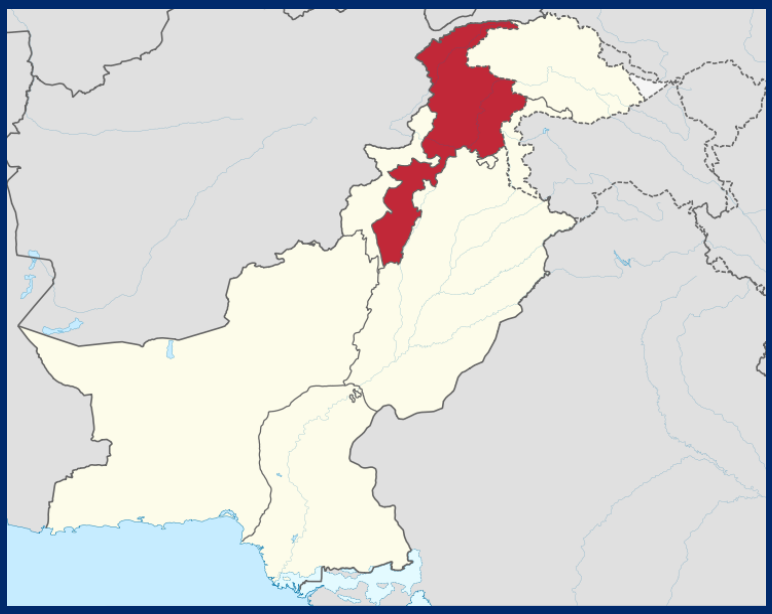
USAID FIRMS PROJECT

Management Information Systems Framework

Health Sector of Khyber Pakhtunkhwa



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Data Page

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Acronyms

CPSP	College of Physicians and Surgeons Pakistan
DEWS	Disease Early Warning System
DGHS	Director General Health Services
DHDC	District Health Development Center
DHIS	District Health Information System
DOH	Department of Health
EDOH	Executive District Officer Health
HIS	Health Information Systems
HR	Human Resource
IDS	Integrated Development Strategy
HSRU	Health Sector Reforms Unit
IT	Information Technology
KP	Khyber Pakhtunkhwa
KMU	Knowledge Management Unit
MDGs	Millennium Development Goals
MIS	Management Information Systems
M&E	Monitoring and Evaluation
NCDs	Non-Communicable Diseases
PHSA	Provincial Health Services Academy
PHDC	Provincial Health Development Centre
PIU	Project Implementation Unit
PMDC	Pakistan Medical and Dental Council
P&D	Planning and Development
UC	Union Council
WHO	World Health Organization

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1. Context

1.1 Background

Health outcomes of KP's population are reflective of a highly inadequate healthcare delivery system. Overall, the health status of the provincial population and the management of the provision of health services have failed to register any significant improvement over the many years since the adoption of the MDGs. The state provision of health services fares poorly in terms of its efficiency, effectiveness and the extent of the coverage of the poor population. People living in remote areas cannot access health services due to the non-availability of such services near their localities. Poverty increases with disease and illness, as income opportunities are lost. Government has realigned development priorities to provide social services, with health and education as top priorities, and further aims to address deficiencies in the healthcare system, improve management at the facility and supervisory levels through a multi-dimensional but integrated approach.

Pursuit of these health goals involves decisions to optimize available resources, attend to priority issues and deploy strengths to counter emergencies. Without reliable information optimal deployment of resources and adoption of appropriate solution does not take place or lags far behind. Information is essential to chart out the broader health environment in which health system in KP operates. It is also necessary to gauge the performance of the system itself from time to time and look for timely policy responses and management actions. Sound management geared toward delivery of specific health goals is not possible on the basis of credible information on health challenges, on the environment in which the health systems work and on various performance indicators to characterize the working of the health system.[1]

