

# **JOINT EXTERNAL EVALUATION OF IHR CORE CAPACITIES**

of the  
**KINGDOM OF SAUDI ARABIA**

Mission report:  
**12–16 March 2017**



**World Health  
Organization**



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# Abbreviations

<b>AFP</b>	Acute flaccid paralysis
<b>AMR</b>	Antimicrobial resistance
<b>BSL</b>	Biosafety level
<b>CBAHI</b>	Central Board for Accreditation of Healthcare Institutions
<b>CCC</b>	Command and Control Centre
<b>CDC</b>	Saudi Centre for Disease Control
<b>EOC</b>	Emergency operations centre
<b>EPI</b>	Expanded Programme on Immunization
<b>EQAS</b>	External quality assessment scheme
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FETP</b>	Field Epidemiology Training Programme
<b>GCC</b>	Gulf Cooperation Council
<b>GCMGM</b>	Global Centre for Mass Gathering Medicine
<b>HCAI</b>	Health care-associated infections
<b>HESN</b>	Health Electronic Surveillance Network
<b>HIV</b>	Human immunodeficiency virus
<b>IEC</b>	Information, education and communication
<b>IHR</b>	International Health Regulations (2015)
<b>JEE</b>	Joint External Evaluation of the IHR
<b>MCM</b>	Medical countermeasures
<b>MERS-CoV</b>	Middle East respiratory syndrome coronavirus
<b>MEWA</b>	Ministry of Environment, Water and Agriculture
<b>MoH</b>	Ministry of Health
<b>NFP</b>	National Focal Point
<b>NITAG</b>	National Immunization Technical Advisory Group
<b>NPCE</b>	National Plan for Chemical Events
<b>OIE</b>	World Organisation for Animal Health
<b>ORT</b>	Outbreak response team
<b>PHEIC</b>	Public health emergencies of international concern
<b>PoE</b>	Point(s) of entry
<b>SFDA</b>	Saudi Food and Drug Authority
<b>SMS</b>	Short (text) message service
<b>SOP</b>	Standard operating procedures
<b>UNICEF</b>	United Nations Children's Fund
<b>WHO</b>	World Health Organization

# Executive summary

Saudi Arabia has made great progress in achieving competencies in the majority of the 19 technical areas based on its technical and scientific expertise as well as the wealth of resources available. Areas that need improvement to achieve to the highest level of competency are: coordination, communication and advocacy; antimicrobial resistance; zoonotic diseases; biosafety and biosecurity; the laboratory system; surveillance; workforce development; and risk communication. The challenge is also to maintain the quality and competency in the technical areas in which the country excels.

The mission was greatly facilitated by the excellent preparatory work of the multisectoral technical experts in Saudi Arabia, notably the self-assessment, thorough documentation, and succinct presentations covering each specific technical area.

## Introduction

The Kingdom of Saudi Arabia (Saudi Arabia) encompasses most of the Arabian Peninsula, with Red Sea and Persian Gulf coastlines.

According to 2013 World Bank figures, the population of Saudi Arabia is 28.83 million (growth rate 1.46%) with a gross national product per capita of US\$ 13 000 per year. The major natural resources are oil, natural gas, iron ore, gold and copper. The official language is Arabic. Riyadh is the capital with a population of 4.7 million. The Saudi Arabian population median age is 27.2 years with an estimated birth rate of 18.4 per 1000, and death rate of 3.3 per 1000 population. The maternal mortality rate is 12 per 100 000 population and infant mortality 13.6 deaths per 1000 live births. Life expectancy is 75.3 years.

Saudi Arabia is the birthplace of Islam and home to the religion's two most sacred mosques: Masjid al-Haram in Makkah, destination of the annual Hajj pilgrimage, and Medina's Al-Masjid an-Nabawi, burial site of the prophet Muhammad (Peace be Upon Him).

Brief summary of the health system in Saudi Arabia

Chapter 5, Articles 27 and 31 of the basic law of Saudi Arabia state that the Government guarantees the right to health care for citizens and their families in case of emergency, sickness, disability and old age. The Government is also responsible for public health and provision of health services to every citizen.

Approximately 60% of health-care services are provided by the Ministry of Health (MoH) and 32% by the private sector. Based on statistics from 2010, there are 2.2 hospital beds, 2.4 physicians and 4.8 nurses per 1000 population. The hospital bed occupancy rate ranges from 93% in large hospitals (> 400 beds) to 29% in small hospitals (50 beds).

Saudi Arabia has one of the highest obesity (33%) and diabetes (17%) rates in the world. Additional contributing factors to chronic illness include road traffic injuries (484 000 accidents in 2009 with 33 000 injuries and disability and 6 000 deaths), lack of physical activity and smoking (ranked 23 in the world with 35–45% adult smokers and 24% teenage smokers).

The traditional health-care system includes a network of health-care centres with referrals to tertiary care hospitals. Saudi Arabia is presently working on "Vision 2030" with the goal of improving the quality of life of its citizens. Vision 2030 will focus on six acute challenges in the health sector, namely access to care, disease burden, quality and safety, workforce, financial stability and digitization. The concept of the future health system builds on key principles of health as central, integrated and comprehensive, with efficiency and accountability. It also includes best practices, financial sustainability and an atmosphere conducive to private sector engagement.

## Saudi Arabia scores

Technical area		Indicators	Score
<b>National legislation, policy and financing</b>	P.1.1	Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR	4
	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)	5
<b>IHR coordination, communication and advocacy</b>	P.2.1	A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR	3
<b>Antimicrobial resistance</b>	P.3.1	Antimicrobial resistance (AMR) detection	3
	P.3.2	Surveillance of infections caused by AMR pathogens	3
	P.3.3	Healthcare associated infection prevention and control programmes	4
	P.3.4	Antimicrobial stewardship activities	3
<b>Zoonotic diseases</b>	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
<b>Food safety</b>	P.5.1	Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination	4
<b>Biosafety and biosecurity</b>	P.6.1	Whole-of-government biosafety and biosecurity system is in place for human, animal, and agriculture facilities	3
	P.6.2	Biosafety and biosecurity training and practices	3
<b>Immunization</b>	P.7.1	Vaccine coverage (measles) as part of national programme	4
	P.7.2	National vaccine access and delivery	4
<b>National laboratory system</b>	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	3
	D.1.4	Laboratory quality system	3
<b>Real-time surveillance</b>	D.2.1	Indicator- and event-based surveillance systems	3
	D.2.2	Interoperable, interconnected, electronic real-time reporting system	4
	D.2.3	Analysis of surveillance data	4
	D.2.4	Syndromic surveillance systems	4

<b>Reporting</b>	D.3.1	System for efficient reporting to WHO, FAO and OIE	<b>4</b>
	D.3.2	Reporting network and protocols in country	<b>4</b>
<b>Workforce development</b>	D.4.1	Human resources are available to implement IHR core capacity requirements	<b>3</b>
	D.4.2	Field Epidemiology Training Programme or other applied epidemiology training programme in place	<b>4</b>
	D.4.3	Workforce strategy	<b>3</b>
<b>Preparedness</b>	R.1.1	Multi-hazard National Public Health Emergency Preparedness and Response Plan is developed and implemented	<b>4</b>
	R.1.2	Priority public health risks and resources are mapped and utilized	<b>4</b>
<b>Emergency response operations</b>	R.2.1	Capacity to activate emergency operations	<b>5</b>
	R.2.2	Emergency operations centre operating procedures and plans	<b>5</b>
	R.2.3	Emergency operations programme	<b>5</b>
	R.2.4	Case management procedures are implemented for IHR-relevant hazards	<b>5</b>
<b>Linking public health and security authorities</b>	R.3.1	Public health and security authorities, (e.g. law enforcement, border control, customs) are linked during a suspected or confirmed biological event	<b>4</b>
<b>Medical countermeasures and personnel deployment</b>	R.4.1	System is in place for sending and receiving medical countermeasures during a public health emergency	<b>5</b>
	R.4.2	System is in place for sending and receiving health personnel during a public health emergency	<b>5</b>
<b>Risk communication</b>	R.5.1	Risk communication systems (plans, mechanisms, etc.)	<b>3</b>
	R.5.2	Internal and partner communication and coordination	<b>3</b>
	R.5.3	Public communication	<b>3</b>
	R.5.4	Communication engagement with affected communities	<b>3</b>
	R.5.5	Dynamic listening and rumour management	<b>3</b>
<b>Points of entry</b>	PoE.1	Routine capacities are established at points of entry	<b>4</b>
	PoE.2	Effective public health response at points of entry	<b>4</b>
<b>Chemical events</b>	CE.1	Mechanisms are established and functioning for detecting and responding to chemical events or emergencies	<b>4</b>
	CE.2	Enabling environment is in place for management of chemical events	<b>4</b>
<b>Radiation emergencies</b>	RE.1	Mechanisms are established and functioning for detecting and responding to radiological and nuclear emergencies	<b>4</b>
	RE.2	Enabling environment is in place for management of radiation emergencies	<b>4</b>

# PREVENT

## National legislation, policy and financing

### Introduction

The International Health Regulations (2005) (IHR) outline obligations and rights for States Parties, in some of which implementation may require new or modified legislation. Even if this is not required, States may choose to revise regulations or other instruments in order to facilitate IHR implementation and maintenance in a more effective manner. Implementing legislation could serve to institutionalize and strengthen the role of IHR and operations within the State Party, and facilitate coordination among the entities involved.<sup>1</sup> Policies that identify national structures and responsibilities, and the allocation of adequate financial resources are also important.

### Target

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

### Saudi Arabia level of capabilities

The term legislation is used generally in this document to refer to the broad range of legal, administrative or other instruments available for the Government to implement the IHR. Such instruments include regulations, orders, acts, laws, polices, royal decrees, ordinances, ministerial council decrees, ministerial decrees, issued circulars, correspondence, and guidelines. Some of these have been in place since 1925 and are under continual update and review, which is either done by the concerned sector or the Bureau of Experts at the Council of Ministers. Amendments take place in the form of decrees, ordinances and regulations, considering previous input and in coordination with all concerned sectors. The budget line available for all emergencies within the national Government budget is updated annually.

Not only does this legislation address all technical areas, it supports particularly the IHR National Focal Point (NFP), public health control measures during Hajj and Umrah, plans for natural disasters, and response to chemical and biological events, primary health care, health information management, health insurance, environmental health, importation of animal medical countermeasures (medications, vaccines), quarantine health, pesticides use and management, nuclear emergency, animal health including wild animals and ship inspections and ship sanitation certificates.

As the Kingdom is a member of the Gulf Cooperation Council (GCC) and the Arab Countries Union, agreements on cross-border collaboration also exist. The legal system also defines the organization of the country's health system. These all are publicly available and accessible through the webpage of each ministry/sector.

<sup>1</sup> Detailed guidance on IHR implementation in national legislation, [www.who.int/ihr/legal\\_issues/legislation/en/index.html](http://www.who.int/ihr/legal_issues/legislation/en/index.html).

Other countries may consider emulating this legislative framework to improve their IHR coordination and implementation.

## Recommendations for priority actions

- Finalize pending legislation: National Public Health Law, radiation laws, and terms of reference for committees.
- Establish a mechanism to accelerate the Bureau of Experts' review and development of IHR-related legislation.
- Finalize the electronic system to disseminate legislation to raise awareness of "first-line implementers".
- Establish a mechanism to monitor implementation of targeted national legislation.

## 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 4

#### *Strengths and best practices*

- Saudi Arabia is fully committed to implementing the IHR; in addition to this JEE, several IHR assessment missions took place in the country.
- A substantial legal framework, in the form of royal decrees/ordinances, ministerial decrees, regulations, policies and procedures, exists for all technical areas under IHR and its implementation, including the NFP core and expanded functions..
- The Bureau of Experts at the Council of Ministers with the mandate of review and update of legislation and avoids duplication, contradictions in the legislation that governs the different sectors.
- Legislation is publically available and accessible through websites of the related sectors.
- Relevant legislation, regulations, administrative requirements and other governmental instruments are reviewed and updated regularly as per the requirements of IHR.

### 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 5

#### *Strengths and best practices*

- Hajj and Umrah legislation is well-established, and complied with all sectors.
- A new, comprehensive public health law has been developed and awaits endorsement.
- The systematic review and update mechanism for legislation is effective.
- Saudi Arabia is part of international agreements on public health protection.

#### *Areas that need strengthening and challenges related to the two indicators*

- Implementation of legislation should be aligned among the different sectors.
- Awareness of first-line implementers should be raised on related legislation in the country.

# IHR coordination, communication and advocacy

## Introduction

The effective implementation of the IHR requires multisectoral/multidisciplinary approaches through national partnerships for efficient and alert response systems. Coordination of nationwide resources, including the designation of a national IHR focal point, which is a national centre for IHR communications, is a key requisite for IHR implementation.

### Target

*Multisectoral/multidisciplinary approaches through national partnerships that allow efficient, alert and responsive systems for effective implementation of the IHR (2005). Coordinate nationwide resources, including sustainable functioning of a national IHR focal point – a national centre for IHR (2005) communications which is a key requisite for IHR (2005) implementation – that is accessible at all times. States Parties provide WHO with contact details of national IHR focal points, continuously update and annually confirm them.*

## Saudi Arabia level of capabilities

The Kingdom has established through royal decree its IHR NFP function, which is headed by an official at Assistant Minister level. The NFP is a member of a number of high-level intersectoral coordination mechanisms. A multisectoral, multidisciplinary coordination mechanism meets at least annually with representation from 22 government sectors. Sub-committees have been put in place to monitor representation of the various areas under IHR. A number of coordination mechanisms meet on a regular basis for animal and human health surveillance.

## Recommendations for priority actions

- Develop standard operating procedures (SOPs) to strengthen coordination and systematic information sharing within the national IHR multisectoral committee.
- Conduct advocacy activities to increase awareness on the IHR and particularly of its decision instrument for the assessment and notification of events (Annex 2).
- Develop an action plan for IHR implementation based on the JEE outcomes with a monitoring and evaluation mechanism to ensure its full implementation.

