Integrated Disease Surveillance and Response (IDSR)

IDSR ROADMAP FOR PAKISTAN 2024-2028

A 'System Strengthening' and 'Collaborative Surveillance' Approach

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CONTENTS

MESSAGE BY THE CEO, NIH

As the Executive Director of the National Institute of Health Pakistan, it is my profound honour to present to you this 5-year Roadmap for Integrated Disease Surveillance and Response (IDSR) in Pakistan. This initiative represents a pivotal step in our ongoing mission to strengthen the public health systems, with a specific focus on enhancing the Integrated Disease Surveillance and Response.

As the custodian of IDSR and the focal point for IHR in Pakistan, NIH has produced this roadmap, envisioning it as a strategic blueprint that embodies our ambition for a robust, responsive, and resilient IDSR framework. This roadmap not only reflects our aspiration but also lays out a comprehensive plan to improve governance, fortify core functions, expand laboratory capacities, introduce IT innovations, and build human resource capacities within the domains of IDSR.

The creation of this document has been a collaborative effort, incorporating the collective wisdom and inputs of experts, partners and stakeholders from national and all provinces, thereby ensuring its inclusivity, feasibility and alignment with national public health priorities. As we move forward, this roadmap will guide our actions what will enable us to effectively monitor, prevent and respond to health threats. Our collective efforts will be directed towards strengthening surveillance systems, enhancing the laboratory network, integrate data-driven approaches and build a workforce that is skilled and prepared to tackle the health challenges.

The journey ahead is significant journey but with the support and collaboration of all public health bodies, partners, and my wonderful team of experts, I am confident that we will achieve our objectives and excel towards excellence in Public Health in the country. My deepest gratitude goes to everyone involved in this huge effort. Your dedication and expertise have been crucial in bringing this roadmap to fruition.

Dr. Muhammad Salman

Chief Executive Officer

National Institute of Health

Islamabad

ACKNOWLEDGEMENTS

ACRONYMS AND ABBREVIATIONS

API	Application Programming Interface
CCHF	Crimean-Congo Haemorrhagic Fever
COVID-19	Coronavirus Disease 2019
CDC	Center for Disease Control
DDSRU	District Disease Surveillance and Response Unit
DHIS	District Health Information System
DHIS-2	District Health Information System Version 2.0
HAI	Healthcare-associated Infection
HMIS	Health Management Information System
HR	Human Resource
IANPHI	International Association of National Public Health Institutes
ICT	Information and Communication Technology
IDIMS	Integrated Disease Information Management System
IDSR	Integrated Disease Surveillance and Response
IHR	International Health Regulations
JEE	Joint External Evaluation
JSI	John Snow, Inc.
LMIS	Logistics Management Information System
LQS	Laboratory Quality Systems
M/o NHSR&C	Ministry of National Health Services, Regulation and Coordination
MDRTB	Multidrug Resistant Mycobacterium Tuberculosis
NAPHS	National Action Plan for Health Security
NIH	National Institute of Health
PDSRU	Provincial Disease Surveillance and Response Unit
PHEOC	Public Health Emergency Operations Center
PHL	Public Health Laboratory
RRT	Rapid Response Team
SARS	Severe Acute Respiratory Syndrome
TIMS	Training Information Management System
TORs	Terms of Reference
TWG	Technical Working Group
UKHSA	United Kingdom Health Security Agency
USAID	United States Agency for International Development
WHO	World Health Organization
XDR	Extensively Drug-Resistant

EXECUTIVE SUMMARY

A strong national surveillance system is the foundation for global public health security, as prevention, detection, response, and mitigation actions in response to epidemics, pandemics, and other emergencies depend on the country's robust and effective surveillance capacities and capabilities.

IDSR promotes the rational use of resources by integrating and streamlining common surveillance activities. Additionally, IDSR takes into account the One World-One Health perspective, which is a strategy that addresses events at the intersection of human, domestic animal, wildlife, and ecosystem health.

Good progress has already been made on IDSR since the publication of the first JEE in 2016; however, there is a need to further develop and enhance the current IDSR system to address the existing gaps, particularly issues related to integration and multi-sector coordination. Similarly, it's critical to review and realign the Pakistan IDSR approach in light of recent COVID-19, flood emergencies, and new emerging surveillance approaches like the WHO "Collaborative Surveillance Approach."

