Scoping Mission on the Review of Pakistan National Health Information System

World Health Organization
Regional Office for the Eastern Mediterranean
Department of Information, Evidence and Research
Health Information and Statistics
Cairo, Egypt
Email: emrgohis@who.int

5 February 2017

World Health Organization
Regional Office for the Eastern Mediterranean

Contents

Acronyms

AJK	Azad Jammu and Kashmir (autonomous territory)
BHU	Basic Health Unit
BLN	Balochistan (province)
DHIS	District Health Information System
DHS	Demographic and Health Survey
EMR	Electronic Medical Records
EPI	Expanded Programme on Immunization
FATA	Federally Administered Tribal Areas
GAVI	Global Alliance for Vaccines and Immunization
G-B	Gilgil-Baltistan (autonomous territory)
HIS	Health Information System
HIMS	Health Information Management System
HIV	Human Immunodeficiency Virus
HMN	Health Metrics Network
ICD	International Classification of Diseases
ICT	Information and Communications Technology
LHW	Lady Health Worker
LHV	Lady Health Visitor
M&E	Monitoring and Evaluation
MIS	Management Information System
MNHSRC	Ministry of National Health Services, Regulations and Coordination
NACP	National AIDS Control Programme
OPD	Out Patient Department
PITB	Punjab Information Technology Board
MICS	Multiple Indicator Cluster Survey
MNCH	Maternal, Newborn and Child Health
PHC	Primary Health Care
PSLM	Pakistan Social and Living Standards Measurement (Survey)
RHC	Rural Health Centre
RIC	Rawalpindi Institute of Cardiology
SDG	Sustainable Development Goal
vLMIS	Vaccine Logistics Management Information System
cLMIS	Contraceptives Logistics Management Information System
WHO	World Health Organization

Summary

Health information systems (HIS) including civil registration and vital statistics systems are indispensable sources of health information data for programme monitoring, performance monitoring, quality of care, planning, and policy making, among others. While HIS data offer many opportunities to assess various aspects of the health system, the processes of national level collation of health statistics are severely hampered in Pakistan after the devolution. Routine health statistics are collected through the District Health Information System (DHIS) and programme Management Information Systems (MIS). These statistics were not systematically relayed to the federal level for analysis and preparation of national health indicators for national and international dissemination since 2011. After consultations with provincial health departments, international aid agencies and development partners, the Ministry of National Health Services, Regulations and Coordination (MNHSRC) established a Health Planning, Systems Strengthening and Information Analysis Unit in July 2015. This unit is envisioned to function as a knowledge management hub for producing national level aggregated figures and numbers for country level reporting since Pakistan is a signatory to international treaties and the Sustainable Development Goals (SDGs).

To better understand the focus areas for a planned WHO-led HIS review mission in 2017, a scoping mission to Pakistan was conducted from 13 to 16 December 2016 at the request of MNHSRC through the WHO Regional Director. The scoping team specifically aimed at informing strategic planning and development of terms of reference - within the context of the devolution - for a full mission to review the national HIS and MIS in health in 2017. The planned HIS review is aimed at supporting Pakistan's efforts to monitor its health development agenda as well as enhance its reporting capacity on the 100 core health indicators, the 68 regional core indicators, and the health-related SDGs. To achieve this, meetings were held with officials from MNHSRC and also included field visits to selected health institutions.

During the scoping mission, a number of observations were made related to HIS in Pakistan. The main strengths of the HIS includes the establishment of a functional Health Planning, Systems Strengthening and Information Analysis Unit that is envisioned to act as a knowledge management hub for producing national level aggregated figures and numbers for Pakistan. Nevertheless, the structure of the national HIS remains fragmented with a number of vertical and multiple information systems that are not integrated at the district, provincial and national levels. For example, there is a vertical MIS for the Lady Health Worker (LHW), Community Midwife, Tuberculosis and other programmes. The broader goal of the Pakistan HIS is to provide updated information about disease and health indicators in order to strengthen coordination, management and planning of health interventions at the national level. However, this can only be achieved if the respective HIS and vertical program MIS are defragmented and linked or integrated horizontally from a health system's perspective.

The MNHSRC has recognized the challenges of fragmentation and is keen to implement measures aimed at unifying the various HIS and preparing the country to report on the development indicators at the national, regional, and international levels. The scoping team

identified a number of key strategic areas that, if addressed, can lead to a unified system, strengthen coordination among various systems and stakeholders, and strengthen capacity of staff in data collection, analysis, information transmission, use and dissemination. A detailed discussion of the proposed focus areas for the planned full HIS review mission in 2017 is presented in the main body of the report. However, a summary of the overarching proposed areas for the planned HIS review mission in 2017 is presented below:

- Identifying ways to address the fragmentation of the HIS and MIS and to make recommendations and provide technical support to streamline mechanism for regular reporting from provincial to federal level. This will ensure that data are reported and consolidated at the national level as well as ensuring that the existing systems are able to address programme specific objectives.
- Mapping of key stakeholders to constitute the national HIS coordinating committee including development of the terms of reference and establishment of a technical sub-committee at the Federal level with representation from provinces and regions. This coordinating committee will respond to strategic issues related to HIS and act as a feeder for the Inter-Ministerial Committee on Health.
- Identify system strengths and weaknesses related to capacity building, data collection, and analysis. This should also include mapping ways to strengthen capacity and promote the culture of evidence-based decision making at the district, provincial, and national levels. If the interest to implement DHIS2 grows, the review team should identify ways for Pakistan to roll out DHIS2 training in an efficient and cost effective way.