## Indicators and scores

### P.2.1 A functional mechanism established for the coordination and integration of relevant sectors in the implementation of IHR - Score 3

#### Strengths and best practices

- The IHR NFP function was established by royal decree and is accessible to all sectors, 24/7.
- A multisectoral, multidisciplinary coordination mechanism (National IHR Committee) is in place with representation from 22 sectors; it is complemented by 19 sub-committees to monitor implementation of the different technical areas.
- Additional intersectoral coordination forums for health security also exist.

### ***Areas that need strengthening and challenges***

- Coordination mechanism may not fully facilitate regular/continuous exchange of information and do not incorporate partners outside of the government sector.
- There has been no formal evaluation of the effectiveness of the IHR function.

# 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. Antimicrobial resistance (AMR) is evolving 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 coordinated by FAO, OIE and WHO to develop an integrated global package of activities to combat antimicrobial resistance, spanning human, animal, agricultural, food and environmental aspects (i.e. a One Health approach). Each country has: (i) its own national comprehensive plan to combat antimicrobial resistance; (ii) strengthened surveillance and laboratory capacity at the national and international levels following international standards developed as per the framework of the Global Action Plan; and (iii) 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.*

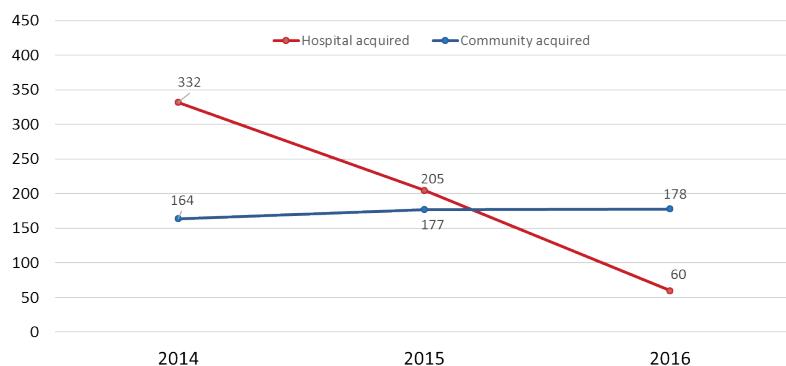
## Saudi Arabia level of capabilities

As an aftermath of Middle-East Respiratory Syndrome Coronavirus (MERS-CoV), Saudi Arabia has made tremendous progress in the area of hospital infection control, which has resulted in a substantial decline of health care-associated MERS-CoV cases from 332 in 2014 to 60 in 2016. Despite this decline in health care-associated cases, community-acquired cases have essentially remained the same (Fig. 1). The Kingdom has also made progress to combat AMR through a National Action Plan, enacting legislation, and putting systems in place. However, the burden of AMR remains high. The literature review of multidrug resistance in Gram-negative bacteria (GNB) shows a substantial increase in the rate of carbapenem-resistant bacteria in Saudi Arabia over the last decade in comparison with the rates of the 1990s. The data above are from various hospitals around the Kingdom, although there is general lack of national data on AMR.

In order to combat AMR, Saudi Arabia formed a national committee that includes all relevant multisectoral stakeholders. The committee includes the following five technical subcommittees that were formed in accordance with WHO objectives: AMR Awareness; Laboratory Surveillance; Infection Prevention and Control; Antimicrobial Stewardship; and Drugs and Economy.

Saudi Arabia has also made good progress in all other areas related to AMR, including surveillance and antimicrobial stewardship, that has led to one of the highest scores for this technical area in the Eastern Mediterranean Region. However, gaps that remain are outlined below as well as under each indicator.

**Fig. 1. Improved infection control practices: decline in health care- versus community-acquired MERS-CoV cases in Saudi Arabia, 2014–2016**



Source: Decline in Saudi Arabia MERS-CoV.

## Recommendations for priority actions

- Implement antimicrobial stewardship programmes across the Kingdom at all levels, and outline a timeline in the National Action Plan.
- Enhance AMR-related activities for all indicators for animal health, including the human–animal interface.
- Designate a central public health laboratory as responsible for AMR testing and confirmation (as needed), including the following:
- Increase the number of sentinel sites for lab-based AMR surveillance by seven sites;
- Share AMR data with epidemiologists for real-time analysis for reporting, detection and response.
- Assess the burden of AMR in Saudi Arabia and its impact on morbidity, mortality and the economy.

## Indicators and scores

### P.3.1 Antimicrobial resistance detection - Score 3

#### *Strengths and best practices*

- Of a total of 150 laboratories nationwide, 30 are designated to conduct AMR detection and reporting of all priority AMR pathogens. These were selected based on their coverage for hospitals with > 150 beds; and the need represent all Saudi regions.
- There are regular antibiograms generated within the hospitals and analysed to fulfil quality requirements for conducting AMR testing reporting results.

#### *Areas that need strengthening and challenges*

- A Central Public Health Laboratory should be designated as responsible for AMR testing and confirmation (as needed).

### P.3.2 Surveillance of infections caused by antimicrobial-resistant pathogens - Score 3

#### *Strengths and best practices*

- There are six designated sentinel sites for surveillance of infections caused by priority AMR pathogens: Riyadh; Al-Hassa; Al-Dammam; Jeddah; Assir; and Al-Kharj.

- Surveillance for detection of Salmonella, Campylobacter and total bacteria count in poultry in all regions began in 2016.

#### ***Areas that need strengthening and challenges***

- The number of sentinel sites for lab-based AMR surveillance should be increased by seven sites.

### **P.3.3 Health care-associated infection (HCAI) prevention and control programmes - Score 4**

#### ***Strengths and best practices***

- The designated facilities have all conducted HCAI programmes for at least one year.
- The national plan for HCAI is updated on annual basis, and is operational in 270 hospitals.
- The infection prevention and control policy, operational plan and SOPs at all tertiary health-care facilities include trained professionals.
- Comprehensive infection control auditing is carried out in all hospitals every three months.

#### ***Areas that need strengthening and challenges***

- AMR data should be shared with epidemiologists for real-time analysis for reporting, detection and response.

### **P.3.4 Antimicrobial stewardship activities - Score 3**

#### ***Strengths and best practices***

- The designated centres are conducting some antimicrobial stewardship practices.
- Saudi Arabia has an approved National Action Plan for Antimicrobial Stewardship, to be updated on an annual basis.
- The national guidelines for antibiotic use have been completed and distributed.
- The Surgical Antibiotic Prophylaxis Guideline has been established with pre-printed order sets.
- The Adult Health Care-Associated Infections guidelines are being finalized.
- Antibiotic awareness campaigns for the public, coinciding with the World Antibiotic Awareness Week, were held in all regions in November 2016, and for health-care workers in some tertiary care hospitals.
- A survey on proper administration of antibiotics was conducted in 20 selected MoH hospitals across all Saudi regions to evaluate the infrastructure for the antimicrobial stewardship programme.
- Physician prescription is required for antibiotics. Although implementation is 100% in hospitals, it is suboptimal in private clinics/pharmacies.

#### ***Areas that need strengthening and challenges***

- Antimicrobial stewardship programmes should be implemented across the Kingdom at all levels, with a timeline outlined in the National Action Plan.
- AMR-related activities for all indicators for animal health should be enhanced, including at the human-animal interface.

# Zoonotic diseases

## Introduction

Zoonotic diseases are communicable diseases that can spread between animals and humans. These diseases are caused by viruses, bacteria, parasites and fungi carried by animals, insects or inanimate vectors that aid in its transmission. Approximately 75% of recently emerging infectious diseases affecting humans are of animal origin; and 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.*

## Saudi Arabia level of capabilities

The veterinary authority is under the umbrella of the Ministry of Environment, Water and Agriculture (MEWA). MEWA is responsible for issuing ministerial decrees and regulations to enact animal health legislation, addressing surveillance for reportable animal diseases, issuing certificates to export animals, approving imports of live animals, and imposing quarantine and restrictions on animal movements in line with international standards set by the World Organisation for Animal Health (OIE). Several ministries have veterinarians as part of the workforce including MEWA, and (less commonly) the MoH, the Ministry of Municipalities, and the Saudi Food and Drug Authority (SFDA). Veterinarians are accredited to perform their functions, and private veterinarians can serve as surge capacity in the event of an emergency.

Legislation, policies and circulars address the control of important animal diseases, including zoonotic disease, and support the “One Health” approach. In addition, there are compensation policies in the event of animal diseases that require depopulation. National policies and strategies on zoonotic diseases are developed through limited but high-level coordination among agencies for prevention, control and response. A multisectoral approach addresses most significant zoonotic diseases, including the sharing of information and data with relevant stakeholders (MoH, Ministry of Municipalities, Ministry of Interior, Saudi Wildlife Authority, SFDA, Saudi Centre for Disease Control (CDC), and Saudi customs). This was demonstrated by joint surveillance of the MoH and MEWA on the traceback of human exposure to camels, and MERS-CoV surveillance in camels. Coordination with other agencies has been successful in preventing the spread of highly pathogenic avian influenza during the 2007 outbreak.

There are SOPs for each of the nine zoonotic diseases currently considered a national priority risk e.g. rabies, MERS-CoV, brucellosis, avian influenza, Rift Valley fever, Alkhurma haemorrhagic fever (AHF). Most priority diseases require immediate Saudi Arabian notification and response. Control of priority zoonotic diseases is challenging since some of them are viral haemorrhagic diseases with clinical signs in humans compatible with dengue and Ebola, animals might not develop pathognomonic clinical signs for some of the diseases, and animal hosts are often asymptomatic.

## Recommendations for priority actions

- Amend, expand, and strengthen the interministerial committee, linking the human and animal interface (both wild and domestic animals).
- Define clear roles and responsibilities to address zoonotic diseases under the One Health umbrella.
- Strengthen the One Health approach by incorporating more veterinarians.

- Provide more capacity-building (e.g. epidemiology/risk assessment training, Field Epidemiology Training Programme, FETP) and an accreditation system for One Health veterinarians.

## Indicators and scores

### P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens - Score 3

#### *Strengths and best practices*

- There is a surveillance system in place for more than 20% of the zoonotic diseases of greatest public health concern.
- The animal health and human health sectors jointly developed the list of zoonotic diseases of priority importance for public health.
- The veterinary surveillance system is linked with the human diseases surveillance system for some of the priority disease (e.g. MERS-CoV and avian influenza).
- The veterinary laboratory tests for avian influenza and provides the results in a timely manner. There is an algorithm in place for the reporting of cases.

#### *Areas that need strengthening and challenges*

- Since there is no routine interaction among focal points at MEWA, MoH, Ministry of Municipalities, and Saudi Wildlife Authority, disease in animals might not be detected until human cases of zoonosis occur (e.g. Q fever, brucellosis, bovine tuberculosis). Coordination among these agencies should therefore be improved, as well as for follow-up to animal exposures (e.g. rabies), positive surveillance results (e.g. toxoplasmosis), and wildlife surveillance implementation.
- Surveillance roles and responsibilities are not clearly defined for some animal diseases including zoonoses.
- Some endemic zoonotic diseases do not have a clear surveillance system in place (e.g. Q fever, bovine tuberculosis, and brucellosis) while other important zoonosis such as rabies are neglected.
- Challenges for the surveillance of some priority diseases exist since animal hosts might be asymptomatic (e.g. Crimean-Congo haemorrhagic fever, Rift Valley fever), making prevention, detection, and control in the animal population difficult.

### P.4.2 Veterinary or animal health workforce - Score 3

#### *Strengths and best practices*

- The veterinary workforce was transparent during the JEE visit, vets working for the Government are very enthusiastic about their jobs and the future of the veterinary services in the Saudi Kingdom.
- The veterinary workforce understands the impact it has on public health.
- Saudi authorities have agreed to have an OIE Performance of Veterinary Services evaluation by the end of 2017.
- Veterinarians have been very successful in dealing with demands related to priority zoonotic diseases such as MERS-CoV and highly pathogenic avian influenza.
- Several agencies within the Government involve veterinarians.

#### *Areas that need strengthening and challenges*

- Only a few animal health workers conduct One Health activities.
- While the animal health workforce has capacity within the national public health system, this is less than half at subnational levels.

- There is a need to modify, expand, and strengthen the interministerial committee linking the human and animal interface (both wild and domestic animals).
- There is a need for capacity-building (e.g. epidemiology/risk assessment training, FETP), an accreditation system for One Health veterinarians, and their further integration into the national public health system.
- Zoonotic functions require increased human resources to comply with surveillance demands.
- Roles and responsibilities of different agencies working under the One Health umbrella need to be more defined.

#### **P.4.3 Mechanisms for responding to infectious and potential zoonotic diseases established and functional - Score 2**

##### ***Strengths and best practices***

- The surveillance disease system successfully responded to at least 20% of zoonotic diseases recognized as a national priority (there is an effective mechanism in place to respond to MERS-CoV and avian influenza).
- There is effective interaction between the public health and the animal health sectors in responding to selected zoonotic diseases.
- The veterinary laboratory provides results of avian influenza passive and active surveillance in a timely manner. There is an algorithm in place for reporting results to relevant stakeholders.
- The Kingdom has scheduled an OIE Performance of the Veterinary Services evaluation by the end of 2017.

##### ***Areas that need strengthening and challenges***

- There is no well-defined mechanism for coordinating response to most priority zoonotic disease outbreaks involving public health, livestock, other domestic animals, and wildlife.

# 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 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

*Surveillance and response capacity among States Parties for food- and waterborne disease risks or events by strengthening effective communication and collaboration among the sectors responsible for food safety, and safe water and sanitation.*

## Saudi Arabia level of capabilities

Saudi Arabia has established a food safety system that is effective in preventing and protecting against foodborne illnesses. In addition to the Food Law, which covers different aspects of food safety, the country implements standards of local, Gulf Organization, and technical regulations. The Law gives the MoH authority, through the General Directorate of Environmental and Occupational Health Programme, to coordinate events related to acute foodborne illness in the human population, while the SFDA is responsible for the coordination of routine food safety risk management. Within the MoH, the Communicable Disease Directorate is responsible for foodborne illness surveillance. Two executive departments within SFDA oversee the monitoring of food safety for local and imported food products. In addition, SFDA has implemented a national food monitoring programme to check for food contaminants in imported and local food products.