Recently, a number of scoping exercises, including NIH, UKHSA, IANPHI IDSR Deep Dive Exercise, JEE 2023, NIH, CDC, UKHSA IDSR data quality assessments, and learning from the IDSR Cascade Trainings supported by UKHSA, CDC, WHO, JSI, and other development partners, identified a number of gaps and opportunities for improvement. For these, a comprehensive approach and a roadmap are required. Hence, this roadmap has been developed in close collaboration and consultation with experts from federal and provincial governments, health partners, and stakeholders, ensuring inclusivity and alignment with national priorities on surveillance and response, stemming from the joint external evaluation of 2023.

This roadmap is a significant step towards reducing avoidable mortality, morbidity, and socioeconomic losses caused by epidemics and public health emergencies in Pakistan and outlines the key steps for the next phase of IDSR implementation in Pakistan. It focuses on key areas of further development, including strengthening governance/coordination, integration of existing surveillance systems, multi-sectoral collaboration, coordination, and a holistic health systems approach. This will serve as an enabler to collect valid data to enhance early detection, verification, follow-up, and response to priority diseases in a sustainable and effective way across Pakistan.

The IDSR 5-year Roadmap also aims to guide priority activities and avoid overlapping efforts toward achieving a robust and effective surveillance system in the country. It is hoped that the development and strengthening of the IDSR system in the country will provide robust and timely information for early detection, investigation, and response to priority diseases both in routine and public health emergencies.

Once fully implemented, this roadmap will enable further strengthening of governance, coordination, and operation of IDSR to make it a comprehensive and effective surveillance mechanism across Pakistan for both routine and emergency surveillance. It will support direction-setting, monitoring, and evaluation for all relevant stakeholders in line with regional and global initiatives and help the country establish a resilient and sustainable public health surveillance system.

INTRODUCTION

Strong national surveillance system is the foundation for global public health security, as prevention, detection, response, and mitigation actions in response to epidemics, pandemics, and other emergencies depend on the country's robust and effective surveillance capacities and capabilities.

IDSR promotes rational use of resources by integrating and streamlining common surveillance activities. Additionally, IDSR takes into account the One World-One Health perspective, which is a strategy that addresses events at the intersection of human, domestic animal, wildlife, and ecosystem health. A number of approaches to IDSR is outlined in literature, however, three of these approaches relevant to Pakistan IDSR, which include the Three Pillars of IDSR (Wilson A, 2016), Five Principles for IDSR (Morgan et al, 2021), and Collaborative Surveillance Approach.

RATIONALE FOR THE IDSR ROADMAP

The first Joint External Evaluation for IHR (2005) was undertaken in Pakistan in 2016 which was followed with the development of a 5-year roadmap and as part of that 'Real time Surveillance and Integrated Disease Surveillance and Response (IDSR) was taken forward as a priority, on a phased approach. The main rationale for taking a phased approach to IDSR in Pakistan relates to the diversity of geographical landscapes, the fragmentation of the existing health information systems, the varying stages of IDSR development across the provinces and the fact that 'no one size can fit all'. There is a lot of progress has already been made on IDSR since the publication of initial Joint External Evaluation 2016. This progress has been reflected in the preliminary findings of the Pakistan Second JEE completed in 2023.

While good progress has been made on IDSR, there is a need to further develop and enhance the current IDSR system to address the existing gaps particularly issues in relation to integration and multi-sector coordination. Similarly, it's critical to review and realign the Pakistan IDSR approach in the light of recent COVID-19, Flood emergencies and new emerging surveillance approaches like the WHO "Collaborative Surveillance approach." A core concept for strengthening the global architecture for health emergency preparedness, response, and resilience.

Based on the findings/recommendations of Joint External Evaluations 2016 & 2023, Annual IDSR reviews, Recently, a number of scoping exercises including NIH, UKHSA, IANPHI IDSR Deep Dive Exercise, NIH, CDC, UKHSA IDSR data quality assessments and learning from the IDSR Cascade Trainings supported by UKHSA, CDC, WHO, JSI and other development partners. The current 5-year roadmap identifies the key challenges and opportunities in the surveillance system of Pakistan.

The IDSR Roadmap outlines the key steps for the phase 2 of IDSR implementation in Pakistan. Focusing on key areas of further development, strengthening and integration of the existing surveillance systems, multi-sectoral collaboration, coordination and holistic health systems approach which will serve as an enabler to collect valid data to enhance early detection, verification, follow up and response of priority diseases in a sustainable and effective way across Pakistan.

