LHW. The main cause of lack of supply is management of procurement and the level of funding.</li> <li>The LHWP provides services nationwide to the rural poor through the collaborative efforts of the Federal Ministry of Health, the Provincial Departments of Health, and the District Health Offices. The monthly meeting at the PPIU is chaired by the Provincial Coordinator and the Deputy Provincial Coordinator, with the remainder of the management team in attendance. The meeting agenda is the same each month, and each FPO presents information (in standa</li></ul>

20.	Zhu, N., Allen, E., Kearns, A., Caglia, J., & Atun, R. (2014). Lady Health Workers in Pakistan: Improving Access to Health Care for Rural Women and Families. Boston, MA: Maternal Health Task Force.	The programme also has an independent monitoring system called the LHW Management Information System (MIS) that informs quarterly review meetings and provides analytical feedback on LHWs' health records. The MIS records and transmits all LHW primary healthcare activities to the district, provincial, and federal management levels. Study Setting: Punjab	<ul> <li>Methods: The process to scale up community-based health interventions involves increasing coverage by geographic expansion, adding technical interventions, changing policies, and strengthening capacity with resources. Several approaches have been used on a global scale to increase the sustainability and scalability of maternal, newborn, and child health worker programs, which include: increasing government involvement in directing and implementing programs: partnerships between government and non-governmental organizations: dissemination of methods and results through manuals, training packages, and mass media: and organic spread from community to community through word-of-mouth or direct observation.</li> <li>Findings: A comprehensive review found that program managers had failed to complete a number of activities, such as: <ul> <li>Developing district-level procurement mechanisms</li> <li>Assessing district and provincial management capabilities</li> <li>Further decentralizing decision-making powers, as set out by the Strategic Plan (2003–2011) and the Planning Commission – 1 (2003–2008), the core LHWP planning document.</li> </ul> </li> <li>The LHWP was implemented through the Prime Minister's Programme for Family Planning and Primary Care and was set within the MOH, with implementation units at the federal, provincial, and district levels (FPIU, PPIU and DPIU).</li> <li>The health system continues to face issues of limited career advancement opportunities for the health workforce, lack of human resources, poor working environments, and inequitable resource allocation.</li> <li>LHWs do not receive leadership training outside managing patient records and prescriptions. Integration at the health system's lower levels, particularly with noce parolic health units, has also been uneven and inadequate. Additionally, there have been issues with noncompliance among LHWs. Twenty-five percent of LHWs are only delivering one-third of the services provided by high-performing LHWs to increase awareness on reprod</li></ul>
21.	Technical Resource Facility. (2013). Essential Package of health services for primary health care in Punjabl; Technical Component Retrieved from	Objective of this study: Strengthening the District Health Care System through transforming each basic health unit and its outreach interventions into a "Mini Primary Health Care (PHC)	<b>Findings:</b> The EPHS–PHC is envisaged to be a "living document," serving as a guideline for the aforementioned purposes, that should be revised every year, or at least once every two years, to incorporate evidence-based guidelines. Newer medicines, cheaper alternatives, changing trends of illness, and changes in relative capacity of the DOH at various levels will also dictate the future direction.