The implementation and consistent use of DHIS is one of the important activities that the Ministry of National Health Services, Regulations and Coordination has been conducting to ensure that health related data are generated for policy and planning at the national and provincial levels. However, generating data is not an end in itself but the beginning of a process that leads to effective use of the information collected. Information can be effectively used if the national HIS is consolidated and includes data from multiple sources such as vertical programs. Nevertheless, the current national HIS suffers from fragmentation due to lack of integration of the various systems that generate health related data. With growing enthusiasm by the Federal and Provincial Governments to improve the DHIS and the existing potential to develop a unified HIS, Pakistan will make significant progress in monitoring and tracking the progress towards the health related SDGs by 2030. Therefore, this report provides an opportunity to finalize the scope, terms of reference and timeline for the planned full HIS review mission in 2017.

1. Introduction

Health information systems (HIS) including civil registration and vital statistics (CRVS) systems are indispensable sources of health information data for programme monitoring, performance monitoring, quality of care, planning, and policy making, among others. HIS and CRVS systems are the only information sources that provide continuous information on the coverage of services in the health sector. The availability of HIS data at the sub-national level provides countries with an opportunity to assess equity in the provision of health services.

While HIS data offer many opportunities to assess various aspects of the health system, the process of national level collation of health statistics are severely hampered in Pakistan after the devolution. Routine health statistics are collected through the District Health Information System (DHIS) and programme Management Information Systems (MIS). The information was not systematically relayed to the federal level for analysis and preparation of national health indicators for national and international dissemination since 2011. After consultations with provincial health departments, international aid agencies and development partners, the Ministry of National Health Services, Regulations and Coordination (MNHSRC) established a Health Planning, Systems Strengthening and Information Analysis Unit in July 2015. This unit is envisioned to function as a knowledge management hub for producing national level aggregated figures and numbers for country level reporting since Pakistan is a signatory to international treaties and the Sustainable Development Goals (SDGs).

To better understand the focus areas for a planned WHO-led HIS review mission in 2017, a scoping mission to Islamabad and Lahore in Pakistan was conducted from 13 to 16 December 2016 at the request of MNHSRC through the WHO Regional Director. The scoping team (see Annex 1) specifically aimed at informing strategic planning and development of terms of reference - within the context of the devolution - for a full mission to review the national HIS in 2017. The planned HIS review is aimed at supporting Pakistan's efforts to monitor its health development agenda as well as enhance its reporting capacity on the 100 core health indicators[1], the 68 regional core indicators[2], and the health-related SDGs.

2. Methodology

There were two key objectives to the scoping mission: (1) To understand how the overall structure of the HIS system in Pakistan enable or hinder reporting of national, regional, and international core indicators; and (2) To identify key areas to strengthen the existing system and ensure that it is responsive to national, regional, and international demands for data within the context of the health-related SDGs. Meetings were held with officials from MNHSRC and the Punjab Provincial Ministry of Health. A meeting with the Punjab Information Technology Board (PITB) was cancelled due to logistics reasons. The meeting in Punjab aimed at a broader understanding of the DHIS and its linkage with other HIS/MIS as well as the different dashboards currently in use. A visit was also made to the Rawalpindi Institute of Cardiology (RIC) to review the functionality of the Electronic Medical Records

[1] http://www.who.int/healthinfo/indicators/2015/100CoreHealthIndicators_2015_infographic.pdf?ua=1
[2] http://applications.emro.who.int/dsaf/EMROPUB_2016_EN_19169.pdf?ua=1

(EMR) system. A full list of people met during the scoping mission is presented in Annex 2. During the meetings, discussions focused more on strategic issues than detailed technical issues. The latter will be the focus of the full review mission. Therefore, this report focuses on selected areas that will inform the planning for the full review mission.

3. Findings on the national HIS

3.1 Overview of National HIS

The structure of the national HIS (Figure 1) includes a number of vertical and multiple information systems that are not integrated (Figure 2). For example, there is a vertical MIS for the Lady Health Worker (LHW) and Visitor (LHV), Community Midwife, Tuberculosis and other programmes.