THE DIRECTION OF TRAVEL

The mission of Ministry of National Health Services, Regulations and Coordination as well as the National Institute of Health in close collaboration with provincial health departments is to reduce avoidable morbidity, mortality, disability and socioeconomic losses due to epidemics and other public

health emergencies in Pakistan by developing and strengthening the IDSR system in the country. Therefore, to provide robust and timely information for early detection, investigation and response to priority diseases, public health emergencies, the Pakistan has developed a 5-year IDSR Roadmap aligned with the National Action Plan for Health Security (NAPHS). One of the key objectives is to progress the expansion and integration of IDSR network across Pakistan by establishing two-way data flows and analysis of prioritises diseases from all provinces with integration of indicator and event-based surveillance programme for early detection, investigation and response to priority diseases and public health emergencies.

The IDSR 5-year Roadmap aims to guide about the priority activities and to avoid overlapping toward the achievement of a robust and effective surveillance system in the country. The annual action Items within the roadmap capture the efforts to be advanced under the following set objectives.

OBJECTIVES

1. To improve the governance and coordination of IDSR implementation across Pakistan

2. To further develop and strengthen core IDSR functions across Pakistan

3. To strengthen national and subnational laboratory capacity to confirm IDSR priority diseases, events and conditions

4. To strengthen the Information and Communication Technology (ICT) infrastructure for improved data flow, data management, data analytics and data dissemination for action

5. To efficiently integrate multiple surveillance and response systems including vertical programs, laboratory, livestock, environment and private sector health data at national and sub-national level utilizing DHIS-2 platform

6. To build multi-sectoral coordination/collaborative approaches for event-based surveillance, risk assessment, and response

7. To develop sustainable HR capacity for IDSR at federal, provincial levels, districts and health care facility level through capacity building and training

8. Strengthening and implementation of IDSR during humanitarian emergencies/crises

Objective 1: To improve the governance and coordination of IDSR implementation across Pakistan

To successfully implement IDSR surveillance, clear governance arrangements, roles and responsibilities, accountability and transparency mechanisms are required that needs to be supported by legislation. This is extremely important as only empowered national and provincial govt authorities, national public health agencies/institutes, national public health/ reference laboratories, and emergency management authorities can coordinate, prioritise, evaluate, and rationalize surveillance systems. Robust governance and coordination mechanism also enables timely execution of activities, facilitate information synthesis and evidence-based decision-making, and strengthen collaboration across different sectors and stakeholders.

The M/o NHSR&C with the support of National Institute of Health and in coordination with the provincial health departments will provide the oversight, policy direction and implementation. The National and Provincial TWGs will oversee the day-to-day IDSR activities and a high-level steering committee will oversee the implementation of IDSR. Table below outlines the key interventions for the phase 2 of IDSR implementation.

Objective 1: To improve the governance and coordination of IDSR implementation across Pakistan				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
1.1	To establish/revitalize an IDSR National Steering Committee with revised TORs, provincial and multi-sector representation including Finance, Planning and other relevant ministries	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X				
1.2	To establish/revitalize the IDSR Technical Working Groups (TWG) with TORs at national and provincial levels	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X				
1.3	To conduct the biannual National IDSR Review Meeting to identify areas of good practice and challenges for implementation at national level	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
1.4	To regularly conduct provincial IDSR quarterly review meetings to identify areas of good practice and challenges for implementation of provincial level	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X

Objective 1: To improve the governance and coordination of IDSR implementation across Pakistan				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
1.5	To increase domestic and partner support in the implementation of IDSR through allocation of flexible funds or a budget line to guarantee sustainability	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
1.6	To develop a comprehensive work plan in line with IDSR roadmap aligned with National Action Plan for Health Security (NAPHS) and to carry out joint planning, implementation, monitoring and evaluation of surveillance and response activities between NIH and provincial govt	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
1.7	To advocate/develop a legal framework to promote Surveillance and response across Pakistan	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
1.8	To develop a national and provincial comprehensive IDSR financing strategy to mobilize sufficient and sustained budget (internal and external) for IDSR	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
1.9	Multi-Sector and Multi-Discipline Coordination Plan to engage all stakeholder	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			

Objective 2: To strengthen Core IDSR functions across Pakistan

Effective, robust and timely core surveillance functions within IDSR underpin global public health security. The core surveillance functions are critical to prevent and mitigate the impact of epidemics, pandemics, and other major emergencies. Once a public health event is detected and verified, enhanced surveillance, field investigations, and continuous risk assessment are needed to understand how the event is unfolding and to define and implement the target control measures.

