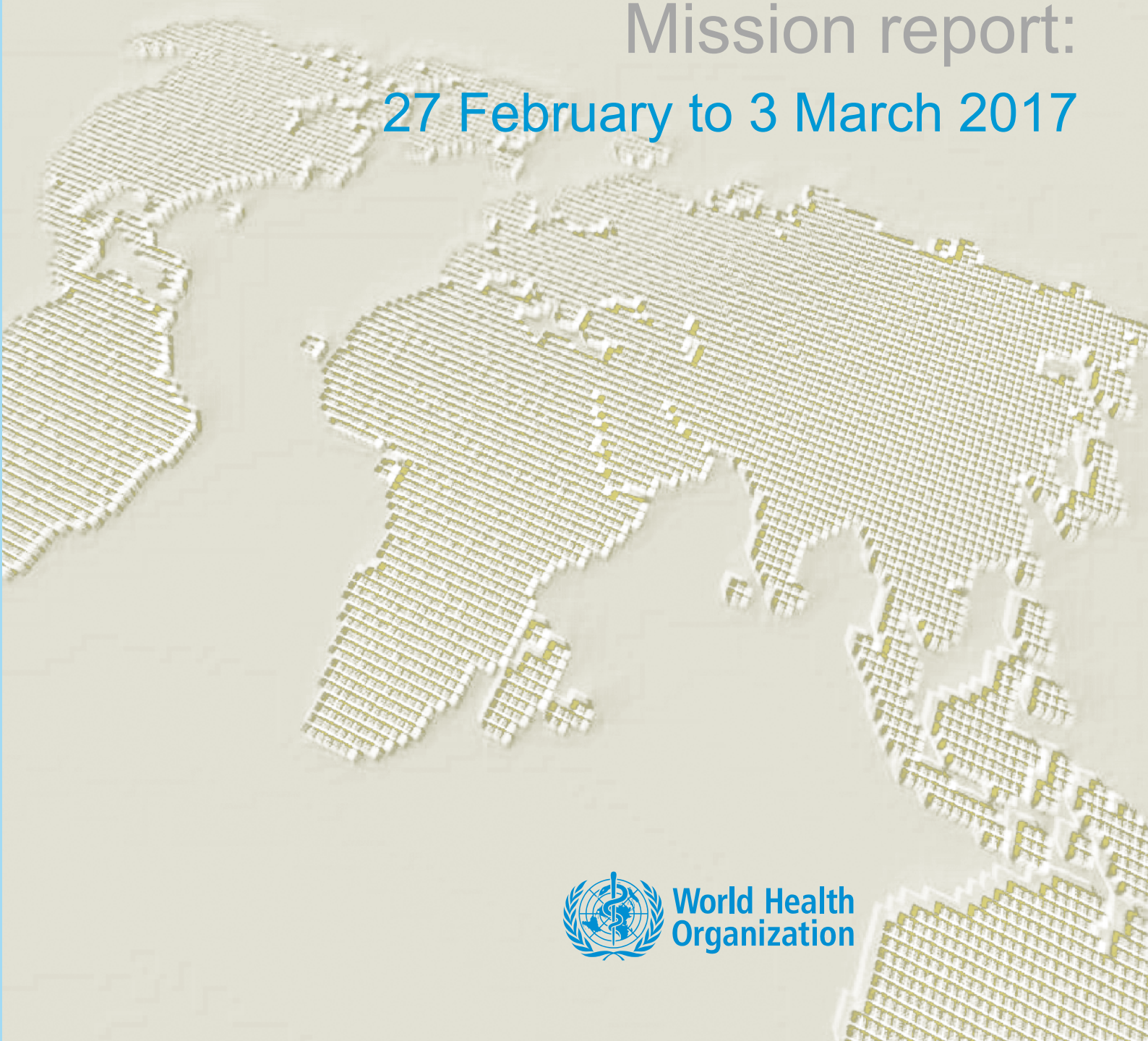
JOINT EXTERNAL EVALUATION OF IHR CORE CAPACITIES

of the

REPUBLIC OF KENYA

Mission report:

27 February to 3 March 2017



World Health Organization

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Contents

Abbreviations

AMR	antimicrobial resistance
CDC	United States Centers for Disease Control and Prevention
EAC	East African Community
EOC	emergency operations centre
FAO	Food and Agriculture Organization of the United Nations
FELTP	Field Epidemiology and Laboratory Training Programme
IDSR	Integrated Disease Surveillance and Response
IHR	International Health Regulations
IPC	infection, prevention, control
JEE	Joint External Evaluation
MoU	memorandum of understanding
NDMU	National Disaster Management Unit
NDOC	National Disaster Operation Centre
NFP	national focal point
OIE	World Organisation for Animal Health
SOPs	standard operating procedures
UNICEF	United Nations Children's Fund
WHO	World Health Organization
ZDU	Zoonotic Disease Unit

Executive summary – findings from the joint external evaluation

Key best practices/strengths

Prevent

Legislative mechanisms exist and several laws have been reviewed, or are being reviewed, to align them to the Constitution of Kenya. Further, multilateral and bilateral agreements and memoranda of understanding (MoUs) exist between the Government of Kenya and the relevant regional bodies and countries, respectively. There are also cross-border protocols for cooperation and a regional laboratory network exists.

Formal mechanisms for intersectoral coordination between human and animal health exist, including: the IHR national focal point (NFP) in the office of the Director of Medical Services, the Zoonotic Disease Unit (ZDU) and the National Task Force Committee. Secondly, informal exchanges of information between ministries exist, based on personal contacts and good will.

A multidisciplinary Antimicrobial Stewardship Advisory Committee on antimicrobial resistance (AMR) surveillance is in place at national level, and a national strategy policy and action plan for AMR has been jointly drafted by the Ministry of Health and Ministry of Agriculture, Livestock and Fisheries. With respect to zoonotic diseases, there is a One Health technical working group, a Zoonotic Disease Unit (ZDU) jointly established by the Ministry of Health and Ministry of Agriculture, Livestock and Fisheries with competent staff to support coordination at national level, and the One Health approach has been introduced in 32 of 47 counties and staff trained.

A multisectoral approach on food safety is followed at national level and a National Food Safety Coordination Committee is in place. There is a Biosafety Act addressing genetically modified organisms, and collaboration among key sectors involved in biosafety and biosecurity is relatively good. Importantly, standard operating procedures (SOPs), safety protocols, job aids and safety signage exist and the country is developing pathogen control in some facilities. Further, a waste management mechanism is available.

Immunization services are provided free of charge to communities, through public and private health facilities, and faith-based organizations, with a dedicated budget line for immunization and multisectoral involvement in service delivery. There is strong political commitment and involvement of leadership in immunization programmes.

Detect

There is country capacity to conduct all 10 WHO core tests for human and animal health, with trained and competent personnel and good infrastructure. There is laboratory ISO accreditation and the country participates in the Strengthening Laboratory Management Toward Accreditation programme. A robust indicator surveillance system is in place and is used by both the human and animal health sectors in all counties and sub-counties. The country has proven experience in investigating and reporting potential public health emergencies of international concern both to WHO and OIE. There is a mature Field Epidemiology and Laboratory Training Programme (FELTP), which is three-tiered and has trained hundreds of highly qualified field epidemiologists in human and animal health.

Respond

The National Disaster Management Unit (NDMU) has an exemplary strategic plan with delegated functions for all relevant sectors, including the health sector which is developing a draft all-hazards plan. There is a functioning public health emergency operations centre (EOC) with ongoing monitoring capacity and

an established system for data collection analysis and dissemination, leading to better coordination and improved response.

With respect to linking public health and security authorities, the legal framework to cover interagency cooperation and coordination is in place and well understood by relevant sectors, including specific provisions under the Public Health Act, the Security Laws Act, the Food, Drug and Chemicals Substances Act, the Meat Control Act and the Animal Diseases Control Act.

In terms of deployment of medical countermeasures and personnel, various multilateral and bilateral agreements exist to support sending and receiving of medical countermeasures and personnel during emergencies. The recent experience with African Union Support to the Ebola Outbreak in West Africa (ASEOWA) for Ebola virus disease in West Africa and Marburg virus disease in Uganda offer lessons for scale up and institutionalization.

Risk communication is identified as a technical area in the National Disaster Response Plan, and draft guidelines on risk communication exist for the Ministry of Health. Further, the Ministry of Health and the Ministry of Agriculture, Livestock and Fisheries have units for coordination with permanent dedicated communications staff.

Other IHR-related hazards and points of entry

The majority of points of entry have emergency contingency plans for a variety of hazards, with the roles of partner agencies clearly stated. There are numerous plans and legislative frameworks which support the potential for Kenya to have a strong enabling environment for the management of chemical risks and events. In addition, there is core capacity for radiation emergency response, able to address most of the low intensity radiation incidents in Kenya.

Areas which need strengthening /priority actions

Prevent

- Conduct a comprehensive review/assessment of the existing laws and policies in all relevant sectors to ensure they address the IHR (2005) and the One Health approach.
- Establish budget lines for IHR (2005) in all key sectors to facilitate domestic resource mobilization and ensure sustainability.
- Conduct an evaluation of the IHR NFP to describe the structure, priorities and effectiveness, and formalize multisectoral and multidisciplinary collaboration in the implementation of IHR that is aligned with the NNMU strategic plan.
- Clarify the chain of communication and command between the national EOC and other EOCs.
- Establish an inter-ministerial committee for political oversight of IHR and One Health.
- Conduct county (province) level sensitization of county assemblies on IHR and One Health.
- Formalize mechanisms for timely information sharing between animal/wildlife, human and other relevant sectors, including surveillance and laboratory data.
- Improve capacity for a timely response to foodborne reports and events especially at county and sub-county (district) levels, reinforce management of foodborne outbreaks, and conduct simulation exercises if there are no real food safety events.
- Implement the national AMR surveillance system strategy, including surveillance in the animal health sector.
- Implement the national IPC strategy.
- Fast-track the approval of the Bioscience Bill to clarify roles and responsibilities, mandates, oversight and regulation of relevant sectors.

- Develop county-specific multi-year plan for immunization with an expenditure tracking component; develop capacity of health workers and lower level managers to deliver immunization services; reduce missed opportunities for vaccination; and institutionalize and improve the quality of microplans with a bottom-up approach to reach the unreached children with immunization.

Detect

- Establish a database of laboratory testing capacities to determine the proportion of population with access to laboratory services for the 10 priority tests.
- Develop a refresher training curriculum on specimen referral system for animal health sector at sub-county level.
- Strengthen the quality management system mechanism for point-of-care testing.
- Incorporate laboratory data into reporting systems in both the human and animal health sectors.
- Review protocols, regulations and structures that govern reporting and procedures for multisectoral collaboration and response to a potential public health emergency of international concern to WHO/OIE.
- Develop a One Health workforce strategy with coordination between various ministries based on workforce mapping.

Respond

- Fast-track the completion, testing and dissemination of the all-hazards plan, aligned with the NDMU Emergency Response Plan.
- Consolidate risk assessments for all emergencies, map resources and potential partners.
- Ensure dedicated funds for the EOC to strengthen its capacity and ensure sustainability.
- Operationalize the technical working group to support improved linkage between public health and security authorities through activities such as developing specific IHR-related hazard SOPs and MoUs/terms of reference.
- Develop a framework to guide and support deployment of medical countermeasures and medical personnel during public health emergencies .
- Develop a comprehensive risk communication plan as part of the all-hazards plan, and improve knowledge and capacity of risk communication principles and its role in preparedness, response and recovery.

Other IHR-related hazards

- Capacity-building support is needed to expand coverage to all points of entry, including for isolation facilities, clinical facilities and ambulance services, and for development of locally adapted emergency response SOPs.
- To allow for more effective prevention, detection and response to chemical risks and events there is a need for formalized multisectoral coordination.
- Enact legislation, and formulate national policies and plans for detection, assessment and response to radiation emergencies.

Immediate next steps

1. Disseminate and publish the JEE report in consultation with the national authorities.
2. Finalize a costed national action plan for health security anchored on the One Health approach, which is aligned with sector strategies and based on a whole-of-government, whole-of-society approach.

Kenya scores

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

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

PREVENT

National legislation, policy and financing

Introduction

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

Target

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

Kenya level of capabilities

Kenya has existing legislation which covers most of the IHR (2005) core capacities, including: the Public Health Act (which provides for reporting of notifiable diseases); the Food, Drugs and Chemical Substances Act; the Environment Management and Co-ordination Act; the Malaria Prevention Act; the Meat Control Act; the Animal Diseases Act; and the Kenya Veterinary Policy, 2015. Further, in 2012, the Ministry of Health reviewed its technical guidelines for integrated disease surveillance and response (IDSR) to incorporate the IHR (2005).

Kenya also has entered into agreements with other countries regarding public health emergencies, including:

- Kenya/Namibia human resources employment and training, 2009;
- Kenya/Botswana technical cooperation in health, 2011;
- Kenya/African Union memorandum of understanding (MoU) for health volunteers to the African Union Support to Ebola Outbreak in West Africa (ASEOWA) mission, December 2014;
- Kenya/United States of America agreement on Biological Threat Reduction, 2015;
- Ethiopia – renewed, 2016;
- East African Community (EAC) One Stop Border Posts Act, 2016 – created by EAC Heads of State for border operations, including surveillance within five countries in the EAC region;

- Kenya/Israel MoU on health cooperation – for human resources capacity-building on disaster management and emergency medicines, 2016;
- Kenya/Mexico – Letter of Intent through diplomatic notes, May–July 2016;
- Kenya/Liberia – Letter of Intent from Liberia requesting specialized clinical and public health resources to work in their health system. This entails capacity-building of human resources for health in specialized clinical and public health services, and information sharing on capacity-building in outbreaks, preparedness and response in line with the IHR, September 2016;
- EAC Protocol on Sanitary and Phytosanitary Measures – Kenya is a signatory to this protocol and the ratification process is ongoing.

Kenya participates in EAC cross-border surveillance meetings and has sent support teams in response to public health emergencies in neighbouring countries and during the Ebola virus disease outbreak. EAC and Intergovernmental Authority on Development partner states, including Ethiopia and South Sudan, held a joint meeting and released a communiqué on joint preparedness and response to the Ebola virus threat in 2014. Kenya also sent 171 volunteers to Liberia and Sierra Leone through the ASEOWA initiative led by the African Union Commission in January 2015.

With respect to financing, there is no specific budget line for implementation of the IHR (2005) within the Ministry of Health. However, each line ministry – through their departments, divisions and units – continuously mobilizes resources for implementation of their core capacity from the Government's national budget, through partners and other governments.

Recommendations for priority actions

- Conduct a comprehensive review/assessment of the existing laws and policies in all relevant sectors to determine whether they address the IHR (2005). Based on the review, conduct comprehensive revision of existing key legislation, policies and regulations to address the IHR (2005).
- Establish budget lines for IHR in all key sectors to facilitate the mobilization of domestic resources to ensure sustainable financing for full implementation of IHR core capacities.
- Establish mechanisms for monitoring and enforcing implementation of the laws and regulations as part of the national action plan for health security.

Indicators and scores

P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR (2005) - Score 2

Strengths/best practices

- Assessment of IHR core capacities was carried out in 2009, with gaps identified and recommendations provided.
- Standalone legislation and several laws covering some of the IHR core capacities exist. Legislative mechanisms exist and several laws have been reviewed, or are being reviewed, to align them to the Constitution of Kenya.
- Multilateral/bilateral agreements and MoUs with regional bodies and several countries exist.
- Cross-border protocols for cooperation are available and a regional laboratory network exists.

Areas which need strengthening/challenges

- There is a need for comprehensive revision of existing key legislation, policies and regulations to address the IHR (2005) and the One Health concept.

- There is a need to increase domestic funding for health security. This will require a resource mobilization strategy to ensure sustainable financing, which is critical for full implementation of all IHR core capacities.
- There is a need for enforcement of the implementation of existing laws.

P.1.2 The State can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with the IHR (2005) - Score 3

The country can demonstrate the existence and use of relevant laws and policies in the various sectors involved in implementation of the IHR (2005).

Strengths/best practices

- The revised technical guidelines for integrated disease surveillance and response (IDSR) 2012 incorporate the IHR (2005).
- The existing Constitution of Kenya and Kenya Health Policy have created avenues for implementation of IHR (2005).
- The existence of a formal One Health Unit has enhanced collaboration within line sectors.
- A coordination office for Biological Threat Reduction /IHR (2005) has been created to facilitate the establishment of a multisectoral, multidisciplinary focal point.

Areas which need strengthening/challenges

- There is a need to comprehensively assess/review relevant legislation to identify those that need adjustment to incorporate the IHR (2005).
- Identified legislation, other relevant legal instruments and policies should be revised; however, there is a lack of resources for policy revision.
- There is need to establish a focal point mandated to regularly meet to encourage coordination of all ongoing measures towards implementation of the IHR (2005).
- Monitoring and evaluation systems to secure the IHR agenda within existing and future policies are lacking.