Coordination of outbreak investigation, reporting, testing, and mitigations use a multisectoral operational approach. The private sector and consumers are only marginally involved in the coordination mechanisms for routine food safety.

Saudi laws, regulations, and circulars specify the shared responsibilities among the MoH, SFDA, MEWA, and Ministry of Municipal and Rural Affairs for the investigation of foodborne illness. Each agency identifies personnel from the relevant sectors who form part of a national committee to participate in the outbreak response team (ORT). Most representatives in the ORT are trained regularly. During an outbreak investigation, the MoH is the main member responsible for the investigation and conducts the interviewing of cases using a standardized questionnaire.

Saudi Arabia has an effective mechanism for rapid reporting and information exchange during an investigation which is described in the foodborne manual (Royal decrees # 67 and # 284). Foodborne events can be reported at different levels, starting from MoH institutions such as hospitals and health centres, other government-related sectors, and the private sector, e.g. clinics, hospitals, private practitioners. In the event of a foodborne illness, ORT members provide input following the procedure for outbreak response described in the foodborne manual. More specifically, the ORT is responsible for the preliminary assessment of the situation, which includes confirmation of the diagnosis, development of a case definition,

collection of specimens, formation of hypotheses, data analysis, environmental investigation, and analysis and interpretation of the results. Once the source of the outbreak is identified, the ORT evaluates the best communication strategies to share the information with patients, colleagues and interested parties, makes recommendations, and proposes remedial actions. Standard processes, roles, and procedures are well identified in circulars, which describe key stakeholders (e.g. animal health, laboratory) that would be involved in the testing of clinical and/or food samples collected during an the investigation.

SFDA has laboratory capacity to detect *Vibrio parahaemolyticus* and cholera, *Escherichia coli* O517, *Listeria monocytogenes*, *Listeria* spp., *Salmonella* spp. and *Campylobacter jejuni*, and enumeration of the Aerobic Plate Count, coliform and faecal coliform, yeasts and moulds, *Enterobacteriaceae*, *Staphylococcus aureus* and *Bacillus cereus*. The laboratory can also detect toxins and chemicals in food and feed. Future plans for the laboratory include adding testing for other viruses such as noroviruses.

Information related to foodborne illnesses is shared among food safety stakeholders through the SFDA web-based Rapid Alert System for Food and Feed. The system has information on contact points at other government agencies involved in food safety. Currently, the MoH, and SFDA are improving communication mechanisms by forming a coordinating committee consisting of members from relevant sectors such as, MEWA and the Ministry of Municipal and Rural Affairs. This coordination will include communication mechanisms targeting specific food safety stakeholders.

## Recommendations for priority actions

- Expand risk assessments for food safety along the food supply chain to identify areas of intervention to mitigate risks.
- Raise public awareness about food safety and foodborne diseases through public health campaigns.

## Indicators and scores

### P.5.1 Mechanisms for multisectoral collaboration established to ensure rapid response to food safety emergencies and outbreaks of foodborne diseases - Score 4

#### *Strengths and best practices*

- There is a strong legal and regulatory framework addressing food safety. Roles and responsibilities for foodborne investigation, prevention, and control of foodborne illness are well defined.
- There is an effective programme to ensure food product safety that includes testing and surveillance of imported and local products.
- Foodborne outbreak investigations are conducted in real time. Information related to foodborne illnesses is shared among food safety stakeholders through the SFDA web-based Rapid Alert System for Food and Feed.
- A coordinating committee consisting of members from relevant sectors shares information on foodborne illness investigations.

#### *Areas that need strengthening and challenges*

- There is a need to conduct a retrospective evaluation of outbreaks in order to determine possible mitigations or remedial actions that could help to reduce, control, and manage future human exposures.
- Continued training and exercises are needed to sustain this capacity in food safety assurance, inspection and investigation.
- Food safety awareness for government employees, managers, consumers, retailers and wholesalers (including local markets) will contribute to a better understanding of the factors affecting risks, strengthen the “food safety mitigation concept” and consequently reduce risk of human exposure at different steps of the food chain.

# Biosafety and biosecurity

## Introduction

It is vital to work with pathogens in the laboratory to ensure 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 diseases 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 with especially dangerous pathogens identified, held, secured and monitored in a minimal number of facilities according to best practices; biological risk management training and educational outreach 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 in place as appropriate.*

### Saudi Arabia level of capabilities

The Kingdom does not yet have national biosafety and biosecurity legislation, although some individual laboratories have good safety manuals, guidelines and SOPs under the ministries of Health, Agriculture, and National Guard Health Affairs. Different sectors have developed biosafety/biosecurity programmes, some of which (such as human health) are stronger than others. The recently established National Committee on Biosafety and Biosecurity, with representatives from relevant governmental sectors, should improve cross-sector coordination. Various government agencies have their own training programmes for biosafety/biosecurity; however, there is no unified and comprehensive training curriculum. All laboratory employees receive safety training upon appointment and regularly thereafter. Positive infectious disease specimens are mainly stored in major laboratories such as regional laboratories of the MoH or Riyadh Veterinary Diagnostic Laboratory. National accreditation standards for medical and public health laboratories are currently administered by the Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI), and include a section on biosafety/biosecurity. This accreditation applies to laboratories overseen by the MoH, including all private medical laboratories; all these laboratories receive safety audits as part of their accreditation assessments once every two years. Other sectors that operate health laboratories have yet to develop a similar accreditation mechanism.

### Recommendations for priority actions

- Review and clearly define the terms of reference of the National Committee on Biosafety and Biosecurity to strengthen coordination and ensure unified biosafety and biosecurity across all relevant sectors and service providers.

- Develop a national strategy identifying prioritized plan of action for implementation of the national biosafety and biosecurity guidelines and legislation.
- Develop a unified, comprehensive training programme on biosafety and biosecurity.

## Indicators and scores

### P.6.1 Whole-of-government biosafety and biosecurity system in place for human, animal and agriculture facilities - Score 3

#### *Strengths and best practices*

- The National Committee on Biosafety and Biosecurity is represented by different government sectors and provides a mechanism for cross-sector coordination.
- SOPs and guidelines have been developed on biosafety and biosecurity for human and animal health laboratories.
- All laboratories in the human health sector, both public and private, are accredited by CBAHI; some advanced laboratories are also accredited by the College of American Pathologists and Joint Commission International.
- Laboratory workers participate in exercises and inspections (CBAHI) every two years.
- Some accredited laboratories use international best practices.

#### *Areas that need strengthening and challenges*

- Cross sector coordination mechanisms, including the National Committee on Biosafety and Biosecurity, are in need of additional strengthening.
- National biosafety and biosecurity legislation and guidelines are yet to be finalized, enacted/endorsed and implemented.
- Laboratory licensing/accreditation mechanisms need to be established in sectors other than human health.
- A mechanism for oversight, enforcement and attribution for biosecurity legislation or guidelines needs further improvement to ensure sustainability.

### P.6.2 Biosafety and biosecurity training and practices - Score 3

#### *Strengths and best practices*

- Capabilities to provide biosafety and biosecurity training are available and workers in different sectors are regularly trained.

#### *Areas that need strengthening and challenges*

- A common training curriculum on biosafety and biosecurity has yet to be developed and implemented.
- Service continuity planning. National Guard Health Affairs, doc. reference # 7010-05-12-0082, 16 Dec 2019.
- Laboratory safety management plan. Riyadh Regional Laboratory, Ministry of Health, doc. reference # RRL-SAFETY MANAGEMENT PLAN (V3), 2015.
- Laboratory chemical hygiene plan. Riyadh Regional Laboratory, Ministry of Health, doc. reference # RRL-CHEMICAL HYGIENE PLAN (V3), 2015.

# Immunization

## Introduction

Immunizations are estimated to prevent more than 2 million deaths a year globally. Immunization is one of the most successful global health interventions and cost-effective ways to save lives and prevent disease.

### Target

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

### Saudi Arabia level of capabilities

Saudi Arabia has strong political commitment and the financial sustainability to ensure a well-functioning Expanded Programme on Immunization (EPI). Annual, and multi-year plans are developed for EPI, in line with the Global Vaccine Action Plan. Polio has been eradicated (last case in 1995) and neonatal tetanus eliminated, but measles is still spreading endemically albeit with decreasing incidence (in 2016, 125 measles cases were reported compared to 252 cases in 2013).

Immunization is free at all government health facilities, mainly in the primary health care centres, but also in private clinics and hospitals, and no vaccination is mandatory. Vaccination coverage is high – at least 95% – for all vaccines in the EPI programme: Bacillus Calmette–Guérin (BCG), diphtheria, hepatitis B, Haemophilus influenzae type B (Hib), measles, mumps, pertussis, pneumococcal, polio, rotavirus, rubella, tetanus, and varicella. Saudi Arabia has an EPI manager at national level in the MoH and more than 20 EPI coordinators in every region, each with a team of at 3–5 collaborators. Training and supervision is done on a regular basis at both the regional and national level, and more often during outbreaks. The country has an independent National Immunization Technical Advisory Group (NITAG), National Certification Committee and causality assessment committee in place. Adverse events following immunization (AEFI) are reviewed within the MoH in collaboration with SFDA in a national committee every four months. An electronic platform for reports on vaccine side effects will soon be in place with cross-notification between SFDA and the MoH.

A challenge for high coverage is to access hard-to-reach or marginalized populations, and illegal immigrants in the western part of the country. Some of the illegal settlers fear contact with the authorities, although mobile vaccination teams offer vaccinations after gaining trust through contact with local leaders. In 2015, the national measles-mumps-rubella campaign reached 98% of the target population between 6–18 years of age. The border with the Republic of Yemen in the south is another area of risk for transmission of vaccine preventable diseases; thus, measles and polio campaigns are regularly performed in border villages, and vaccination status is controlled at the border crossing.

Another challenge is vaccine hesitancy, or population groups refusing vaccination and spreading false rumours about vaccination via social media. Parent reluctance and public distrust of vaccination were not an issue before 2009, when vaccine effectiveness was not questioned. The situation changed drastically in 2009, first because of the H1N1 influenza vaccination campaign, and second because of the switch from mandatory to voluntary vaccination. The plan for 2017 is to launch a big campaign during the Global Immunization Week in April to increase trust through regular transmission of animated films and messages about the advantage of immunization on social media.

During Hajj, vaccination against meningococcal disease is required for all, and against polio and yellow fever for pilgrims from endemic countries. In 2017, influenza vaccination will also be recommended for all before Hajj. Close surveillance of vaccine preventable diseases is carried out and vaccination of internal pilgrims is offered during and around Hajj. NITAG is evaluating vaccination needs and new recommendations before Hajj.

## Recommendations for priority actions

- Conduct a coverage survey to verify administrative data.
- Train auxiliary and regional staff on reporting tools.
- Map hesitancy groups among the population.
- Increase communication for behavioural change and impact across social media and other communication platforms.
- Call for proposals for long-term contracts with vaccine manufacturing companies and localize an essential vaccines industry.

## Indicators and scores

### P.7.1 Vaccine coverage (measles) as part of national programme - Score 4

#### *Strengths and best practices*

- Measles-mumps-rubella vaccination coverage has been steadily above 95% for at least the last five years at national level and above 90% in more than 80% of districts.
- Vaccination services are provided free of charge in all government health facilities.
- A defaulter registration and retrieval system is in place.
- Unvaccinated children, or children with incomplete vaccination, are actively traced and requested to complete their vaccinations at primary health care centres and before school registration.
- Supplementary immunization activities are conducted every 4–5 years in areas at risk of outbreaks.
- Vaccination (polio, measles-mumps-rubella, meningococcal vaccine) is provided free of charge for all arrivals at the single functioning point of entry along the southern border as a means to prevent and control outbreaks.
- Vaccination services are provided to troops assigned to work along the southern borders.
- Vaccination campaigns to reach marginalized, illegal and nomadic populations are in place.
- A structured reporting system exists with data flow from service providers to regional level for validation before submission to the national level.
- Coverage surveys are done every three years.
- Compiled and analysed data are used to inform actions and change policies and strategies as needed.
- A national electronic vaccine registry, including short messaging services (SMS) for reminders, is built into the HSEN system and will be fully operational within a few years.

#### *Areas that need strengthening and challenges*

- The reluctance of parents to complete their children's immunization schedule needs to be addressed.
- Illegal settlers may be hesitant to approach government facilities for vaccination and, since they are not officially registered, their exact number is unknown.

- More mobile vaccination services are needed to reach nomadic groups and those living in hard-to-reach areas.

### P.7.2 National vaccine access and delivery - Score 4

#### ***Strengths and best practices***

- Vaccine delivery (maintaining the cold chain) is available in all districts in accordance with required standard specifications.
- Cold chain temperatures are controlled by an electronic system with alarms in place at national and regional level, and mainly using continuous monitoring equipment on fridges at local level.
- Vaccine delivery has been tested through nationwide vaccine campaigns (measles-mumps-rubella, influenza, subnational polio campaign).
- Hajj ensures the country is vigilant in international monitoring of vaccine preventable diseases, and schedules and recommendations are adapted according to needs.

#### ***Areas that need strengthening and challenges***

- Inadequate vaccine procurement and forecasting, and delayed supply from manufacturers, lead to occasional shortages at district level.
- Rapid staff turnover due in part to high reliance on expatriate staff requires frequent training and supervision activities.

# DETECT

## National laboratory system

### Introduction

Public health laboratories provide essential services such as 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.*

### Saudi Arabia level of capabilities

Health laboratory services in Saudi Arabia are provided by a number of government agencies, including the MoH, MEWA, Ministry of National Guard, Ministry of Defence, Ministry of Interior, and major universities. There is also a strong private sector. The country has a demonstrated ability for real-time surveillance using a national laboratory system featuring excellent infrastructure, modern diagnostic equipment and point-of-care testing, and well trained and qualified staff. Several BSL-3 facilities are available.