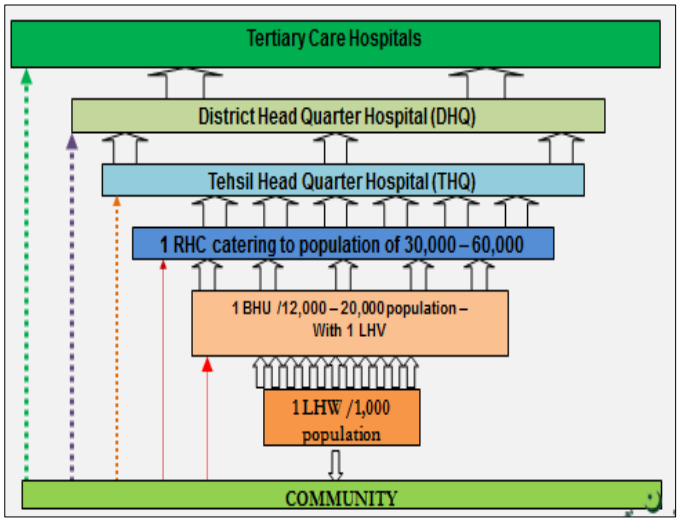

Figure 1. Pakistan Healthcare Delivery System at the Primary and Secondary Level
Source: MNHSRC

The national HIS aims at providing updated information about disease and health indicators in order to strengthen coordination, management and planning of health interventions at the national level. Through a publicly available dashboard[3], the Pakistan HIS provides information from latest surveys including the Pakistan Social and Living Standards Measurement (PSLM) Survey - carried out after every two years, Multiple Indicator Cluster Survey (MICS) and Pakistan Demographic and Health Survey (DHS; carried out every 5 years) (Figure 3). The system also makes available information on health programmes including the Expanded Programme on Immunization (EPI); Tuberculosis; LHW; Maternal, Newborn, and Child Health (MNCH); among others. Similar information systems are being developed for the four provinces (Balochistan, Punjab, Sindh, and Khyber Pakhtunkhwa) to position the country to report on the SDGs and other national needs.

S #	Information Systems	Source of data	Current Linkage	Remaining Linkage
1	LHW-MIS	Community based	Sindh Province only	6 provinces/regions
2	DHIS	Primary and secondary facilities	4 provinces (Punjab Province in process)	G-B, AJ&K, ICT, FATA
3	MNCH	Community based	6 provinces and regions	FATA, ICT
4	M&E	Both	Sindh, Punjab and KPK Provinces	BLN, G-B, AJ&K, ICT, FATA
5	EPI	Both	8 regions including ICT & National	None
6	vLMIS	Facility based	8 regions including ICT & National	Not all of each province covered
7	cLMIS	Facility based	8 regions including ICT & National	Not all of each province covered
8	TB Control	Facility based	4 provinces	G-B, AJ&K, ICT, FATA
9	Malaria	Facility based	None	All
10	Nutrition		None	All
11	Polio		None	All
12	Hepatitis		None	All
13	NACP -HIV		None	All

Ministry of National Health Services Regulations & Coordination
THE GOVERNMENT of PAKISTAN

Figure 2. Current linkages of Pakistan Health Information System with DHIS and MIS of the provinces and regions
Source: MNHSRC

[3]www.nhrsc.gov.pk/; last accessed 14 December 2016.

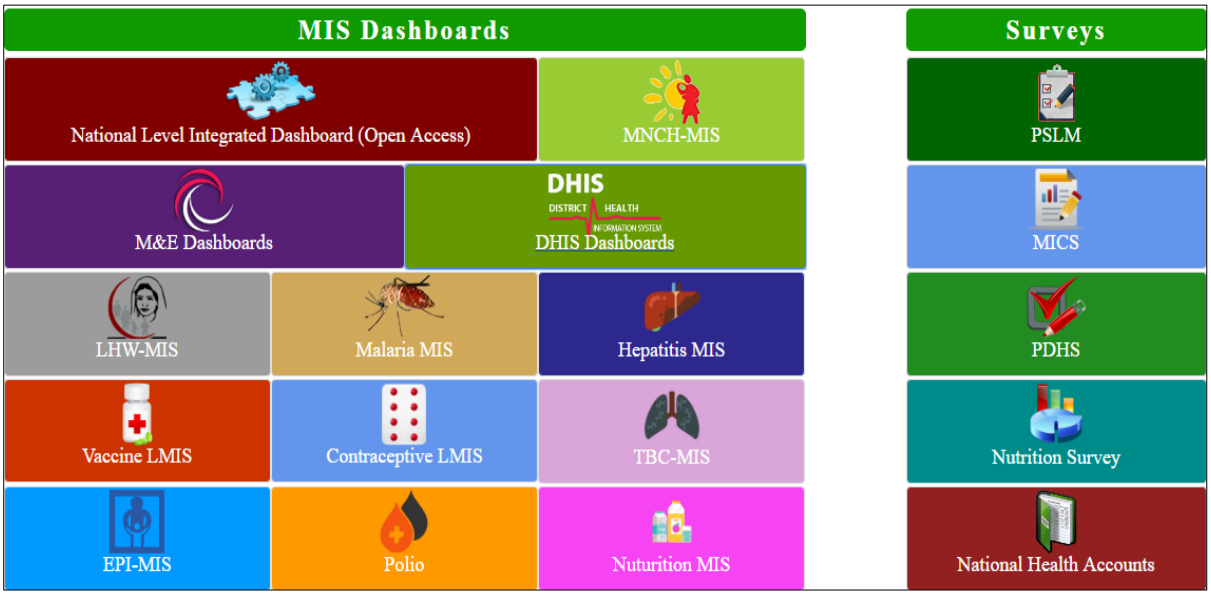

Figure 3. Pakistan Health Information System Dashboard
Source: MNHSRC; www.nhrsc.gov.pk/