IHR coordination, communication and advocacy

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 designation of an IHR national focal point (NFP), which is a national centre for IHR communications, is a key requisite for IHR (2005) implementation.

Target

The NFP should be accessible at all times to communicate with the WHO IHR regional contact points and with all relevant sectors and other stakeholders in the country. States Parties should provide WHO with contact details of NFPs, continuously update and annually confirm them.

Kenya level of capabilities

The office of the Director of Medical Services of Kenya has established a structure to coordinate the IHR (2005) at the national level, and identified potential partners and stakeholders to support implementation. A multisectoral, multidisciplinary National Task Force Committee, chaired by the Cabinet Secretary, has been established for preparedness and response to public health events. This was last activated in May 2016 for a coordinated multisectoral response to cholera and chikungunya outbreaks. Additionally, a Zoonotic Disease Unit (ZDU), which brings together human health and animal health experts, is well functioning with clear terms of reference to support IHR (2005) implementation. The ZDU recently led a multisectoral response to highly pathogenic avian influenza.

There is a new public health Emergency Operations Centre (EOC) at the Ministry of Health; development of SOPs is still in process. The National Disaster Operation Centre (NDOC), within the Ministry of Interior and Coordination of National Government, coordinates responsible ministries on national responses to disasters including public health events (e.g. radionuclear and chemical events). The NDOC is currently activated for the ongoing drought that has been declared a national disaster. In addition, a multisectoral AMR technical working group and a National Food Safety Coordinating Committee are functioning and working with the Ministry of Agriculture, Livestock and Fisheries.

The NFP has been rapidly evolving within the office of the Director of Medical Services. However, despite these efforts, multisectoral collaboration with other relevant ministries is not fully and systematically institutionalized. A National Public Health Institute is under development and will house the NFP as the national centre for IHR coordination and communication. The institute will be co-directed by the human and animal public health sectors. Mechanisms to improve terms of reference and systematic exchange of information between the NFP and other relevant platforms and sectors need to be strengthened.

A best practice that could serve as a model for other Member States is the shared leadership between human and animal sectors. The multisectoral response platforms for the IHR NFP coordinating body and National Public Health Institute are in the final development stage.

Recommendations for priority actions

- Strengthen coordination between sectors:
  - evaluate the NFP to describe its structure, priorities and effectiveness;

- formalize multisectoral, multidisciplinary collaboration in implementation of IHR (2005) between all relevant stakeholders;
- develop clear SOPs and terms of reference.

- Establish formalized mechanisms for regular data sharing and information exchange between relevant sectors and stakeholders regarding public health events, using a One Health approach.
- Strengthen advocacy, awareness and resource allocations for implementation of IHR (2005) at the highest government levels and to all relevant stakeholders.

Indicators and scores

P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of the IHR (2005) - Score 3

Strengths/best practices

- Formal mechanisms for intersectoral coordination between human and animal health sectors exist through the ZDU and the National Task Force Committee, and both participated in latest events.
- There are informal exchanges of information between ministries, although primarily through personal contacts.

Areas which need strengthening/challenges

- There is a need to formalize multisectoral coordination in implementation of IHR (2005) with the IHR NFP as the central coordinating body between all four response platforms, stakeholders and sectors with clear terms of reference that identify responsible agencies for each IHR hazard; evaluate for effectiveness and, if needed, restructure the NFP to accomplish this.
- There is no system for a systematic exchange of information between sectors, as reporting to other ministries is not mandatory. Any information is shared through bulletins and updates or through informal communications. No formal communication mechanism is established to regularly share information between line ministries.
- The IHR NFP would benefit from increased advocacy, awareness and resource allocations for IHR implementation at the highest government levels and across sectors, with specific policies and SOPs for IHR implementation. This could also include updates of IHR implementation shared with all relevant sectors.

Antimicrobial resistance

Introduction

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

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

Target

Support work being coordinated by FAO, OIE, and WHO to develop an integrated and global package of activities to combat AMR, 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 AMR; (ii) strengthened surveillance and laboratory capacity at the national and international level following agreed international standards developed as per the framework of the Global Action Plan, considering existing standards, 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.

Kenya level of capabilities

AMR has been given due consideration in Kenya in both the organizational structure of the Ministry of Health and the Ministry of Agriculture, Livestock and Fisheries. A focal point for AMR has been established under the Directorate of Standards, Quality Assurance and Regulation within the Ministry of Health, and the under the State Department of Livestock within the Ministry of Agriculture, Livestock and Fisheries.

The capabilities for AMR in Kenya have developed over time since the initiation of the infection safety programme in 2006. In 2009, a multidisciplinary working group was established and the first situation analysis on AMR was conducted in 2011. The development of the infection prevention and control (IPC) policy in 2010, by the National AIDS and Sexually Transmitted Infections Control Programme, has laid the ground for strengthening AMR programmes. The scope of the AMR programme was further strengthened by the establishment of the Patient Safety Unit within the Ministry of Health in 2013. After the establishment of this unit, the IPC policy was reviewed and IPC strategy, guidelines and training modules were developed. In 2016, the situation assessment analysis was updated and AMR policy developed. The country has also developed a national action plan for AMR and developed a surveillance strategy in line with the Global Action Plan on AMR and the Global Health Security Agenda.

Currently, Kenya has established a mechanism for monitoring AMR in both animal and human health sectors. Through its 128 public health laboratories and 4 central veterinary investigation laboratories, the country can detect and report AMR. In addition, capacity exists in private hospitals and faith-based organization laboratories. The National Public Health Laboratory is certified by both the Kenya Accreditation Service and ISO. There is ongoing training on AMR and awareness-raising on IPC. However, weak technical capacity, inadequate and inconsistent laboratory supplies, inadequate infrastructure in many hospitals, and limited financial and material resources pose major challenges in the implementation of the national action plan and strategy for AMR.

Recommendations for priority actions

- Strengthen and fully implement:
  - AMR surveillance strategy with the implementation of an integrated surveillance system for detecting and reporting AMR, including from the animal health sector;
  - the surveillance system for health care-associated infections;
  - antimicrobial stewardship programmes in health care settings and pharmacovigilance systems in public and animal health sectors.

Indicators and scores

P.3.1 Antimicrobial resistance detection - Score 2

National plans are complete and awaiting signature for (i) detection and reporting of priority antimicrobial-resistant pathogens, and (ii) surveillance of infections caused by priority antimicrobial-resistant pathogens.

Strengths/best practices

- A multidisciplinary technical working group on AMR surveillance has been in place since 2009. This led to the early development of a national strategy for AMR.
- National action plan to combat AMR has been drafted by the Ministry of Health, together with the Ministry of Agriculture, Livestock and Fisheries.
- Laboratory capacities are assured at national level by the National Microbiology Reference Laboratory and the Kenya Medical Research Institute, which is a WHO Collaborating Centre for surveillance of AMR.
- Baseline assessment on capacity was conducted for the identification of early implementation sites for AMR surveillance. Laboratory capacity assessment for veterinary laboratories was also conducted.
- Establishment of on-site mentorship programme to build skill and technical expertise of front-line health workers is ongoing.
- ISO quality accreditation of the National Microbiology Reference Laboratory.
- Integrated approach (One Health) in developing the AMR surveillance strategy and its inclusion in the IPC policy.

Areas which need strengthening/challenges

- Technical capacity for the detection and reporting of AMR in laboratories needs to be improved, especially at subnational level.
- Difficulties in the supply of laboratory commodities are hampering surveillance activities.
- A centralized laboratory surveillance reporting system is needed (establishment of a national database), also covering the data from public health and veterinary sectors.
- Despite the communication campaigns and efforts, there is still a lack of clear understanding of the importance of microbiology in hospitals by management and clinicians.

P.3.2 Surveillance of infections caused by AMR pathogens - Score 2

National plan for detection and reporting of priority antimicrobial-resistant pathogens is complete and awaiting signature.

Strengths/best practices

- A national strategy for AMR surveillance is in place, which includes specific training activities for involved personnel.

- Previous existing and fully implemented surveillance systems (for tuberculosis and HIV drug resistance and for monitoring infections due to blood-transmitted pathogens) facilitate the development of national surveillance plan on AMR for the WHO priority pathogens.
- Sites for AMR surveillance have been identified.
- AMR is integrated in the IPC strategies, policies and related guidelines.

Areas which need strengthening/challenges

- National AMR surveillance system should be fully implemented, including surveillance in the animal health sector.

P.3.3 Health care-associated infection prevention and control programmes - Score 3

Strengths/best practices

- A national IPC programme has been developed.
- Health care-associated infection surveillance is included in the strategic objectives of the IPC policy.
- Training of multidisciplinary health workers on basic IPC including introduction to surveillance of health care-associated infections and AMR is ongoing.
- Identification and mentorship of IPC model sites is ongoing.
- Establishment of hospital IPC teams.
- Monitoring of occupational exposures to bloodborne pathogens.

Areas which need strengthening/challenges

- The national health care-associated infection surveillance system should be fully implemented.
- Strong capacity-building activities for health workers should be performed to promote correct implementation of IPC programmes for health care-associated infections.
- A national reporting system for health care-associated infections is needed for correct monitoring of surveillance activities and results.

P.3.4 Antimicrobial stewardship activities - Score 2

National plan for the prevention and containment of AMR has been approved and includes antimicrobial stewardship.

National action plan for antimicrobial stewardship is complete and development of antibiotic use guidelines for veterinary practice is complete.

Strengths/best practices

- Medicines and therapeutic committees are established in hospitals.
- Clinical guidelines have been developed and are available for different levels of care.
- Treatment guidelines exist for infectious diseases of public health importance (tuberculosis/HIV/malaria).
- Development of antibiotic use guidelines for veterinary practice.
- Development of the Kenya Food and Drug Authority Bill, which includes a section on AMR.
- AMR awareness campaigns for hospital IPC teams.
- Antimicrobial stewardship training modules included in IPC training course.

Areas which need strengthening/challenges

- There is a need for systematic implementation of existing treatment guidelines.
- There is a need to develop training curriculum for antimicrobial stewardship for pre-service and in-service training to reinforce the provisions for prudent/correct use of antimicrobials at all levels.
- An evaluation of antibiotic use patterns is required.
- There is a need for full implementation of antimicrobial stewardship activities in the human and animal health sector.

Zoonotic diseases

Introduction

Zoonotic diseases are communicable diseases and microbes infections that spread spreading between animals and humans. These diseases are caused by bacteria, viruses, parasites, and fungi that are carried by animals and insect or inanimate vectors may be needed to transfer the microbe. Approximately 75% of recently emerging infectious diseases affecting humans is of animal origin; approximately 60% of all human pathogens are zoonotic.

Target

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

Kenya level of capabilities

A Zoonotic Disease Unit (ZDU) was established in August 2012 through a MoU between the Ministry of Health and Ministry of Agriculture, Livestock and Fisheries. ZDU's mission is to establish and maintain active collaboration at the animal–human–ecosystem interface to prevent and control zoonotic diseases. Prior the formation of the ZDU, a One Health technical working group was established in 2006. The One Health technical working group is an advisory committee including all professionals, sectors and stakeholders in One Health, which provides technical advice to the ZDU through quarterly meetings. A list of priority zoonotic diseases in Kenya has been defined, using a modified version of the semi-quantitative tool developed by CDC, the results of which are published in PLoS One. ZDU developed a 5-year strategic plan for the implementation of One Health (2012–2017) with three main objectives:

- strengthen surveillance, prevention and control of zoonoses in both humans and animals;
- establish structures and partnerships to promote a One Health approach;
- conduct applied research at the human–animal–ecosystem interface.

Some of the activities include risk mapping for priority diseases: Rift Valley fever, rabies and highly pathogenic avian influenza. Trainings were conducted using a decentralized One Health approach in 68% of counties, and One Health response teams were established at the county level. A Field Epidemiology and Laboratory Training Programme (FELTP) offers basic and intermediate training for field officers, including field veterinarians. This approach allowed has helped integrate responses in outbreak investigations such as anthrax, Rift Valley fever and rabies.

Public and animal health sectors have been integrated at the central level via joint development of strategic and contingency plans for select zoonotic diseases (Rift Valley fever and rabies).

Recommendations for priority actions

- Develop national control strategies for two additional priority zoonotic diseases: brucellosis and anthrax.
- Develop formal mechanisms for timely information sharing between animal/wildlife, human and other relevant sectors, including surveillance and laboratory data.
- Identify ways to encourage reporting at the county and sub-county levels in the animal health sector.

- Continuous updated mapping of animal health workforce at both national and subnational levels is essential to identify human resource gaps.

Indicators and scores

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

Zoonotic surveillance system is in place and epidemiological analyses have been performed for some of the priority diseases.

Strengths/best practices

- ZDU was established in August 2011, and employs one medical and one veterinarian epidemiologist. ZDU's mission is to establish and maintain active collaboration at the animal–human–ecosystem interface towards better prevention and control of zoonotic diseases.
- One Health technical working group was established in December 2006, and provides technical advice to the ZDU.
- A decentralized One Health approach is in place and training have been conducted in 68% of counties.
- A ZDU strategic plan is in place for the implementation of One Health for 2012–2017.
- The ZDU has conducted risk mapping for Rift Valley fever, rabies and highly pathogenic avian influenza.
- Priority zoonotic disease list was developed in 2015, and published in PLoS One.
- Multidisciplinary disease outbreak investigations are conducted.
- EOC shares data with the ZDU.

Areas which need strengthening/challenges

- Laboratory diagnosis of some priority zoonotic diseases is still inadequate, especially at subnational levels.
- No formal infrastructure exists for sharing data across human health and animal health sectors.
- Low diseases reporting rates in animal health sector.

P.4.2 Veterinary or animal health workforce - Score 4

Medical and veterinary epidemiologists were seconded to the ZDU. At least 4–5 official veterinarians are in each county, covering the veterinary public health tasks. However, more documentation of veterinarians and human health workers must be provided for substantiating the allocation of this score.

Strengths/best practices

- Adequate human resources capacity in the country (768 animal health workers, of which around 50 work at the national level); however, there are low numbers of animal health workers in remote areas.
- Well established training institutions offering certification up to PhD.
- FELTP offers basic and intermediate training for field officers.
- Inclusion of One Health curricula in veterinary and public health schools.
- On-job trainings to animal health workers.

Areas which need strengthening/challenges

- Animal health workforce to population ratio needs to be improved. This is especially a problem in remote, arid areas due to insecurity issues and other reasons.

- There is a need for more structured and routine on-job training for animal health workers.

P.4.3 Mechanisms for responding to zoonoses and potential zoonoses are established and functional - Score 3

Existence of a One Health office (the ZDU) in Kenya that has direct links to the human health, animal health and wildlife sectors. Integrated prevention and control strategies, jointly issued by the Ministry of Health and Ministry of Agriculture, Livestock and Fisheries for two priority zoonotic diseases: Rift Valley fever and rabies.

Strengths/best practices

- Strategic and contingency plans for select zoonotic diseases (Rift Valley fever, Rabies) have been developed.
- There is active surveillance for rabies in 2 pilot counties.
- Participated in outbreak investigations of anthrax, Rift Valley fever and rabies.
- Rabies Elimination Project is being conducting.
- Joint studies on brucellosis, swine influenza and anthrax ecological niche modelling are being conducted.
- Writing workshop was conducted, resulting in eight abstracts being accepted in peer-reviewed journals.
- Syndromic surveillance was piloted for wildlife (Kenya Livestock and Wildlife Syndromic Surveillance). Event-based surveillance for seven syndromes in livestock and five syndromes in wildlife.
- Multidisciplinary response teams exist at the county level.
- Decentralization of the One Health approach to counties.

Areas which need strengthening/challenges

- There is a need to improve capacity for a timely respond to zoonotic disease outbreaks.
- Continued training of rapid response teams at subnational levels is required.
- Coordination between human and animal health sectors is not optimal at subnational levels.
- To proceed with the work on identified priority zoonotic diseases, contingency plans for brucellosis and anthrax have to be prepared.

Food safety

Introduction

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

Target

State Parties should have surveillance and response capacity for food- and waterborne disease risks or events. It requires effective communication and collaboration among the sectors responsible for food safety, and safe water and sanitation.

Kenya level of capabilities

In Kenya, the food safety control system utilizes a multisectoral approach and is implemented by Government ministries, departments and regulatory agencies. Each agency operates independently to fulfil the function for which it was established. There are 22 articles of legislation that promote food safety and quality. To integrate activities at various levels, the National Food Safety Coordination Committee was created. The Principal Secretary, State Department of Fisheries and the Blue Economy is the Chair and the Ministry of Health is the Secretariat of the Committee.

