

JOINT EXTERNAL EVALUATION OF IHR CORE CAPACITIES

of the

ISLAMIC REPUBLIC OF PAKISTAN

Mission report:
27 April – 6 May 2016



**World Health
Organization**

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Abbreviations

AFP	acute flaccid paralysis
AJK	Azad Jammu and Kashmir
AMR	antimicrobial resistance
BSL	biosafety level
CADD	Capital Administration and Development Division
CCHF	Crimean-Congo haemorrhagic fever
CDA	Capital Development Authority
DEWS	disease early warning systems
DHIS	district health information system
DoCHE	Directorate of Central Health Establishments
DSS	disease surveillance system
EET	external evaluation team
EMR	WHO Eastern Mediterranean Region
EOC	emergency operations centre
EPA	Environmental Protection Agency
EPI	Expanded Programme for Immunization
EPR	emergency preparedness and response
EQAS	external quality assurance scheme
FATA	federally administered tribal areas
FELTP	Field Epidemiology and Laboratory Training Programme
FAO	Food and Agriculture Organization of the United Nations
FP	focal point
GAP	WHO Global Action Plan for influenza vaccines
GB	Gilgit-Baltistan
GHSA	Global Health Security Agenda
GOARN	Global Outbreak Alert and Response Network
HCAI	health care-associated infections
HEPRN	health emergency preparedness and response network
HRH	human resource for health
ICT	Islamabad Capital Territory
IDSR	integrated disease surveillance and response system
IEC	information, education and communication
IHR	International Health Regulations

ILI	influenza-like illness
ISO	International Organization for Standardization
JEE	Joint External Evaluation of the IHR
MERS-CoV	Middle East respiratory syndrome coronavirus
NAPHIS	National Plant, Animal Health and Inspection Service
NARC	National Agricultural Research Centre
NDMA	National Disaster Management Authority
NFP	National Focal Point
NGO	nongovernmental organization
NHEPRN	National Health Emergency Preparedness and Response Network
NHSR&C	National Health Services Regulations and Coordination (Ministry of)
NIH	National Institute of Health
NRLPD	National Reference Laboratory for Poultry Disease
OIE	World Organisation for Animal Health
PDMA	Provincial Disaster Management Authority
PNRA	Pakistan Nuclear Regulatory Authority
PoE	points of entry
PPE	Personal protective equipment
PVS	performance of veterinary services
RRT	rapid response team
SARI	severe acute respiratory infection
SOP	standard operating procedures
TB	tuberculosis
UNICEF	United Nations Children's Fund
UVAS	University of Veterinary and Animal Sciences
VHF	viral haemorrhagic fever
VLMIS	Vaccine Logistics Management Information System
VPD	vaccine-preventable disease
WHO	World Health Organization

Introduction

The Islamic Republic of Pakistan is a signatory to the International Health Regulations – IHR (2005). However, despite multiple efforts, it has yet to meet the required core capacities, which could jeopardize the country's travel and trade. Even more important, it means the country is not fully prepared to prevent, detect and respond to health threats to protect its population, irrespective of whether the threats arise internally or externally.

The IHR Review Committee on Second Extensions for Establishing National Public Health Capacities and on IHR Implementation (WHA 68/22 Add.1) recommended in 2014 "to move from exclusive self-evaluation to approaches that combine self-evaluation, peer review and voluntary external evaluations involving a combination of domestic and independent experts." A concept note outlining this revised approach was discussed by the WHO Regional Committees in 2015, and a revised IHR Monitoring and Evaluation Framework was noted by the 69th World Health Assembly. As soon as October 2015, during its 62nd session, the WHO Regional Committee for the Eastern Mediterranean Region had discussed such a new approach for the assessment and monitoring of IHR implementation.

The WHO Secretariat, with input from partners, including the Global Health Security Agenda, subsequently developed a Joint External Evaluation (JEE) tool as one of four components of a new framework for IHR monitoring and evaluation.

In response to resolution EM/RC62/R.3 of the Regional Committee WHO Eastern Mediterranean to assess and monitor the implementation of the IHR (2005), Pakistan as the first country in the WHO Eastern Mediterranean Region, and the fourth globally, volunteered for a Joint External Evaluation.

The findings of the evaluation will guide Pakistan in finalizing its 5-year roadmap to develop a strong public health system that will meet the standards for IHR.

Pakistan is a federal system comprising four provinces: Baluchistan, Khyber Pakhtunkhwa, Punjab and Sindh; and four federating areas: Gilgit-Baltistan (GB, province-like status under 2009 presidential ordinance), Islamabad capital territory (ICT), State of Azad Jammu and Kashmir (AJK) and federally administered tribal areas (FATA). These provinces/administrative areas vary in their level of development. The population of Pakistan is around 180 million, with a per capita yearly income of US\$ 1560 (Economic Survey of Pakistan, 2015–2016). The budgetary allocation for the health sector has consistently remained below 1% of gross domestic product (GDP).

On 30 June 2011, the 18th Amendment to the Constitution of Pakistan abolished the Federal Ministry of Health and devolved health issues to the provincial level. The Ministry of National Health Services Regulations and Coordination (NHSR&C) was established on 4 May 2013 with specific rules of business under federal legislative list I and II. In its stewardship role, the Ministry is responsible for developing a vision for the health sector, interprovincial coordination, regulation in medical and allied education, research, national reporting for the health sector, establishing quality standards and meeting international obligations, including United Nations Sustainable Development Goals and IHR. The development and implementation of health sector strategies and plans are, however, a provincial responsibility. Therefore, this JEE focused on assessment of capacities at both the national level and in the provincial/federating areas. Throughout the evaluation, the commitment of all parties to work together to improve the health of the population was unequivocal. This continued commitment will be a critical determinant and component of Pakistan's future success to achieve compliance with the IHR.

The mutual commitment of the federal government and the provincial governments and federating areas to collaborate effectively was apparent throughout the assessment. This dialogue on both sides will maximize efficiencies, create opportunities, and form the foundation of a world-class, equitable system of health care for the citizens of Pakistan.

This report presents jointly developed recommendations and priority actions that resulted from discussions between the EET and their Pakistani peers representing all the sectors relevant to the 19 technical areas of the IHR as described in the JEE tool.

Technical area scores, supporting information, and specific recommendations for priority actions are provided under each of the technical area sections of this report.

Executive summary

This evaluation was a joint assessment of International Health Regulations (2005) (IHR) core capacities of the Islamic Republic of Pakistan using the World Health Organization (WHO) IHR Joint External Evaluation (JEE) tool. A multisectoral international External Evaluation Team (EET) selected on the basis of their recognized technical expertise from a number of countries and international organizations conducted the assessment. The mission took place from April 27 to 6 May 2016.

The Joint External Evaluation was based on completely collaborative, multisectoral discussions with country experts at both the national and provincial level. Prior to the arrival of the external team, the Government of Pakistan completed a self-assessment using the JEE tool following four weeks of rigorous preparatory work at national and provincial level to compile data and information on all 19 technical areas in the JEE tool. Two intense orientation sessions were conducted in Karachi and Lahore for 120 participants from the national, provincial and federating areas. Participants included representatives from health, environment and climate change sectors, food security, livestock, agriculture, national and provincial disaster management authorities, and the Pakistan Atomic Energy Commission.

The results of the self-assessment for all technical areas were presented and discussed in detail with the EET at the start of the external assessment on 27 April. The EET and host country experts then participated in a series of facilitated discussions to jointly assess Pakistan's current strengths/best practices, areas that need strengthening/challenges, scores, and recommending 3–5 priority actions for each of the 19 technical areas. The follow-up meetings and site visits in Islamabad and four major provinces ensured representation of national, provincial and federating area perspectives.

This summary highlights the important cross-cutting themes that emerged as priorities for action.

Major findings

The timing of the JEE is optimal given international attention to global health security and the post-devolution scenario in the country, particularly the opportunity to optimize federal and provincial coordination across multiple sectors for a "One Health" approach.¹ It is also timely because it reflects the country's commitment to public health, given that Pakistan is on the verge of polio eradication.

Significant differences exist in capacity to provide primary and preventive health care. Some areas and sectors are quite advanced while others are currently less so. This diversity is a challenge but also an opportunity to replicate the experiences and best practices of more advanced areas to strengthen health-care delivery throughout Pakistan.

Five major cross-cutting themes emerged from the review of the 19 technical areas that are required to fulfil the IHR requirements to prevent, detect and mount a comprehensive public health response to health threats.

- First and foremost, there is a critical need for continued and expanded multisectoral communication and coordination.** This extends in all directions – between sectors (including but not limited to public health, animal health, security, and environment) and between the federal government and provincial authorities. The devolution and subsequent renotification of the Ministry

¹ The "One Health" concept was introduced at the beginning of the 2000s. In a few words, it summarizes that human health and animal health are interdependent and bound to the health of the ecosystems in which they exist. World Organisation for Animal Health, www.oie.int/en/for-the-media/onehealth/

of NCSR&C has created both challenges and opportunities. Pakistan has begun to capitalize on the opportunities by establishing the regulatory base, structures and systems that maximize the strengths of each. Work to define roles and responsibilities should be continued: in any devolved or federated system, clarity on the roles and responsibilities at all levels is critical to success and forms the basis on which to build effective collaboration and coordination.

- **Second, there is a critical need for a sufficiently funded, widely supported country 5-year plan/roadmap to strengthen IHR capabilities.** Use of an open, transparent, fully collaborative and multisectoral process like the JEE assessment will strengthen buy-in and commitment at all levels. This plan will provide the basis for the Government of Pakistan, the Ministry of NCSR&C, Ministry of National Food Security and Research, Ministry of Climate Change and other stakeholders to agree on priorities for implementation and negotiation with internal and external partners for investment and support. The roadmap will also provide the core platform to develop action plans for the key priorities identified across the 19 technical areas. The roadmap should include clear milestones (for example establishing a functioning public health laboratory in each province within three years) and identify the responsible implementing authorities/stakeholders.
- **Third, there is a need to establish a strong, visible, active surveillance and tiered public health laboratory system,** covering human and zoonotic animal health as well as food and water safety, with appropriate infrastructure, at national and provincial levels. The development of a National Public Health Institute² might meet this criterion, but would need to be considered in the context of a “One Health” approach. The organization of the surveillance system could be modelled on the overall approach to devolution in Pakistan with the national level setting the policy and framework in mutual consultation, and the provincial level implementing the framework.
- **Fourth, there is a need to develop and enhance regulations, standards, and coordination mechanisms for food safety,** from the beginning to end of the production chain, addressing both chemical and microbiological contamination.
- **Fifth, there is a need for a national cross-sectoral approach** to managing antimicrobial resistance and control of health care-associated infections.

Next steps

The following are overarching, high priority actions for implementing the results of this assessment.

- **Immediately establish and strengthen coordination mechanisms** across sectors and between provinces and the federal ministry. The National IHR Task Force comprising health and non-health sectors and provincial representation is already established and in place. There is however, a need to enhance the scope and representation of this Task Force to include relevant stakeholders in a strong “One Health” approach in order to build the requisite IHR core capacities. This can be done within the current governmental mandate and framework as it essentially involves getting the right people together to build on the goodwill for collaboration developed through the self-assessment process, facilitated by the external evaluation.
- **Task the Ministry of NCSR&C to identify any gaps in the legal framework** for the new system and processes in order to institute them without delay. However, most actions appear to be restricted by current legislation and administrative orders.

² The NIH, as assessed by the EET, does not currently fulfil all critical tasks characteristic of a public health institute or for the implementation of essential public health measures.

- **Finalize and cost the 5-year roadmap** using the JEE report as the basis for priority actions (building into the plan the recommendations of previous international assessments such as the performance of veterinary services (PVS) pathways). The following themes will need to be taken into account, as they will be underpin actions for all technical areas.
 - **Workforce development:** This is a major challenge highlighted at both the federal and provincial levels. There is a need for human resource policies and strategies that include projected needs, eligibility criteria, efficient recruitment, and development of a career ladder to improve retention for various categories of public and animal health professionals.
 - **Polio eradication transition:** Systematic planning must determine how the assets and best practices of polio eradication are transitioned and mainstreamed over time to support other priorities, particularly immunization and vaccine-preventable disease surveillance. More generally, the integrated infectious disease surveillance and control system should be developed toward a more generic horizontal system capable of detecting and responding to any disease.
 - **Legislative gaps:** The Ministry of NCSR&C should initiate a review with the Ministry of Law and Justice to identify whether gaps exist in the legislative system to support the roadmap and examine the need to accelerate finalization and approval of important national and provincial legislation and plans. Examples include legislation for notifiable diseases, the National Animal and Plant Health Inspection Service (NAPHIS) legislation currently under consideration, and the national and provincial Health Emergency Preparedness and Response Plans. However, efforts to start development should not depend on completing the legislative reform but rather be initiated immediately.
 - **Cross-sector preparedness:** Cross-sector preparedness and response capacity for all hazards applying the incident management system approach should be established.
 - **Funding:** Domestic and technical funding for the country plan/roadmap should be allocated or sought. A number of priority actions can be completed within existing resources, but additional investment is needed, which should come from a combination of domestic and external support.
 - **Engagement and coordination with external partners to fill gaps in financial and technical support:** This report should serve as a common platform for coordination of international agency, donor and technical support to the country plan/roadmap and its priorities. The multisectoral and collaborative nature of the JEE process, which enjoys broad global support and visibility, makes it ideally suited for this purpose. There is an inherent presumption in the global health security process that countries will help each other and that agencies and donors of the international community will support countries in need.
 - **Continual improvement:** Pakistan should institute annual JEE self-evaluation and repeat the external JEE in 3–5 years. The JEE is a continuous process of evaluation and improvement. It supports and is a part of other processes such as the Sendai Framework for Disaster Risk Reduction, WHO's emergency response reform and the restructuring of the IHR's monitoring process (of which the JEE is an integral part), the OIE Performance of Veterinary Services, the evolution of the Global Health Security Agenda (formed based on article 44 of the IHR to support its implementation), and the response to international evaluation of the Ebola response. A common theme is that, although evaluation is an essential step to improve a country's ability to protect the health of its people, it is not an end in itself; it is the start of a process of continuous review and improvement. The JEE therefore is one step along this process and should include both a wider and longer term perspective.

Pakistan scores

Capacities	Indicators	Score ¹
National legislation, policy and financing	P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR	2
	P.1.2 The state can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with the IHR (2005)	3
IHR coordination, communication and advocacy	P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR.	3
Antimicrobial resistance	P.3.1 Antimicrobial resistance (AMR) detection	1
	P.3.2 Surveillance of infections caused by AMR pathogens	1
	P.3.3 Healthcare associated infection (HCAI) prevention and control programs	1
	P.3.4 Antimicrobial stewardship activities	1
Zoonotic diseases	P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens	3
	P.4.2 Veterinary or Animal Health Workforce	3
	P.4.3 Mechanisms for responding to zoonoses and potential zoonoses are established and functional	2
Food safety	P.5.1 Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination.	2
Biosafety and biosecurity	P.6.1 Whole-of-Government biosafety and biosecurity system is in place for human, animal, and agriculture facilities	2
	P.6.2 Biosafety and biosecurity training and practices	2
Immunization	P.7.1 Vaccine coverage (measles) as part of national program	2
	P.7.2 National vaccine access and delivery	4
National laboratory system	D.1.1 Laboratory testing for detection of priority diseases	4
	D.1.2 Specimen referral and transport system	3
	D.1.3 Effective modern point of care and laboratory based diagnostics	2
	D.1.4 Laboratory Quality System	2
Real-time surveillance	D.2.1 Indicator and event based surveillance systems	3
	D.2.2 Inter-operable, interconnected, electronic real-time reporting system	2
	D.2.3 Analysis of surveillance data	2
	D.2.4 Syndromic surveillance systems	4
Reporting	D.3.1 System for efficient reporting to WHO, FAO and OIE	2
	D.3.2 Reporting network and protocols in country	2
Workforce development	D.4.1 Human resources are available to implement IHR core capacity requirements	3
	D.4.2 Field epidemiology training programme or other applied epidemiology training programme in place	3
	D.4.3 Workforce strategy	2

¹ Red: no capacity; yellow: developed or demonstrated capacity; green: sustainable capacity.

Source: Indicator tables of the Joint External Evaluation Tool, IHR (2005) Monitoring and Evaluation Framework.

Preparedness	R.1.1 Multi-hazard National Public Health Emergency Preparedness and Response Plan is developed and implemented	1
	R.1.2 Priority public health risks and resources are mapped and utilized	1
Emergency response operations	R.2.1 Capacity to activate emergency operations	2
	R.2.2 Emergency Operations Centre operating procedures and plans	2
	R.2.3 Emergency operations programme	3
	R.2.4 Case management procedures are implemented for IHR relevant hazards	2
Linking public health and security Authorities	R.3.1 Public health and security authorities (e.g. law enforcement, border control, customs) are linked during a suspect or confirmed biological event	3
Medical countermeasures and personnel deployment	R.4.1 System is in place for sending and receiving medical countermeasures during a public health emergency	4
	R.4.2 System is in place for sending and receiving health personnel during a public health emergency	4
Risk communication	R.5.1 Risk communication systems (plans, mechanisms etc.)	1
	R.5.2 Internal and partner communication and coordination	2
	R.5.3 Public communication	2
	R.5.4 Communication engagement with affected communities	2
	R.5.5 Dynamic listening and rumour management	3
Points of entry (PoE)	PoE.1 Routine capacities are established at PoE.	2
	PoE.2 Effective public health response at Points of Entry	2
Chemical events	CE.1 Mechanisms are established and functioning for detecting and responding to chemical events or emergencies	2
	CE.2 Enabling environment is in place for management of chemical events	2
Radiation emergencies	RE.1 Mechanisms are established and functioning for detecting and responding to radiological and nuclear emergencies	5
	RE.2 Enabling environment is in place for management of radiation emergencies	5

Note on Scoring of technical areas of the JEE Tool:

The Joint External Evaluation process is a peer to peer review. As such, it is a collaborative effort between host country experts and External Evaluation Team members. In completing the self-evaluation, the first step in the JEE process, and as part of preparing for an external evaluation, host countries are asked to focus on providing information on their capabilities based on the indicators and technical questions included in the JEE Tool. The host country may score their self-assessment or propose scores during the on-site consultation with the external team. The entire external evaluation, in particular the discussions around the score, the strengths, the areas which need strengthening, and the priority actions should be collaborative, with external evaluation team members and host country experts seeking agreement. Should there be significant and irreconcilable disagreement between the external team members and the host country experts or among the external or among the host country experts, the External Evaluation Team Lead will decide on the final score and this will be noted in the Final Report, along with the justification for each party's position.

PREVENT

National legislation, policy and financing

Introduction

The International Health Regulations - IHR (2005) provides obligations and rights for States Parties¹. In some States Parties, implementation of the IHR (2005) may require new or modified legislation or simply the use of existing legislative instruments. Even if new or revised legislation may not be specifically required, States may still choose to revise some regulations or other instruments in order to facilitate IHR implementation in a more effective manner. Implementing legislation could serve to institutionalize and strengthen the role of IHR (2005) and operations within the State Party. It can also facilitate coordination among the different entities involved in their implementation. See detailed guidance on IHR (2005) implementation in national legislation at http://www.who.int/ihr/legal_issues/legislation/en/index.html. In addition, policies which identify national structures and responsibilities as well as the allocation of adequate financial resources are important.

Target

States Parties should have an adequate legal framework to support and enable the implementation of all of their obligations and rights to comply with and implement the IHR (2005). In some States Parties, implementation of the IHR (2005) may require new or modified legislation. Even where new or revised legislation may not be specifically required under the State Party's legal system, States may still choose to revise some legislation, regulations or other instruments in order to facilitate their implementation and maintenance in a more efficient, effective or beneficial manner. State parties should ensure provision of adequate funding for IHR implementation through national budget or other mechanism.

Pakistan level of capabilities

Pakistan has a substantial national and provincial legal framework to support and enable the implementation of IHR and the Global Health Security Agenda (GHSA) technical areas targets. Laws govern the regulation of medicines, health-care services, health professionals, food safety and ports of entry among others. Although some new legislation might be needed, overall the current legal system provides numerous legal instruments such as regulations or other administrative measures that can provide the necessary legal foundation for IHR implementation, obviating the need for parliamentary approval – a process that can require intense time and effort.

The legal framework for IHR coordination derives from the 1973 Constitution and its amendments that contain mechanisms for coordination between the different parts of the Government and the rules of business that define the responsibilities of each ministry. This legal framework is a good example of a best practice for countries to take into consideration for IHR coordination.

Given the fundamental changes to the Constitution since 1973, the structure of Government since the IHR (2005), and the fact that the national and provincial legal landscape has multiple relevant laws, there are inevitably some gaps, overlaps and areas for improvement in the national and provincial legal landscape for IHR. The best practice to ensure a comprehensive legal framework would be to conduct a legal and regulatory assessment to identify all areas for improvement.

¹ <http://nhsr.gov.pk/> - > Downloads - > Laws, SROs and Notifications

Recommendations for priority actions

This report recommends the following priority actions to fulfil the obligations of IHR.

- Conduct a legal and regulatory assessment jointly by public health and legal experts to define the public health activities needed to implement fully the IHR: determine the legal authority needed and, if already present, identify gaps, adjust laws where necessary or adopt administrative arrangements where possible. This assessment should follow the "One Health" approach across the whole of Government by clearly defining stakeholders and bodies of law outside the health sector that are essential to IHR – the judiciary, agriculture, food safety, transportation, aviation, tourism, the police – to ensure the laws relevant to non-health sector stakeholders are consistent and supportive of IHR implementation.
- Implementation of the recommendation in the near term
 - Use administrative legal tools to address IHR stipulations that require a legal foundation
 - Build a legal unit in the Ministry of National Health Services, training senior staff through international and domestic legal technical assistance until an internal legal unit is functional
 - Approve and implement outstanding policies
- Implementation of the recommendation in the medium and long term
 - Align and harmonize national, interprovincial, and provincial laws, policies and administrative arrangements as part of overall IHR coordination
 - Pass new and pending legislation as needed, and
 - Reinforce IHR implementation linked to health system strengthening.

Indicators and scores

P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR.

Score 2: Limited capacity. Assessment of relevant legislation, regulation, administrative requirements and other government instruments for IHR implementation has been carried out.