The specific objective of this section is to enhance the capacity of the existing surveillance systems to detect, report, investigate and respond to public health emergencies, conditions and events as required by IHR (2005) and other Health Security Frameworks. This shall be undertaken through following interventions outlines in table below.

Objective 2: To further develop and strengthen core IDSR functions across Pakistan				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
2.1	To expand IDSR system at remaining Primary & Secondary level health care facilities across the country	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X				
2.2	To expand IDSR system at all Tertiary care level health facilities (Public & Private) across the country	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X		
2.3	To initiate the case base information collection for the most frequently reported diseases each year as per national and provincial priority/disease severity (Dengue Fever, CCHF, Typhoid, Measles, Influenza etc)	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
2.4	Expansion of DHIS-2 app-based data across the country	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X		
2.5	To review and update revised training curriculum of IDSR training if required and develop provincial govt. own	NIH, Ministry of NHSRC and	Relevant Development	X	X	X	X	X

Objective 2: To further develop and strengthen core IDSR functions across Pakistan			Timeline				
SN	**Key Interventions**	**Lead Organization**	**Supporting Organizations**	**2024**	**2025**	**2026**	**2027**	**2028**
	refresher IDSR training plan utilizing the HR already trained. Development of E-learning courses on IDSR	Provincial Health Departments	Partners and Stakeholders					
2.6	To fully operationalize DDSRUs and PDSRUS for surveillance and response. Notification of provincial and district PHEOCs with development of surge capacity plans at all levels. Strengthening of Event Based Surveillance through Implementation of National RRT Programme	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
2.7	Periodic review and dissemination of list of notifiable diseases, case definition booklets, case reporting forms and charts	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
2.8	To enhance capacity building of IDSR staff on DHIS-2 and advance analytics. Moreover, development of District Dashboards for early detection and response	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
2.9	To initiate the development of weekly automated report at district level in coordination with the National IDSR TWG, NIH	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
2.10	Development of Incident Action Plans and Specialized Trainings on specific diseases	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
2.11	To develop a regular programme of monitoring and evaluation with supportive feedback for IDSR at national and provincial levels (Formulation of monitoring and evaluation indicators to ensure surveillance data quality and advance data management)	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			

Objective 2: To further develop and strengthen core IDSR functions across Pakistan				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
2.12	To develop framework and implementation plan of mortality surveillance system to strengthen mortality reporting component in DHIS-2 at national and sub-national levels. Alignment of mortality data with morbidity data at national and sub-national level for effective planning and decision-making	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X				
2.13	To further develop HAI surveillance system to provide evidence and data for advocacy and resource mobilization to improve the IPC component	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X		
2.14	To develop and implement community-based surveillance system across the country	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X		

Objective 3: To strengthen Pakistan IDSR national and sub-national laboratory capacity to confirm IDSR priority diseases, events, and conditions

Public Health Laboratories are an essential component of the IHR 2005. The global Public Health faces significant challenges with the rise of antimicrobial resistance in common pathogens, Multidrug Resistant Mycobacterium Tuberculosis (MDRTB), Extensively Drug-Resistant (XDR) Salmonella typhi. There is also the continuing threat of new and emerging infections which may cause global pandemics. This changing dynamic is the reason for an Integrated Disease Surveillance and Response (IDSR) system and Public Health Laboratories (PHLs) to respond to ongoing and future challenges from infectious diseases. The emergence of the SARS-CoV-2 virus is a perfect example of the need to have an IDSR system in place for early detection, supported by PHLs for confirmation. Table below outlines the key interventions for the PHLs that is required for the next phase of the IDSR implementation.