	http://pspu.punjab.gov.p k/system/files/Essential%20 Package%20on%20Health %20Services%20(EPHS).pdf	System" for the catchment area population. Ensuring effective referral linkages from household to BHU to RHC to THQH to DHQH and other tertiary level healthcare facilities. Ensuring essential reproductive and child health package at all levels starting from communities to district headquarter hospitals. Improving child health in programme areas. Study Setting: Punjab	The DOH is moving towards integrating primary healthcare and reproductive health services for maximizing efficiency and effectiveness, avoiding duplication and removing overlaps in management structures. Community-level screening of children will be carried out by LHWs and CMWs by measuring mid-upper arm circumference measurement (MUAC). All concerned providers will refer children to the facility level, as per need. LHWs and CMWs will promote child spacing services by educating communities on the importance of Healthy Time Spacing (HTSP). They will help women in selecting a method of their choice and provide them with that method, and/or refer them to BHU. They will also counsel women facing any side effects and refer them to BHU for appropriate treatment and guidance.
22.	Douthwaite, M., & Ward, P. (2005). Increasing contraceptive use in rural Pakistan: an evaluation of the Lady Health Worker Programme. <i>Health policy</i> <i>and planning</i> , <i>20</i> (2), 117– 123.	This article assesses the impact of the LHWP on the uptake of modern contraceptive methods using data from a national evaluation of the LHWP, completed in 2002. The objective of the quantitative survey was to provide a nationally representative picture of the functioning of the LHWP and to assess the programme's impact by comparing LHW areas with non-programme, control areas. Fieldwork was conducted between October 2000 and April 2001 and covered all provinces and federally administered areas of Pakistan. <b>Study Setting</b> : Punjab	<ul> <li>Methods: The evaluation used a number of analytical approaches, including quantitative and qualitative data collection, a review of programme management systems and an analysis of programme expenditure. The analysis presented here uses data from the quantitative component of the evaluation. The data for this analysis comes from a national evaluation of the LHWP. The evaluation was commissioned by the Ministry of Health in Pakistan, funded by the Department for International Development (DFID), UK, and implemented by Oxford Policy Management in collaboration with the Population Council in Pakistan.</li> <li>Findings: Findings from the first national evaluation of this Programme.</li> <li>This study provides strong evidence that the LHWP has succeeded in integrating family planning into the doorstep provision of preventive healthcare and in increasing the use of modern reversible methods in rural areas.</li> <li>The lack of an experimental design limits the confidence with which programme effects can be inferred. Nevertheless, two different analytical approaches are employed that together provide a relatively strong test of programme impact. First, trends in ever-use of modern reversible contraception over time are compared between programme and control area, based on retrospective information provided by respondents.</li> <li>Secondly, two-level statistical modelling was performed using the software package STATA to estimate the effect of the LHWP on the current use of reversible modern methods in rural areas, controlling for other differences between the two populations.</li> </ul>

23.	Neudorf, C., & Muhajarine, N. (1998). Using a Comprehensive Community Health Information System for Public Health Planning and Program Delivery. In: Proceedings of the 1998 Geographic Information Systems in Public Health Conference.	Study Setting: Canada	<ul> <li>Findings: The CCHIS is, technically, a network of information systems from the provincial level through to the regional and the local levels (i.e., subdistrict level), each connecting "up" as needed for district-wide use. This type of information system requires organizational change and is enabled by today's information technology. It relies on the use of computers and communication technology to decentralize information and communicate it to the appropriate points of use (e.g., service delivery, monitoring, planning, and evaluation).</li> <li>The proposed CCHIS will have the following main functions: <ul> <li>Assembly of existing health data on the population, mortality, morbidity, supply of hospitals and health professionals, utilization of services, and more. Some qualitative data on public expectations and preferences will need to be collected.</li> <li>Analysis of data to produce health information on the needs, preferences, and health status of the population. Closely related is the function of synthesis and interpretation of the information to produce evidence, spelling out the implications for health planning, services, research, and policy-making.</li> <li>Dissemination of the results to decision-makers and the general public.</li> <li>Enhance strategic decision-making by improving the quality of data used, expanding the breadth of relevant data available, and presenting information in an easily understandable manner.</li> <li>Facilitate the use of evidence in planning and delivery by assembling and managing a single repository that incorporates a variety of sources and elements of data.</li> <li>Increase staff's skills in the analysis, interpretation, and application of information in planning by providing training in the principles of data use, attributes of the database, and analytical tools.</li> <li>Promote partnerships within the district health system and between the health system and other key sectors by sharing data, information, and other resources.</li> <li>Contribute to the resear</li></ul></li></ul>
24.	Wazir, M. S., Shaikh, B. T., & Ahmed, A. (2013). National program for family planning and primary health care Pakistan: a SWOT analysis. Reproductive health, 10(1), 1.	Study Setting: Pakistan	<ul> <li>Methods: SWOT analysis was used by making recourse to the structure and dynamics of the program, as well as searching the literature.</li> <li>Findings: Strengths of the program include: <ul> <li>Comprehensive design of planning</li> <li>Implementation and supervision mechanisms aided by an MIS</li> <li>Selection and recruitment processes and evidence created through improving health impact indicators</li> </ul> </li> <li>Weaknesses identified are: <ul> <li>Slow progress</li> </ul> </li> </ul>

