

JOINT EXTERNAL EVALUATION OF IHR CORE CAPACITIES

of the

SWISS CONFEDERATION AND THE PRINCIPALITY OF LIECHTENSTEIN

Mission report:
30 October - 3 November 2017



World Health
Organization

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Acronyms and abbreviations

ACMO	Airport chief medical officer
ADR	European Agreement Concerning the International Carriage of Dangerous Goods by Road
AMR	Antimicrobial resistance
BSL	Biosafety level
BTSF	Better Training for Safer Food (EU courses)
CDC	US Centers for Disease Control and Prevention
DURC	Dual use research of concern
ECDC	European Centre for Disease Prevention and Control
ECHO-ERCC	European Civil Protection and Humanitarian Aid Operations Emergency Response Coordination Centre
EFSA	European Food Safety Authority
EQA	External quality assurance
ESVAC	European Surveillance of Veterinary Antimicrobial Consumption
EU	European Union
EWRS	Early warning and response system (EU)
FETP	Field epidemiology training programme
FIWI	Swiss Centre for Fish and Wildlife Health
FOAG	Swiss Federal Office for Agriculture
FOCA	Swiss Federal Office of Civil Aviation
FOCP	Swiss Office for Civil Protection
FOEN	Swiss Federal Office for the Environment
FOPH	Swiss Federal Office for Public Health
FSVO	Swiss Federal Food Safety and Veterinary Office
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
GLASS	WHO Global Antimicrobial Resistance Surveillance System
HBV	Hepatitis B virus
HPV	Human papilloma virus
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICRP	International Committee for Radiological Protection
IGS	Swiss chemistry database

IHR	International Health Regulations
IHR NFP	National focal point for the IHR (2005)
ILI	Influenza-like illness
INFOSAN	WHO International Network of Food Safety Authorities
IPC	Infection prevention and control
IRA	Swiss Institute of Radiation Physics
MANCP	Multiannual national control plan
MAO	Major Accidents Ordinance
MDRO	Multidrug resistant organisms
MIC	Minimum inhibitory concentration
MSF	Médécins Sans Frontières
NARA	Swiss National Reference Centre for Emerging Antibiotic Resistance
NENT	Swiss National Reference Centre for Enteropathogenic Bacteria and Listeria
NEOC	Swiss National Emergency Operations Centre
NOSO	Swiss national strategy for monitoring, prevention and control of healthcare-associated Infections
POC	Point of contact
PSI	Paul Scherrer Institute
RASFF	Rapid Alert System for Food and Feed
SAICM	Strategic Approach to International Chemicals Management
SANKO	Swiss medical services coordinating body
SARS	Severe acute respiratory syndrome
SAS	Swiss Accreditation Service
SDC	Swiss Agency for Development and Cooperation
SHA	Swiss Humanitarian Aid Unit
SOPs	Standard operating procedures
SPSU	Swiss Paediatric Surveillance Unit
SUVA	Swiss national accident insurance fund
Swissmedic	Swiss federal medicines agency
ZOBA	Swiss Centre for Zoonoses, Animal Bacterial Diseases and Antimicrobial Resistance

Executive summary

Introduction

WHO developed the International Health Regulations (IHR) 2005 to help the international community prevent, detect and respond to acute public health events with potential to cross borders and threaten populations worldwide. The regulations have been ratified by 196 states parties worldwide, and entered into force in 2007.

This report is the product of a Joint External Evaluation (JEE) of the capacity of the Swiss Confederation (Switzerland) and the Principality of Liechtenstein to prevent, detect and rapidly respond to public health threats of a natural, deliberate or accidental nature. The assessment uses the World Health Organization (WHO) International Health Regulations (IHR 2005) JEE tool.

Switzerland and Liechtenstein are the 9th and 10th member states of the WHO European region to conduct a JEE of IHR (2005) core capacities. The JEE is a voluntary process, multisectoral in approach, that consists of peer-to-peer collaboration to reach a consensus, and is transparent in nature. It enables countries to identify priority actions to enhance their health security, foster partnerships with stakeholders, and mobilize resources.

The JEE is a key component of the WHO IHR Monitoring and Evaluation Framework. It uses a standard tool to measure national capacities across 19 technical areas related to health security, and provides the opportunity to sustain momentum in strengthening health security through identifying gaps in national systems and facilitating the development of plans of action to fill those gaps.

A unique feature of the JEE process described in this report is that it addressed the IHR core capacities of two independent countries at the same time. This arrangement was agreed between the WHO and both countries, at the countries' request. It is dependent on the special relationship between the two nations, as Liechtenstein is a small nation (of less than 38,000 inhabitants) that relies on Switzerland, as set out in mutual agreements and treaties, for a number of key functions of the IHR (2005).

Switzerland is a federal state in which state power is divided between the central (federal) government and the 26 cantons (regions) and their communes. The system implies equal rights and a high degree of cantonal and communal independence—i.e. powers are highly decentralized. The central element of Swiss federalism is the subsidiarity principle, which implies that competences not explicitly assigned to the Swiss Confederation fall within the competence of the cantons.

During the JEE self-assessment process and the external team visit to Switzerland and Liechtenstein, country capacities in each of the technical areas were evaluated separately for the two countries, as relevant, and interconnections were noted. In many technical areas, Liechtenstein is in practice fully integrated into the Swiss system (very much operating as if it was a 27th canton), and thus scores were given as one single score for both countries. In a number of technical areas, though, the capacities and modes of operation of the two countries are sufficiently diverged and independent as to necessitate separate scores. In a few technical areas, no score was given to Liechtenstein as the questions were not applicable to the country (e.g. biosafety and biosecurity, an area in which Liechtenstein has no facilities or activities, or designated points of entry under the IHR, of which Liechtenstein has none). Differences between Switzerland and Liechtenstein are noted when relevant, and recommendations for priority actions are given either for the integrated systems of both countries, or separately when appropriate.

Another feature of note of these two central European countries is that neither are members of the European Union (EU)—though Liechtenstein is a member of the European Economic Area (EEA). Both, however, are members of the European Free Trade Area (EFTA) and of the Schengen area of free movement across borders. Liechtenstein therefore enjoys some benefits of EU-related health security cooperation that are not available to Switzerland.

The external JEE Team is grateful to the national teams of Switzerland and Liechtenstein for collaborative, open and transparent dialogue throughout the JEE process, and the strong commitment both countries have shown to enhancing their IHR (2005) core capacity requirements.

Key findings from the Joint External Evaluation

During the JEE mission, the capacities of Switzerland and Liechtenstein were evaluated across 19 technical areas through a peer-to-peer, collaborative process that brought together Swiss, Liechtensteinian and JEE subject matter experts.

The Swiss Confederation legislates on health and accident insurance. The system is a regulated market model with a combination of private competition (not-for-profit) and state regulation. All residents of Switzerland must have mandatory health insurance that provides:

- Universal coverage (outpatient and hospital care) with an extensive standardized benefit package
- Full mobility between health insurers (there is an obligation to accept all applicants residing in Switzerland, with no formal risk selection)
- Cost sharing, as some services require co-payment/franchising (until an annual cap is reached).

The healthcare system of Liechtenstein is very similar, with compulsory insurance, per capita premiums, cost sharing and a benefits catalogue.

Health is one of the key areas where Swiss cantons have many competencies. The cantons:

- Provide and fund health services
- Grant approvals to open medical practices or pharmacies
- Prevent diseases and promote health
- Implement federal laws delegated by the federal government.

There are 297 hospitals in Switzerland: 147 are public or subsidized and 150 are privately run. This translates into 5.4 hospital beds, four physicians and 18 pharmacies per 1,000 inhabitants. In Liechtenstein there is only one, small, basic hospital and one clinical laboratory, though there are many family doctors and private practitioners. The physician density in Liechtenstein is also high: 2.9 per 1,000 inhabitants, comparable to that of Switzerland. In many regards, Liechtenstein relies on the Swiss, and to some extent the Austrian, health systems, through formal agreements (e.g. for general hospitals, paediatric and other specialized and high-tech hospitals, and psychiatric and rehabilitation clinics). Other close links to Switzerland exist for epidemiological functions, licensing of medical products (through Swissmedic, the Swiss federal medicines agency), electronic cost allocation, and eHealth.

The IHR National Focal Points of both Switzerland and Liechtenstein rely on the support of IHR contact points within Switzerland. Switzerland has implemented the IHR (2005) through national legislation and the relevant policy, organizational and legal frameworks and protocol agreements have been developed. Legislation for implementation of the IHR (2005) covers human, animal and environmental health and food aspects. Cross border agreements are in place with Germany, Italy, France, Liechtenstein and Austria. Capacity could be improved by strengthened regional coordination, more frequent and thorough exercising, and strengthened regional cooperation.

Liechtenstein relies on Swiss capabilities for detecting, monitoring and preventing antimicrobial resistance (AMR), based on One Health collaboration between the public health and the veterinary/food safety sectors. There is systematic monitoring of emerging AMR threats and common reporting of human & animal surveillance results, as well as environmental sampling in rivers and lakes. This could be strengthened

in both countries with enhanced stewardship, surveillance and monitoring, and the implementation of screening and outbreak management guidelines for multidrug resistant organisms.

Liechtenstein's responses to zoonoses and zoonotic events are integrated into the Swiss system, which has strong capacity for preventing, detecting and responding to zoonotic diseases of public health significance. It is based on a One Health approach, with the right competencies in place, regular reporting, and close collaboration between the relevant bodies.

Liechtenstein follows the same processes as, and works closely with, Swiss authorities in detecting and managing food hazards, and in cases of larger foodborne outbreaks it relies on Swiss capabilities. Food hazard management in Switzerland is based around a single responsible organization with good lines of communication between national and cantonal levels, one national contact point for food safety issues including international information exchange, and regular meetings between relevant bodies, stakeholders and consumers. Improvements in both countries could be made to the timeliness of information exchanges on foodborne outbreaks and ongoing investigations, and testing procedures could be strengthened by improved financing for laboratories and a review of issues inhibiting data exchange and availability of sample material.

No high consequence pathogens are stored or handled in Liechtenstein, so they were given no scores for biosafety and biosecurity. Switzerland has a sophisticated, comprehensive biosafety system that ensures safe handling and record-keeping of dangerous pathogens, provides suitable training, and restricts access. To a certain—and in some areas sufficient—extent, these systems also address biosecurity issues; but there is no specific legislation in effect that addresses biosecurity and dual use research of concern.

Switzerland has a comprehensive immunization programme with good coverage that has increased in recent years, a positive exception among European peer countries. The Liechtenstein system relies on Swiss structures of vaccine programmes and product regulation and registration. WHO coverage goals are almost but not completely achieved. Some weaknesses exist due to a small market, a lack of central procurement, and the requirement for national approval for market introductions. This means that not all vaccine products generally approved on the EU market are available in Switzerland, and vaccine shortages are harder to manage.

Liechtenstein relies on Swiss laboratory capacity, which is based on a strong legal foundation and a dense network of laboratories enabling rapid access even to high security BSL3 and 4 labs. Relevant analyses are reimbursed by the state, and the flexibility is in place required to modify the legal basis for compulsory declaration. Reference laboratories are in place for the majority of pathogens.

As far as real-time surveillance of infectious diseases is concerned, Liechtenstein is a de facto part of the Swiss system, which is based on long-term collection of information on a range of defined diseases and pathogens and allows for continuous, ongoing analysis of trends and timely outbreak detection in both humans and animals. Regional and international collaboration should be improved, especially with the EU, as could support to less developed countries.

For reporting, both Switzerland and Liechtenstein have functional focal points (NFPs) for the IHR (2005), but Liechtenstein depends on the national IHR contact points and the IHR NFP of Switzerland. All contact points and the two NFPs are united under a single IHR platform that meets regularly. Collaboration could be improved by increased Liechtensteinian participation in Swiss simulation exercises.

While Switzerland has a well-developed public health and veterinary workforce sufficient to meet its needs—both in numbers and in capacity—Liechtenstein has only 11 employees working in public health. Though this is adequate to meet routine requirements, Liechtenstein's default position is to rely on relevant experts from Switzerland for support for surges and/or when required. There is a legal basis for this reliance. Switzerland would benefit from a more strategic approach to curriculum development for training, while the vulnerabilities of its small workforce mean Liechtenstein might do more to establish functions to ensure continuous coverage and knowledge transfer.

Every Swiss office or ministry is responsible for preparedness in its own field. Risk assessments have been performed and several national scenario-based plans, produced by the FOPH in cooperation with the cantons and other national partners, are in place. Public health risk and resource mapping is a key part of national risk analysis. In Liechtenstein, the relevant authorities are all part of the Crisis Management Board, and a national pandemic preparedness plan (along with further plans related to natural disasters) is in place, though this requires updating. Liechtenstein relies mainly on Switzerland and Austria for emergency services.

Liechtenstein's individual capabilities to cope with public health emergencies are limited. Due to Liechtenstein's small size, any event of public health concern would very quickly also affect the neighbouring countries of Switzerland and Austria. Strong bilateral relations and MOUs are therefore crucial. In Switzerland, responsibility for managing public health events is delegated to the lowest level, where first responses are coordinated. National level bodies take charge for events of bigger magnitude, and Swiss national authorities have the capacity to respond adequately, though they would benefit from increased coordination and a common system for situational awareness. The cooperation of public health and security authorities in Switzerland is part of the generic preparedness process, and well-established mechanisms exist to facilitate it; in Liechtenstein, the relevant authorities are all part of the National Crisis Management Board.

Switzerland can deploy medical countermeasures in responses to humanitarian crisis situations worldwide. Civil and military actors work closely together in preparation and response, in line with WHO guidelines, applying internal procedures for logistics, security, liability and financial concerns. Swiss engagement in the Host Nation Support mechanism is coherent with the respective guidelines of the EU European Civil Protection and Humanitarian Aid Operations Emergency Response Coordination Centre (ECHO-ERCC). Liechtenstein is so small and resources so scarce that there are no national plans to send medical countermeasures to other countries; in daily life, the country depends on the capacity of others.

Switzerland demonstrates well-developed capacity in risk communication, but would benefit from systems and strategies for dynamic listening and rumour management, increased social media monitoring and usage, and community management. Liechtenstein relies heavily on Swiss capacity, with few of its own communication experts or resources in place. Swiss materials and campaigns are sometimes adapted to the Liechtenstein cultural context.

Liechtenstein has no designated points of entry under the IHR, while Switzerland has two: the international airports at Geneva and Zurich. These are components of the national public health emergency preparedness and response plans, and are approached in a multisectoral manner involving immigration, health, security, media and customs. IHR core capacities are fully implemented in both airports, and both have well established multisectoral public health emergency plans, successfully tested in real and simulated events. An exit screening policy would be a positive addition to current arrangements.

Switzerland has national legislation for management of chemicals and chemical events, with alert and response at both cantonal and federal levels that also covers Liechtenstein. Emergency response plans are in place at both levels, with—for example—inventories of major hazards sites and facilities, or access at local level to necessary medicines and equipment. Switzerland also has a poison centre. There is a need to further test real time response mechanisms, especially between the federal and cantonal levels, and to raise mutual awareness and strengthen interactions and collaboration between those levels.

Liechtenstein has no nuclear facilities and no significant use of radiation, and relies on Swiss systems to provide mitigation, response, and recovery in the event of a radiation emergency. Switzerland has an advanced system for managing and monitoring radionuclear facilities and for responding to potential radionuclear emergencies, with systems and interventions covering legal, policy, operational, and tactical elements. Switzerland would benefit from a radiation protection strategy that fits the national emergency plan, and a mechanism to ensure long term medical care of exposed people and measures for the expedited return of affected communities to normality after a radiation event.