Objective 3: To strengthen national and sub-national laboratory capacity to confirm IDSR priority diseases, events and conditions				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
3.1	IDSR Steering Committee and TWGs will also ensure effective networking of Federal and Provincial Public Health Reference Labs and networking of public and private sector clinical labs with PPHRLs. (For details see Objective 1)	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
3.2	To develop/update a PHLN strategic plan to ensure planning, training and clearly documented operational procedures to ensure prompt communications between public health laboratories and the surveillance teams at national and provincial levels	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
3.3	Upgradation/Establishment of PPHLs as well as clinical labs across the country	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
3.4	Mapping of potential clinical and public health labs and establishment of PHL network adopting a standard data reporting platform i.e., DHIS-2/IDIMS/LIMS/ELIMS.	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			

Objective 3: To strengthen national and sub-national laboratory capacity to confirm IDSR priority diseases, events and conditions			Timeline				
SN	**Key Interventions**	**Lead Organization**	**Supporting Organizations**	**2024**	**2025**	**2026**	**2027**	**2028**
3.5	To develop/update and implement a laboratory quality systems (LQS) plan and guidelines for a laboratory network, accreditations, validation, certification, EQS as well as capacity building	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
3.6	To develop/update protocols for specimen handling, collection, storage/preservation and transportation/referral for all IDSR priority disease in IDSR (molecular, serological, microbiology etc)	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
3.7	Mapping of potential zoonotic labs/one health labs and integration with IDSR to ensure reliability and consistency of multi-sector diagnostic capabilities	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
3.8	To develop a training programme for facilities that work with high-consequence agents	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders		X	X	X	X
3.9	Development of standardized/essential/recommended diagnostic list for priority diseases at national and provincial levels. Periodic review and update, new tests e.g., by WHO/CDC, sensitize facilities on recommended tests, add turnaround time and recommended supplies e.g., kits as well	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
3.10	Strengthening of National Genomic Centre to reinforce the genomic surveillance to support IDSR. Establishment of genomic centres at provincial levels as well	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
3.11	Strengthening/Establishment of entomological reference laboratories at national and provincial levels	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X

Objective 4: To strengthen the Information and Communication Technology (ICT) infrastructure for improved data flow, data management, data analytics and data dissemination for action

Use of information technology is critical for data management in an IDSR system; however, this requires computing facilities at all levels including district, provincial and national. The application of electronic systems in IDSR has the potential to provide real-time validated data for public health surveillance, field investigation, and prompt response. Following are key guiding principles that should be considered in further developing Pakistan IDSR/IT infrastructure.

- First, the IDSR system should continue to focus on use of existing framework and systems for IDSR, such as paper based, DHIS-2 software and app based, etc. This enables easy adaptability by implementers and promotes smooth transitions.
- It's important to standardize data and electronic tools that in turn will promote uniformity in data collection and aggregation. Standardization promotes comparison between various levels of the health systems and provinces.
- The current IDSR system is built in spirit of integration. This involves integration of various data sources and information systems from other health programmes into a common platform or data warehouse.
- The IDSR is a flexible to adapt to change of disease and event profiles over time and can be used both for routine and emergency surveillance and response

Objective 4: To strengthen the Information and Communication Technology (ICT) infrastructure for improved data flow, data management, data analytics and data dissemination for action				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
4.1	IDSR Steering Committee and TWGs will ensure the strengthening of IT capacity requirements for IDSR. (For details see Objective 1)	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
4.2	To assess IT capabilities and infrastructure needs of the IDSR system including network coverage, hardware, software, equipment, software development, IT system maintenance and sustainability	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
4.3	Develop a plan based on gaps identified through Assessment of IT infrastructure at national and provincial levels and implementation to address the gaps	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders		X	X		

Objective 4: To strengthen the Information and Communication Technology (ICT) infrastructure for improved data flow, data management, data analytics and data dissemination for action				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
4.4	Strengthening of National Health Data Centre to align/integrate IDSR data, different vertical surveillance programmes, lab systems, livestock and other relevant health data utilizing the DHIS-2. Establishment/ Strengthening of Data Centres at provincial levels	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
4.5	To develop capacity building of the data manager, data analyst and IDSR relevant staff on data collection, management, analysis and dissemination for action at national and provincial levels	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
4.6	Establishment of district dashboards to review and validate the IDSR data	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
4.7	To train the IDSR workforce on developing the automated weekly report at district. Development of DHIS-2 manual to support the data personnel	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
4.8	To develop and implement IDSR data management SOPs at all levels.	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X		
4.9	Establishment of the system generated alerts of priority diseases based on inbuilt alert/outbreak thresholds in DHIS-2	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X		
4.10	To develop and implement advance analytics in DHIS-2 and other related platforms/Software	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X		