	<ul> <li>Poor integration of the program with health services at local levels including MIS</li> <li>Demotivational factors such as job insecurity and non-payment of salaries in time</li> </ul>
	<ul> <li>Opportunities include</li> <li>Further widening the coverage of services</li> <li>Its potential contribution to health system research</li> <li>Its use in areas other than health, such as women's empowerment and poverty alleviation</li> </ul>
	Threats the program may face are: Political interference Lack of funds Social threats Implications for professional malpractices Political commitment Recruitment and selection procedures Wide coverage outreach—rural areas focused Integration with healthcare system at upper levels Defined management and supervisory structures Comprehensive healthcare provision Management Information System (MIS) Training of the LHWs part of the system Positive impact on health indicators Cost effective intervention Poor management at lower levels Poor integration at lower levels Poor integration at lower levels Dob insecurity Weak supplies and equipment provision Weak referral systems Poor integration of MIS with health system Poor supervision and linkages with peripheral health facilities Low quality care in some parts Slow progress in meeting targets
	<ul> <li>Less impact in areas such as sanitation and breast reeding.</li> <li>After her recruitment, each LHW has to undergo 15 months of training, after which she is supposed to serve a population of about 1,000, or 150 homes, by visiting 5-7 homes on daily basis. Currently, over 100,000 LHWs are working in the country, covering about 60–70% of a population which is mostly rural. The government is spending on average PKRs 44,000 per LHW, on an annual basis.</li> </ul>

25.	Qazi, M. S., & Ali, M. (2009). Pakistan's health management information system: health managers' perspectives. JPMA. The Journal of the Pakistan Medical Association, 59(1), 10.	To explore the perceptions of health managers regarding the health management information system (HMIS), within their organizational setting and in the context of the decentralization process in Pakistan.	<ul> <li>Methods: In-depth interviews carried out at health facilities at the federal level, all four provinces, and seven districts (Hyderabad, Lahore, Sheikhupura, Islamabad, Peshawar, Quetta, and Mustang). The questionnaire was piloted and modified accordingly. A total of thirty interviews were undertaken at their work places. Open-ended questionnaires with probes were used during face-to-face interviews. Data analysis was done through statements, meanings, themes, and general descriptions of experiences that emerged out of the responses.</li> <li>Findings:</li> </ul>
		Study Setting: Punjab, Pakistan	<ul> <li>The strengths highlighted were:</li> <li>Sustainability of system even after suspension of funds from donors</li> <li>Vast coverage of over 10,000 health facilities</li> <li>Logistics and drug support systems</li> </ul>
			<ul> <li>The weaknesses included:</li> <li>Scarcity of resources (i.e., skilled personnel and financial resources)</li> <li>Contentious quality</li> <li>Underutilization of data</li> <li>Lack of motivation and feedback among health managers</li> <li>Management styles and the structure of public sector systems are unsupportive <ul> <li>Marked by oppressive use of power</li> </ul> </li> <li>Adversarial relationships between managers and their subordinates</li> <li>Managers assert their authority by excluding subordinates from decision-making or transferring staff</li> </ul>
			These attributes were reconfirmed in this study. In such an atmosphere of prevailing fear, the role of the leader can be very significant. Lack of clear job descriptions leads to confusion over roles and responsibilities, dissatisfaction, and a lack of motivation secondary to absence of appreciation or rewards for hard work, as reported in other studies.
			Great hurdles to the integration of the HMIS with vertical programmes are perceived even in the developed world where donor-driven "vertically structured empires" with separate systems, separate manpower, and separate management hierarchy are set apart from line management. Some of the respondents suggested integration and coordination among vertical information systems as a solution to this problem.