Food safety standards are developed by committees which are composed of stakeholders from regulatory and research agencies, industry, consumer information networks, producers and academics. The Kenya Bureau of Standards provides secretarial duties for the development of standards.

Current legislation (under revision and final endorsement) defines roles and responsibilities of different sectors in the management of foodborne outbreaks. This system was utilized during recent outbreaks of Rift Valley fever, cholera and aflatoxin poisoning.

Reporting for foodborne events is done in collaboration with the Food Safety and Nutrition Unit, the Water, Sanitation and Hygiene (WASH) Unit, and the Disease Surveillance and Response Unit. These units formed a team to help control the outbreaks. For example, during the cholera outbreak, the Food Safety and Nutrition Unit, with powers bestowed by the Public Health Act and the Food, Drugs and Chemical Substances Act, closed down eating places and banned hawking of food. The WASH Unit gave water purifiers at the household level and educated communities on proper disposal of human waste. The Disease Surveillance and Response Unit conducted case findings, monitored the cases and provided treatment; the reports of the suspected cases were sent to WHO.

In general, it is thought that the response to foodborne illnesses has been more reactive than proactive, and foodborne illnesses have had a negative impact on public health. However, data are lacking and also not often used in decision-making.

Most laboratories in the country are not accredited and have a limited scope. There is inadequate capacity in human resources, equipment and skills development to cope with emerging issues.

Recommendations for priority actions

- Revise and update the Food, Drugs and Chemical Substances Act, Chapter 254.
- The National Food Safety Policy needs to be enacted into law.
- Develop institutional structures at the county level that are in harmony with the national Government.
- Simulation exercises on the response and management of foodborne outbreaks should be performed, involving all government sectors at national and county level.

Indicators and scores

P.5.1 Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination - Score 3

Despite the fact that the actions are more reactive than proactive and an integrated food safety surveillance system is not operative, operational links between surveillance and response staff, food safety, animal health and laboratories have been established. However, these need to be further consolidated, especially at the county level.

Strengths/best practices

- Food safety standards are developed by committees comprised of various stakeholders and the process is managed by the Kenya Bureau of Standards.
- CODEX standards have been adopted as part of national standards.
- Various national acts support food safety. The implementation of food laws and regulations is included in the Constitution of Kenya at the national and county levels.
- Risk-based food inspection manual is in use at the county level.
- Multisectoral approach is used, where various agencies are responsible for different aspects of the process and the food safety office is brought in at the end.

Areas which need strengthening/challenges

- Most food safety laboratories are not accredited.
- There is inadequate capacity for a timely respond to foodborne reports and events.
- There is inadequate enforcement of laws and acts.
- Lack of political will should be addressed (the draft National Food Safety Policy has been in Parliament for at least three political cycles).
- Food safety systems are underdeveloped and underfunded.
- Trace-back investigation at the local level is difficult.
- There is no direct funding for food safety.
- The food safety system is more reactive than proactive in nature.
- External standards are higher than internal standards.

Biosafety and biosecurity

Introduction

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

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

Target

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

Kenya level of capabilities

A national biosafety and biosecurity system was established in 2010 for both human and animal health sectors. Systems for the human health sector were created at the National Public Health Laboratory Services (NPHLS), which collaborates closely with other institutions such as Kenya Medical Research Institute and the Department of Veterinary Services. Kenya has also designated biosafety/biosecurity officers in almost all laboratories who conduct internal routine safety audits and SOPS. The Strengthening Laboratory Management Toward Accreditation programme for medical laboratories, based on ISO 15189, is in place. Out of over 4000 laboratories nationally, 141 laboratories from the Ministry of Health, faith-based organizations and the private sector have been enrolled. Fifteen laboratories have been accredited so far, and there are currently 11 biosafety level 3 (BSL-3) laboratories in the country (two at NPHLS, eight at Kenya Medical Research Institute, and one at the University of Nairobi's Institute of Tropical and Infectious Diseases).

For the animal health sector, biosafety and biosecurity systems have been established under the Directorate of Veterinary Services at the Central Veterinary Laboratories, Kabete, and the National Veterinary Quality Control Foot and Mouth Disease Laboratory, Embakasi. The country has developed and distributed biosafety and biosecurity policy guidelines that have been used in developing laboratory-specific safety manuals. A Bioscience Bill, which includes a biosafety and biosecurity component, is currently being considered in Parliament.

Staff from both sectors have been trained locally and internationally, but not all staff at facilities that maintain or work with dangerous pathogens and toxins have been trained. The biosafety and biosecurity

programme office located at the NPHLS supports capacity-building on biosafety/biosecurity of counties and other entities e.g. the National Disaster Management Unit (NDMU), Ministry of Interior and Coordination of National Government, on the biological component of chemical, biological, radiological and nuclear (CBRN) .

Kenya does not currently have a formal academic training institution for biosafety and biosecurity. However, the Ministry of Health has developed a biosafety and biosecurity curriculum for training health care workers (particularly medical laboratory personnel) and provides an annual refresher training guide for use at the health facility level. With funding from CDC through the United States President's Emergency Plan for AIDS Relief, and using the locally designed curriculum, over 3000 medical laboratory personnel have been trained on basic biosafety by local implementing partners and NPHL's biosafety and biosecurity office. In addition, 100 biosafety/biosecurity trainers-of-trainers have been trained.

In the animal health sector, over 75 laboratory workers have been trained at national and regional laboratories. Eight biosafety/biosecurity training-of-trainers programmes have been conducted. In both trainings, the Global Biorisk Management Curriculum from Sandia National Laboratories (United States of America) was used. A common training curriculum for both animal and human health sectors has not been developed.

The infrastructure to implement biorisk management is inadequate. However, a BSL-3 laboratory capable of handling priority events such as disease outbreaks is being established.

Kenya has not adopted a list of selected hazards and pathogens. A process of monitoring and developing an inventory of pathogens within facilities that store or process dangerous pathogens and toxins is not yet in place. However, pathogen control measures are being developed and include standards for physical containment, operational handling and containment failure reporting systems. Dangerous pathogens and toxins have not been consolidated into a minimum number of facilities, and diagnostics that preclude culturing dangerous pathogens have not been undertaken.

Recommendations for priority actions

- Fast-track the passage of the Bioscience Bill through Parliament to clarify roles and responsibilities, mandates, oversight and regulation of all relevant sectors regarding biosafety and biosecurity.
- Develop a common curriculum for basic biosafety and biosecurity training and training-of-trainers between the human, animal and plant health sectors.
- Develop and implement pathogen repository and inventory systems (database).
- Strengthen collaboration and coordination efforts among key sectors.
- Conduct joint biorisk assessments and biorisk management trainings in regions not currently covered by CDC- United States President's Emergency Plan for AIDS Relief-funded partners.

Indicators and scores

P.6.1 Whole-of-government biosafety and biosecurity system in place for human, animal and agriculture facilities - Score 2

Strengths/best practices

- Bioscience Bill is developed and awaiting passage through Parliament, and will lead to national biosafety and biosecurity legislation. (The existing Biosafety Act addresses only genetically modified organisms).
- There is good collaboration among key sectors involved in biosafety and biosecurity.

- SOPs, safety protocols, job aids and safety signage have been developed.
- Pathogen control processes are developed in some facilities and a waste management mechanism is available.

Areas which need strengthening/challenges

- There is a need for consolidation of dangerous pathogens and toxins into a minimum number of facilities.
- There is a need for development, implementation and oversight of monitoring and enforcement mechanisms.
- Access control mechanisms are needed at medical laboratories to minimize potential inappropriate removal or release of biological agents.
- Collaboration among key sectors (Ministry of Health, Ministry of Agriculture, Livestock and Fisheries, Kenya Wildlife Service) should be enhanced.
- Specimen transfer agreements with other countries need to be strengthened through the Bioscience Bill and subsequent legislation.
- There are limited human and financial resources.

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

Strengths/best practices

- Achievement of general awareness on standard biosafety/biosecurity best practices among the laboratory workforce.
- Biosafety/biosecurity training programme is in place for basic training.
- Kenya national biosafety/biosecurity training curriculum is being developed.
- A database of trained personnel is available.
- SOPs, safety protocols, job aids and safety signage are available.

Areas that need strengthening/challenges

- Development and implementation of a common training curriculum between health and agriculture is required.
- Training needs to be scaled up at subnational levels and in all facilities working with dangerous pathogens and toxins.
- Donors need to be Identified for additional training (in regions not funded by the United States President's Emergency Plan for AIDS Relief).
- Development and implementation of a training-of-trainers programme is required.
- Collaboration among key sectors (Ministry of Health, Ministry of Agriculture, Livestock and Fisheries, Kenya Wildlife Service) should be improved.
- There are limited human and financial resources.
- There is a lack of a sustainability plan for training.

Immunization

Introduction

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

Target

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

Kenya level of capabilities

Kenya has one of the most robust immunization programmes in the region. The immunization programme in Kenya started in the 1980s to provide coverage against six vaccine-preventable childhood diseases. The programme, which initially was delivered on an ad hoc basis through primary schools and larger health facilities, has evolved over the years to its current form.

Currently, immunization is delivered mainly through the routine immunization programme using more than 6000 health facilities throughout the country. Additional strategies have been employed to reach populations in hard-to-reach areas. These strategies include national immunization days that are organized twice a year and integrated with other basic health services, as well as supplementary immunization campaigns that provide rapid scalable immunization programmes during outbreaks.

The immunization programme has expanded both in its coverage and introduction of new vaccines. Currently the routine immunization programme delivers 13 antigens, and nationwide coverage is estimated at 80%. Two of the antigens (yellow fever and human papillomavirus) are currently delivered only to parts of the country, but national roll-out is expected soon.

The performance of routine immunization has stagnated at around 80% over the last decade. Measles vaccine coverage among the 12-month-old population is 89%, and the target is at least 90% by 2018. The Government has scaled up financing for routine immunization programmes, covering 100% of the antigens and related supplies except for the new vaccines recently introduced (pentavalent, yellow fever and pneumococcal) where 90% of the budget is coming from GAVI. Logistical support and cold chain capacity have been strengthened to ensure timely delivery of the vaccines to health facilities.

The programme has improved communication with communities, resulting in high levels of acceptance of vaccines throughout the country. Kenya has strong political commitment for vaccine programmes, a favourable legislative and regulatory framework, and a dedicated budget line for immunizations. Efforts also have been made to maintain quality through training and quality assurance interventions.

However, there are still gaps that require further attention. Immunization coverage has stagnated at 80%, and there is need to strengthen the capacity of health workers – especially in the areas of micro-planning and data quality assurance. Special attention should also be given to marginalized populations such as mobile groups, and those in slum settlements. The programme also needs to strengthen the use of data for advocacy and decision-making. The reliance on external funding for newly introduced vaccines should be minimized by creating sustainable financing mechanisms.

Recommendations for priority actions

- Develop a comprehensive multi-year plan for immunization with an expenditure-tracking component.
- Develop the capacity of health workers and lower level managers to deliver immunization services and reduce the missed opportunities for vaccination.
- Institutionalize and improve quality of micro-plans through a bottom-up approach, to reach the unreached children with immunization.
- Support the implementation of vaccine management standards, a continuous quality improvement process.
- Set up innovative approaches to link communities to service delivery and achieve equity.

Indicators and scores

P.7.1 Vaccine coverage (measles) as part of national programme - Score 3

Strengths/best practices

- Immunization services are provided free of charge to communities through public health facilities, faith-based organizations and private health facilities.
- A dedicated budget line exists for immunization and a multisectoral involvement in service delivery.
- There is political commitment and involvement of the leadership in immunization.
- Immunization in Kenya is mandatory.
- Advisory bodies have been established e.g. the Kenya National Immunisation Technical Advisory Group.

Areas which need strengthening/challenges

- Immunization receives low prioritization despite the high levels of awareness.
- Vaccine hesitancy exists, due to a wide range of determinants.
- Knowledge gap exists among health workers and lower level managers regarding vaccine management.
- Missed opportunities for vaccination need to be reduced.
- Ageing and inadequate cold chain equipment.
- Inadequate availability, poor quality and low utilization of data for decision-making, especially at operational levels.

P.7.2 National vaccine access and delivery - Score 4

Strengths/best practices

- New health facilities have been established through devolved units, Constituency Development Fund and partners.
- Joint planning and vaccine forecasting between national and county levels has been undertaken.
- Systems are in place to reach marginalized populations (outreaches).
- A comprehensive multi-year plan, cold chain expansion and replacement plan and vaccine policy guidelines are being developed.
- Electronic stock management system has been rolled out.

Areas which need strengthening/challenges

- Immunization allocations are not ring-fenced.
- Mechanisms for immunization expenditure tracking should be developed and implemented.
- There is an increasing number of urban informal settlements, nomadic and border populations, security challenged areas.
- Linkage of communities with service delivery needs to be developed.

DETECT

National laboratory system

Introduction

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

Target

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

Kenya level of capabilities

The national laboratory system comprises the national reference laboratories at the Ministry of Health, medical research laboratories at the Kenya Medical Research Institute, teaching and referral hospital laboratories, Government Chemist laboratories and the Central Veterinary Laboratory.

The public health laboratory system in Kenya is a three-tiered structure that includes:

- primary health care level composed of dispensaries and health centres that offer basic laboratory services;
- sub-county and county hospitals that provide moderate to relatively comprehensive laboratory services for inpatients and out-patients;
- reference laboratories, teaching and research institutions that offer highly specialized laboratory services.

Two of the NPHLS reference laboratories (National HIV Reference Laboratory, National Microbiology Reference Laboratory) are accredited by the Kenya Accreditation Service for ISO 15189. In addition, there are three laboratories at the county level, four hospital laboratories and three partner laboratories that have also received accreditation under ISO 15189 standards. The country has capability to conduct the core tests at the national level for all 10 priority diseases. Other reference laboratories are undergoing accreditation.

Government, private and faith-based institutions offer both diplomas and degrees in medical laboratory sciences. Additional training for laboratory staff is available through short courses with technical and management content. The Kenya Medical Laboratory Technologists and Technicians Board (established by an Act of Parliament) oversees training, registration and licensing of medical laboratory staff. It regulates professional conduct of medical laboratory scientists, licenses and regulates business practices in medical laboratory services, inspects and approves institutions to train in medical laboratory science, and registers medical laboratory technicians and technologists to practice.

There are established laboratory networks for testing including for HIV viral load/early infant diagnosis, tuberculosis culture, and culture for outbreak samples such as cholera; there are also satellite county laboratories under the East Africa Public Health Laboratory Networking Project and the Eastern Africa Regional Laboratory Network i.e. regional veterinary laboratory network.

Recommendations for priority actions

- Establish a database of laboratory testing capacities to determine the proportion of the population with access to laboratory services for the 10 priority diseases.
- Develop a refresher curriculum for training in specimen referral system for animal health sector at sub-county level, including specimen collection, packaging and transportation.
- Develop specimen referral protocols to sensitize and streamline laboratory referral services.
- Develop quality management system mechanism for point-of-care testing, including quality indicators for point-of-care testing and other test profiles.
- Strengthen the quality management system by offering external quality assurance to county and sub-county laboratories
- The comprehensive NPHLS should draw lessons from the referral systems and procedures of vertical programmes such as polio, measles and HIV/AIDs.

Indicators and scores

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

Strengths/best practices

- Kenya has robust capacity to conduct all the 10 core tests recommended by WHO through:
  - availability of trained and competent personnel in human and animal health;
  - robust infrastructure improvement of NPHLS (renovations, establishment of BSL-3 laboratory);
  - accreditation of the National Microbiology Reference Laboratory.
- There are reference laboratories at Kenya Medical Research Institute for polio, measles and viral haemorrhagic fever. Kenya Medical Research Institute also has a laboratory supported by CDC that has capability for multiple pathogen testing when there are samples of unknown etiology.
- Kenya is proficient in molecular testing technology (equipment and supplies) and has established national reference laboratories and national specimen referral networks. The Kenya Medical Research Institute laboratory responsible for the testing of polio scored extremely high (~100%) on proficiency testing provided by WHO.
- There is laboratory ISO accreditation at some national, subnational and partner laboratories and the country participates in the Strengthening Laboratory Management Toward Accreditation programme.
- There is engagement of multiple partners that provide advanced laboratory capacity even beyond that of the national laboratories.

Areas which need strengthening/challenges

- There is a need to increase external quality assurance coverage at subnational level.
- The National Microbiology Reference Laboratory bacteriology external quality assurance programme offers proficiency testing for 21 county and sub-county laboratories, but this needs to be expanded to all designated subnational laboratories.
- Importantly, the country needs to ensure sustainability of kits and reagents for both human and veterinary laboratories.