Switzerland and Liechtenstein scores

Technical areas	Indicators	Consensual Score	
		SUI	LIE ¹
PREVENT		SUI	LIE¹
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)	5	
	P.1.2 The State can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with IHR (2005)	5	
IHR coordination, communication and advocacy	P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR	5	3
Antimicrobial resistance	P.3.1 Antimicrobial resistance detection	5	
	P.3.2 Surveillance of infections caused by antimicrobial-resistant pathogens	4	
	P.3.3 Health care-associated infection (HCAI) prevention and control programmes	4	
	P.3.4 Antimicrobial stewardship activities	3	
Zoonotic diseases	P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens	5	
	P.4.2 Veterinary or animal health workforce	5	
	P.4.3 Mechanisms for responding to infectious and potential zoonotic diseases are established and functional	5	
Food safety	P.5.1 Mechanisms for multisectoral collaboration are established to ensure rapid response to food safety emergencies and outbreaks of foodborne diseases	4	
Biosafety and biosecurity	P.6.1 Whole-of-government biosafety and biosecurity system is in place for human, animal and agriculture facilities	3	N/A
	P.6.2 Biosafety and biosecurity training and practices	4	N/A
Immunization	P.7.1 Vaccine coverage (measles) as part of national programme	4	5
	P.7.2 National vaccine access and delivery	4	
DETECT		SUI	LIE
National laboratory system	D.1.1 Laboratory testing for detection of priority diseases	5	N/A
	D.1.2 Specimen referral and transport system	5	N/A
	D.1.3 Effective modern point-of-care and laboratory-based diagnostics	5	N/A
	D.1.4 Laboratory quality system	5	N/A
Real-time surveillance	D.2.1 Indicator- and event-based surveillance systems	5	
	D.2.2 Interoperable, interconnected, electronic real-time reporting system	4	
	D.2.3 Integration and analysis of surveillance data	5	
	D.2.4 Syndromic surveillance systems	3	
Reporting	D.3.1 System for efficient reporting to FAO, OIE and WHO	5	2
	D.3.2 Reporting network and protocols in country	5	3

¹ Due to the simultaneous assessment of the two countries and the fact that Liechtenstein, as a very small country, is highly reliant on Swiss systems and capacities, scores reflect three different situations:

Technical areas	Indicators	Consensual Score	
Workforce development	D.4.1 Human resources available to implement IHR core capacity requirements	5	
	D.4.2 FETP ² or other applied epidemiology training programme in place	5	
	D.4.3 Workforce strategy	4	
RESPOND		SUI	LIE
Preparedness	R.1.1 National multi-hazard public health emergency preparedness and response plan is developed and implemented	4	2
	R.1.2 Priority public health risks and resources are mapped and utilized	5	2
Emergency response operations	R.2.1 Capacity to activate emergency operations	5	3
	R.2.2 EOC operating procedures and plans	4	2
	R.2.3 Emergency operations programme	4	2
	R.2.4 Case management procedures implemented for IHR relevant hazards.	5	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	4	3
Medical countermeasures and personnel deployment	R.4.1 System in place for sending and receiving medical countermeasures during a public health emergency	5	3
	R.4.2 System in place for sending and receiving health personnel during a public health emergency	4	2
Risk communication	R.5.1 Risk communication systems (plans, mechanisms, etc.)	5	3
	R.5.2 Internal and partner communication and coordination	4	3
	R.5.3 Public communication	5	3
	R.5.4 Communication engagement with affected communities	3	1
	R.5.5 Dynamic listening and rumour management	3	2
OTHER IHR HAZARDS AND POE		SUI	LIE
Points of entry	PoE.1 Routine capacities established at points of entry	5	N/A
	PoE.2 Effective public health response at points of entry	5	N/A
Chemical eventss	CE.1 Mechanisms established and functioning for detecting and responding to chemical events or emergencies	5	
	CE.2 Enabling environment in place for management of chemical events	4	
Radiation emergencies	RE.1 Mechanisms established and functioning for detecting and responding to radiological and nuclear emergencies	4	N/A
	RE.2 Enabling environment in place for management of radiation emergencies	4	N/A

Notes:

- Liechtenstein operates similarly to a Swiss canton, and thus the scoring is applicable to Switzerland and Liechtenstein together, and so is only shown once
- The two countries operate more or less independently, and are thus scored separately
- The technical area is not applicable for Liechtenstein, because no related activities whatsoever take place in the country (e.g. Liechtenstein has no designated points of entry under the IHR). This is indicated by a score of N/A for Liechtenstein.

Scores: 1=No capacity; 2=Limited capacity; 3=Developed capacity; 4=Demonstrated capacity; 5=Sustainable capacity.

² FETP: field epidemiology training programme

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 more effectively. Implementing legislation could serve to institutionalize and strengthen the role of IHR (2005) and operations within the State Party. It could also facilitate coordination among the different entities involved in their implementation. See detailed guidance on implementing IHR (2005) in national legislation at:

http://www.who.int/ihr/legal_issues/legislation/en

In addition, it is important to have policies that identify national structures and responsibilities, and allocate adequate financial resources.

Target

States Parties to 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 legislation, regulations or other instruments in order to facilitate their implementation and maintenance in a more effective manner.

States Parties to ensure the provision of adequate funding for IHR implementation, through the national budget or another funding mechanism.

Switzerland and Liechtenstein: level of capabilities

Switzerland is a federal state composed of 26 cantons (including six half-cantons). Each canton has its own constitution and coordinates its own medical and hospital services.

Duties and responsibilities in the Swiss health care system are divided among the federal, cantonal, and municipal governments. Tasks and competencies related to public health are divided between the Confederation (the federal government) and the 26 cantons.

Following the severe acute respiratory syndrome (SARS) outbreak in 2002-2003, the Swiss legal office revised national laws in order to bring them in line with the requirements of the International Health Regulations as they were then. In 2006, the Swiss Federal Council approved the updated IHR (2005) without reservation. The section relating to communicable diseases was integrated into Swiss national law through the revision of the Federal Epidemics Act on Combating Communicable Human Diseases, which was passed on 28 September 2012. After a popular vote in 2014, the law came into force on 1 January 2016. A corresponding ordinance accompanies this law, stipulating further details.

The Swiss Epidemics Act of 2012 is an all-encompassing law for the protection of the population from communicable diseases. It covers information gathering, surveillance, reporting, laboratories, prevention, immunization, biosafety, response, measures concerning international travel, points of entry, special measures, facilitation, coordination platforms (including for NFPs), delegation of responsibilities to the cantons, etc.

The Act further clarifies the respective responsibilities of cantons and federal authorities. The federal level takes charge of information, entry/exit borders and international coordination, while the cantons cover a large number of intervention measures (medical examinations, quarantine, protection of the population, etc.). Legislation relating to chemical and radiation events is outlined in the respective sections.

As the Swiss Epidemics Act only concerns humans, separate legislation covers zoonoses, environmental protection, radiation protection and chemical products. These interact well. A working group on One Health has also been put in place.

Switzerland has designated the Federal Office of Public Health (FOPH) as its IHR (2005) National Focal Point (IHR NFP). The National Focal Points of Switzerland and Liechtenstein rely on the support of different IHR contact points within Switzerland. Protocol agreements between the NFP and the IHR contact points have been signed with the federal offices responsible for food safety and veterinary issues; civil protection (the national alarm centre); agriculture; and therapeutic products (Swissmedic, the Swiss Federal Medicines Agency). Within the FOPH, protocol agreements have been signed with the divisions responsible for chemicals and radiation safety.

Cross-border agreements or memoranda of understanding on emergencies are in place with neighbouring countries (Germany, Italy, France, Liechtenstein and Austria).

Switzerland has a national list of notifiable diseases, with two and 24 hours and seven days time delays for different levels of reporting.

Liechtenstein and Switzerland cooperate closely on matters of IHR legislation and policy, and all legislation of IHR relevance is applicable in Liechtenstein through the Swiss-Liechtenstein Customs treaty³. Scores in this technical area, therefore, reflect the situation in both countries.

Recommendations for priority actions

Switzerland and Liechtenstein

- Strengthen coordination and enforce adherence to procedures at all governance levels in crisis situations.
- Include scenarios requiring IHR notification for both Switzerland and Liechtenstein in preparedness exercises.
- Explore opportunities for engaging Swiss public health authorities in sustainable information sharing and permanent regional cooperation on serious cross-border threats to health (i.e. EU decision 1082/2013/EU).
- Explore the possibility for personal data information exchange between Austria and Liechtenstein using the EWRS⁴ bilateral communication section.

³ Treaty between Switzerland and the Principality of Liechtenstein concerning the assembly of the Principality of Liechtenstein with the Swiss customs territory (29 march 1923)

⁴ The EU European Early Warning and Response System

Indicators and scores

P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of International Health Regulations (IHR) (2005) - Score 5

Strengths/best practices

- Switzerland has implemented the IHR fully through national legislation. Following legislative and policy reviews, the relevant policy and organizational frameworks have been developed.
- Policies and strategies for public health emergency preparedness and response are in place (e.g. a pandemic plan). Plans have been tested, and meaningful experience has been gained in the management of recent major crises (pandemics of SARS, H1N1, avian flu, and Ebola).
- The legal framework for emergency preparedness covers both public authorities and private bodies.
- Legislation is in place for implementation of the IHR (2005) that covers human, animal and environmental health and food safety.
- Regular exchanges of information take place between federal and cantonal authorities, other relevant health structures and international partners.
- Cross border agreements are in place with Germany, Italy, France, Liechtenstein and Austria.

Areas which need strengthening/challenges

- Implementation of procedures among stakeholders, especially during public health emergencies, could be improved.
- Coordination between national and cantonal levels within the federal system could be improved.

P.1.2 The state can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with the IHR (2005) - Score 5

Strengths/best practices

- In 2010 Switzerland conducted a rigorous assessment of IHR capacities, which concluded with the revised version of the Epidemics Act of 2012.
- Existing federal structures were integrated into an IHR contact point network for quick, lean and effective IHR implementation.

Areas which need strengthening/challenges

- Cooperation with the European Union (EU) on early detection, surveillance, prevention and control of communicable diseases should be improved.
- Work is needed to ensure an adequate supply of medicines, particularly vaccines; a new system should be considered that allows central purchasing of vaccines if necessary, as is the case in many other countries.

IHR coordination, communication and advocacy

Introduction

The effective implementation of the IHR (2005) requires multisectoral/multidisciplinary approaches through national partnerships for efficient and alert response systems. Coordination of nationwide resources, including the designation of a national IHR focal point (which is a national centre for IHR communications), is a key requisite for IHR implementation.

Target

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

Switzerland and Liechtenstein: level of capabilities

The Federal Office of Public Health (FOPH) is the designated IHR NFP for Switzerland, and has a long-standing tradition of multi-disciplinary and multi-sectoral work. With the advent of the IHR (2005), the practices and structures already in place paved the way for adoption of the IHR at national and cantonal levels. The IHR NFP is available 24/7/365.

Standard operating procedures and guidelines outline the work of the IHR NFP and collaboration work streams with other IHR-relevant sectors. These are practiced through a network of IHR contact points, one in each of the relevant sectors/federal entities. Collaboration and coordination between the IHR NFP and the IHR contact points is defined and executed through bilateral agreements.

The FOPH has a crisis handbook (currently under revision) detailing operational modalities during a health crisis. A Crisis Management Board (the NBCN) exists at federal level, and has the mandate to run and coordinate response activities during crises. Multiple platforms exist to augment inter-sectoral coordination: for example, the IHR platform for Swiss IHR contact points (which meets at least annually); the coordination platform for the Epidemics Act; the One Health coordination platform; the regional laboratory network; and the Swiss Airport Network for traveller health.

Updates on IHR implementation and the latest WHO information are shared with contact points under the IHR platform.

Multi-sectoral, multidisciplinary simulation exercises are also conducted at regular intervals to test (and improve) response coordination and communication mechanisms. These include Strategische Führungsübungen (strategic leadership exercises) every four years and Sicherheitsverbundübungen (security network exercises) every other four years, alternating; Gesamtnotfallübungen (global emergency exercises on radiation events) every two years; and regular smaller-scale exercises at cantonal level. Post-exercise evaluations are routinely held to assess gaps and to identify and implement remedial measures.

Liechtenstein is a member of the Swiss IHR Platform, the Conference of Cantonal Health Directors, and the Regional Laboratory Network.

Liechtenstein's IHR system is integrated into the Swiss IHR Platform of IHR contact points, and its reporting system is based on the customs treaty between the two countries. Swiss contact points examine and assess public health events in Liechtenstein and report to the Swiss and the Liechtenstein National IHR Focal

Points on events potentially constituting public health emergencies of concern, in accordance with the IHR (2005). The IHR 24/7/365 entry point in Liechtenstein is the National Police (not the Office of Public Health), and refers all events of concern to the Liechtenstein Office of Public Health for relevant screening and possible further action.

Recommendations for priority actions

Switzerland

- IHR NFPs, IHR contact points and the IHR Network should be involved more frequently and more substantially in national multisectoral exercises.

Liechtenstein

- Guidelines should be established (including standard operating procedures (SOPs), etc.) to facilitate multidisciplinary and multisectoral collaboration and ensure continuity.
- Multidisciplinary coordination and communication mechanisms should be tested through regular simulation exercises.
- A system for deputising should be established in the relevant offices.

Indicators and scores

P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR - Score Switzerland 5 / Liechtenstein 3

Strengths/best practices

Switzerland

- Mechanisms are in place and active to ensure annual updates on the status of IHR implementation across all relevant sectors.
- With the advent of the IHR (2005), in 2007 existing federal structures were integrated into an IHR contact point network for quick and effective IHR implementation, paving the way for adoption of IHR guidelines and SOPs for efficiency, with minimal effort required. This has also yielded an efficient, effective collaboration and communication structure and culture. A long-standing history and practice of inter-sectoral collaboration has inculcated and strengthened interpersonal relationships.
- Exercises are conducted regularly at national and sub-national levels. Identification of gaps/challenges and implementation of remedial measures have led to continuous quality improvement at systems level.

Liechtenstein

- A small office (for a small country) implies a flat hierarchy, efficient communication channels, and well-established interpersonal and working relationships between staff at strategic, policy, and operational levels.

Areas which need strengthening/challenges

Switzerland

- The FOPH expressed concern that WHO forwards potentially sensitive information to a substantial number of internal staff when country information is shared with WHO under the IHR. More clarity is needed about WHO internal processes and, on a case-by-case basis, exactly which internal experts need to be informed.

Liechtenstein

- Liechtenstein is a small country and crises are rare, so limited resources are allocated to preparedness. There are no formal guidelines to facilitate multidisciplinary collaboration and communication, and no testing. Awareness should be raised by working together regularly, developing guidelines for multidisciplinary coordination and communication, and introducing mechanisms for regular testing.
- A deputy system should be introduced in the Office of Public Health.

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, this problem was manageable, as the growth of resistance was slow and the pharmaceutical industry continued to create new antibiotics.

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

Target

Support work coordinated by the FAO, OIE and WHO to develop an integrated global package of activities to combat antimicrobial resistance, spanning human, animal, agricultural, food and environmental aspects (i.e. a One Health approach). This would include: (i) having a national comprehensive plan for each country to combat antimicrobial resistance; (ii) strengthening surveillance and laboratory capacity at national and international levels following agreed international standards developed in the framework of the Global Action Plan; and (iii) improved conservation of existing treatments and collaboration to support the sustainable development of new antibiotics, alternative treatments, preventive measures and rapid, point-of-care diagnostics with systems to preserve new antibiotics.

Switzerland and Liechtenstein: level of capabilities

Liechtenstein relies on Swiss capabilities for detecting, monitoring and preventing antimicrobial resistance (AMR), takes part in Swiss AMR monitoring programmes in both the human and animal sectors, and will apply the Swiss AMR strategy. The comments and scores below are therefore applicable to both countries.

The Swiss Centre for Antibiotic Resistance (established in 2004) monitors AMR in the human population. It forms a representative network of 22 microbiology laboratories covering more than 60% of inpatients and about 30% of outpatients in both Switzerland and Liechtenstein.

Laboratories currently provide data on a voluntary basis, with the exception of data on carbapenem resistance, provision of which has been mandatory since 2016. Comprehensive resistance data (including for all priority pathogens designated by the WHO) are constantly updated and available via the online anresis.ch database. Detection and reporting of AMR is continuously developed according to public health needs. Switzerland also participates in WHO's Global Antimicrobial Resistance Surveillance System (GLASS), and the Central Asian and Eastern European Surveillance of Antimicrobial Resistance (CAESAR).

In the veterinary area, a system was established following the Epizootic Disease Ordinance of 2006 to enable continuous monitoring of antimicrobial resistance in livestock animals and meat. This ordinance describes a national monitoring programme protecting public health, and requires that the FSVO and the cantons devise monitoring programmes on zoonotic pathogen resistance, as well as indicator bacteria and animal pathogens. The Centre for Zoonoses, Animal Bacterial Diseases and Antimicrobial Resistance (ZOBA) is the national veterinary AMR reference laboratory for both Switzerland and Liechtenstein, and the designated laboratory for the Swiss national monitoring programme.

A system for monitoring AMR in farm animals, meat and dairy products was introduced in Switzerland in 2007. This programme is updated yearly by the Food Safety and Veterinary Office (FSVO), and is aligned with European provisions in this field. A pilot project has been launched to analyse AMR of pathogens causing infections in livestock and pets. Since 2009, data on sales of veterinary antimicrobials and results of the resistance monitoring have been published yearly.

From the environmental perspective, there is also a sampling programme to detect AMR in rivers and lakes.

Switzerland has no mandatory guidelines for the testing of antibiotic resistance, but the Swiss Society of Microbiology promotes the use of EUCAST methods (the European Committee on Antimicrobial Susceptibility Testing). Complementary guidelines related to methodologies, available lab tools, and specific analyses on certain samples will be released in 2019. There is no systematic collection of resistant isolates or formal validation of species identification, but all participating laboratories are accredited and controlled by Swissmedic.

There is an integrated One Health approach to monitoring the presence of AMR in humans, animals, agriculture and the environment. Since 2015, sales data of antibiotics in livestock has been published every second year in a joint report, together with anresis.ch data from the human sector. Since 2016 the use of critical antibiotics in veterinary medicine has been restricted for food producing animals. There are programmes in place, designed and delivered by stakeholders, which identify and promote good practice in livestock production and healthy animals as a way to reduce the use of antimicrobials. A national strategy against healthcare-associated infections also exists.

A strategic plan on antimicrobial resistance was adopted by the Federal Council and published in 2015. Its main objective is to ensure the long term efficiency of antibiotics in preserving human and animal health, taking into consideration monitoring; appropriate use; resistance control; research and development; cooperation with stakeholders in the private and public sectors; and education. The strategy was developed through close cooperation between the relevant bodies in the sectors of public health, animal health, agriculture and the environment.

Recommendations for priority actions

- Develop screening and outbreak management guidelines for multidrug resistant organisms, and monitor adherence to those guidelines.
- Enhance surveillance of antimicrobial resistant infections through pilot projects and implement a national monitoring programme for animal pathogens.
- Expand and consolidate monitoring of healthcare-associated infections.
- Foster adherence to outpatient antibiotic prescription guidelines and the Swiss national plan for stewardship in hospitals (to be released in 2019/20); and implement a system to collect veterinary antibiotic prescription data.

Indicators and scores

P.3.1 Antimicrobial resistance detection - Score 5

Strengths/best practices

- Switzerland has the capability to detect new and emerging AMR features through interagency One Health collaboration between the public health and the veterinary/food safety sectors.
- Emerging AMR threats are monitored systematically by the National Reference Centre for Emerging Antibiotic Resistance (NARA), which fills the gap between data needed for patient management and data needed for public health.