Objective 5: To efficiently integrate multiple surveillance and response systems including vertical programs, laboratory, livestock, environment and private sector health data at national and sub-national level utilizing DHIS-2 platform

During the past two decades, across the globe there have been several initiatives to integrate health surveillance systems using various mechanisms ranging from the integration of data sources to changing organizational structures and responses. The need for integration is caused by an increasing demand for joint data collection, use and preparedness for emerging infectious diseases. There is a need for integration and harmonization of multiple data systems from the current platforms including paper-based systems and DHIS2 supported platform and, other IT data transmission systems to a single master digital platform for collection and management of data and communication to enhance analysis of data, sharing and use for decision making for timely response. Table below outlines the key interventions for integration of multiple surveillance and response systems implementation.

Objective 5: To efficiently integrate multiple surveillance and response systems including vertical programs, laboratory, livestock, environment and private sector health data at national and sub-national level utilizing DHIS-2 platform				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
5.1	To integrate multiple surveillance systems using standardized data collection and transmission system (e.g., utilizing DHIS-2) at national, provincial and district levels	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
5.2	To integrate laboratory data for all priority diseases into IDSR using DHIS-2/IDMIS/LIMS/ELIMS. Moreover, integration of animal side laboratories and reference entomological laboratories	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
5.3	Integration of zoonotic laboratories/one health labs at national and provincial levels	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
5.4	Mapping of potential environmental sector related to health data, advocacy, strengthen and integration	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
5.5	To integrate all sentinel sites data including Influenza, Cholera, Typhoid, AMR and others	NIH, Ministry of NHSRC and	Relevant Development	X	X	X		

Objective 5: To efficiently integrate multiple surveillance and response systems including vertical programs, laboratory, livestock, environment and private sector health data at national and sub-national level utilizing DHIS-2 platform			Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
		Provincial Health Departments	Partners and Stakeholders					
5.6	Development of SOPs related to data integration, management and utilization for action	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
5.7	Integration of resource management software, HMIS, TIMS and others	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X		

Objective 6: To build multi-sectoral coordination/collaborative approaches for event-based surveillance, risk assessment, and response

Multi-sector collaboration is critical for the development of IDSR that draw upon the key surveillance dimensions to generate actionable intelligence for decision-makers. The multi-sector surveillance mechanisms should include new and innovative approaches to develop multi-disciplinary capabilities at federal and provincial levels to forecast, detect, and assess risks and monitor risk-informed response actions. Table below outlines the key interventions for strengthening multi-sector coordination across Pakistan.

Objective 6: To build Multisectoral Coordination/Collaborative approaches for event-based surveillance, risk assessment, and response				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
6.1	To advocate and sensitize for development of animal, food and environmental diseases surveillance and response system with critical interface with IDSR. Identify indicators for sharing of data impacting human health–sharing of APIs	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
6.2	National and provincial multi-hazard risk assessment and risk profiling	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
6.3	To develop operational protocols/incident action plans for DDSRU/PDSRU for multi-sector response to public health event	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X		
6.4	Multi-sector RRT roster development	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X		
6.5	To establish multi-sector surveillance outputs that provide systematic feedback to all sectors and routinely published and made accessible to the public	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X

Objective 7: To develop sustainable HR capacity for IDSR at federal, provincial levels, districts and health care facility level through capacity building and training

It is evident that if there is no adequate numbers of well-trained staff to carry out all the various functions of disease surveillance then it will not be robust or sustainable system. IDSR system is heavily dependent on a diverse, effective and highly skilled public health workforce that is required at all levels. This workforce should be part an appropriately mandated institutional framework and be able to scale up during emergencies. The surveillance workforce should include both FELTP graduates, frontline trained health worker as well as local public health staff with skills to support all aspects of surveillance. The IDSR system should include both the establishment of in-house capabilities of public health staff and additional shared capacity across epidemiology, One Health, clinical/ laboratory sciences, information technology, and other expertise across sectors (e.g., agriculture, animal health, environment, etc.). Other opportunities to build and share best practices through regular and on need basis surveillance network meetings is also important for long term sustainable workforce development. Table below highlight the key interventions for phase 2 of the IDSR.