In the human health sector, a domestic accreditation programme, administered by CBAHI, is mandatory for all laboratories operating under the MoH and all private medical laboratories. Many private laboratories and at least seven public laboratories are accredited to international standards by the College of American Pathologists and Joint Commission International. Accreditation renewal inspections are performed every two years. Similar accreditation mechanisms are being finalized in other sectors. A major issue is poor coordination of laboratory services across sectors as there is no comprehensive cross-sector national laboratory policy, legislation or national laboratory strategic plan. The Saudi Health Council could potentially play a coordinating role because it includes representatives from all stakeholders except MEWA. In the human health sector, a three-tier laboratory network has existed until recently, with regional laboratories as the top tier, followed by hospital-based laboratories and primary health care facilities. The scope of services was clearly and explicitly defined for each tier by the MoH.

The Kingdom does not have designated reference laboratories for priority diseases, except for polio located at the Riyadh Regional Laboratory. Without a central public health laboratory, confirmatory and referral testing has been distributed among regional laboratories, five of which (Riyadh, Jeddah, Makkah, Madinah, and Dammam) play a crucial role. Many specimens have also been referred for testing overseas at significant cost. A National Health Laboratory has now been established and will soon become fully functional. This will require a thorough review and revision of the current public health laboratory network in terms of its functions and minimal standards for tests, techniques, equipment and personnel for each tier, as well as for technical, administrative and referral linkages.

In the human health sector, all laboratories are covered by external quality assessment schemes (EQAS), most of which are outsourced and therefore costly. Some laboratories exchange split samples with each other as an alternative approach to EQAS. Laboratory information systems are not standardized or well integrated. Different systems are being used in different sectors, and even in individual laboratories within the same sector. Some major laboratories have no computerized laboratory information system. Compatibility of the currently used systems with each other as well as with the Health Electronic Surveillance Network (HESN), the current system used for public health reporting purposes, is unclear but will be a crucial factor for establishing an integrated public health laboratory information system in the future.

The specimen transportation system overall is quite good, at least in the human health sector. The MoH has four contracts with a courier company (SMSA) to transport polio, MERS-CoV, neonatal screening, and routine testing specimens, respectively. However, these contracts do not cover primary health care facilities, which have to arrange specimen transport on a case-by-case basis, often resulting in inefficiencies and delays. Moreover, the existing provision does not allow to expand specimen transportation services to all notifiable diseases or all IHR hazards.

An equipment maintenance programme, including maintenance and certification for biosafety cabinets, is well established in the human health sector, and to a lesser extent in the animal health sector. SFDA is the national regulatory authority responsible for qualification and registration of in vitro diagnostic devices, including reagents.

## Recommendations for priority actions

- Establish a multidisciplinary regulatory and oversight body, with higher authority functions than the concerned ministries and a mandate to improve communication and coordination of laboratory services among sectors, conduct risk assessment and risk impact, and develop regulations and legislation.
- Strengthen a tiered and integrated national public health laboratory network, with clear leadership and well defined roles and responsibilities (both technical and managerial) at each level of the network; effective referral and reporting mechanisms; and clear procedures for collection and transportation of biological specimens and other infectious and potentially infectious materials in compliance with applicable national and international regulations.
- Implement a standardized and integrated electronic laboratory information system in high-volume laboratories.
- Develop and implement national standardized testing algorithms and SOPs for selected core tests and pathogens of concern.
- Ensure participation of all health laboratories in appropriate EQAS.

## Indicators and scores

### D.1.1 Laboratory testing for detection of priority diseases - Score 4

#### **Strengths and best practices**

- Well-developed capabilities are available for many core tests for priority disease, e.g. acute flaccid paralysis (AFP), avian influenza, brucellosis, cholera, HIV, malaria, measles, meningococcal meningitis, MERS-CoV, plague, tuberculosis, and viral haemorrhagic fever.

#### **Areas that need strengthening and challenges**

- The national public health laboratory network should be reviewed and upgraded to become more comprehensive with improved cross-sectoral coordination.

## D.1.2 Specimen referral and transport system - Score 3

### *Strengths and best practices*

- A well-functioning sample transportation system exists through contracts with SMSA courier company.
- Established and operational referral links between different tiers, at least in the human health sector.

### *Areas that need strengthening and challenges*

- Current specimen transportation contracts with SMSA do not cover primary health care facilities or many notifiable diseases or IHR hazards.
- Due to a lack of reference laboratories in the country, many specimens are referred for overseas testing at significant cost.

## D.1.3 Effective modern point-of-care and laboratory-based diagnostics - Score 3

### *Strengths and best practices*

- The scope of services for laboratory network tiers in the human health sector is standardized.
- Modern sophisticated equipment and testing techniques are available and staff trained and qualified to use them.
- Point-of-care devices are available and used.

### *Areas that need strengthening and challenges*

- Standardized services and testing protocols should be developed for other laboratory sectors.
- Equipment maintenance programmes beyond the human health sector need strengthening.
- Laboratory information systems are fragmented or lacking within the human health sector.

## D.1.4 Laboratory quality system - Score 3

### *Strengths and best practices*

- National quality standards for health laboratories are available.
- A well-established and functioning mandatory accreditation process exists in the human health sector through CBAHI, with regular inspections and audits.
- EQA programmes are available in most laboratories in the human and animal health sectors.

### *Areas that need strengthening and challenges*

- The laboratory accreditation process needs to be expanded beyond the human health sector.
- A significant number of laboratories both within and outside the human health sector are not yet covered by proper EQAS.
- Most EQAS are outsourced and therefore costly.

# 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 (local and intermediate), national and international levels of authority regarding surveillance of events of public health significance; improved country and intermediate level regional capacity to analyse and link data from and between strengthened, real-time surveillance systems, including interoperable, interconnected electronic reporting systems. This would include epidemiologic, clinical, laboratory, and 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 OIE standards.*

## Saudi Arabia level of capabilities

The country has established an event-based surveillance system in which high mortality, any unusual health events, suspect death of animals, etc. are reported directly by individuals, municipalities and security departments to the MoH and MoEWA. These ministries verify the public health problem and initiate active surveillance and field investigation unilaterally or together depending on the outbreak. The MoH has a dedicated hotline to receive reports of public health events (937 for human health and 800 for animal health).

Saudi Arabia also has a fully operational indicator-based surveillance system for infectious diseases. There are 47 notifiable diseases of which 23 should be reported immediately and 24 within a week. All notifiable diseases are reported using an electronic notification system called HESN, which was established in 2014. HESN not only registers diseases, but includes detailed case investigations, outcomes and repeated laboratory results. HESN has reporting tools that enable visualization of data, for example, and sharing them with each region so they have the opportunity to look at their own surveillance data. Weekly reports on surveillance data are generated from the system (dashboard). The system is also able to produce alerts: when new MERS cases are notified to the system, for instance, an SMS is sent to key experts and decision-makers.

Laboratory data are currently collected electronically in HESN for a few diseases only. However, the system will soon be able to collect laboratory notifications for all diseases electronically. MEWA has also developed an electronic notification system for 13 high priority animal diseases, which should be notified to the system by regional focal points or any stakeholder with direct relation to the animal. While this electronic system is in its infancy, in principle it will produce real-time surveillance data to be displayed on the website. Currently, human and veterinary sectors do not have access to each other's databases and data continue to be shared traditionally through faxes and emails. In principle, electronic sharing of data should be possible in the near future.

Electronic surveillance systems are in place for both human and animal diseases and are sustained by the Government. The systems are able to produce reports of surveillance data that can be accessed by regional and local authorities. Currently, data are shared traditionally between human and veterinary sectors; the functioning electronic surveillance systems are not yet interconnected. Weekly reports of surveillance data are produced, and the data are also reviewed during weekly Command and Control Centre meetings. There are several public health specialists at national level able to analyze and interpret surveillance data.

Syndromic surveillance exists for a number of syndromes: AFP, fever with rash, severe acute respiratory infection, influenza like illness, and haemorrhagic fever. In addition, there is syndromic surveillance for sexually transmitted diseases. AFP and fever with rash syndromes are reported by all health-care facilities; influenza-like illness surveillance is implemented at six sentinel sites; and sexually transmitted diseases in primary health care centres. Fever with rash and AFP are notified electronically, sexually transmitted diseases currently manually.

## Recommendations for priority actions

- Formalize and standardize event-based surveillance.
- Enhance the laboratory surveillance system in HESN.
- Interconnect the public health and veterinary electronic surveillance systems.
- Conduct the planned evaluation of HESN.

## Indicators and scores

### D.2.1 Indicator- and event-based surveillance systems - Score 3

#### *Strengths and best practices*

- The indicator-based surveillance system for human diseases is well-developed and functioning. Real-time surveillance for MERS cases collects timely data with almost 100% coverage; this experience is also used for developing surveillance of other infectious diseases.

#### *Areas that need strengthening and challenges*

- Event-based surveillance is based on voluntary reporting of unusual health events by individuals, municipalities and security departments to MoH. However, few events are notified to the hotline. Event-based surveillance should be formalized and standardized.

### D.2.2 Interoperable, interconnected, electronic real-time reporting system - Score 4

#### *Strengths and best practices*

- An electronic surveillance system is in place for human and animal diseases.
- Regions have access to reports of surveillance data in their own area.
- HESN is able to produce alerts of significant findings, e.g. new MERS cases.
- Data are also used for research.

#### *Areas that need strengthening and challenges*

- Currently laboratory data are collected directly from laboratories for a limited number of diseases; data should be collected on all notifiable microbes.
- Electronic surveillance systems for human and animal diseases should be interconnected.

### D.2.3 Integration and analysis of surveillance data - Score 4

#### *Strengths and best practices*

- Data for some notifiable diseases are received directly from laboratories.
- SMS alerts for some diseases (MERS) are sent to decision-makers in real time.

#### *Areas that need strengthening and challenges*

- Notifications of all notifiable microbes should be sent directly from laboratories to HESN.

### D.2.4 Syndromic surveillance systems - Score 4

#### *Strengths and best practices*

- Data for AFP and fever with rash are collected electronically in HESN.
- Influenza-like illness surveillance is implemented in six sentinel sites.

#### *Areas that need strengthening and challenges*

- Electronic reporting should be also implemented for surveillance of sexually transmitted diseases.

# 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.*

## Saudi Arabia level of capabilities

Saudi Arabia has nominated an operational IHR NFP – Dr Abdullah M. Assiri at the MoH – who is supported by a whole team. The country has also nominated an operational OIE focal point, Dr Mansour al Balaway in the MEWA. The following mechanisms ensure that information between these focal points is exchanged: the Committee for Deputy Ministers of Health, Agriculture and Municipalities; weekly meetings of the Control and Command Centre (MoH, MEWA, National Guard and Military); and the Joint Interministerial Committee of Zoonotic Diseases. Public health, animal health and security authorities have clear mechanisms for making decisions on reporting: the IHR NFP is a member of the Command and Control Centre (CCC), National Hajj Committee and National Infectious Diseases Technical Group.

The country has received training for these NFP roles in WHO intercountry meetings and regular consultations with the WHO Regional Office for the Eastern Mediterranean. Saudi Arabia also has regional reporting requirements as a member of the GCC, Arab League and Organization Islamic Conference.

There are no limitations for the performance of IHR NFP, and the country has used the informal consultation mechanisms with WHO under article 8 of the IHR.

SOPs are in place for approving and reporting a potential public health emergency of international concern (PHEIC) to WHO. Guidelines for control of communicable disease and implementation of preventive measures define the procedures and approvals for reporting a potential PHEIC to WHO. Saudi Arabia has also tested its systems to identify and report a PHEIC during the last Hajj. Several ministries and government institutions participated in the exercise.

## Recommendations for priority actions

Although the country has well-established procedures for reporting a PHEIC to WHO, several priority actions were identified during the evaluation.

- Establish a national electronic platform for the timely reporting of potential PHEIC, with access to all relevant national stakeholders for the rapid assessment of these events.
- Develop SOPs to improve and standardize multisectoral risk assessments of potential PHEICs.
- Enhance the awareness and use of Annex 2 of IHR, particularly among non-health sectors.
- Conduct simulation exercises to test the capacity and timely reporting of chemical and radiation events to WHO through the IHR NFP.

## Indicators and scores

### D.3.1 System for efficient reporting to FAO, OIE and WHO - Score 4

#### ***Strengths and best practices***

- A reporting system for a potential PHEIC to WHO is in place.
- Hajj has enhanced the importance of public health and multisectoral reporting.
- HESN is an effective and timely system for notifying potential PHEIC to the MoH.

#### ***Areas that need strengthening and challenges***

- Awareness of all relevant sectors about events that may be of public health concern should be increased, including authorities at regional and local level.
- Limited collaboration exists regarding potential PHEIC among some of the relevant stakeholders.
- Training is limited for some relevant sectors.

### D.3.2 Reporting network and protocols in country - Score 4

#### ***Strengths and best practices***

- The country has substantial experience of reporting PHEIC to WHO.
- In addition to reporting real events, the country has carried out exercises on reporting a PHEIC to WHO.

#### ***Areas that need strengthening and challenges***

- Roles, responsibilities and leadership in assessing a potential PHEIC need clarification and SOPs.
- Despite substantial experience of assessing and reporting potential PHEIC of biological origin, experience is lacking for chemical and radiation events.

# Workforce development

## Introduction

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

### Target

*States Parties with 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).*

## Saudi Arabia level of capabilities

Saudi Arabia still relies heavily on an expatriate population for its health workforce, particularly nurses, which leads to a great deal of turnover and instability in the health-care system. Of the 83 000 nurses and 55 000 physicians, 22 000 are Saudi (Department of Statistics).

Workforce capacity-building strategies and plans include national and international training and for special situations such as the Haji workforce strategy, southern region frontline workforce strategy, and for certain outbreaks (MERS, avian influenza etc.). Implementation of the workforce capacity strategy needs to be multisectoral, incorporating human, animal and environmental health on a One Health platform. Updated numbers and tracing of the public health workforce by profession (epidemiologist, veterinary, nursing, etc.) is needed, particularly beyond personnel educated at the national level. There are 73 colleges of medicine, health and nursing, as well as 4 health institutes; Saudis can also obtain a degree through a number of international institutions. Due to a lack of clear career paths, positions, and ability to attract and retain human resources, the country has identified the need for a multi-organizational incentive system for the public health workforce.