- Results of resistance monitoring of a wide array of pathogens (based on antimicrobial susceptibility test results of all routine human clinical analyses) are published monthly.
- An open online database providing region-specific data is continuously updated.
- There is a national monitoring programme on AMR in livestock animals and meat, reflecting trends in the food chain.
- There is common reporting of human & animal surveillance results.
- A sampling programme is in place to detect AMR in rivers and lakes.

Areas which need strengthening/challenges

- Switzerland should increase the number of microbiological laboratories in the human field that participate in enhanced reporting on multi-drug resistant isolates detected in humans. The collection of multidrug resistant organisms is not currently centralised.
- Laboratories provide their data only on a voluntary basis, and resistant isolates are not systematically collected for formal validation of species identification.
- Mandatory guidelines are required for methodologies, available lab tools, and specific analyses for testing antibiotic resistance (though these are due to be released in 2019).
- Not all laboratories have the technical capabilities required for carbapenemase detection. This can be overcome by increasing the number of samples analysed by the National Reference Centre for Emerging Antibiotic Resistance.

P.3.2 Surveillance of infections caused by resistant pathogens - Score 4

Strengths/best practices

- Switzerland requires mandatory reporting of carbapenemases, and ongoing monitoring of colistin resistant (*mcr-1* & *mcr-2*) isolates.
- There is monitoring of AMR in food-producing animals and food, and a pilot has been launched to analyse AMR of pathogens causing infections in livestock and pets.
- Switzerland is capable of implementing whole genome sequencing of AMR pathogens, for outbreak detection and surveillance of emerging resistance threats.

Areas which need strengthening/challenges

- Except for bloodstream infections, there is no specific surveillance for infections caused by AMR pathogens causing disease in humans.
- There is a need to collect clinical and epidemiological data related to isolates of resistant microbial strains, resistant antimicrobial treatments, and their outcomes. The existing pilot project in long-term care facilities should be expanded in the long run.
- A better overview is needed of the burden of disease associated with AMR.
- Data collection on AMR isolates should be harmonized, to ensure that quantitative (minimum inhibitory concentration/MIC) data is always available.
- Not all hospitals or laboratories have the same capabilities for local rapid characterization of antimicrobial resistant organisms.
- Human and animal surveillance should be integrated beyond common reporting.

P.3.3 Healthcare associated infection prevention and control programmes - Score 4

Strengths/best practices

- Switzerland has a national strategy for monitoring, prevention and control of healthcare-associated Infections (the NOSO Strategy).
- National clinical practice guidelines are in place for antimicrobial prophylaxis in surgery.
- Switzerland has national recommendations for reprocessing medical devices.
- An infection prevention and control (IPC) policy, operational plan and SOPs are available at all health facilities.
- Recommendations regarding isolation of colonised or infected patients are available in all acute and chronic care facilities.
- A national surgical site infection surveillance programme is in place, with 164 hospitals participating.
- Hand Hygiene measures are applied in all health care facilities, with 93 hospitals using the “CleanHands” application.
- A network of public health and academic partners is in place to develop and evaluate prevention interventions.
- There are officially endorsed animal health schemes for bovines and pigs.

Areas which need strengthening/challenges

- There is a need for guidelines on screening for multidrug resistant organisms (MDRO) and outbreak management, and to foster adherence to those guidelines; they will be published within the two years following this report, and MDRO-outbreak management guidelines will be released by 2019.
- Hospital hygiene quality indicators are required, and hospital hygiene outcomes should be integrated into hospital performance evaluations.
- An HAI prevention & control plan is required for residential care facilities.
- The degree of AMR surveillance at all acute care hospitals is unknown (it is not mandatory to provide this information).
- Local alert systems are only informal, based on cooperation between health facilities and laboratories.

P.3.4 Antimicrobial stewardship activities - Score 3

Strengths/best practices

- An electronic reporting system on antibiotic usage at health care facilities is in place, with annual reports (including qualitative and quantitative information for benchmarking) provided to the hospitals. From 2018, hospitals will be provided with automated monthly feedback on consumption of key antibiotics.
- Guidance is available on appropriate antibiotic use for the most frequent diseases of pigs and cattle. For small animals, guidance including recommendations for prudent use is emerging at time of writing.
- Sales data on antibiotics for veterinary medicine use is available. Switzerland also participates actively in the ESVAC Project (European Surveillance of Veterinary Antimicrobial Consumption). A system to collect veterinary prescription data at species level is under construction, and will allow analysis of treatment intensity.
- Antibiotic residues in rivers and lakes are monitored, with a target to further reduce dissemination of antibiotic residues into the environment by wastewater treatment (with upgraded ozone treatment and/or activated carbon filters).

Areas which need strengthening/challenges

- 2015 outpatient antibiotic consumption data was based on only 65% of pharmacies. Monitoring of outpatient antibiotic consumption should be expanded, including to cover residential care facilities.
- There are regional discrepancies in antibiotic distribution (e.g. through dispensing physicians).
- Qualitative surveillance of antibiotic usage should be implemented per diagnosis group, or for at-risk patients.
- Stewardship programmes are being implemented in only about a third of acute care hospitals.
- Only local guidelines are available on appropriate use of antibiotics, and corresponding levels of adherence are not systematically measured.
- Physicians' adherence to national guidelines for ambulatory care (to be issued successively in 2017 and 2018) should be fostered.
- Hospitals should be encouraged and assisted to participate in the National Antimicrobial Stewardship Plan (to be launched in 2019/20).
- For livestock, there is no formal antimicrobial stewardship or benchmarking of farmers and veterinarians.
- The results of the National Research Programme (NRP 72) on AMR should be translated into actions.

Zoonotic diseases

Introduction

Zoonotic diseases are communicable diseases that can spread between animals and humans. These diseases are caused by viruses, bacteria, parasites and fungi carried by animals, insects or inanimate vectors that aid in their transmission. Approximately 75% of recently emerging infectious diseases affecting humans were of animal origin; and approximately 60% of all human pathogens are zoonotic.

Target

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

Switzerland and Liechtenstein: level of capabilities

Liechtenstein's responses to zoonosis/zoonotic events and its veterinary structure and reporting follow the same structures as any canton in Switzerland. The scores and comments below are therefore applicable to both countries.

Switzerland has a strong system for detecting, preventing and responding to zoonotic diseases of public health significance. A One Health approach focusing on the human/animal interface is a critical component of the programme.

At federal level, the Federal Office of Public Health (FOPH) and the Federal Food Safety and Veterinary office (FSVO) routinely coordinate with other agencies and with the cantons for all activities related to detection, prevention, and response to outbreaks of zoonotic disease.

Since 1994, the FSVO has been tasked with eradicating diseases under surveillance, through specific programmes that are part of the national Swiss surveillance programme. The National Epidemics Law (2012) gives the FOPH authority at federal level to coordinate with other federal agencies and cantonal authorities in activities related to the investigation of zoonoses. The law also outlines mechanisms by which the confederation cooperates with the cantons, and those for further coordination through a subsidiary One Health body.

The goal of this latter body is to support and coordinate cross-departmental topics (including animal diseases) that address the human/animal/environmental component. The subsidiary body is led by the FSVO, which is also the IHR contact point for zoonosis and food safety within the Swiss IHR network. Members of the taskforce exchange information and knowledge about interdisciplinary topics, and meet regularly to address zoonotic diseases in a coordinated/multisectoral manner. The subsidiary body also contains representatives from several federal offices, including the Federal Office for the Environment (FOEN), the Federal Office for Agriculture (FOAG) and the FOPH, as well as cantonal departments for public health, veterinary affairs, food safety, agriculture and the environment. Experts at the Centre for Fish and Wildlife Health (FIWI) are involved as appropriate.

At a regional level, all cantons have a complete veterinary administration led by the cantonal veterinarian, with a staff of official veterinarians. The cantonal veterinary offices are each responsible for the implementation, execution, and enforcement of national legislation. The responsibilities of the cantonal authorities (cantonal veterinary services and cantonal food control units) include monitoring good practices at different steps of the food production system (e.g. official supervision of slaughterhouses and of compliance with standards in food production).

Switzerland has comprehensive surveillance of zoonoses and control systems in humans, animals and food. Surveillance reports are published yearly and cover the public health and animal health aspects of zoonoses. The system aims to collect accurate information on the occurrence of zoonotic agents at all stages of the food production chain. Mitigation measures are based on the analysis of data, with the aim of protecting the consumer from zoonoses. The FSVO aims to combat zoonotic agents in food and thus reduce the number and severity of outbreaks in humans.

Switzerland considers campylobacter the most prevalent zoonosis, and has implemented measures accordingly (e.g. awareness raising around food hygiene in kitchens and hygiene for the slaughtering of broilers), reducing the number of cases to 5,000/year. Monitoring for campylobacter takes place all year round when animals are slaughtered, as part of the programme to investigate resistance to antibiotics. The information obtained from this programme, together with data on the number of cases of campylobacteriosis in humans, is used for ongoing assessment of the Campylobacter situation.

Combatting Salmonella in the animal population is focused on the programme to control Salmonella infections in poultry and measures to reduce salmonellosis in various animal species. Monitoring in poultry is geared towards detection and extermination of infected flocks.

Real-world outbreak responses to several zoonoses (e.g., hepatitis E in Ticino, Q Fever, etc.) have demonstrated the Swiss Veterinary services' capability to conduct outbreak investigations, identify risk, and implement the required mitigation measures.

Switzerland does not offer a dedicated field epidemiology training programme (FETP) for public health officers. The system in place does, however, demonstrate that veterinary and public health officers have the necessary skills/training to conduct disease prevention and outbreak investigation for animal disease events (zoonotic and non-zoonotic), and implement control measures for prioritized zoonoses.

Recommendations for priority actions

- Improve the education of public health professionals in controlling zoonotic diseases following the One Health Approach.
- Support the integration of public health, animal health and food safety where appropriate.
- Promote the use of state-of-the-art laboratory methods such as whole genome sequencing, especially for outbreak investigations.
- Ensure sufficient resources are available for extended epidemiological investigations of outbreaks.
- Develop a strategy to enable integrated analysis of data for zoonoses events and zoonotic agents linked to humans, animals, and food, and to coordinate response measures.

Indicators and scores

P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens - Score 5

Strengths/best practices

- Switzerland has a comprehensive surveillance and control system for humans, animals and food.
- The relevant competencies are concentrated in one ministry.
- A zoonoses report is published yearly.
- Switzerland regularly reports zoonoses to the European Food Safety Authority (EFSA).
- There is close collaboration and coordination between FOPH and FSVO.
- Federal and cantonal institutions support and coordinate the subsidiary One Health body.

- Reference laboratories are coordinated.
- Switzerland has a centre for fish and wildlife health.

Areas which need strengthening/challenges

- Different organisations are not currently sufficiently integrated with one another at the canton level.
- There is no integration of human and animal data.

P.4.2 Veterinary or animal health workforce - Score 5

Strengths/best practices

- All cantons have a complete veterinary administration led by the cantonal veterinarian, with a staff of official veterinarians.
- Official veterinarians have to complete compulsory further education, including four subject modules and hands-on training.
- Most cantonal veterinarians have passed further education in executive public management.
- Animal health experts have to complete compulsory further education including modules on animal health and animal legislation, and hands-on training.
- Switzerland has officially endorsed animal health services.

Areas which need strengthening/challenges

- Public health staff should be provided with formal training in controlling zoonotic disease in animal populations.

P.4.3 Mechanisms for responding to zoonoses and potential zoonoses are established and functional - Score 5

Strengths/best practices

- Interdisciplinary collaboration functions well in Switzerland, and respective responsibilities are clear
- Preparedness is at a high level (as a consequence of Coxiella and Hepatitis E outbreaks).

Areas which need strengthening/challenges

- Further resources are required (for example, for whole genome sequencing or extended epidemiological outbreak investigations).
- The number of well-trained experts in public health is small.
- Further education is required for experts in public health, animal health and the One Health approach.

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 an outbreak's source and its subsequent containment are critical for control. Risk management capacity must be developed with regard to control throughout the food chain continuum. If epidemiological analysis identifies food as the source of an event, suitable risk management options that ensure the prevention of human cases (or further cases), based on risk assessments, must be put in place.

Target

States Parties to have surveillance and response capacity for risks or events related to food- and waterborne diseases, with effective communication and collaboration among the sectors responsible for food safety and safe water and sanitation.

Switzerland and Liechtenstein: level of capabilities

Liechtenstein follows the same processes as, and works closely with, Swiss authorities in detecting and managing food hazards. In cases of larger foodborne outbreaks, it relies on Swiss capabilities. Food hazard management in Switzerland is based around a single responsible organization with good lines of communication between national and cantonal levels, one national contact point for food safety issues including international information exchange, and regular meetings between relevant bodies, stakeholders and consumers. The comments and scores below are therefore applicable to both countries.

A single multiannual national control plan (MANCP) forms the basis for food safety in both Switzerland and the Principality of Liechtenstein, and scores and comments below are therefore applicable to both countries.

Food safety systems consist of frequent controls in companies dealing with food, and controls of primary production.

Communication pathways between food business operators and cantonal food safety authorities are described in Article 84 of the Ordinance on Foodstuffs and Utility Articles and Article 54 of the Federal Act on Foodstuffs and Utility Articles. When unsafe food is suspected to be on the market, information on analysis and inspection reports, and on documents analogous to the rapid alert on food and feed (RASFF), are provided to the competent cantonal authority (the cantonal chemist), and if necessary, to Swiss national authorities, for public warning. The Swiss FSVO then informs enforcement bodies by e-mail.

General information, guideline documents, reporting forms and contact addresses are available for stakeholders and business operators on the FSVO website for food safety, and on the FOAG website for feed safety. For example, all RASFF alerts are published on these websites.

In order to ensure good coordination in the case of a food chain emergency, a specialized crisis organization (KoKo) is activated between the FSVO and the FOAG. At time of writing in November 2017 the FSVO is about to establish an automated early warning system that compiles and analyses available food-related data to support detection of potential hazards. The system is planned to be in place in 2018.

The enforcement bodies to investigate foodborne outbreaks and to restore food safety (including for potable water) are the cantonal authorities of public health and food safety. The cantonal medical officer collects medical data, and the cantonal chemist carries out food sampling and makes decisions on analyses.

The National Reference Centre for Enteropathogenic Bacteria and Listeria (NENT) monitors matching results of food and human sample analyses. Should a positive case arise, NENT informs the competent federal and cantonal authorities, including Liechtenstein. According to the Epidemics Act, all outbreaks are notifiable to the FOPH and to the cantonal health authorities within 24 hours. Foodborne infections are notifiable in periods from 24 hours to one week, depending on the infectious agent in question. The list of notifiable diseases is evaluated annually and updated if needed. The FOPH runs outbreak statistics on all reported foodborne infection cases every week, and alerts the relevant authorities on signals pointing out foodborne hazards.

The national outbreak response team consists of experts from several federal offices (the FOPH, FSVO and FOAG). The FOPH members are experts in public health epidemiology, and the FSVO members are experts in risk assessment, zoonosis and One Health issues, and management of food hazards. The FOAG members are experts in agricultural practices and work in close contact with the FSVO in cases where primary food production is involved. If necessary, competent authorities at the cantonal level and at the NENT also join the team.

The FOPH has established a Competence Centre for Outbreak Investigations, which is mandated to conduct any necessary such investigations, including interviewing patients and conducting patient checks. For every notifiable disease there is a predefined case definition for reporting, and in case of an outbreak, the case definition is defined according to the aims of the case-control study. The outbreak event is closed by a summary report (standard form) sent to the national competent authority by the cantonal food safety officer involved.

Rapid exchange of information between the public health and food safety sectors (between canton and national levels and between different national bodies) is based on emergency phone numbers and e-mail lists. A formal mechanism to notify foodborne outbreaks has been established, but is too little used by the food safety investigation teams; the forms are often sent to the FSVO too late. The main means of communication are phone calls, e-mails and letters.

National training on foodborne outbreaks took place in 2008 and 2012, and involved both federal and cantonal employees. All authority officers have the opportunity to attend the Better Training for Safer Food (BTSF) courses on foodborne outbreaks offered by the EU.

The Principality of Liechtenstein has its own national outbreak response team, which consists of experts from several offices (including the Food and Veterinary Office and the Office of Public Health), and which collaborates closely with Swiss authorities. This team undertakes all actions related to outbreak investigations of foodborne diseases, and follows the same processes as Switzerland. There have not, however, been any food related events/outbreaks in Liechtenstein in recent years.

Information concerning food and the food chain is provided on the website of the Liechtenstein Food and Veterinary Office and during information meetings (e.g. to provide information on changes in food law, tuberculosis in deer, etc.).

Recommendations for priority actions

- Ensure timely exchange of information on foodborne outbreak notifications and ongoing outbreak investigations between cantonal and federal levels.
- Support strain characterization to link human and food analysis through financing laboratories; address legal issues currently inhibiting data exchange; and ensure availability of sample material.

- Ensure sufficient staff and training at federal and canton levels to support investigations of foodborne outbreaks, and on federal level to enhance collaboration in management of multi-country incidents.