26.	Siddiqui, A. A., Raza-us- Samad, M., Siddiqui, F. A., & Shaikh, Z. A. (2013, December). Community health information system focusing Pakistan. In: Information & Communication Technologies (ICICT), 2013. 5th International Conference on (pp. 1–9). IEEE.	Main focus regarding this system was to ensure the required information (health and management) about healthcare are available to the entirety of the population and community in a health sector who use it. Study Setting: Pakistan	<ul> <li>Findings: The community health information system is a web-based application, which can improve the productivity of healthcare through delivering integrated evidence-based and effective health information in real-time. The system can provide useful and efficient data containing a wide range of health KPIs and health determinants—to the general public, patients, health professionals, and policymakers. The basic purpose of this community health information system is to centralize the health-related data for policymakers, healthcare authorities, the ministry of health, city district government, and local NGOs.</li> <li>Source of information collection: <ul> <li>Health and healthcare facility-based records</li> <li>Vital event registrations</li> <li>Population surveys and research teams</li> <li>Reports of community monitoring and observation</li> </ul> </li> <li>Main usage of information: <ul> <li>Measuring the health status of community and people</li> <li>Compute the problems of health</li> <li>Calculate medical and healthcare needs</li> <li>Formulate health policies, plans, goals, objectives, and strategies</li> <li>Promote the performance of priority-based work during decision-making and targeting affected areas</li> <li>Design health interventions to facilitate better healthcare solutions for the community Monitoring trends and changes in trend</li> <li>Evaluate effectiveness and efficiency of health services</li> <li>Progress evaluation</li> </ul> </li> </ul>
27.	Bossert, T. J., Mitchell, A. D., & Janjua, M. A. (2015). Improving health system performance in a decentralized health system: capacity building in Pakistan. Health Systems & Reform, 1(4), 276–284.	Focus on the effects of capacity building in a decentralized health system in Pakistan on the use of decision space and on the impact of the changes in capacity, decision space, and accountability on indicators of health system performance. Study Setting: Pakistan	<ul> <li>Methods: This study was based on a survey of local health sector decision-makers in 15 districts in Pakistan.</li> <li>Findings: Findings indicate that while local authorities in both districts reported using a wider decision space by 2009, institutional capacities in PAIMAN districts improved to a higher degree than in comparison districts. Officials in neither set of districts reported significant changes in their accountability to local elected officials, although those districts with more decision space and institutional capacity mobilized greater local support for health programs.</li> <li>Extending findings from an earlier study focused on similar questions, there were strong synergies among the dimensions of decentralization for different health sector functions, as well as some evidence of associations between stronger institutional capacities/wider decision space and improvements in health coverage and in better administration of the health system.</li> </ul>

28.	Ali, M., & Horikoshi, Y. (2002). Situation analysis of health management information system in Pakistan. Pak J Med Res, 41, 64–9.	<ul> <li>Objectives:</li> <li>1. To do a situational analysis of the Health Management Information System (HMIS) in Pakistan, highlighting strengths and weaknesses in the system.</li> <li>2. To review the present status of the GI s in the health information system in Pakistan.</li> <li>Study Setting: Pakistan</li> </ul>	<ul> <li>Method: The main methodology used was interviews with key stakeholders, including government officials and donor agencies, besides the literature review of relevant documents. The results showed that currently the HMIS is generating information and its coverage is encouraging, but at the same time it needs a lot of room for strengthening at various levels.</li> <li>Findings: Health information is information about people's health and what they, the government, and others are doing about it. It describes the incidence, prevalence, and causes of major diseases, as well as availability and effectiveness of curative activities.</li> <li>The HMIS is generating tremendous amounts of information, which flows directly from the peripheral health facilities to the district computer centers, then to the divisional and provincial computer cells. Ultimately, this information reaches the National Health Management Information System Cell. At present, almost 110 districts are sending the reports to the National HMIS Cell and the percentage of the reports received from these districts is 76%. The results showed that currently HMIS is generating information and its coverage is encouraging, but at the same time it needs room for strengthening at various levels.</li> <li>The HMIS approach seems more 'data driven' than 'action oriented;' there is duplication and lack of coordination among various vertical health information.</li> <li>Current HISs are therefore widely seen as management obstacles rather than as tools. The reasons can be summarized in the following points:     <ul> <li>Duplication and waste among multiple parallel health information systems</li> <li>Poor quality of data</li> <li>Lack of timely reporting and feedback</li> <li>Lack of information on management issues, and inadequate information usage</li> </ul> </li> </ul>
29.	Nawaz, R., Khan, S. A., & Khan, G. S. (2015). SWOT analysis of district health information system in khyber pakhtunkhwa. Gomal Journal of Medical Sciences, 13(2).	Objective of this study was to evaluate and highlight within a framework of a SWOT analysis, the strengths, weaknesses, challenges, and opportunities of the District Health Information System. Study Setting: KPK, Pakistan	<ul> <li>Methods: Provincial office and two districts (Nowshera and Swabi) were assessed for DHIS by conducting SWOT analysis. Literature was searched and health managers were interviewed for detailed information regarding DHIS in Khyber Pakhtunkhwa province.</li> <li>Findings: SWOT analysis included: <ul> <li>Strengths of DHIS as infrastructural design of the system at the provincial level, and computerized systems at district and provincial levels.</li> <li>Weaknesses identified in the system included invalid data, non-integration of the system with DHIS program, non-motivated and untrained staff, improper implementation with any supervision mechanisms, and non-usage of information for any decision-making process.</li> <li>Opportunities included integration with other sources of information, making coverage of services vast, potential contribution in health system research, and use of quality and valid data for decision-making in planning and management.</li> </ul> </li> </ul>