In Pakistan, reporting on health information has evolved and varied across provinces since the 1970s and 1980s. For example, in Punjab province over 200 indicators were being reported since the 1970s and have been reduced to 52 within the current DHIS. Other provinces are reporting on different number of indicators. Thus, the DHIS has been customized to focus on the reporting of key indicators. However, a number of challenges facing the current system were highlighted during the meetings held with the Federal MoNHSRC and the Provincial Department of Health in Punjab. These include:

- *Fragmentation and existence of multiple systems* implemented by vertical programs such as EPI, TB, LHWs, and HIV/AIDS Programme. Some of the vertical programmes have effective information systems such as the web-based system for all the 21 centres providing HIV treatment to 8,133 individuals registered at the national level (as of September 2016). However, these systems are not integrated to enable Pakistan produce a consolidated and representative national report on health indicators. That is, the impact of activities and interventions in the provinces are not known or tracked within the HIS. Fragmentation also exists at the provincial level with different provinces implementing different HIS.
- *Irregular reporting of data from districts to provinces* particularly for vaccines and logistics within the EPI; including lack of reporting of data by the private sector which, for example, contributes 24% of the TB cases. Majority of tertiary hospitals do not report data to the federal level.
- *Lack of paperless systems* for some of the programmes such as Malaria which can be facilitated by developing dashboards for coverage, surveillance, and monitoring and evaluation.
- *Quality assurance and completeness of data* produced from existing systems such as data from the TB Programme. For example, of the 500,000 estimated TB cases only 330,000 are notified. Hence, there is lack of information on the status of 170,000 people.

- *Capacity building in data analysis* is needed to strengthen the HIS both at federal and provincial levels. This is very important within the context of the developments and interventions for social protection through the Prime Minister Health Programme which provides health care for poor families to the maximum of 300,000 Pakistan Rupees per family per year[4]; and the HIS should be the backbone to assess effectiveness over time.
- *Efforts to implement a web-based system for the TB programme* were initially unsuccessful due to bugs that were identified during the conversion from paper-based to web-based system. However, efforts to address this challenge are ongoing and may benefit through technical support.

Efforts are being made to address some of the challenges and the MNHSRC is keen to update the current DHIS and explore opportunities to transition to DHIS2 in the near future[5]. These efforts include but are not limited to (1) meetings to develop standards and agree on a common format/tools for data collection and reporting at the provincial level; (2) Engaging the private sector to collect and report data, e.g. on immunization and reporting cases of notifiable diseases; (3) exploring opportunities for public-private partnerships; (4) designating focal points in every district to report data on programs such as malaria and HIV/AIDS; (5) working on integration of systems to ensure that services are properly aligned with demand; for example, identifying people who are HIV positive and ensuring that they receive treatment; and (6) implementation of data quality audits recommended by WHO and GAVI Alliance. These initiatives are being implemented as part of a donor funded workplan for 2014-2019.

<u>Recommended focus for the review:</u> The full review mission should focus on identifying ways to address the fragmentation of the national HIS and to streamline mechanism for regular reporting from provincial to federal level. This will ensure that data are reported and consolidated at the national level as well as ensuring that the existing systems are able to address programme specific objectives. Specifically, ways to address the challenges of integrating the vertical MIS into the current DHIS should be explored with focus to align these with the SDG 3 indicators and the 68 regional core health indicators. In addition, opportunities to explore enabling factors for a transition to DHIS2 should be explored. This is important

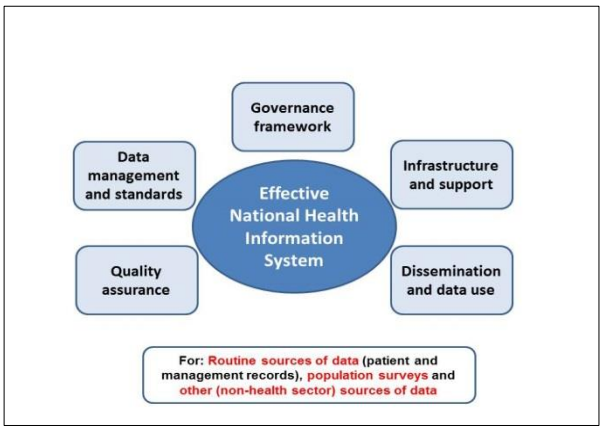

Figure 4. Effective national health information system
Source: WHO Regional Office for the Eastern Mediterranean, version 2.