Strengths/best practices

- Pakistan demonstrates commitment to implementing the IHR; in addition to this JEE, an IHR assessment in 2013 and a legislative assessment of the existing rules and laws related to public health were undertaken in 2010 and 2012–2013. In addition, a PVS evaluation was conducted in 2015.
- A substantial legal framework exists for most technical areas.
- Pakistan has a senior, knowledgeable lawyer assigned to public health matters in the Ministry of Law and Justice, and a capable private legal sector that can provide short-term technical legal expertise.
- The Ministry publishes laws and actively maintains a website with a complete repository of laws accessible to the general public.²

² <http://nhsr.gov.pk/> - > Downloads - > Laws, SROs and Notifications

Areas that need strengthening/challenges

- Some provinces lack laws in essential areas such as food safety. Provinces that already have such laws should provide technical support to plug these gaps.
- Ministry staff unfamiliar with the legal framework incorrectly presume that legislation only concerns Acts of Parliament, and are thus unable to advise on the range of legal options available. Advocacy and awareness training of health staff and technical support to effectively and efficiently use existing legal instruments would be beneficial.
- Multisectoral coordination between stakeholders should be strengthened, especially with those outside the health sector under the umbrella of the “One Health” approach (e.g. coordination between human and animal health surveillance programmes to address priority zoonotic diseases and antimicrobial resistance (AMR)).

P.1.2 The state can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with the IHR (2005).

Score 3: Developed capacity. The country can demonstrate the existence and use of relevant laws and policies in the various sectors involved in the implementation of the IHR.³

Strengths/best practices

- IHR is entrusted to the Ministry of National Health Services Regulation and Coordination (including the National IHR Focal Point (NFP)).
- Progress has been made to develop and approve policies and draft bills, for example policies on AMR, biosafety and biosecurity, and national laboratories; and draft bills on food safety, animal and plant health regulation.
- Pakistan is in the process of building a stronger regulatory system by establishing health-care commissions, a Drug Regulatory Authority and professional councils. These will provide the legal framework to include health establishments and health (human and animal) professionals into a coordinated and integrated surveillance and reporting system.

Areas that need strengthening/challenges

- There is insufficient legal capacity to support the Ministry of National Health Services Regulation and Coordination. Although one senior staff/lawyer from the Ministry of Law and Justice is assigned to public health, there is a need for a dedicated legal unit within the Ministry of NHSR&C.
- Draft bills and policies need to be reviewed and approved by Parliament and other relevant authorities, and implemented.
- Funding for IHR/disease surveillance and emergency response has been fragmented with no specific budget allocations for the IHR in the regular or development budget in the past. A dedicated budget line and funding need to be approved to support IHR implementation.

Relevant documentation

A chart of the laws for the 19 technical areas at national and provincial level is available upon request.

³ For the animal health sector, this information can be found in the country PVS report, Critical Competencies card IV-1: Preparation of legislation and regulation, and card IV-2: Implementation of legislation and regulation and compliance thereof.

IHR coordination, communication and advocacy

Target

The effective implementation of the IHR (2005) requires multisectoral/multidisciplinary approaches through national partnerships for effective alert and response systems. Coordination of nationwide resources, including the sustainable functioning of a National IHR Focal Point (NFP), which is a national centre for IHR (2005) communications, is a key requisite for IHR (2005) implementation. The NFP should be accessible at all times to communicate with the WHO IHR Regional Contact Points and with all relevant sectors and other stakeholders in the country. States Parties should provide WHO with contact details of NFPs, continuously update and annually confirm them.

Pakistan level of capabilities

Despite being effective since June 2007, the understanding and importance of IHR for health- and non-health related sectors remain uneven at best. In most instances, the former Ministry of Health and now the Ministry of NCSR&C is the custodian of IHR implementation. However, linkages and coordination within health, (human and animal) and with critical non-health sectors (trade, transportation, tourism, aviation, maritime, commerce, etc.) is either lacking or limited at all levels.

The Ministry of NCSR&C has designated an IHR NFP accessible 24/7 and, together with WHO, has established an IHR multisectoral Task Force that meets periodically. Advocacy sessions have also been conducted for other line ministries at federal and provincial levels and need to be maintained. However, institutionalized and sustainable linkages based on a clear understanding of the significance of IHR and the benefits that may accrue to other sectors from such multisectoral coordination are lacking. Furthermore, post devolution, application and practice of key elements of IHR at provincial/federating area levels in response to a threat/event are also lacking. All provinces have an IHR focal point except for the Azad Jammu and Kashmir and Gilgit-Baltistan. None of the provinces or federating areas has in place a multisectoral One Health body to practise and execute these elements locally in times of need.

Recommendations for priority actions

- The effectiveness of the national IHR Task Force may be improved by holding regular meetings for communication on IHR/GHSA updates. These should be supplemented with advocacy and supported with clear terms of reference tested through periodic tabletop exercises simulating multisectoral response to major public health risks that may confront Pakistan.
- Replicating federal IHR NFP and IHR Task Force modalities, IHR provincial focal points (FPs) should be complemented with multisectoral IHR Task Forces/committees in all provinces/areas. Provincial IHR FPs must also be available 24/7. Provincial task forces should also meet on a regular basis with clear terms of reference, tested at least yearly through simulation modalities as they are at national level. The simulation scenarios may also include testing of linkages between provinces/areas and national authorities and assets.

Indicators and scores

P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR.

Score 3: Developed capacity. A multisectoral, multidisciplinary body, committee or task force addressing IHR requirements on surveillance and response for public health emergencies of national and international concern is in place and participated in the latest event.

Strengths/best practices

- An IHR NFP is designated at the National Institute of Health (NIH) with 24/7 availability.
- IHR FPs are available in all four provinces.
- A multisectoral IHR Task Force is established at national level with clear terms of reference.
- The draft Pakistan Public Health Act, developed through a consultative process in 2010, may be adapted to the provincial context in the post-devolution scenario.
- The multisectoral IHR Task Force meets regularly and on ad hoc/needs basis (e.g. for Zika preparedness and response).
- A substantial legal framework exists for almost all IHR core capacities.

Areas that need strengthening/challenges

- The IHR NFP needs to have a legal mandate to coordinate with non-health sectors for implementation of IHR.
- The composition of IHR Task Force should be reviewed to include additional sectors to cover the 19 technical areas.
- Strong additional advocacy is needed across sectors to highlight IHR significance and the need for institutionalized and sustainable, multisectoral coordination and collaboration structures based on clear terms of reference and delineated mutual benefits for all at federal and provincial/area levels.
- IHR FPs need to be designated in all provinces/areas with 24/7 communication capacities.
- Yearly simulations should take place to test and improve the functioning of IHR FPs and multisectoral IHR structures.

Relevant documentation

- Federal notifications designating IHR NFP and establishing the IHR Task Force.
- Provincial notifications from Punjab, Khyber Pakhtunkhwa (KP), Balochistan and Sindh designating provincial IHR FPs.
- Draft Pakistan Public Health Act 2010.
- IHR Capacity Assessment Report 2013.
- PoE Assessment Report 2014.

Antimicrobial resistance

Introduction

Bacteria and other microbes evolve in response to their environment and inevitably develop mechanisms to resist being killed by antimicrobial agents. For many decades, the problem was manageable as the growth of resistance was slow and the pharmaceutical industry continued to create new antibiotics.

Over the past decade, however, this problem has become a crisis. The evolution AMR is occurring at an alarming rate and is outpacing the development of new countermeasures capable of thwarting infections in humans. This situation threatens patient care, economic growth, public health, agriculture, economic security, and national security.

Target

Support work being coordinated by WHO, FAO, and OIE to develop an integrated and global package of activities to combat antimicrobial resistance, spanning human, animal, agricultural, food and environmental aspects (i.e. a one-health approach), including: a) Each country has its own national comprehensive plan to combat antimicrobial resistance; b) Strengthen surveillance and laboratory capacity at the national and international level following agreed international standards developed in the framework of the Global Action Plan, considering existing standards and; c) Improved conservation of existing treatments and collaboration to support the sustainable development of new antibiotics, alternative treatments, preventive measures and rapid, point-of-care diagnostics, including systems to preserve new antibiotics.

Pakistan level of capabilities

The Government of Pakistan has recognized AMR as a major threat to the health and development of its population. The Ministry of NCSR&C expressed an interest to join the early implementation of the Global Antimicrobial Resistance Surveillance System (GLASS). In November 2015, a joint WHO/Ministry of NCSR&C team visited selected sites in the country and mapped available capacities for establishing an AMR Surveillance System. Subsequently, an intersectoral core steering committee was formed to oversee the process of developing a national AMR policy.

There is a high level of commitment and willingness at the national and provincial levels for establishing a national AMR surveillance system. Despite the fact that many of the components needed for AMR surveillance exist, additional work is required to develop a national AMR detection and surveillance system capable of generating quality data for evidence-informed national policies, strategies and plans, and timely operational and tactical response for mitigation and control. Sentinel sites for antimicrobial resistance detection and surveillance are in the implementation stage in at least two provinces. There is an urgent need to standardize laboratory methods and interpretation metrics for antimicrobial resistance testing. The concept of health care-associated infection (HCAI) prevention and control is relatively new to Pakistan. Programmes for antimicrobial stewardship, surveillance, prevention and control of HCAI are limited to certain tertiary care and university hospitals. There is a nationwide shortage of qualified infection control experts, infectious disease specialists and medical microbiologists.

Recommendations for priority actions

- Develop a National Action Plan to address AMR detection and surveillance in line with the WHO Global Action Plan for influenza vaccines (GAP).

- Develop a national programme to address the prevention and control of HCAI.
- Develop a national antimicrobial stewardship programme that involves human and animal sectors.
- Strengthen infrastructure of diagnostic laboratories in public health and animal health sectors and standardize the antibiotic sensitivity testing and interpretation.

Indicators and scores

P.3.1 Antimicrobial resistance detection.

Score 1: No capacity. No national plan for detection and reporting of priority AMR pathogens has been approved.

Strengths/best practices

- Recently, the NIH was designated as the AMR focal point at the federal level.
- An AMR assessment mission conducted in 2015 evaluated and designated sentinel sites in both the public and private health sector. The designated laboratories are working in collaboration with the NIH and the WHO Regional Office for the Eastern Mediterranean.
- The Ministry of NCSR&C has initiated a consultative process for the development of a National Policy for Containment of Antimicrobial Resistance.
- Facilities are available for testing some priority pathogens especially at universities and tertiary care hospitals, such as multi drug resistance testing under the National Tuberculosis Control Programme.
- Some animal health laboratories are undertaking antibiotic sensitivity testing for treatment purposes.

Areas that need strengthening/challenges

- A National Action Plan to address AMR needs to be developed in line with the WHO GAP.
- Infrastructure of diagnostic laboratories in public health and animal health sectors should be strengthened.
- Laboratory methods and interpretation metrics for AMR testing needs to be standardized.
- There is need for an integrated One Health approach and coordination between the health and non-health sectors to address the issue of AMR in Pakistan.

P.3.2 Surveillance of infections caused by AMR pathogens.

Score 1: No capacity. No national plan for surveillance of infections caused by priority pathogens has been approved.

Strengths/best practices

- The Pakistan Antimicrobial Resistance Network (PARN) is a nongovernmental organization (NGO) involved in AMR surveillance and information on AMR patterns is shared by some laboratories, mostly from the private sector. This network helps create awareness through meetings and seminars, and sharing protocols and educational material for antimicrobial testing and control of HCAI.
- An AMR surveillance system for *Mycobacterium tuberculosis* exists in Pakistan through a network of provincial and federal laboratories.

Areas that need strengthening/challenges

- Basic laboratory infrastructure exists in many tertiary care hospitals, research institutes and universities. However, capacities to perform, report and share AMR testing are not widely available.
- Building human capacities and securing laboratory supplies are prerequisites to have a functional AMR surveillance system.
- The Pakistan Antimicrobial Resistance Network should be empowered and scaled up to enable launching nationwide AMR surveillance.

P.3.3 Health care-associated infection prevention and control programmes.

Score 1: No capacity. No national plan for an HCAI programme has been approved.

Strengths/best practices

- Some large tertiary care hospitals have assigned infection prevention and control activities to physicians and microbiologists. Infectious diseases isolation units are available at some health-care facilities.
- A federal government document on Rules of Hospital Waste Management has been available since 2005 and practised in some health-care facilities. Attempts to scale up the applications of these rules are under way in one province.

Areas that need strengthening/challenges

- A comprehensive HCAI prevention and control mechanism is needed both at the federal and provincial levels.
- There is a national need for trained infection control/infectious disease professionals to enable the establishment of hospital-based infection prevention and control programmes.

P.3.4 Antimicrobial stewardship activities.

Score 1: No Capacity. No national plan exists for antimicrobial stewardship activities.

Strengths/best practices

- Some hospitals, especially in the private sector, practise antimicrobial stewardship activities.
- Antimicrobial stewardship will be an integral part of the planned national AMR containment policy.
- Antimicrobial peptides are being introduced to replace antibiotics used currently as animal growth promoters.

Areas that need strengthening/challenges

- Awareness of antimicrobial stewardship is generally low, even among health-care providers. Advocacy and knowledge dissemination is needed.
- The Government needs to revise and issue regulations to monitor and control the use of antibiotics in human and animal sectors.

Relevant documentation

- Report on Country Capacity Review Mission for Early Implementation of AMR Surveillance in Pakistan, 23–28 November 2015.
- Hospital Waste Management Rules, Notification S.R.O.1013 (1), 2005.
- Formation notification of a steering committee to oversee the process of developing a national AMR containment policy F.No.8-30/2015-DDP-I.

Zoonotic diseases

Introduction

Zoonotic diseases are communicable diseases and microbes spreading between animals and humans. These diseases are caused by bacteria, viruses, parasites, and fungi that are carried by animals, and an insect or inanimate vector may or may not be needed to transfer the microbe. Approximately 75% of recently emerging infectious diseases affecting humans is of animal origin; approximately 60% of all human pathogens are zoonotic.

Target

Adopted measured behaviours, policies and/or practices that minimize the transmission of zoonotic diseases from animals into human populations.

Pakistan level of capabilities

Agriculture and livestock production are important contributors to the economy of Pakistan. The large animal population is a potential source of zoonotic diseases and consequently, animal diseases are an important veterinary health priority. Several zoonotic diseases endanger public health, especially at the human–animal interface. Leishmaniasis, rabies, brucellosis, Crimean-Congo haemorrhagic fever (CCHF), pandemic Influenza, and anthrax are priority zoonotic diseases in Pakistan.

In response, Pakistan has established several surveillance programmes and projects to monitor animal diseases including zoonotic diseases. In addition, there is a core of trained professionals and capable laboratories on both the animal and public health side. Pakistan's National Programme for the Control and Prevention of Avian Influenza was established in 2006 in response to the emergence of A(H5N1) in Asia. This successful programme remains sustainable and in effect and follows an exemplary One Health approach. Animal health and public health authorities conduct routine surveillance for influenza viruses in their respective populations of interest as well as wild birds. When a zoonotic event is suspected, it is jointly investigated by sampling both populations, conducting laboratory diagnostics, and sharing results on ad hoc basis. Coordination exists throughout the system, i.e. within the provinces, at the national level, and between the provinces and the national level. This programme can provide an excellent platform for surveillance and response for other zoonotic diseases of importance.

However, a One Health approach for zoonotic disease management would be boosted by implementing necessary legal instruments and mechanisms.

Recommendations for priority actions

- Develop and implement necessary legal instruments and coordination mechanisms to adopt a One Health approach for zoonotic disease management.
- Conduct systematic surveillance at the human–animal interface using a One Health approach for priority zoonotic diseases.
- Enhance training of veterinary and public health professionals on zoonotic disease management using a One Health approach and enhancing laboratory capacity.

Indicators and scores

P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens.

Score 3: Developed capacity. Zoonotic surveillance systems are in place for 1–4 zoonotic diseases/pathogens of greatest public health concern (variability exists between provinces).

Strengths/best practices

- A list of priority zoonotic diseases is available.
- The country has past experience of successfully running a One Health zoonotic disease surveillance system (avian Influenza).
- Other One Health projects have been handled jointly in recent years (CCHF, brucellosis).
- Some international financial and technical assistance is still available to support One Health surveillance activities.
- A CCHF Task Force has been notified in Balochistan province which has significant cross-border movement of animals. The Director General of Health Services is the focal point for the Task Force, which coordinates with the livestock department as and when required.
- Surveillance and laboratory capacity are available for monitoring zoonotic and other animal diseases in the provinces, with plans for expansion.
- Local veterinary vaccine production capability exists with the capacity to tailor to local needs.

Areas that need strengthening/challenges

- One Health hubs should be established with defined terms of reference and operational mechanisms.
- Mechanisms of joint action need to be developed and implemented against major zoonoses by all the stakeholders at national and provincial levels.
- The establishment of legal instruments would enhance zoonotic disease surveillance, response, and related enforcement interventions at national and provincial levels.
- Laboratory capacity should also be enhanced to support surveillance activities at national, provincial, and district levels.
- The list of priority zoonotic diseases should be reviewed and updated periodically due to the high zoonotic disease burden in Pakistan. Among others, *Mycobacterium bovis*, which is very common among livestock, should be added to the list.

P.4.2 Veterinary or animal health workforce.

Score 3: Developed capacity. Animal health workforce capacity exists within the national public health system, but at less than half of subnational levels.

Strengths/best practices

- The veterinary curriculum contains sufficient training for handling zoonotic diseases for Doctor of Veterinary Medicine graduates.
- Post-graduate degree programmes in microbiology and epidemiology are offered by veterinary and medical schools.
- Training programmes of the Health Services Academy and the Field Epidemiology and Laboratory Training Programme (FELTP) include veterinarians in the 2-year programme.

- The University of Veterinary and Animal Sciences (UVAS) in Lahore, Punjab incorporates training on One Health in the curriculum and offers an Master of Philosophy degree (MPhil) in Epidemiology and Public Health.
- UVAS has a strong research focus with collaboration with local government, industry, and international bodies.

Areas that need strengthening/challenges

- Short in-service and refresher training modules on zoonotic disease surveillance would be useful for different cadres of public health and animal health professionals at all levels.
- Efforts should be made to develop training curricula that focus on the One Health approach at national and provincial levels.
- The number of veterinary epidemiologists needs to be increased; FELTP should include training in this subject.

P.4.3 Mechanisms for responding to zoonoses and potential zoonoses are established and functional.

Score 2: Limited capacity. A mechanism for coordinated response to outbreaks of zoonotic diseases by human, animal and wildlife sectors is established.

Strengths/best practices

- Experience gained from the avian influenza programme can be used as a platform to develop/ expand mechanisms.
- Trained epidemiologists and laboratory staff are available in both public and animal health.
- A system exists to mobilize field vets to investigate or respond to an outbreak within 24–48 hours.
- Very strong public–private sector interaction has been built up in the area of poultry zoonoses.
- An informal committee for coordination between animal and public health sectors is established in KP.
- KP also has an integrated vector management programme focused on relevant zoonotic diseases.

Areas that need strengthening/challenges

- A One Health zoonotic disease management programme should be developed and implemented, supported by the necessary legal instruments that clearly define the role of all stakeholders at both national and provincial levels.

Relevant documentation

- Avian Influenza Contingency Plan for Pakistan.
- NIH/Pakistan Agricultural Research Council One Health Agreement.
- Notification of establishment of National Zoonoses Surveillance and Research Unit (NaZSRU).
- World Organisation for Animal Health Performance of Veterinary Services 2015.

Food safety

Introduction

Food and waterborne diarrhoeal diseases are leading causes of illness and death, particularly in less developed countries. The rapid globalization of food production and trade has increased the potential likelihood of international incidents involving contaminated food. The identification of the source of an outbreak and its containment is critical for control. Risk management capacity with regard to control throughout the food chain continuum must be developed. If epidemiological analysis identifies food as the source of an event, based on a risk assessment, suitable risk management options that ensure the prevention of human cases (or further cases) need to be put in place.

Target

State Parties should have surveillance and response capacity for food and waterborne diseases' risk or events. It requires effective communication and collaboration among the sectors responsible for food safety and safe water and sanitation.

Pakistan level of capabilities

Food safety is a responsibility of multiple ministries at the federal level and departments of health at the provincial level. With the 18th Amendment to the Constitution of Pakistan, most functions of the agriculture and health sector were devolved to the provincial level in 2011. At this level, an entity called a Food and Agriculture Department (KP) or Food Authority (Punjab, KP) etc. is responsible for enacting the Food Act and Regulations. Provinces such as Punjab and KP have passed a Food Act and also have an Act to establish the Food Authority. However, this is not the case in all provinces and territories (AJK and Gilgit-Baltistan (GB) do not have a food act; ICT implements the Pure Food Ordinance of 1960).

Where present, legislation generally covers only an end product inspection and testing and does not address the preventive approach to the complete food chain. Neither are risk-based preventive approaches covered in food legislation. Each province separately deals with the subject and there is no federal level authority/mechanism to enforce uniformity. Crop and animal health and safety, including zoonoses, are responsibilities of the Agriculture, Livestock and Dairy Departments at the provincial level. Quality control of the import of fish and fishery products is the responsibility of the Ministry of National Food Security and Research, but export-related issues are handled by the Ministry of Ports and Shipping at the federal level. Foodborne disease outbreaks are addressed by the departments of health at provincial/area levels.

Zoonotic disease situations are addressed in coordination with the livestock departments and veterinary institutes in the public and private sector. This coordination has recently been significantly strengthened. However, for chemical foodborne disease surveillance, linkages with animal and agriculture departments are not well established. There is no evident system for risk communication of food safety-related emergencies in terms of a rapid alert system for food and feed as is the case in the European Union. There was also no information in relation to International Food Safety Authorities Network (INFOSAN) activities. The National Codex contact point is with the Ministry of Food Security and Research and is envisaged to come under the National Animal and Plant Health Inspection Service (NAPHIS), when and if it is established.

In the agriculture sector, the Pakistan Agricultural Research Council of the Ministry of Food Security and Research is responsible for research and technology support. This Council has a strong infrastructure with seven centres distributed throughout the country. One of these – the National Agricultural Research Centre (NARC), Islamabad – houses 19 research institutes with 96 laboratories in various subsectors of

agriculture. These laboratories generally have capacity to test for residues, contaminants and heavy metals. In addition, two of the labs are accredited, one in the area of grain testing and the other for poultry diseases, covering avian influenza. This provides agricultural support but is thus far not well utilized for food control management activities.

The laboratory set-up for food safety controls is at the NIH at federal level. Some provinces have labs but the capacity for food safety testing is limited. The overall coordination for food safety control management across the food chain (primary production to consumption) is generally not well addressed within federal and provincial levels or intersectorally between the ministries of Health and Agriculture, Livestock and Fisheries.

A decision was taken to bring back some functions of food control to the federal level, particularly in regard to establishing nation-wide standards, imports and exports and a regulatory body. The Ministry of National Food Security & Research was established at the national level with the responsibility for policy formulation, economic coordination and planning in respect of food grains and agriculture. It also covers international liaison and economic studies for framing agriculture policies. Some of the important arms of this Ministry include an Animal Quarantine Department, Livestock Wing, National Veterinary Laboratory, Pakistan Agricultural Research Council, and a Livestock and Dairy Department) Board.