The Saudi FETP, a division of the Public Health Department, was established in 1989. It is a 2-year postgraduate training programme in collaboration with King Saud University, Riyadh, leading to a diploma (master's) degree in field epidemiology for physicians. To date, 168 students have been trained. Regional and international partnerships exist with Emory University, USA, Liverpool University, United Kingdom, and the Sultanate of Oman. Saudi Arabia is providing Omani residents with FETP training. Partnership also exists with the US Centers for Disease Control and Prevention, Eastern Mediterranean Public Health Network (EMPHNET), WHO Regional Office for the Eastern Mediterranean, Food and Agriculture Organization (for veterinary workforce), and the Arab Organization for Agricultural Development (for improved training).

## Recommendations for priority actions

- Establish a national multisectoral workforce development committee, which includes representatives of each of the involved institutions/ministries (stakeholders).
- Ascertain the actual number of health workers in Saudi Arabia through the Department of Statistics.
- Establish short (3–6 months) and intermediate (1 year) FETP courses for public health workers (physicians and non-physicians) and develop FETP training for veterinarians, including short courses for assistant vets.

- Establish career paths for public health workers (including FETP graduates), with financial and professional incentives as well as recognition of national training programmes.

## Indicators and scores

### D.4.1 Human resources available to implement IHR core capacity requirements - Score 3

#### *Strengths and best practices*

- The Public Health Department formed a multidisciplinary team (CCC) in response to the MERS outbreak and a specific rapid response team, which it plans to generalize to cover public health threats other than MERS.
- Each region has a public health division with an epidemiologist, and MEWA representation in most districts.
- The country managed to attract expatriate health staff where Saudi health staff were lacking to ensure a good health system and to work within the IHR framework.

#### *Areas that need strengthening and challenges*

- Reliance on expatriate health staff, in particular nurses, needs to be addressed.
- Coordination and multisectoral collaboration is lacking, and multiple investigation teams can deployed in the field during the same event.
- Tracing, attracting and retaining qualified staff within the public health sector should be improved.
- Incentives and efforts to maintain the existing public health workforce are needed, and are currently under review.
- Specialized human capacity in some areas of IHR is scarce, such as risk communication and animal health.

### D.4.2 FETP or other applied epidemiology training programme in place - Score 4

#### *Strengths and best practices*

- Advanced FETP is in place with plans to expand to other professionals in the One Health network (veterinarians, nurses, etc.). Plans are to start national basic and intermediate training.
- Trained field epidemiologists are available throughout the country for both human and animal health capacities.
- Other long-term public health training programmes (Master of Public Health, Master of Science) are available within the country for health-care workers. Also, there are agreements with international bodies to provide public health and epidemiology training.

#### *Areas that need strengthening and challenges*

- Advanced FETP training for veterinarians and other professionals that contribute to the One Health approach needs to be established.
- Improvement is needed regarding multidisciplinary team formation and communication.
- Field epidemiology capacity tracking of human resources, mainly educated abroad, has started but needs further development.
- Partnerships with countries in the region to share FETP graduates during emergency events needs to be established.

### D.4.3 Workforce strategy - Score 3

#### ***Strengths and best practices***

- A health-care strategy is available for the labour workforce, although it needs multisectoral collaboration.
- Other health workforce strategies and plans exist for certain situations like Hajj and outbreaks (MERS and avian flu).

#### ***Areas that need strengthening and challenges***

- Work is ongoing to improve the public health workforce strategy and tracking system.
- Multisectoral collaboration on the One Health platform should be strengthened.
- A plan for a multi-organization incentive system for the public health workforce is required.

# RESPOND

## Preparedness

### Introduction

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 an IHR NFP, which is a national centre for IHR communications, is a key requisite for IHR implementation. The IHR 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 IHR NFP, continuously update and annually confirm them.

### Target

*Development and maintenance of national, intermediate (district) and local/primary level public health emergency response plans for relevant biological, chemical, radiological and nuclear hazards. This covers mapping of potential hazards, identification and maintenance of available resources, including national stockpiles and the capacity to support operations at the intermediate and local/primary levels during a public health emergency.*

### Saudi Arabia level of capabilities

The Kingdom has made significant investments in its public health preparedness and response infrastructure, which includes a holistic and integrated approach to preventing and mitigating public health emergencies. Multi-hazard public health national and subnational response plans have been developed and implemented across the nation. Saudi Arabia, in collaboration with several sectors of the Government, has identified priority public health risks and mapped resources to mitigate these risks for an effective emergency response. Additionally, Saudi Arabia has demonstrated its ability to respond to all-hazards events by performing a simulation exercise for the JEE team in the Dammam region. A multisectoral approach was utilized to convey how the Eastern Province Civil Defence, subnational response decontamination unit and civilian hospitals communicate and coordinate effectively to quickly resolve public health emergencies and crisis events. Consequently, Saudi Arabia's investments have led to an effective and robust public health preparedness and response capability that can respond to, manage and mitigate multi-hazards on all levels. Meticulous planning, multisectoral collaboration, decisive leadership, appropriate resources and trained and fully functional staff, have led to the development and implementation of an effective multi-hazard plan. The Saudi emergency response accomplishments can be used as a regional standard for GCC – and other – countries to emulate.

### Recommendations for priority actions

- Establish a high-level steering committee within the Saudi CDC to ensure an all-hazard and multisectoral approach for health within the national preparedness structure; the committee should have formal linkage with the Civil Defence Council.

## Indicators and scores

### R.1.1 National multi-hazard public health emergency preparedness and response plan developed and implemented - Score 4

#### ***Strengths and best practices***

- A multi-hazard national public health emergency preparedness and response plan that covers IHR core capacity requirements has been developed.
- National response plan(s) incorporates Global Health Security Agenda IHR-related hazards.
- Coverage for points of entry and surge capacity to respond to public health emergencies of national and international concern is available.
- Procedures, plans and a strategy is in place to reallocate or mobilize resources from national and intermediate levels to support action at local response level (including capacity to scale up the level of response).
- The national public health emergency response plan has been tested in an actual emergency for Hajj and subnational endemics, and updated accordingly.

#### ***Areas that need strengthening and challenges***

- The existing plans are not comprehensive and should fully reflect a multi-hazard approach; communicable diseases and all other hazards are not seamlessly managed in a holistic manner.
- A high-level overarching steering committee that has a 360° field of vision could serve to analyse and anticipate public health impact and ensure that necessary resources beyond local and subnational response capacity are procured.

### R.1.2 Priority public health risks and resources mapped and utilized - Score 4

#### ***Strengths and best practices***

- A risk assessment has been conducted to identify potential urgent national and subnational risks.
- National resources have been mapped, including the needs for each sector.
- National profiles on risks and resources are developed and reviewed regularly and sector stockpiles (critical stock levels) for responding to priority events and other emergency risk are accessible.

#### ***Areas that need strengthening and challenges***

- The risks and resource mapping should extend beyond communicable diseases and Hajj/Umrab season.

# Emergency response operations

## Introduction

A public health emergency operations centre (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

*Country with public health emergency operations centre functioning according to minimum common standards; maintaining trained, functioning, multisectoral rapid response teams and "real-time" biosurveillance laboratory networks and information systems; as well as trained EOC staff capable of activating a coordinated emergency response within 120 minutes of the identification of a public health emergency.*

### Saudi Arabia level of capabilities<sup>2</sup>

Saudi Arabia has developed emergency response procedures and established EOCs at national and subnational level. The organizational construct complies with WHO's Framework for Public Health EOC standards, and significant investments have been made in infrastructure development, staff training and resource procurement. State-of-the art EOC facilities exist at the national, subnational and local level. These facilities are seamlessly integrated and layered to match the appropriate level of coordinated response support to the situation. Detailed plans and activation protocols are available to facilitate activation at the appropriate emergency response level.

From individual medical staff at hospitals to managers and leaders at the Eastern Province Civil Defence, including the Dharan Military Complex, all are fully aware of emergency management operations and the triggers for response. As a demonstration of excellence in emergency operations management, the hospital developed colour coded Job Action Sheets for each staff member with a response function. This technique expedites the functional capability of the teams and ensures that teams have the right checklist for the right purpose. The entire operation reflected a highly efficient training programme that frequently conducts sustaining training, drills and planned exercises for the organization. The hospital decontamination drill set-up and demonstration showcased the high level of professional competence of which the unit is capable during a time of crisis or public health emergency.

### Recommendations for priority actions

- Sustain levels of investment, infrastructure and capacity developed in relation to Hajj/Umrah and MERS-CoV in order to maintain the capacity to activate a coordinated emergency response to any public health threat.
- Maintain the momentum for implementation of 911 (unified emergency telephone number) and ensure integration with other systems (including surveillance information to Saudi CDC).

<sup>2</sup> It should be highlighted that each of the Saudi presenters for each function of preparedness/response and emergency operations performed brilliantly in describing how plans and emergency response actions supported the larger national response structure.

## Indicators and scores

### R.2.1 Capacity to activate emergency operations - Score 5

#### *Strengths and best practices*

- Dedicated EOC staff are trained in emergency management, SOPs for PHEIC, and can activate a response within two hours.
- The system is tested at least twice a year to test EOC activation.
- Staff use actual responses to further hone their skills and improve response times.

#### *Areas that need strengthening and challenges*

- EOC staff and infrastructure capacity may not be adequate to cover an all-hazard response.
- Testing should be expanded to hazards beyond health and not exclusively specific to Hajj/Umrab.
- A guidance document should be strategically planned and developed to strengthen and expand medical countermeasures and personnel deployment.
- Legislative guidance or regulations should also be developed as appropriate.

### R.2.2 EOC operating procedures and plans - Score 5

#### *Strengths and best practices*

- Several functioning EOCs are in place connecting the whole country.
- EOC plans are in place for functions including public health science (epidemiology, medical and other subject-matter expertise) with an expanded set of functions.
- Response plans are in place that describe scaled levels of response with resource requirements for each level and procedures for acquiring additional resources.

#### *Areas that need strengthening and challenges*

- Capacity should be expanded to noncommunicable disease-related hazards.

### R.2.3 Emergency operations programme - Score 5

#### *Strengths and best practices*

- Multiple EOC exercises have been completed to test systems, operational capabilities and decision-making.
- EOC activated a response system for communicable diseases and epidemics and demonstrated capability to coordinate one health emergency response within 120 minutes.

#### *Areas that need strengthening and challenges*

- Despite the fact that the functions and operations were tested with demonstrated capability to coordinate one health response, such coordination needs to be strengthened to include standardized information management system (IMS) operations within and outside the health sector.

### R.2.4 Case management procedures implemented for IHR relevant hazards - Score 5

#### *Strengths and best practices*

- Case management guidelines are available for priority epidemic-prone diseases.
- Case management guidelines for other IHR-relevant hazards are available at relevant health system levels.

- Case management SOPs are available and implemented for the management and transport of potentially infectious patients in the community and at points of entry with the appropriate capacity including staff and resources.

***Areas that need strengthening and challenges***

- Case management SOPs should be expanded beyond transport of potentially infectious patients.

# Linking public health and security authorities

## Introduction

Public health emergencies pose special challenges for law enforcement, whether the threat is manmade (e.g. an anthrax terrorist attack) or naturally occurring (e.g. a flu pandemic). In a public health emergency, law enforcement will need to quickly coordinate its response with public health and medical officials.

### Target

*Country conducts a rapid, multisectoral response in case of a biological event of suspected or confirmed deliberate origin, including the capacity to link public health and law enforcement, and to provide and/or request effective and timely international assistance, such as to investigate alleged use events.*

## Saudi Arabia level of capabilities

In Saudi Arabia, cooperation between public and security sectors has grown and has been tested in the event of emergencies and exercises. The Royal Decree and the Civil Defence Act facilitate the current linkages between the health and the security sectors under the Ministry of Interior and Ministry of National Guard. Integrated with security sectors, the health authorities can undertake contact tracing for suspected/confirmed cases of Saudi nationals and those coming from overseas. Sharing of information in the context of chemical, biological, radiological and nuclear events is in place, which extends to include countries under the GCC. If needed, the IHR NFP can communicate with authorities to share the medical data of pilgrims from other countries. The National Security Council and Civil Defence lead investigations of deliberate or accidental/incidental health security events.

Facilities of the Civil Defence and designated hospitals have decontamination capacities to manage chemical or radiation contaminated patients. Site visits to Makkah indicated that the frontline facilities have access to mobile and fixed lab facilities in addition to in situ detection kits. Toxicology expertise is available from stand-by service providers but not embedded within frontline capacities.

The 911 hotline under the Ministry of Interior in Makkah is a well-resourced set-up with the mandate for risk reduction, public health and safety in the region. It has been in operation for seven months with full functionality of a major incident management system, and allows the Kingdom to manage any major incident that could affect the holy city. Although the facility is under the Ministry of Interior, it provides a platform for all relevant authorities, including the MoH, in their routine operations and during major events.

There are clear aspirations and expectations of all stakeholders to institutionalize the existing linkages. A review of legal and policy instruments is necessary, which could lead to the development of a focused legislative framework and refined SOPs to concretize joint working during and between all hazards (accidental, incidental, deliberate and infectious events). The newly established Saudi CDC can be instrumental to provide operational and institutional oversight of all relevant aspects of linkages between health and wider security services.

## Recommendations for priority actions

- Develop a regulatory framework to harmonize and further strengthen the existing linkage between public health and security sectors to ensure multisectoral health response and preparedness.

- Enhance integrated capacity development, including joint guidelines, SOPs and joint training and exercises to ensure effective linkages to respond to all hazards.
- Review the outcome and lessons learnt from joint activities and exercises to strengthen the linkages between public health and security sectors.

## Indicators and scores

### R.3.1 Public health and security authorities (e.g. law enforcement, border control, customs) linked during a suspect or confirmed biological event - Score 4

#### ***Strengths and best practices***

- Triggers for notification and information sharing in the context of emergencies are in place.
- A Royal Decree and Civil Defence Act provide the legal framework for ongoing linkages.
- SOPs are in place that enable integrated response.
- Experience is available on joint exercises and emergency responses.