1.2 Challenges in Health Information Systems

Health information systems (HIS) play an important role in ensuring that reliable and timely health information is available for operational and strategic decision-making. HIS is a crosscutting component, providing the basis for the overall policy and regulation of all the other health system blocks. It is essential for health system policy development and implementation, governance and regulation, health research, human resources development, health education and training, service delivery and financing. HIS is sometimes equated with monitoring and evaluation but this is too reductionist a perspective. In addition to being essential for monitoring and evaluation, the information system also serves broader objectives, such as providing an alert and early warning capability, supporting patient and health facility management, enabling planning, underpinning and stimulating research, permitting health situation and trends analyses, orienting global reporting, and reinforcing communication of health challenges to diverse users. Information is of little value if it is not available in formats that meet the needs of multiple users, i.e. policymakers, planners, managers, healthcare providers, communities and individuals.

Availability of credible data is essential to chart out the burden of disease, the efficacy of various policy interventions and the mundane working of healthcare in the province. The current state of health data is very weak. It is an area of management that has been long ignored. Decision making seldom requires evidence from the field. In the absence of such demands from decision-making levels in government, data systems have not developed to produce timely, accurate and credible data. Only periodic surveys provide insights into health indicators. Despite of the

endeavours, data collection, processing, analysis, transmitting and presenting the information has always remained a challenge to date, as identified in the challenges to be addressed in order to strengthen the health information system[2] are as follows:

- Overall information system in the province is fragmented as existing systems for facility based and community based information suffer lack of integration at district level. Therefore, planning process aiming at informed decision-making remain without this important component of analysis.
- There is no standardized and regular reporting mechanism for tertiary hospitals. Similarly, current HIS does not cover private sector hospitals and healthcare facilities, which deliver healthcare services to a larger proportion of population in KP.
- There is no integrated disease surveillance system in the province, which is owned and implemented by the DoH or DGHS. WHO introduced Disease Early Warning System (DEWS) has limited implementation and poor integration in public health facilities. Again, there is no inclusion of private sector for establishing an extensive disease surveillance mechanism in the province.
- Despite a number of surveys and research studied conducted every year by different agencies, there is no mechanism for central storage of data at the provincial level.
- There is no mechanism available for public dissemination of performance of health sector based on information collected through health information system.
- Health related research in the province is still not catering to the research and information needs of the province. Research infrastructure in the province is poorly developed due to lack of expertise, resources and incentives.

All the issues that come across in managing the health information, needs to be resolved to ensure the evidence based decision-making that is transparent, for the benefit of the population. Healthcare system must be designed, based on strategies and intervention to understand the available information, technological options and their application to justify the reason for the change in the existing practice. There is a need to devise and formulate mechanisms, which are in place for timely data collection, analysis and dissemination of the information. That is continuously monitored and evaluated at all the levels of the data flow; input, processes, outputs and outcomes to improve timely dissemination and communication of the quality data, advocating the performance of the health system, to all the major and minor stakeholders.

2. Management Information Systems Framework

This rationale signifies the lack of one unified source of information about the health related information. Hence, there is dire need for a system to be emplaced for tackling the health information collection and usage challenges. It is one of the strategic priorities of the GoKP, as according to the IDS 2014-2018, one of the key strategic measures targeting the evidence-based decision-making is to "Establish a Knowledge Management Unit at PHSA linked with Khyber Medical University".[3]

This framework will fill this gap and allow easier access to knowledge in a move towards creating a culture of research and evidence based decision making in the province. Key objectives of the frmaework includes the following.

1. To identify all the health-related information and establish a central repository
2. To provide a mechanism to capture, store, and integrate this information
3. To develop its linkage with governmental departments operating the services (routine MIS), Bureau of Statistics, academic institutions, development partners and donors involved in health-related research
4. To support the function of "clearing house" regarding health-related research
5. To strengthen governance and assist policy makers, planners, and health managers in evidence-based decision-making

2.1 Data Repository

In KP, HIS draws upon a set of key data sources. The role and contribution of each source varies due to overlap in the type of information best collected by each source. As shown in following figure, HIS data are usually generated either directly from populations or from the operations of health and relevant institutions.