Indicators and scores

P.5.1 Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination - Score 4

Strengths/best practices

- A single organization is responsible for food safety, and regular meetings take place between the supervising level (the FSVO) and the operational level (cantonal chemists), as well as between the national veterinary body (the FSVO) and national public health authority (FOPH).
- There is a single national contact point for food safety issues, including international information exchange between RASFF, the WHO International Network of Food Safety Authorities (INFOSAN), and the IHR.
- Regular meetings take place between central veterinary officers of the FSVO, food industry stakeholders, and consumers.
- A highly educated and trained food safety workforce is in place, with yearly training and specific education for food inspectors, food controllers, and food chemists.
- The healthcare system encourages people to visit doctors, and encourages physicians to take samples for clinical diagnosis.
- There is sufficient laboratory network capacity for clinical and food analysis, quality assured by accredited (ISO 17025) laboratories.

Areas which need strengthening/challenges

- An information exchange and data management system is in place to handle outbreak suspicions and investigations, and to ensure more efficient information flow between cantons and federal offices. This ensures that central officials are aware of all ongoing outbreak investigations in the country (including Liechtenstein).
- Food safety incident management is handled at central level; staff are familiar with management of large crises, and are able to participate in responses to food hazard events involving several countries.
- Switzerland participates in international networks and tool development for multicounty outbreak investigations, and has full access to international systems.
- There are restrictions affecting comparison of pathogen findings from patients, food and animals in the support of outbreak detection and investigation.
- Delivery of pathogen strains to reference laboratories now takes place on a voluntary basis, and some existing laboratory information is not always available for officials.
- Switzerland should support the utilization of existing opportunities for extended laboratory analyses on isolated pathogen strains.
- High costs for analysis—especially for newer generation methods such as whole genome sequencing (WGS)—can be restrictive.

Biosafety and biosecurity

Introduction

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

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

Target

A whole-of-government national biosafety and biosecurity system is in place, to ensure 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.

Switzerland and Liechtenstein: level of capabilities

No high consequence pathogens are stored or handled in Liechtenstein, and this technical area does not apply to Liechtenstein. The JEE team, in agreement with their national counterparts, therefore decided to not score Liechtenstein on biosafety and biosecurity. Scores and comments below refer to the Swiss system.

Switzerland has a sophisticated and comprehensive biosafety system that ensures safe handling and record keeping of dangerous pathogens, provides a suitable amount of training, and restricts access when necessary. There is a large number of biosafety level three (BSL3) laboratories in Switzerland, and four level four (BSL4) facilities.

Biosafety measures are in place. To a certain—and in some areas sufficient—extent, these regulations also address biosecurity issues.

Dual use aspects are recognized, and on certain levels also addressed; but there is no specific legislation in effect that addresses Biosecurity and dual use research of concern (DURC).

Designated experts from Zürich consult with Liechtenstein on biosafety issues, and advise the Liechtenstein head of operations when incidents require action. In general, therefore, Swiss capacity extends to Liechtenstein when required or needed.

The main challenge is therefore to implement biosecurity measures, including by addressing dual use, in the legislature.

Recommendations for priority actions

Switzerland

- Develop a new regulatory framework and integrate new provisions into existing national legislation to address issues related to biosecurity (physical, personal and information security) and dual use research of concern.
- Introduce a mandatory import authorization regime for dangerous human pathogens (e.g. category A agents according to the ADR⁵).
- Introduce a risk-based approach to classifying frontline diagnostics for group 4 microorganisms, and promote the use of detection methods that do not need culturing steps.
- After careful evaluation, consider introducing a legal exemption for the use of point-of-care environmental tests for first responders, in defined cases of suspected intentional use of harmful biological agents.

Liechtenstein

- Ensure that Liechtenstein is included in exercises, as determined in agreements with AWEL (canton Zurich).

Indicators and scores

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

Strengths/best practices

- A legal framework is in place that regulates all kind of organisms (wild type, GMOs, alien, alien invasive, etc.) under one single ordinance, thereby allowing the enforcement of consistent biosafety standards using a risk-based approach.
- This legal framework is regularly evaluated and can be adapted rapidly.
- This framework is also flexible, and concretizes many of the practical challenges encountered by laboratories and users (guidelines, guides, statements, etc.).
- There is good cooperation between different federal and cantonal authorities.
- Regular meetings bring together different federal and cantonal authorities to exchange experiences, challenges and problems.
- Relevant information is channelled through newsletters.
- Enforcement bodies receive training and advanced training.
- Explanatory and technical guidance, recommendations, advices, etc. have been published.

Areas which need strengthening/challenges

- A regulatory framework for biosecurity and DURC concerns (i.e. an oversight mechanism) is required.
- Relevant physical, personal and information security requires improvement.
- Biosafety and biosecurity accreditation/certification programmes are required.
- Diagnostic methods that preclude the need for culturing dangerous pathogens capacities must be strengthened/developed and used.

5 ADR: European Agreement Concerning the International Carriage of Dangerous Goods by Road

- It can be difficult to coordinate measures between 26 cantons with different biosafety culture, languages and political systems.
- Harmonized approaches should be maintained and increased.
- Clearer coordination is required between national and cantonal authorities (e.g. when attributing competencies and assuming responsibilities).
- A code of conduct for biosecurity and dual use is required in relevant institutions that have not already established such a code—and especially in high containment workspaces such as BSL-3 and BSL-4 laboratories.

P.6.2 Biosafety and biosecurity training and practices - Score 4

Strengths/best practices

- National biosafety training is self sustaining.
- There is a high level of coordination and harmonization between regulators and users.
- Training attendance is high.
- Training evaluation scores are always “good” to “very good.”
- Swiss transport regulations are fully compatible with international regulations.
- Organization, planning and financial oversight are outsourced.
- Switzerland enjoys active involvement of federal and cantonal authorities, as well as experienced biosafety officers, in issues of biosafety and biosecurity.
- Oversight is provided by a steering committee of federal, cantonal and academic experts.

Areas which need strengthening/challenges

Switzerland

- Biosecurity/DURC awareness and training courses should be reinforced at levels from BSL2 to BSL4.
- The authorization regime, along with the ContainO notification system for importing defined dangerous human pathogens, needs to be strengthened.
- Implementation of biosecurity measures and dual use aspects in legislature can be difficult, and may only be possible on a generic level.
- Biosecurity and dual use aspects should be integrated into harmonized training for biosafety officers and research personnel.

Liechtenstein

- Liechtenstein should be incorporated into biosafety and biosecurity measures by bilateral agreements.
- Liechtenstein should participate in relevant exercises.
- Though many tasks are delegated to Swiss authorities, Liechtenstein’s awareness of domestic responsibility for actions that take place on its territory nevertheless needs to be strengthened.

Immunization

Introduction

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

Target

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

Switzerland and Liechtenstein: level of capabilities

Switzerland has a comprehensive programme of recommended immunizations (annually reviewed and updated as necessary), which follows international recommendations such as the WHO extended vaccination programme. The programme has been developed based on recommendations provided by the national immunization technical advisory group (NITAG), which is composed of members from different specialties (paediatricians, immunologists, travel medics, etc.). Vaccinations are funded through the same compulsory health insurance system as all other healthcare.

The recommended programme in Liechtenstein is similar to the Swiss programme, with one notable exception: for the Swiss programme, vaccinations are not exempt from co-payment (franchise), while they are provided free of charge in Liechtenstein.

Childhood vaccinations are mainly administered through the private sector (paediatricians and family doctors), and to a lesser degree through hospitals. In addition, some vaccinations are provided by school health services (e.g. for Hepatitis B virus (HBV) and HPV in adolescence, and DTP and MMR catch-up), and some by the army (Switzerland has mandatory military service). For adult recommended vaccines, family practitioners are the main providers, along with some hospitals and gynaecologists. Influenza vaccinations are available in selected pharmacies. For migrants, vaccinations are offered on entry into the country; and for unregistered migrants services are available if they are insured.

There is no central procurement of vaccines at the Swiss federal level or even at cantonal level, but providers buy vaccines directly from importers and pharmacies. This puts Switzerland in a weak negotiating position in case of disturbances to vaccine production, and is reflected in shortages of some vaccines. Additional challenges come from a national necessity for market authorisation, because EU EMA-authorized vaccines are not automatically authorized for Swiss use. This results in a situation where there is only one product on the market for many vaccines, further reducing options in case of shortages. In addition, vaccine prices are high in Switzerland compared to neighbouring countries.

As with all Swiss health services, the practical organisation of immunizations varies by canton and by commune. Especially in smaller cantons, where fewer paediatricians are available, there is a suggestion that this may lead to lower immunization coverage; but MMR coverage for Switzerland has substantially improved in recent years, and the country is close to the 95% theoretical threshold for stopping local transmission. Data from 2016 shows coverage of 94% (92.9-94.4 CI) for one dose and 87% (86.4-88.5) for two doses at age two. Liechtenstein, on the other hand, has coverage of 98%, well above the threshold.

Immunization coverage in Switzerland is monitored by cantons and the use of vaccination cards (requested at the ages of two, eight and 16). There is a three-year rolling national survey of vaccination coverage: each year one third of cantons are surveyed. Random sampling is done in three target groups (i.e. populations at two, eight, and 16 years old) based on population registries and done through requesting vaccination cards. Cantonal coverages are estimated for all recommended vaccinations. Calculation of national coverage is based on weighted cantonal data. The system has recently been evaluated.

In Liechtenstein, physicians send a copy of each patient's preventive visit form to the Office of Public Health. This form contains information on vaccinations given, and can thus be used for estimating vaccination coverage (administrative data).

There is a system in place to monitor adverse effects of vaccines (as part of the general post-marketing surveillance of therapeutic products), and a national compensation scheme in case of vaccine injuries.

In general the immunization system functions very well in both Switzerland and Liechtenstein, with few people lacking the opportunity to benefit from immunization. The system has several strengths, though some challenges remain, and are listed below. Some of these are common to the general European region, while others are country-specific. The recommendations address the most pressing issues.

Although the Immunisation system are largely similar in both countries, a few key differences exist and thus separate scores are given for Switzerland and Liechtenstein.

Recommendations for priority actions

Switzerland

- Strongly consider introduction of centrally procured essential vaccines.
- Consider streamlined approval of EMA approved vaccines for preparedness purposes, particularly to ensure market availability of more than one product.
- Strongly consider removing franchise/co-payment for essential vaccinations, to promote uptake and help reach coverage targets.
- Strengthen promotion of the health benefits of vaccinations among the general public and healthcare workers.

Liechtenstein

- Continue support for cost-free vaccinations and preventive paediatric examinations.

Indicators and scores

P.7.1 Vaccine coverage (measles) as part of national programme – Score Switzerland 4 / Liechtenstein 5

Strengths/best practices

Switzerland

- Immunization coverage in Switzerland is continuously increasing, and the measles campaign has increased coverage among young adults.
- School-based immunization for HBV and HPV is in place in most cantons, reaching out to girls and boys.
- The Swiss electronic vaccination card is an expert system that facilitates checking of vaccination status, provision of reminders, and compliance.

- Three-year rolling coverage monitored at cantonal level provides a standardized method for extrapolating data for all of Switzerland.

Areas which need strengthening/challenges

Switzerland

- There is a need to remind adults to get vaccinated.
- There is a need for further work to increase acceptance of new tools.
- Influenza vaccination coverage could be increased by overcoming hesitancy among health care workers.
- There is a need for more and better communication about vaccination: the anti-vaccine lobby remains active.
- A reduction in franchise costs for vaccination would be beneficial: general decisions need to be made on costs of preventive measures. Political commitment is required to change this.

P.7.2 National vaccine access and delivery - Score 4

Strengths/best practices

- Routine immunization is in place, backed by strong support from paediatricians.
- School immunization programmes are in place for adolescents in most cantons.
- Cantonal immunization programmes are in place (HPV).
- There is easy access to immunizations without appointment: vaccines can be obtained at pharmacies.
- A pre-procurement agreement/contract is in place for pandemic vaccines.
- A national vaccination strategy was recently adopted by the Federal Council (January 2017), and will be implemented together with all stakeholders following a comprehensive action plan.

Areas which need strengthening/challenges

- The number of vaccines available on the Swiss market (1 hexa, 1 penta, etc.) should be increased.
- Swiss authorization is needed for those vaccines already authorized by the EMA and/or FDA (there are currently 30+ such vaccines).
- Switzerland is a small market, which imposes some challenges.
- There is a legal mandate for mandatory stockpiling by vaccine companies, but none for additional national stockpiles. Company stockpiles should be filled up faster, but there is no legal basis to force companies to do this, and at time of writing in November 2017 additional doses for stockpiling were not available for all vaccines.
- There is no legal mandate for joint vaccine procurement within the EU.
- Switzerland suffers from high costs of vaccines as compared to EU countries.

DETECT

National laboratory system

Introduction

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

Target

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

Switzerland and Liechtenstein: level of capabilities

Liechtenstein relies on Swiss laboratory capacity, so the scores and comments below are relevant when evaluating both countries together. Considering Liechtenstein separately, this capacity would have to be treated as not present in the country. It would therefore be advisable to have specific agreements in place to cover shortfalls in capacity. However, since Liechtenstein is technically treated in the same fashion as a Swiss Canton with regard to sharing of laboratory capacity, the scores and comments below reflect the situation of both countries considered together.

Swiss laboratories are able to conduct all six mandatory core tests mentioned in the IHR (2005). These are:

- PCR for influenza virus
- Culture for Polio virus
- Serology for HIV
- Microscopy for mycobacterium tuberculosis
- Rapid diagnostic tests for plasmodium spp. (e.g. lateral flow serology)
- Bacterial culture for salmonella enteritidis serotype typhi.

The other core tests can be country-specific.

National priority core tests are not specifically defined. In general, Swiss laboratories are able to test for approximately 45 additional human pathogens, indicating sufficient capacity and fulfilling requested requirements.

With the exception of Rift Valley Fever, which is not subject to mandatory declaration in Switzerland, the national reference laboratories (NRL) cover all registered (communicable) infectious diseases. Switzerland operates 19 NRLs in total; 16 national reference laboratories test for human pathogens (located in seven cities), and three reference laboratories test for animal pathogens. Two national reference laboratories, in Bern and Zürich, conduct testing for both human and animal pathogens.

Switzerland operates four biosafety level (BSL) 4 laboratories. However, of these four only the one in Spiez is fully BSL4 operable. Two others are BSL4D labs, able to conduct diagnostic testing of BSL4 pathogens, but not propagation and storage of isolated/purified pathogens. The laboratory in Zurich operates daily as a BSL 3 laboratory but can be upgraded to BSL 4 if needed. The last laboratory is a BSL4A facility for animal pathogens only.

Overall there are sufficient microbiological laboratories in Switzerland to handle larger sample processing demands (e.g. during an outbreak). Capabilities are mirrored in some laboratories, creating alternative testing options and increasing testing capacities. Most of these laboratories are accredited to ISO standards. Accreditation is not mandatory, but all microbiology labs in Switzerland and Liechtenstein are mandatorily authorized (by Swissmedic or FSVO).

Switzerland has a dense network of high containment laboratories (BSL3 and 4), which allows for short transportation times and fast sample processing. First results can be ready as soon as two hours after sample reception.

Recommendations for priority actions

Switzerland

- Improve use and applicability of in vitro diagnostic analyses for group 4 pathogens.
- Evaluate new diagnostic techniques and their relevance for communicable diseases, and take necessary and adequate measures to assure the safety and security of the use of these new techniques (e.g. quality assessment/control).
- Refine national concept of operations to define responsibilities of different stakeholders in crisis situations, to improve coordination and response.

Liechtenstein

- Consider specific agreements with Switzerland to cover shortfalls in capacity.

Indicators and scores

D.1.1 Laboratory testing for detection of priority diseases - Score 5

Strengths/best practices

- The national laboratory system has a strong legal foundation.
- The national system is capable of conducting:
 - Analyses for ~50 human pathogens, including the six core tests listed by the IHR (2005) and the US Centers for Disease Control (CDC)
 - Analyses for animal diseases with zoonotic potential
 - Analyses in food chain products for pathogens affecting humans.
- Switzerland has a dense network of laboratories enabling rapid access even to high security BSL3 and 4 labs.
- Relevant analyses are reimbursed by the state.
- Switzerland has the flexibility required to modify the legal basis for compulsory declaration.
- Reference laboratories (NRC) are in place for the majority of pathogens.
- A regional laboratory network (RLN) is in place for highly contagious and emerging diseases and bioterrorism agents, and has its own external quality assurance (EQA) programme.

Areas which need strengthening/challenges

- Improved collaboration on quality assurance is required between laboratories and federal authorities.
- Best practices should be followed for assignment of analyses, avoiding unnecessary analysis costs.
- New techniques relevant to the health system (e.g. next generation sequencing) should be implemented (after thorough consideration of cost-effectiveness).
- The roles and duties of the regional laboratory network should be clarified.
- A secure electronic system for clinical and laboratory documentation—i.e. a central database—should be established and maintained.
- Secure/restricted access to the database should be provided for health professionals and laboratories
- Increasing costs should be controlled.

D.1.2 Specimen referral and transport system - Score 5

Strengths/best practices

- Reference laboratories are available to cover the majority of pathogens (confirmation diagnostic capability).
- Switzerland participate in international proficiency testing (EQA) and this is mandatory for national reference labs.
- Swiss national reference labs are connected with EU and international networks.
- Connections are in place with labs outside Switzerland for specific analyses not done in Switzerland or Liechtenstein (e.g. marine toxins, botulinum toxin and confirmation analyses for some emerging pathogens).
- National reference laboratories are partly financed at federal level.
- In relevant cases, the FOPH decides where samples have to be analysed.
- Information about packaging, labelling and shipment of samples (following guidelines published by the ADR, the International Air Transport Association (IATA), the International Civil Aviation Organization (ICAO), etc.) is accessible online.
- Transport of samples for proficiency testing within the regional laboratory network is financed by the FOPH.