There is a bill to establish a regulatory body for food safety, animal and plant health – the National Animal and Plant Health Inspection Service. This body, if established, in addition to controls for imports and exports and development of standards, would be expected to develop protocols and procedures and generally oversee that food safety control management is implemented uniformly across the provinces. It is also proposed to have a strong collaboration function with the Ministry of NCSR&C at national and provincial levels.

One of the main post-devolution challenges is that each province handles food safety in a different manner in terms of legislation, standards, food control management, inspection and enforcement, foodborne disease surveillance and risk communication. There is limited coordination currently from the federal level. This implies that foods traded interprovincially and globally are under different levels of control and of varying safety levels. In addition, the response capacity for foodborne emergencies, incidents and disease outbreaks is fragmented, varying across provinces.

Recommendations for priority actions

- Develop a national food safety strategy and policy using risk-based approaches to achieve food safety outcomes.
- Develop and document a formal mechanism for cross-sectoral collaboration and coordination, including sharing of data, a rapid alert system for food and feed, food safety emergencies, traceability and recall, and links with research.
- Improve uniformity of procedures and processes across provinces and federating areas for better implementation of food safety laws.
- Improve understanding and interpretation of laws for better coordination between the federal, provincial and federating area levels.
- Develop a system for risk assessments, ideally at the federal level.

Indicators and scores

P.5.1 Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination.

Score 2: Limited capacity. Focal points are identified in relevant domains (food safety, human health, and animal health sectors, surveillance and response staff, key laboratories). This would generally apply across provinces but certain provinces (e.g. ICT and Punjab) have a better surveillance and response capacity for foodborne disease and food contamination. In the Ministry of Agriculture, once the new regulatory authority is established, many of the functions should be covered gradually over a period of time.

Strengths/best practices

- The responsibility for enacting and implementing the Food Safety Act and Regulations lies with provincial governments; however, coordination of equal levels of safety standards between provinces is lacking.
- There is an established mechanism under which health authorities at provincial and district levels investigate foodborne outbreaks with multisector collaboration for rapid response to food safety-related emergencies.
- The good research capacity available within the various centres of the Pakistan Agricultural Research Council needs to be more effectively utilized.

Areas that need strengthening/challenges

- Coordination of food safety standards across the country is lacking
- A risk-based approach must be included in the development of standards and their implementation.
- A new regulatory authority (the National Animal and Plant Health Inspection Service [NAPHIS]) has been proposed to be established, which would coordinate functions of standards; their implementation and controls for export and import; and oversight for domestic food safety.
- Better linkage should be sought between the health and agriculture sectors to achieve food safety outcomes, with a view to cover food safety across the food chain.
- More consistency is needed among provinces in terms of food safety control management.
- The system for the collation and sharing of data from different agencies, and their use for evidence-based decision-making, should be strengthened.
- Research organizations should be tapped for food safety controls and decision-making.

Relevant documentation

- Pure Food Ordinance, 1960.
- Punjab Pure Food Ordinance, 1968.
- Punjab Food Ordinance, 2015.
- Punjab Local Government Ordinance, 2013.
- Punjab Food Authority Act, 2011.
- Multi Sector Nutrition Strategy Punjab, 2014
- KP Food Safety Authority Act, 2014.
- Pakistan Hotels and Restaurant Act, 1976.
- Pakistan Standards and Quality Control Act, 1996.

Biosafety and biosecurity

Introduction

Working with pathogens in the laboratory is vital to ensuring that the global community possesses a robust set of tools—such as drugs, diagnostics, and vaccines—to counter the ever-evolving threat of infectious diseases.

Research with infectious agents is critical for the development and availability of public health and medical tools that are needed to detect, diagnose, recognize, and respond to outbreaks of infectious disease of both natural and deliberate origin. At the same time, the expansion of infrastructure and resources dedicated to work with infectious agents have raised concerns regarding the need to ensure proper biosafety and biosecurity to protect researchers and the community. Biosecurity is important in order to secure infectious agents against those who would deliberately misuse them to harm people, animals, plants, or the environment.

Target

A whole-of-government national biosafety and biosecurity system is in place, ensuring that especially dangerous pathogens are identified, held, secured and monitored in a minimal number of facilities according to best practices; biological risk management training and educational outreach are conducted to promote a shared culture of responsibility, reduce dual use risks, mitigate biological proliferation and deliberate use threats, and ensure safe transfer of biological agents; and country-specific biosafety and biosecurity legislation, laboratory licensing, and pathogen control measures are in place as appropriate.

Pakistan level of capabilities

Pakistan has taken initial steps towards reaching the targets for biosafety with the drafting of some national guidelines and rules. Legislation exists on biosafety but is missing for biosecurity. There is no systematic inventory of biohazards, although a patchy network exists of public health and/or veterinary laboratories that could maintain and control biohazard materials. Some laboratories such as the National Reference Laboratory for Poultry Disease (NRLPD) have an accredited facility with biocontainment and controlled access. Together with all countries in the WHO Eastern Mediterranean Region, Pakistan is committed to conducting a nationwide survey to identify facilities that might store stocks of polioviruses or infectious materials with the objective to destroy or safely contain all stocks of wild and vaccine-derived polioviruses. This international commitment is an essential element of the endgame for global polio eradication.

Recommendations for priority actions

- Federal and provincial authorities to develop a comprehensive biosafety/biosecurity programme, including resource identification and allocation.
- Implement and strengthen biosafety/biosecurity legislation and/or regulations in the country.
- Establish an updated database of facilities housing dangerous pathogens and toxins, including identification of collected pathogens and toxins. The nationwide survey that Pakistan will conduct to identify stocks of polioviruses and infectious materials will provide an excellent opportunity to establish such a database.
- Carry out risk-based staff training on biosecurity procedures and their assessment.

Indicators and scores

P.6.1 Whole-of-government biosafety and biosecurity system is in place for human, animal, and agriculture facilities.

Score 2: Limited capacity. This score was given acknowledging that a process for the inventory and monitoring of pathogens within a facility is lacking and oversight and enforcement is ad hoc. There is inadequate consolidation of dangerous pathogens and toxins at a limited number of facilities; limited use of diagnostics that preclude culturing dangerous pathogens; and limited oversight, monitoring and enforcement mechanisms. However, some elements of a comprehensive biosafety and biosecurity system are in place. Pakistan is developing:

- a process to establish and monitor an updated record and inventory of pathogens within facilities that store or process dangerous pathogens and toxins;
- comprehensive national biosafety and biosecurity legislation;
- laboratory licensing;
- pathogen control measures, including standards for physical containment and operational handling and failure reporting systems.

Strengths/best practices

- Pakistan Biosafety Rules were notified in 2005 (although they only regulate genetically modified objects and do not cover naturally occurring infectious agents).
- Trained biosafety officers are placed in some laboratories at national and provincial levels. This is an ongoing process undertaken through NIH.
- Pathogens are transported under appropriate conditions.
- KP Provincial Reference Laboratory follows national guidelines for tuberculosis (TB) control.

Areas that need strengthening/challenges

- Implementation of biosecurity legislation and/or regulations should be extended to the whole country.
- A system is needed for the inventory and monitoring of dangerous pathogens.
- The capacity of national and provincial laboratories to house, manipulate and safely destroy biohazardous materials should be strengthened.

P.6.2 Biosafety and biosecurity training and practices.

Score 2: Limited capacity. Pakistan has conducted a training needs assessment and identified gaps in biosafety and biosecurity training, but has not yet implemented comprehensive training or a common training curriculum. Awareness is generally lacking among the laboratory workforce on international biosafety and biosecurity best practices for safe, secure and responsible conduct. The country does not yet have sustained academic training in institutions that train personnel who maintain or work with dangerous pathogens and toxins.

Strengths/best practices

- Biosafety personnel are trained at academic and international organizations.
- There is a functional biosafety level (BSL)-3 laboratory at the national level.
- Some accredited laboratories use international best practices.

Areas that need strengthening/challenges

- Comprehensive biosafety and biosecurity rules need to be adopted.
- Regular assessments are required for biosafety and biosecurity needs as well as regular monitoring and assessment exercises.
- Funding and capacity are needed to sustain biosafety and biosecurity training.
- Personal protective equipment (PPE) must be provided to all staff working with potentially infectious or dangerous materials.

Relevant documentation

- Pakistan Biosafety Rules, 2005.
- National Biosafety Guidelines, 2005.
- Code of Conduct for Life Scientists, 2009.
- Draft National Biosafety Policy.

Immunization

Introduction

Immunization is one of the most successful global health interventions and one of the most cost-effective ways to save lives and prevent disease. Immunizations are estimated to prevent more than two million deaths a year globally.

Target

A functioning national vaccine delivery system—with nationwide reach, effective distributions, access for marginalized populations, adequate cold chain, and ongoing quality control—that is able to respond to new disease threats.

Pakistan level of capabilities

The Expanded Programme for Immunization (EPI) in Pakistan has made significant strides during the past 18–24 months. The federal EPI in particular is resurging after a period of near collapse following devolution, which severely disrupted vaccine procurement, financing and donor relations, immunization policy formulation and coordination between the federal and provincial programmes.

The EPI in Pakistan has suffered from gaps in immunization service delivery resulting in a substantial proportion of children remaining unprotected from vaccine-preventable diseases (VPD). Wide variations in levels of immunization coverage exist between provinces and between districts in each province. Periodic outbreaks of VPDs, particularly measles and polio, have affected all provinces.

The most recent assessed estimate (2012 Pakistan Demographic and Health Survey) of fully immunized children 12–23 months of age was 54% (range: 16% Baluchistan – 66% Punjab). This was estimated by the programme in 2015 to have increased to 63% (range: 30% Baluchistan – 67% Punjab). The first measles dose coverage assessed at 61% in 2012 is also estimated to have increased to 68% in 2015.

While there are several root causes of low immunization coverage, the most pervasive and recalcitrant challenges relate to inadequacy of infrastructure to deliver vaccines, insufficient human resources, and lack of rigorous monitoring and surveillance systems linked to robust accountability. A significant proportion of union councils (and health facilities) in the provinces of Sindh, Balochistan and KP either have no vaccination staff or no facilities that provide vaccination.

Emerging from post-devolution challenges affecting the immunization programme, the federal EPI Cell has made several critical advancements with inputs and consent of provinces. The agreement and processes for pooled vaccine procurement by the federal EPI has overcome the longstanding confusion around this critical function. Implementation of effective vaccine management across the country and introduction of a Vaccine Logistics Management Information System (VLMIS) have resulted in no stockouts in any district during the last 12 months. Most critically, agreement has been reached with provinces and donors on federal and provincial mechanisms to finance EPI through establishment of the Multi-Donor Trust Fund with appropriate performance-based, indicator-linked reimbursement.

The Government of Punjab has taken several strong measures to improve routine immunization coverage, including monitoring and evidence-based corrective actions and accountability; improvements in human resource management and capacity; implementing measles surveillance with laboratory confirmation; and innovative approaches such as android hand-held devices for real-time monitoring of vaccination. The

Government of Balochistan has taken concrete steps to develop a costed EPI improvement plan which has been approved. Measures to restore EPI infrastructure (human resources, service delivery logistics and cold chain) are under way. KP has achieved 65% coverage with the first dose of measles vaccine, despite multiple challenges of reaching hard-to-access populations. All districts of Sindh are participating in the VLMIS pilot phase and are in the process of revamping their cold chain infrastructure. Sindh is currently responding to outbreaks of measles in areas where coverage with measles vaccine was suboptimal during the mass vaccination campaigns conducted in 2014 and where routine childhood vaccination coverage remains low.

Given the low measles vaccination coverage in three of the four major provinces, the risk of frequent large outbreaks of measles and other VPDs remains real. Technical partners should assist the federal EPI and provincial programmes to conduct predictive analyses of risks and measures to prevent large-scale measles outbreaks across provinces.

Recommendations for priority actions

- Expand immunization service delivery and restore logistic and human resource infrastructure in order to:
 1. establish vaccination centres in health facilities that currently are not providing the service;
 2. rehabilitate services in union councils that lack vaccination staff or in non-functioning EPI centres;
 3. enhance capabilities for mobile and outreach vaccination.
- Establish robust systems for programme monitoring, VPD surveillance, and capacity for data management at all levels that enable:
 1. performance accountability and validation of disbursement linked indicators (DLIs);
 2. Systematic use of data on EPI collected by the polio eradication initiative for corrective actions and programme planning;
 3. prompt detection and response to VPD outbreaks, monitoring of the changing epidemiology of VPDs and prevention of outbreaks.
- Systematically adapt the best practices and assets of the polio eradication initiative to support EPI, in particular: leveraging and building on monitoring, disease surveillance and data management, micro planning and ability to vaccinate children in areas that are hard to reach or are insecure; engaging and mobilizing communities with vaccine hesitancy; enhancing the case specimen transport system for laboratory testing; and using the trained workforce.

Indicators and scores

P.7.1 Vaccine coverage (measles) as part of national programme.

Score 2: Limited capacity. Of the country's 12-month-old population, 50–69% have received at least one dose of measles-containing vaccine, as demonstrated by coverage surveys or administrative data; a plan is in place to reach 90% within the next five years to include supplemental immunization activities.

Strengths/best practices

- A national costed plan has been approved with broad support from provinces, donors and partners.
- Agreement with provinces and donors has been reached on federal and provincial mechanisms to finance EPI with defined roles and responsibilities.

- The recently established Multi-Donor Trust Fund has an appropriate performance indicator-based financial reimbursement process.
- Each province has developed a costed EPI improvement plan aligned with the national costed multi-year plan.
- Legislative bills on mandatory immunization are under review in Sind, Punjab and ICT.
- A range of best practices demonstrated by the polio eradication programme will be utilized for broader EPI, as noted above.

Areas that need strengthening/challenges

- Significant gaps exist in immunization service delivery and human and material infrastructure – a large proportion of union councils are without trained staff and health facilities that can offer vaccination services.
- No systematic laboratory-linked surveillance for VPDs exists other than polio. Only the province of Punjab has initiated case-based surveillance for measles and rubella with laboratory diagnosis.
- Limited capacity exists for data management and analyses in federal EPI and most provincial programmes.

P.7.2 National vaccine access and delivery.

Score 4: Demonstrated capacity. Vaccine delivery (maintaining the cold chain) is available in 60–79% of the target population in the country; functional vaccine procurement and forecasting lead to no stockouts at the central level and only rare stockouts at the district level.

Strengths/best practices

- National consensus has been reached on the processes to pool vaccine procurement by the federal EPI.
- Effective vaccine management across the country has recently been implemented and introduction of VLMIS has led to no stockouts in any district over the last 12 months.
- Provincial plans include refurbishment and expansion of the cold chain to optimize vaccination service delivery through both static facilities and mobile outreach.

Areas that need strengthening/challenges

- Expansion is needed for full implementation and efficient maintenance of VLMIS and effective vaccine management systems across the country.
- Timely refurbishment of cold chain infrastructure should be effected, especially in Baluchistan and Sind.

Relevant documentation

- the Islamabad Mandatory Vaccination and Protection of Health Workers Act, 2015
- Planning Commission Form 1 (PC-1) Expanded Programme on Immunization (EPI) 2015-16 to 2019-20.
- Multiple Indicator Cluster Survey (Unicef, Provincial Governments)
 - Balochistan, 2010
 - Khyber Pakhtunkhwa, 2010
 - Punjab, 2014
 - Sindh, 2014

- National Institute of Population Studies (NIPS) [Pakistan] and ICF International. Pakistan Demographic and Health Survey 2012-13. Islamabad, Pakistan, and Calverton, Maryland, USA: NIPS and ICF International. 2013.
- Effective Vaccine Management (EVM Assessment) Report Pakistan, 2014.
- Comprehensive Effective Vaccine Management (EVM) Improvement Plan to strengthen the Immunisation Supply Chain in Pakistan (2015-2018), 2015.

DETECT

National laboratory system

Introduction

Public health laboratories provide essential services including disease and outbreak detection, emergency response, environmental monitoring, and disease surveillance. State and local public health laboratories can serve as a focal point for a national system, through their core functions for human, veterinary and food safety including disease prevention, control, and surveillance; integrated data management; reference and specialized testing; laboratory oversight; emergency response; public health research; training and education; and partnerships and communication.

Target

Real-time biosurveillance with a national laboratory system and effective modern point-of-care and laboratory-based diagnostics.

Pakistan level of capabilities

Pakistan has some laboratories with excellent capabilities and capacity including, but not limited to, the National Reference Laboratory for Poultry Disease, NIH, Polio Laboratory, and the Veterinary Foot and Mouth Disease Laboratory. The transportation of samples for polio diagnosis is well established. Some laboratories have highly developed tools such as genome sequencing. Eight laboratories are accredited by the Pakistan National Accreditation Council to ISO standards. There is a public–private mix in the TB Control Programme for detection and management of cases through its 2000+ basic management units and other private sector care providers.

However, there are no laboratories in the provinces with public health responsibilities at this stage and the majority of patient testing is performed in the private sector, with limited governmental control: private sector laboratories have no obligation to report detected cases.

Recommendations for priority actions

- Approve and implement the National Laboratory Policy, in particular the establishment of minimum standards.
- Strengthen infrastructure and human resources for diagnostic, food, public health and animal health laboratories and establish four provincial public health reference laboratories in the country.
- Develop a coordination mechanism for sharing zoonoses diagnosis and research capabilities.
- Introduce external quality assurance schemes (EQAS) at all levels starting at provincial level and linking with federal reference laboratories.

Indicators and scores

D.1.1 Laboratory testing for detection of priority diseases

Score 4: Developed capacity. The national laboratory system is capable of conducting 5 or more of the 10 core tests.

Strengths/best practices

- Disease-specific reference laboratories are established, including TB, polio, influenza, foot and mouth disease and poultry diseases.
- Collaboration exists with international laboratories for test referral and quality control.
- Examples of capacity and expertise in international standards in the public and private sectors are the NIH, NARC, Aga Khan University and Shaukat Khanum Memorial Cancer Hospital and Research Centre.

Areas that need strengthening/challenges

- National diagnostic algorithms for performance of core laboratory tests should be developed and utilized at all levels in the country.
- Active mechanisms need to be set up at national level for validation of the tests used in provincial labs.
- Active training of the workforce should be ensured, and succession for experienced staff planned.
- The provincial designated labs should be upgraded to undertake the 10 core tests.

D.1.2 Specimen referral and transport system.

Score 3: Developed capacity. A system is in place to transport specimens to national laboratories for advanced diagnostics from 50–80% of intermediate level/districts (TB and polio sample transportation system is at demonstrated capacity 4).

Strengths/best practices

- Standard operating procedures (SOPs) are in place for specimen collection, packaging, and transport.
- Staff are trained in packing and shipping samples, especially TB, polio and some animal samples.
- A courier system exists to transport specimens from intermediate/district levels to reference and national laboratories.

Areas that need strengthening/challenges

- Domestic regulations for sample transportation need to be developed.
- The specimen shipment network to overseas referral labs is to be strengthened.
- Systems for the transportation of samples other than TB and polio need to be improved.

D.1.3 Effective modern point-of-care and laboratory based diagnostics.

Score 2: Limited capacity. Minimal laboratory diagnostic capability exists, but no tier-specific diagnostic testing strategies are documented. Structured use of point-of-care testing is not established.

Strengths/best practices

- A system of reagent and laboratory material procurement exists in almost all public sector institutions.
- Procurement is carried out using standard procedures.

Areas that need strengthening/challenges

- No developed structure exists for the use of point-of-care and laboratory-based testing in different tiers of laboratories; or national, provincial, district and community testing.
- Few vendors provide long-term after-sale services for repair and maintenance of equipment.
- Training of staff at all levels of testing needs to be improved.

D.1.4 Laboratory quality system.

Score 2: Limited capacity. National quality standards have been developed but there is no system for verifying their implementation.

Strengths/best practices

- ISO accreditation is available through Pakistan National Accreditation Council, which has accredited eight laboratories.
- The polio, measles, influenza and TB programmes at NIH are WHO accredited.
- Several key laboratories participate in EQAS, such as TB, measles and rubella, and NRLPD.
- KP and Punjab have laboratory licensing and inspection.

Areas that need strengthening/challenges

- The National Laboratory Policy needs to be adopted and implemented to establish the licensing and inspection of all human, veterinary and food laboratories.
- A nationally coordinated EQAS should be established for all core human tests and relevant testing in the veterinary and food laboratories.
- The adoption of quality management systems should be promoted.

Relevant documentation

- Draft of National Laboratory Policy.
- Disease early warning systems booklet regarding sample selection and shipment protocols.
- Certificates from the accredited laboratories.
- WHO laboratory quality management system handbook.

Real-time surveillance

Introduction

The purpose of real-time surveillance is to advance the safety, security, and resilience of the nation by leading an integrated biosurveillance effort that facilitates early warning and situational awareness of biological events.

Target

Strengthened foundational indicator- and event-based surveillance systems that are able to detect events of significance for public health, animal health and health security; improved communication and collaboration across sectors and between subnational, national and international levels of authority regarding surveillance of events of public health significance; improved country and regional capacity to analyse and link data from and between strengthened, real-time surveillance systems, including interoperable, interconnected electronic reporting systems. This can include epidemiologic, clinical, laboratory, environmental testing, product safety and quality, and bioinformatics data; and advancement in fulfilling the core capacity requirements for surveillance in accordance with the IHR and the OIE standards.

Pakistan level of capabilities

Several infectious disease surveillance systems operate in Pakistan, in both the human health and livestock health sectors. The main existing generic systems are event- and syndrome-based. Comprehensive generic case-based surveillance systems are missing from the human health sector; physician and/or laboratory notifications are not required, and thus statutory listings of notifiable diseases (laboratory confirmed or based on clinical diagnosis) have not been specified. Disease-specific case definitions for notification do not exist. In the human sector, there are exceptions as several enhanced vertical surveillance systems capable of notifying and collecting defined case data do exist. Good practices for disease surveillance based on case notification have been developed for the tuberculosis and the polio eradication programmes.

Along with significant contributions from other public and private institutions at national and provincial levels, the FELTP at NIH is significantly strengthening a competent epidemiology workforce. Through these programmes, epidemiologists are being trained, and graduates work at both the federal level and at Disease Surveillance and Response Units at each provincial Director General of Health Service office (except Punjab). With the SUPPORT OF FELTP, the graduates are able to perform outbreak investigations and analytical studies.