#### ***Areas that need strengthening and challenges***

- A specific legal instrument should be developed to enable routine and proactive engagement between sectors including security sectors/services for all IHR hazards.
- An overarching institutional home is needed to maintain and promote linkages between the health and security sectors to facilitate the cross-benefit of joint collaboration that could extend beyond public health. Saudi CDC can provide this institutional home.

# 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

*National framework for transferring (sending and receiving) medical countermeasures, and public health and medical personnel from international partners during public health emergencies.*

## Saudi Arabia level of capabilities

The country has integrated the receipt and sending of medical countermeasures and personnel as part of its plans and procedures. It has an established national framework and institution to manage these needs..

## Recommendations for priority actions

- Strengthen and expand MCM and personnel deployment regulatory framework to be proactive rather than reactive.
- Ensure availability of fast-track mechanisms for incoming personnel.
- Explore additional partnerships for sending and receiving both MCM and personnel deployment.

## Indicators and scores

### R.4.1 System in place for sending and receiving medical countermeasures during a public health emergency - Score 5

#### Strengths and best practices

- A coordination entity has been established for sending MCM.
- Plans and procedures have incorporated both receiving and sending MCM.
- There have been at least annual opportunities to demonstrate functionality of the deployment systems during the Hajj/Umrah season and in relation to the MERS-CoV response.
- The country has joined a number of regional partnerships covering medical countermeasures.

#### Areas that need strengthening and challenges

- The deployment of MCM should be expanded.

#### R.4.2 System in place for sending and receiving health personnel during a public health emergency - Score 5

##### ***Strengths and best practices***

- Plans and procedures incorporate both receiving and sending personnel.
- There have been at least annual opportunities to demonstrate functionality of the deployment systems during the Hajj/Umrah season and in relation to the MERS-CoV response.
- The country has joined a number of regional partnerships covering personnel deployment

##### ***Areas that need strengthening and challenges***

- Fast-track processes (particularly facilitated entry requirements) need to be developed for incoming personnel deployment.
- Partnerships are mainly limited to regional entities (GCC, Arab League, Organization of Islamic Cooperation).

# Risk communication

## Introduction

Risk communications should be a multilevel and multifaceted process that aims to help 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 disease outbreaks. 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, including the voice of the affected population.

Communications of this kind promote appropriate prevention and control action through community-based interventions at individual, family and community levels. Disseminating the information through appropriate channels is essential. Communication partners and stakeholders in the country need to be identified, and functional coordination and communication mechanisms established. In addition, the timely release of information and transparency in decision-making are essential to build trust between authorities, populations and partners. Emergency communications plans should be tested and updated as needed.

### Target

*State Parties use multilevel and multifaceted risk communication capacity. Real-time exchange of information, advice and opinions between experts and officials or people who face a hazard or threat to their survival (health, economic or social well-being), so that informed decisions can be made to mitigate the effects of the threat or hazard and protective and preventive action can be taken. This includes a mix of communication and engagement strategies, such as media and social media communications, mass awareness campaigns, health promotion, social mobilization, stakeholder engagement and community engagement.*

## Saudi Arabia level of capabilities

MERS-CoV outbreaks, declining public trust in immunization and a large, unregistered migrant population are some of the recent challenges that have reinforced the need for strengthened risk communication capacities and activities in Saudi Arabia. A joint Risk Communication Capacity Assessment, organized by the MoH and WHO Regional Office for the Eastern Mediterranean in August 2015, provides detailed recommendations to formalize a risk communication system by expanding the use of experts, MoH units and experiences to improve the five IHR indicators for risk communication discussed below. The MoH has taken on board many of the recommendations and accelerated its investment in risk communication coordination and capacities within the Ministry and across sectors to better manage public health emergencies.

A risk communications unit within the Global Centre for Mass Gathering Medicine (GCMGM) to respond to emergencies during the Hajj, and a broader working group in MoH, activated in the event of an emergency, were formally established with strong links to EOCs in Riyadh, Jeddah and Makkah. The mass migration of pilgrims during the Hajj presents tremendous public health preparedness challenges for Saudi Arabia. During the 2016 Hajj, the MoH seized the opportunity to improve public preparedness and response measures. National emergency risk communication capacity was strengthened, particularly in monitoring and evaluating social media, improving internal coordination among different sectors and partners, and expanding health messages in several languages across social media channels. Hajj-specific communication strategies and SOPs were developed, implemented and tested.

The MoH plans to expand these strategies and SOPs into strong operational communication structures and procedures that address public health emergencies, ensure better information sharing and regular coordination between sectors, and across subnational and directorate levels. Efforts are already underway to standardize risk communication within the EOC structure.

The MoH has also scaled up public communication efforts with a core team, led by the Director General of Media and Public Relations who reports directly to the Vice-Minister of Health. Health information is regularly disseminated to strictly controlled media (TV, radio, newspapers). Media monitoring and an enhanced 937 call centre for data analysis, dynamic listening and rumour management are in place.

Saudi Arabia also has one of the fastest growing social media markets in the Middle East due to high rates of smartphone ownership. More than 40% of the population regularly access Twitter and YouTube.<sup>3</sup> The MoH has started to capitalize on the information sharing and feedback potential of these social media platforms.

Community engagement efforts are limited to specific, health-day campaigns and dissemination of information education and communication (IEC) materials. In general, the efficacy of these activities has not been evaluated. However, as part of the 2016 Hajj preparations, the MoH trained rapid response teams made up of medical students, local charity members, and Red Crescent volunteers to improve social mobilization, and generate engagement and feedback with pilgrims.

Saudi Arabia has good capacity across all five domains of risk communication. Additional investments for proactive risk communication activities during the Hajj over the past 18 months have produced ample lessons, experiences and successful models to build a formal risk communications system that can provide cross-cutting responses to public health emergencies.

## Recommendations for priority actions

- Scale up risk communication structure and functions across the MoH, and at subnational and directorate levels.
- Formalize a national coordination mechanism for risk communication that includes relevant ministries, civil society and the private sector with standardized roles and responsibilities.
- Expand public communication and health education capacity-building to relevant MoH staff across national, subnational and directorate levels.
- Expand the volunteer network to reach local communities across the country.
- Integrate feedback and lessons learnt from the listening and rumour system into high-level MoH decision-making.

## Indicators and scores

### R.5.1 Risk communication systems (plans, mechanisms, etc.) - Score 3

#### ***Strengths and best practices***

- There is strong MoH commitment and investment to improve staff skills and develop sustainable, cross-sectoral, national capacities in this area of work.
- A broad risk communication working group within the MoH includes coordination with public relations, health promotion, other internal units and some external partners, particularly from the animal health sector when managing zoonotic diseases.

<sup>3</sup> BBC news, Saudi Arabia profile – media ([www.bbc.com/news/world-middle-east-14703480](http://www.bbc.com/news/world-middle-east-14703480)).

- The roles and responsibilities of the risk communication unit within the GCMGM are outlined in the National Emergency Plan. An operational communication plan and SOPs have been developed for emergency response during the Hajj.
- Media plans and SOPs for risk communication have been drafted but require endorsement by MoH leadership.
- The 973 hotline has been significantly expanded to include surge capacity of 150 operators on call at all times and in-depth data analysis which can be used to better inform MoH public communication decisions.

#### ***Areas that need strengthening and challenges***

- The risk communication function at the subnational and directorate levels are weak and do not provide a two-way information loop for information sharing and decision-making.
- The concept of risk communication has negative connotations in the Arabic language and lacks common understanding across all sectors. Risk communication orientation workshops provided across all levels of the MoH can increase awareness and acceptance of this IHR domain as a critical component of public health emergency response.

### **R.5.2 Internal and partner communication and coordination - Score 3**

#### ***Strengths and best practices***

- Main stakeholders have been identified and the MoH is in the process of developing a multi-hazard risk communication plan that includes clear roles and responsibilities for MoH, other ministries, and external partners. The new working group for risk communications within the MoH is building its mandate to lead internal and partner communication for disease outbreaks and other public health alerts.
- Increased investment in EOC scale-up contributes to improved internal communication and coordination during emergencies. For emergency response, risk communication procedures are being tested and integrated within EOC structures. These processes can be transferred and altered for use during disease outbreaks or public health crises.
- External partnerships with the MoH are expanding through recent memoranda of understanding with academic and government institutions and more formal linkages with Civil Defence, Ministry of Agriculture, Red Crescent and charity groups.
- Internal and partner coordination and collaboration were scaled up during the 2016 Hajj and supported by an operational communications plan for the Hajj period.

#### ***Areas that need strengthening and challenges***

- Coordination of resources and information within the MoH is weak. Top-level decisions do not reach lower levels of government. This jeopardizes information flow and compromises decision-making at lower management ranks.
- The lack of regular coordination meetings between ministries during non-emergency times hampers consistent two-way flow of information and better planning for emergencies.

### **R.5.3 Public communication - Score 3**

#### ***Strengths and best practices***

- The Media and Public Relations Unit engages in weekly media briefings and public outreach through social media platforms and mobile phone applications.

- Official spokespersons are designated at the subnational and directorate levels and can engage with the media on local public health issues.
- SOPS for public communication during emergencies have been developed but need to be revised, expanded and endorsed by MoH leadership.
- Since 2015, there has been an increase in communication materials and messages in several languages. Public communication materials are now systematically produced in seven languages during the Hajj.
- A social media listening project, launched during the 2016 Hajj for target audience analysis, found that the MoH needed to expand its use of social media beyond Twitter and Facebook. YouTube, Snapchat, and Instagram were the most popular platforms used by the pilgrims.

#### ***Areas that need strengthening and challenges***

- A MoH public communication strategy with SOPs and trained staff should be finalized and endorsed by 2017.
- In-depth media briefings on public health threats combined with journalist training are needed for better reporting on scientific information related to public health.
- There is low international and local media engagement.

### **R.5.4 Communication engagement with affected communities - Score 3**

#### ***Strengths and best practices***

- The MoH trained more than 520 Red Crescent volunteers and medical/nursing students for rapid response and community engagement during the 2016 Hajj. An additional 1200 volunteers will be trained in 2017. Health promotion and community engagement procedures are now outlined in the national emergency plan.
- The MoH conducted surveys and focus group discussions for community feedback during the 2016 Hajj. Community feedback and consultations have also increased through the scale-up of the 937 call centre, and training of community volunteers and primary health care workers.
- The recently established MoH internal working groups have improved coordination between the Health Promotion Unit and other teams to develop public health messages and IEC materials.

#### ***Areas that need strengthening and challenges***

- Proactive communication engagement efforts need to be expanded to local communities, other regions, and outside the Hajj season. Targeted communication and resources are needed for vulnerable populations such as unregistered migrants and Bedouin tribes.
- Communication engagement must also focus on vaccine-averse parents, reaching mothers in particular, to counter the growing spread of anti-vaccine information through mobile applications such as WhatsApp.

### **R.5.5 Dynamic listening and rumour management - Score 3**

#### ***Strengths and best practices***

- The 937 call centre has increased its capacity for multi-level response and data analysis: it now provides a real-time, multi-channel, two-way feedback system to address rumours and misunderstandings of public health concerns.
- Rapid response teams for community engagement are trained to provide community feedback but are only operational during the Hajj.
- A routine media and social media monitoring system is in place at national and subnational levels.

- A social media listening project launched during the 2016 Hajj produced a thorough audience analysis of MoH's communication efforts. The results highlighted lessons on the efficacy of messages, use of different languages and social media platforms that are being applied to improve MoH's response to public health concerns across the country.

#### ***Areas that need strengthening and challenges***

- To improve local knowledge, attitudes and behaviour of underserved population, there should be more regular focus groups, intercept interviews, test messages with communities, across all regions, and year-round.
- Audience analyses and primary health care community outreach programmes should be expanded to all regions and vulnerable populations in Saudi Arabia.
- A process should be established to enable data analysis from dynamic listening mechanisms to be shared for high-level decision-making.

# OTHER IHR-RELATED HAZARDS AND POINTS OF ENTRY

## Points of entry

### Introduction

All core capacities and potential hazards apply to points of entry and thus enable the effective application of health measures to prevent international spread of diseases. States Parties are required to maintain core capacities at designated international airports and ports (and where justified for public health reasons, a State Party may designate ground crossings), which will implement specific public health measures required to manage a variety of public health risks.

### Target

*States Parties designate and maintain core capacities at international airports and ports (and where justified for public health reasons, a State Party may designate ground crossings) that implement specific public health measures required to manage a variety of public health risks.*

### Saudi Arabia level of capabilities

The Kingdom encompasses 28 points of entry (PoE) including 7 international airports, 8 international seaports and 13 ground crossings. The airports are regulated and operated by the General Authority of Civil Aviation except Al Madinah airport, which is operated by TAV. Saudi Ports Authority regulates the ports. In line with the provisions of IHR Annex 1, 13 PoE have been "designated" due to the fact that they are assigned for Hajj and Umrah.

Indeed, beside Umrah, which is a shorter pilgrimage to Makkah, the Hajj is one of the largest yearly religious mass gatherings worldwide. The PoE in Saudi Arabia have accumulated extensive experience built on decades of planning, managing, monitoring and providing health care during these two mass gathering events. Moreover, the Kingdom houses the institution in charge of the pilgrimages, i.e. the Global Centre for Mass Gathering Medicine (GCMGM). This is a WHO collaborating centre and can collaborate closely with the PoE in terms of evidence-based research, performance assessment and risk communication.

On the other hand, the cooperation and the communication between the competent authority at Tabouk ground crossing on the Saudi side and its neighbouring counterpart on the Jordanian side, exemplifies compliance with IHR article 21, which deals with the joint designation of adjacent ground crossings.

### Recommendations for priority actions

- Review, test and update public health emergency contingency plans at PoE and their integration in the emergency plans.
- Extend the capacity to issue Ship Sanitation Certificates to other major seaports.
- Enhance and formalize at seaport and at airport freight areas, in compliance with IHR article 22, coordination between the competent authority and the Saudi Customs, the SFDA and MEWA.

- Enhance the capacity of human resources at PoE for the early detection, investigation and response to all hazards.