- There is a need for regular equipment maintenance for both human and veterinary laboratories (calibration).
- There is a need to establish a database of laboratory testing capacities to determine proportion of population with access to laboratory services for the 10 priority diseases.
- It would be in the country's best interests to clearly define all national and partner reference laboratory capabilities to provide clear lines of specimen referral and testing at the national level.
- Some of the partner laboratories have capacity to provide secondary confirmation on many of the IHR reportable diseases; this would allow for a higher level of certainty of results prior to reporting a public health emergency of international concern.
- There is a need to reduce the heavy dependence on donor support for laboratory services because sustainability becomes a challenge.

D.1.2 Specimen referral and transport system - Score 2

System is in place to transport specimens to national laboratories from less than 50% of intermediate level/ districts in country for advanced diagnostics.

Strengths/best practices

- Policy guidelines for laboratory referral networks for human health exist, and there are established networks for laboratory services (HIV viral load/early infant diagnosis, tuberculosis culture, Gene-Xpert, polio, measles and viral haemorrhagic fever).
- The country participates in regional (international) laboratory networks e.g. East Africa Public Health Laboratory Networking Project.
- There is collaboration between public health, teaching and referral laboratories, research laboratories and private laboratories in specimen referral networks.
- There is an integrated Ministry of Health and partner-supported courier services for specimen referral.

Areas which need strengthening/challenges

- There is a need to conduct mapping of capacities and capabilities of laboratory services at the different tiers.
- Linkages between laboratory and programme information systems should be improved to ensure seamless and timely sharing of data during public health emergencies.
- There is a need to enrol more laboratories and carry corrective actions in poorly performing laboratories.
- The specimen referral system needs to be reviewed at all levels of the national laboratory system to determine if knowledge of protocols and procedures are in place, and whether there is capability to transfer specimens to higher levels as needed.
- Ministry of Health should look at vertical systems, such as polio, HIV and tuberculosis, to see if there are best practices that could be adopted for other IHR priority diseases.
- Referral laboratories lack capacity to store isolates.
- Limited capacity and awareness in sample management at the county and regional level (training, emergency stockpiles).
- Low coverage of courier delivery services.

D.1.3 Effective modern point-of-care and laboratory-based diagnostics - Score 2

Strengths/best practices

- Point-of-care testing guidelines for human health exist.
- Human capacity is available and there is decentralization of testing services.
- Point-of-care testing does occur for some diseases of public health importance, but they are primarily within vertical systems that are supported by partners.

Areas which need strengthening/challenges

- There is an urgent need to implement the point-of-care testing guidelines. This will require the wide dissemination of the guidelines to subnational levels.
- There is a need to develop a mechanism and indicators for monitoring the implementation of the guidelines.
- There is a need to improve the quality management system for point-of-care testing, as well as to develop quality indicators for point-of-care testing.
- Supportive supervision for point-of-care testing should be conducted and periodic audits of performance of the point-of-care testing kits should be conducted.
- Presently there is no system for evaluating point-of-care testing technology and some veterinary regional laboratories do not have supplies for point-of-care diagnostics for certain diseases.

D.1.4 Laboratory quality system - Score 3

A system of licensing of health laboratories that includes conformity to a national quality standard exists but it is voluntary or is not a requirement for all laboratories

Strengths/best practices

- The Kenya Medical Laboratory Technologists and Technicians Board was established to oversee training, registration and licensing of medical laboratory staff.
- Kenya Veterinary Board inspects and licences veterinary laboratories, as provided for in the Veterinary Surgeons and Veterinary Para-professionals Act of 2011.
- Conformity regulations on quality standards are documented.

Areas which need strengthening/challenges

- There is a laxity in enforcing licensure of government laboratories.
- Development and implementation of mandatory legislation adherence procedures for public health laboratories by the regulatory body is needed.

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 bio-surveillance 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 sub-national, national and international levels of authority regarding surveillance of events of public health significance; improved country and regional capacity to analyse and link data from and between strengthened, real-time surveillance systems, including interoperable, interconnected electronic reporting systems. This can include epidemiologic, clinical, laboratory, environmental testing, product safety and quality, and bioinformatics data; and advancement in fulfilling the core capacity requirements for surveillance in accordance with the IHR and the OIE standards.

Kenya level of capabilities

Kenya has been implementing the regional IDSR strategy since 2003. The current IDSR in Kenya includes 36 human and 17 animal diseases, and there is a provision for reporting additional events of public health importance. The current list of reportable human diseases was developed during the revision of the IDSR technical guidelines in 2012. Animal diseases are included in the Animal Diseases Act, which was enacted into law in 1965 (Chapter 364). In general, Kenya has a well functioning surveillance system for human and animal diseases, conditions and events. The surveillance structure in the health sector is supported by focal points assigned from national to sub-county level. The Kenya FELTP was initiated in 2004 to provide much needed capacity-building for surveillance focal points. Tools and guidelines are available to facilitate recording, reporting and analysis. An electronic-based reporting system is available for sub-county and national levels, while paper-based reporting is used at health facilities and sub-county focal points.

The IDSR system started as a paper-based system, with case counts reported weekly by health facilities for all reportable diseases. These aggregate counts were then forwarded on to the sub-county level where they were combined with other health facilities, totalled and submitted to the county level. The county combined all of the sub-county reports and sent to the national level for analysis and reporting. Today, weekly surveillance summary reports from the facilities are still paper-based or sent using unstructured SMS to the sub-county. The surveillance focal person at the sub-county then enters these data by facility into an electronic web-based system (DHIS 2) which can be accessed at all levels (county and national) by those with rights to access the system. For animal health, at the sub-county level a surveillance officer is responsible for collecting data from a variety of different sources including livestock markets, abattoirs and others. This information is combined and submitted to the county disease reporting officers, who then submit it to the national level. For animal health surveillance, reports or bulletins are sent on a quarterly basis to the counties, partners and other organizations.

The Ministry of Health launched an EOC in May 2016. One of the roles of the EOC is to coordinate event-based surveillance. This is done in a variety of different ways using information obtained through indirect sources such as media outlets, social media, and direct sources such as rumour reporting (telephone

hotlines, SMS and web-based reporting (mSOS). Event-based surveillance reports are generated on a daily basis and submitted to the Disease Surveillance and Response Unit as well as other interested parties that can act upon this information. The Ministry of Agriculture, Livestock and Fisheries collects information from a variety of sources including veterinary service providers, livestock staff, farmers and laboratories using an email-based platform (Google Groups) and a mobile phone app (EpiCollect).

Data collected through the surveillance system are analysed and shared with managers and partners through the weekly epidemiological bulletin and used to guide decision-making. The media and rumour monitoring is managed by the public health EOC with daily analysis and reporting to relevant managers. In addition, there is a sentinel surveillance system for selected conditions, and community-based surveillance is being piloted in some counties. However, the event-based system is not yet well established and improvements are ongoing.

For human health, syndromic surveillance has been implemented for several priority diseases including severe acute respiratory illness, acute flaccid paralysis, acute jaundice, rotavirus, pediatric bacterial meningitis and viral haemorrhagic fever exists at select sites or nationwide in-country. There are plans to add acute febrile illness surveillance with funding received from the Global Health Security Agenda. The sentinel sites used for surveillance seem to be predominately in the western and central parts of the country. A few sites exist on the coast and the north-western part of the country, but there does not seem to be geographic distribution that is representative of the population. It is possible that these sites exist in areas of disease foci, but that is not evident from the self-assessment. The IDSR Unit also includes syndromic surveillance indicators within their weekly reporting forms. Syndromic data are validated as events through an increase in the number of cases reported at a sentinel site (threshold exceeded).

A syndromic surveillance system is being developed for the animal health sector. Currently, syndromic surveillance is part of the animal health reporting systems with data collected on abortions, sudden deaths, hemorrhagic syndromes, skin lesions and stomatitis. These data are reported to veterinary officers or animal health assistants, who then investigate the reports, collect samples and send to either the regional or the central veterinary laboratories. In addition to general syndromic surveillance, sentinel surveillance exists at four sites for emerging and re-emerging diseases such as Rift Valley fever. The Ministry of Agriculture, Livestock and Fisheries is also in the process of developing a syndromic system to be used for wildlife and livestock, which will be piloted before being used more broadly within Kenya. There is recognition that guidelines need to be developed at the subnational level for event reporting. Data are investigated when suspected outbreaks occur in sentinel herds. It is not clear whether historical data are used as the baseline and thresholds are created to identify these suspected outbreaks. For syndromic surveillance, it is said that this information is used to determine morbidity and mortality indices, but is not said whether denominator data are used to create rates based upon census or other means.

DHIS 2 has data checks in place when entering data at the different levels within the system. For IDSR data, all fields are forced fields that require entry in line with recommended zero reporting. At the national level, there appears to be analysis done on a weekly basis and surveillance officers contact sub-counties if errors or inconsistencies are identified. DHIS 2 has an analytic module that provides some standardized calculations, visualization and reporting. When health workers receive IDSR training, basic surveillance data analysis is included and it is also covered in the basic and intermediate levels of the FELTP. At the national level, many of the surveillance officers are graduates of the advanced FELTP and have in-depth skills using descriptive and analytic epidemiology. Evidence was not provided of examples of data analysis at the sub-national levels, but there is a weekly epidemiological bulletin produced at the national level that contains elements of data analysis. For animal health, data analysis is done at the national level and aggregate data is provided through a bulletin or report distributed on a quarterly basis. There is an identified need in animal health to provide skills at the sub-national level to allow surveillance officers to analyse data, report back to community disease reporters, and observe trends and inconsistencies in their areas.

At times, data quality audits are conducted where surveillance officers visit health facilities and compare reports against registers. There are data quality audit reports available, but it is not known what corrective measures are put in place if themes emerge from data quality audits at different facilities. There does not appear to be widespread use of data at lower levels, and therefore a possibility exists that data quality is not reviewed and verified.

Human health, at this time, only enters malaria laboratory data in DHIS 2 on a weekly basis. Other diseases collect laboratory data individually and report on a weekly basis, but this is not fed into DHIS 2. Analysed laboratory data are shared with various stakeholders on a weekly basis and raw data for specific diseases (such as acute flaccid paralysis and measles) are shared with WHO. For animal health, laboratory data are shared as needed for zoonotic disease events. These data do not seem to be included in the indicator-based surveillance system. It seems that the systems have the ability to include data from clinical or reference laboratories, and this could possibly occur through an interface with laboratory information management systems.

Analysis of data in the animal health sector is not based on an automated framework, but rather on a manual process. Data are downloaded and transferred by a data manager to analysis software. This significantly affects feedback turnaround time.

Recommendations for priority actions

- Establish a method of incorporating laboratory data into both the human and animal indicator-based surveillance systems.
- Expand training on the revised IDSR technical guidelines for human health and the Notifiable Disease 1 form and process for animal health at the county and sub-county levels. By the next reporting period, training should occur in 100% of the counties and sub-counties.
- Enhance event- and community-based surveillance in both the human and animal health sectors. Reports should be shared across sectors and data can be available for review by counterparts if needed based on a formal data sharing mechanism.

Indicators and scores

D.2.1. Indicator and event-based surveillance systems - Score 4

Strengths/best practices

- The revised IDSR technical guidelines (2012) incorporate IHR requirements.
- Training materials and other tools to collect, document, analyse and disseminate information are available.
- Human health surveillance coordinators exist in 293 out of 300 sub-counties.
- Cross-border surveillance exists for various diseases and conditions.
- Sentinel surveillance system is established for selected priority conditions.
- A community-based surveillance system is being piloted in selected counties.

Areas which need strengthening/challenges

- Training on the revised IDSR technical guidelines (2012) has occurred in less than 50% of the counties and sub-counties. It is possible that this may also need to be incorporated into pre-service training in order to ensure that health care workers are familiar with IDSR reporting and response.
- Event-based surveillance may need to be better sensitized at all levels within the system to encourage use and flex the system on a regular basis.

- Community-based surveillance requires focus in the future on both the human and animal health surveillance sectors to encourage reporting of diseases at the lowest level within the health systems.
- There is a need to strengthen the use of surveillance data as evidence for planning, advocacy and early response at all levels.
- Allocation of budget from the Government is required to ensure sustainability.

D.2.2 Interoperable, interconnected, electronic real-time reporting system - Score 2

Strengths/best practices

- Web-based indicator surveillance system for human health is in place and used by all sub-counties as well as level 4, 5 and 6 health facilities.
- Mobile phone event-based surveillance is established and in the process of expanding.

Areas which need strengthening/challenges

- Laboratory data are not incorporated into reporting systems in both the human and animal health sectors.
- Paper-based reporting occurs at the facility and sub-county level for the human and animal health sectors, respectively. Cell-phone coverage is high in Kenya and therefore a method of SMS or other reporting could be considered at lower levels to increase reporting and timeliness.

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

Strengths/best practices

- Data validation and visualization is built into DHIS 2.
- Analysis of human surveillance data is completed on a weekly basis.

Areas which need strengthening/challenges

- Feedback mechanism at lower levels is limited and inconsistent.
- Data analysis and use is limited at lower levels of the systems for both the human and animal health sectors.
- There is a need for an automated data analysis mechanism.

D.2.4 Syndromic surveillance systems - Score 4

Strengths/best practices

- Syndromic surveillance exists for select public health priority diseases and conditions.
- Laboratory capacity exists to provide presumptive and confirmatory diagnosis of diseases. There is also capacity for testing for diseases of unknown etiology.
- Syndromic surveillance is included in both the human and animal health indicator-based surveillance systems.

Areas which need strengthening/challenges

- Syndromic and/or sentinel surveillance is donor-dependent and may not be sustainable.
- Syndromic surveillance included in the routine surveillance system needs to be operationalized and additional resources may be required for further roll-out.

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.

Kenya level of capabilities

The Government of Kenya has been exemplary in identifying and reporting public health events of international concern. Recent examples include imported cases of yellow fever, polio, anthrax and Rift Valley fever, were reported to WHO and OIE. The Ministry of Health closely follows the decision matrix included in Annex 2 of the IHR (2005).

The Government of Kenya has an informal process leading up to the use of the decision instrument (Annex 2 of the IHR) to make a determination of whether a public health emergency of international concern will be reported to WHO, OIE or the World Animal Health Information System. The NDOC refers to a Disaster Management Manual which has policy for the investigation of such events. Kenya is in the process of establishing a technical working group that will operationalize this function in the manual. In addition, the office of the Director of Medical Services, Ministry of Health, currently serves as the IHR NFP. For animal health diseases of public health importance, there is also an informal process for investigating and reporting events. The Department of Veterinary Services serves as the OIE NFP and it is believed that this office is responsible for investigating events and rumours, confirming and reporting to OIE. There is a World Animal Health Information System NFP in Kenya and it is an appointee of the Department of Veterinary Services.

Currently, as there is no formal process leading up to the decision instrument in place, the Ministry of Health and Department of Veterinary Services are formalizing these processes independently. And will likely share through the One Health technical working group, which has representation from both sectors and is co-Chaired by the Director of Medical Services and Department of Veterinary Services. It does not seem that SOPs are in place for reviewing, approving and reporting of public health emergencies of international concern. The Ministry of Health is in the process of redefining the IHR NFP, the protocols, SOPs and processes that will be used to investigate reports of public health emergencies of international concern. On the animal health side, the Department of Veterinary Services is also further defining the approach to investigating events for reporting to OIE.

While there is no specific legislation related to IHR, there are elements of the Constitution and the Public Health Act which apply to emergencies and could be considered applicable to IHR (2005):

- the Public Health Act, the primary legislation applicable to matters of public health crises, authorizes public health authorities, particularly the Minister of Health, to take various actions during public health crises, including declaring an infectious disease either a "notifiable infectious disease" or

a "formidable epidemic, endemic or infectious disease," and taking the necessary prevention and suppression measures to fight the disease;

- the Constitution adopted in 2010 states that subject to certain limitations, the President has the power to declare a state of emergency, including when the country is under threat from a "natural disaster or other public emergency" and doing so "is necessary to meet the circumstances for which the emergency is declared."

Ordinarily, national and local governments have different responsibilities related to health matters. Kenya is no exception, especially after the adoption of the Constitution in 2012 and devolution of government to the county levels. The national Government is responsible for matters such as health policy, technical assistance, referral facilities, and monitoring and investigation of public health across counties, while the county governments may be responsible for issues related to county health services including health facilities, cemeteries, funeral parlours and crematoria. While health issues over which the county governments have responsibility are considered local in nature, diseases of public health importance may have great ramifications for the prevention and suppression of an infectious disease outbreak across counties and potentially countries. It could be assumed that elements of the Public Health Act and Constitution provide for the authority to report to WHO and IHR, but this needs to be codified and the process should be clearly defined.

Recommendations for priority actions

- At national level, review protocols and regulations that govern reporting and procedures for multisectoral collaboration and response to potential public health emergencies of international concern to WHO/ OIE.
- Evaluate NFP functions with a view to strengthening its structures for optimal functionality and ensuring effective collaboration and coordination mechanisms between key sectors to enable joint decision-making on reporting.
- Strengthen formal communication mechanisms to improve information sharing between and among relevant sectors.