In the livestock sector, laboratory-based notification systems exist (based on OIE (World Organisation for Animal Health) standards and reporting criteria), utilizing data collected for clinical diagnosis and through herd inspections, where samples are collected for screening purposes or for outbreak management/control. Surveys for prevalence estimation among livestock have also been conducted for some zoonotic diseases. The latter data are mainly used within the livestock sector and are reported upwards from the district to the provincial and federal levels. Zoonotic disease data concerning livestock are currently not routinely shared with the human health sector, although ad hoc cooperation and coordination has occurred in the past, mainly in the context of highly pathogenic avian influenza outbreaks.

An electronic disease and health indicator reporting system and web application has been developed and is operational at the federal level. This is linked with provincial district health information systems (DHIS) and selected management information systems (maternal, newborn and child health, and lay health workers in Sindh). Data from multiple sources is entered and collected into a central database and visualized through a web-based dashboard-type user interface that has a wide range of descriptive reporting features but fewer

analytical functions. The dashboards are available at the federal level as well as in the provinces where DHIS dashboards are operational. In Punjab, dashboards for communicable diseases, namely the "Disease Surveillance System (DSS) and Dengue Surveillance Dashboard", are also operational. Most indicators are based on operational performance and outcomes and do not relate to infectious disease threats. Data on syndromic surveillance are available through disease early warning systems (DEWS), DHIS and acute flaccid paralysis (AFP) surveillance, while data from some vertical disease surveillance systems are channelled through their respective management information systems.

Recommendations for priority actions

- Formulate and enact infectious disease surveillance and control legislation with a list of notifiable diseases and AMR indicators (including physician and laboratory notification). The Draft legislation "Act on Pakistan Public Health (Surveillance And Response), 2010" should be readdressed and modified for implementation in the post-devolution administrative environment
- Establish permanent cross-sector platforms for surveillance and response cooperation and data sharing between human health, livestock management, food safety and wildlife sectors at national, provincial and district levels.
- Start the process to integrate vertical surveillance systems into a wider comprehensive horizontal surveillance system, replicating and building on current strengths and best practices.

Indicators and scores

D.2.1 Indicator and event-based surveillance systems.

Score 3: Developed capacity. Indicator OR event-based surveillance system(s) is in place to detect public health threats.

Strengths/best practices

- Surveillance is functional and event-based for VPDs, acute watery diarrhoea, viral haemorrhagic fever (VHF), severe acute respiratory infections (SARI), etc.
- A dashboard is integrated at the Ministry of NCSR&C.
- The DHIS report on communicable diseases.
- Vertical programmes such as polio have their own surveillance mechanism (indicator- and event-based).
- The multiple dashboards available in different provinces and at national level plan to gather surveillance-related information.
- Provincial Disease Surveillance and Response Units are being established for disease surveillance at national and provincial levels with government funding and the assistance of FELTP.

Areas that need strengthening/challenges

- A legal framework for surveillance to be formulated and enacted.
- A structured national surveillance programme needs to have an integrated approach.
- Existing public health labs to be strengthened, extended, and linked with surveillance programmes.
- Increased resource allocation is needed (financial and technical).
- Vertical programmes to be integrated with the national surveillance programme, while leveraging their strengths and best practices.

D.2.2 Interoperable, interconnected, electronic real-time reporting system.

Score 2: Limited capacity. The country is developing an interoperable, interconnected, electronic real-time reporting system, for either public health or veterinary surveillance systems.

Strengths/best practices

- Electronic information platforms are available to capture health-related information.
- National and provincial (DHIS) dashboards are in place.
- The workforce is trained for surveillance and response (rapid response teams; RRTs).
- Disease-specific reporting systems exist (polio, influenza).
- Electronic reporting systems are functioning in Punjab (Dengue Dashboard and DSS Dashboard).
- Web-based reporting is in place for TB.

Areas that need strengthening/challenges

- Electronic reporting systems should be expanded as part of surveillance systems in all provinces and linked with the national dashboard.
- Vertical programme data should be integrated into main surveillance platforms.
- IT communication equipment and tools should be enhanced.
- Resource allocation and capacity-building for public health is needed in both the human and animal sectors.
- Public health laboratories (human and animal) to be linked with surveillance.
- Intermediate levels (subregional) are not included/involved in real-time reporting.
- The One Health approach is not comprehensive.

D.2.3 Analysis of surveillance data.

Score 2: Limited capacity. Reports related to data collection are sporadic with delays.

Strengths/best practices

- The Field Epidemiology Training Programme is well established in the country with and additional laboratory component already a part of the programme (FELTP). Long-term training is offered at FELTP, as well as at other public and private institutions, for fellows from human and animal health with special focus on data analysis.
- AFP surveillance systems exist for Middle East respiratory syndrome coronavirus (MERS-CoV), SARI, respiratory tract infections, pyrexia of unknown origin, through DHIS and integrated disease surveillance and response systems (IDSR).
- Diseases are under surveillance through IDSR in six pilot districts of KP. DSS is available in Punjab.
- An electronic reporting system exists in all provinces. In Punjab, electronic reporting through android phones exists for selected diseases.
- A national dashboard exists.
- Short-term training courses and DEWS training are provided. Training is also provided for RRTs.
- Analysis capacity is available.
- Indicator-based surveillance system(s) and mechanisms, a list of priority disease, and conditions and case definitions have been developed by the vertical programmes.

- Data validation and quality assurance is provided through internal systems of vertical programmes.
- A tri-annual seasonal alert and awareness letter, advisories, and weekly bulletins are issued as a means of information sharing.

Areas that need strengthening/challenges

- The mechanism for integration of surveillance data varies from province to province.
- Utilization of surveillance reports by decision-makers is limited.
- No formal mechanism exists to share reports, including lab data, among stakeholders.
- Linkages between health information systems are not fully established at the national level.
- There is no standardization (electronic or otherwise) for data collection of different health information systems operating in the health sector and there is a need for a centrally located mechanism to integrate data from clinical case reporting and clinical or reference microbiological labs.
- A mechanism is needed to feed public health lab data from both human and animal sectors into the surveillance systems.
- The Ministry of NCSR&C lacks connection to the surveillance system and ongoing collection of real-time laboratory data.

D.2.4 Syndromic surveillance systems.

Score 4: Demonstrated capacity. Syndromic surveillance system(s) in place to detect three or more core syndromes indicative of public health emergencies.

Strengths/best practices

- A disease prioritization exercise has been conducted.
- Syndromic surveillance is functioning for AFP, influenza-like illness (ILI)/SARI, and VHF.
- The DHIS list is used for IDSR in KP, and DSS in Punjab (mainly syndromic).
- Human resources in the provincial and district health systems are trained and enabled to utilize DEWS.

Areas that need strengthening/challenges

- Data validation mechanisms and the number of participating sites vary from province to province.
- A legal framework for real-time surveillance needs to be developed and implemented.
- The disease prioritization mechanism should be improved and updated on a regular basis.
- Consensus-building should be promoted on the national priority disease list.
- There is a need for standardized case definitions, and updated guidelines and mechanisms.
- Resource allocation and capacity-building to be enhanced.
- Notifications should be based on lab confirmation of cases.
- The private sector should be included in the surveillance reporting network.

Relevant documentation

- Pakistan Public Health (Surveillance And Response) Act, 2010 (Draft)
- Pakistan International Health Regulations Report, 2014–2015.

- Ebola virus disease preparedness assessment summary, Pakistan 21-12-14.
- IHR Assessment Mission, Pakistan, 2013.
- Notification of Technical Working Group (TWG) for Disease Surveillance & Response 24-11-15.
- Terms of Reference: Technical Working Group (TWG) for Disease Surveillance & Response, Ministry of National Health Services Regulations & Coordination Pakistan, 2015
- Protocols for Disease Notification Punjab, 2005
- Report of Workshop on Disease Prioritization for Surveillance, 8 Dec 2015.
- DEWS (Disease Early Warning and Response System) Manual, 2012 Edition.
- Case Definitions and Standard Procedures for Collection and Transportation of Human Infectious Disease's Samples including Prevention & Control Measures. Disease Early Warning System (DEWS). Ministry of Health, the National Institute of Health and the World Health Organization. 2009
- Umrami, AP; Dewani, P and Parkash, O. Important Zoonotic Diseases of Sindh Province. Directorate of Veterinary Research and Diagnosis Tando jam, Sindh, 2016. 84 p.

Reporting

Introduction

Health threats at the human–animal–ecosystem interface have increased over the past decades, as pathogens continue to evolve and adapt to new hosts and environments, imposing a burden on human and animal health systems. Collaborative multidisciplinary reporting on the health of humans, animals, and ecosystems reduces the risk of diseases at the interfaces between them.

Target

Timely and accurate disease reporting, according to WHO requirements and consistent coordination with FAO and OIE.

Pakistan level of capabilities

The country has designated an IHR NFP in the NIH as well focal points in the Provincial Health Directorates. The Focal Point for OIE is established within the Ministry of National Food Security and Research.

In general, there is good communication between sectors and levels. During emergencies there are multisectoral meetings arranged by the Ministry of NCSR&C. However, there are neither formal nor informal agreements for regular information exchange. During outbreaks, this takes place on an ad hoc basis. This lack of a clearly defined mechanism can put at risk timely decisions and reporting. Also, a common understanding on the use of Annex 2 of the IHR, reporting thresholds and cross-sectoral information exchange has yet to be defined and exercised.

The country is aware of the importance of informal consultation mechanisms with WHO and other IHR NFPs, but so far they have not been used.

Recommendations for priority actions

- Establish permanent formal protocols for the reporting mechanism, zoonotic disease information exchange, SOPs (and legislation, if necessary), for the IHR NFP and OIE Contact Point.
- Build reporting capacity and training for relevant staff.
- Strengthen multilateral or bilateral reporting mechanisms, between sectors and provinces as well as with neighbouring countries.

Indicators and scores

D.4.1 System for efficient reporting to WHO, FAO and OIE.

Score 2: Limited capacity. Country has identified an IHR NFP, OIE delegates and World Animal Health Information System (WAHIS) NFP; the IHR NFP is linked to a learning package and best practices as provided by the Food and Agriculture Organization (FAO), OIE and WHO.

Strengths/best practices

- Mechanisms for information sharing and reporting during outbreaks between public health, animal health and security authorities, although established on an ad hoc basis, have been tried and tested.
- An active relationship exists between IHR NFP and OIE Contact Point, who respond to each other's needs.

- Multisectoral meetings are held to evaluate potential public health threats (Ebola, Zika).
- Coordination has increased between human and animal sector counterparts.

Areas that need strengthening/challenges

- Informal consultation mechanisms of IHR NFP with WHO, e.g. by telephone, and bilateral exchange mechanisms with other IHR NFPs, are not yet in practice; in general the threshold for reporting events internationally is too high.
- The reporting mechanism of food safety issues through the IHR NFP and to the OIE needs strengthening.
- There is a lack of legislation authorizing the IHR NFP as a national multisectoral communication hub with WHO; in addition, continuously changing ministries hosting the IHR NFP team, devolution, and acting responsibilities limit its performance.
- Training is lacking for IHR NFP and OIE Contact Point on reporting.
- The multilateral or bilateral reporting mechanism is poor, especially with neighbouring countries.
- A regular and more formal information sharing mechanism should be developed among IHR NFP and OIE Contact Points.

D.4.2 Reporting network and protocols in country.

Score 2: Limited capacity. Country is in the process of developing and establishing protocols, processes, regulations, and/or legislation governing reporting to start implementation within a year.

Strengths/best practices

- Polio surveillance keeps the country's systems and capacities to identify and report events at a high level.
- Identification of other public health events are enabled through existing surveillance systems.
- SOPs for RRT are defined clearly for response to notifiable diseases and potential events.
- SOPs for PoE are available.

Areas that need strengthening/challenges

- Formally approved reporting networks need to be established.
- There is a lack of clearly defined national, regional and local reporting mechanisms and thresholds for timely decisions.
- SOPs should be developed and implemented based on Annex 2 of the IHR for reporting events of international concern; so far this is only in place for polio.

Relevant documentation

- SOPs for PoE.
- National Emergency Action Plan.
- SOPs for RRTs from Ebola.
- DSS and HSS Bulletins.

Workforce development

Introduction

Workforce development is important in order to develop a sustainable public health system over time by developing and maintaining the highly qualified public health workforce with appropriate technical training, scientific skills, and subject-matter expertise.

Target

State Parties should have skilled and competent health personnel for sustainable and functional public health surveillance and response at all levels of the health system and the effective implementation of the IHR (2005).

Pakistan level of capabilities

The Government of Pakistan has been generally allocating less than 1% of its GDP on health, of which a major share is spent on the workforce. This includes training of physicians, veterinarians, nurses, paramedical staff (including laboratory technicians, lady health visitors, etc.). Some public and private academic institutions – Health Services Academy Islamabad, UVS Lahore, Agha Khan University and Dow and Khyber Medical universities at Karachi and Peshawar – provide basic as well as post-graduate professional training. The number of such institutions varies by province based on the availability of infrastructure and faculty. In the public health sector, the provincial departments of health also provide ongoing continuing medical education and refresher courses to its workforce.

The Government established FELTP in 2006 to address documented needs to: develop human resources in field epidemiology and response, establish disease surveillance and outbreak response units, develop a legal framework for disease reporting, and create a functioning public health laboratory network. Since then, 67 field epidemiologists from the public sector across the country have graduated from FELTP and 39 are currently enrolled. Graduates are distributed throughout Pakistan. Outbreak response became more frequent and timely through the activities of FELTP. These outbreaks responses included preparedness for pandemic diseases such as A(H5N1) avian influenza and MERS, to relatively rare but fatal infections such as primary amoebic meningoencephalitis, to common but widespread problems such as waterborne diseases and measles, and responses to natural disasters. FELTP has partnered with all four Pakistani provinces and the federal government to develop disease surveillance and response units (DSRU). These are now becoming the principal surveillance points in Pakistan, and FELTP fellows are now posted in these units for their field training.

Additionally, a public health network through five sentinel surveillance sites for hepatitis has been established in collaboration with NIH, the Pakistan Army and NARC, who work with FELTP to have more encompassing training in field epidemiology for all concerned in Pakistan. Collaboration and working with NARC has enabled improved capacity for prompt detection of zoonotic diseases. Among other impacts of FELTP is the coverage of districts at high risk for polio through the National Stop Transmission of Polio Programme, which grew from 16 districts in 2011 to 45 districts in 2015. In these and other areas of importance in surveillance and epidemiologic response, FELTP made important improvements from 2007 until 2015.

Recommendations for priority actions

- Develop a comprehensive public health workforce policy to address specific targets (based on national or WHO Eastern Mediterranean Regional Office targets) for various cadres, strategy for training, recruitment and retention.
- Develop specific eligibility and qualification standards for various cadres of the public health workforce both in human and animal health.
- Develop a career structure for effective placement and retention of eligible and qualified candidates.

Indicators and scores

D.5.1 Human resources are available to implement IHR core capacity requirements.

Score 3: Developed capacity. Multidisciplinary human resource capacity is available at national and intermediate levels.

Strengths/best practices

- Human resources are available in various disciplines (physicians, epidemiologists, biostatisticians, information systems specialists, veterinarians, social scientists, laboratory technicians/specialists and other public health personnel), trained in public and private sector institutions.
- Capacity is available both at national and provincial level to Implement IHR core requirements.
- A human resource for health (HRH) assessment has been completed in some provinces. Indigenous capacity for training of HRH exists in various sectors: Sindh has developed a strategy that still needs to be implemented.
- Punjab has also a well developed Human Resource Information System.
- FELTP exists with the residents assigned both at national and provincial levels.
- A large workforce of community health-care workers (lady health workers, migrant workers, etc.) provide primary health-care services.

Areas that need strengthening/challenges

- There are funding constraints which result in attrition of qualified public health professionals due to limited career opportunities.
- There is also a limited number of fully trained epidemiologists and the need is far below the target of 1/200 000 trained epidemiologists (or equivalent).
- Strengthening of technical capacities of all cadres is needed not only at the provincial but also at district level.
- Government should allocate resources for sustainable funding to introduce new positions within the government structure for various public health professional categories, such as epidemiologists, with a structured career ladder at national and provincial levels across the country.
- There is also a need for training of professionals in multiple disciplines, including infection control, medical entomology (the Health Services Academy and other institutions offers training programmes).

D.5.2 Field Epidemiology Training Programme or other applied epidemiology training programme in place.

Score 3: Developed capacity. One level of FELTP (basic, intermediate or advanced) or comparable applied epidemiology training programme is in place in Pakistan.

Strengths/best practices

- Health Services Academy, Pakistan Homeopathic Doctors Council/Provincial Health Services Authority institutions in all four provinces exist where public health professionals are trained on regular long- and short-term programmes.
- FELTP programme has 67 graduates. In addition to the advanced two-year programme, it also offers training to in-service officers in both health and veterinary sectors.
- Partnerships exist with other countries in the region to share FELTP graduates during emergency events through the Eastern Mediterranean Public Health Network (EMPHENET). The programme has also helped establish and train the first cohort for Afghanistan FELTP.
- This programme has also helped establish the National Stop Transmission of Polio Programme in Pakistan; comprising FELTP graduates and trainees.
- Public health professionals are also being trained at private sector institutions/universities in epidemiology.
- Public health training programmes exist in both public and private institutes that offer graduate and post-graduate level training and degrees (Master of Public Health, MPhil, Doctor of Philosophy).

Areas that need strengthening/challenges

- The field epidemiology training programme only targets the public health workforce and should also cater for academic professionals.
- Effective placement and utilization of FELTP graduates in the field should be encouraged with placement of field epidemiologist in each district of the country.
- Mechanisms should be developed at the international level for cooperation and collaboration.
- FELTP training should have recognition/registration within appropriate forums/registering bodies.

D.5.3 Workforce strategy.

Score 2: Limited capacity. A health-care workforce strategy exists but does not include public health professions (e.g. epidemiologists, veterinarians and laboratory technicians).

Strengths/best practices

- Sindh and Punjab provinces have and human resource strategy.
- Incentives (hardship allowances) are given to retain the existing health workforce within some provinces. Incentive-based retention exists for health professionals in Punjab and KP.
- Management cadres exist in some provinces.

Areas that need strengthening/challenges

- Although an HRH assessment has been completed in some provinces, there is neither a national HRH policy nor any structured human resources department.
- Sindh and Punjab provinces have developed their human resource strategies; however, they still need to be implemented.

- While specific monetary/other incentives exist to retain the public health workforce in some provinces (e.g. physicians, nurses, veterinarians, biostatisticians, laboratory assistants, other specialties' or animal health professionals), there is no uniformity in such incentives.

Relevant documentation

- Government of Pakistan presentation on self-assessment of JEE in Pakistan (as provided and presented to EET during mission)
- Provincial Human Resources profiles.
 - Balochistan
 - Punjab, 2012
 - Sindh, 2013
- Sindh Human Resources strategy, Powerpoint Presentation, Sindh Department of Health. 2015
- Training workshop (IHR, RRT, Lab trainings) reports.
- FELTP at a glance report, 2015
- Human Resource Development plan for National Disaster Management Authority (NDMA).

RESPOND

Preparedness

Introduction

Preparedness includes the development and maintenance of a national, intermediate and community/primary response level, and public health emergency response plans for relevant biological, chemical, radiological and nuclear hazards. Other components of preparedness include mapping of potential hazards, the identification and maintenances of available resources, including national stockpiles, and the capacity to support operations at the intermediate and community/primary response levels during a public health emergency.

Target

The effective implementation of the IHR (2005) requires multisectoral/multidisciplinary approaches through national partnerships for effective alert and response systems. Coordination of nationwide resources, including the sustainable functioning of a National IHR Focal Point (NFP), which is a national centre for IHR (2005) communications, is a key requisite for IHR (2005) implementation. The NFP should be accessible at all times to communicate with the WHO IHR Regional Contact Points and with all relevant sectors and other stakeholders in the country. States Parties should provide WHO with contact details of NFPs, continuously update and annually confirm them.

Pakistan's level of capabilities

Health emergency preparedness in Pakistan encompasses all measures taken before a disaster or severe event aimed at minimizing loss of life, disruption of critical services, and damage when the disaster occurs. Thus preparedness, a protective process, has enabled national and provincial disaster management authorities, the national and provincial health emergency preparedness and response (EPR) networks, and provincial health departments to respond rapidly and effectively to disaster situations. Health emergency preparedness in Pakistan includes capacity-building, development of emergency response plans, effective warning systems, and maintenance of inventories. With support from WHO, the National Health Emergency Preparedness and Response Network (NHEPRN) was established in 2010. NDMA has been playing a vital role in the preparation of monsoon contingency plans as well as earthquake, flood and disaster risk reduction procedures and policies.

Following the mega-flood disaster of 2010–2011, WHO as the United Nations humanitarian cluster lead agency for health, and the former Ministry of Health, worked together to establish health emergency preparedness and response networks (HEPRN) at federal and provincial levels, as the assigned crisis management and coordination entities in health. HEPRN led the multisectoral and all-hazards health preparedness and response planning and implementation in consultation with the NDMA. HEPRN and WHO initiated the All-Hazard National Emergency Preparedness Plan in 2014, but lack of resources precluded the finalization of the plan. Other national level hazard-specific preparedness efforts include the National Epidemic and Pandemic Preparedness Plan (2014), the Avian Influenza Preparedness Plan (2011), National Disaster Risk Reduction Policy (2012), National Contingency Plan 2010 to Manage Industrial Technical Disasters, National Monsoon Contingency Plan (updated yearly), National Disaster Risk Management Framework (2007), United Nations Inter-Agency Preparedness Plan (2014), and respective provincial/regional contingency and preparedness plans developed annually.

- NHEPRN in consultation with NDMA develops required emergency preparedness plans and collaborates with the relevant stakeholders for implementation. United Nations agencies/international NGOs coordinate at the national level to provide technical assistance for the formulation of required policies and plans on health EPR when formally asked by the Government in the wake of an emergency.

At the provincial level, health departments, PDMA and provincial HEPRNs support and contribute to the development of policies and formulation of multi-hazard health emergency plans.

Recommendations for priority actions

- Adopt NDMA legislation and delegate all public health-related functions to the health sector.
- Establish a One Health strategy development and implementation body to be led by the health sector. This entity should also serve as the technical advisory body to NDMA to bridge the existing chasm between NDMA and its public health goals and objectives.
- Conduct hazards/risk mapping at the national and provincial levels and develop a national level, multisectoral, all-hazards public health EPR plan. This plan should include elements of community-based disaster risk reduction prescribed under the Sendai Preparedness Framework of 2015.
- Advocate at all levels to promote, prioritize, and invest in preparedness rather than response.
- Invest in advocacy and awareness for policy- and decision-makers to ensure adequate linkages between preparedness and development programmes.

Indicators and scores

R.1.1 Multi-hazard National Public Health Emergency Preparedness and Response Plan is developed and implemented.

Score 1: No capacity. No national public health emergency preparedness and response plan is available to meet the IHR core capacity requirements (Annex 1A Article 2).