## Indicators and scores

### PoE.1 Routine capacities established at points of entry - Score 4

#### *Strengths and best practices*

- A huge number of staff have been appointed at PoE. Indeed, of the 26 000 personnel hired during the Hajj season, 1700 are assigned to points of entry.
- Cutting-edge equipped medical services are endowed with large premises and skilled, trained staff.
- Ambulances are available, provided by the Fire and Rescue Services under the General Authority of Civil Aviation, Saudi Red Crescent, MoH and private companies.
- Meningitis vaccination is verified (quadrivalent meningococcal vaccine against serogroups A,C,W135,Y); chemoprophylaxis is provided to unvaccinated pilgrims and those from meningitis belt countries; polio vaccine is given to unvaccinated pilgrims from certain countries according to WHO recommendations; and yellow fever vaccination is verified for the pilgrims from affected or endemic countries. Medical follow-up is carried out for unvaccinated pilgrims.
- Health promotion and education is carried out through sensitization and the distribution of pamphlets.
- Conveyances are systematically inspected, complemented by the check of disinfection certificates.
- The competent authority has full membership in the facilitation committees at points of entry.

#### *Areas that need strengthening and challenges*

- The surveillance, and the vector control programmes carried out by the Directorate of Health Affairs should be expanded, including the entomological surveillance of mosquito and adult larvae, to non-designated points of entry.
- Apart from Jeddah Islamic Port, which issues three Ship Sanitation Certificates, the other seven seaports should be enabled to issue Ship Sanitation Control Certificates and Ship Sanitation Control Exemption Certificates, in addition to the extension certificates which they already issue on a regular basis.
- Conveyance inspection at airports needs to be generalized to include the check of the Aircraft General Declaration, even out of Hajj season.
- The functioning supervisory system activities should be reinforced and completed to ensure a safe environment at the designated PoE, and the process accelerated for their duplication at non-designated PoE (food safety, potable water and liquid and solid waste management).

### PoE.2 Effective public health response at points of entry - Score 4

#### *Strengths and best practices*

- Public health emergency contingency plans, incorporated within local emergency plans, are available, documented and tested at the designated points of entry.
- The competent authority has full membership, at points of entry, in the EOCs.
- Pre-arrangements are in place with facilities to assess and quarantine suspect travellers and/or animals.
- Appropriate spaces are available, on site, to interview and assess suspected or affected travellers.
- Adequate isolation rooms are available at points of entry.
- Personal protective equipment and hand held infrared thermometers are available.

### **Areas that need strengthening and challenges**

- Emergency contingency plans need to be validated at non-designated PoE and incorporated within the general PoE emergency plans. Additionally, exercises/drills should be conducted to test these plans and consider any necessary update.
- The development and testing of SOPs for the safe transfer of infected/contaminated travellers to pre-designated health facilities should be considered.
- Awareness needs to be made among airlines crews by promoting the International Air Transport Association procedure regarding the detection of suspected cases on-board, as well as the use of the Passenger Locator Form and the PANS-ATM doc 4444.
- Voluntary requests for the WHO certification of PoE, as well as CAPSCA<sup>4</sup> visits, should be considered.

<sup>4</sup> CAPSCA: Collaborative Arrangements for the Prevention and Management of Public Health Events in Civil Aviation.

# Chemical events

## Introduction

Timely detection of, and effective response to potential chemical risks and/or events requires collaboration with other sectors responsible for chemical safety, industry, transportation and safe disposal. This requires State Parties to have surveillance and response capacity to manage chemical risks or events and effective communication and collaboration among the sectors responsible for safety.

### Target

*States Parties with surveillance and response capacity for chemical risks or events. This requires effective communication and collaboration among the sectors responsible for chemical safety, industries, transportation and safe disposal.*

## Saudi Arabia level of capabilities

Saudi Arabia has high capabilities and capacities to deal with chemical events, and is slowly moving towards establishing a national chemical safety body to consolidate and streamline the following areas:

- Surveillance and response for chemical events, intoxication and poisonings.
- Information exchange between key government sectors involved in chemical events.
- Functional mechanisms for multisectoral collaboration.

Guidelines or manuals for key government sectors involved in chemical events and any associated SOPs on intoxication and poisoning are developed based on the National Plan for Chemical Events (NPCE) with roles and responsibilities clearly defined. Major chemical and oil companies, e.g. ARAMCO and SABIC, have their own guidelines or manuals, which are also developed based on the NPCE.

There are nine poison centres located in different regions of Saudi Arabia, all of which have surveillance in place and are accredited with full laboratory capacity to confirm priority chemical events. Key government sectors involved in chemical events have their own databases in place to promote timely and systematic information exchange between chemical and surveillance units and other relevant sectors on urgent chemical events and potential chemical risks and their response.

Standard planning, environmental permits and specific regulations are in place for the control of major hazard sites and facilities such as ARAMCO and SABIC, where comprehensive inventories are required. Key government sectors involved in chemical events are well equipped with detection, identification and monitoring, and personal protective equipment. In addition, sampling and detection, identification and monitoring are securely carried out by government sectors involved in chemical events.

Key government sectors involved in chemical events participate in multisectoral collaborations and Saudi Arabia is involved with international chemical/toxicological networks, e.g. the Strategic Approach to International Chemicals Management.

## Recommendations for priority actions

- Continue to improve multisectoral collaborations and promote data and information exchange with transparency and progress towards the One Health goal.

- Achieve internationally recognized accreditation for government laboratories, in addition to the national accreditation system already in place.
- Test and update national policies and guidelines or manuals and associated SOPs on chemical events through occurrence of real event or simulation exercises on a national level involving key government sectors.

## Indicators and scores

### **CE.1 Mechanisms established and functioning for detecting and responding to chemical events or emergencies - Score 4**

#### ***Strengths and best practices***

- The NPCE has a traffic light system that indicates strategic triggers with descriptions of key government sectors, their functions in detecting and responding to chemical events, and business continuity.
- Guidelines or manuals are available for key government sectors on surveillance, assessment and management of chemical events, intoxication and poisoning, all based on the NPCE. Although major chemical and oil companies have their own guidelines, these are also based on the NPCE.
- All nine poison centres located in different regions of the country have surveillance in place and are accredited with full laboratory capacity to deal with chemical events, intoxication and poisonings. In addition, online resources are available to hospital and medical staff, including treatment protocols for exposure to some chemicals. These protocols will continue to be developed.
- A support network is in place to promote more systematic analysis by the SFDA.
- Key government sectors involved in chemical events have their own databases to promote secure data and information exchange in a timely and systematic manner. Early alert summaries are produced and multisectoral meetings regularly held for chemical surveillance, environmental monitoring and incident reporting.
- Saudi Arabia is developing its own national database to include data and information, such as material data sheets, safety data sheets, and contact details of manufacturers.

#### ***Areas that need strengthening and challenges***

- Multisectoral collaboration should be improved and secured data and information exchange promoted with transparency in order to achieve the One Health goal.
- Internationally recognized accreditation is necessary for government laboratories, in addition to the national accreditation system in place.

### **CE.2 Enabling environment in place for management of chemical events - Score 4**

#### ***Strengths and best practices***

- Regulations are in place to ensure and promote data and information exchange and collaboration between key government sectors involved in chemical events.
- Elements of alerts, e.g. SOPs for coverage, criteria of when and how to alert, duty rosters, are included in guidelines or manuals developed for key government sectors on the surveillance, assessment and management of chemical events, intoxication and poisonings.
- Roles and responsibilities are clearly defined in the NPCE, guidelines, manuals and SOPs for key government sectors dealing with chemical incidents.
- In addition to standard planning and environmental permit regulations, specific regulations are in place for the control of major hazard sites and facilities, e.g. ARAMCO and SABIC, for which comprehensive inventories are produced.

- Key government sectors involved in chemical events are well equipped with detection, identification and monitoring, and personal protective equipment, and can securely carry out sampling.
- Functional, multisectoral mechanisms are in place for collaboration on chemical events, e.g. regular joint exercises on a local scale, conferences open to external participation, professional development and training, and research and development.
- Saudi Arabia participates in international chemical/toxicological networks, e.g. the Strategic Approach to International Chemicals Management, and in establishing focal points, writing and peer-reviewing documents, assisting with training and making available expertise and knowledge to the international community.

#### ***Areas that need strengthening and challenges***

- National policies, plans and legislation for chemical event surveillance alert and response need to be consolidated and streamlined.
- National policies, guidelines, manuals and associated SOPs on chemical events should be tested and updated through real events or simulation exercises at a national level involving key government sectors.

# Radiation emergencies

## Introduction

To counter radiological and nuclear emergencies, timely detection and an effective response towards potential radiological and nuclear hazards/events/emergencies are required in collaboration with sectors responsible for radiation emergency management.

### Target

*States Parties with surveillance and response capacity for radiological and nuclear hazards/events/emergencies. This requires effective communication and collaboration among the sectors responsible for radiological and nuclear emergency management.*

## Saudi Arabia level of capabilities

In the area of radiation emergencies, Saudi Arabia established through Royal Decree the King Abdullah City for Atomic and Renewable Energy (KA CARE). Articles 4 and 5 transferred the roles and responsibilities from King Abdulaziz City for Science and Technology to KA CARE including nuclear and radiological safety and security of public, workers and other tasks including, but not limited to: setting radiation protection policy, procedures and authorities; capacity-building; monitoring radiation exposure; and developing a emergency response plan.

Saudi Arabia has formed a permanent National Committee to respond to radiological and nuclear emergencies; the Committee consists of all main response and support organizations, including Civil Defence as Incident Commander, and the MoH as the health response entity. The country has approved both a national plan and a medical plan to respond to radiological and nuclear emergencies. The plans define roles and responsibilities of all concerned entities. Moreover, Saudi Arabia is a party on the GCC regional radiological and nuclear emergency preparedness and response plan, led by the GCC Emergency Management Centre in Kuwait, which manages the Plan. Saudi Arabia is also a member of the International Atomic Energy Agency conventions for early notification and request for assistance and continuously participates in that agency's training and exercises.

## Recommendations for priority actions

- Communicate the medical requirements and priorities through the permanent national committee to respond to radiological and nuclear emergencies.
- Harmonize the response organization procedures for radiological and nuclear emergencies, including the national public health plan.
- Conduct an assessment of the medical sector related to radiation emergencies, workforce capabilities, equipment and health facilities.
- Improve participation of the medical sector in national and international exercises and training, to identify areas of improvement.

## Indicators and scores

### RE.1 Mechanisms established and functioning for detecting and responding to radiological and nuclear emergencies - Score 4

#### *Strengths and best practices*

- KA CARE is linked with international and national organizations as the national warning point. Systematic information exchange is in place between the response organizations (Civil Defence as Incident command and MoH for designated hospitals) for radiological events and potential risks.
- International standards related to emergency planning are closely followed for interventional level early and long-term countermeasures such as shelter, evacuation and return, thyroid-blocking, food, and agriculture.
- A permanent National Committee has been formed to respond to radiological and nuclear emergencies and be responsible for the next phase of emergency preparedness, response and recovery.
- The Government has performed safety assessments on radiation dose estimates for the general public. Calculations are based on official data on radioactivity in air, soil, water and food supplies post Fukushima nuclear accident in Japan.
- A survey has also been conducted in the provinces to verify the need for additional guidelines for use by public health authorities during radiological or nuclear emergency interventions.
- In the National Response Plan for Radiological and Nuclear Emergencies, approved by the Prime Minister in 2008, the SFDA is responsible for monitoring imported food. However, KA CARE still manages and regulates the industry at present.
- The national medical plan for radiological and nuclear emergencies has designated a focal point for coordination and communication with the MoH and IHR NFP.
- Monitoring stations are able to detect radiation in areas surrounding the Kingdom.

#### *Areas that need strengthening and challenges*

- The draft Nuclear Law for an independent nuclear regulatory body should be considered, with cooperation and coordination with other stakeholders.
- Implementation of international conventions, e.g. on early notification of a nuclear accident, and on assistance in the case of a nuclear accident or radiological emergency, need further improvement.
- Access to health facilities that can manage patients of radiation emergencies should be enhanced and radiation emergency response drills regularly conducted.
- Coordination needs to be developed with WHO's Radiation Emergency Medical Preparedness and Assistance Network through the focal point at the MoH (which needs to be updated).
- Guidelines are needed to assist public health authorities to support decision-making during planning and managing an emergency response to a radiological or nuclear accident.
- Laboratory tools, techniques, and procedures for systematic analyses need to be revised, enhanced and updated.

### RE.2 Enabling environment in place for management of radiation emergencies - Score 4

#### *Strengths and best practices*

- The national plan for radiological and nuclear emergencies is up-to-date, implemented, and has a structure for coordinating responses among the main stakeholders.

- The Permanent National Committee for Response to Radiological and Nuclear Emergencies facilitates and coordinates multisectoral functions, including information sharing, updating SOPs, and assessments.
- Policies and regulations are in place concerning the transportation of radioactive materials, samples and waste materials.
- Laboratory capacity is available for the systematic analysis of radiation emergency samples.

#### ***Areas that need strengthening and challenges***

- A Nuclear Law is under development to regulate the peaceful nuclear energy projects under way in the Kingdom. Meanwhile, KA CARE is responsible for the ad hoc coordination of the different stakeholders to regulate the nuclear industry.
- A self-assessment should be conducted with a view to prioritizing the needs of the medical sector related to radiation emergencies, workforce capabilities, training, equipment and health facilities.
- Participation of the medical sector in national and international exercises and training should be increased, and areas for improvement identified. In addition, more drills are needed to test the emergency plans.
- Procedures for radiological and nuclear emergencies should be harmonized among the response organizations, including the detailed national medical plan.
- Human resources will have to increase significantly to meet radiation safety needs of the planned nuclear power plant in Saudi Arabia.

# Annex 1: Joint External Evaluation background

## Mission place and dates

Riyadh, Kingdom of Saudi Arabia, 12–16 March 2017.

## Objectives

- Assess the implementation of 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 IHR capacities.
- Recommend priority actions to update and finalize the national plan to achieve and maintain IHR capacities for global health security.