Areas which need strengthening/challenges

- Switzerland is technically not part of ECDC, which may have an impact on its ability to receive reference material for the Swiss national reference laboratories—though this has not yet proved to be the case at time of writing in November 2017.
- Stockpiling of reagents for sample preparation and shipment in extraordinary events (e.g. a pandemic) should be improved.
- Costs should be reduced for sample preparation, packaging and shipment for highly dangerous pathogens.
- There are political challenges around the balancing of federal and cantonal authorities.
- Expiry dates of stockpiled reagents and equipment need to be considered, and appropriate measures taken.
- Allocating the costs of rare but high-impact laboratory installations and equipment at federal level can be difficult.

D.1.3 Effective modern point-of-care and laboratory-based diagnostics - Score 5

Strengths/best practices

- Diagnosis at point of care can be done in almost any physician's office or hospital in the country.
- State of the art diagnostics are available.

Areas which need strengthening/challenges

- A system is required for efficient evaluation and implementation of new techniques (e.g. rapid testing).
- Better interfaces are needed between the FOPH, Swissmedic, SUVA (the Swiss National Accident Insurance Fund) and Qualab for in vitro diagnosis.
- A risk-based approach should be taken to the primary detection of group 4 human pathogens.
- Gaps should be closed in the legal basis for implementation of (and quality assurance for) new techniques.
- Guidelines and rules should be harmonized. Different rules cover the same samples—e.g. pathogen detection is covered by the Ordonnance sur l'utilisation confinée, while all other analyses are covered by the Ordonnance sur la protection des travailleurs contre les risques liés à l'exposition à des microorganismes.

D.1.4 Laboratory quality system - Score 5

Strengths/best practices

- All microbiological laboratories require Swissmedic/FSVO authorization:
 - Regular inspections check compliance with legal requirements and system quality requirements, and the withdrawal of licenses is possible if requirements are not met.
 - Participation in EQA programmes is mandatory.
- All national reference laboratories participate in international proficiency testing.
- Quality assurance systems exist at national level, with Swissmedic and the FSVO in charge of licensing and authorization, and optional accreditation is available through the Swiss Accreditation Service (SAS).

Areas which need strengthening/challenges

- A national EQA program should be developed—at least for some parameters.
- Higher transparency should be sought with regard to EQA performance.

Real-time surveillance

Introduction

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

Target

Strengthened foundational indicators, and event-based surveillance systems that are able to detect events of significance for public health, animal health and health security; improved communication and collaboration across sectors and between subnational, national and international levels of authority regarding surveillance of events of public health significance; and improved country and regional capacity to analyse and link data from and between strengthened, real-time surveillance systems, incorporating interoperable, interconnected electronic reporting systems. 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 IHR and OIE standards.

Switzerland and Liechtenstein: level of capabilities

The Swiss surveillance system for infectious diseases has a long tradition. Long-term collection of information on a range of defined diseases and pathogens allows for continuous, ongoing analysis of trends and timely outbreak detection, in both humans and animals.

The surveillance system for infectious diseases in humans consists of a central mandatory indicator-based routine system, accompanied by surrounding systems providing additional information—for example, surveillance of health care associated infections, the work of the Swiss Paediatric Surveillance Unit (SPSU), and market surveillance of medical products, services and severe adverse events. An important additional part is the “Sentinella” sentinel system hosted by the FOPH, which includes data from 160 primary care physicians across the country, and provides aggregated data on consultations presenting in ambulant health care with influenza-like illness (ILI).

Laboratories and physicians are obliged to notify 54 pathogens or diseases, and the vast majority of notifications are sent from laboratories. All notifications are sent to competent public health authorities on disease- or pathogen-specific paper-based notification forms. Timeliness of notification depends on the pathogen or disease; for some events, notifications must reach authorities within two hours of diagnosis. Physicians are trained and aware of their responsibility to notify. Data entry, data cleaning and integration is done at the national level; information is then re-directed to cantonal level, where further verification of the data and—if necessary—further data collection is performed. Data is continuously analysed at national level and results are communicated regularly, e.g. through monthly bulletins on veterinary health (BVL Bulletin) and human health (BGA Bulletin). The FOPH also provides the public with regular, detailed and structured analysis of the data: reports compile information for every pathogen/disease, and stratified analyses by regions and age groups are published online annually.

Not all Cantons can provide 24/7 availability, but reachability of public health authorities is guaranteed through the national on-call service of the FOPH. Here, additional event-based-surveillance is conducted. Laws for notification of infectious diseases in humans and animals also include event-based components, as every observed outbreak—irrespective of presumed cause—is notifiable.

For infectious diseases in animals, a real-time electronic surveillance system is in place. Daily reporting is practised and can be used for timely analysis of data and targeted response.

A hospital-based syndromic sentinel surveillance system is still under development, and will be used to measure the occurrence of acute severe community-acquired infections and their impact on the health care system.

The statutory indicator-based surveillance system is also currently being developed into an interoperable, inter-connected real-time reporting system. At the moment, however, reporting from laboratories and physicians is still paper-based, and systems for human and animal health operate in parallel. Currently, data are neither integrated in a common database nor jointly analysed—but they are jointly assessed on the established One Health platform.

Additionally, Swiss systems are not fully integrated into the well-established regional networks of the EU, hindering direct and low-threshold exchange with neighbouring countries such as Germany, Austria, France and Italy, which are all strongly interconnected through EU mechanisms including the DG Sante Health Security Committee; the EWRS; the European Centre for Disease Control (ECDC) TESSy European Surveillance system; the NFP disease-specific networks of the ECDC; and joint training activities and exercises.

As far as real-time surveillance of infectious diseases is concerned, Liechtenstein is a de facto part of the Swiss system, functioning in the same manner as an additional Swiss canton. Liechtenstein has endorsed the Swiss legal framework.

Notifications from Liechtenstein (e.g. from laboratories) are sent directly to Swiss national authorities; in response, Swiss authorities provide Liechtenstein with epidemic intelligence, data collection, data analysis, data reporting and data communication. Only in terms of actions based on the surveillance data (e.g. concrete measures) might Liechtenstein authorities be more independent from Swiss national authorities than Swiss cantons. Liechtenstein also has access to the EU structures listed above.

Given the deep integration of systems, the scorings and comments below are relevant to both countries.

Recommendations for priority actions

Switzerland

- Improve international collaboration in the field of communicable diseases, especially permanent collaboration between Switzerland and the EU (via technical networks, information exchange etc.).
- Improve support to less developed countries in developing surveillance systems (share best practices, contribute experience, etc.).
- Develop and implement a real-time electronic surveillance system for infectious diseases in humans with electronic declarations from physicians and laboratories, enabling national and regional public health authorities to have real-time online access and perform prompt analysis and immediate responses.
- Establish a hospital-based sentinel surveillance system for early detection of severe progressing diseases/syndromes.

Indicators and scores

D.2.1 Indicator- and event-based surveillance systems - Score 5

Strengths/best practices

- For some diseases, single-case-based data has been collected for 30 years.
- The legal basis for the surveillance system was renewed in the 2016 Epidemics Act, which implements lessons learned from the 2009 Influenza pandemic, clearly defines roles and responsibilities for reporting, and strengthens the legal basis at national level for the implementation of measures. Details are further specified in various ordinances, which are easy to revise when needed.
- The Epidemics Act also provides a legal basis for the further development of the electronic reporting system.
- Switzerland contributes data on infectious diseases in humans, animals and feed to various regional networks of the EU (e.g. RASFF, INFOSAN, EFSA and others), and also reports to the European database run by ECDC (TESSy).

Areas which need strengthening/challenges

- International cooperation in surveillance currently only takes place through very close bi-national cooperation with Liechtenstein.
- Switzerland should work to help develop the capacity of less developed countries by sharing its experience and supporting WHO and OIE in their efforts to build up strong surveillance systems worldwide.

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

Strengths/best practices

- The veterinary sector already has a state-of-the-art electronic surveillance system.
- A real-time electronic surveillance system is under development for the human sector. A centrally hosted shared database with distributed access rights will allow decentralised data entry and improve timeliness and completeness of data.

Areas which need strengthening/challenges

- The flow of data on infectious diseases in humans could be simplified; this should be helped by the planned new database.
- Solving data protection issues and developing technical solutions will be challenging—especially as there is a lack of qualified IT personnel with a deep understanding of epidemiological needs.

D.2.3 Analysis of surveillance data - Score 5

Strengths/best practices

- The FOPH conducts thorough analysis and additional studies on an ad hoc, demand-orientated basis, and publishes the findings in national and international peer-reviewed journals.
- Qualified and trained staff are available for human and veterinary health at the national level, check data quality, and routinely analyse the data. Diseases in humans and animals and surveillance of pathogens in food products are monitored jointly: all three competences are concentrated under the roof of one ministry. Results are regularly published in the joint zoonosis report.

Areas which need strengthening/challenges

- Where feasible, Switzerland should fully apply a One Health approach, integrating the health data of animals and humans and laboratory results from food controls in a single common database. This may speed up analysis and foster early detection of zoonotic diseases.
- Feedback to data providers in the human health sector (laboratories and physicians) could be more thorough—e.g. through provision of a public use file or automatic feedback mechanisms.

D.2.4 Syndromic surveillance systems - Score 3

Strengths/best practices

- During influenza season, ILI data is published on a weekly basis, and the algorithms have been adopted by other European countries as examples of best practice.
- Sentinella also collects data on tick bites.
- Data on all-cause excess mortality is available online and contributed weekly to the European EURO-Momo project, in which data from European countries is pooled and jointly analysed weekly. Through this, Switzerland contributes to better understanding of the severity of events like seasonal influenza.

Areas which need strengthening/challenges

- Gaps exist between surveillance of disease in ambulant settings on one hand, and mortality surveillance on the other.
- To complete the picture of burden of disease, a population-based surveillance of acute respiratory or acute gastrointestinal diseases might be helpful.

Reporting

Introduction

Health threats at the human–animal–ecosystem interface have increased over the past decades, as pathogens 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 disease.

Target

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

Switzerland and Liechtenstein: level of capabilities

Both Switzerland and Liechtenstein have functional focal points for the IHR (2005) (IHR NFPs) that are attainable 24/7/365 (Switzerland since 2006, and Liechtenstein since 2012). Both NFPs are in contact with the eight Swiss national IHR contact points for the different areas covering the IHR (2005). The Liechtenstein NFP depends on the national IHR contact points and the IHR NFP of Switzerland. All contact points and the two NFPs are united under a single IHR platform that meets regularly. Liechtenstein also has access to the EU regional Early Warning and Response System operated by the ECDC for DG SANTE.

The national IHR contact points for zoonoses and food safety also serve as contact points for OIE and FAO respectively.

The information flow for a notification is from local contact points at cantonal level or in Liechtenstein up to a national IHR contact point, then up to the IHR NFP, and then to WHO (or from the OIE/FAO contact point to the OIE/FAO).

Collaboration and coordination between the IHR NFP and the IHR contact points is outlined and executed by means of bilateral agreements. Liechtenstein is treated in this aspect as a body equivalent to an additional Swiss Canton, but it has its own IHR NFP and is mandated to report to WHO as an individual entity. Liechtenstein also has the option of IHR reporting to WHO through the EWRS system, which is not available for Switzerland. Reporting from Liechtenstein is managed in consultation with the Liechtenstein Office of Public Health and IHR contact points in Switzerland as and where relevant.

There have so far been no notifications from either country, so the reporting system has not been tested with a real event. There have been occasional consultations with WHO, and there has been about one verification every 1-2 years regarding events in Switzerland.

The most frequent international exchanges are through direct exchanges between the Swiss IHR NFP and IHR NFPs of other countries. There are approximately 50 such events each year, concerning IHR-related contact tracing and other issues (e.g. TB, measles, etc.).

The Epidemics Act of 2012 is valid in both countries and serves as a legislative basis for the respective SOPs for notification and reporting.

In place of real events, the Swiss NFP conducts regular tabletop exercises with its National IHR contact point for communicable diseases, using the WHO tutorials.

Recommendations for priority actions

Liechtenstein

- Develop SOPs and reporting templates or formally adopt and implement Swiss guidelines.
- Participate in Swiss exercises and include scenarios requiring IHR reporting from Liechtenstein.

Indicators and scores

D.3.1 System for efficient reporting to WHO, FAO and, OIE - Score Switzerland 5 / Liechtenstein 2

Strengths/best practices

Switzerland

- Switzerland has a strong reporting network including local contact points, a national reporting system, the National IHR Contact Points and the NFP, all of which work well together.
- National IHR Contact Points for zoonoses and food safety are also contact points for OIE and FAO, respectively.
- The NFP is attainable 24/7/365 using an on-duty schedule.
- Lean and efficient reporting structures are used frequently—for the most part, daily.
- National IHR contact points carry out regular risk assessments according to Annex 2 of the IHR (2005).

Switzerland and Liechtenstein

- There are regular meetings of the national IHR platform that bring together National IHR contact points and the NFPs of Switzerland and Liechtenstein on a regular basis; these frequent meetings ensure that every relevant entity/agency is aware of its mutually agreed responsibilities in times of crises.

Areas which need strengthening/challenges

Switzerland and Liechtenstein

- As there are very few, if any, real time crises, more frequent testing (through simulation exercises) is warranted.

D.3.2 Reporting network and protocols in country - Score Switzerland 5 / Liechtenstein 3

Strengths/best practices

Switzerland

- Adaption of the 2012 Epidemics Act has strengthened the functioning of the reporting network
- SOPs and reporting templates exist.
- Regular exercises are held using WHO tutorials.

Switzerland and Liechtenstein

- Regular meetings of the national IHR platform bring together all National IHR contact points and the NFPs of Switzerland and Liechtenstein on a regular basis.

Areas which need strengthening/challenges

Switzerland and Liechtenstein

- Both countries have very few real life crisis events that challenge existing systems to identify gaps or challenges in processes.
- If a real major crisis was to occur in Switzerland and/or Liechtenstein, it could pose significant threats to Switzerland, Liechtenstein, Austria and other neighbouring countries, because of the extensive movement of residents across borders.

Liechtenstein

- There is a need to identify triggers and thresholds that mandate 24/7/365 availability of emergency staff, which may normally only function on a part-time basis.
- SOPs and reporting templates have to be developed.
- Liechtenstein requires more simulation exercises.

Workforce development

Introduction

Workforce development is important in order to develop a sustainable public health system over time. A highly qualified public health workforce should be developed and maintained with appropriate technical training, scientific skills and subject matter expertise.

Target

State Parties to 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). Workforce should include physicians, veterinarians, biostatisticians, laboratory scientists and farming/livestock professionals, with an optimal target of one trained field epidemiologist (or equivalent) per 200 000 population. This workforce should cooperate systematically to meet relevant IHR and Performance of Veterinary Services core competencies.

Switzerland and Liechtenstein: level of capabilities

Switzerland has a well-developed public health workforce sufficient to meet its needs—both in numbers and in the skills, knowledge and expertise required to address core capacity areas under the IHR (2005). This is also true for the veterinary health sector and for capacity to handle chemical and radiological events.

Liechtenstein, on the other hand, has only 11 employees working in public health. Though this workforce is adequate to meet routine day-to-day requirements, Liechtenstein's default position is to rely on relevant experts from Switzerland for technical and operational support for surge and/or in additional areas when required. This reliance is based on an agreement with Switzerland signed in Bern on 2 December 2011⁶.

The Swiss medical workforce in hospitals (secondary and tertiary care) is well developed. Like many developed countries, Switzerland faces a small number of challenges, in that high quality medical services are mainly available in urban areas, with limited numbers of primary care clinicians, nurses, paramedics and veterinarians in remote rural areas. However, this shortfall is not critical, and medical emergency services can be assured within 30 minutes in all Swiss territory.

In Liechtenstein, almost every village has a medical doctor. The country's one hospital, which has 65 beds, can only perform basic medical services, and all advanced cases are referred to Switzerland. Regarding the workforce for IHR implementation, the country has two veterinarians but no epidemiologists, and depends fully on Switzerland. Coordination is mainly done by phone.

In Switzerland, the cantons are responsible for deploying the public health workforce, and for maintaining communication platforms between experts in the cantons and at federal level. A general coordination meeting, providing a platform to coordinate cantonal and federal authorities, is held at least twice a year. A One Health platform also operates twice a year, and an IHR platform meets annually.

During an outbreak, the necessary workforce is organized by the Federal Crisis Management Board.

6 The *Vereinbarung zwischen der Regierung des Fürstentums Liechtenstein und dem Schweizerischen Bundesrat betreffend der Zusammenarbeit im Bereich der Bewertung und Meldung von Ereignissen gemäss den Internationalen Gesundheitsvorschriften (2005) der Weltgesundheitsorganisation*—or the Agreement between the Swiss Federal Council and the Government of the Principality of Liechtenstein concerning cooperation in the field of assessment and reporting of events in accordance with the International Health Regulations (2005) of the World Health Organization.

Switzerland has sufficient epidemiological capacity in health care facilities, and continued training for public health and medical staff is well organized and mainly financed by public funding.

Switzerland has no dedicated Field Epidemiology Training Programme (FETP), but epidemiology training is part of Masters of Health qualifications, or other Masters and Bachelor level programmes in public health. The FOPH does not regulate the curricula or quality of epidemiological education, as this is done by relevant academic entities. The same applies for education in veterinary sciences and biostatistics. Curricula are driven by demand, and dependent on the universities. Field epidemiology training per se is not directly offered, and is acquired through on-the-job training. Veterinary education includes public health modules.

Liechtenstein has no medical or veterinary universities and relies on Switzerland and other countries for educational development.