			<ul> <li>Threats the program may face are non-political commitment, lack of funds for stationery, social threats, and implications for professional malpractices.</li> <li>DHIS coordinators from both the districts informed about the timely submission of monthly reports to the district health office from over two-thirds of the health facilities of the district. Data is entered into computer at the DHO office and then sent to the provincial health directorate for further processing. Standard data collection tools are available in health facilities and the district health office. Data collected at health facilities are compiled in the form of monthly reports. Data from monthly reports are stored in computers at the district health office.</li> <li>There is little knowledge on analysis, interpretation, or utilization of data and inadequate skills in understanding and processing of information. There are usually staff conflicts (senior management and staff), and the senior level does not want lower staff to benefit in any way.</li> <li>DHIS is lacking in integration of various public health programs, especially EPI and the national program for FP &amp; PHC since the devolution of health to the provinces with the 18th amendment in the constitution in 1973.</li> <li>Political commitment must be there in making sound health policies. Good governance, change and sustaining the health management and administration culture, introduction of punishment and performance incentives, workers' motivation and accountability are all essential. There should be a provincial health policy formulation addressing all building blocks of the health system, including DHIS. Training workshops for workers, continuous research, monitoring and supervision of DHIS throughout the province were the other recommendations.</li> </ul>
30.	Islam, A., Malik, F. A., & Basaria, S. (2002). Strengthening primary health care and family planning services in Pakistan: some critical issues. JPMA. The Journal of the Pakistan Medical Association, 52(1), 2–7.	This study was conducted to understand the problems faced by the LHWs and VBFPWs in their routine work. <b>Study Setting</b> : Karachi, Pakistan	<ul> <li>Methods: A situational analysis followed by focus group discussions conducted with a cross-section of LHWs and VBFPWs in four districts, one from each province.</li> <li>Findings: Findings revealed that LHWs and VBFPWs are faced with a number of problems that severely limit their effectiveness.</li> <li>Moreover, these two categories of workers differ considerably in terms of level of education, training, and skills. There is a lack of well-designed client record cards, proper training, and backup support, including emergency obstetric care, to cover the range of essential services demanded by the consumers and a lack of information feedback.</li> <li>Compared to the VBFPWs, the LHWs use much more complex and numerous reporting tools. However, these multiple reporting tools not only contain duplication in terms of information collected, but also include rather redundant items.</li> </ul>

			Such duplication and redundancy make the LHWs 'waste' a considerable amount of their time that could otherwise be utilized in the field. Every month, the LHWs are required to submit a monthly report to the health facility through their supervisors and receive their monthly supplies from the health facility. The salary structure of these two levels of frontline workers is also different. Although LHWs are better trained and perform more diverse and complex functions, their monthly salary is a little lower than that of the VBFPWs. However, salary disbursements seem to be irregular. During the focus group discussions, both the LHWs and VBFPWs complained of not receiving a salary for the 'last three months.' Clearly, this irregularity in salary disbursement acts as a disincentive for these frontline workers.
31.	Jain, A. K., & Jain, A. Family planning in Asia and the Pacific addressing the challenges	The first objective was on how the program has evolved since its inception; the second on the trends in family planning outcomes over the last two decades; and the third on explanations for Pakistan's poor performance, and recommendations on how to make the population program more effective. Study Setting: Pakistan	<ul> <li>Methods: Both analysis of secondary data, mainly taken from fertility surveys conducted over the last two decades, as well as primary data collection, through interviews with key stakeholders.</li> <li>Findings: Family planning services were first introduced in the government's First Five-Year Plan 1955-1960 through the Family Planning Association of Pakistan (FPAP) and other voluntary organizations. Over the next two decades, the major achievements included: the creation of an independent family planning set-up, a mass-scale information, education and communication (IEC) campaign, and the establishment a service delivery network in the 1960s; and the introduction of the 'Continuous Motivation Approach' in the 1970s. The role of quality of family planning services and methods in the uptake of contraceptive use demonstrates yet another failing of the supply of family planning. In their analysis of DHS data, Zaidi (2009) found that over time increasing numbers of women have reported fear of side effects and health concerns as their primary reason for not intending to use contraception in the future.</li> <li>The NGO sector in Pakistan is probably the one most affected by the shortages in funding for FP, and NGOs have moved into newer reproductive health research areas, such as HIV/AIDs, where funding was available. As a result, funding channels for NGOs working on FP and RH have been limited, except by the very large NGOs, such as FPAP. Marie Stopes Society, etc. The program can be strengthened through the following means: <ul> <li>Strong monitoring and oversight role at the center, but with full participation of provinces</li> <li>Strong body to steer, assist, and coordinate the role of the private and not-for-profit sector</li> <li>Maximum number of NGOs and CBOs providing services in areas where underprivileged, hard to-reach populations are located</li> </ul> </li> </ul>