[4]As of December 2016, the programme was earmarked for implementation in 23 out of 151 districts; with the programme launched in 13 districts and planned for the remaining 10 districts. 300,000 Pakistan Rupees was almost US$2,900 in December 2016.

[5]DHIS 2 enables countries to collect, manage and analyse transactional, case-based data records; and lets them store information about individuals and track these persons over time using a flexible set of identifiers. For example, DHIS 2 can be used to collect and share essential clinical health data records across multiple health facilities. Individuals can be enrolled for longitudinal programs with several stages. The system can be configured for SMS reminders, track missed appointments, generate visit schedules, among others (https://www.dhis2.org/overview).

considering that the DHIS2 promoted by WHO utilizes data from multiple sources; and also that some provinces are trying to expand the current DHIS to accommodate the multiple MIS and enable it generate a holistic HIS. The review should also focus on all the key components of a well-functioning HIS (Figure 4) which were highlighted during the scoping mission.

3.1.1 Rawalpindi Institute of Cardiology Electronic Medical Records System

A visit was made to Rawalpindi Institute of Cardiology (RIC) located in Rawalpindi, Punjab Province, to understand its operations and identify its linkages with the national HIS. RIC is a 272-bed non-profit and autonomous tertiary level Cardiac hospital. Inaugurated in September 2012, RIC - apart from the management of patients - also helps patients and their families learn about treatments, identify risk factors and work toward making heart-healthy lifestyle changes. RIC is also one of the well-equipped cardiac hospitals in Pakistan.

In brief, RIC maintains a comprehensive EMR system and operates on a redundant network infrastructure[6] covering 26 HIS/MIS modules; with flexibility to include additional modules. The system uses unique patient identification including the national identification number. The RIC system is paperless and real-time for virtually all processes from registration of patients, referral to other departments within the institute and to discharge. The institute has the source codes for its EMR making system modifications and troubleshooting easy; and holds fortnight meetings to review system operations and define/update user needs. RIC is running a huge client base, with over 200,000 registered patients as of December 2016. The team was shown almost 1,000 new patients that visited the facility by 11am on the day of the mission on 13 December 2016.

While the RIC system's functionality is an ideal model for hospital information systems, the team was informed that the system is not integrated with the national HIS. The RIC team highlighted the importance of the enormous data being collected yet the data are not reported to the federal level. In addition, similar institutions have their own different electronic systems and also do not report data to the national level but only use them internally. This is an example of fragmentation.

<u>Recommended focus for the review:</u> Discussion with the management of RIC or any other health facility that will be selected for field visit should focus on identifying enablers for integration of the EMR though the DHIS to the national HIS.

3.1.2 Punjab District Health Information System

A visit was made to Lahore in Punjab Province to discuss the DHIS and its linkage with other information systems. The team met staff from the Directorate General of Health Services which houses the HIS (see organogram, Annex 3) and was informed that from independence (in 1947) to 1992, Punjab used manual reporting system. With a population of almost 100 million and spread across 36 districts, implementation of HMIS in the province took place

[6]Network redundancy provides an existing network infrastructure with additional or alternate instances of network devices, equipment and communication mediums to ensure network availability in the event of network device or path failure and unavailability. Hence provides a means of network failover.

between 1993 and 2006. During the 1993-2006 period, Punjab province collected and analysed data from first level care facility (includes, BHUs and RHCs) by focusing on 18 priority diseases. In 2004, the Government of Pakistan upgraded the HMIS to DHIS with funding from the Japanese International Cooperation Agency. The DHIS was piloted in 2006 and the number of priority diseases was increased from 18 to 43. Since 2006, the Government at the Federal and Provincial levels has supported the DHIS which continues to provide selected key information from primary and secondary level facilities including vertical programs and sub systems such as logistics, financial, human resources and capital asset management. There is 99% compliance in reporting of all the indicators across all facilities and districts. The list of tools or instruments used as of December 2016 is presented in Table 1.

Table 1. DHIS tools used by the Directorate General of Health Services, Punjab Province