Strengths/best practices

- Provincial consultative workshops on the Multi-Hazard National Public Health Emergency Preparedness and Response Plan have been conducted.
- A draft National Epidemic and Pandemic Preparedness Plan is available for adoption and implementation.
- Pakistan has developed disease-specific preparedness and response plans, e.g. Avian Influenza Plan 2011.
- An Airport (PoE) Contingency Plan exists with a public health emergency component at main airports.
- National/provincial contingency plans are available (monsoon-related as well as winter contingency plans for KP and Northern areas) with NDMA, PDMA and provincial health departments.
- An Ebola preparedness assessment was conducted in 2014 with the support of WHO.
- SOPs for PoE for Ebola were developed in 2014; national emergency response plans specific to the country needs are prepared by NDMA and provincial plans by respective PDMA involving all relevant sectors and district administrations.
- NHEPRN has engaged all stakeholders to ensure involvement and community participation in disaster risk management activities.

- The United Nations cluster approach is adopted during emergencies for a coordinated response.
- Punjab health department allocates 15% of its budget for emergencies at all levels.

Areas that need strengthening/challenges

- Technical capacities of the HEPN should be enhanced and collaboration improved between all stakeholders (United Nations/WHO, Ministry of NCSR&C, NDMA, HEPN, etc.) for the formulation of health emergency plans and procedures.
- A holistic approach and the involvement of all relevant stakeholders is needed for optimum resource mobilization.
- NHEPRN has limited capacities and resources for emergency preparedness.
- The National Pandemic Preparedness Plan 2014 needs endorsement and translation into operational plans for implementation at federal and provincial levels.
- Resource availability and allocation are required to implement these plans.
- Finalization of the All-Hazard National Emergency Preparedness Plan is pending due to lack of resources.
- The various available preparedness plans need to be integrated into one comprehensive plan.

R.1.2 Priority public health risks and resources are mapped and utilized.

Score 1: No capacity. Public health risk and resources mapping is not done.

Strengths/best practices

- NDMA has been strengthened by the addition of arms such as climate change adoption and policy planning.
- The annual budget of NDMA has been increased two-fold from 2012 to 2013.
- WHO/health cluster partner profiling is done through the 4W matrix (who, what, where and when) primarily in emergency/conflict areas.
- Risk mapping for polio is achieved and partially for dengue in Punjab.
- Resource mapping for vertical health programmes has been done at limited levels.
- A one-month stock of medicines and supplies is reserved for emergencies at all levels.
- NHEPRN has a preparedness plans for foreseen/unforeseen emergencies (cholera outbreak response, avian influenza).
- In all provinces, high risk districts are notified by PDMA for monsoon rains/floods every year.
- Monsoon contingency plans are prepared yearly by NDMA/PDMA and other relevant departments.
- RRTs are notified at federal level and in three provinces (Punjab, KP and Baluchistan).
- Annual refresher training of RRTs for preparedness and response is a regular feature.

Areas that need strengthening

- The National Epidemic and Pandemic Preparedness Plan and National Emergency Preparedness Plan need to be endorsed and implemented.
- An early warning system at national and provincial levels should be institutionalized.
- A regular mechanism for budget allocations to the district authorities and relevant departments need to be established.

- A regular mechanism should be set up for resource mapping and stockpiling of essential medicines and supplies.

Relevant documentation

- National Disaster Management Authority Act 2010.
- National Pandemic Preparedness Plan 2014.
- National Disaster Response Plan 2010.
- National Monsoon Contingency Plan 2015.
- National Contingency Plan to Manage Industrial/Technical Disasters.
- National Disaster Risk Management Framework 2007.
- Pakistan Ebola preparedness assessment mission report 2014.
- SOPs for POE for Ebola 2014- Draft.
- Inter-agency preparedness plan 2014- UN.

Emergency response operations

Introduction

Emergency response operations include the plans, policies, programs, and surge capacities to coordinate and respond to emergencies in an effective and a timely fashion. A public health emergency operations center (EOC) is a central location for coordinating operational information and resources for strategic management of public health emergencies and emergency exercises. EOCs provide communication and information tools and services and a management system during a response to an emergency or emergency exercise. They also provide other essential functions to support decision-making and implementation, coordination, and collaboration.

Target

Countries will have a public health Emergency Operation Center (EOC) functioning according to minimum common standards; maintaining trained, functioning, multi-sectoral rapid response teams and “real-time” biosurveillance laboratory networks and information systems; and trained EOC staff capable of activating a coordinated emergency response within 120 minutes of the identification of a public health emergency.

Pakistan level of capabilities

Since the start of the Afghan conflict in the 1980s, emergency response capacities of relevant authorities in Pakistan have been repeatedly tested by the increasing scale and magnitude of natural disasters, cross-border conflict, communicable disease outbreaks, intentional mass casualty events, and internal strife in the north. Significant international support and emergency response assistance arrived following the massive influx of Afghan refugees in the late 1980s and 1990s, Pakistan's earthquake of 2005, and mega floods in 2010–2011 with a subsequent cholera outbreak. Varying levels of floods brought about by monsoon rains are a nearly annual challenge.

As a result of recurrent crises, several emergency response agencies and departments have been established. These include the Department for Managing Afghan Refugees' Affairs in the 1990s, the Earthquake Recovery and Rehabilitation Authority established in 2005, and the recent NDMA established post-floods in 2010. NDMA is the most comprehensive and advanced emergency response and coordination entity established to date. Health emergencies and technical aspects have been handled by the Ministry of Health/NHSR&C supported by the United Nations/WHO when needed. The United Nations inter-agency humanitarian cluster response system was also informally activated and implemented in Pakistan to address the 2005 earthquake. Formal activation occurred for the 2010 floods, and conflict in the north. WHO was the lead health cluster coordination and response agency, which collaborated with the Ministry of Health/ NHSR&C from the government side.

NHEPRN was established following the 2010 floods as the health emergency response lead entity in the health sector. HEPRN has received support from the United Nations and other donors. However, continuation of institutional development in a systematic, predictable, and consistent manner has dwindled. In response to outbreaks, and particularly to the threat of Ebola, RRTs have been trained and are available at national level and in a few provinces under corresponding health authorities and perform outbreak investigations and response where warranted.

NDMA and its provincial arms – PDMA – has well structured EOCs to coordinate emergency response at the national, provincial and districts level to events that exceed local capacity. However, there is no centralized One Health EOC authorized to coordinate with all stakeholders to manage health events and/

or disasters with health impact; this finding extends to provinces and districts. The Ministry of NCSR&C developed and approved a NHEPRN and provincial HEPRN to coordinate and respond to events at their respective levels. However, they lack the legislative foundation, political support, finances, administrative structure and operational functions to lead, coordinate, and manage/enforce health emergency response.

National emergency operational plans have been developed to address different health emergencies and emerging disease threats. NDMA conducts exercises on disaster risk management at all levels. Functional exercises are held on regular basis; additional drills, table-top exercises and simulations supplement these exercises.

The polio programme has garnered unprecedented attention, support and focus because globally Pakistan is one of the last two remaining countries still affected by the disease. After declaration of polio as a public health emergency of international concern under IHR, emergency coordination and response assets and capacities have increased significantly. Currently, polio has functioning and well equipped and staffed EOCs at national and provincial levels in the health sector. Under the polio programme, the whole emergency response coordination structure (procedures, operations, human resources, other logistical and operational equipment, surge capacity training, mobilization and deployment) offers best practices and a unique opportunity for the country to adopt and sustain after-polio eradication.

Recommendations for priority actions

- Develop a multisectoral, all-hazards, national health EPR plan based on a hazards/risk profile.
- Adapt or develop a 'One Health Emergency Response Operation' body led by the Ministry of NCSR&C, to coordinate, manage, develop, enforce, and sustain a One Health event management and response, integrated, collaborative, multi-disciplinary and multi-hazard plan. This body can work under, and obtain its authority and support from the governing structure of NDMA for an effective, efficient, and evidence-based coordination and response to health threats under a One Health approach.
- Expand the existing polio/EPI EOCs to cater to other One Health-related hazards and emergencies beyond EPI and/or polio, and regularly review and update emergency procedures and plans to incorporate this perspective.
- Create, based on the One Health strategy implementation body, cross-cutting processes to strengthen capacities to manage IHR-related hazards including finances and training human resources to sustain EOCs and response operations.

Indicators and scores

R.2.1 Capacity to activate emergency operations.

Score 2: Limited capacity. EOC point of contact with the support of partners' resources is available 24/7 to guide response.

Strengths/best practices

- EOCs have been established at all levels since 2015 and remain constantly active due to polio being declared a public health emergency.
- NDMA takes a lead role in response and coordinates with relevant health authorities at the federal and provincial levels for activation according to the level of emergency.
- WHO, the United Nations Children's Fund (UNICEF) and the Bill & Melinda Gates Foundation provide technical and human resources support to the EOC functions. Specific guidelines and mechanisms are in place for polio field staff training at all levels.

- In provinces, the health departments have round the clock functional control rooms in the District Coordinator's Office.
- Six polio-specific EOCs are established at the national and provincial levels. All stakeholders sit together and operate the EOC for a coordinated polio response.
- The emergency health cluster approach is well established.
- The Strategic Health Operations Centre by WHO at NHEPRN can be activated during any emergency.

Areas that need strengthening/challenges

- The scope and mandate of EOCs need to be further enhanced and strengthened to respond effectively to other public health emergencies besides polio.
- National and provincial HEPRN need to be strengthened to coordinate the emergency response more effectively in the context of a One Health approach.
- A holistic approach should be adopted to ensure involvement of all relevant stakeholders for the mobilization of resources.
- Collaboration between the public sector and United Nations agencies should be strengthened for well coordinated emergency operations.
- Community engagement and mechanisms to manage emergency response activities should be strengthened.
- A hotline should be established to respond to disease outbreaks.
- Funding constraints should be addressed.
- There is a lack of specific budgetary allocation for emergencies at the provincial level.

R.2.2 Emergency Operations Centre Operating Procedures and Plans.

Score 2: Limited capacity. EOC plans/procedures describing incident management structure or equivalent are in place; a plan describes key structural and operational elements for basic roles (including Incident management or command, operations, planning, logistics and finance).

Strengths/best practices

Pakistan is prone to natural disasters having a significant economic impact. However, a number of plans are in place to strengthen emergency response at the federal and provincial levels, including:

- Pakistan Humanitarian Response Plan 2010
- National Pandemic Preparedness Plan 2014
- National Disaster Response Plan 2010
- National Monsoon Contingency Plan (updated yearly)
- National Contingency Plan to Manage Industrial/Technical Disasters
- National Disaster Risk Management Framework 2007
- National Disaster Risk Reduction Policy 2013
- National Emergency Action Plan (updated yearly/endorsed by Prime Ministers National Task Force).

Due to the high number of emergency events related to climate and natural disasters, coupled with man-made risks and threats, Pakistan obtained best practice experience and capability in its emergency response operation reflected by:

- Flood emergency plans updated on annual basis
- Disaster drills and exercises conducted by NDMA
- Disaster risk management plans being in place
- A hotline to call for help on handling a disease of unknown origin in Punjab.

Areas that need strengthening/challenges

- There is a need to adopt the One Health approach for health emergency operations, with close and institutionalized linkages to the NDMA. This is essential to bridge the technical gaps in relation to IHR and to build capacities to respond to multisector emergencies of public health concern, through establishing a One Health EOC equipped with all requirement to address routine events, disaster drills and exercises.
- Communication need to be enhanced to provide information and advice on the importance and the value of the One Health approach.
- There are insufficient evidence-based effective and efficient processes, policies and procedures, and legislation.
- Authority should be adapted through delegation of the NDMA legislation that enforces, funds and supports functions in relation to One Health event management and preparedness including:
 - regular conduct of multi-hazard national and provincial risk assessments
 - mapping all stakeholders and responding bodies to One Health events, and regular update, testing and implementation of the Multi-Hazard National Health Emergency plan
 - improved integration and coordination between disaster management agencies both at the federal and provincial levels.
- Adoption of the One Health approach to integrate all relevant and concerned public sector departments for a formulation/upgrading of procedures and emergency plans.
- Linkages should be established with the NDMA and PDMA emergency response operations to ensure effective implementation of the One Health approach.
- Financial constraints and insufficient technical capacities should be addressed at all levels.

R.2.3 Emergency Operations Programme.

Score 3: Developed capacity. A functional exercise has been completed to test operational capabilities. However, the system is not yet capable of activating coordinated emergency response within 120 minutes of the identification of a public health emergency.

Strengths/best practices

- In Punjab, EOC is placed in the EPI Directorate at the Office of the Director General of Health Services; Director EPI is also the EOC Coordinator for management and coordination of both routine immunization and polio activities.
- Most national and provincial emergency response operations and programmes conducted by NDMA and PDMA include yearly simulation exercises.
- Rapid response and security exercises are conducted.

- Round the clock EOC exists for polio.
- WHO emergency operations supports NHEPRN, provincial health departments and implementing partners through the health cluster.
- The health cluster approach has proven effective and avoids duplication of efforts and waste of resources.
- Response to disease outbreaks such as cholera, CCHF, dengue, A(H1N1) is functioning through health departments.
- NIH as the National Reference Laboratory has the capacity for detection and surveillance of major infectious diseases.

Areas that need strengthening/challenges

- EOCs should be strengthened to respond to all notifiable/priority diseases and public health emergencies.
- Capacity-building is needed for the relevant line departments in emergency operations.
- Capacity-building is also needed on risk communication and appropriate information sharing.
- Defined terms of reference and policies are not in place to respond to emergencies.
- There is a need to create a multisectoral commission/multi-disciplinary emergency response department for public health.
- Community engagement and mechanisms should be strengthened to manage emergency response activities.
- A hotline should be established for response to disease outbreaks.
- Concerted efforts are required to expand the polio-specific EOCs into overall emergency operations.
- No mock exercises have been carried out during the last year.

R.2.4 Case management procedures are implemented for IHR relevant hazards.

Score 2: Limited capacity. Case management guidelines are available for priority epidemic-prone diseases.

Strengths/best practices

- Due to the high number of emergency events related to climate and natural disasters, coupled with man-made risks and threats, Pakistan obtained best practice experience and capability in its emergency response operation reflected by:
 - Flood emergency plans are updated on annual basis
 - Disaster drills and exercises are conducted by NDMA
 - Disaster risk management plans are prepared with the support of WHO/UNICEF
 - In Punjab, a hotline is available to call for help on handling disease outbreaks.
- Case management guidelines are available and disseminated for priority epidemic-prone diseases like A(H1N1), CCHF, dengue haemorrhagic fever, diphtheria, leishmaniasis and IHR-relevant hazards at all health system levels.

Case definition and management guidelines of notifiable diseases were established in 2012 with the support of WHO.

- SOPs are available for the management and transport of potentially infectious patients and point of entry.
- Patient referral and transportation mechanisms with adequate resources are partially available.
- Provincial RRTs are trained in case management of IHR-related emergencies by WHO.
- Guidelines for AFP surveillance, investigation and case management are being followed at all levels across the country.

Areas that need strengthening/challenges

- Limited capacity exists in the hospital setting for infection prevention and case management of IHR-related events such as avian influenza, CCHF and Ebola.
- SOPs for the management and transport of potentially infectious patients should also be available at other PoE (land crossings and sea ports).
- Availability of resources and budgetary allocation needs to be increased.

Relevant documentation

- Draft National Pandemic Preparedness Plan, 2014.
- National Disaster Response Plan, 2010.
- National Monsoon Contingency Plan (updated yearly).
- National Contingency Plan to Manage Industrial/Technical Disasters.
- National Disaster Risk Management Framework, 2007.
- National Disaster Risk Reduction Policy, 2013.
- Pakistan Humanitarian Response Plan.
- National Emergency Action Plan (updated yearly/endorsed by Prime Ministers National Task Force).

Linking public health and security authorities

Introduction

Major public health emergencies, especially those with societal implications and/or large population displacements, pose special challenges for law enforcement both in man-made crises (e.g. intentional mass casualty events) and in natural disasters (e.g. pandemics, earthquakes, flash floods, tsunami, hurricanes). In a public health emergency, law enforcement and public health systems need to coordinate their response in order to minimize loss of life, or injury, and for optimal public safety and security.

Target

In the event of a biological event of suspected or confirmed deliberate origin, a country will be able to conduct a rapid, multisectoral response, including the capacity to link public health and law enforcement, and to provide and/or request effective and timely international assistance, including to investigate alleged use events.

Level of capabilities

Pakistan has faced multiple major natural disasters, including floods, earthquakes and mudslides as well as food and nutrition insecurity, intentional attacks on health workers and infectious disease outbreaks (e.g. A(H1N1) influenza, dengue, measles, polio). These have necessitated a multisectoral response involving both national and international stakeholders. This substantial cumulative experience with emergencies and disasters has led to the establishment of strong institutions that have the statutory authority to engage public health and law enforcement in the response.

The NDMA is the lead agency at the federal level, which is mandated to manage and coordinate activities in response to a wide spectrum of disasters and emergencies. In the event of a disaster, all stakeholders – including government ministries and departments, armed forces, international and other NGOs, United Nations agencies – work through and form part of the NDMA to conduct a ‘single window’ operation.

At the provincial level the PDMA liaises with provincial and district health authorities to coordinate a multisector response involving public health and law enforcement. At the district level, the Deputy Commissioner within the rules of business has the authority to direct and coordinate all line departments in response to an event or disaster. In a health event or hazard of unparalleled consequences the Deputy Commission can request for law enforcement agencies and army assistance for a coordinated relief operation.

In addition to NDMA and PDMA, a current best practice in Pakistan is a highly coordinated and integrated strategy to mitigate the risk of attacks on health workers involved in the polio eradication programme. Pakistan faced an unprecedented challenge with a series of fatal attacks on health workers that began in 2012. Since then, important lessons have been learnt and innovative strategies progressively developed to diminish the risks and maintain continuity of programme operations.

Although the existing structures, statutes and the rules of business in Pakistan may obviate the need to develop memoranda of understanding between public health, animal health, food safety and law enforcement and security agencies, SOPs are important to cement and accelerate the coordination needed for a prompt and appropriate response. The SOPs should be developed within the framework of the National and Provincial Health Emergency Preparedness and Response Plans. The SOPs should clearly define the authorities, commitment of resources, roles and responsibilities of health and law enforcement and security

agencies, particularly the local police that are specific to the various types of health events and hazards. Events might include disease outbreaks, events at points of entry, quarantine issues, food contamination, chemical and radiation hazards, and intentional use of biological agents. These all require information sharing, joint investigations, joint risk assessments, coordinated control activities and law enforcement. The current linkage between polio eradication and law enforcement took some time to develop and mature, and is an important benchmark to guide the development of such SOPs.

In the absence of any formal agreement between relevant national authorities and international organizations for the joint investigation of events related to possible intentional use of biological or toxin weapons, SOPs should be developed to facilitate joint investigations and coordinated response. The SOPs should involve public health, law enforcement, foreign affairs and other sectors, and should include terms of engagement with international entities and mechanisms such as Interpol, United Nations agencies, and the UN Secretary General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons.

Recommendations for priority actions

- Establish SOPs for coordination across public health and security sectors within the framework of the National and Provincial Health Emergency Preparedness and Response Plans. The SOPs should clearly define the authorities, commitment of resources, roles and responsibilities of health and law enforcement and security agencies.
- Finalize the National and Provincial Health Emergency Preparedness and Response Plans.
- Provide in-service training for public health and security personnel at all levels on the SOPs and conduct simulation exercises to test them and reinforce the training.

Indicators and scores

R.3.1 Public Health and Security Authorities (e.g. Law Enforcement, Border Control, Customs) are linked during a suspect or confirmed biological event.

Score 3: Developed capacity. A memorandum of understanding or other agreement (i.e. protocol) exists between public health and security authorities within the country and has been formally accepted.

Strengths/best practices

- NDMA and its provincial counterpart, PDMA, have clear protocols that engage the police or the army when there is a disaster or major hazardous event.
- National statutes enable the civil government to call in the army to assist with any event requiring law enforcement, rescue, or relief and rehabilitation operations.
- The 'Rules of Business' in the Government of Pakistan enable the public health service at federal, provincial and district levels to request assistance from the police and other security assets.
- At the district level, the Deputy Commissioner, as the chief executive of the district, is empowered to direct both health and law enforcement to respond to an event.
- There are highly coordinated and integrated strategies developed jointly by public health and security agencies to mitigate the risk of attacks on health workers involved in the polio eradication programme.
- The Pakistan Army has an enormous medical infrastructure that is engaged during response to major disasters along with provincial departments of health.

Areas that need strengthening/challenges

- There is a lack of SOPs to guide the actions of different stakeholders in a highly coordinated multisectoral response to a health emergency.
- The National and Provincial Health Emergency Preparedness and Response Plans should rapidly be finalized.
- There is an absence or lack of training at regional and national levels that includes both public health and security authorities on topics related to specific roles and responsibilities, information sharing, and joint investigations and responses.

Relevant documentation

- Inter-agency preparedness plan, Pakistan, Asia, IASC, 2014. United Nations Office for the Coordination of Humanitarian affairs (OCHA).
- Inter-Agency Real Time Evaluation of the Humanitarian Response to Pakistan's 2010 Flood crisis. 2014. Inter-Agency Standing Committee (IASC).
- A Network of Schools of Public Health Partnering with State and Local Health Agencies and CDC to Protect the Nation from Bioterrorism, Infectious Disease Outbreaks and Other Emergent Public Health Threats. 2002. Framework Document, Academic Centers for Public Health Preparedness.

Medical countermeasures and personnel deployment

Introduction

Medical Countermeasures (MCM) are vital to national security and protect nations from potentially catastrophic infectious disease threats. Investments in MCM create opportunities to improve overall public health. In addition, it is important to have trained personnel who can be deployed in case of a public health emergency for response.

Target

A national framework for transferring (sending and receiving) medical countermeasures and public health and medical personnel among international partners during public health emergencies.

Pakistan level of capabilities

The NDMA is the lead agency at the federal level to deal with the whole spectrum of disaster management activities. In the event of a disaster, all stakeholders – including government ministries, departments and organizations, the armed forces, international and other NGOs, United Nations agencies – work through and form part of the NDMA to conduct integrated operations. A similar structure exists at subnational level as provincial or district Disaster Management Authorities. The National Disaster Management Plan and the National Disaster Response Plan contain provisions for sending and/or receiving medical countermeasures and health personnel. Pakistan has a process of regulating any local or international donation of drugs. Any aids to health are presently coordinated by the Ministry of Inter-Provincial Coordination. To assist other countries, an Emergency Relief Cell (Cabinet Division, Government of Pakistan) acts as focal point with international support during emergencies in Pakistan.