Switzerland has no federal workforce development strategy, as supply and demand for education and skills are regulated by academic markets and at cantonal level. Because the system is working well, the country sees no need for federal intervention.

Both Switzerland and Liechtenstein have provided, and continue to provide, staff for potential international surges. The scores below are applicable to both countries.

Recommendations for priority actions

Switzerland

- Working jointly with the Swiss Public Health Institute, the FOPH should build a platform for guidance for public health training curricula according to emerging needs and required quality recommendations, especially with regard to the applied epidemiology training (in both the human and animal health sectors).
- Measures should be considered to enhance availability of, and access to, primary care medical staff in remote areas, as well as nurses, nursing staff and veterinarians.

Liechtenstein

- Develop standard operating procedures (SOPs) and job action sheets to prepare for staff turnover, and consider establishing deputy functions to ensure continuous coverage and knowledge transfer.

Indicators and scores

D.4.1 Human resources are available to implement IHR core capacity requirements - Score 5

Strengths/best practices

- Driven by a market-oriented system, the academic sector works well to produce a sufficiently capable workforce in relevant areas, meeting the needs and demands of a highly developed economy, without public sector intervention. Content and quality of curricula are well regulated by the academic sector, and aligned to current as well as emerging needs and demands.
- There is a well-developed information flow between different public health sectors.

D.4.2 Field epidemiology training programme or other applied epidemiology training programme in place - Score 5

Strengths/best practices

- Though there is no FETP per se in place, current needs for applied and field epidemiologists are adequately addressed through undergraduate and graduate level programmes offered by academic centres and/or in on-the-job training, especially in human health roles.

Areas which need strengthening/challenges

- The FOPH should consider coordinating and guiding development of curricula for public health, helping to ensure that universities offer epidemiological training.
- The inherent high cost of field epidemiology training for medical doctors and veterinarians poses a challenge to ensuring the availability of an adequate number of well-trained medical and veterinary epidemiologists in the public health workforce.
- The recruitment and availability of an appropriately trained, adequate work force is addressed at cantonal level, which poses policy and operational challenges for the FOPH.

D.4.3 Workforce strategy - Score 4

Strengths/best practices

- There is no federal strategy in place, but a devolved cantonal system meets cantonal and national needs, and continues to do so without federal regulation/intervention.

Areas which need strengthening/challenges

- Liechtenstein has a need to work on the creation of formal mechanisms (SOPs, job descriptions, command and control structures, etc.) to meet human resource needs during surges in times of health emergencies.

RESPOND

Preparedness

Introduction

The effective implementation of the IHR (2005) requires multisectoral/multidisciplinary approaches through national partnerships for effective alert and response systems. It requires coordination of nationwide resources, including the sustainable functioning of a national IHR focal point that is accessible at all times to communicate with WHO IHR regional contact points and all relevant sectors and stakeholders in the country. (The IHR focal point is a national centre for IHR (2005) communications, and a key requisite for implementing the IHR (2005)). States Parties should provide WHO with contact details for their national IHR focal points, update them continuously, and confirm them annually.

Target

Preparedness includes the development and maintenance of national, intermediate and local or primary response level public health emergency response plans for relevant biological, chemical, radiological and nuclear hazards. These will cover mapping of potential hazards, identification and maintenance of available resources—including national stockpiles—and the capacity to support operations at intermediate and local or primary response levels during a public health emergency.

Switzerland and Liechtenstein: level of capabilities

In general, every Swiss office or ministry is responsible for preparedness in its own field, and coordination between federal agencies is well developed. Risk assessments have been performed and several national scenario-based plans, produced by the Federal Office of Civil Protection (FOCP) in cooperation with the cantons and other national partners, are in place. Public health risk and resource mapping is a key part of national risk analysis.

During crises the FOCP activates the National Crisis Management Board to coordinate the response. Preparedness is tested regularly through national/cantonal exercises, and on a day-to-day basis. Following multi-level risk assessments, preparedness is verified for each scenario, gaps are identified, and measures are proposed for the necessary strengthening.

Some of Switzerland's 297 hospitals are private, and therefore not part of the plan. For some threats (including chemical threats), only 19 hospitals are prepared.

In Liechtenstein, the relevant authorities are all part of the Crisis Management Board. The country has a national pandemic preparedness plan, and other plans related to natural disasters. Liechtenstein possesses one 65-bed hospital and one or two ambulances, and relies mainly on Switzerland and Austria for emergency services. Helicopter services based in Switzerland can perform evacuations, and are able to fly at night.

In addition to the priority recommendations listed below, and as discussed with country counterparts during the JEE, Liechtenstein could benefit from centralised use of shared IT and defined procedures for informing the public during emergencies, as well the establishment of a hotline for information about wounded and missing people. A national emergency drill could be arranged, covering the whole chain from local event through to receipt of international assistance, and examining time taken to respond to life saving missions.

Both Switzerland and Liechtenstein could also benefit from carrying out annual assessments of all threats and assessing the readiness to respond to those threats of infrastructure, procedures and SOPs, equipment, and manpower. This would help to keep alertness and skills at high level despite a lack of real events. A committee of multidisciplinary experts and stakeholder representatives could review procedures, SOPs, new treatments, stockpiles, protective gear, etc.

Protocols should be established and equipment maintained or purchased to ensure that in an emergency the provision of health care services to communities is not interrupted. This may require hospitals to build additional capability by adding additional equipment in emergency rooms or at other special sites. Additional human resources for use in surges for emergency response are identified and trained to assist in emergencies. These include retired medical personnel, Red Cross personnel, NGOs, military medical teams and/or university student volunteers studying in medical fields.

Recommendations for priority actions

Switzerland

- Continue to increase preparedness for multi-hazard risks, including in the health sector, following defined scenarios.
- Improve coordination of preparedness and prevention activities between different stakeholders inside and outside the health sector.
- Define a national exercise plan, coordinated between and accepted by all stakeholders (federal agencies and crisis staff, cantonal crisis staff and partners).

Liechtenstein

- Revise and amend the outdated Pandemic Preparedness Plan.
- Consider developing a strategy/plan for mobilization and involvement of other human, material and financial resources in preparation of and during emergencies.
- Regarding medical stockpiles: verify which agreements exist and which medication urgently needs to be stocked and/or properly stored.

Indicators and scores

R.1.1 Multi-hazard national public health emergency preparedness and response plan is developed and implemented - Score Switzerland 4 / Liechtenstein 2

Strengths/best practices

Switzerland

- Competencies and means are delegated to cantons/communes.
- Risk assessments and gap analyses are carried out regularly.
- Plans of action exist at all levels, from the federal down through cantons and regions/communes, to emergency agencies.
- Higher-level support and coordination is guaranteed, in addition to the principle by which cantons in need are always helped by their neighbours.

Areas which need strengthening/challenges

Switzerland

- Switzerland has very limited additional means to increase public health capacities in case of major emergencies.
- Switzerland has very little experience of dealing with major emergencies.

Liechtenstein

- Liechtenstein's pandemic preparedness plan is outdated.
- There is a need to curb the possible perception that emergencies cannot happen in Liechtenstein.
- Joint exercises should be run with Switzerland.

R.1.2 Priority public health risks and resources are mapped and utilized - Score Switzerland 5 / Liechtenstein 2

Strengths/best practices

Switzerland

- Planning activities are ongoing at all levels, based on revised legislation and under governmental control.
- Ongoing monitoring of risk evolution and readiness is carried out by governmental and neutral organizations, and risks are ranked to ensure they are addressed in the correct order.
- Established plans are verified based on national, cantonal and regional exercises to test procedures and readiness.
- There is a regularly updated national pandemic plan for influenza.
- The National Crisis Management Board plans strategically for different hazards.
- Internal and external analysis is carried out on exercises and reports.

Areas which need strengthening/challenges

Switzerland

- Switzerland should assess all threats from a preparedness perspective.

Liechtenstein

- Liechtenstein's pandemic preparedness plan is outdated.
- Some stockpiled material is expired.
- Resources are limited.
- It was suggested that the perception among decision-makers that "money is key," and that all solutions can be bought, might be a challenge; awareness should be raised that there are limits to this approach.

Emergency response operations

Introduction

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

Target

Country has capacity for: a public health emergency operations centre functioning according to minimum common standards and maintaining trained, functioning, multisectoral rapid response teams; real-time biosurveillance laboratory networks; information systems; and trained PHEOC staff capable of activating a coordinated emergency response within 120 minutes of the identification of a public health emergency.

Switzerland and Liechtenstein: level of capabilities

Switzerland benefits from very high standards in medicine, strong domestic pharmaceutical and chemical industries (including vaccine production), and the availability of BSL 4 laboratories. Guidelines for risk assessment are available and implemented in both the relevant federal offices and at canton level. Verification is done by experts of the relevant offices and members of the crisis management staff. Political decision-makers and administrators are aware of the necessity to prepare for emergencies, and are willing to engage.

In Switzerland, the primary responsibility for managing public health events is delegated to the lowest level, where initial decisions on measures are taken, and first responses are coordinated. National level bodies only take charge for events of bigger magnitude or geographical spread. If this happens, Swiss national authorities have the capacity to respond adequately. As the responsibility for covering costs rests with the leadership in crisis management, local levels and cantons tend not to be too reluctant to escalate.

The Swiss National Crisis Management Board is the major national strategic crisis management body, and contains representation from all federal departments, including 17 ministers and five directors general of cantonal conferences (including the conference for public health). The board is supported operationally by the national emergency operations centre (NEOC), which deals with all major events, including those related to public health. The centre reports to the board, and serves as the point of contact (POC) for ministries, cantons and critical infrastructure companies in major events or emergencies. Since 2003, the centre has been a division of the FOCP. Its responsibilities include alerting and informing the government, population and international organisations, and generating situational awareness. The centre also deals with all the internal processes and direct partners in the public health sector, coordinates any necessary action, and manages additional resources when needed.

The NEOC has existed for a long time and has accrued practical experience over four decades. Processes are well developed and regularly trained. Collaborations between the NEOC and cantonal EOCs are well established. Activation of EOCs is always only at the minimum level needed. There are no pre-defined levels of activity and no fixed criteria for escalation and de-escalation, allowing flexibility. Multiple scenario-based plans have been prepared to define processes for all sorts of critical events. These scenarios are regularly exercised, focusing on different subjects and including other levels, actors and sectors. Results of all exercises are evaluated systematically and findings are fed back to improve plans and procedures. Timeliness of activation is, however, hindered by the bottom-up escalation process from local to cantonal to national level.

General case management guidelines and specific guidelines for priority diseases are available. Staff at the specialized clinics are trained (e.g. through personal experience in the context of deployments with Médecins Sans Frontières/MSF). In addition, the Swiss Armed Forces provide special training on treatment and transport of highly contagious patients. Detailed SOPs clarify (for example) the management of contacts. For contact tracing purposes, an electronic system is available for the coordinated medical services.

Switzerland has demonstrated the capacity to activate a national EOC at short notice—however, due to the bottom-up escalation process, activation happens at the request of cantons, and thus not necessarily within two hours of the occurrence of an event. Qualified and trained staff is available 24/7, and written SOPs clearly define roles and responsibilities. Staff capacity can rapidly and substantially be scaled up to over 150 people at national level. The centre is centrally located and very well equipped; it is staffed by the same trained personnel irrespective of event type, but in each event, if necessary, relevant subject matter experts are recruited, and the lead is taken by the relevant sector. For public health crises, additional staff specialized in public health matters are drawn from the FOPH crisis management staff. There is additional capacity at lower levels (local/regional), which bear the primary responsibility for responses. The medical services coordinating Body (SANKO) and the Staff Army Medical Services can be considered as further surge capacity in special health emergency situations. In the absence of real events, scenario-based exercises have been conducted regularly.

The FOPH and the cantons are also able to run emergency hotlines for the population.

Liechtenstein's individual capabilities to cope with public health emergencies are limited. In case of an event of public health concern, a crisis task force is convened, led by the minister of education, home affairs and environment and consisting of public health staff and representatives of other affected ministries as well as representatives of the health, civil protection police, and communication offices. Additional experts (e.g. from the veterinary or security fields) may be included if required. A task list and basic checklists define different functions of the board, but no detailed written SOPs are available to define roles and responsibilities during crises, and decision-making procedures are not specified. The crisis management board would convene fast, irrespective of the type and magnitude of the event.

A meeting venue with technical infrastructure and staff of up to 25 people is available. There is no pre-defined public health emergency operation centre, but the basic functions of a crisis management board and EOC—such as physical premises, technical equipment and staffing—do exist. The police headquarters is available 24/7/365 and would serve as an EOC during any crisis. This centre is equipped with communication infrastructure and a power supply. Its tasks include provision of information services, and coordination between police, government, security, public health, technical staff and rescue teams.

No training is provided locally. Liechtenstein benefits from training provided by Switzerland. Emergency exercises have been completed by the national police. Mechanisms for operability during a health event have not been tested locally, either through real health events or with simulation exercises of any kind.

Liechtenstein has no capacity to transport or treat highly contagious patients. Bilateral agreements including SOPs with the Swiss medical service cover the transportation of patients.

Due to Liechtenstein's small size, any event of public health concern would very quickly also affect the neighbouring countries of Switzerland and Austria. Strong bilateral relations and MOUs are therefore crucial.

Recommendations for priority actions

Switzerland

- Define and develop a common system for situational awareness that allows leaders on different levels to have simultaneous access to all relevant information.
- Reduce the number of institutions involved at federal level, in order to reduce the demands associated with coordinating multiple partners during a response.
- Implement a usable, IT-based tool to support the routine and emergency work of staff and facilitate coordination of resources at all national levels.

Liechtenstein

- Ensure 24/7/365 availability of the crisis management board; a deputy mechanism should be implemented, as there is currently only one person responsible per position, and these people might not be available during a crisis.
- Carry out more frequent and more regular exercises to test HR capacities, ensuring they include the Crisis Management Board.
- Develop national guidelines or SOPs, or formally adopt and implement Swiss guidelines.
- Consider how other resources (such as volunteers and ambulances from the neighbouring Swiss canton) could be mobilized in emergency response, and provide a corresponding legal basis for this.
- Establish alert levels, including specific missions and timelines for responders and stakeholders in all sectors.
- Consider establishing software and protocols to create fast, accurate national and local situational pictures.
- Develop a quick alert system for responders and managers.
- Define different call lists according to event type.

Indicators and scores

R.2.1 Capacity to activate emergency operations - Score: Switzerland 5 / Liechtenstein 3

Strengths/best practices

Switzerland

- Warning/alerting capacity for the population and for governmental organizations exists on national level (via the NEOC) and in every canton.
- Every level (federal, cantonal or communal) has its own crisis management staff or board, and is able to activate emergency operations 24/7/365.
- Relevant emergency telephone numbers are the same nationwide.
- The FOPH and the cantons are also able to run emergency hotlines for the population.
- Reaction time at local level is very short due to the decentralisation of response resources
- Process descriptions and flows for the NEOC are well defined.
- Regular assessment is carried out by official quality verification agencies for nearly all relevant governmental organisations.
- All partners were involved in the relevant legislative processes.

- Activation and emergency operations are regularly trained on all levels, using multi-branch scenarios.
- The results of all exercises are evaluated to define measures for improvement.

Liechtenstein

- Networks are established, with clearly defined working routines.
- Communication pathways are short.

Areas which need strengthening/challenges

Switzerland

- Coordination of information and communication between different governmental levels and responsible offices needs to be strengthened.
- Various plans exist for different scenarios, which might create difficulties in cases where crises evolve and scenarios change, especially when responsibilities are transferred from one level to the other or from one sector to the other.
- Only a few emergency types are dealt with by a single, clearly designated responsible office—most emergency situations are cross-sectoral.
- The system has not been well tested by real events, which are rare in Switzerland.
- It can be difficult for medical staff and public health professionals to de-prioritize otherwise important tasks during crises.

Liechtenstein

- Liechtenstein has limited resources and requires support from external partners.
- The country cannot guarantee 24/7/365 availability of the crisis management board, as health experts might not be available, especially during holidays.
- Emergency response mechanisms have not been tested during real events or simulation exercises
- Education and training of staff relies entirely on Swiss capacities.
- Deputising functions should be considered to ensure continuous functionality.

R.2.2 Emergency operations centre operating procedures and plans - Score Switzerland 4 / Liechtenstein 2

Strengths/best practices

Switzerland

- Most processes are well defined and follow standard procedures that are valid for most branches.
- Communication is tested on a regular basis.
- The collaboration and exchange of best practice is well established between governmental organizations and other partners, as well as with neighbouring countries.

Liechtenstein

- Irrespective of event, leadership is always clearly defined and lies with the minister of education, health and internal affairs.
- Unlike bigger state entities, Liechtenstein experiences no problems with intersectoral collaboration, as all relevant sectors are under one roof.
- Electronic documentation and incident management exists.

Areas which need strengthening/challenges

Switzerland

- Coordination and generation of an overarching situation awareness report, involving all needed partners (based on GIS systems and adapted filter functions), can be challenging.
- Too many different stakeholders are involved at federal level.
- Cantons are independent and use different tools that are not necessarily compatible. At local level there might be limited availability of some tools, depending on means of communication (power supply, internet access, etc.).
- Redundant communications methods mean excessive cost.

Liechtenstein

- Leadership of the crisis management board changes regularly due to political changes: institutional knowledge and expertise are difficult to build and maintain.
- Not all operational responsibilities are clearly defined, as there is a lack of guidelines or SOPs.