DHIS Instrument No.	**Description of Instrument**
DHIS – 01 (R)	Central Registration Point Register
DHIS – 02 (R)	OPD Ticket | DHIS – 02-A (F) | Medicine Requisition Slip
DHIS – 03 (R)	Outpatient Department Register
DHIS – 04 (R)	OPD Abstract Form
DHIS – 05 (R)	Laboratory Register
DHIS – 06 (R)	Radiology/Ultrasonography Register
DHIS – 07 (R)	Indoor Patient Register
DHIS – 08 (R)	Indoor Abstract Form
DHIS – 09 (R)	Daily Bed Statement Register
DHIS – 10 (R)	Operation Theatre (OT) Register
DHIS – 11 (R)	Family Planning Register
DHIS – 12 (R)	Family Planning Card
DHIS – 13 (R)	Maternal Health Register
DHIS – 14 (R)	Antenatal Card
DHIS – 15 (R)	Obstetric Register
DHIS – 16 (R)	Daily Medicine Expense Register
DHIS – 17 (R)	Stock Register (Medicine/Supplies)
DHIS – 18 (R)	Stock Register (Equipment/Furniture/Linen)
DHIS – 19 (R)	Community Meeting Register
DHIS – 20 (R)	Facility Staff Meeting Register
DHIS – 21 (R)	PHC Facility Monthly Reporting Form
DHIS – 22 (R)	Secondary Hospital Monthly Reporting Form
DHIS – 23 (R)	Tertiary Hospital Monthly Reporting Form
DHIS – 24 (R)	Catchment Area Population Chart
DHIS – 25 (R)	Health Institute Database (HIS) Report Form

Source: Directorate General of Health Services, Punjab Province

There are 8 categories of indicators generated from the DHIS: Overall health care facility utilization (15 indicators); preventive and curative service delivery (48 indicators - 14 for preventive and 34 for curative); financial management (3 indicators); logistics (1 indicator); human resources (2 indicators); capital assets (6 indicators); regulation (1 indicator); and other information systems (3 indicators).

Efforts to improve the DHIS include internal validation of the existing data systems and regular feedback mechanisms of the reported data from the health facility to the district and

provincial level. An annual report is prepared and shared with stakeholders and the DHIS is linked with the Federal level HIS.

The scoping team was informed that the DHIS at the provincial level is managed by three staff and that is one of the key challenges experienced is enhancing data quality. This is an area that needs strengthening. The Directorate General of Health Services is also keen to explore opportunities to make a transition to DHIS2 and is seeking technical support and awareness raising on the advantages of DHIS2. The timing of the scoping mission to Punjab also coincided with the launching of SDG 3 (Figure 5) and underscores the importance of enhancing preparedness of the Federal and Provincial Governments to report progress on this important health Goal.

<u>Recommended focus for the review:</u>
Discussion with the management of Punjab DHIS should focus on identifying enablers for integration of the existing DHIS with vertical programmes and its linkages with the national HIS. Since the province has made tremendous efforts in enhancing and rolling out the DHIS, the review team should seek a thorough understanding of the successes and challenges of the DHIS and build on them to provide practical ways to integrate and recommend the transition to DHIS2.

LAHORE: The Punjab government in collaboration with the World Health Organisation (WHO) and Unicef Pakistan has launched the Sustainable Development Goal-III (SDG) titled 'Good Health and Wellbeing for All'.

The aim of the launch is to reiterate the government's commitment towards achieving the health goals included in the SDGs and to provide a platform for the government and development partners.

Pakistan being a member of the UN signed the SDGs in 2015 and made a commitment to the 17 goals and 169 targets.

All SDGs were integrated and at the heart lies the SDG-III, which aims to create awareness among relevant sectors at all levels about the goals, its targets and how to effectively anchor them in provincial policies and programmes while reflecting on the challenges and lessons learnt from the millennium development goals.

Figure 5. "Punjab launches SDG for health, wellbeing"
Source: Printed in the *Express Tribune, December 16th, 2016*

3.1.3 Punjab Information Technology Board

A meeting with senior management of Punjab Information Technology Board (PITB) was cancelled due to logistics problem. However, information publicly available at the PITB website (https://www.pitb.gov.pk/) shows that the PITB is an autonomous body set by Government of Punjab to provide the foundation for Punjab's innovation economy. The Board, among other things, aims at increasing the digital literacy in Pakistan and is committed to effectively and efficiently provide IT services and infrastructure to the government and local and international businesses. As a leader of technology in the province, the PITB is responsible for maintaining the foundational IT infrastructure and system of Punjab. The Board continues to provide systems and solutions that have positively impacted the Health, Education and Law & Order sectors of the province.

<u>Recommended focus for the review:</u> The full review mission should make efforts to meet the PITB particularly within the context of the Punjab Directorate General of Health Services plans to explore the feasibility of transitioning to DHIS2.

3.2 HIS coordination mechanisms

The establishment of the Health Planning, Systems Strengthening and Information Analysis Unit within the MNHSRC is an important milestone in efforts to strengthen the national HIS. The scoping mission was informed that the Unit can be strengthened if it operates under the auspices of a national HIS coordinating committee, which is non-existent. The mission was also informed that an Inter-Ministerial Committee on Health related issues meets every quarter and the next meeting for 2016 was scheduled for end December 2016. The agenda for the meeting include HIS coordination.

Recommended focus for the review: Map out key stakeholders to constitute the national HIS coordinating committee including development of the terms of reference and establishment of a technical sub-committee at the Federal level with representation from provinces and regions. This coordinating committee will respond to strategic issues related to HIS and act as a feeder for the Inter-Ministerial Committee.