Pakistan has experience of receiving medical countermeasures and health personnel during disasters such as flooding, earthquakes and some disease outbreaks (dengue). Similarly, Pakistan has been extending its support to disaster-stricken countries with medical countermeasures and health personnel. Within the country there is a mechanism in place to declare an emergency, which allows various levels of government to receive medical countermeasures during emergencies. The country has deployed health personnel from one province to another and validated a mechanism for facilitation of receiving medical countermeasures like medicine, equipment, ambulances etc. during emergencies.

Some areas could be further strengthened and reinforced, i.e. developing a comprehensive plan for receiving and sending medical countermeasures and health personnel, stockpiling of essential countermeasures and deployment of human resources. There are no formal mechanisms for agreements with national and international manufacturers and/or distributors to procure medical countermeasures during public health emergencies. Issues of licensure and liability of foreign medical personnel should be regulated. As Pakistan is a disaster-prone country, having a comprehensive plan of mobilization of health personnel, with appropriate training, procedures and materials, could benefit the emergency response.

Recommendations for priority actions

- Develop a comprehensive plan and strategy that identifies procedures and decision-making mechanisms, including roles and responsibilities related to sending and receiving health personnel during a public health emergency.

- Provide capacity strengthening programmes to ensure that all staff deployed have the appropriate guidance and continuous training to prepare them for an emergency response setting (link with WHO foreign medical team standards).
- Allocate resources to ensure that technical institutions can become an active part of networks involved in emergency response at international level (Global Outbreak Alert and Response Network (GOARN) and other partners).
- Establish a mechanism to allow agreements with national and international manufacturers and/or distributors for rapid procurement of medical countermeasures during public health emergencies.

Indicators and scores

R.4.1 System is in place for sending and receiving medical countermeasures during a public health emergency.

Score 4: Demonstrated capacity. At least one response OR a formal exercise or simulation within the previous year in which medical countermeasures were sent or received by the country.

Strengths/best practices

- A mechanism to declare an emergency is in place, which allows various levels of government to receive medical countermeasures during emergencies.
- Pakistan has exercised plans for sending and receiving medical countermeasures in the past, some of which were within the past year (e.g. medical countermeasures in response to Nepal earthquake).
- A mechanism is in place for receiving medical countermeasures like medicine, equipment, ambulances etc. during emergencies (Policy for Issuance of No Objection Certificates).

Areas that need strengthening/challenges

- Stockpiling of essential medical countermeasures at national level and vulnerable provinces could be improved with development of a distribution plan during public health emergencies within and outside of the country.
- A mechanism should be established to have an agreement with national and international manufacturers and/or distributors to procure medical countermeasures during public health emergencies.

R.4.2 System is in place for sending and receiving health personnel during a public health emergency.

Score 4: Demonstrated capacity. At least one response OR formal exercise or simulation within the previous year in which health personnel were sent or received by the country.

Strengths/best practices

- Pakistan has experience of sending and receiving health personnel in the past, some of which within the past year (e.g. medical team mobilization in response to Nepal earthquake). This mobilization is coordinated through the Ministry of Foreign Affairs and the Pakistan Army.
- Some institutes are part of GOARN network and participated in outbreak responses.

Areas that need strengthening/challenges

- A regulatory mechanism should be developed for licensure and liability of foreign health personnel received during emergencies. Pakistan could develop or adopt standards of foreign medical team guidelines.
- An orientation package should be provided to foreign health personnel on the local situation, background and immediate local needs based on the risk assessment of the public health emergency.
- A comprehensive plan of mobilization of health personnel within the country should be developed, with appropriate training, procedures and materials.

Relevant documentation

- National Disaster Management Plan.
- Policy Issuance No Objection Certificate, Flood, 2011. NDMA.
- NDMA annual reports.
- National Disaster Response Plan (page 16), NDMA, 2010.

Risk communication

Introduction

Risk communications should be a multi-level and multi-faceted process which aims at helping stakeholders define risks, identify hazards, assess vulnerabilities and promote community resilience, thereby promoting the capacity to cope with an unfolding public health emergency. An essential part of risk communication is the dissemination of information to the public about health risks and events, such as outbreaks of diseases. For any communication about risk caused by a specific event to be effective, the social, religious, cultural, political and economic aspects associated with the event should be taken into account, as well as the voice of the affected population. Communications of this kind promote the establishment of appropriate prevention and control action through community-based interventions at individual, family and community levels. Disseminating the information through the appropriate channels is essential. Communication partners and stakeholders in the country need to be identified, and functional coordination and communication mechanisms should be established. In addition, the timely release of information and transparency in decision making are essential for building trust between authorities, populations and partners. Emergency communications plans need to be tested and updated as needed.

Target

State Parties should have risk communication capacity which is multi-level and multifaceted real time exchange of information, advice and opinion between experts and officials or people who face a threat or hazard to their survival, health or economic or social well-being so that they can take informed decisions to mitigate the effects of the threat or hazard and take protective and preventive action. It includes a mix of communication and engagement strategies like media and social media communication, mass awareness campaigns, health promotion, social mobilization, stakeholder engagement and community engagement.

Pakistan level of capabilities

Generally, there is limited capacity in the area of risk communication, and no formal risk communication system is in place. However, there are informal mechanisms at both federal and provincial levels. In KP for instance, there is a risk communication structure functioning during emergencies but no system at other times. In Punjab, the health education unit is essentially carrying out some of the risk communication activities.

There is neither a national nor a provincial risk communication plan. However, there are communication plans as well as SOPs for major programmes such as EPI/polio, influenza, Ebola, HIV/AIDS, TB and recently Zika, and in some areas for emergencies. These can be used as baseline documents in drafting an all-Pakistan risk communication strategy encompassing all hazards.

Limited risk communication capacity exists in the Ministry of NCSR&C. The National Contingency Plan to Manage Industrial/Technical Disasters (2012) reasonable addresses risk communication. As part of the United Nations Contingency Plan, a strategic Avian Influenza Communication Plan was developed for Pakistan in 2006. This plan included pandemic Influenza and outlines communication objectives, audience groups, strategies, messages, activities and a coordination mechanism to provide adequate communication support for different phases.

An existing community engagement structure is utilized by other health programmes. Since 1994, the role of lady health workers has been essential in disseminating health messages and communicating with communities.

There are communications personnel and government departments that informally respond to public information needs during emergencies in KP and Punjab. These provinces also have a dedicated budget line for communications personnel, materials and activities for emergencies.

Recommendations for priority actions

- Establish a formal risk communications system by initially creating a risk communication unit at the federal and provincial levels with dedicated staff who will be formally trained in risk communication.
- Develop a proactive national risk communication plan and provincial risk communication action plan encompassing all hazards with SOPs that are endorsed by leadership, shared with partners, regularly tested and revised as needed.
- Develop a mechanism to ensure sustained coordination among all communications focal persons in the different levels of the federal and provincial health structures, and develop guidelines reflecting the roles and responsibilities of these departments during non-emergency and emergency times.
- Establish a mechanism for regular collection of rumours and misinformation, finding the methods and messages to address them and share them with partners to ensure message consistency.

Indicators and scores

R.5.1 Risk Communication Systems (plans, mechanisms, etc.).

Score 1: No capacity. No formal government risk communication arrangement exists.

Strengths/best practices

- There are communications personnel or government departments that informally respond to public information needs during emergencies at national level and in KP and Punjab.
- Mechanisms are in place at the federal level and in KP and Punjab to vet messages prior to dissemination.
- There is a dedicated budget line for communications personnel, materials and activities for emergencies only in Punjab.
- There are designated posts of Public Relations Officer and Health Education Officer in Punjab and a Health Education Officer at the Director General of Health Services Office in KP to serve as risk communications personnel.

Areas that need strengthening/challenges

- Building on the existing structure, a formal risk communications system should be created across the country. The establishment of the risk communication unit at the national level as well as the provincial level should be considered as a priority.
- Neither a national nor a provincial risk communication plan is in place. However, major health programmes such as EPI, dengue, TB/HIV and others have drafted plans and SOPs in communicating risks. These programme communication plans should be reviewed and considered when drafting the provincial risk communication plan.
- There are no permanent or surge staff dedicated to risk communication during emergencies. Only lady health workers are involved as surge staff to reach out to communities during an emergency.

R.5.2 Internal and Partner Communication and Coordination.

Score 2: Limited capacity. Some ad hoc communication coordination exists such as during meetings with some partners and/or irregular information sharing.

Strengths/best practices

- The federal government, during an emergency event, formally informs the international community after which all partners, i.e. United Nations agencies and international NGOs participate and coordinate for an assessment and then initiate the response.
- The country has informal mechanisms at both the federal and provincial levels for coordination and internal communication with stakeholders and response agencies through a health cluster forum represented by government, United Nations partners, and international and other NGOs.
- Informal mechanisms exist to coordinate communication with the hospital and health-care sector, among civil society organizations, and with the private sector during an emergency. Punjab has a formal mechanism in place to coordinate communication among international stakeholders and response agencies during an emergency.

Areas that need strengthening/challenges

- Coordination/agreement among stakeholders/partners during emergencies needs strengthening to release consistent or non-contradictory information or regarding which agency would respond during an emergency.
- Exercises should be conducted to test communication and coordination with partner organizations.
- Budgeted communication response plans need to be developed with external partners and stakeholders.

R.5.3 Public Communication.

Score 2: Limited capacity. A public communication unit or team exists; government spokesperson identified and trained; and procedures for public communication are in place.

Strengths/best practices

- The public health sector has a formalized function to communicate with the public through a designated and trained spokesperson and communication team dedicated for handling the media.
- Sindh, KP and Punjab provide information and messages in local languages as needed by the audience.
- During emergencies, regular media briefings and updates through mass and social media are provided.
- A seasonal awareness and alert letter is issued tri-annually from NIH.
- Advisories for specific diseases are also issued periodically.
- In Punjab, there is a committee that reviews, edits and issues publications, TV clips, etc.

Areas that need strengthening/challenges

- Target audience analyses are required for better understanding of audience language, trusted information resources and preferred communication channels.
- A communication strategy is needed that proactively reaches out to a variety of media platforms such as newspapers, radio, TV, social media, web in order to target communication messages to specific audiences.

- Media research should be conducted to determine messages, as well as a risk perception survey to craft messages properly, consider sociocultural norms and taboos, religious sensitivities and gender biases.

R.5.4 Communication Engagement with Affected Communities.

Score 2: Limited capacity. A community-level engagement system is semi-formed with mapping of existing processes, programmes, partners and stakeholders. Social mobilization, behaviour change communication and community engagement are included in the national risk communication strategy in the context of health emergencies. Some key stakeholders in this domain are identified at national and intermediate (provincial/regional) level.

Strengths/best practices

- The public health sector has social mobilization, health promotion or community engagement working groups at the federal and provincial levels that are used for communication during emergencies, regularly work with a media department or focal person, and reach out to the affected or at-risk populations during health emergencies.
- PDMA provides information sharing or training opportunities between experienced community engagement experts and volunteers, and potential surge capacity to be used during emergencies.
- A community engagement structure is utilized by other health programmes. Since 1994, the role of lady health workers has been essential in disseminating health messages and communicating with communities.
- The social mobilization, health promotion or community engagement department or working group regularly and rapidly changes messages to address audience feedback, misinformation and questions, and to receive audience feedback or questions (e.g. in KP and Punjab during the latest emergency).

Areas that need strengthening/challenges

- There are no social mobilization, health promotion or community engagement functions working at the intermediate (district/provincial) levels, except for lady health workers.
- Health departments need to conduct regular testing of information, education and communication (IEC) materials with members of the target audience as done by vertical programmes.
- A plan is needed to scale up existing community engagement capacities to be deployed during emergencies.
- Health communication messages need to be reinforced.

R.5.5 Dynamic Listening and Rumour Management.

Score 3: Developed capacity. Routine and event-based systems for listening and rumour management exist or an ongoing system with limited or unpredictable influence on the response.

Strengths/best practices

- The public health sector in KP and Punjab has a formal communication function to monitor and address rumours and misinformation; ad hoc methods to learn of rumours regarding public health issues; and a method to addressing them.
- Communication messages take into account rumours and misinformation from the public.
- All vertical programmes have developed effective IEC components.

Areas that need strengthening/challenges

- There is no evaluation of communication response and ability to address rumours and misinformation to determine that actions changed behaviour and/or stopped the rumour from spreading.
- There is a need to regularly collect rumours and misinformation, to find the methods and messages to address them and share them with partners to ensure message consistency.

Relevant documentation

- Pakistan: Communication Strategy for Routine Immunization, 2015–2018.
- SoPs for Prevention and Control of Dengue in Pakistan.
- National Emergency Action Plan for Polio Eradication, 2015⁴.

⁴ http://www.Polioeradication.org/Portals/0/Document/InfectedCountries/Pakistan/2015-16_NEAP_Pakistan.pdf

OTHER

Points of entry

Introduction

All IHR core capacities and potential hazards apply to points of entry (PoE) and this is a key area for the effective application of health measures to prevent international spread of diseases. States Parties are required to maintain the core capacities at the designated international airports and ports and designate ground crossings in order to be able to implement specific public health measures required to manage a variety of public health risks.

Target

States Parties should designate and maintain the core capacities at the international airports and ports and designate ground crossings which implement specific public health measures required to manage a variety of public health risks.

Pakistan level of capabilities

Pakistan has a 1046 km coastline along the Arabian Sea and the Gulf of Oman in the south and is bordered by India to the east, the Islamic Republic of Afghanistan to the west, the Islamic Republic of Iran to the south-west and the People's Republic of China in the far north-east.

Pakistan encompasses eight international airports (Faisalabad, Islamabad, Karachi, Lahore, Multan, Peshawar, Quetta and Sialkot), six ground crossings (Chaman, Khokarapar, Sost, Taftan, Thurkum and Wagah) and three international seaports (Bin Qasim, Gawadar, Karachi and Keemari).

The public health representatives at PoE are the "competent authority" as per the IHR. They respond to the Directorate of Central Health Establishments (DoCHE) under the authority of the Ministry of NCSR&C. The PoE can reach out to the IHR NFP through the DoCHE in case of any potential public health emergency of international concern (IHR Articles 22 et 4). They transmit data regarding their routine activities to the DoCHE, which should consider standardized reporting to feed the national surveillance system on a regular basis as the PoE are part of this system.

Further to the temporary recommendations of the polio IHR emergency committee (1 March 2016), exporting countries should ensure that travellers who have not received a dose of OPV (oral poliovirus vaccine) or IPV (inactivated poliovirus vaccine) in the previous 4 weeks to 12 months receive a dose of Polio vaccine by the time of departure. Under the DoCHE there are 17 PoE/IHR vaccination points at airports, seaports and border crossings vaccinating all travellers in Pakistan. There are also 18 permanent vaccination points along the border with Afghanistan vaccinating all children aged below 10 years of age.

No "designated" PoE, as prescribed by the IHR, has been declared yet to WHO.

No "authorized" seaport, according to the IHR definition, has been added yet to the IHR list of authorized ports to issue Ship Sanitation Certificates.

Recommendations for priority actions

- Ensure that PoEs constitute an integral part of the national surveillance system.
- Implement the process of port authorization and points of entry designation as per the IHR.
- Set up and enhance mechanisms of collaboration and coordination, at central and local level, with other relevant stakeholders in order to involve them more in public health issues.
- Update the Pakistan Aircraft Health Rules, 1970 and the Pakistan Port Health Rules, 1974 whose provisions are related to the International Sanitary Regulations, 1951, the predecessor of the current IHR.

Indicators and scores

PoE.1 Routine capacities are established at PoE.

Score 2: Limited capacity. Designated PoEs have access to appropriate medical services including diagnostic facilities for the prompt assessment and care of ill travellers and with adequate staff, equipment and premises.

Strengths/best practices

- With a few exceptions, a limited range of the medical services are available at PoE in Pakistan. Overall, they include preliminary diagnostic facilities for the prompt assessment and care of ill travellers. This capacity is reinforced by the presence of medical emergency units under the civil aviation authority at airports and primary care units for Pakistani seafarers at seaports.
- Full mobilization complements national polio vaccination coverage in line with the IHR emergency committee recommendations.
- Consistent data management provides relevant information regarding the epidemiological situation at the PoE using documents like: the International Certificate of Vaccination, the Health Part of the General Declaration of Health, the Death Certificate, the Medical Certificate of Fitness to Fly, Restaurant Canteen/ Food-Outlet Check-Up, Medical Examination Report for Food Handlers, Tracking Form, Health Clearance Certificate, Personal Declaration of Origin and Health, Important Events and Development Monthly Form, Monthly Report of Principal Activities, and Ship Sanitation Certificates.

Areas that need strengthening/challenges

- All POEs need strengthening in terms of manpower, their skill development, appropriate space availability, quarantine facilities, diagnostic equipment, referral linkages and transport facilities.
- A continuing training programme needs to be customized and adapted to the specific needs of the personnel covering especially civil aviation aspects and the maritime areas.
- Detailed and comprehensive assessments of all POEs should be conducted to determine personnel requirement, and their technology and logistics needs followed by a procurement plan.
- Quarantine area and ambulances for the transport of ill travellers to appropriate medical facilities are either absent or inadequate.
- A comprehensive procurement plan should be developed for personnel and the logistics needs, followed by budgetary provisions by the government, donors and development partners.
- Deficiencies in terms of inspection and supervision of programmes relate to food safety, potable water, liquid and solid waste management and vector control.

- Adequate space should be made available for medical facilities and technical staff at PoE.
- Technical and administrative matters of central health establishments should be reorganized, enabling them to comply with IHR regulations for air and sea ports having human resources/ dispensaries with limited capacities.

PoE.2 Effective Public Health Response at Points of Entry.

Score 2: Limited capacity. A national public health emergency contingency plan is in place for responding to these emergencies at PoE, integrated with other public health response plans, covering all relevant sectors and services at PoE developed and disseminated to all key stakeholders.

Strengths/best practices

- The public health emergency plan is embedded within the emergency plans at international airports. This plan describes the measures to be adopted during a public health emergency of international concern. It is in compliance with the relevant articles in the IHR and the International Civil Aviation Organization, Annexes 6, 9, 11 and 14. This process is in progress at seaports.

Areas that need strengthening/challenges

- There is a shortage of appropriate personal and protective equipment.
- Clear SoPs are lacking regarding the entry or exit controls for arriving and departing travellers including the existence of isolation rooms and referral to designated health facilities.
- There is need to enhance cross-border collaboration with neighbouring countries under the framework of IHR.
- POEs should be equipped to generate digital reporting (through a customized software) which should ultimately link up with the national surveillance system.
- Similarly, institutional arrangements and culture should be developed to coordinate and liaise regularly and periodically with the concerned cross-border agencies for joint reviews of the status and progress and for joint action as and when required.
- The adequacy of public health services at PoE should be reviewed, including: ambulances for the transport of ill travellers to appropriate medical facilities, PPE for staff, SoPs regarding the entry or exit controls for arriving and departing travellers, and isolation rooms.
- There is a need to review the adequacy of inspection and supervision of programmes related to food safety, potable water, liquid and solid waste management, and vector control.
- A surveillance plan should be established targeting local and potential vector species and vector-borne diseases. This will support proper decision-making on vector control methods. In case of an outbreak of vector-borne disease or the detection of exotic vector species, an immediate response should be triggered with a view to eradication.
- POEs should be brought into the ambit of the National Emergency Preparedness and Response Plan.
- There is no channel of communication or collaboration with privileged partners like the Department of Plant Protection or the Animal Quarantine Department, both of which are under the authority of the Ministry of National Food Security and Research.

Relevant documentation

- Draft of the Pakistan Public Health (Surveillance and Response) Act, 2010.
- Pakistan Aircraft Health Rules, 1970.

- Pakistan Port Health Rules, 1974.
- Civil Aviation Authority Ordinance, 1960.
- Map of Points of Entry, Pakistan, 2013.
- Airport Contingency Plans.
- WHO Points of Entry Assessment Reports.
- DCHE Brief.
- Points of Entry SoPs for Ebola.

Chemical events

Introduction

Uncontrolled chemical events can constitute a significant threat to public health, service sectors and infrastructure unless coordinated multi-agency response is mobilized in a timely manner. State parties should therefore have the surveillance and response capacity for chemical risk or events. It requires effective communication and collaboration among the sectors responsible for chemical safety, industries, planning, transportation, safe disposal and health protection.

Target

State Parties should have the surveillance and response capacity for chemical risk or events. It requires effective communication and collaboration among the sectors responsible for chemical safety, industries, planning, transportation, waste disposal, environment, and public health protection.

Pakistan level of capabilities

In Pakistan, concerns about chemical risks and safety have traditionally been centred on the use of agrochemicals in its large agriculture sector. Laboratory facilities exist within academic and government research sectors and have the capacity to detect the environmental presence of typical chemical substances. Pakistan's Environmental Protection Agency (EPA) is responsible for the protection and well-being of the environment while NDMA is the lead authority to coordinate multi-agency responses to major disasters including significant chemical events. Pakistan has ratified relevant global treaties and conventions concerning hazardous chemicals and chemicals safety.

However, a systematic approach has yet to be adopted in the management of chemical sectors by utilizing infrastructure and experience available in the country. No cohesive legislative and organizational frameworks are in place to deal with occupational health and well-being, or provide protection of wider population health and the environment from risks of uncontained chemical events. Regulatory inspections of sensitive industrial facilities, leftover stockpiles and chemical wastes are ad hoc and limited, and there is no integrated surveillance or early alert protocol between relevant industry, regulatory authorities, emergency responders/services and health sectors to rapidly detect and contain accidental, natural or deliberate releases.

Currently, EPA has no baseline data or proper system to deal with hazardous substances. At national level, EPA and NDMA prepared a National Contingency Plan in 2010 to manage industrial and chemical disasters. In Punjab, EPA has drafted rules to deal with hazardous substances, hospital waste, etc. and an EDH Directorate has been established in this regard.

There is a lack of awareness in the judiciary of the public health impact and benefit of environmental regulations at provincial level. This is reported to have hampered EPA's ability to enforce environmental safety laws and regulations on industry, as courts usually view such cases as unwarranted and a sign of red tape. As Pakistan embraces industrialization and common security treats, there is growing acknowledgement of the need to protect the environment and population health from the chemical hazards of known, diffuse and unpredictable sources.

Recommendations for priority actions

- Review prevailing regulations in the context of their efficacy and scope to address: the expanding chemicals sector; life cycle of chemicals and waste; security threats involving chemicals; multi-

agency coordination, i.e. emergency health services. This should lead to the development of cohesive national regulations associated with statutory guidance outlining responsibilities and implementation at all three administrative tiers (federal, provincial and district).