Indicators and scores

D.3.1 System for efficient reporting to WHO, FAO and OIE - Score 3

Strengths/best practices

- NFPs exist for WHO-IHR, OIE and FAO.
- The One Health technical working group provides a forum for exchange of information related to public health emergencies between the NFPs, as the working group is co-chaired by the Director of Medical Services and Department of Veterinary Services.

Areas which need strengthening/challenges

- A formal process has not been established for multisectoral decision-making on reporting to WHO/ OIE for public health emergencies of international concern, especially those that are zoonotic in nature.

D.3.2 Reporting network and protocols in country - Score 2

Strengths/best practices

- Kenya has proven experience in investigating and reporting public health emergencies of international concern to both WHO and OIE.

Areas which need strengthening/challenges

- At national level, there is need to develop protocols and regulations that govern reporting on potential public health emergencies of international concern to WHO, in addition to using the IHR decision instrument.
- IHR and OIE NFPs should be restructured to include focal persons from relevant line ministries.

Workforce development

Introduction

Workforce development is important in order to develop 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

State parties should have skilled and competent health personnel for sustainable and functional public health surveillance and response at all levels of the health system and the effective implementation of the IHR (2005). A workforce includes physicians, animal health or veterinarians, biostatisticians, laboratory scientists, farming/livestock professionals, with an optimal target of one trained field epidemiologist (or equivalent) per 200 000 population, who can systematically cooperate to meet relevant IHR and PVS core competencies.

Kenya level of capabilities

In 2015, there were 133 000 registered medical personnel in Kenya with seven universities that train doctors, dentists and pharmacists and two universities that train veterinarian doctors. According to the Health Sector Human Resources Strategy 2014–2018, there were a total of 68 185 human health workers; out of these, there were 728 medical and public health specialists. Less than 30% of medical personnel trained are employed by the Ministry of Health. There are approximately 2000 veterinarians and veterinary specialists employed nationally, and the number of animal health assistants is 3800.

The Kenya Field Epidemiology and Laboratory Training Programme (FELTP) started in 2004 and is mandated to train field epidemiologists for the ministries in charge of animal and human health. So far, a total of 152 epidemiologists have graduated from the advanced level (Master's in field epidemiology) with over 85% retention within the government at both national and county levels. The FELTP is a full, three-tiered, pyramid programme. The length of the basic level FELTP is 3 months, and intermediate level FELTP is 6 months; all programmes require that participants remain on their jobs during training. So far, over 423 health workers in all counties have been trained in basic FELTP and 67 health workers have been trained in intermediate FELTP. Basic and intermediate level graduates work at county and sub-county levels, while the advanced graduates work at both national and county levels mainly in leadership positions.

The inception and implementation of the FELTP has boosted availability of skilled epidemiologists who have significantly contributed to strengthening of public health at all levels. The programme is owned and anchored within the Ministry of Health which supports the salaries, benefits and facilities for the programme, while donors fund the operational costs which are fairly significant and need to be absorbed by the Ministry of Health to make FELTP sustainable.

At the national level, all capacities are present with concentration of specialized cadres including epidemiologists, social scientists, specialized medical personnel and biostatisticians. At the county level, the distribution of capacities vary from county to county. All counties have 8-—10 health workers trained in basic epidemiology. Laboratory personnel, health records and information officers, nurses, medical officers, clinical officers, surveillance, public health officers and technicians are available at all levels up to the sub-county level. Community health volunteers are available at village level to connect the community to the level 1 health facilities.

All counties and sub-county levels have a county veterinary officer. At least two veterinary officers in all counties have been trained in basic and or intermediate level epidemiology, but less than 10 counties have an advanced level field epidemiologist.

At county and sub-county levels, county health management teams and sub-county health management teams are formed and headed by the county health director and sub-county medical officers, respectively. There is a multidisciplinary team available at national level, but counties and sub-county levels have varying capacities in both human and animal health. One Health coordination is robust at national level; however, it is not well structured at the subnational levels.

The Ministry of Health has developed 5-year health workforce strategies, and the current strategy covers 2014–2018. Human health cadres including laboratory personnel, health information officers, clinicians, public health officers, technicians, medical specialties and nurses, among others, are tracked; however, public health specialties such as epidemiology and biostatistics, as well as animal health cadres, are not included in the Ministry of Health plan. According to the Health Sector Human Resources Strategy 2014–2018, key challenges facing human resource for health in Kenya include: staff shortages, inequitable distribution, high attrition especially in hard-to-reach areas, and out-migration of health staff especially nurses and doctors. The strategy does not address communication and coordination between various ministries, county and national levels, and levels of epidemiologists, nor between animal and human health sectors.

There exists an increasing pool of trained public health personnel graduating from various institutions (both public and private) and these are registered with the registration bodies in the country. However, only about 20% of registered health workers work within the Government, and this number is further reduced by high attrition rates.

Both ministries have workforce development strategies and, in the case of human health, all cadres are tracked apart from public health specialists including epidemiologists. Although there is a monitoring and evaluation plan for the strategy, apart from the monthly and quarterly data collection on staff returns, there is no consistent way of tracking or mapping the workforce in the strategy.

Recommendations for priority actions

- Track and map all cadres involved in IHR implementation, specifically the basic FELTP graduates at the sub-county level.
- Implement the guidelines on developing human resource for health at the county and sub-county level in order to achieve sustainable capacity for the IHR core functions.
- Advocate that the Government of Kenya progressively invest in the FELTP in order to assure financial sustainability for the programme.
- Create a One Health workforce strategy with communication and coordination between various ministries, county and national levels, and levels of epidemiologists, and between animal and human health sectors.

Indicators and scores

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

Strengths/best practices

- Multisectoral human resources are available at national level for both animal and human health.
- All counties have health workers trained in basic and intermediate epidemiology for both human and animal health and every county has a veterinary officer. Developed capacities are available at the county levels, although numbers may not be adequate or sufficient.

- All counties have a health management team comprising health workers who are designated to carry out the basic IHR capacities.

Areas which need strengthening/challenges

- The number of registered medical personnel per 100 000 population is below the WHO standard in all or most of the different cadres.
- There is no tracking or mapping of non-clinical care personnel (e.g. epidemiologists, biostatisticians) or animal sector personnel.
- At the national level, in both sectors, there is perceived adequate staffing and mix of staff; but at the county and sub-county levels this is inconsistent due to devolution, redistribution and attrition of staff.
- There is a need to increase and map the number and diversification of all the cadres of trained staff at lower sub-county levels for IHR implementation.
- Workforce development is a joint effort between national and subnational levels due to the devolved responsibilities as a result of the Constitution; while the mandate to train is reserved for the national Government, all the counties are responsible for their own staff management including hiring and distribution.

D.4.2 Field Epidemiology Training Programme or other applied epidemiology training programme in place - Score 4

Strengths/best practices

- All three tiers of the FELTP are operational, including: advanced level 2-year Master's in field epidemiology (by 2019, there will be 189 graduates); intermediate level 6-month on-job training (60 staff trained); and basic level 3-month on-job training with 354 staff trained.
- There is an additional veterinary and medical students elective and IMPACT.
- There is funding and support:
  - Ministry of Health supports the FELTP staff and infrastructure;
  - scholarships are available for priority speciality areas, including epidemiology. Recipients of the scholarships are bonded and required to provide service for the same amount of time as in training;
  - FELTP is fully integrated within Ministry of Health at the division level, similar to Disease Surveillance and Response Unit;
  - participants take part in most outbreak investigations and response, and are placed in various units in Ministry of Health and provide epidemiological service;
  - CDC funds most of the FELTP operational costs.

Areas which need strengthening/challenges

- FELTP is donor-funded and, therefore, greater investment is needed from the Government of Kenya.

D.4.3 Workforce strategy - Score 2

Strengths/best practices

- The Ministry of Health has a human resources for health strategy, renewed every 5 years. The current version covers 2014–2018, and demonstrates:
  - status of current and projection of future needs, with priorities for hiring and training;
  - coordinating mechanism using national and intercounty human resource managers to coordinate the health workforce.

Areas which need strengthening/challenges

- No specific human resources strategy is in place for animal health workers.
- With constitutional devolution, implementation is not consistent in all counties and may need a lot of buy-in from the county level management.
- Tracking is not centralized; every department or sector is expected to track their own human resources for health and cadres important in IHR core capacity implementation. Epidemiologists, biostatisticians and animal health specialists are not tracked or mapped.

RESPOND

Preparedness

Introduction

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

Target

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.

Kenya level of capabilities

Preparedness in Kenya has been previously coordinated by multiple agencies at various levels of government, including: NDOC; NDMU; Disease Surveillance and Response Unit and NDMU at the Ministry of Health; ZDU; animal health sector; county and sub-county; CBRN Unit; Kenya Red Cross; and United Nations Children's Fund (UNICEF).

The country has developed several event- and sector-specific preparedness and response plans, including: National Disaster Response Plan (NDOC); National Emergency Response Plan and SOPs (Ministry of Interior and Coordination of National Government and NDMU); Public Health Events of Initially Unknown Etiology (ZDU); mass casualty incident management protocols (CDC, Ministry of Health, police); CBRN National Response Plan (Ministry of Interior and Coordination of National Government); national patient referral strategy (Ministry of Health); Disaster Risk Management Strategic Plan (Ministry of Health); national policy guidelines for laboratory specimen referral (Ministry of Health); and El-Niño and drought plans (multisectoral).

There are disease-specific plans in the animal health sector, including for foot and mouth, peste des petits ruminants and highly pathogenic avian influenza. There are disease-specific plans in the human health sector, including for pandemic influenza, cholera, Rift Valley Fever, yellow fever and measles. A multisectoral hazards plan that will include an "all-hazards" approach, IHR core capacity requirements, IHR-related hazards and points of entry is being developed and is expected to be completed in the second half of 2017.

The country has undertaken disease-specific risk mapping for Rift Valley fever, yellow fever and rabies. Kenya is also conducting human resources mapping of health facilities, laboratories and its health workforce. A health workforce database has been established at the county and sub-county levels and includes surge staff (ASEOWA volunteers, volunteers for Marburg response, FELTP) and experts for public health emergencies. Agreements are in place with the African Union to bring in surge staff. Rapid response teams

also have been identified at subnational level; however, but they only have been trained for infectious diseases (not all hazards) and they report at the county level. A public health EOC was established in May 2016. Although regional stores are available, stockpiles are not available, and plans for stockpiles have not been developed. Emergency funds are available through the office of the Principal Secretary.

SOPs to guide response to emergencies are being created. Simulation exercises have been developed to test mass casualty incident management protocols, Rift Valley fever outbreaks and the National Disaster Plan.

Recommendations for priority actions

- Fast track the completion, testing and dissemination of the all-hazards plan in the next 12 months to compliment the National Emergency Response Plan (NDOC).
- Consolidate risk assessment for all emergencies.
- Establish contingency funds and plans.
- Develop multisectoral database for surge staff and experts.
- Develop plans, procure and pre-position stockpiles.

Indicators and scores

R.1.1 National multi-hazard public health emergency preparedness and response plan developed and implemented - Score 1

Strengths/best practices

- A draft multi-hazard plan is being developed based on risk analysis and evaluation of disasters in Kenya for the past 10 years; plan will include whole-of-society approach, other IHR-related hazards, and IHR core capacities including points of entry.
- IDSR technical guidelines exist.
- Event-specific preparedness plans are in place e.g. measles, cholera, influenza, yellow fever risk assessment.
- Draft plan for disaster risk management has been developed.
- There is surge capacity to respond to public health emergencies of national and international concern.

Areas that need strengthening/challenges

- There is a need for a multisectoral database for surge staff.
- Preparedness plans require updating.
- Procedures and plans to relocate or mobilize resources from national and intermediate levels to support response at the local level are not available.
- There is a lack of technical capacity and funding.

R.1.2 Priority public health risks and resources are mapped and utilized - Score 2

Strengths/best practices

- Specific mapping has been done for laboratories, health facilities and human resources.
- The management of Disasters is contained in annexes for National Disaster Response Plan, El-Niño.
- Disease-specific risk mapping of Rift Valley fever, yellow fever and rabies has been undertaken.

- Funds for emergencies are available through the office of the Principal Secretary.
- There are referral guidelines for patients and samples.
- Policy guidelines for laboratory specimen referral network have been developed.
- Yellow fever risk assessment has been conducted.

Areas which need strengthening/challenges

- Stockpiles planning and logistics need to be addressed.
- A multisectoral database of experts should be developed.
- Profiles on risks and resources need regular updating.
- There is a lack of plans and resources for stockpiles.
- There is inadequate funding.
- There are bureaucratic delays in accessing emergency funds; funds need to be made readily available.
- Human resource needs should be addressed.

Emergency response operations

Introduction

A public health emergency operations center (EOC) is a central location for coordinating operational information and resources for strategic management of public health emergencies and emergency exercises. EOCs provide communication and information tools, services, and a management system during a response to an emergency or emergency exercise. They also provide other essential functions to support decision-making and implementation, coordination, and collaboration.

Target

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

Kenya level of capabilities

The health emergency response in Kenya is led by the public health EOC. The EOC was established in 2015 with support from WHO and partners. Currently, the public health EOC has the minimum infrastructure to run its activities including information technology equipment, 25 trained staff working on a rotational basis, and software that is under development.

The public health EOC gathers real-time information from public rumours and other sources using hotlines, media monitoring and DHIS 2. The information collected is analysed daily and submitted to relevant authorities for evidence-based decision-making. In addition, situation reports are prepared during emergencies and shared with partners. Weekly epidemiological bulletins are prepared and shared with relevant partners and health workers. The EOC also serves as the interface with the media and provides reliable information to the public during emergencies. Information collected is available at the public health EOC for analysis and research.

An incident management system links with the animal health sector and other relevant agencies. Case management guidelines in human and animal health facilitate rapid and effective responses during emergencies. Kenya utilizes a draft public health EOC framework that defines the vision, mission, objectives, scope, purpose, concept of operation, structure, roles and responsibilities and SOPs. There are also national mass casualty incident management protocols. There is a national isolation facility in Kenyatta National Hospital that meets the minimum standards for IPC. The facility is well equipped and has the minimum staff required along with arrangements for surge capacity.

However, there are some gaps that require immediate attention:

- The public health EOC has no dedicated budget from the Government and relies on donor support;
- staff working in the EOC have other responsibilities;
- lack of alternative electric power supply and no data back-up system;
- inadequate ambulance services and isolation facilities;
- limited financial and human resource capacity to respond to large-scale emergencies, especially to meet the standard of mounting a response within 120 hours;

- SOPs for the EOC are not finalized;
- all-hazards plan is not currently available;
- no simulation exercise has been conducted to test the system.

Recommendations for priority actions

- Allocate a budget line for public health EOC and ensure availability of adequate human resources, procurement and maintenance of information, communication and technology (ICT) equipment, and power back up.
- Finalize the all-hazards plan, develop SOPs for the public health EOC and conduct simulation exercises.
- Build response capacity in the country through developing and conducting training programmes, building surge capacity and networking with regional and subregional EOCs.
- Strengthen coordination and linkages among key stakeholders at national and subnational levels to ensure timely response to various hazards, including CBRN.

Indicators and scores

R.2.1 Capacity to activate emergency operations - Score 2

An emergency focal person is available 24 hours a day, 7 days a week. However the staffs at the public health EOC are not permanent staff members and have additional responsibilities. In addition, SOPs are not finalized and simulation exercises to test the functionality of the EOC have not been conducted. This technical area is therefore scored as limited capacity.

Strengths/best practices

- Public health EOC has been established, with the minimum infrastructure, ICT equipment and human resources on a rotational basis (despite no budget line from the Government) necessary to enable Kenya to monitor and mount response to health-related emergencies.
- Availability of response plans and procedures for specific events affecting both animal and human health, which contribute for effective response to emergencies.
- Application of an incident management system using available expertise relevant to the emergency.

Areas which need strengthening/challenges

- There is a need for greater allocation of resources to sustain the public health EOC.
- Simulation exercises should be conducted to test the functionality of the ECO and build local capacity.
- Linkages with the other EOCs within the country and in the region should be improved.
- Coordinating response within 120 hours using the limited resources available is the major challenge in this technical area.

R.2.2 EOC operating procedures and plans - Score 2

Strengths/best practices

- The public health EOC draft framework is available and all-hazards plan is in the process of development.
- An all-hazards plan is also in the process of development. These plans are used to guide the emergency response and incident management system; key structures and basic roles are described in this draft framework. However, no comprehensive trainings have been done and experts in certain areas (such as chemical and radiological events) are not readily available. In addition, there is no budget line from the Government.

- Availability of event-specific response plans.

Areas which need strengthening/challenges

- Finalization of the public health EOC framework, the all-hazards plan and SOPs.