Figure 1 Management Information Systems Framework

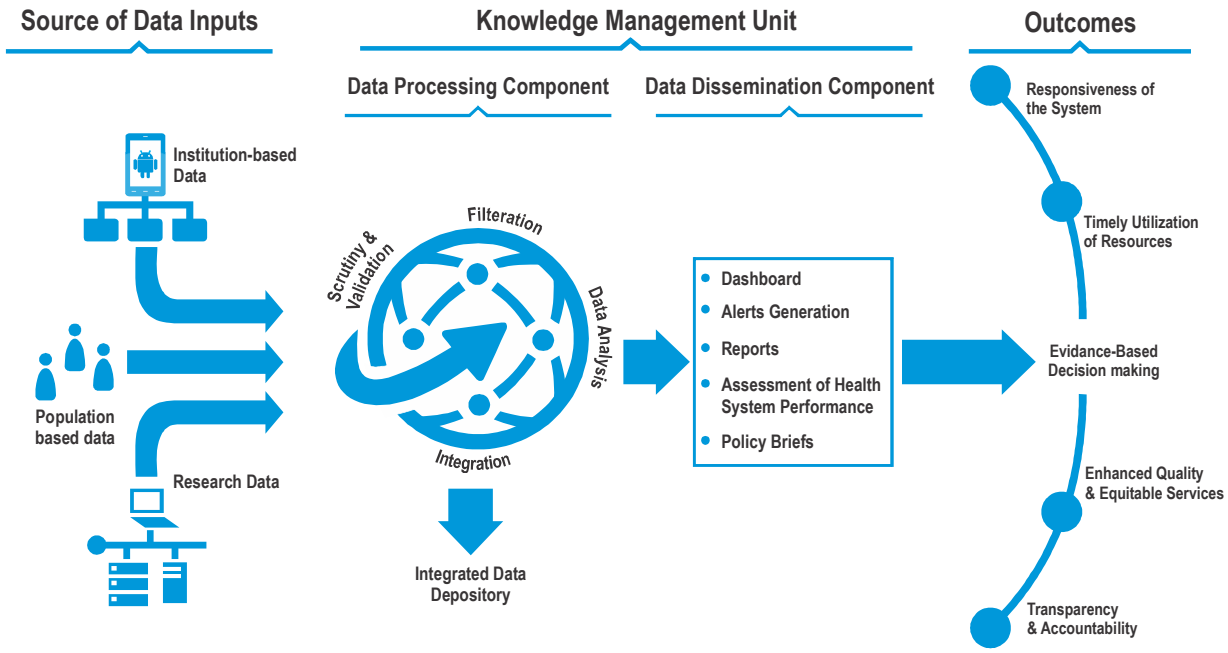
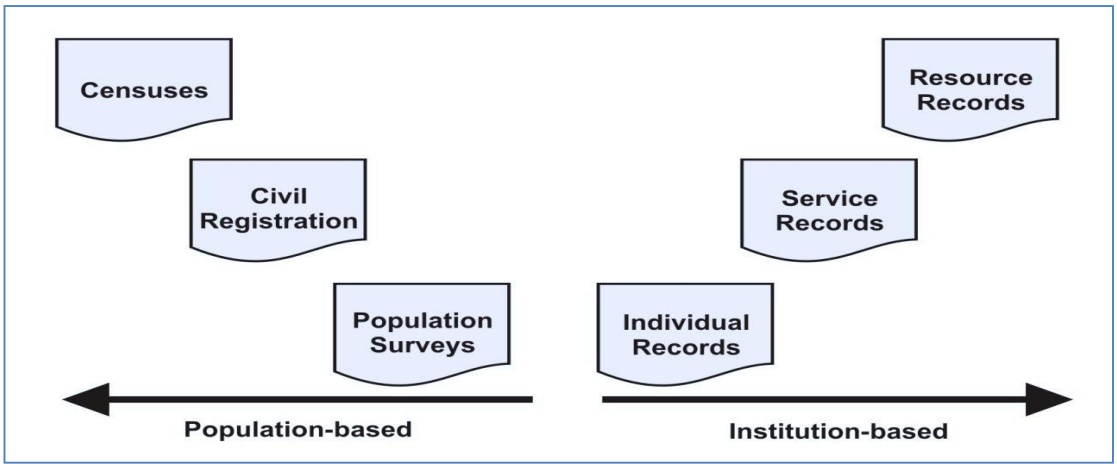