R.2.3 Emergency operations programme - Score Switzerland 4 / Liechtenstein 2

Strengths/best practices

Switzerland

- Many exercises have been conducted, and all have been well prepared and observed; the NEOC conducts three training weeks every year.
- For all exercises reports are established, discussed with the involved parties, and used for improvement.
- On average, a national exercise takes place every year, involving federal, cantonal and local levels and engaging different sectors. Health care is always part of the scenario.
- Every new plan is tested before being declared valid; improvements are implemented following the test results, and tested again before validation of the plan.
- Reports and examples of best practice from after action reviews are shared, and the lessons implemented.

Liechtenstein

- Physical premises, in the form of an air-raid shelter, are used yearly during a mass gathering event for police and medical services. This can be regarded as a test for functions.

Areas which need strengthening/challenges

Switzerland

- Availability of experts is limited because nearly all staff fulfil multiple functions.
- There is a danger of single individuals becoming indispensable "bottle necks" during crises.
- It is difficult to run exercises in which all experts can participate under realistic conditions.
- Due to financial and cultural priorities, maximal resources are allocated to local and cantonal level, leaving limited means at federal level to support cantonal emergency organizations. This might hinder responses.

Liechtenstein

- Local capacities and capabilities for health crisis response should be tested through tabletop and simulation exercises involving competent authorities from Switzerland and Liechtenstein—especially in order to test collaboration and communication.

R.2.4 Case management procedures are implemented for IHR relevant hazards - Score Switzerland 5 / Liechtenstein 2

Strengths/best practices

Switzerland

- Risk and case management processes are in place and accepted by elected political leaders at federal, cantonal and often also communal level.
- Exercise results are shared throughout Switzerland.

Liechtenstein

- Liechtenstein and Switzerland have bilateral agreements on shared resources regarding transport and treatment of highly contagious patients.

Areas which need strengthening/challenges

Switzerland

- Current high standards must be maintained.
- Best practices should be shared, e.g. through further exercises.

Liechtenstein

- Liechtenstein should train the local hospital in first responses to suspect cases of highly contagious disease (isolation, use of personal protective equipment, etc.).

Linking public health and security authorities

Introduction

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

Target

In the case of a biological event of suspected or confirmed deliberate origin, a country should be able to conduct a rapid, multisectoral response, with the capacity to link public health and law enforcement, and to provide and/or request effective and timely international assistance (for example, to investigate instances of alleged use).

Switzerland and Liechtenstein: level of capabilities

Switzerland

The cooperation of public health and security authorities in Switzerland is part of the generic preparedness process, and well-established mechanisms exist to facilitate it. Joint responses in cases of suspected or confirmed biological events are incorporated into federal legislation that applies to response at all levels. In accordance with the NBCN Operations Ordinance, the federal Crisis Management Board includes representatives of the following bodies as permanent members:

- The FOPH
- The FOCP
- The FSVO
- The Federal Office of Police
- Armed Forces Customs (represented by the Chief).

An MOU between public health and security authorities applies to the exchange of personal information between the FOPH and the Federal Office of Police, in order to identify Swiss residents in the case of a public health emergency. A second MOU covers division of competences between the FOPH and the Armed Forces concerning entry screening at Switzerland's two designated points of entry (the international airports in Zurich and Geneva).

Liechtenstein

The relevant authorities are all part of the Liechtenstein National Crisis Management Board. The sharing of information and coordination between different sectors is thus guaranteed. Measures are coordinated by the board, and then executed by the respective responsible authority.

Recommendations for priority actions

Switzerland

- Improve routine sharing of information between law enforcement and public health.
- Clarify allocation of responsibilities in public health emergencies in instances where no legal regulations apply.

Liechtenstein

- Consolidate and develop checklists of relevant responsible actors, to facilitate the work of the Crisis Management Board.
- Increase the number and quality of exercises that include activation and operation of the Crisis Management Board.

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 Switzerland 4 / Liechtenstein 3

Strengths/best practices

Switzerland

- There are well-established organisations and crisis management structures at all levels where public health and security sectors are linked.
- Using these mechanisms, information is shared during suspected biological events.
- Regular joint exercises take place, mainly but not exclusively at cantonal level.
- Interaction with Interpol has a legal framework and is well established.

Liechtenstein

- Collaboration between public health and security authorities is incorporated into the makeup of the national Crisis Management Board.

Areas which need strengthening/challenges

Switzerland

- Routine information sharing between the National Intelligence Service and public health authorities requires strengthening and improvement.
- The roles and responsibilities of different actors require clarification.

Liechtenstein

- Security authorities must be fully aware of their role in public health emergencies; but public health is not part of the core business of security authorities and therefore is not on their priority list.

Medical countermeasures and personnel deployment

Introduction

Medical countermeasures are vital to national security. They protect nations from potentially catastrophic infectious disease threats. Investments in medical countermeasures create opportunities to improve overall public health. It is also important to have trained personnel who can be deployed in case of a public health emergency for response.

Target

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

Switzerland and Liechtenstein: level of capabilities

The Swiss Agency for Development and Cooperation (SDC), working through the Swiss Humanitarian Aid Unit (SHA), enables Switzerland to deploy medical means (personnel, relief goods etc.) in responses to humanitarian crisis situations worldwide. Civil and military actors in Switzerland work closely together in preparation and response.

SDC works in line with WHO guidelines, as well as with the legislation of affected countries, and applies internal procedures for logistics, security, liability and financial concerns. The engagement of SDC and SHA in the Host Nation Support mechanism is coherent with the respective guidelines of the EU's European Civil Protection and Humanitarian Aid Operations Emergency Response Coordination Centre (ECHO-ERCC).

When sending health personnel into humanitarian crisis situations abroad, all necessary equipment and medication for deployment is covered by the SHA internal section. This internal unit is authorised to run a private pharmacy.

The SHA consists of a pool of around 640 active members and 11 specialized groups. One unit is dedicated to medicine, and this group contains around 80 active members, including medical doctors, midwives, paramedics, pharmacists and physical therapists.

Medical countermeasures in the context of humanitarian aid interventions encompass:

- A medical unit integrated into the internationally deployable Swiss rescue chain ("Swiss Rescue")
- Medical modules to be deployed as specialized rapid response teams, such as the "Mother & Child" (M&C) team
- Donations of relief goods such as pharmaceuticals, medical instruments etc.
- Capacity building activities within the context of specific preparedness projects (e.g. improvement of the ambulance service in Beirut) or as part of a rapid response intervention (e.g. capacity building for staff of the Gorkha hospital after the 2015 earthquake in Nepal).

The SDC has provided assistance to a number of recent missions—for example, deploying the Mother and Child medical module during earthquakes in 2010 in Haiti and in 2015 in Nepal, and providing alcohol-based hand-wrap solutions in Guinea and Liberia during the 2014/15 Ebola crisis.

SDC and SHA employees organize the Reception and Departure Centre (RDC), which is the entry point for any incoming assistance received from abroad. Incoming resources are forwarded through the RDC to the relevant entities of the Swiss government, in order to be deployed to affected cantons and regions.

Liechtenstein is so small and resources so scarce that there are no national plans for sending medical countermeasures to other countries. In daily life, the country depends on the help of others—for example, paramedics, rescue helicopters and health personnel have to be called regularly from other countries, mainly Switzerland.

There are agreements with Switzerland and Austria on mutual help in crises and catastrophes, but these require revision. At government level, the Office of Civil Protection is responsible for tracking and distribution of countermeasures.

Recommendations for priority actions

Switzerland

- Finalize the “Host Nation Support” project.
- Strengthen the competencies of medical personnel through training programmes in safety and security, particularly in the context of complex emergencies.
- Further promote an holistic approach, linking health/medical interventions with areas such as urban search and rescue, shelter, water & sanitation, etc.
- Further promote a differentiated and sensitive analysis of emergency situations in order to plan and realize efficient response/support actions.

Liechtenstein

- Analyse existing international agreements pertinent to medical countermeasures, and make adjustments if needed.
- Design a structure for sending/receiving medical countermeasures and procedures for mobilizing other resources (e.g. volunteers) during operations.
- Carry out regular and more frequent training and exercises for personnel, including the Liechtenstein Crisis Management Board.

Indicators and scores

R.4.1 System is in place for sending and receiving medical countermeasures during a public health emergency - Score Switzerland 5 / Liechtenstein 3

Strengths/best practices

Switzerland

- The country has strong logistical assets and a large internal network of governmental entities, NGOs, hospitals, etc.
- Special niche expertise, such as the Mother & Child module, creates high visibility and credibility for responses to international emergencies.
- The current system is characterized by quality, accountability, respect and neutrality.
- Best practices include close cooperation with local actors (e.g. the Gorkha hospital in Nepal); a mid-term oriented approach to response, including having exit strategies from the beginning of every deployment; and capacity building activities as a linkage between rapid response interventions and the re-establishment of the affected country’s/partner’s daily business.

Liechtenstein

- Tabletop exercises are performed (though these take place irregularly) and possible mechanisms for receiving assistance from neighbouring countries are discussed.

Areas which need strengthening/challenges

Liechtenstein

- Liechtenstein has limited resources, and requires support from external partners in cases of emergency.
- A lack of operational leadership (due to scarce resources) is seen as challenge.

R.4.2 System is in place for sending and receiving health personnel during a public health emergency - Score Switzerland 4 / Liechtenstein 2

Strengths/best practices

Switzerland

- The country has strong logistical assets and a large internal network of governmental entities, NGOs, hospitals, etc.
- Special niche expertise, such as the Mother & Child module, creates high visibility and credibility for responses to international emergencies.
- The current system is characterized by quality, accountability, respect and neutrality.
- Best practices include close cooperation with local actors in emergency regions outside Switzerland (e.g. the Gorkha hospital in Nepal); a mid-term oriented approach to response, including having exit strategies from the beginning of every deployment; and capacity building activities as a linkage between rapid response interventions and the re-establishment of the affected country's/partner's daily business.

Areas which need strengthening/challenges

Switzerland

- Switzerland would benefit from further promotion of preparedness/capacity building activities.
- The country should consider an holistic approach based on the emergency preparedness cycle.
- SDC's development and humanitarian aid work requires a coherent vision of the organization's engagement in health/medical activities.
- Awareness should be strengthened among international organizations and NGOs of the Swiss government's position and priorities regarding medical countermeasures and personnel.

Liechtenstein

- Liechtenstein has limited resources, and requires support from external partners in cases of emergency.
- A lack of operational leadership (due to scarce resources) is seen as challenge.

Risk communication

Introduction

Risk communication should be a multilevel, multifaceted process that helps 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 disseminating information to the public about health risks and events, such as disease outbreaks. For communication about risk to be effective, the social, religious, cultural, political and economic effects of the event should be taken into account—including the voice of the affected population.

Communications of this kind promote appropriate prevention and control action through community-based interventions at individual, family and community levels. Disseminating information through appropriate channels is essential. Communication partners and stakeholders 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 should be tested and updated as needed.

Target

States Parties should have risk communication capacity that includes multilevel, multifaceted real-time exchange of information, advice and opinion between experts and officials and people who face a threat or hazard to their survival, health or economic or social wellbeing. This information should enable them to take informed decisions to mitigate the effects of the threat or hazard, and to take protective and preventive action). It should consist of a mix of communication and engagement strategies such as media and social media communication, mass awareness campaigns, health promotion, social mobilization, stakeholder engagement, and community engagement.

Switzerland and Liechtenstein: level of capabilities

Switzerland demonstrates well-developed capacity in risk communication. Dedicated human and financial resources are available at federal level, and communication teams are well trained. Both the FOPH Health Department and the FSVO Veterinary Department have well-staffed communication departments that show a high degree of professionalism and experience. In case of a national crisis, supplementary mechanisms and resources are put into place by the Department of Home Affairs/Chancellery.

There is no dedicated risk communication team or staff, but risk communication is considered part of teams' daily activities and objectives.

Communication plans are in place at the FOPH for specific events (e.g. pandemics or radionuclear events), and include clear descriptions of roles and responsibilities. The FSVO demonstrates the same professionalism but has a more generic approach to crisis communication, in order to increase adaptability to different crises.

Internal communication of important information is well planned and professionally organised in Switzerland, and dissemination is tailored to the nature of an incident or crisis to assure that the personnel involved are sufficiently informed. Mechanisms for coordinating communication with partners and stakeholders exist at both FOPH and FSVO. Creating engagement between the federal departments and a multitude of stakeholders and partners is, however, sometimes difficult, because of the complexity of the country's structures and the large number of cantons involved. Exercises and actual events do however demonstrate that partner communication capacity is sufficiently developed.

More communication resources are available at canton level, although capacity and degree of professionalism may vary from one canton to another.

Public communication by federal authorities is extremely well developed in Switzerland. Communication staff use a multitude of techniques and strategies to stay in touch with public opinion and products and channels are state-of-the-art, of excellent quality, and well tailored to the needs of target groups. Authorities are well staffed with professional spokespersons and demonstrate proactive outreach to the media. Social media are used to reinforce communication and offer a wide variety of information to the Swiss population.

Communication campaigns are targeted at the whole of the population or tailored to the linguistic or cultural needs of specific target groups. Target audience analysis is used to evaluate and adapt public messaging. Both the FOPH and the FSVO websites demonstrate best practice, and investment has been made to make all messages available in Switzerland's four official languages. In addition, various communication campaigns and the "Miges Plus" project target vulnerable (migrant) groups in 18 non-official languages.

Stakeholders and contacts are mapped by federal authorities, but this information is spread over different departments and units, sometimes even within the same organisation. Systems exist to collect stakeholder feedback, which is used to improve future communication with targeted communities. There is no overall approach for social mobilisation and community engagement, although different strategies can be found within different topic-specific communication plans. The independence of cantons makes an overall approach difficult, but great effort is put into sharing lessons and best practices to benefit all partners.

Current guidelines and communication plans are well developed, but often topical. Movement towards a more generic approach in planning would be useful and more efficient.

Federal authorities have earned a high degree of trust from both media and the public, which can be considered a very valuable asset in times of emergencies. Press relations are well developed, and operate in a transparent and timely manner. Federal authorities listen to public opinion and rumours through analysis of traditional sources and channels such as press reviews, hotlines and website inquiries. In times of crisis, this monitoring becomes more intense and rumours or false information are countered by broadcasting information through all available channels and to the press.

Although social media are actively used to broadcast information to the public, monitoring of social media and using them as a tool to converse with the public for dialogue and rumour management still has to be developed. This would be a useful addition in managing rumours and mobilising the population during serious incidents or crises.

Liechtenstein relies heavily on Swiss risk communication capacity, and has few resources in place for communication. Swiss material and campaigns are sometimes slightly adapted to their own cultural context, but the Liechtenstein Department of Health has no professional communicator on its staff. If needed, the Chief Medical Officer takes the role of spokesperson. This function is taken over by the police department in case of a serious incident.

As far as internal and stakeholder communication is concerned, Liechtenstein benefits from being a very small country where interpersonal relationships are well developed, although communication functions are not.

Recommendations for priority actions

Switzerland

- Develop systems and strategies for dynamic listening and rumour management, social media monitoring, and community management.
- The FOPH and FSVO could strengthen communication engagement with affected communities by sharing information on partners, stakeholders and opinion leaders between departments and units.
- Continue work on the risk and crisis communication plan, ensuring it is composed of generic building blocks.

Liechtenstein

- Consider adding a professional communicator/spokesperson to the staff at the department of health.

Indicators and scores

R.5.1 Risk communication systems (plans, mechanisms, etc.) - Score Switzerland 5 / Liechtenstein 3

Strengths/best practices

- Sufficient professional communication staff are available throughout the Swiss federal departments.
- Plans, guidelines and procedures show a high standard of quality and are well documented for specific topics.
- Best practices are shared between federal departments and with the cantons.

Areas which need strengthening/challenges

- A more generic approach to risk communication planning is required, with description of necessary roles and procedures to facilitate collaboration between communication professionals from different departments and entities.
- In times when there are no ongoing incidents or crises, human and financial resources should be freed up for the further development and testing of (generic) risk communication plans.

R.5.2 Internal and partner communication and coordination - Score Switzerland 4 / Liechtenstein 3

Strengths/best practices

- Well planned and professionally organised internal communication procedures exist at federal level.
- Switzerland benefits from the added value of coordination by the National Emergency Operations Centre in case of critical incidents.

Areas which need strengthening/challenges

- Coordination mechanisms with partners and stakeholders should be further formalized.

R.5.3 Public communication - Score Switzerland 5 / Liechtenstein 3

Strengths/best practices

- Switzerland has invested in offering information to the public in four different languages, and adapting messages to different cultural contexts.
- The high professionalism of government spokespersons is rewarded by the media and the public placing a high level of trust in authorities and the government.

- Products and channels (websites, campaigns, social media accounts) are of exemplary quality.

Areas which need strengthening/challenges

- Although social media are already actively used to broadcast information to the public, investment and development in this field would surely reinforce public communication.
- Social media monitoring would be an asset in managing rumours and mobilising the public during serious incidents or a crisis.

R.5.4 Communication engagement with affected communities - Score Switzerland 3 / Liechtenstein 1

Strengths/best practices

- Lessons are shared between federal authorities and the cantons.
- Switzerland has invested in offering information to the public in four different languages, and adapting messages to different cultural contexts.
- The “Miges Plus” project targeting migrants speaking foreign languages should be considered best practice and an example for other countries.
- Stakeholder feedback is collected through hotlines during major incidents.

Areas which need strengthening/challenges

- The already-available mapping of stakeholders and contact points within communities should be centralized.
- A common understanding and strategy for social mobilisation and community engagement is required. Stakeholders, volunteers and partners in the cantons should be trained accordingly.

R.5.5 Dynamic listening and rumour management - Score Switzerland 3 / Liechtenstein 2

Strengths/best practices

- Hotlines can be set up during an incident or emergency, and are used to listen to concerns and inquiries from the public.
- Traditional channels are monitored, and this feedback is used to counter false information and rumours.