R.2.3 Emergency operations programme - Score 2

The public health EOC has staff available to monitor emergencies and initiate immediate response; even though no simulation exercises have been conducted, staff have been trained on emergency response and hence this area is rated as limited capacity.

Strengths/best practices

- Active surveillance from informal (newspapers, social media) and formal (reporting systems) sources; daily and weekly reports.

Areas which need strengthening/challenges

- There is a need to organize regular simulation exercises to test functionality and strengthen response capacity of the public health EOC.

R.2.4 Case management procedures are implemented for IHR-relevant hazards - Score 2

Case management guidelines are available for major communicable diseases; however, guidelines on other areas of emergency specially chemical and radiological are not yet available. This area is rated as limited capacity.

Strengths/best practices

- Case management guidelines are available for specific diseases such as measles, acute flaccid paralysis, cholera, viral haemorrhagic fever and diarrhoea.
- Case management procedures for animal health are available for Rift Valley Fever, peste des petits ruminants and foot and mouth disease.

Areas which need strengthening/challenges

- Case management guidelines for priority diseases and IHR-relevant hazards need to be made available at all levels of the health system.
- Existing guidelines need to be updated.

Linking public health and security authorities

Introduction

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

Target

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

Kenya level of capabilities

Kenya has formal, legally mandated mechanisms for linking public health and security authorities during a public health emergency. The NDOC, established under the Office of the President, maintains the overarching command and control structure. The National Emergency Response Plan (2014) specifies the coordination for different types of emergencies at various levels of government. Public health authorities are formally linked to security authorities through the Border Control and Operations Coordinating Committee (BCOCC), which was established under the Ministry of Interior and Coordination of National Government.

There are clear examples of multisectoral emergency response plans that include public health and security services including: National Emergency Response Plan; mass casualty incident management protocols; Public Health Events of Initially Unknown Etiology framework; and integrated emergency contingency plans at points of entry.

Draft plans for an all-hazards emergency response and for CBRNE events also include clear roles and links for public health and security authorities. A number of these plans have been evaluated and tested through simulation exercises in recent years.

The multitude of plans and stakeholders, as well as insufficient numbers of jointly trained personnel, has led to difficulties with coordination, resource mobilization and timely response in past emergencies. There is a need for clearer, more specific SOPs that link first responders and relevant stakeholders, especially at the subnational level. A technical working group has been convened by the Ministry of Health to improve the linkages between all relevant sectors and to harmonize roles and responsibilities for IHR responses.

Recommendations for priority actions

- Operationalize the technical working group to support improved linkage between public health, emergency response and security authorities, and include activities such as strengthening specific IHR-related hazard SOPs and MoUs between relevant agencies.
- Capacity-building for personnel from all agencies involved in response, through improved joint training and simulation exercises and clear agreements for resource sharing and deployment.

Indicators and scores

R.3.1 Public health and security authorities (e.g. law enforcement, border control, customs) are linked during a suspect or confirmed biological event - Score 3

Strengths/best practices

- The legal framework necessary to cover interagency cooperation (security services and public health) and coordination on public health emergencies is in place and well understood by the relevant sectors, and includes specific provisions under the Public Health Act, the Security Laws Amendment Act, the Food, Drugs and Chemicals Substances Act, the Meat Control Act and the Animal Diseases Control Act.
- There are disaster management units within individual ministries that have links to the security services, and there are several examples of joint exercises and training for a variety of IHR-related hazards including at points of entry.
- The country is revising its National Emergency Response Plan and developing an all-hazards public health emergencies plan (based on existing disease response, emergency and contingency plans) to further refine and clarify the roles and links of public health stakeholders and security services.

Areas which need strengthening/challenges

- Frontline emergency response personnel have limited knowledge of the various plans in existence and their roles and responsibilities, as few clear MoUs and SOPs linking public health and security services exist.
- Limited understanding among stakeholders of how specific response plans (e.g. contingency response plans at points of entry) relate to the National Emergency Response Plan and the all-hazards emergency plan currently under development.

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 deploy in case of a public health emergency for response.

Target

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

Kenya level of capabilities

Kenya has developed a number of policy documents, guidelines and MoUs for medical countermeasures and the deployment of medical personnel during a public health emergency, including: the National Policy for Disaster Management, 2009; guidelines for communicating health risks and related emergencies (draft); ASEOWA MoU, 2014, between the African Union and Kenya; Kenya–Ethiopia MoU on health; cross-border disease surveillance; China–Kenya (health, social and cultural activities, technology transfer); EAC One Stop Border Posts Act health component (cross-border disease surveillance).

Additionally, there are other policy documents containing guidance on medical countermeasures such as: the National Pandemic Influenza Preparedness and Response Plan, 2009; Cholera Control Plan; National Disaster Risk Management Bill, 2016; El Niño contingency plan, 2014–2018; and tsunami SOPs.

The country is equipped with specialized laboratory infrastructure at the national level in the NPHLS and Kenya Medical Research Institute to support emergency response. Emergency laboratory supplies are provided by NPHLS and occasionally by Kenya Medical Research Institute, CDC laboratories, etc. The Kenya Medical Supplies Authority provides storage of medical supplies; however, there is no mechanism in place to prioritize emergency supplies or buffer supplies to support public health emergencies.

Regarding human resources, Kenya has a pool of epidemiologists available at the national level to respond to public health emergencies from the Disease Surveillance and Response Unit (Ministry of Health) and FELTP. There are rapid response teams, including epidemiologists, at the Disease Surveillance and Response Unit to provide surge capacity for response to public health emergencies in the country and beyond. However, there are no systematic mechanisms to support the deployment of medical personnel (surge capacity) during public health emergencies.

Recommendations for priority actions

- Develop systems and plans to support sending and receiving of medical countermeasures and deployment of personnel during public health emergencies (by ensuring that the draft all-hazards plan incorporates medical countermeasures and medical personnel deployment).
- Establish surge capacity to respond to public health emergencies for both animal and human health sectors.

Indicators and scores

R.4.1 System is in place for sending and receiving medical countermeasures during a public health emergency - Score 1

No national countermeasures plan has been drafted.

Strengths/best practices

- National Disaster Response Plan is in place, although it does not address medical countermeasures.
- There are disease-specific plans that guide requirements for medical countermeasures.
- Simulation exercises are occasionally conducted to address public health challenges.

Areas which need strengthening/challenges

- There is a need to ensure that the draft all-hazards plan incorporates and guides sending and receiving of medical countermeasures and medical deployment during public health emergencies.

R.4.2 System is in place for sending and receiving health personnel during a public health emergency - Score 1

No national personnel deployment plan has been drafted.

Strengths/best practices

- Kenya has experience of sending public health workforce to West Africa during the Ebola outbreak (ASEOWA).
- Government structures and procedures are in place to support and guide sending and receiving of medical personnel to provide technical support.
- Various bilateral agreements exist which support sending and receiving of medical personnel during emergencies.
- There is a functional EOC which has capacities and SOPs to support medical countermeasures.
- There is a pool of epidemiologists available at the national and county levels.
- There are rapid response teams to provide surge capacity to disasters at the lower tiers.
- Kenya has experience in disease outbreak response in the country and region over the years e.g. cholera in the United Republic of Tanzania, Ebola in West Africa, Marburg virus disease in Uganda, etc.

Areas which need strengthening/challenges

- Specific plans and systems need to be developed to support sending and receiving of medical personnel during public health emergencies.
- A legal framework should be developed to support sending and receiving of medical personnel during public health emergencies.
- Mechanisms to support personnel deployment may be slow, and need to be developed.

Risk communication

Introduction

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

Target

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

Kenya level of capabilities

The country has integrated a risk communication component in its draft national disaster response plan with specific plans in priority sectors. The Ministry of Health and Ministry of Agriculture, Livestock and Fisheries both have coordination units for activities for communication, while the Ministry of Health also has draft guidelines on risk communication at the national level. The country has permanent communications staff in the different sectors located at the national level. There remains a need to develop a comprehensive risk communication plan in the national preparedness and all-hazards plan. While dedicated communications personnel exist in concerned ministries, there is a lack of knowledge and capacity of risk communication principles and its role in preparedness, response and recovery as articulated under the IHR (2005). Coordination structures exist at various ministries at national level, but would benefit from streamlined SOPs with clear roles and responsibilities including the subnational levels. There is also need for stronger coordination and participation of partners and civil society.

Since 2013, Kenya has had a devolved health system in the country's 47 counties with ownership of subnational health budgets and health risk prioritization. There is need to engage county parliaments and advocate for IHR capacities at subregional levels. The capacity of county-level community health volunteers needs to be reinforced at operational level with commensurate budgeting. This strong network, which was witnessed at sub-county level during a field visit to Namanga in Kajiado County, serves as community engagement practitioners, social mobilizers and agents to address community preoccupations and rumours. Community health volunteers are the principal link for communities to health facilities, and also carry out community-based surveillance to monitor tuberculosis and HIV treatment defaulters. Kenya has strong

experience in past health emergencies that could be studied for lessons learned and best practices to inform risk communication work. There is a need to document and share these examples of the country's rich preparedness and response capacities.

Recommendations for priority actions

- Develop, test and complete a multisectoral national risk communications plan.
- Build the capacity of existing communications officers at national and subnational levels with reinforced knowledge and skills in risk communication as part of the IHR (2005). This includes the training of designated spokespersons.
- Formalize the coordination mechanisms to strengthen participation with partners and civil society, while developing formal community/dialogue mechanisms.
- Develop and strengthen rumour and misinformation tracking mechanism at national and subnational levels.
- Train the media on their role and responsibilities in health emergencies under the IHR.

Indicators and scores

R.5.1 Risk communication systems (plans, mechanisms, etc.) - Score 2

Strengths/best practices

- Provision is made for risk communication in the National Disaster Response Plan, although it is limited in content and is yet to be embedded.
- Disease-specific response plans exist, including for Rift Valley fever, Ebola, polio, yellow fever and cholera.
- Ministry of Health has risk communication guidelines awaiting printing.
- Units for coordination of communication activities are available in the Ministry of Health and the Ministry of Agriculture, Livestock and Fisheries.
- There are permanent staff implementing communication at national level for both ministries with health promotion roles at county and sub-county levels.

Areas which need strengthening/challenges

- No comprehensive multisectoral risk communications plan currently exists.
- The draft National Disaster Response Plan captures a small component of risk communication and this component needs to be embedded with a multisectoral national risk communications plan.
- Although there are permanent staff for communication at national and county levels, they have inadequate training in risk communication.
- There is no surge staff or mechanism for surging communications staff and although a communication budget is available for staff salaries and routine activities, no funding currently exists to support the risk communication activities.
- Currently budget lines are provided on an ad hoc basis for disease-specific response activities.

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

Strengths/best practices

- There is a formal coordination structure among both ministries for communication and coordinating activities.

- The Ministry of Health has a Health Promotion Advisory Committee at national and county levels; it also has advocacy, communication and social mobilization subcommittee which provides technical advice on risk communication activities.
- Coordination of international partners is led by the Cabinet Secretary, Principal Secretary or directors according to need; meanwhile, informal information sharing exists.

Areas which need strengthening/challenges

- There is no dedicated risk communication focal point, nor does funding exist to regularize partner coordination.
- There is very little engagement with other sectors, nor a framework to facilitate regular and formal coordination.
- There is need to greatly increase understanding on IHR (2005) and WHO guidance on risk communication for public health emergencies between the communicators and the partners.

R.5.3 Public communication - Score 3

Strengths/best practices

- Both ministries have strategies for public communication during emergencies and routine activities with demonstrated experience of engaging early with the media.
- Public communication activities are carried out during emergencies, including regular press briefings with ministries, dedicated communication units and public information office.
- Public communication strategies exist and the communications unit carries out rapid assessments to gauge audience segmentation and message development based on geographic and ethnic specificities.

Areas which need strengthening/challenges

- The testing of public communication messages and feedback to inform message development would greatly benefit credible and reliable messaging.
- The Ministry of Health should reinforce coordination of health messaging to existing toll-free numbers during emergencies.
- There is a need to engage media with understandable and credible products including public services announcements during health events.
- While spokespersons exist during public health emergencies, they have to be formally designated with clear lines of command and operational frameworks. This would be greatly aided by the development of terms of reference and risk communication training for the identified spokespersons at national and county levels.

R.5.4 Communication engagement with affected communities - Score 3

Strengths/best practices

- Both ministries have multisectoral units to provide technical leadership for community engagement with Ministry of Health communication focal points at the national level as outlined in the national Health Promotion guidelines.
- Both ministries have permanent and community volunteers at intermediate and community levels to link between national authorities and communities.
- There is evidence of strong community health volunteer capacity at the county and sub-county level central to community engagement, social mobilization, rumour monitoring and addressing misconceptions. Key messages are developed with pre-testing at the national level.

Areas which need strengthening/challenges

- There remains understaffing issues at subnational levels to adequately fill the identified needs.
- To better respond to the increasing transversal role expected from community health volunteers, there is a need to reinforce capacity-building activities among community engagement practitioners at national, county and sub-county level.
- There is a need for a motivation mechanism for community resource persons who act as the community surveillance reporting interface with health facilities.
- Community participation and feedback mechanisms of community preoccupations should be reinforced and formalized to ensure community feedback.

R.5.5 Dynamic listening and rumour management - Score 2

Strengths/best practices

- There is some ad hoc media monitoring at the national level through dedicated staff at the EOC.
- The community health volunteer network provides a rumour monitoring system at county and sub-=county levels.
- A partial system of disease rumour collection exists.

Areas which need strengthening/challenges

- There is no formal listening system for community and public rumours on perceptions.
- There is inadequate capacity for timely monitoring and verification of rumours.
- Monitoring and evaluation of the implementation of risk communication strategies should be strengthened, which can also assist in rumour management.
- Human resources at intermediate levels are not sensitive enough to address rumours in timely way. The country would benefit from increased engagement and alignment of county structures to reinforce listening and rumour management in collaboration with the surveillance systems.

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

Kenya level of capabilities

Kenya has 38 points of entry including 8 airports, 4 sea or lake ports, and 26 ground crossings. In addition, there are numerous informal crossing points at all land borders. Kenya borders five countries: Ethiopia, Somalia, South Sudan, Uganda and the United Republic of Tanzania. The Public Health (Ports, Airports and Frontier Health) Rules, under Section 73 of the Public Health Act, Chapter 242 of the Laws of Kenya Public Health Act, outlines the functions of port health officers.

Kenya has 271 274 officers deployed at 22 points of entry with no port health capacity at the remaining 16. In these 16 points of entry, limited services are offered by health staff from the counties. There is little veterinary capacity at most points of entry and quarantine isolation, temporary holding facilities and clinical treatment facilities are limited to a handful of "one-stop border posts" and Jomo Kenyatta International Airport in Nairobi. Ambulance and diagnostic services are similarly limited and arrangements for referral of ill travellers to nearby health care facilities are generally through informal agreement. The larger points of entry such as Jomo Kenyatta International Airport, Moi International Airport, Kilindini Harbour and Namanga one-stop border post have stocks of personal protective equipment for both clinical and vector/pest control purposes and have effective inspection regimes in place for cargo vessels.

The majority of points of entry have emergency contingency plans for a variety of hazard types with roles of partner agencies clearly stated. There are a few examples of simulation exercises being conducted at the larger points of entry. However, a single overarching national emergency contingency plan is still currently under development and locally adapted SOPs are lacking for the majority of points of entry. Consolidated SOPs for points of entry are being developed with financial and technical support from CDC.

Kenya also has a large number of citizens, visitors and livestock which cross overland borders at informal crossing points. These are only partially monitored by security services and via community-based surveillance programmes, such as polio. There currently is no strategy to improve cross-border IHR-related hazard control at these informal crossing points.

Kenya has increased efforts to build emergency response capacity for a variety of hazards (including CBRN), and has developed relevant contingency plans at points of entry. There is, however, a need to expand and develop current capacities to cover all points of entry and also develop a strategy for addressing IHR-related hazards moving across informal crossing points.

Of the 38 officially listed points of entry, Kilindini Harbour in Mombasa is the only one equipped with a systematic radiation detection system for goods and foodstuffs. Jomo Kenyatta International Airport is equipped with handheld monitors to be used on suspect packages or personnel, but other points of entry do not have any monitoring equipment. Kilindini Harbour staff operating the portal monitors have received appropriate training and an MoU exists for the detection and management of radiation incidents. Any other staff involved in the radiation emergency response (NDMU, Institute of Nuclear Science and Technology, and police) have not received any formal training or procedures to follow for radiological emergency preparedness and response, even when equipped with monitoring assets. A training-of-trainers programme has been implemented for customs officers for the identification radiological packages, but the quick turnover of staff result in a loss of competencies. Medical staff are not trained to detect and follow-up radiologically exposed or contaminated people and no procedures have been created for self-presenters. Kenya lacks equipment and knowledge for utilizing internal dosimetry. Whole body monitoring, excreta analysis and bio-dosimetry capabilities are not available. Atmospheric dispersion software is not utilized by the radiation safety agencies. There are no safety plans or SOPs for radiation emergency preparedness and response. The draft CBRN plan is the only document outlining a response plan and delineating responsibilities.