Objective 7: To develop sustainable HR capacity for IDSR at federal, provincial levels, districts and health care facility level through capacity building and training				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
7.1	To develop a sustainable IDSR training strategy; hybrid (online/face to face) IDSR training modalities in consultation with all stakeholders	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X				
7.2	To conduct regular and refresher IDSR trainings to further strengthen the IDSR utilizing master trainers at each level	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
7.3	To develop a manual of DHIS-2 for training of IDSR staff on data collection, extraction, collation, analysis/ production of tables graphs and epidemic curves and dashboard development in DHIS-2	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
7.4	To conduct regular and refresher trainings on the DHIS-2 training manual	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders		X	X	X	X

Objective 7: To develop sustainable HR capacity for IDSR at federal, provincial levels, districts and health care facility level through capacity building and training				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
7.5	To conduct regular FELTP frontline trainings using master trainers at all levels	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
7.6	To develop and implement a leadership training programme for IDSR staff	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
7.7	To develop and implement a coaching and mentoring training programme for IDSR staff	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
7.8	Periodic Public Health Laboratory training programme for laboratory staff	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
7.9	To conduct periodic advance trainings on data entry, analysis, and presentation for IDSR staff	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
7.10	To develop and implement automated report generation training for IDSR staff	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
7.11	To develop both generic and disease specific outbreak plans followed by training of relevant staff on outbreak investigation, management and report writing	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
7.12	To develop all hazard multi-sector coordination and training programme	NIH, Ministry of NHSRC and	Relevant Development	X	X			

Objective 7: To develop sustainable HR capacity for IDSR at federal, provincial levels, districts and health care facility level through capacity building and training			Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
		Provincial Health Departments	Partners and Stakeholders					
7.13	To develop and implement periodic multi-hazard risk assessment, risk profiling and risk communication trainings	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
7.14	To develop an advocacy and sensitization training on IDSR for Ministers, Secretaries, Senior Policymakers and deliver it across Pakistan	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X
7.15	To Incorporate IDSR & RRT module into FELTP, medical and nursing schools/universities across Pakistan	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
7.16	Development of E-Modules/Short Courses on the IDSR curriculum for the periodic online refresher trainings at all levels	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X		

Objective 8: Strengthening and implementation of IDSR during humanitarian emergencies/crises

Humanitarian emergencies have major implications for the populations where they occur and for their health services surveillance systems. Emergencies typically result in population displacement to congested settings where access to basic needs like water, food, shelter and other social services are constrained. These conditions increase the risk of death from common epidemic and endemic diseases.

Consequently, effective public health surveillance and outbreak response is a priority during public health emergencies in affected populations. Due to the disruption of health and other social services during the emergencies, the routine IDSR system must be enhanced to meet the public health surveillance and outbreak response needs in humanitarian contexts.

In these settings, IDSR should be tailored to the prevailing context to meet the additional emergency needs. Similarly, an Enhanced IDSR system should be established in such settings to address the humanitarian emergency.

Objective 8: To develop and implement IDSR in complex humanitarian emergencies/crises				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
8.1	Gap analysis of IDSR utilization during emergency and humanitarian crisis (Description of governance, coordination mechanism, methods of data collection, reporting, analysis, transmission methods, interpretation and dissemination)	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
8.2	To develop and implement the improvement plan for the implementation of IDSR during humanitarian crisis (Description of Governance, coordination mechanism, methods of data collection, reporting, analysis, transmission methods, interpretation and dissemination)	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
8.3	To develop/update of multi-hazard rapid assessment/Situational analysis tools; manual & DHIS-2 based online system	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
8.4	To develop training curriculum for the IDSR implementation during emergencies	NIH, Ministry of NHSRC and	Relevant Development	X	X			

Objective 8: To develop and implement IDSR in complex humanitarian emergencies/crises				Timeline				
SN	Key Interventions	Lead Organization	Supporting Organizations	2024	2025	2026	2027	2028
		Provincial Health Departments	Partners and Stakeholders					
8.5	Development/readiness for hazard specific diseases reporting tools within DHIS-2	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X			
8.6	Periodic simulation exercises on data reporting and response using IDSR during different types of emergencies	NIH, Ministry of NHSRC and Provincial Health Departments	Relevant Development Partners and Stakeholders	X	X	X	X	X

MONITORING THE PROGRESS

Taking a logical approach, monitoring and evaluation of IDSR will be based on the eight objectives outlined in this roadmap. The progress of this roadmap will only become evident with comprehensive monitoring through the IDSR Technical Working Group (TWG). Quarterly and annual monitoring of progress will be undertaken to track activities, and report will be produced and shared with all stakeholders.

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