32.	USAID. (2009). Review and	To review and assess various	Methods: A variety of qualitative and quantitative methodologies were used to review the
	assessment of various	PHC models implemented in	performance of the PHC models in terms of accessibility, acceptability, infrastructure, resources,
	primary health care	Pakistan to generate	knowledge of service providers, service delivery and utilization, community participation, and quality
	models in Pakistan.	evidence for restructuring of	of care (QOC). The qualitative research was conducted through key informant interviews to
	TACMIL Health Project.	PHC service delivery for better	understand management structure and functions, organization of service delivery, coordination and
	Retrieved from	health outcomes.	linkages with the overall health system, and community participation.
	http://pdf.usaid.gov/pdf_		
	docs/Pnadw278.pdf	Study Setting: Pakistan	Findings: Interviews with key informants revealed that health facilities that employ integrated routine
			neaith service delivery and evidence-based decision making are quite uncommon.
			Fragmonted outroach and facility based service delivery vertical information systems, and lack of
			ossential service packages and OOC standards further mar the system. Monitoring and evaluation
			(M&E) activities in the health sector are confined to supervisory practices and there is no built in routine
			M&E system in place to track the progress of National Health Policy implementation.
			······································
			The first major gap found in PHC management is the lack of a culture of evidence-based decision
			making in the public health sector, especially at the district level. The decision making, especially
			resource allocation, is based mainly on capacity and the historic structures (number of hospital beds,
			health outlets, and staff strength), rather than performance (units of service provided) or need (size
			and health status of the population).
			A second major issue is the tragmentation of outreach and facility-based service delivery. The EDOH
			making is retained by federal program units. This situation has created management conflict and poor
			ownership of national programs by the district health department
			ownersnip of hational programs by the distilet health department.
			The third major issue is the vertical HMIS owned by various national programs. The information systems
			are too vertical, centrally oriented, and poorly linked to program subsystems; in addition, they are
			overloaded with data that are of little relevance to the technical management of the health
			programs at the operational level. M&E processes are usually not built into the HMIS. Therefore, a
			holistic picture of a district's overall health performance is not available in one place—instead,
			information is tragmented, and so is the management of health programs and activities.