In support of this assessment, the JEE team were able to visit four points of entry including Jomo Kenyatta International Airport, Kilindini Harbour, Moi International Airport and the Namanga one-stop border crossing.

Recommendations for priority actions

- National capacity-building support is needed to expand coverage to all points of entry including for isolation facilities, clinical facilities and ambulance services, and for development of locally adapted SOPs for emergency response.
- A community-based surveillance strategy should be developed to address IHR-related hazard control at informal border crossing points.
- There is a need to significantly increase the animal health workforce at all points of entry, further build the human health workforce and provide more regular training for IHR-related hazard control through multisectoral exercises and drills.
- A national emergency contingency plan for points of entry should be finalized to provide overall standards and a guidance framework for points of entry to adapt to their local circumstances.
- Broader capacity-building across both human and animal health services at points of entry should be better defined and costed in the development/update of national action plans.

Indicators and scores

PoE.1 Routine capacities are established at point of entry - Score 2

Strengths/best practices

- There is a good inspection and risk assessment regime with clear SOPs for cargo vessels at major points of entry.
- There is appropriate use of vector and pest control strategies at major points of entry.

- Personal protective equipment is in place for both clinical assessment of ill travellers and vector/pest control at major points of entry.
- Existing interagency coordination structures are clearly laid out at points of entry.

Areas which need strengthening/challenges

- There exists large variation in capacities to respond to IHR hazards across official points of entry.
- Capacity to monitor informal border crossings for IHR-related hazards is currently very limited.
- Clinical and diagnostic services are very limited at most points of entry, with no formal arrangements for referral to nearby health care facilities. Ambulances are present only at major points of entry and mainly function as transport vehicles.
- Facilities for isolation/quarantine of ill travellers are very limited at most points of entry (with Jomo Kenyatta International Airport and the seven one-stop border posts being notable exceptions) and for managing hazardous cargo.
- Points-of-entry port health functions are a national responsibility, but many of the support services (such as clinical referral facilities, diagnostics and treatment) do not get sufficient national funding support. While national funding covers the port health workforce salaries, there is a need for the financing of broader capacity-building across both human and animal health services at points of entry to be better defined and supported.

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

Strengths/best practices

- The majority of points of entry have emergency contingency plans for a variety of hazards, with roles of partner agencies clearly stated.
- There is evidence that joint border committees at some points of entry (e.g. Namanga) are able to monitor informal border crossings for potential IHR-related hazards.
- There is good experience from community-based surveillance programmes active in border communities (e.g. polio control programme) that are able identify risks at informal border crossing points.
- Kenya has been taking steps to increase capacity (trained human resources, laboratories and equipment) to address potential CBRNE emergencies and manage chemical and radiation hazards at points of entry.

Areas which need strengthening/challenges

- There is a shortage of port health staff, particularly of the animal health workforce, to adequately cover all points of entry.
- There is a need for more regular timetabling of multisectoral table-top/simulation exercises and drills for IHR-related hazards at points of entry.
- There is a need for locally adapted SOPs to be developed from guidance provided in emergency contingency plans currently available at points of entry.
- Capacity to manage animal disease risk, chemical, environmental and radiation hazards are still very limited at points of entry.
- Safe disposal of hazardous waste and contaminated cargo needs increased investment and monitoring.

Chemical events

Introduction

Timely detection and effective response for potential chemical risks and/or events require collaboration with other sectors responsible for chemical safety, industries, transportation and safe disposal. This would entail that States Parties need to have surveillance and response capacity to manage chemical risk or events and effective communication and collaboration among the sectors responsible for safety.

Target

State parties should have surveillance and response capacity for chemical risk or events. This requires effective communication and collaboration among the sectors responsible for chemical safety, industries, transportation and safe disposal.

Kenya level of capabilities

Kenya has ratified a number of international conventions relating to chemical management, including the Rotterdam, Stockholm, Basel and Chemical Weapons conventions. A number of these conventions have yet to be domesticated in Kenyan law. Kenya is also in the process of preparing for ratification of the Minamata Convention and has implemented the Strategic Approach to International Chemical Management (SAICM).

There are a number of Government stakeholders managing chemical risks and events in Kenya, including the Ministry of Health, the National Environment Management Authority, the Ministry of Environment and Natural Resources, and the Government Chemists Department. There are also other agencies involved, including the Pest Control Products Board, the Pharmacy and Poisons Board, the Water Resources Management Authority and the Energy Regulatory Commission. There is a need for strengthening the multisectoral collaboration on chemical risks and events in Kenya. There is currently no public health technical working group for chemicals.

The NDMU and the NDOC coordinate disaster level incidents with multiple stakeholders and can also access funds for disaster level chemical events. There is also a Division of Disaster and Emergency Response in the Ministry of Health which are in the process of drafting an all-hazards plan (to include risk mapping for chemical hazards). Access to mobile detection and monitoring equipment is sporadic. Timeliness of acquiring equipment maintained by the University of Nairobi, Disaster Response Unit and private contractors and the scale of incident for which equipment is made available is not clear. National emergency responders, such as the fire service and the national youth service, do not carry detection and monitoring equipment. Monitoring equipment is also not readily available to the Ministry of Health or Ministry of Environment and Natural Resources for chronic investigations, such as land contamination. There is also a shortage of personal protective equipment for emergency responders.

Kenya receives support for the management of chemical risks and events from WHO, United Nations Development Programme (UNDP), United Nations Environment Programme, CDC and the private sector. Kenya has a National Profile to Assess Chemical Management, which includes mapping of chemical hazards.

Kenya has numerous plans and legislative frameworks which support the management of chemical risks and events. However, there is a need for consolidation and formalization of these multisectoral plans. Kenya recognizes there is a need for improved coordination and collaboration across multiple sectors and, therefore, a number of projects are currently in progress including:

- production of an overall orientation guidance roadmap for involving the Ministry of Health in chemical management and events;
- establishment of the Health and Environment Strategic Alliance, to bring together the Ministry of Environment and Natural Resources and the Ministry of Health to create national plans for joint action and cross-cutting themes with other agencies (including the National Environment Management Authority);
- establishment of the National Public Health Institute.

Kenya is in the early stages of a project for "Sound Chemicals Management Mainstreaming and Unintentional Persistent Organic Pollutants Reduction in Kenya", aiming to reduce the releases of unintentional persistent organic pollutants and other substances of concern relating to municipal and health care waste.

Kenya is also working with a number of national and international partners on projects to strengthen the enabling environment, including an European Union chemical, biological, radiological and nuclear initiative to identify high-risk chemical facilities; and a Multilateral Environmental Agreement on Persistent Organic Pollutants with UNDP/WHO/Ministry of Health/Ministry of Environment and Natural Resources.

Kenya has three main poison centres, including the national Poison Information Centre at Kenyatta National Hospital (which has a 24/7 publically available toll-free number). The two further poison centres are managed by the Pharmacy and Poisons Board and the Agrochemical Association of Kenya (with informal input from the Poison Information Centre). Kenyatta National Hospital has established the inclusion of clinical toxicology (including chemical poisonings) on the curriculum of a number of degree programmes (including the qualifying medical degree). There are no formal arrangements for surveillance or reporting of chemical incidents. There is a need for agreement on the use of an internationally recognized toxicology database such as POISINDEX or TOXBASE.

Recommendations for priority actions

- Establish a public health technical working group for chemicals including multisectoral agreement and MoUs for roles and responsibilities in chemical emergency response (for non-CBRN/disaster-level events)
- Review multisectoral availability of fixed and mobile detection and monitoring equipment for acute and chronic chemical analysis for land, air and water. Identify key shortages for funding and establish MoUs to allow timely access to equipment.
- Implement findings of the "Kenya Laboratory Mapping Project" (including establishing sustainable funding).
- Implement findings of the multisectoral project on "Sound Chemicals Management Mainstreaming and Unintentional Persistent Organic Pollutants Reduction in Kenya" (including establishing sustainable funding).
- Initiate a multisectoral collaborative project on sound management of chemicals for other (non-persistent organic pollutants) key chemical contaminants of concern for Kenya (including establishing sustainable funding).

Indicators and scores

CE.1 Mechanisms established and functioning for detecting and responding to chemical events or emergencies - Score 2

Strengths/best practices

- There is some laboratory capacity for analysis of consumer products and food at the NPHLS and Government Chemists Department. Kenya is in the early stages of a "Laboratory Mapping Project",

which is seeking to identify laboratory equipment and human resource capacity and capability across the country.

- The University of Nairobi and the Disaster Response Unit have access to some handheld monitoring equipment which may be used in the event of an incident (including that acquired through a European Union donor). The Disaster Response Unit also has some decontamination facilities.
- There are funding streams available if a disaster-level chemical event is declared, which may be obtained via the NDMU.

Areas which need strengthening/challenges

- There is need for a review of the existing legislative framework for environmental protection, including the efficiency and effectiveness of the framework. The Ministry of Environment and Natural Resources is working with consultants to undertake this review.
- There is a need for further mapping of laboratory facilities for analysis of environmental media (land, air and water). Nationally, there is a lack of specialist equipment for analysing a comprehensive suite of chemicals and media. There is a shortage of adequately trained staff in this field and the existing laboratories are not accredited for chemical analysis.
- Neither hospitals nor emergency responders (Disaster Response Unit excepted) maintain decontamination facilities/equipment. There are no readily available case management guidelines for clinicians or emergency responders relating to isolation and decontamination.
- There are a number of emergency responders who may become involved in scene management, including the fire service, national youth service, Disaster Response Unit, police and the third sector. However, command and control at scene level for chemical events is not clear. There is a need for more training of emergency responders in chemical events.
- There is a need for the agreement of standards/guidelines, values for chemicals in land, air and biological media to aid risk assessment and remedial action.
- Work is required to improve proactive and reactive risk communication capabilities for chemical risks and events, particularly at subnational level.

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

Strengths/best practices

- Kenya has a variety of draft and published legislation, plans and guidelines to enable chemical management and event response. The Health Sector Disaster Risk Management Strategic Plan 2014–2018 includes strategic objectives and a broad implementation plan for establishing systems for management of HAZMAT/CBRN incidents.
- There is a draft National Disaster Response Plan, which sets out a framework for planning for multiple hazards, including chemicals. There is also a draft Kenya National CBRN Plan for emergency response coordination in the event of a CBRN incident or emergency (relating to those events under the definition of chemical, biological, radiological and nuclear).
- Kenya has an agreement for cross-border support under the East Africa Unit, though this does not specifically relate to chemicals.

Areas which need strengthening/challenges

- Although a number of international conventions have been ratified, not all have not been formalized under Kenyan law; such as the Chemical Weapons Convention, which was ratified in 1997, but does not yet have implementing legislation.

- There is currently no plan for the management of chemical events which do not fall under the definition of CBRN (under the Kenya National CBRN Response Plan) or disaster (under the draft National Disaster Response Plan). There is a need to develop such a plan. There is also a need for development of SOPs for disaster level chemical events, as stated in the draft National Disaster Response Plan.
- Industrial regulations for pollution, prevention and control require strengthening to allow for employment of best available techniques to minimize pollution; improved waste management; accident planning and prevention; and better control of emissions to land, water and air. There is need for further training of environmental inspectors to better identify potential hazards as part of the enforcement activities of the National Environment Management Authority.
- Kenya has identified the need for further development of legislation, frameworks, guidance and training relating to the import, storage and transport of chemicals. There are a number of agencies already involved in this area (including the National Environment Management Authority, Kenya Bureau of Standards, and Ministry of Roads and Infrastructure) and there is strategic trade control legislation in development; however there is a need for better collaboration to identify priorities and progress work in this area.

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

State parties should have surveillance and response capacity for radionuclear hazards/events/emergencies. This requires effective communication and collaboration among sectors responsible for radionuclear management.

Kenya level of capabilities

The Radiation Protection Board in the Ministry of Health oversees every aspect of radiation control. Its legal duty, under the Radiation Protection Act of 1982, calls for the regulation of any radioactive source or irradiating device used in Kenya, and for the provision of expert advice on radiation protection. Although radiation emergency preparedness and response has not been legislated, the Radiation Protection Board has taken responsibility for radiation protection and safety. Aside from its main Nairobi office, six regional offices have been opened (in Coast Province, Eldoret city, Eastern Province, Nyanza Province, Jomo Kenyatta International Airport, and Nairobi County), reducing the response time when radiation specialists are needed. An on-call rota is also implemented in every office, enabling a 24/7 response all over the country. Response time could be reduced further by involving nationwide radiation specialists from the medical and industry sector into a voluntary scheme for support to radiation emergency preparedness and response.

National policies, plans and SOPs are the weak point of Kenyan radiation emergency preparedness and response arrangements. The draft CBRN plan currently leans on already existing procedures and plans for radiation emergency response, and the future draft Nuclear Regulatory Bill only makes provision for the approval of emergency plan on licensed sites. The existing Radiation Protection Act Chapter 243 does not incorporate the notion of radiation emergency preparedness and response, and leaves the scope of radiation incident management to personal interpretation.

Kenya has a strong CBRN strategy and, although the corresponding CBRN plan is still in a draft version, procedures for the national coordination and response to such incidents are operational. CBRN threats are a growing source of concern for the national authorities, and significant efforts have been made to address this issue. Kenya has had several minor incidents regarding radiation safety, including the theft of two small industrial sources. Kenya has a draft National CBRN Response Plan; monitoring equipment has been distributed via United States and European Union support programmes; simulation exercises have been organized by the International Atomic Energy Agency (source location and recovery actions organized by the United States of America and European Union) for source location and recovery actions. Considerable efforts have been made to develop the CBRN response arrangements and equipment. However, many category II and III mobile or fixed sources (e.g. gammagraphy sources and nuclear gauges) are present around the country and pose potential threats.

On a suspected radionuclear incident, the NDOC would be established (NDOC is an established body already) and used as a national EOC for coordination and management of the incident at a strategic level. The Radiation Protection Board would seat at the NDOC as an expert body. On the operational level, the

NDMU would be the first responder on scene able to support the police for monitoring, identification of the threat and to provide decontamination if needed. The NDMU would be supported by the Radiation Protection Board for expert consultation and advice and could also be supported by the Institute of Nuclear Science and Technology for further forensic analysis. The NDOC and NDMU both have access to emergency funds for the management of the disasters.

The Institute of Nuclear Science and Technology (Ministry of Education, Science and Technology) focuses on training radiation scientists, and the Kenya Nuclear Electricity Board (Ministry of Energy) is charged with fast-tracking the implementation of nuclear power in Kenya.

No health care facilities or rest centres have been identified for use in radiation emergencies and no mass decontamination procedures have been implemented so far, despite the human and material resources currently existing within the country (fire engines). Some military units have nevertheless been equipped with mass decontamination structures and could be deployed in such incidents.

Imported foodstuffs are systematically controlled for radioactive contamination, through a mandatory service provided by a chartered Radiation Protection Service Provider, able to produce an assessment report. The report is thereafter reviewed by the Radiation Protection Board and clearance granted.

Despite recent progress, Kenya would be challenged by medium to complex scenarios as identified in the International Atomic Energy Agency's General Safety Requirements Part 7 (2015). Kenya would rely heavily on the military (Defence Response Unit), nongovernmental organizations (e.g. Kenya Red Cross, St John Ambulance Kenya volunteers) and foreign governments (through the International Atomic Energy Agency). However, capacity-building for CBRN events is in progress at NDMU.

The Kenyan authorities intend to implement a nuclear power programme and to commission its first reactor by 2027. Partnerships with foreign nations have been ratified for the training of nuclear and radiation scientists, albeit at a slow pace. A sharp increase in resources would be necessary to meet the deadline.

A field visit to the Radiation Protection Board and the Institute for Nuclear Science and Technology were undertaken during the mission.

Recommendations for priority actions

- Develop and enforce a legal framework for radiation emergency response and preparedness. Dose limits for members of the public, radiation workers and first responders should be specifically detailed, both for normal and emergency situations. The modality of the emergency response, including the mention of the creation of a national plan, but also stakeholders' involvement in the response, should be included in the bill. To this end, the current draft of the Nuclear Regulatory Bill could be developed and adapted to include this important piece of information.
- Set the base of a National Radiation Emergency Response Plan (NRERP). This plan will be enforced through the Nuclear Regulatory Bill, and be multipartite and mandatory. Roles and responsibilities of each stakeholder should be clearly defined. A comprehensive risk assessment will be created and contingency plan for each risk explained. The new NRERP will also make reference to any other relevant policies, plans and procedures and be regularly updated. The plan should be tested on a regular basis (yearly), with regulatory exercises and drills, umpired by the regulator. Corrective actions would be undertaken for stakeholders not compliant with their legal duty as notified in the plan.
- Develop SOPs for stakeholders involved in the NRERP, in particular for the first responders. These SOPs should be scenario-based, be written by technically competent bodies and be approved by the regulator. They will aim to define step by step the procedures of intervention for any radiation-related incident. The SOPs will be referenced in the national or local plans and will therefore be tested during exercises.