## Mission team members

- Kashef Ijaz, (Lead) Centre for Global Health, Division of Global Health Protection, Centres for Disease Control and Prevention, Atlanta GA, United States of America
- Dalia Samhouri, (Co-Lead) Country Health Emergency Preparedness and IHR, Health Emergency Program, WHO Regional Office for the Eastern Mediterranean, Cairo, Egypt
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- Fahad Al Bloushi, Emergency Preparedness and Response, Federal Authority For Nuclear Regulation, Dubai, United Arab Emirates
- Mohammed Moussif, Public Health Department, Mohammed V International Airport, Casablanca, Morocco
- Laura Ngo-Fontaine, Communications and Advocacy specialist, Geneva, Switzerland

## Preparation and implementation of the mission

Prior to the visit, several communications took place between assessment team members and experts in Saudi Arabia to review the agenda, responsibilities, and logistics. A national training was conducted

on 23–24 February 2017 to provide national stakeholders with the information and resources necessary to participate successfully in the JEE process; and to provide guidance on self-reporting requirements and responsibilities. Background documents were collected and shared with the JEE team along with the complete JEE tool for review.

One-day orientation was provided to the JEE external experts on the JEE process and tool, objectives and expected outcomes, and to discuss and finalize the agenda of the mission.

Meetings with the relevant stakeholders and field visits were conducted to validate the collected information and to reach a consensus on the scores and priority actions. A debriefing meeting was held with senior officials and national technical teams involved in the evaluation to present the outcomes of the JEE, best practices and priority actions.

### **Limitations and assumptions**

- The evaluation lasted one week, which limited the amount and depth of information that could be managed. Field visits were conducted to Jeddah, Dhahran and Madinah to look at EOCs and points of entry. There was insufficient time to visit other cities in the Kingdom.
- The results of this evaluation will be made publicly available.
- Information provided by the Kingdom is not independently verified, but was jointly discussed and an assessment rating mutually agreed by the external assessment team and the Saudi counterparts.

### **Key host country participants and institutions**

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Dr.Inas Abdul Aziz Ibrahim	General Department of Infectious Diseases Control,
Dr.Zahir Mohamed Al Amin	General Department of Infectious Diseases Control,

### Supporting documentation provided by host country

#### IHR coordination, communication and advocacy

- Royal Decree for the establishment of the IHR National Focal Point function.
- Notification system in Saudi Arabia.
- Nominations letter for the IHR focal points in different sectors.
- Health surveillance system at points of entry.
- Executive regulations for health surveillance system at points of entry.
- Health condition for pilgrims.
- External assessment reports for points of entry, food safety, EPI.

- Drill documents.
- Reports of Ministry of Environment Water and Agriculture on animal to human Middle East respiratory syndrome cases.

## Antimicrobial resistance

- National AMR Committee RFP.
- National Action Plan.
- All technical committee action plans.
- Appointment of AMR leader.
- Meeting minutes of committees.
- Core components in Infection Prevention and Control.
- National Infection Prevention and Control manual.
- Infection control audit tool.
- Microbiology lab policies and procedures.
- Ministry of Environment Water and Agriculture lab policies and procedures.
- MEWA document on number of farms and sentinel site for AMR surveillance.
- GDIPC document on IPC staff in tertiary care hospitals.
- GDIPC document on isolation rooms in hospitals.

## Food safety

- National verbal presentation during plenary.
- National presentations on Laboratory Monitoring Food Contaminants, Microbiology Section during the visit to the SFDA laboratory.
- JEE national self-assessment for the technical area "Food Safety".

## Biosafety and biosecurity

- Laboratory safety management programme. National Guard Health Affairs, doc. reference # 7010-05-12-0003, 01 March 2010.
- Implementation, maintenance, inspection of safe working practice. National Guard Health Affairs, doc. reference # 7010-05-12-0004, 01 March 2010.
- Microbiological hazards and specimen safety. National Guard Health Affairs, doc. reference # 7010-05-12-0041, 01 March 2010.
- Bioterrorism agents policy. Riyadh Regional Laboratory, Ministry of Health, doc. reference # DPP-BAC-0051 (V4), 02 May 2017.
- Laboratory infection control manual. Riyadh Regional Laboratory, Ministry of Health, doc. reference # RRL-LAB- INFECTION CONTROL MANUAL (V3), 2015.
- Laboratory safety manual. Riyadh Regional Laboratory, Ministry of Health, doc. reference # RRL-SAFETY MANUAL (V3), 2015.

## Immunization

- NITAG meeting agenda and minutes.
- Circulars between MoH and medical supply directorate and other stakeholders as needed.
- Comprehensive multi-year and annual plans.
- Desk review report.
- Coverage survey proposal.
- National Immunization Schedule.
- Catch up Immunization Schedule.
- Annual WHO/UNICEF joint report.
- Monthly statistical reports from regions.
- WHO MR report.

## National laboratory system

- CBAHI quality standards for health laboratories.
- Royal decree No. M/3 on National Laboratory System, issued on 8/2/1423.
- Scope of services for different tiers of laboratory network, Ministry of Health.
- General policy and procedures manual for mycobacteriology reference laboratories, Ministry of Health.

## Real-time surveillance

- Guidelines notification of infectious diseases (sixth ed. 2016); MoH,
- [www.moh.gov.sa/Portal/Whatsnew/Pages/default.aspx](http://www.moh.gov.sa/Portal/Whatsnew/Pages/default.aspx).
- Guidelines of infectious diseases policy and procedures (p 12 reporting to WHO); MoH.
- Guidelines of veterinary hospitals and clinics; MEWA, [www.irshadvetsu.com/mwg-internal/](http://www.irshadvetsu.com/mwg-internal/).
- Veterinary brochures; MEWA.
- The law of veterinary medicine practice in the Gulf countries; MEWA, [www.irshadvetsu.com/blog/2016/05/---2](http://www.irshadvetsu.com/blog/2016/05/---2).
- Animal protection law for the Gulf Countries Council; MEWA
- [www.boe.gov.sa/printsystem.aspx?lang=ar&systemid=350&versionid=326](http://www.boe.gov.sa/printsystem.aspx?lang=ar&systemid=350&versionid=326)
- [www.moa.gov.sa/webcenter/faces/systemRegulations/UCM\\_conn\\_u23\\_dDocName\\_u3a\\_UCM\\_071583](http://www.moa.gov.sa/webcenter/faces/systemRegulations/UCM_conn_u23_dDocName_u3a_UCM_071583)
- OIE World Animal Health Information System (reports); MEWA.
- Circular of mandatory reporting all over the country; MoH.
- Circular of mandatory reporting all over the country through electronic system (HESN); MoH.
- The system of practicing health profession; MoH, [www.nazaha.gov.sa/mwg-internal/de5fs23hu73ds/progress](http://www.nazaha.gov.sa/mwg-internal/de5fs23hu73ds/progress).
- Ministerial decree to form an infectious diseases committee; MoH.
- Letter from SFDA showing intersectoral collaboration in health matters.

- Royal order of forming an intersectoral committee (MoH, MEWA, Ministry of Interior affairs, SFDA, Ministry of Finance, Municipality); MoH.
- Preventive medicine Hajj committee objectives; MoH.

## Reporting

- Guidelines of infectious diseases policy and procedure (p 12 reporting to WHO); MoH.
- Guidelines of veterinary hospitals and clinics, MEWA, [www.irshadvetsu.com/mwg-internal/](http://www.irshadvetsu.com/mwg-internal/).
- Veterinary brochures; MEWA.
- The law of veterinary medicine practice in the Gulf countries; MEWA, [www.irshadvetsu.com/blog/2016/05/----2](http://www.irshadvetsu.com/blog/2016/05/----2).
- Animal protection law for GCC countries; MEWA, [www.boe.gov.sa/printsystem.aspx?lang=ar&systemid=350&versionid=326](http://www.boe.gov.sa/printsystem.aspx?lang=ar&systemid=350&versionid=326), [www.moa.gov.sa/webcenter/faces/systemRegulations/UCM\\_conn\\_u23\\_dDocName\\_u3a\\_UCM\\_071583](http://www.moa.gov.sa/webcenter/faces/systemRegulations/UCM_conn_u23_dDocName_u3a_UCM_071583).
- OIE Animal Health Information System (reports): MEWA.
- Circular of mandatory reporting all over the country; MoH.
- Circular of mandatory reporting all over the country through electronic system (HESN); MoH.
- The system of practicing health profession; MoH, [www.nazaha.gov.sa/mwg-internal/de5fs23hu73ds/progress](http://www.nazaha.gov.sa/mwg-internal/de5fs23hu73ds/progress).
- Ministerial decree of forming an infectious diseases committee; MoH.
- Letter from SFDA on intersectoral collaboration in health matters; SFDA.
- Royal order on forming an intersectoral committee (MoH, MEWA, Ministry of Interior, SFDA, Ministry of Finance, Municipality); MoH
- Preventive medicine Hajj committee objectives; MoH.
- Print of outbreak news; MoH.
- Exercise of Ebola case in Jeddah airport, MoH.
- Minutes of meetings.

## Workforce development

- Statistics of the MoH; Healthcare Strategy in the Kingdom [www.moh.gov.sa/Ministry/Statistics/book/Documents/%D8%A7%D9%84%D9%83%D8%AA%D8%A7%D8%A8%D9%8A%D9%84%D8%A5%D8%AD%D8%B5%D8%A7%D8%A6%D9%8A%D9%84%D8%B3%D9%86%D9%88%D9%8A%D9%85%D9%87%D9%80.pdf](http://www.moh.gov.sa/Ministry/Statistics/book/Documents/%D8%A7%D9%84%D9%83%D8%AA%D8%A7%D8%A8%D9%8A%D9%84%D8%A5%D8%AD%D8%B5%D8%A7%D8%A6%D9%8A%D9%84%D8%B3%D9%86%D9%88%D9%8A%D9%85%D9%87%D9%80.pdf).
- Statistics of MEWA.
- MoH infectious disease reporting system Health Electronic Surveillance Network (HESN).
- MEWA national reporting system.
- Documents for establishing the CCC: centrally and regionally.
- Document for establishment of Saudi FETP; Saudi Arabia and MoH.
- Documents for FETP curriculum, rules and regulations, faculty, short courses, FETP graduates contact list and placements, [www.fetp.edu.sa/DFEcourse\\_Layout.php](http://www.fetp.edu.sa/DFEcourse_Layout.php).

- Documents for other long-term national training programmes.
- Documents for MEWA veterinary workforce training programmes.
- Agreements with International bodies for providing training in public health, e.g. CDC, Emory University, Liverpool University.

## Preparedness

- Presentation from MoH.
- Interviews with officials from the Ministry of Health, Ministry of Interior, Ministry of Defence and Dammam General Hospital staff.
- Site visit at Dharaan Military Complex and Eastern Province Civil Defence facilities.

## Emergency response operations

- Presentation from MoH.
- Interviews with officials from MoH, Ministry of Interior, Ministry of Defence and Damman General Hospital staff.
- Site visit at Eastern Province facilities.
- Staff guides for facilities.

## Linking public health and security authorities

- Civil Defence Act.

## Risk communication

- Risk Communication Capacity Assessment, 2015.
- Hajj 2016 Operational Plan for Public Communications.
- Hajj 2016 Media Preparation Plan.
- Hajj 2016 SOPs for Communications.
- Hajj 2016 Emergency Plan.
- Social Intelligence Project for Hajj: Concept Paper and Results Report.
- Heat Stroke Infographic (English and Arabic versions).
- Risk Communication Training Course Concept Paper.
- Risk Assessment and Recommendations for Risk Communication.
- Memorandum of Understanding with the General Presidency for the Affairs of the Grand Mosque and the Prophets Mosque (Risk Assessments).
- Memorandum of Understanding with Um Al-Qura University (training of rapid response teams).

## Points of entry

- Royal Decree, N° M/47 on 07/08/1433 of the Hegira, regarding the implementation of health control, according to the IHR, at the points of entry.
- Procedure of application of the above-mentioned Royal Decree, 2012.

- Health care and preventive measures during Hajj, at Jeddah Islamic Port.
- Manual of procedures of the border health control at points of entry. General Directorate of Communicable Diseases, Department of Public Health, Ministry of Health, 2012.
- Evacuation plan in case of disaster or emergency. Border Health Control, Jeddah International Airport.
- Public health emergency contingency plan, Jeddah International Airport.
- Public health emergency contingency plan and drill documents, Al Madinah International Airport.
- Public health emergency contingency plan and drill documents, Jeddah Islamic Port.
- WHO report regarding the assessment of the IHR core capacities at points of entry, Saudi Arabia, 2–7 September 2015.

## Chemical events

- Law of Chemicals Import and Management.
- National Plan for Chemical Events (Civil Defence).
- PME Assessment of Chemical Management.
- MoH Public Health Plan for Chemical Emergencies.
- MoH System of Surveillance and Monitoring for Chemical Incidents.
- Chemical Management from ARAMCO and SABIC.
- Documents from SFDA.

## Radiation emergencies

- National plan to respond to radiological and nuclear emergencies.
- National medical plan for radiological and nuclear emergencies.
- GCC, regional radiological and nuclear emergency preparedness and response (RNEPR) plan.
- Royal Decree establishing King Abdullah City for Atomic and Renewable Energy.
- Draft evaluation report for the current practices of the management of chemical and hazardous materials including radioactive transportation in Saudi Arabia.
- Safety requirements and preventive supervision, Part IV: requirements for preventive hazardous materials, Civil Defence; Ministry of Interior.
- Basic Regulation for Radiation Protection against Ionizing Radiation.
- Regulations for Safe Transport of Radioactive Materials.
- Regulations for Radioactive Waste Management.
- International Atomic Energy Agency related documents:
  - BSS Safety Series No. 115 (1996)
  - Safe Transport No. TS-R-1 (2000)
  - Regulations for the Safe Transport of Radioactive Material; 2009 Edition for protecting people and the environment No. TS-R-1 Safety Requirements.
- IAEA convention on early notification of a nuclear accident.
- IAEA convention on assistance in the case of a nuclear accident or radiological emergency.
- Samples of licensing applications for the industrial and medical sectors.