33.	World Health Organization. (2013). Country cooperation strategy for WHO and Pakistan 2011–2017.	Its aim is to facilitate the provision of health for all within the purview of the primary healthcare philosophy and the pursuit of the Millennium Development Goals (MDGs). Study Setting: Pakistan	<ul> <li>Methods: The current document discusses the priorities for Pakistan for the period 2011–2017 under the unique circumstances of no Ministry of Health at the national level. The document critically analyses in great detail the health situation in the country, including strengths and weaknesses of all six building blocks of the health system, activities of health development partners, and the exact pattern of financing in the health sector of Pakistan.</li> <li>Findings: Research, monitoring and evaluation, and surveillance remain weak at all levels due to a lack of focus on results and the absence of an integrated system. The need for evidence-based knowledge to inform policy-making and management decisions is especially imperative for the efficient use of limited resources and the benefit of the poor and marginalized people. Despite recognition of the importance of using research to influence policy and practice, understanding of how evidence uptake might be achieved is less clear. It continues to be confronted with major issues such as poor data quality and accuracy, with negligible use of information from the large private sector hospitals to enable the state to undertake its function of protecting the larger public interest. </li> <li>Weak information systems often lead to suboptimal institutional mechanisms for monitoring and evaluation, coupled with lack of ownership and organizational support for data and information. Governments tend to focus more on routine data coming from the health information systems than on data collected through household surveys. </li> <li>Pakistan has not undertaken a national health survey for more than a decade. However, at present Pakistan has no single surveillance system able to generate high quality information for making key public health decisions. The fragmentation results from a lack of organizational capacity for surveillance at all levels, a legal framework for disease reporting, and a skilled workforce and resources for this important function.</li></ul>
34.	Shidende, N. H. (2005). Challenges and approaches to the integration of HIS: Case studies from Tanzania (Master's thesis).	The purpose of the research was to study the challenges encountered by the health workers at the local level with regard to information collection, use, and reporting. The focus of this thesis is on problems of fragmentation and challenges of integration. <b>Study Setting:</b> Tanzania, South Africa	<ul> <li>Methods: The study employed qualitative research methods, including: ethnographic interviews, participation in workshops, document analysis in the health facilities, and hands-on experience with existing computer systems in the district. The empirical data were analyzed using the principles of qualitative research, and the analysis was informed by my theoretical framework.</li> <li>Findings: The findings indicated that the HIS performance is hindered by the fragmentation within and across the HIS. Fragmentation creates duplication of work and data, lack of information sharing, and poor quality of information, poor use of information, and hindering of health care service provision. As an organizing framework to describe the findings, the study categorizes them into four dimensions, fragmentation problems related to: software, to data, to work practices, and to institutional factors.</li> </ul>

		: the system's level, the problems are inflexible code, poor performance of the computerized system, and different software between programmes.
		The low performance is reflected in the duplication and waste among parallel information systems, poor quality of data, irrelevance of the data gathered, lack of timely reporting and feedback, and poor use of information.
		However, it has been argued by various researchers that the information system concept in developing countries needs a holistic approach, involving not only technical matters but also socioeconomic ones. The problems associated with information systems in developing countries include poor quality data, lack of resources (material and human), lack of transport/communication, and fragmentation of information systems caused by the donor community.
		IT: The authors point out that different professional groups associate different meanings to the term integration—IT professionals will associate technical integration, health professionals may think about integrating data sets and indicators, and policymakers may think of institutional/organizational integration.
		Software issues: Often, different software programmes are used in different subsystems of a HIS or in different vertical programmes (Braa et al. 2005).
		Data issues: The content, meaning, and logic aspects of data, indicators, and information may vary and integration at the level of data and indicators is basically about standards and standardization
		Institutional related: This involves coordination between different actors involved in the implementation of the HMIS (Braa et al. 2005:5). An example of such a situation is where donor-funded systems have better quality than routine systems due to availability of resources such as data collection materials.
		The adverse effects of fragmentation include duplication of work and data, lack of information sharing, and poor quality of information—all contributing to poor use of information systems due to the multiplicity of channels. Integration may be any bringing together of things and fragmentation may mean one part which has been broken into many pieces or separate parts. With respect to software, integration requires interconnection and interoperability. The term interoperability means that different programmes can read and write the same file formats and utilise the same network protocols, so that different products can work together to accomplish tasks. This makes standardisation a crucial feature of integration (Braa et al. 2005). However, integration is more than the technical side; it often touches on fundamental issues within the organisation concerned, including issues of ownership and whether people want to share their data.
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35.	Galimoto, M. (2007). Integration of health information systems: Case study from Malawi (Master's thesis).	The objective of this study was to assess the HIS in Malawi to identify where fragmentation exists, understanding why it exists with the purpose of making conclusions and recommendations on whether and how the identified fragmentation could be reduced. Study Setting: Malawi, South Africa	<ul> <li>Methods: The study used qualitative research methods such as semi-structured interviews; document analysis; participant observation of activities such as meetings and facility supervision; and software analysis of the empirical data was informed by literature reviewed on health management, the components/aspects of HIS, the factors causing fragmentation in HIS, and the proposed strategies for reducing fragmentation in order to improve overall health system performance.</li> <li>Findings: The research revealed that fragmentation existed in the HIS, even though commendable efforts had been made by the MOH to achieve an integrated HIS through implementation of the HMIS. The fragmentation existed in that, in addition to the HMIS, parallel programme-specific reporting systems were operating. This parallel reporting was attributed to various reasons, including the fact that the HMIS did not meet the information requirements of the programmes because it did not provide data on a monthly basis and it did not collect all the data elements required by the district programme coordinators and by national level programme management functions. All health personnel involved in managing and delivery of health services are expected to collect, aggregate, and analyse information using paper, pencil, and a simple calculator and make immediate use of the data in their daily work. At the end of every quarter each facility aggregates data from all the registers into a quarterly report and submits it to the district health office, i.e., to the statistician as indicated in the institutional set up.</li> <li>The statistician compiles a report each quarter based on the quarterly reports received from the facilities in the district. A computerized system, the DHIS, has been established to assist in processing data from each facility, including the district hospital. The district report is the submitted to the MOH, i.e., the HMIU. This report is also required to be fed back to the health facilities and other stakehold</li></ul>
			The factors contributing to fragmentation were inflexible code, poor performance of the computerized system, and different software between programs. In terms of work practices, the study revealed problems related to information sharing between staff of different programs and at the institutional level, the problems were related to clients attending several and different clinics. Existing HISs had been unable to provide information in a timely and useful manner which resulted in parallel reporting systems, primarily along vertical program lines. Therefore, the development of the HMIS was a direct effort to eliminate the fragmentation that existed because of parallel reporting. Specifically, the HMIS aims to provide program managers and staff with reports on how well each program is functioning and to alort sources.