- Train nominated lawyers and judges on the public health impact and benefit of environmental regulations.
- Compile and implement relevant minimum service delivery standards/national environmental quality standards.
- Review, update, develop, strengthen and operationalize public health protection plans in partnership with relevant industry, regulators, emergency health services for chemical safety, and the prevention and control of chemical incidents/emergencies (including those related to imported waste, ship-breaking operations, disposal mechanisms of obsolete chemicals, etc.).
- Strengthen human and financial resources to enable routine chemical safety, surveillance, detection, alerts, toxicology, risk assessment and health protection – integrated with resilient health systems development.
- Develop a database and shared-information repository/inventory for chemical stockpiles, risk profiling, vulnerability assessments, and templates for risk communication for use during an emergency.
- Coordinate with industrial associations to collect and share relevant data.

Indicators and scores

CE.1 Mechanisms are established and functioning for detecting and responding to chemical events or emergencies.

Score 2: Limited capacity. Guidelines or manuals on the surveillance, assessment and management of chemical events, intoxication and poisoning are available.

Strengths/best practices

- NDMA is mandated to provide coordinated response to significant industrial accident/chemical events.
- Laboratory capacity is available for the analysis of chemicals at the Pakistan Council of Scientific and Industrial Research, NARC, and provincial facilities.
- An emergency unit to handle chemical poisoning is available at hospitals.
- Chemical safety assessment surveys focusing on agriculture have been carried out.
- A National Poison Control Centre is established at Jinnah Postgraduate Medical Centre, Karachi.
- Relevant key international chemical conventions/agreements have been ratified.

Areas that need strengthening/challenges

- There is a need for active participation of authorities of public health and emergency responders with those responsible for industry, trade, regulation, agriculture, and planning to ensure a multi-agency approach to develop good practices in proactively managing chemical security threats. This could clearly include EPA on the Provincial Multisectoral IHR Task Force/Committee.
- Relevant authorities need to map and implement routine surveillance and monitoring of chemical events of facilities that use chemicals, not just during the inspection and enforcement period, but integrated with wider public health surveillance. This will benefit from assigning an authority as the “competent authority” to deal with all aspects of chemicals and coordination with all relevant partner organizations.

- Guidelines or manuals are needed on surveillance, environmental public health risk assessment and management of chemical events, intoxication and mass-poisoning, decontamination, and PPE.
- Monitoring of consumer products should be put in place (e.g. foodstuffs and goods) and of contemporary and emerging economic activities such as ship breaking with regard to chemical, environmental and public health hazards.
- An inventory and risk profile should be made of chemical stockpiles and industries that could present potentially significant risks to public health.
- The safety and security of waste disposal systems and facilities for hazardous chemicals need to be reviewed, and safe options for waste management developed and established.
- Awareness, control and monitoring of the use of chemicals in the agricultural sector should be prioritized.

CE.2 Enabling environment is in place for management of chemical Events.

Score 2: Limited capacity. National policies, plans or legislation for chemical event surveillance alert⁵ and response exist.

Strengths/best practices

- National coordinating bodies exist for pesticide safety management, environment protection and disaster management.
- A strategic plan is established for industrial chemical safety formulated by the plant protection authority.
- An action plan is available for public health safety in the event of chemical incidents/emergencies.
- A National Poison Control Centre is operational at Jinnah Postgraduate Medical Centre in Karachi.

Areas that need strengthening/challenges

- A coordination mechanism should be established for systematic information sharing between the sectors involved in chemicals, surveillance, emergency response and health services.
- A database should be set up on high tonnage industrial chemicals and stockpiles, and risk-based contingency plans developed with input from public health professionals.
- Consistent law enforcement should take place at all three levels of the country to ensure good practices in chemical sector management.
- The audit/evaluation system should include exercises/responses to chemical events and lessons learnt.
- Consideration should be given to have at least one hospital serve as a reference facility at provincial level to handle chemically contaminated or poisoned patients, resourced with necessary logistics and know-how.
- Lab facilities at public, private and research sectors should be able to link with the national environmental surveillance network, including those in place for drinking water quality monitoring, to provide rapid identification of acute, fast evolving and protracted chemical events.
- There is an urgent need for training of health-care staff on chemical risk assessment and medical toxicology. This could include the development of laboratory facilities capable of performing qualitative and quantitative toxicology.

⁵ Elements of alert include SOPs for coverage, criteria of when and how to alert, duty rosters etc.

- The telephone-based/online toxicology advisory service of the National Poison Control Centre, Karachi should be exploited and expanded to other provincial levels. This could entail establishment of toxicology alert systems with public health authorities and hospitals.
- Judiciary awareness needs to be created of the public health impact and benefit of environmental regulations at provincial levels, which will enable EPAs to enforce environmental safety laws and regulations on industry.

Relevant documentation

- Pakistan Environmental Protection Agency, <http://environment.gov.pk/>.
- Pakistan National Disaster Management Authority, www.ndma.gov.pk/site.
- IHR JEE Tool country self-assessments report.
- Social Security Hospital Islamabad.
- National Poison Control Centre at Jinnah Postgraduate Medical Centre Karachi.

Radiation emergencies

Target

State Parties should have surveillance and response capacity for radio-nuclear hazards/events/emergencies. It requires effective communication and collaboration among the sectors responsible for radio-nuclear management.

Pakistan level of capabilities

The Pakistan Nuclear Regulatory Authority (PNRA) is the designated institute for radiation safety, surveillance, preparedness and response. This authority has adequate available resources, performs safety assessments of medical radiation facilities, and the nuclear and radiation facilities provide annual safety reports that are reviewed at PNRA. The Nuclear Emergency Management System fall under the National Disaster Management Authority Plan and addresses all radio-nuclear emergencies. Adequate legislation/regulatory authority is available for EPR, e.g. the Regulations on Management of Nuclear or Radiological Emergencies. The emergency plans are revised and updated regularly and adequate resources are ensured for surveillance, laboratory analysis, hazard assessment and the conduct of exercises or drills. Medical facilities to treat contaminated individuals or victims of radiation emergencies are enlisted and available with adequate resources. A coordination mechanism is in place with relevant stakeholders, and international standards and guidance are closely followed and regularly evaluated.

Recommendations for priority actions

- Establish and maintain systematic information exchange between radiological competent authorities and human health surveillance units about urgent radiological events and potential risks that may constitute a public health emergency of international concern.
- National authorities responsible for radiological and nuclear events to identify a designated focal point to coordinate and communicate with the Ministry of NHSR&C and the IHR NFP.
- Allocate additional human and financial resources to embrace the expansion of the nuclear power programme and increased use of radiation in medical, industrial and other sectors.

Indicators and scores

RE.1 Mechanisms are established and functioning for detecting and responding to radiological and nuclear emergencies.

Score 5: Sustainable capacity. A mechanism is in place to access⁶ health facilities with capacity to manage patients of radiation emergencies.

Strengths/best practices

- PNRA, the designated institute for radiation safety, surveillance, preparedness and response, has adequate available resources.
- PNRA performs safety assessment of medical radiation facilities. The nuclear and radiation facilities provide annual safety reports that are reviewed at PNRA.

⁶ Agreements, arrangements and mechanisms exist to access these capacities in relevant collaborating institutions in-country or in other countries.

- The Nuclear Emergency Management System, part of the National Disaster Management Authority Plan, manages nuclear and other radiological emergencies; the Plan is revised and updated following exercises or drills.
- PNRA has authority to assess facilities, issue and revoke licenses, set standards and requirements for waste management, and regularly monitor them.

Areas that need strengthening/challenges

- Mechanism are needed for systematic information exchange between radiological competent authorities and human health surveillance units about urgent radiological events and potential risks that may constitute a public health emergency of international concern.
- National authorities responsible for radiological and nuclear events should be identified for coordination and communication with the Ministry of NCSR&C and the IHR NFP.

RE.2 Enabling environment is in place for management of Radiation Emergencies.

Score 5: Sustainable capacity. Radiation emergency response drills are carried out regularly, including the requesting of international assistance (as needed) and international notification.

Strengths/best practices

- Adequate legislation and a strategic plan on radiation protection required for radiation safety is available.
- A nuclear emergency management system has SOPs with clear delineation of roles and responsibilities, public communication, management of affected populations, decontamination and availability of adequate resources.
- Coordination with relevant stakeholders is in place (national and subnational levels of all relevant sectors like health, environment, emergency services, reference laboratory etc.).

Areas that need strengthening/challenges

- Allocation of additional human and financial resources are required due to expansion of the nuclear power programme and increased use of radiation in medical, industrial and other sectors.

Relevant documentation

1. The International Atomic Energy Agency evaluation and certification (findings).
2. Reports of exercises and drills.
3. Legislation mentioned (copies).
4. Nuclear Emergency Management System Plan (NDMA Plan).

Reports on provinces and federating areas

Due to the highly devolved nature of organizing the capabilities necessary to achieve IHR compliance in the federal system of Government specified by the Constitution of the Islamic Republic of Pakistan, special emphasis was given during the mission to capture provincial capabilities. This was achieved by a series of sub-missions to the four major provinces and a separate session to assess the other four semi-autonomous regions.

Note: Provincial reports focus on specific technical areas identified by each province to be their top priorities.

Sindh

Technical areas assessed: zoonosis, food Safety, laboratory, biosafety and biosecurity, immunization, surveillance, workforce development, EOC, risk communication, PoE, chemical hazards.

Situated in the south-eastern part of Pakistan with the Arabian Sea to the south, Sindh is the second largest province by population. The provincial capital and its largest city is Karachi – the country's financial and economic hub and a major seaport. The province has an industrialized economy with manufacturing, education and agriculture as its three major economic and income-generating activities.

Capacities and functions in provincially relevant JEE action areas range from low to moderate. Key assessment indicators for disease surveillance, immunization, zoonosis, food safety, laboratory, biosafety and biosecurity, and EPR show limited capacities. A workforce strategy is under formulation to support health security-related cadres. Advocating better understanding on the benefits and long-term cost saving of prevention and control activities versus mere curative health-care is needed – thus introducing a stronger public health approach to implementation of health care, food, water safety and zoonosis management.

In Sindh, the provincial cells are under-staffed. There are no surveillance monitoring officers. Also, the existing set-up of training is insufficient. The training academy is virtually non-existent. There is no human resource department and the province relies on the antiquated public services commission system, which is slow. The multidisciplinary nature of the public health workforce has outgrown the ability of the system to hire public health professionals in a quick and efficient manner. Presently, there is a shortage of 4000 physicians. There is also need for additional lady health workers.

The airport and seaport in Karachi have moderate levels of assets and capacities to shoulder surveillance, quarantine, detection, and response to public health threats. Legislative acts to address these two PoEs of national importance exist but are 3–4 decades old. These need radical revamping to align with and meet the health security needs of the 21st century.

Strengths/best practices

- There is a willingness to develop One Health approaches across specialties and between federal and provincial levels.
- A human resources strategy and a separate public health management cadre are in place.
- Laboratory, epidemiological and surveillance capacity is available in the veterinary sector (cattle, poultry) and tertiary care hospitals in the private sector.
- A system for monitoring endemic zoonotic diseases and outbreaks among livestock exists and responsive outbreak investigations can be conducted in the case of human zoonotic diseases.

- A disease surveillance unit exists with competent FELTP-trained staff at the Health Directorate.
- Electronic DHIS syndromic surveillance and a health management system are available in the Sindh Province.
- Local veterinary vaccine production enables rapid tailoring as required to local needs.
- A legislative Act covers the Karachi Port Trust.

Areas that need strengthening/challenges

- Legislative acts to address the two key PoEs need to be updated at the federal level.
- Many zoonotic infections remain endemic and cause frequent outbreaks (anthrax, brucellosis, rabies, bovine TB).
- Reporting of zoonotic livestock outbreaks routinely remains within the veterinary sector.
- Awareness is low in the health sector on the current situation of zoonotic health threats.
- Public health laboratory capacity in human health is weak or non-existent.
- No antimicrobial resistance surveillance exists.
- Major challenges continue regarding environmental exposure to pesticides and chemical waste, arsenic in ground water as well as methanol poisoning and drug overdoses.

Recommendations for priority actions

- Create/update legal instruments for One Health approaches to zoonoses, and for effective implementation of food safety regulations and monitoring.
- Strengthen multisectoral coordination to address public health threats and IHR/GHSA implementation through notifying the IHR Task Force with specific terms of reference.
- Establish active disease surveillance with peripheral coverage: strengthen and establish formal multisectoral coordination mechanisms for surveillance, reporting, and response for priority diseases within and between the human and animal health sectors for zoonoses under the One Health approach and link with PoE, One Health and the national level.
- Improve immunization access and coverage especially in urban slums/rural/desert areas of provinces.
- Conduct a hazard analysis and develop and execute provincial multi-hazard EPR plans.
- Urgently improve capacity to systematically prevent and respond to poisonings, and to coordinate with the Environmental Protection Agency for chemical hazards.
- Establish a public health reference laboratory at the provincial level with links to the NIH laboratory.
- Ensure workforce development for disease surveillance and response at all levels of the health system, including for laboratories.

Punjab

Technical areas assessed: IHR coordination and risk communication, environment (chemical hazards), laboratory, biosafety and biosecurity, surveillance, reporting, workforce development, zoonosis, PoEs, EOC

Punjab is the most populous of all provinces/areas of Pakistan. It has an area of 205 344 km² (79 284 square miles) and a population of 9.14 million in 2011, 56% of country's total population. Its provincial capital and largest city is Lahore. Agriculture is the chief source of income and employment, with wheat and cotton being the principal crops. Since independence, it remains the most industrialized province of Pakistan, representing 39.2% of large-scale and 70% of small-scale manufacturing. Lahore is a major regional cultural, historic, and economic centre.

During this assessment, Punjab Province demonstrated the most advanced capacity in terms of the JEE technical areas that have provincial implications, roles and responsibilities. With capacity in most areas, the province also provides in-country best practices for other provinces/ areas/ territories to replicate. Key IHR health security areas like disease surveillance, reporting, zoonosis, preparedness, response, IHR advocacy, multisectoral coordination, and immunization were better addressed in comparison with the other three provinces although substantial strengthening and improvement are still necessary. While this has almost certainly been helped by good governance, the team were unable, in the time available, to determine whether other factors such as higher funding contributed to Punjab's better performance.

Technical areas with primarily national responsibility such as chemical hazards and PoEs showed minimal to moderate progress in meeting IHR standards. Additionally, there were questions about the appropriate staffing of the provincial disease surveillance and response system, which is yet functioning. Effective disease surveillance systems are critical for detection and response coordination of infectious diseases. While some disease-specific surveillance systems are functioning well (e.g. AFP, measles, Dengue, ILI/SARI), the province should increase its capacity and establish a strong generic public health surveillance and reporting system supported by a tiered system of public health laboratories. Steps should be taken to ensure appropriate staffing at all levels and across disciplines using existing sources such as the FELTP, where possible and appropriate.

Despite this relatively good positioning, the provincial health department is restructuring to meet the demands of the 21st century, adopting a structure that will improve functioning and operation by hiring relevant, well qualified experts to lead the respective technical areas of management, communicable diseases and surveillance, vector control, health systems strengthening, international coordination, operations and logistics, health informatics, etc.

In Punjab, there is also a need for training frontline public health workers, through FELTP and other relevant training programmes at the provincial and district level to enhance disease surveillance and response. Academic institutions such as the University of Health Sciences and Institute of Public Health provide training in public health through their Masters in Public Health programmes. However, most of the trained students pursue careers as instructors and academicians in public and private institutions and not in the public health sector in the Government due to lack of career ladders and incentives.

A priority action area for Punjab is laboratory/biosecurity/biosafety capacity. The laboratories visited displayed varying degrees of adherence to biosafety and biosecurity. One laboratory designed to operate at BSL-3⁷ and six BSL-2 laboratories, although at least one is still to be commissioned.

⁷ The external team did not have the opportunity to verify design and operational qualities required for a BSL-3 laboratory.

The Shaukat Khanum Memorial Cancer Hospital was the only laboratory visited that had a systematic method of maintaining an inventory of high-risk pathogens. Punjab has relevant legislation and all institutions conducting research/diagnostics are required to have an Institutional Biorisk Management Committee. Punjab University has internal regulations under which a 2-credit hour course on biosafety/security is offered.

The Institute of Public Health in Lahore has refurbished a new laboratory, designed to operate at BSL-3, that is due to be commissioned imminently. This facility is being considered as the provincial reference laboratory, although it does not perform a full range of priority disease testing. A provincial food safety laboratory is also under establishment and is expected to be operational within months. Punjab University currently assists the livestock department with diagnostics of several animal diseases. There are two ISO certified food laboratories for which proficiency testing is conducted in collaboration with FAO.

Although a formally established multisectoral mechanism for IHR coordination does not exist, the relevant sectors work together when faced with an imminent threat/active outbreak, e.g. dengue, polio, pandemics, Ebola, Zika.

Strengths/best practices

- Real-time surveillance, reporting assets and capacities under indicator-based surveillance for immunization and polio eradication with dashboard/electric records are accessible through android cell phones.
- The dashboard also serves as a monitoring and evaluation tool highlighting compliance or otherwise with required actions. SOPS are in place.
- A strong avian influenza surveillance and response programme exists.
- A good risk communication mechanism also exists for public health professionals.
- One BSL-3 and six BSL-2 laboratories are functional in the province.
- A well developed human resource Information System is in place.
- A human resources strategy and a separate public health management cadre is in place.
- Incentives (hardship area allowances) are available to retain the existing health workforce.
- UVAS faculty have good ties with the livestock and food safety departments as they collaborate on diagnostics, research, and training with several projects on brucellosis, CCHF and foot and mouth disease.
- UVAS incorporates training on One Health in their curriculum and offers an MPhil in Epidemiology and Public Health. It also has a strong research focus with collaboration with local government, industry, and international bodies; two ISO certified labs and several others participate in FAO lab proficiency testing.
- Multisectoral IHR coordination is triggered by an event.
- An event management system is in place.
- A provincial IHR focal point has been designated.

Areas that need strengthening/challenges

- The Shaukat Khanum Memorial Cancer Hospital was the only laboratory visited that had a systematic method of maintaining an inventory of high-risk pathogens.
- The provincial public health reference laboratory does not perform a full range of priority disease testing.
- No overall food safety risk communication strategy currently exists although a health education unit does exist within the provincial health department, and health education and communication activities are undertaken during alert and peak seasons.
- A coordinated disease surveillance and response mechanism is necessary based on updated list of notifiable diseases.

Recommendations for priority actions

- Establish a comprehensive inventory for high-risk pathogens in both human and veterinary laboratories throughout the province; this information should be shared with the national public health and security authorities.
- Strengthen and further build upon existing coordination mechanisms for active disease surveillance, outbreaks and emergency response under the One Health approach based on the provincial list of notifiable diseases; the latter should be updated on a regular basis.
- Notify an IHR Task Force at provincial level to coordinate with all stakeholders under IHR.
- Develop a provincial public health reference lab by strengthening capacity at the existing laboratory at the Institute of Public Health, including BSL-3 with *Mycobacterium bovis* as a zoonotic priority disease as it is very prevalent in livestock.
- Develop health workforce planning on a systematic basis, using estimated future needs and career structures, and incentives for a trained workforce.
- Ensure consistent allocation/recruitment of appropriate staff across all disciplines for effective disease surveillance at all levels of the health system including, but not limited to, FELTP.
- Ensure as a top priority adequate and appropriate response to chemical hazards in this highly industrialized and agriculture-dependent province with heavy use of pesticides. Current chemical safety capacities, from transportation to storage to disposal, are lacking or extremely limited, which poses a major public safety threat.
- Develop and implement a biosecurity and biosafety programme following the national model, and improve biosafety with increased access and training in the use of PPEs.
- Support , and develop terms of reference for a multisectoral IHR Implementation Task Force/ Committee.
- Promote IHR advocacy with district coordination offices for IHR/GHSA in general, and the benefits of embracing a One Health approach.

Khyber Pakhtunkhwa

Technical areas assessed: zoonosis, IHR coordination and communication, immunization, laboratory, surveillance, preparedness, risk communication.

Khyber Pakhtunkhwa (KP) is the third largest province of Pakistan by size and economy; it is located in the north-western part of Pakistan. The provincial capital and the largest city is Peshawar. KP shares an international border with Afghanistan connected through the historic Khyber Pass. It contributes 10.5% of the country's economy and is home to approximately 26 million people (12% of the county's population). The province is still reeling from the massive earthquake in 2005, severe flash floods in 2010–2011 and large numbers of Afghan refugees as well as those internally displaced by episodes of conflict in the region.

Assessment of technical areas that have primarily provincial roles and responsibilities (e.g. zoonosis, food safety, surveillance, reporting, immunization, preparedness and response) showed considerable progress, functioning, and operations. Progress was shown in IHR advocacy, legislation on food safety is in place, and a provincial strategy for IHR implementation is under development. A workforce development strategy is also being formulated although it currently focuses disproportionately on clinical care cadres and not public health. Similarly, a career structure for public health professionals including FELTP graduates is lacking.

Since KP undergoes frequent flash floods in the monsoon season, EPR capacities have garnered significant attention. A risk/hazard analysis has been completed and a multi-hazards EPR plan is in place.

As with other provinces, there is a basic approach to biosafety but only a rudimentary approach to biosecurity. One laboratory in the province has a biosafety regulation but no biosafety officers. The TB programme in KP is an excellent example of a tiered approach to laboratory testing, surveillance and control. The provincial TB laboratory performs a full range of TB microscopy, culture, sensitivity as well as molecular testing. TB laboratories have an active training programme for GeneXpert and microscopy, and monitor the performance of testing by EQAS, re-testing and field visits. A TB laboratory applies BSL-3 practices; however, this is not accessible to other diseases because it is funded for TB only. The laboratories in KP often service Afghan citizens who cross the border to seek better health care.

The four teaching hospitals in KP have no interaction. Two medical testing laboratories are accredited to ISO 9001:2000 but none to ISO 15189. There are few pathologists in the province. About 120 scientists are enrolled as undergraduates. The district laboratories perform very limited testing. A strong desire prevails to establish a provincial reference laboratory that is well supported by the provincial government. NIH has also offered its support to KP in this regard. On a related note, KP University has a group of PhDs and a functional laboratory but no funding to undertake research. It would be interested in working with diagnostic laboratories to explore research opportunities.

Strengths/best practices

- Experience gained from EPR, in particular multisectoral collaboration and coordination, can serve as a base from which to create additional synergies.
- A hazard analysis has been undertaken and an EPR plan is in place. Measures for deployment of RRTs, for medical countermeasures and personnel deployment, and for linking public health with security authorities, are in place.
- A comprehensive programme for avian influenza exists.
- There is event-based collaboration between animal and public health sectors as well as an informal coordination committee.