Figure 2 Sources of Data Inputs



2.1.1.1 Institution-based sources

Institution-based sources generate data as a result of administrative and operational activities. Within the health sector of KP, the wide variety of health service data are produced through routine information systems, including morbidity and mortality data, for people using institution based health services; services delivered; drugs and commodities provided; information on the availability and quality of services; case reporting; and resource, human, financial and logistics information. Individual records including health records (for example, growth monitoring, antenatal, delivery outcome) and disease records (consultation, discharge) are important in supporting the quality and continuity of care for individual patients. Program based data

comprises of the existing vertical and other programs currently in place and supervised by the Department of Health[4].

Research data is an important constituent that may help establish link between evidence-based knowledge and the existing policies to identify gaps that may be addressed and considered while designing the M&E strategies. Coverage of data on institution-based services comes with a selection bias and therefore is of low value for analysing population trends.

2.1.1.2 Population-based sources

Population-based sources generate data on all individuals within defined populations. In KP, it includes total population counts such as the census and civil registration, and data on representative populations or subpopulations such as household and other population surveys. Such data sources are either continuous and generated from administrative records such as civil registers or periodic such as cross-sectional household surveys like Pakistan Demographic and Household Survey, Multiple Indicator Cluster Survey, and Pakistan Social and Living Standards Measurement Survey.

2.2 Knowledgement Management Unit

In accordance with IDS 2014-2018, KP's KMU shall be established within the realm of a Provincial Health Services Academy (PHSA) with linkages established with the Khyber Medical University. KMU will be implemented as an umbrella concept in PHSA and Khyber Medical University, and working collaboratively with HSRU, Director General Health Services (DGHS) and technical support of the development partners. The technical IT-support is required to channel the bulk data influx from the source (input), through the data analysis unit, managed by the work force to generate evidence-based information, which is to be disseminated to the end-users of the KMU. This will help build the organizational and technical capacity of the users (at provincial, district and local level) of the KP KMU to generate quality data, for effective monitoring and evaluation to strengthen the process of decentralization. The term decentralization is used in the context of the flow of feedback (information) from clients, community and community leaders, health managers to the decision/policy makers, thus increasing the level of accountability within the system and achieving better health outcome.

2.2.1 Data Processing Component

KMU will gather all health related information from various input sources as its initial fundamental step synchronized with the framework. KMU's team would analyze and convert available data inputs into evidence-based information that may aid in policy briefs, planning guides, disease and management alerts, M&E strategies and reports, strategic planning and commissioning purposes. In a task-oriented work place, following three skill-mixes are required for proposed framework of Data Processing Component of KMU.

- Analytical team comprising of Epidemiologists, Public Health Experts, Biostatisticians, Management Experts, and support staff
- Information validation team comprising of assessors
- Dissemination team comprising of Health Communication Experts and Graphic Designers

In the Data Processing Component, the data obtained from the input source is routed in a continuous cycle of data processing and specific activities carried in order to generate evidence-based information are data validation & scrutiny; data filtering, based on need and quality of the source. After that, it is quantitatively and qualitatively analyzed for sharing with the stakeholders. The processed information will then be used for the program and task specific data integration in the Integrated Data Depository by the team. At the end, the evidence-based information generated will be disseminated via the Data Dissemination Component, in the form of dashboard interface, alerts generation, reports generation, M&E planning and reporting, advocacy of services, health system performance evaluation, indicators mapping, need-based assessments, planning and commissioning of services and promoting new research to strengthen the healthcare system. Figure 1 represents the processes, working in accordance with one another comprise the functional unit of the KP KMU, at the same time linking the inputs with the outputs in the framework.