3.3 Capacity building

One of the key areas relating to capacity building is the need for ICD-10 coding and analysis. The team was informed that few hospitals are using ICD-10. There is also a need to ensure that relevant staff are trained on data collection and analysis and ensure that the reports are disseminated to district and provincial teams to promote evidence based planning.

Recommended focus for the review. Identify system strengths and weaknesses related to capacity building, data collection, and analysis. Map out ways to strengthen capacity and promote the culture of evidence-based decision making at the district, provincial, and national levels. If the interest to implement DHIS2 grows, the review team should identify ways for Pakistan to roll out DHIS2 training in an efficient and cost effective way.

4. Next steps

The implementation and consistent use of DHIS is one of the important activities that the Ministry of National Health Services, Regulations and Coordination has been conducting to ensure that health related data are generated for policy and planning at the national and provincial levels. However, generating data is not an end in itself but the beginning of a process that leads to effective use of the information collected. Information can be effectively used if the national HIS is consolidated and includes data from multiple sources such as vertical programs. Nevertheless, the current national HIS suffers from fragmentation due to lack of integration of the various systems that generate health related data. In an ideal setting, the national HIS should be integrated as illustrated in Figure 6, the Health Metrics Network model of health information system integration[7].

[7]Health Metrics Network (2008). Assessing the National Health Information System: An Assessment Tool VERSION 4.00, World Health Organization, Geneva.

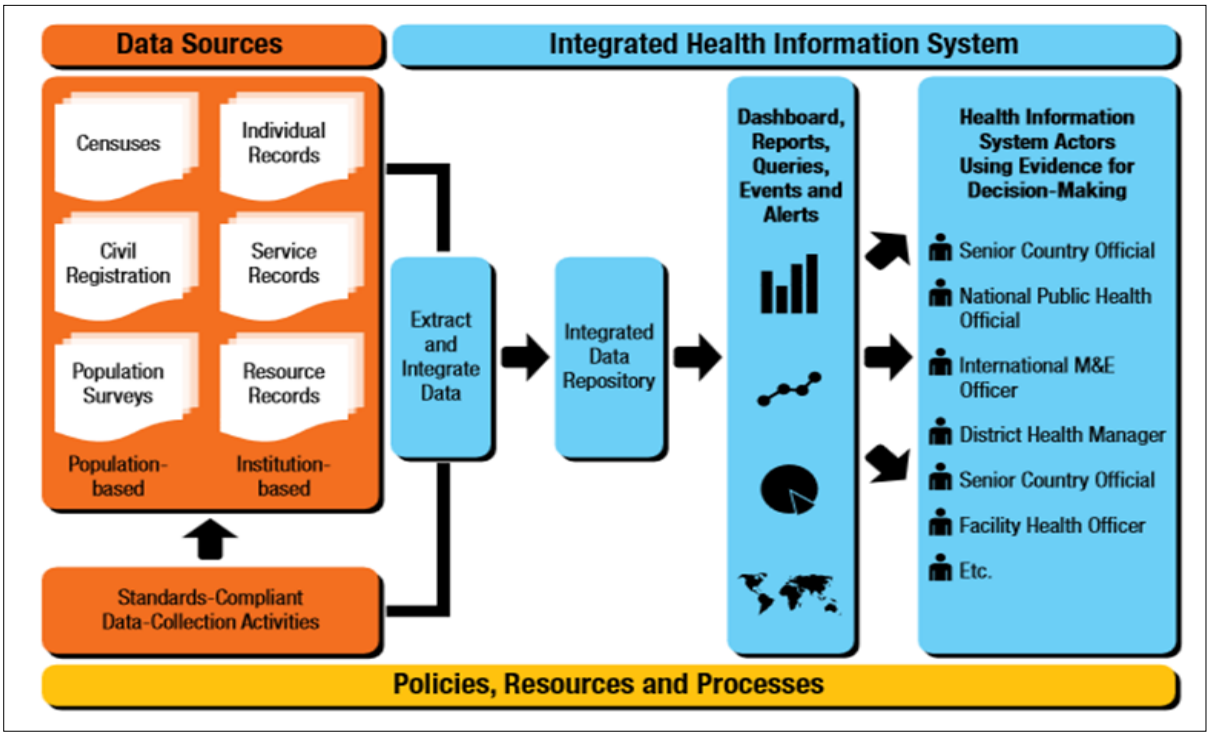

Figure 6. HMN model of health information system integration

While the MNHSRC anticipates the full HIS review mission, there are a number of things that should be considered. These include but are not limited to:

- *Governance structure* should be clear with respect to the role of the Federal Government in ensuring timely reporting of data from the provinces. The governance structures and leadership should also be extended in areas related to data sharing and integration.
- *Integration of the system* should be a top priority in order to align the country's HIS and the expectation to report on the regional core indicators and health-related SDGs.
- *Data visualization and utilization* is a critical part of any information system. The existing data should be presented in a format that can easily be understood particularly for programme managers and policy makers. This can be done by customizing the dashboard to provide senior health management with information instead of the aggregated data which cannot be converted into indicators due to the absence of reliable indicators. The management dashboard has advantages of facilitating or improving the quality assurance process.
- *Capacity building* should focus on areas related to data analytics, dissemination, and quality assurance. Capacity building initiatives can work effectively alongside policies that promote retention of core HIS staff.
- *Creating awareness on the importance of HIS among staff and policy makers* in order to reap the benefits of investments in HIS. Without a cadre of staff who understand the importance of HIS, quality assurance will not become a reality.
- *Taking stock of current activities or initiatives to improve HIS that are taking place with support from donor agencies and the Government of Pakistan.* This will avoid duplication of efforts to improve HIS in Pakistan and ensure that additional resources or support is targeted appropriately.