- A human resources strategy and a separate public health management cadre are in place.
- FELTP-trained vets are now focusing on zoonotic diseases.
- Incentives (hardship allowances) exist to retain the active health workforce.
- The veterinary workforce is capable and sufficient.
- The Integrated Vector Management Programme focuses on relevant zoonotic diseases.
- The TB programme with its tiered approach to laboratory testing, surveillance and control can be used as a best practice model for other diseases.

Areas that need strengthening/challenges

- The current workforce development strategy should be strengthened to include sufficient focus on public health concerns.
- No formal multisectoral coordination mechanisms currently exist.
- Laboratory capacities differ widely in terms of technical capacity and biosafety.
- The biosecurity situation is essentially unknown; there is no inventory of dangerous pathogens.
- Gaps exist in immunization coverage across many districts, and pockets of populations are under-vaccinated among mobile, displaced and hard-to-access groups.

Recommendations for priority actions

- Establish formal intersectoral coordination mechanisms for IHR, disease surveillance, and outbreaks and emergency response under a One Health approach and in this context notify an IHR Task Force at provincial level.
- Ensure active integrated disease surveillance with peripheral coverage by strengthening and establishing formal multisectoral coordination mechanisms for surveillance, reporting, and response for priority diseases within health, and between human and animal health for zoonoses under the One Health approach.
- Ensure that the workforce development strategy includes sufficient focus on public health cadres and related career structures.
- Formulate a risk communication strategy.
- Introduce simulation exercises and drills on a regular basis to test EPR plans.
- Address gaps in immunization coverage among vulnerable groups
- Ensure interruption of wild poliovirus transmission in 2016.
- Develop and implement a national biosecurity and biosafety programme that transcends all provinces, and places biosafety regulations and officers in all major laboratories at the provincial level.
- Establish a KP reference laboratory with the capabilities to test for priority pathogens, and develop a laboratory network at province and district level.
- Formulate and implement a risk-based food safety mechanism.

Balochistan

Technical areas assessed: zoonosis, immunization, surveillance, preparedness, EOC, IHR coordination, PoE

Balochistan is located in the south-western region of the country; its capital and the largest city is Quetta. It shares borders with Afghanistan to the north and Iran to the west. Although largely underdeveloped, the provincial economy is dominated by natural resources, especially its natural gas fields, which supply the entire country. Gawadar seaport also plays a significant role in the economic development of the province. Balochistan's population density is very low due to the mountainous terrain and scarcity of water sources. The population of Balochistan was estimated to be around 13 million in 2012, approximately 7% of country's total population.

Being sparsely populated with a challenging terrain, coupled with widely prevalent underdevelopment and poor transportation access, immunization coverage is extremely low (estimated in 2012 to be only 16%). This low/poor showing on the immunization indicator is mirrored by similarly low grading of capacities and systems in the following areas: disease surveillance (essentially only for polio and TB plus Avian Influenza); linkages between animal and human health surveillance for zoonoses; detection and response capacities to public health threats at its major international airport in Quetta; risk communication (again, only for polio); laboratory, biosafety and biosecurity; and EPR operations (EOC caters only for Polio), with no hazard/risk assessment and analysis. In the areas of workforce development, no strategy or policy is present or planned for the near future.

Some biosafety and biosecurity training has been conducted recently by NGOs within the province. There is no BSL-3 laboratory. PPE is generally unavailable or staff untrained to use it. There is no tracking system for samples received from the more peripheral areas.

AMR testing capacity is available and routinely performed in animal health laboratories; human health laboratories test for a few selected pathogens. There is a lack of an effective sample transport system and little or no point-of-care testing. There is no EQAS or contingency for testing priority diseases except sending samples to NIH.

Strengths/best practices

- A CCHF Task Force is notified, with a focal point in the Office of the Director General of Public Health (Provincial Disease Surveillance and Response Unit), and contact with livestock as required.
- Priority diseases in the animal sector are well understood but no notifiable disease list is available.
- Avian influenza surveillance is implemented successfully.
- Currently infrastructure is in place to test for foot and mouth disease.
- Some data sharing occurs with FAO.
- Veterinary human resources are available at district level; FELTP also has veterinarians.
- Basic laboratory capacity is available at tertiary care hospitals in the public and private sectors.
- Food safety laws, and field assets for monitoring and laboratory testing are available but limited.
- The Public–Private Health Initiative provides public health care at approximately 40% of peripheral health facilities.

Areas that need strengthening/challenges

- Balochistan's overall capacities and capabilities are very weak; the entire structure must be strengthened.
- The underdevelopment of the province, its extensive terrain, and the dispersed population all present significant challenges to strengthening public health.

Recommendations for priority actions

- Develop the workforce at strategic and policy levels in this significantly underdeveloped province.
- Establish active disease surveillance with peripheral coverage by establishing or strengthening formal multisectoral coordination mechanisms for surveillance, reporting, and response for priority diseases within health, and between human and animal health for zoonoses under the One Health approach.
- Establish and enhance capacity for public health laboratory diagnostics and sample shipment and transportation.
- Augment implementation of existing laws and regulations including food safety monitoring and testing.
- At the federal level, establish minimal levels of public health assets and capacities under IHR at Quetta international airport and the health post at the border crossing with Afghanistan and Iran, and include these in the developmental plans of Gawadar seaport.
- Develop multi-hazard EPR plans based on hazard analysis, and field test these to ensure access and coverage to scattered populations in mountainous terrain.
- Improve immunization coverage through strong outreach to cover the geographical periphery, and a risk communication strategy especially to improve acceptance of immunization.
- Stop wild poliovirus transmission in 2016.
- Notify a multisector IHR Task Force at provincial level as a coordination mechanism across all relevant sectors, especially the animal health sector.

Islamabad Capitol Territory

Islamabad Capitol Territory (ICT) represents Islamabad, the capital city of Pakistan, divided into its urban and rural areas. The main administrative authority of the city is the ICT Administration (assisted by the Capital Development Authority (CDA)), which oversees the planning, development, construction, and administration of the city.

ICT has a fragmented health services infrastructure divided between ICT administration under the Ministry of Interior and the Capital Administration and Development Division (CADD). The district health officer Islamabad manages the dispensaries, basic and rural health centres and the community health workers in rural Islamabad. The CDA's health section runs dispensaries for urban populations of Islamabad and a food safety and monitoring programme in the city. Immunization coverage exceeds 90% in urban parts of ICT, but is lower in rural areas underscoring poor health service availability, access and utilization in these areas. EPR operations are catered for by the NDMA, which is a well-established, staffed and funded national entity. The territory hosts the national reference laboratory at NIH (which, however, is a federal institution), the laboratory for the Pakistan Institute of Medical Sciences (the leading tertiary care and teaching hospital in Islamabad); the laboratory at the Poly Clinic provides diagnostic cover. The animal health diagnostic facilities visited – the National Reference Laboratory for Poultry Diseases and the National Reference Laboratory for Foot and Mouth Disease – are both ISO accredited and manipulate high-risk pathogens. Laboratories at the NIH and the national veterinary laboratories showed little evidence of a systematic approach to biosecurity. Generally there is adequate biohazard waste disposal with ready access to autoclaves and incinerators, with waste held in relatively secure areas during disposal.

The NIH, NRLPD, national TB reference laboratory and other laboratories with good capacity all reside in Islamabad. This places Islamabad in a position of leadership nationally. All priority diseases can be tested and the reference laboratories receive samples for testing from all other provinces. There is a well established process for the transport of samples from remote regions to Islamabad, with staff recently trained in this transport. Some laboratories have good infrastructure and a few even BSL-3 facilities and access to complex technology such as gene sequencing. Staff training is generally high although continued building of human resource capacity is required, especially within the reference laboratories, which are reliant on specific individuals. Few laboratories are accredited to an ISO standard, although notable exceptions are the NRLPD and the reference laboratory for foot and mouth disease. General bacteriology laboratories in both medical and veterinary disciplines, which do not attract external funding, have limited resources and infrastructure. However, they do detect priority diseases such as cholera, anthrax, diphtheria and typhus.

Strengths/best practices

- Excellent capacity exists for avian influenza surveillance.
- A multisectoral health forum has been established.
- There is good overall participation in ad hoc projects for CCHF and brucellosis.
- National reference laboratory capacities are functional in human and animal health sectors.
- Personnel are well trained in both human and animal sectors.
- Capacity for disaster/crisis management is excellent.

Areas that need strengthening/challenges

- A workforce strategy needs to be developed for ICT.
- General bacteriology laboratories in both medical and veterinary disciplines, which do not attract external funding, have limited resources and infrastructure despite the fact that they address priority diseases.

Recommendations for priority actions

- Combine the fragmented health service delivery structures under ICT and CDA into a single service.
- Establish formal coordination mechanisms for disease surveillance for priority diseases, including zoonoses and reporting/data sharing with animal health and wildlife.
- Develop and implement a national biosecurity programme, with biosafety regulations and officers in all major laboratories coordinated under the One Health umbrella at ICT level.
- Designate NIH and animal health reference laboratories to serve as lead technical resources to support provincial public health reference laboratories under the One Health umbrella.
- Improve immunization access, availability and acceptance in rural areas using risk communication strategies.
- Conduct regular simulations and drills to practise emergency response and crisis management.

Gilgit-Baltistan

Gilgit-Baltistan (GB) is the northern most part of the country, the capital city of which is Gilgit. In 2009, an Order was signed by the President of Pakistan that granted self-rule to the people of Gilgit-Baltistan, and thus a de facto province-like status. It has Afghanistan as a border in the north and China to the east. Highly mountainous, GB has a population of under 2 million. GB is home to three of the world's longest glaciers outside the polar regions and spreads over an area of 28 000 square miles (73 000 km²). Tourism is the major source of income, mostly in trekking and mountaineering.

With extreme weather and high mountainous terrain, GB is sparsely populated and underdeveloped as a whole. No capacity/systems exist for disease surveillance, reporting, laboratory, medical/nursing education, EPR, or risk communication (except polio). Immunization coverage (except for polio) is also low. A private health-care system does provide health-care coverage under Agha Khan health services in few GB districts, where health indicators are far better.

There are serious workforce deficiencies in GB. More engagement from FELTP as well as training of front-line public health professionals are needed. GB has no capacity to deal with outbreaks: the district health officer of each of the 10 districts who work under the department of health has to rely on assistance for this from the federal government. Primary health care facilities are managed by the Public–Private Health Initiative, while community-based workers are under the department of health.

Strengths/best practices

- Public sector health-care delivery is augmented by the private sector to provide health care, especially for maternal and child health.
- Tourism and local mining assets, if efficiently managed, could generate financial resources to shoulder health development and health security interventions.

Areas that need strengthening/challenges

- No capacity/systems exist for disease surveillance, reporting, laboratory, medical/nursing education, EPR, and risk communication (except polio).
- Immunization coverage (except for polio) is low.

Recommendations for priority actions

- Establish disease surveillance with peripheral coverage by strengthening and establishing formal multisectoral coordination mechanisms for surveillance, reporting, and response for priority diseases within health, and between human and animal health for zoonoses under the One Health approach.
- Designate a provincial IHR FP with 24/7 communication and reporting capacity.
- Establish a reference laboratory, and sample shipment and transportation capacities.
- Establish minimal levels of public health assets and capacities under IHR at health posts at land crossing with China and Afghanistan.
- Develop multi-hazard EPR plans based on hazard analysis, and field test these to ensure access and coverage during emergency response for scattered populations in mountainous terrain.
- Prioritize workforce development at strategic and policy levels in this significantly underdeveloped administrative territory.
- Establish medical and nursing schools within GB.

Azad Jammu and Kashmir

The state of Azad Jammu and Kashmir is a self-governing administrative territory of Pakistan with an estimated population of 5 million. In the east, it is separated from the Indian-administered state of Jammu and Kashmir by the de facto border between India and Pakistan. The capital is Muzaffarabad, the area's major city. A major earthquake in 2005 killed 100 000 people and left another three million people displaced, with widespread devastation. Since then, with help from the Government of Pakistan and foreign donors, reconstruction of infrastructure is under way. AJK's economy largely depends on agriculture, services, tourism, and foreign remittances. While similar to GB, AJK largely depends on funding received from the federal Government. It has a literacy rate of over 60%, quite high compared to other provinces/territories. In Azad Kashmir, despite its three medical colleges in the public sector and one in the private sector, there is still a lack of career development, job openings or training for laboratory professionals.

AJK has fairly well developed capacities in those IHR/GHSA-related technical areas which are part of the provincial roles and responsibilities. These include immunisation an programme reaching high immunization coverage, a functioning surveillance and reporting system, and a pandemic-led collaboration system between human and animal health authorities. Learning from the devastating earthquake in 2005, EPR systems have been given due attention, managed by the AJK arm of the NDMA. While workforce development is a priority area for the Government, and academic institutions in AJK are expanding, there is no overarching workforce strategy. Food safety regulations exist but require support for effective enforcement and coverage.

Strengths/best practices

- Population literacy rates are high.
- Medical schools exist and the education scene is expanding.
- An indicator-based surveillance system is partially functioning.
- Immunization coverage is also high.
- There is acute awareness of the need for and significance of effective and efficient EPR plans and capacities.
- A laboratory is housed within the provincial university.

Areas that need strengthening/challenges

- No overarching workforce strategy exists.
- Food safety regulations exist but require support for effective enforcement and coverage.

Recommendations for priority actions

- Establish formal intersectoral coordination mechanisms for disease surveillance and reporting for zoonoses, disease outbreaks, and emergency response under a One Health approach.
- Designate a provincial IHR FP with 24/7 communication and reporting capacity.
- Conduct regular simulations with scenarios based on hazard analysis.

Federally administered tribal areas

The federally administered tribal areas (FATA) are semi-autonomous tribal regions in north-western Pakistan, bordering Afghanistan to the west and north. FATA are directly governed by Pakistan's federal Government. According to 2011 estimates, this tribal population was estimated to be about 3.3 million, although only 3.1% reside in established townships and thus FATA is the most rural administrative unit in Pakistan.

Unfortunately ongoing active conflict and security concerns precluded a visit by the JEE team and/or staff from the FATA administration to meet and discuss IHR/GHSA-related issues.

Annex: Joint external evaluation background

Mission place and dates

This mission took place from 27 April to 6 May 2016. The team held multisectoral discussions and site visits in the capital city of Islamabad (national authorities, Islamabad Capitol Territory, Azad, Jammu and Kashmir, Gilgit-Baltistan, and the Federally Administered Tribal Areas) and also in Balochistan, Khyber Pakhtunkhwa, Punjab, and Sindh provinces.

Objective

- Assess the implementation of the IHR public health capacities for surveillance and response to public health events including at points of entry;
- Review all related documents;
- Develop a report describing the progress and gaps in implementing the IHR capacities; and
- Recommend priority actions to update and finalize the national plan to achieve and maintain IHR capacities for global health security.

Limitations and assumptions

- The assessment was of two weeks' duration, which limited the amount and depth of information that could be managed.
- For the assessment of provincial capabilities, the Team was divided into five groups, which limited the available expertise at any given site.
- It is assumed that the results of this assessment will be made publicly available.
- The assessment is not an audit, and information provided by Pakistan will not be independently verified. Information provided by Pakistan was discussed and an assessment rating was mutually agreed between the host country and assessment team. This is a peer-to-peer review.

Mission team members

- Brian McCloskey, Public Health England, United Kingdom (Team Co-Lead)
- Mika Salminen, National Institute for Health and Welfare (THL), Finland (Team Co-Lead)
- Karen Sliter, Department of Agriculture, United States of America (Team Co-Lead)
- Abdullah Assiri, Ministry of Health, Kingdom of Saudi Arabia
- Wayne Dimech, National Reference Laboratory, Australia
- Michele Forzley, Public Health Legal Advisor, Forzley & Associates, United States of America
- Khalid Abu Hamaid, Ministry of Health, Kingdom of Saudi Arabia
- Kashef Ijaz, Centers for Disease Control and Prevention, United States of America
- Hamid Jafari, Centers for Disease Control and Prevention, United States of America
- Ghazi Kayali, Human Link, Lebanon

- Wael Khouly, Nuclear and Radiological Regulatory Authority, Egypt
- Mohammed Moussif, Public Health Department, Morocco
- Sohel Saikat, Public Health England, United Kingdom
- Kleio Stoidou, Independent Public Health Legal Advisor, Greece
- Sareen Shashi, Food and Agriculture Organization, Regional Office for Asia and the Pacific
- Christina Banluta, World Health Organization, Regional Office for the Eastern Mediterranean
- Thomas Hofmann, World Health Organization, Regional Office for Europe
- Nirmal Kandel, World Health Organization headquarters
- Irshad Shaikh, World Health Organization, Regional Office for the Eastern Mediterranean

Key host country participants and institutions

Pakistan lead representative

Dr Malik Muhammad Safi, Director of Programs and Focal Point of the JEE Mission, Ministry of National Health Services, Regulations and Coordination, Pakistan

Participating institutions

Federal level

- Central Health Establishments
- Directorate Health Services, Capital Development Authority
- District Health Office, Islamabad Capital Territory
- Expanded Programme on Immunization
- Ministry of Climate Change
- Ministry of Food Security and Research
- Ministry of Law and Justice
- Ministry of National Health Services Regulations and Coordination
- National Agricultural Research Council
- National Disaster Management Authority
- National Emergency Operations Cell
- National Health Emergency Preparedness Response Network
- National Institute of Health
- National Tuberculosis Control Programme
- Pakistan Atomic Energy Commission
- Pakistan Nuclear Regulatory Authority
- Social Security Hospital, Rawalpindi
- Strategic Planning Department, General Headquarters, Rawalpindi

Health development partners

Food and Agriculture Organization of the United Nations
United Nations Children's Fund
United Nations Population Fund
United Nations Programme for HIV/AIDS
United States Agency for International Development
World Health Organization

Provincial and regional levels

1. Punjab

Allama Iqbal International Airport, Lahore,
Government of Punjab, Department of Agriculture
Government of Punjab, Department of Environment Protection
Government of Punjab, Department of Health
Government of Punjab, Provincial EPI Programme
Government of Punjab, Ministry of Livestock and Dairy Development
Institute of Public Health, Lahore
Mayo Hospital, Lahore
Provincial Disease Surveillance and Response Unit
Provincial Emergency Operations Cell
Provincial Focal Point for Risk Communication
Provincial IHR Focal Point
Shaukat Khanam Memorial Hospital, Pathology Unit, Lahore (private sector laboratory)
Shaikh Zayed Hospital, Lahore
University of Veterinary and Animal Sciences, Department of Livestock, Lahore
Wagah Border, Lahore (land crossing between Pakistan and India) including Wagah Railway Station (Samjhota Express railway service operating between Pakistan and India)

2. Sindh

Directorate of Central Health Establishments
Emergency Operations Cell
Government of Sindh, Department of Health
Government of Sindh, Department of Health, Provincial EPI Programme
Provincial IHR Focal Point
Government of Sindh, Department of Agriculture, Supplies and Prices

Government of Sindh, Department of Food
 Government of Sindh, Department of Forest, Environment & Wildlife
 Government of Sindh, Department of Industries and Commerce
 Government of Sindh, Department of Planning and Development
 Government of Sindh, Jinnah Post Graduate Medical Centre, Karachi
 Government of Sindh, Ministry of Livestock and Fisheries, Sindh Poultry Vaccine Centre, Karachi
 Government of Sindh, Ministry of Livestock and Fisheries, Tando Jam Agriculture University
 Quaid e Azam International Airport, Karachi
 Seaport, Karachi

3. Khyber Pakhtunkhwa

Director General of Health Services, Health Emergency Preparedness and Response Unit
 Director General of Health Services, Provincial EPI Programme
 Emergency Operations Centre, Peshawar
 Government of Khyber Pakhtunkhwa, Department of Agriculture and Livestock
 Government of Khyber Pakhtunkhwa, Department of the Environment
 Government of Khyber Pakhtunkhwa, Department of Food
 Government of Khyber Pakhtunkhwa, Department of Health
 Government of Khyber Pakhtunkhwa, Department of Planning and Development
 Government of Khyber Pakhtunkhwa, Provincial Disaster Management Authority
 Hayatabad Medical Complex, Peshawar
 Integrated Disease Surveillance and Response Unit/ Provincial Disease Surveillance and Response Unit
 Khyber Medical University, Peshawar
 Provincial IHR Focal Point
 Provincial TB Control Programme, Laboratory Section (BSL-3 laboratory)

4. Balochistan

Bolan Medical Complex Hospital, Quetta
 Government of Balochistan, Department of Agriculture and Cooperatives
 Government of Balochistan, Department of Environment Supports and Youth Affairs
 Government of Balochistan, Department of Food
 Government of Balochistan, Department of Forests and Wild Life
 Government of Balochistan, Department of Health, Emergency Operations Cell
 Government of Balochistan, Department of Health, Provincial EPI Programme
 Government of Balochistan, Department of Industries and Commerce
 Government of Balochistan, Department of Planning and Development

Government of Balochistan, Ministry of Livestock and Dairy Development

Provincial Disaster Management Authority

Provincial Disease Surveillance and Response Unit

Provincial IHR Focal Point

Quetta Airport

5. Gilgit-Baltistan

Government of Gilgit-Baltistan, Department of Food and Agriculture, Livestock and Fisheries

Government of Gilgit-Baltistan, Department of Forest, Wildlife, Environment and Commerce

Government of Gilgit-Baltistan, Department of Health

Government of Gilgit-Baltistan, Ministry of Livestock and Dairy Development

6. Azad Jammu & Kashmir (AJK)

Government of Azad Jammu and Kashmir, Department of Health

Government of Azad Jammu and Kashmir, Ministry of Information, Agriculture and Livestock

Government of Azad Jammu and Kashmir, Department of Food

Government of Azad Jammu and Kashmir, Department of Forests

Government of Azad Jammu and Kashmir Department of Industries

Government of Azad Jammu and Kashmir, Department of the Environment

Government of Azad Jammu and Kashmir, Department of Finance Planning and Development

Government of Azad Jammu and Kashmir, Department of Sports, Youth and Culture

7. Federally Administered Tribal Territory

Directorate Health Services, Peshawar

Supporting documentation provided by host country

- Self-reporting on JEE assessment tool, Pakistan.
- Presentation on orientation of health and non-health sectors on IHR, GHSA and JEE assessment (preparatory orientation workshops, 4–8 April 2016).
- Presentation on the current status of IHR implementation in Pakistan (preparatory orientation workshops 4–8 April 2016).
- Presentation on overview of the health system in Pakistan (JEE assessment mission, 27 April 2016).
- Technical area presentations on each of the 19 technical areas of the JEE tool (27–29 April 2016).
- Agendas for technical meetings and federal and provincial site visits (including individual agendas for JEE experts).
- Online repository of supporting documents, notifications, data sources, previous assessments and web links for the 19 technical areas of the JEE tool