Integrated Data Depository

- Data Management
- Impact & Need-based Assessment
- Strategic/Operational Planning & Management
- Establishing Coordination & Consultation with local & Provincial Stakeholders
- Policy & Decision Making
- Monitoring & Evaluation
- Third Part Validation
- Use of Information for Strategy & Learning
- Development of Sustainable & Accountable Health System

2.2.2 Data Dissemination Component

Information if collected but fail to reach the concerned users is of no use. After data processing, key function of the KMU is dissemination of the information to the stakeholders and the users of the KP KMU. Information generated through analysis of data may be presented in different forms, which are as follows:

1. The integrated information may be presented as a dashboard for providing updated information to all the users on User Preferred Interface. This would include Input Mapped Updates (spot mapping), Diseases Trends and Prevalence, Rationalized Statistics (District, Provincial Disease trends, and prevalence), Stakeholder Updates, and Downloadable Statistics.
2. The alerts based on the standard guidelines may be generated through the data, to ensure effective and efficient response of the healthcare services, thus providing a continuous surveillance of the diseases, and forward and backward flow of information within the system. This will help in developing a continuous M&E system of the services and the alert response. Overall alerts generations (both immediate and scheduled) will cover Diseases (communicable, NCD, Notify-able early recognition), Cluster Marking (Disease Specific), and resource demands as well as availability.
3. Report generation and the performance evaluation will be a click away, based on the users' compliance at the input phase and involvement in the framework of the model. The importance of the evidence-based information is that, the information collected will be the representation of the compliance of the system and may be compared with the outcomes

indicators by all the users and the stakeholder, without the hassle of maintaining bulk black and white paper documentation. Reports can be generated on Organizational Performance (Indicator specific), Rationalisation of Services, Duplication of Services, Financial (Accountability), Quality of Care, Access to the services, Services Mapping based on Population/Community Needs, Monitoring & Evaluation Reports, and Advocacy of the Services.

4. Further, information would be generated regarding the Health System Performance Evaluation and provide data on indicators based on UC, District, and Provincial Data about Population Pyramids (Province-District-Tehsil-UC), Disease Trends of the Districts (In comparison to National & Provincial Statistics), Financial Spending versus Allocations, Health System Performance Evaluation, and Effective Services Mapping & Equitable Resource Mapping.

2.3 Coordination Mechanisms

Data flow linkages will primarily be established with the health facilities working in the province of KP. Further, coordination mechanisms will be established with other provincial departments, organizations, development partners, international agencies, and regulatory bodies, national and international academic institutions working on health issues relevant to KP. Linkage with comprehensive health research databases will be create by making a repository of all the open access and paid relevant literature and provide access to databases such as Pubmed, Cochrane Reviews, etc. This component should be available to individuals or institutions at subsidized rates to encourage research in the province.

2.4 Users of the Data Outputs

This framework is designed to act as an information source that is continuously monitored and updated based on the prevailing scenarios. An information reservoir that is free to access by the people to become aware of what the GoKP and Health Department is doing to overcome the prevailing health issues. This will create a transparent system that is self-advocated by the strengthened health system. Apart from the KP, population, there are administrative institution, acting as the power/supportive users of the KP KMU, tasked with continuous feedback and evaluation of the service. These includes Planning & Development institution (P&D), Financial Institution, Department of Health (DoH), KP Health Sector Reform Unit (HSRU), Director General Health Services (DGHS), Provincial Health Development Centre (PHDC) & District Health Development Centre (DHDC), Vertical Programs, District Health Management Teams (DHMT), Donor and Development Partners, Health Institutions (PMDC, CPSP), Private and Non-Government Institutions.