- Develop competencies in atmospheric dispersion calculation, internal dosimetry and retrospective dosimetry. Existing resources within health trusts should be used for biodosimetry assessment.

Indicators and scores

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

Strengths/best practices

- Capacity exists to deal with most low intensity incidents. The Radiation Protection Board is the expert agency for radiation safety, monitoring and emergency response. Specialist support for any given radiological incident nationwide is strengthened by the dispatched geographical repartition of the regional offices of the Radiation Protection Board and the support of the NDMU.
- Kenya has a strong CBRN strategy and, although the corresponding CBRN plan is still in a draft version, procedures for the national coordination and response to such incidents are operational.
- The NDOC and NDMU both have access to emergency funds for the management of disasters.

Areas which need strengthening/challenges

- National policies, plans and SOPs for radiation emergency preparedness and response arrangements need strengthening.
- Radiological monitoring equipment is in short supply among custom officers and only two points of entry are currently equipped.
- Medical staff are not trained to detect and follow-up radiologically exposed or contaminated people and no procedures have been created for self-presenters. Other staff involved in the radiation emergency response have not received any formal training or SOPs to follow for radiation emergency preparedness and response, even when equipped with monitoring assets.
- No health care facilities or rest centres have been identified for use in radiation emergencies and no mass decontamination procedures have been implemented.

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

National authorities responsible for radiological and nuclear events have a designated focal point for coordination and communication with the Ministry of Health and/or IHR NFP.

Strengths/best practices

- Radiation safety is enforced through the Radiation Protection Board which relies on the Radiation Protection Act to inspect, control and deliver licenses to radiation facilities in a timely manner depending on the importance of the risk identified. This graded inspection approach, together with the upkeep of a national radioactive source registry allows the Radiation Protection Board to regulate in a safe manner every registered source present on its territory.
- The creation of a Nuclear Security Coordination Centre in 2012, under the Radiation Protection Board in conjunction with the International Atomic Energy Agency, aims to assess nuclear security threats in the country, as well as coordinate and sustain the nuclear security regime. The Nuclear Security Coordination Centre favours the communication between different stakeholders and improves national security towards malevolent acts.
- Combined analysis capabilities of the Radiation Protection Board and the Institute of Nuclear Science and Technology enable Kenya to cover many radiological scenarios. Energy dispersive X-ray fluorescence, gamma spectrometry (high-purity germanium) and liquid scintillation enable Kenya to characterize

many types of radionuclide. Furthermore, recently donated equipment from aid programmes (such as plastic scintillators or cadmium zinc telluride detectors) allow the Radiation Protection Board to locate sources and make quick decisions with regards to their hazard potential.

Areas which need strengthening/challenges

- Procedures for internally contaminated people do not currently exist in Kenya. A liquid scintillator is operational within the Radiation Protection Board, but is only used for environmental monitoring purposes. Additional training on radiochemistry techniques would enable Kenya to use this equipment for urine or faeces analysis. Likewise, hospitals and laboratories could be included in the response plan for triaging people in case of a major radionuclear event for external contamination monitoring and biological dosimetry (e.g. blood cell count, cytogenetic).
- Training on atmospheric dispersion software should be implemented for a pool of qualified personnel so as to assess the dose to members of the public and deposited activities in affected areas. These tools prove to be particularly useful for making quick decisions on countermeasures, estimated dosimetry and food bans. Scenarios such as a transport accidents or a radiological dispersal device fall within this category.
- No national waste management policy currently exists within the country. Orphan sources are managed by the Materials Testing and Research Laboratory or the Radiation Protection Board. The National Environment Management Authority would be responsible for the decontamination and remediation of the affected areas in a chemical, biological, radiological and nuclear scenario event.

Appendix 1: JEE background

Mission place and dates

Nairobi, Kenya: 27 February–3 March 2017

Mission team members

- Ambrose Talisuna, WHO, Uganda (Team Leader)
- Lucy (Linda) Boulanger, CDC, United States of America (Team Leader)
- Eric Gogstad, CDC, United States of America
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Objective

To assess Kenya's capacities and capabilities relevant to the 19 technical areas of the JEE tool in order to provide baseline data to support the country's efforts to reform and improve their public health security.

The JEE process

The JEE process is a peer-to-peer review. As such, it is a collaborative effort between host country experts and external evaluation team members. The entire external evaluation, including discussions around the scores, the strengths, the areas which need strengthening, best practices, challenges and the priority actions should be collaborative, with external evaluation team members and host country experts seeking full agreement on all aspects of the final report findings and recommendations.

Should there be significant and irreconcilable disagreement between the external team members and the host country experts or among the external or among the host country experts, the JEE team leader(s) will decide the outcome; this will be noted in the final report along with the justification for each party's position.

Preparation and implementation of the mission

Teleconferences were held weekly with assessment team members and the host country prior to the JEE to review the agenda, responsibilities and logistics. An advanced team arrived on 23 June 2017 to assist in the preparatory arrangements before the JEE was conducted. A preparatory meeting was held led by the team leader(s) to brief the external subject matter experts on the JEE process.

Limitations and assumptions

- The evaluation was limited to 1 week, which limited the amount and depth of information which could be managed.
- It is assumed that the results of this evaluation will be made publically available.
- The evaluation is not an audit but a peer-to-peer review. Information provided by the Republic of Kenya was not independently verified, but was discussed and the evaluation rating mutually agreed by the host country and evaluation team.

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Supporting documentation provided by host country

National legislation, policy and financing

Relevant documentation

- Kenya IHR core capacity assessment report (2009)
- EAC One Stop Border Posts Act
- EAC Vision 2050: regional vision for socio-economic transformation and development (2016)
- IDSR technical guidelines, 2nd Edition (2012)
- Public Health Act (Chapter 242 of the Laws of Kenya)
- Food, Drugs and Chemical Substances Act (Chapter 254)
- Environment Management and Co-ordination Act
- Malaria Prevention Act (Chapter 246)
- Meat Control Act (Chapter 356)
- Animal Diseases Act (Chapter 364)
- Kenya Veterinary Policy (April 2015)
- MoU between the Government of the Republic of Kenya and Republic of Namibia, Ethiopia, Botswana, Israel, on Technical Cooperation in Health
- Letters of intent from Republic of Liberia and Mexico
- EAC One Stop Border Posts Act (2016)

IHR coordination, communication and advocacy

Relevant documentation

- Kenya's Statement during the Sixty-ninth World Health Assembly on the role of the International Health Regulations (2005) in the Ebola outbreak and response – document A69/21 (2016)
- Kenya IHR core capacity assessment report (2009)
- IHR plans of action (2010–2012, 2012–2014 and 2015–2016)
- Report of stakeholders meeting of 24 May 2012 to revise IHR plan of action
- Ministry of Health letter to WHO on IHR focal point
- Minutes of National Task Force meetings
- Kenya public health events posted in the IHR event information site

Antimicrobial resistance

Relevant documentation

- National Policy on the Prevention and Containment of Antimicrobial Resistance in Kenya (advance copy, 2017)
- National action plan on prevention and containment of antimicrobial resistance in Kenya (advance copy, 2017)

- National surveillance strategy on antimicrobial resistance in Kenya (advance copy, 2017)
- National strategy on infection prevention and control in Kenya (2014)
- National policy and guidelines on infection prevention and control in Kenya (2015)
- Situation analysis and recommendations: antibiotic use and resistance in Kenya (Global Antibiotic Resistance Partnership, 2011 and 2016)
- Global action plan on antimicrobial resistance (WHO, 2015)
- Global antimicrobial resistance surveillance system: manual for early implementation (WHO, 2015).
- AMR surveillance in low- and middle-income settings: a roadmap for participation in the Global Antimicrobial Surveillance System (GLASS) (London School of Hygiene & Tropical Medicine, 2016)

Zoonotic diseases

Relevant documentation

- Kenya One Health strategic plan 2012–2017 (ZDU, 2012)
- Strategic plan for the elimination of human rabies in Kenya 2014–2030 (ZDU, 2014)
- National Rift Valley fever contingency plan (2014)
- Highly pathogenic avian influenza control and prevention plan
- List of priority zoonotic disease for Kenya (ZDU)
- A One Health advocacy strategy to promote One Health
- Draft One Health policy document (under development)

Food safety

Relevant documentation

- Food, Drugs and Chemical Substances Act, Chapter 254, Laws of Kenya
- Public Health Act, Chapter 242, Laws of Kenya
- Sanitary and Phytosanitary Measures protocol
- Draft National Food Safety Policy

Biosafety and biosecurity

Relevant documentation

- Kenya national biosafety/biosecurity policy guidelines - http://www.biosafetykenya.go.ke/
- Kenya national biosafety/biosecurity training curriculum
- Kenya national biosafety and biosecurity annual refresher training guide
- Draft Bioscience Bill
- Global biorisk management curriculum (Sandia national Laboratories) http://biosecurity.sandia.gov/gbrmc/catalog.html
- National public health laboratory strategic plan
- National Commission for Science, Technology and Innovation survey report

Immunization

Relevant documentation

- The Constitution of Kenya
- National policy guidelines on immunization 2013 (Ministry of Health, 2013)
- Post-introduction evaluation of rotavirus and measles second dose (2015)
- Comprehensive multi-year plan 2015–2018
- Accelerating attainment of health goals: the Kenya health sector strategic and investment plan 2014—2017
- Kenya health policy 2014–2030: towards attaining the highest standard of health (Ministry of Health, 2014)
- National human resources for health strategic plan 2009–2012 (Ministry of Medical Services, 2009)
- Global vaccine action plan 2011–2020 (WHO, 2013)

National laboratory system

Relevant documentation

- National public health laboratory strategic plan, 2016–2020
- Quality policy manual for medical laboratory services in Kenya, 2011
- National integrated external quality assessment strategy for medical laboratory services, strengthening laboratory management toward accreditation programme (SLMTA) (2014)
- National policy guidelines for laboratory specimen referral networks (2012)
- National HIV viral load testing scale-up implementation guidelines 2016–2019
- Kenya essential medical laboratory commodity list (2014)
- National policy guidelines for medical equipment management (2012)
- National policy guidelines for medical laboratory infrastructure (2012)
- Standard laboratory design guidelines (2012)
- Guide for the national public health laboratory networking (2008)

Real-time surveillance

Relevant documentation

- IDSR technical guidelines, 2nd Edition (2012)
- IDSR training modules (participant and facilitator)
- Draft IDSR Unit strategic plan 2013–2018
- Kenya: weekly epidemiological bulletin
- IDSR weekly/mSOS training manual
- VEES quarterly bulletin
- Manual of field surveillance in animal health

- National list of notifiable animal diseases
- Kenya livestock syndromic surveillance training plan
- National animal diseases contingency plans –Rift Valley fever and peste de petits ruminants as examples

Reporting

Relevant documentation

- Annex 2 of the IHR (2005) Imported yellow fever cases report from WHO electronic information system
- Terrestrial animal health code. Volume 1: general provisions (OIE, 2011)

Workforce development

Relevant documentation

- Health sector human resources strategy 2014–2018 (Ministry of Health, 2014)
- Devolved HRM policy guidelines on human resources for health (Ministry of Health, 2015)
- Economic survey 2016 (Kenya National Bureau of Statistics, 2016)
- Veterinary staff establishment
- Human health staff establishment
- FELTP residents advanced handbook

Preparedness

Relevant documentation

- Draft Kenya public health EOC framework
- Database of health workers who have responded to international events
- National mass casualty incident management protocols
- National disaster response plan (2009) (http://www.ifrc.org/docs/idrl/857EN.pdf)
- National emergency response plan and SOPs (NDMU, 2014)
- National policy guidelines for laboratory specimen referral networks (http://www.afro.who.int/sites/default/files/2017-06/afro-guidance-lab-systems-final_dec2014_0.pdf)
- Yellow fever risk assessment report
- Reports for cholera and chikungunya outbreaks and alerts
- Case management guidelines for priority diseases
- Kenya health sector referral implementation guidelines, 1st edition (Ministry of Health, 2014) (http://publications.universalhealth2030.org/uploads/ministry-of-health-referral-guidelines.pdf)
- Agenda for national task force for polio containment

Emergency response operations

Relevant documentation

- Draft Kenya public health EOC framework

- Database of health workers who have responded to international events
- National mass casualty incident management protocols
- National disaster response plan (2009) (http://www.ifrc.org/docs/idrl/857EN.pdf)
- National policy guidelines for laboratory specimen referral networks (http://www.afro.who.int/sites/default/files/2017-06/afro-guidance-lab-systems-final_dec2014_0.pdf)
- Yellow fever risk assessment report
- Reports for cholera and chikungunya outbreaks and alerts
- Case management guidelines for priority diseases
- Integrated disease surveillance and response (IDSR) technical guidelines, 2nd
- Kenya health sector referral implementation guidelines, 1st edition (Ministry of Health, 2014) (http://publications.universalhealth2030.org/uploads/ministry-of-health-referral-guidelines.pdf)
- Agenda for national task force for polio containment
- ZDU technical working group

Linking public health and security authorities

Relevant documentation

- Public Health Act, Chapter 242, Laws of Kenya
- Points of entry contingency plans (Jomo Kenyatta International Airport and Kilindini Habour)
- Food, Drugs and Chemical Substances Act, Chapter 254, Laws of Kenya
- Security Laws (Amendment) Act, No 19 of 2014
- SOPs for border management committees
- Hazard maps, NDOC

Medical countermeasures and personnel deployment

Relevant documentation

- Influenza pandemic preparedness plan – Kenya
- Cholera prevention and control plan – Kenya
- EAC One Stop Border Posts Act
- NDOC – Kenya plan
- ASEOWA MoU with the Government of Kenya

Risk communication

Relevant documentation

- Draft national disaster response plan - http://www.afro.who.int/sites/default/files/2017-05/drm-2014--2018.pdf
- Health promotion guidelines

Points of entry

Relevant documentation

- Public Health Act, Chapter 242, Laws of Kenya, Section 56–75 (Ports and inland borders of Kenya)
- Exercises and drills report from Jomo Kenyatta International Airport and Moi International Airport
- Malaria Prevention Act, Chapter 246, Laws of Kenya
- IHR (2005)
- International Civil Aviation Organization regulations
- SOPs for port health services (Jomo Kenyatta International Airport, Kilindini Harbour, Namanga one-stop border post)
- Emergency and aerodromes contingency protocols

Chemical events

Relevant documentation

- National CBRN response plan (final draft, October 2015)
- Kenya national profile to assess chemicals management (Ministry of Environment and Mineral Resources, 2011)
- Kenya health sector disaster risk management strategic plan 2014–2018 (Ministry of Health)
- Disaster Management Bill (draft, 2016)
- Food, Drug and Chemical Substances Act. Chapter 254, Laws of Kenya (2012)
- Hazardous substance registration (draft, 2015)
- Occupational Safety and Health Act (2007) and supporting regulations
- Environmental Management and Co-ordination Act (1999, amended 2015)
- Environmental management and coordination (toxic and hazardous industrial chemical and material management) regulations (draft, 2013 and 2015)
- Environmental management and co-ordination (waste management) regulations (2006)
- Pest Control Products Act , Chapter 346, Laws of Kenya (1983, revised edition 2013)
- National solid waste management strategy (National Evironment Management Authority, 2015)
- Water quality regulations (Ministry of Environment and Mineral Resources,2006)
- Environmental management and coordination (air quality) regulations (2015)
- Guidelines for E-waste management in Kenya (Ministry of Environment and Mineral Resources,2010)
- Implementation plan for strategic approach to international chemical management (SAICM) in Kenya (Ministry of Environment and Mineral Resources,2011)

Radiation emergencies

Relevant documentation

- Radiation Protection Board brief on: Kenya Nuclear Security Coordination Centre
- Statement of the Republic of Kenya at the ministerial segment of the international conference on nuclear security

- Standard operating procedures for detection of radioactivity on imported motor vehicles and other conventional cargo in the port of Mombasa: draft report of the technical committee
- Kenya national CBRN response plan (final draft, October 2015)
- Radiation Protection Act, Chapter 243, revised edition 2014
- Radionuclear conventions and treaties
- Radiation Protection Board strategic plan (2011)
- National emergency response plan & SOPs
- Board Committee terms of reference
- Nuclear Regulatory Bill (draft, 2016)

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