Note: This matrix contains text taken from relevant articles; the text is not paraphrased so the originality of the text could be retained.

# Appendix C. Core Tasks of LHWs

Core Tasks of LHWs
Register and educate all eligible couples, in the catchment population, about FP methods
Distribute oral contraceptives pills, condoms, and Injectable contraceptives to eligible couples
Facilitate IUD and surgery from nearest centers for eligible couples
Maintain a register of all pregnant mothers and children under 5 years in the catchment population
Look after pregnant mothers and issue them pregnancy cards
Provide iron and folic acid tablets for pregnant mothers and women of reproductive age
Encourage and facilitate antenatal, birth, and post-natal care by a skilled birth attendant (SBA)
Facilitate expanded program of immunization
Provide basic treatment and appropriate referrals for children with diarrhea and acute respiratory infections
Raise awareness about balanced nutrition
Educate women of all ages on common ailments
Encourage breastfeeding and complimentary feeding
Health education through growth monitoring of children
Promote use of iodized salt in the community
Provide treatment for common ailments
Provide awareness on prevention from Malaria and TB and participate in DOTS management
Provide awareness on prevention and control of HIV/AIDS and STDs
Promote principals of basic hygiene
Prepare and submit a monthly report about her work, on a structured performa, to the attached health facility (FLCF)
Maintain a close liaison with the lady health supervisor
Provide medicine/supplies provided by the government, to the catchment population
Maintain close liaison with the attached health facility for skill training, supplies and supervision, as well as for referral
Additional Tasks Undertaken by LHWs
Immunization, including Ntl. Immunization Days (About 20 million polio doses administered by LHWs)
Maternal Neonatal Tetanus: LHWs' role was recognized in the success of neonatal tetanus elimination campaign and they vaccinated hard to reach groups of women in difficult areas
Measles campaign: In the recent nationwide measles elimination campaign almost 100% coverage was achieved by involving LHWs
Emergency relief activities (earthquake relief, 2006; flood relief, 2007-2008)
TB DOTS: LHWs play a vital role in case detection and case retention to enhance treatment completion and cure rates
Malaria control: Results-based management programme utilizes LHWs in various malaria control activities

Innovations: Various innovations have been introduced in the programme after pilot testing through LHWs to extend these PHC services to the community

# WORKING PAPER

### **MEASURE** Evaluation

Carolina Population Center University of North Carolina at Chapel Hill 123 West Franklin Street, Suite 330 Chapel Hill, North Carolina 27516 Phone: +1 919-445-9350 | Fax: +1 919-445-9353 Email: measure@unc.edu www.measureevaluation.org

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