2.5 Implementation Strategy

Initially USAID FIRMS will provide technical support to the DoH, GoKP in designing of the framework to sustainably manage and take ownership of MIS Framework. In order to sustain functional integration, the framework is divided into two implementation units at District and Provincial level. Provincial implementation plan consists of developing a Program implementation Unit (PIU). In the District an experienced District Resource Person (DRP), based in the DHIS cell located at the EDOH office will assist in the implementation of the KP KMU. This district and provincial implementation strategy will be according to the work force placement in PHSA, linked with Khyber Medical University.

Utilizing the existing DHIS human resource/health facility staff for the health facility data (Service and Resource record) with additional HR support, Information will continue to flow from all health facilities in the KP, DHIS cells in districts and DGHS office, to the PIU; PIU will manage the overall program. DHIS cell will coordinate with the health facilities in the districts.

Additional support will be district specific consisting of the District Resource Person (DRP) (1 per district) stationed at the DHIS cell in the EDOH office. Provincial PIU will provide IT technical support at the Provincial level within the PIU. It will assist in placement of IT equipment (Data servers, Backup servers, IT team to manage the information with the technical support from the work force) to provide Dashboard User Interface, Active Disease Surveillance, and Information Dissemination and Alerts generation.

At the District level technical support will be provided through fixed work stations (where required based on already existing DHIS system), and provision of Android Handsets for health facility based staff (with software app to update live data and information).

2.6 Institutionalization and Sustainability

Sustainability of this framework is a significant concern as a number of health programs have failed to last in KP and rest of the provinces of Pakistan during recent years. The proposed framework for MIS addresses these concerns of health leaders, including policy makers, planners, funders, and manager for improving sustainability by taking a systems approach. This approach reflects a focus on three areas: program institutionalization, capacity building, and maintenance of health benefits[5].

Institutionalization involves the incorporation of the programs into existing organization and community structure and it is concerned to ensure that program activities (rather than outcomes) are sustained over time. In order to institutionalize this framework, it will be established in an existing public sector infrastructure – Provincial Health Services Academy. Its linkages with Khyber Medical University will also provide a platform for technical supervision.

Another aspect of sustainability is concerns about system or organization's capacity to provide infrastructure, workforce, facilities and equipment, and to be innovative and respond to emerging needs through research and monitoring[6]. In the proposed framework, operations of KMU will be funded through routine public health care expenditures of GoKP. Initial cost of setting up physical infrastructure, IT component, and facility level capacity building can be obtained through donors and development partners but they will not be relied upon for recurrent expenditures.

Purpose of all health programs is to produce health benefits. Therefore, in order to sustain the MIS Framework, it will have to produce sufficient health benefits while keeping in view the cost of resources. It is expected that the performance of KMU will improve the technical efficiency of provincial health department that will translate into health benefits outnumbering the cost of KMU.

3. References

[1] Government of Khyber Pakhtunkhwa. Integrated Development Strategy 2014-2018.

[2] Government of Khyber Pakhtunkhwa, Department of Health. Health Sector Situation Analysis for Health Sector Strategy, 2010.

[3] Government of Khyber Pakhtunkhwa. Integrated Development Strategy 2014-2018.

[4] Government of Pakistan and Government of Japan. Improvement of Management Information Systems in Health Sector in the Islamic Republic of Pakistan, 2006.

[5] Scheirer MA. Is Sustainability Possible? A Review and Commentary on Empirical Studies of Program Sustainability. American Journal of Evaluation. 2005 September 1, 2005;26(3):320-47.

[6] Swerissen H, Crisp BR. The sustainability of health promotion interventions for different levels of social organization. Health Promotion International. 2004;19 (1):123-30.

USAID Firms Project
info@epfirms.com