- *WHO is promoting the use of DHIS2* and there is a need to consider not only updating the current DHIS but explore opportunities to transition to DHIS2. The DHIS2 is the preferred HMIS in many countries across the four continents and is funded by the Norwegian Agency for Development Cooperation through the University of Oslo[8].
- *Setting standards* is very important for the initiatives highlighted above to work effectively. For example, setting standards for minimum data set reporting for any information system of vertical programme is ideal to ensure that the data can be integrated at the national level as part of the national HIS. The standards should also specify reporting requirements or protocol.

In conclusion, the findings of this report provide an opportunity to review and finalize the scope, terms of reference and the timeline for the planned full mission to review the Pakistan HIS in 2017.

[8]A short video is available (https://youtu.be/gFnnNWC55Iw) which highlights use of DHIS 2 as a routine health management information system and data warehouse. The list of 47 countries using DHIS 2 at various levels is available at https://www.dhis2.org/deployments (last accessed 18 December 2016).

Annex 1: Team members for the scoping mission

- Dr. Arash Rashidian, Director: Information, Evidence and Research, WHO, Regional Office for the Eastern Mediterranean (WHO/EMRO); and team leader
- Dr. Henry V. Doctor, Technical Officer, Health Information and Statistics, WHO/EMRO
- Dr. Qais Sikandar, Head of WHO Sub Office, Quetta, Balochistan.

Annex 2: List of people met

Name	Organization	Position/Designation/Unit
Islamabad		
Dr. Michel Thieren	WHO	WHO Representative, Pakistan
Dr. Malik Muhammad Safi	NHSRC	Director (Programs)
Dr. Baseer Khan Achakzai	NACP	National Manager, National AIDS Control Programme (NACP)
Dr. Arshad Chandio	NHSRC	Deputy National Programme Manager, EPI
Dr. Saqlani Gillani	NHSRC	Programme Manager, EPI
Dr. M. Saibulemu	NHSRC	Technical Officer, EPI
Ms. Safdar Kamal Pasha	NACP	M&E Specialist, NACP
Dr. Umar	NACP	NACP
Dr. Quaid Saeed	NACP	NACP
Dr. Jaina Paracha	NACP	NACP
Fahad Hafeez	NHSRC	MIS Officer
Ali Saeed Mirza	NHSRC	MIS Officer
Tajwali Khan	NHSRC	Deputy Director
Ms. Lubna Yaqoob	NHSRC	Manager, Health Planning, Systems Strengthening and Information Analysis Unit (HPSIU)
Dr. Ahsan M. Ahmed	NHSRC	Consultant/Epidemiologist (HPSIU)
Dr. Umar Farooq	AMC	Associate Professor
Dr. Naisr Mahmood	NHSRC	National Programme Manager, TB Programme
Dr. Khawaja Ahmad	NHSRC	Manager
Dr. Sohail	RIC	Medical Superintendent
Brig. Qudus	RIC	Director, Clinical Administration
Col. Waliyat	RIC	Administration and Security Officer
Dr. Nasir Iqbal	RIC	Deputy Medical Superintendent
Dr. Javeria	RIC	Deputy Medical Superintendent
Major (Retired) Abdullah Farid	RIC	IT Specialist
Dr. Imran	RIC	Cardiologist
Lahore, Punjab Province		
Dr. Munir Ahmad	DirHS	Programme Manager, EPI and Provincial Emergency Operations Centre
Dr. Shaheed Ahmed	DirHS	Assistant Director of Health Services, EPI
Dr. Nusrat Jabeen	DirHS	Director Health Services (MIS)
Dr. Nadeem Zaka	DirHS	Policy Strategy and Planning Unit
Mr. Farooq Ahmad	DirHS	IT Specialist, DHIS
Dr. Imran Qureshi	WHO/ACO/PAK	Technical Officer, EPI
Dr. Mazhar Quershi	WHO/ACO/PAK	Technical Officer
Dr. Shafiqur Rehman	WHO/ACO/PAK	Technical Officer

Notes: NHSRC - Ministry of National Health Services, Regulation and Coordination; DirHS – Directorate of Health Services; RIC – Rawalpindi Institute of Cardiology

Annex 3: Organogram of the Directorate General of Health featuring DHIS, Punjab Province