Areas which need strengthening/challenges

- Monitoring of social media and its use as a tool for dialogue and rumour management add value in the timely management of rumours and false information during emergencies, especially when targeting younger generations.

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 the international spread of diseases. States Parties are required to maintain core capacities at designated international airports and ports (and, where justified for public health reasons, a State Party may also designate ground crossings as points of entry). These should implement specific public health measures to manage a variety of public health risks.

Target

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

Switzerland and Liechtenstein: level of capabilities

Liechtenstein has no designated points of entry under the IHR. The scores below are therefore applicable to Switzerland only.

Under the framework of the IHR (2005), Switzerland has two international airports as designated points of entry (POE): Geneva and Zurich. The two airports were selected on the basis of their international connections and yearly numbers of passengers (> 2 million). They were formally appointed in 2013 and are obliged to establish and maintain the necessary IHR core capacities.

Points of entry are considered a component of the national public health emergency preparedness and response plans, and are approached in a multisectoral manner involving immigration, health, security, media and customs.

The IHR core capacities are fully implemented in both airports, and both have very well established multisectoral public health emergency plans. The functionality of these plans has been successfully exercised during rare real events (e.g. the planned medical evacuation of an Ebola case in 2014) and diverse multi-sectoral simulation exercises including both tabletop and full-scale exercises.

The various roles and responsibilities of national and cantonal authorities, airports and airlines are clearly defined. The primary responsibility for financing and application of measures related to the IHR (2005) lies with the FOPH. Cantonal/national public health authorities and further stakeholders are in close and frequent exchange, and human and veterinary health authorities have established and documented routines for dealing with suspected human or animal cases at point of entry.

A roster of airport chief medical officers (ACMO) is designated, trained and paid by FOPH. These ACMOs are highly qualified infectious disease specialists employed in nearby university hospitals in Geneva and Zurich. They are reachable at all times by phone, and are able to access the airport for the first assessment of suspected cases of severe infectious diseases within 30 to 45 minutes. Dedicated medical personal (> 10

per airport) are trained regularly (e.g. on communication, procedures and use of PPE). For diagnostic and treatment purposes, the safe and fast transport of human suspected cases to dedicated medical facilities can be arranged in collaboration with ambulance services, and carried out at short notice. Ill passengers can be assessed and transferred rapidly (within 15 to 30 minutes) to diagnostic and treatment facilities.

The two designated airports have their own public health emergency plan covering all relevant sectors, which is disseminated to all key stakeholders. Other international airports also have public health emergency plans, but with reduced capacities and standards as compared to the designated POEs. For each of these airports, an ACMO is also designated and reachable if needed.

The Swiss Airport Network for Traveller Health has been created (as per Article 57 of the Epidemics Ordinance) and is currently led by the FOPH. It networks partners responsible for responding to a public health emergency at a point of entry, such as the FOPH, the Federal Office of Civil Aviation (FOCA), and the Swiss Airports authority.

A surveillance and inspection programme to ensure safe environmental control (vector control) exists at the airport and is run under the national surveillance programme for invasive mosquitoes, which is the responsibility of the airports' respective cantons. Further development of disinsection and disinfection procedures for aircraft, luggage and cargo is ongoing.

Recommendations for priority actions

- Maintain already high standards.
- Improve international collaboration and share experiences—for example, through developing training (as started for CAPSCA) and joint simulation exercises (field and tabletop exercises) with all national stakeholders, including neighbour countries.
- Evaluate the need to develop a concept for implementing exit screening in Switzerland.
- Disinfection and disinsection protocols for aircraft, luggage and cargo containers need to be further developed.

Indicators and scores

PoE.1 Routine capacities are established at points of entry - Score 5

Strengths/best practices

- A roster of highly qualified and trained Airport Chief Medical Officers is in place, reachable round the clock, and funded by the FOPH.
- There are regular multi-sectoral simulation exercises.
- Capacities have been demonstrated and evaluated during real events.
- Direct information exchange takes place between the between Airport Chief Medical Officers and the FOPH.

Areas which need strengthening/challenges

- The quarantine facility at the airport might be not sufficient for a huge number of passengers needing to be quarantined for a longer period. However, arrangements have been made to use alternative facilities such as a nearby hotel.
- Disinfection and disinsection protocols for aircraft, luggage and cargo containers need to be further developed.

- International contact tracing remains a challenge because it is difficult to obtain passenger data from airlines. International standards are required—for example, from WHO and/or ICAO—to foster prompt and complete sharing of information.
- Switzerland cannot use established regional collaboration within the European Union via the EWRS selective exchange.

PoE.2 Effective public health response at points of entry - Score 5

Strengths/best practices

- Key stakeholders from FOPH, cantonal health authorities and airport medical services have an established long-term network, with a platform and a secretarial function provided by FOPH. Associated partners include hospitals, ambulances and the fire brigade.
- FOPH has produced guidance material for developing preparedness plans at airports.
- Plans are available and updated not only at designated POE, but also at other Swiss airports.
- These plans cover many sectors, including health, transport, civil protection, the fire brigade, the police and customs.
- Switzerland has developed and tested a concept for entry screening at Zurich airport, involving the Swiss Army as surge capacity.

Areas which need strengthening/challenges

- The need to develop a concept for implementing exit screening in Switzerland should be evaluated.

Chemical events

Introduction

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

Target

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

Switzerland and Liechtenstein: level of capabilities

While there are many similarities between chemical events and the other IHR-relevant hazards, certain unique aspects need to be borne in mind when considering the capacities required under the IHR (2005).

As chemicals are ubiquitous, a very broad spectrum of chemicals may be involved in an event and the whole life cycle needs to be considered. Events may occur with hazardous chemicals and toxic wastes as well as contaminated or defective products, and may result from intentional or unintentional accidental or terrorist activities.

While radiological events are a separate IHR-related hazard, certain radioactive materials may have important toxic effects due to their chemical components, and may be more hazardous as chemicals than as a radiation hazard.

Air and waterborne chemicals, along with soil, air, water and food contamination, may be involved, which can impose both internal and international/trans-boundary impacts.

Chemical events may involve contamination of pharmaceuticals and/or exposure to natural toxins.

While acute toxic effects may be of primary concern, chronic and long-term effects may also need to be considered in terms of capacity to deal with chemical events.

Borders may be porous; consequently, it may not be easy to define precise points of entry. Moreover, chemical events of airborne origin may have quite broad entry points. Similar considerations apply for international waterways and offshore chemical events.

Switzerland is a large producer and user of chemicals for the agricultural, domestic, industrial and health sectors. These are well managed, with established legislative infrastructure that covers chemical waste. Different kinds of chemical events are treated in different ways (by different legislation), and by different institutions. Specific legislation is in place for responses to events of chemical origin, particularly the 1991 Federal Major Accident Ordinance (MAO) for industrial accidents. Furthermore, a toxic substances database (IGS) was established in 1992. Regarding chemical accidents, surveillance, assessment, management and response are mainly in the competence of the cantons.

National legislation is in place for management of chemicals and surveillance of chemical events, with alert and response at both cantonal and federal levels; this also covers Liechtenstein. Emergency response plans are in place at both levels, with—for example—inventories of major hazard sites and facilities, or access

at local level to necessary medicines and equipment. The Swiss poison centre takes part in international toxicological networks.

There is a need to further test real time response mechanisms, especially between the federal and cantonal levels.

Pharmaceuticals are specifically regulated, though Swissmedic. A federal chemistry expert network (Fachverbund Chemie) was established in 2014 and, as an informal functional institution, allows the distribution of knowledge between federal offices and the coordination of federal tasks (e.g. in response to a major accident with transboundary effects).

The Swiss poison centre or toxicological information centre operates on a 24/7/365 basis, is easily reached with a short telephone number (145), and provides information and expertise for the population and health and other relevant professionals. If a major accident occurs that might have a cross-border effect, the NEOC provides the international contact point, as per the UNECE Convention on Industrial Accidents.

Extensive toxicology laboratory facilities are available in most cantons, and a specialized institution in the Spiez Laboratory—the national centre for protection against nuclear, biological and chemical threats—provides additional services in the event of chemical threats and hazards, and especially in events of terrorist origin.

There are five national IHR contact points relevant to chemical events, for the following areas:

- Major accidents, covered by the NEOC
- Food, covered by the FSVO
- Chemicals, covered by the FOPH
- Medicaments, covered by Swissmedic
- Fertilizers and plant protection products, covered by the FOAG

Various stakeholders are involved in preparation for and response to chemical events at different administrative levels, including the Swiss poison centre. At the national level, in addition to the Federal Chemical Experts Network, the following institutions are involved:

- Swiss Federal Office of the Environment (FOEN)
- The FOCP
- The NEOC
- The Spiez Laboratory
- The FOPH
- The FSVO
- The FOAG (fertilizers and plant protection products)
- Swissmedic (authorisation of medicinal products and market surveillance of medicinal products and medical devices)

In Liechtenstein the relevant authorities are:

- The Office of the Environment
- The Food Safety and Veterinary Office
- The Office of Civil Protection
- The Office of Public Health

- The fire service

At the canton level the institutions involved are:

- The Major Accident Ordinance (MAO) enforcement authorities, for prevention of and preparedness for industrial accidents
- The environment office (water, air, soil), for prevention
- The cantonal chemists, for food safety
- The cantonal police
- The fire brigade, for dealing with hazardous materials
- Paramedic services, for response
- The ABC coordinator for the response strategy

Switzerland and Liechtenstein have ratified the Basel, Minamata, Rotterdam and Stockholm Conventions as well as the Paris Convention on Chemical Weapons; adhere to the Strategic Approach to International Chemicals Management (SAICM); and implement the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). The international headquarters for the Basel, Minamata, Rotterdam and Stockholm Conventions and SAICM, as well as other relevant institutional actors, are in Geneva, which is a main international center for global policies on the sound management of chemicals and wastes.

Switzerland has a comprehensive surveillance capacity for chemical events, which covers the whole of the country and includes Liechtenstein. There is comprehensive collaboration at the cantonal and federal levels to identify and confirm chemical events and report in the required time frame.

Guides and procedures for sound chemicals management have been elaborated and, in general, implemented. Capacity building is supported to promote the implementation of multilateral environmental agreements in selected developing countries.

Switzerland has access to international databases relating to chemicals (e.g. INTOX and INCHEM).

Environmental monitoring of air and water and other environmental media is in place and covers the whole country.

Liechtenstein has no laboratories and therefore no capacities, and depends mainly on Swiss laboratories and support. The countries are thus scored as a unit for this technical area.

Recommendations for priority actions

Switzerland

- Continue and strengthen close cooperation between the Federal Chemistry Expert Network (FVC) and its partners.
- Raise mutual awareness and strengthen interactions and collaboration between cantonal emergency response centres and national institutions.
- As far as is reasonably feasible, promote joint practical and realistic simulation exercises between Confederation and Cantonal levels.
- Complete the IMGS project to develop the existing chemistry database (IGS) with a module for sharing information within an event (implementation planned for 2019).
- Ensure that the Swiss Toxicology Centre (ToxInfo Suisse) has access to appropriate redundancy of communication systems in emergency situations, and established, long term, stable resources for the centre.

Liechtenstein

- Develop public health guidelines or SOPs for chemical incidents.
- Carry out regular and more frequent training and exercises.

Indicators and scores

CE.1 Mechanisms are established and functioning for detecting and responding to chemical events or emergencies - Score 5

Strengths/best practices

- Switzerland has well established chemical safety guidance at operational, cantonal level—including for Liechtenstein, which also has access to surveillance and laboratory capacity (though there may be need to share facilities among groups of cantons).
- A hazmat handbook exists (for the Firefighting Society); the Major Accident Ordinance provides applications and aids; and internal documents exist at operational levels.
- Mechanisms are in place for information exchange among cantons and with the various responsible federal authorities.
- Health professions have rapid access to adapted information 24/7/365 via the national poison centre, which has a countrywide short telephone number (145).
- Highly specialised laboratory facilities are available through the Spiez Centre, particularly in the event of a terrorist attack.

Areas which need strengthening/challenges

- Continued and strengthened close cooperation between the Federal Chemistry Expert Network (FVC) and their partners could enhance Swiss capacity.
- While there are hindrances to organising realistic simulation exercises, mainly due to lack of human resources, further exercising would raise mutual awareness and strengthen interactions and collaboration between cantonal emergency response centres and the national institutions.
- The planned goals of realising the IMGS project in 2019 and the development of the IGS chemistry database with a module for sharing information within an event should be encouraged.

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

Strengths/best practices

- Legislation for management of chemical events is in place and there is good cooperation between the FVC and its partners.
- The MAO establishes the basis for strong and well coordinated cooperation between all involved stakeholders in the area of major accidents prevention in Switzerland.
- There are inventories of major hazard facilities (FOEN). At local level, there are five support pillars for chemical emergency response: the fire brigade (including hazmat), the police, the medical professions, civil protection, and related infrastructure. Additionally, there is the National Poison centre, NEOC, and the FCV.
- Coordination and exchange of information takes place among cantons and between federal agencies. Information flows from the event scene to the cantonal emergency response centres and then to the NEOC.
- Internationally, there is collaboration with the European Union and international conventions such as UN/ECE, and international professional toxicological societies.

Areas which need strengthening/challenges

- Systematic collection and analysis of data on chemical events could enhance future response capabilities.
- Joint cross-sectoral exercises should be promoted.
- Horizontal contact between relevant offices, as well as enhanced vertical contacts, could raise awareness of chemical events issues in cantons.
- Better and more rapid information flow should be encouraged.
- In the event of a major disaster, when normal communication systems cease functioning, the poison information centre should have access to an appropriate redundancy of communication systems.
- Only two thirds of the resources of the centre are currently secured through agreements: a longer-term, stable resource basis for the centre is desirable.

Radiation emergencies

Introduction

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

Target

State Parties should have surveillance and response capacity for radionuclear hazards/events/emergencies, with effective communication and collaboration among the sectors responsible for radionuclear management.

Switzerland and Liechtenstein: level of capabilities

Since no nuclear facilities exist in Liechtenstein, and there is no significant use of radiation in the country's only hospital, no scores are warranted for Liechtenstein in this area. That said, the population of Liechtenstein could be exposed to radiation hazards and associated risks from an acute radiological event in neighbouring countries or even elsewhere in Europe. Accordingly, in the case of such an event, Switzerland will provide mitigation, response, and recovery as if Liechtenstein were an additional canton. Unless otherwise indicated, the scores and comments below therefore refer to Switzerland.

Switzerland has an advanced system for managing and monitoring radionuclear facilities and for responding to potential radionuclear emergencies, with systems and interventions covering legal, policy, operational, and tactical elements.

The Radiological Protection Act and the Swiss Radiological Protection Ordinance act as umbrella legal instruments governing the radionuclear sector and relevant events. The Swiss Federal Nuclear Safety Inspectorate (ENSI) is the licensing and supervisory authority for nuclear installations.

The federal NBCN Crisis Management Board directs federal measures for managing radiation emergencies; the Federal Office for Civil Protection (FOCP) is responsible for the preparation of the national emergency plan; and the Federal Office of Public Health (FOPH) is the licensing and supervisory authority for radiation use in clinical medicine, medical education, and research.

The FOPH is also responsible for the calculation, assessment and verification of radiation doses received by the public, and ensures the maintenance of knowledge and capacity concerning treatment of severely irradiated persons. However, during the acute phase of a radionuclear event, this responsibility belongs to the NEOC, as per the NBCN Ordinance.

There are specialized measurement teams in the Institute of Radiation Physics (IRA); the Paul Scherrer Institute (PSI); the FOCP; and the Spiez laboratory. Checking for radioactive substances in foodstuffs is part of its annual control programme, carried out through various monitoring networks.

The University Hospital in Zurich is the designated reference hospital for treatment of severe radiation injuries. A general emergency exercise is undertaken every two years to test the entire intervention system, and the coordination of functions in case of a radiation emergency.

Recommendations for priority actions

- Add Liechtenstein to Swiss national radiation protection planning, at a level equivalent to that of a canton.
- Elaborate a radiation protection strategy that fits the national emergency plan.
- Develop a mechanism to ensure long term medical care of exposed people (decontamination, diagnostics and treatment) within the well-established coordination framework for care centres.
- Examine the measures required to expedite the return of affected communities to normality after a radiation event, through decontamination and other recovery measures. Build capacity accordingly and test through simulation exercises.

Indicators and scores

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

Strengths/best practices

- Switzerland has a management and coordination body in place (National Crisis Management Board).
- The national alarm system is in place and operational (NEOC).
- Relevant response tasks are distributed among the services that would normally provide them.
- The entire country is radiologically monitored (external exposure, air contamination, river contamination, etc.).
- There is pre-distribution of iodine tablets in households up to 50 km from nuclear power plants, following the HERCA WENRA approach, and stockpiles are available for the whole population.
- Responses to a radiological or nuclear emergency are integrated into the general intervention system.
- Services involved in the response are coordinated by national staff (National Crisis Management Board).
- An emergency ordinance is in place for the early phase of a response, with responsibility assessment built in.

Areas which need strengthening/challenges

- The procedures in the radiation protection strategy should be revised as follows:
 - The concepts of the International Committee for Radiological Protection (ICRP) should be introduced (this measure is in preparation at time of writing, under the authority of the FOPH).
 - Other hospitals should be coordinated with the reference hospital.
 - Medical interventions require stronger coordination between intervention teams, the radioactivity information centre, transport services, decontamination hospitals and the reference hospital.
 - Organizations representing the population should be involved in preparedness planning.
 - Crisis communication requires strengthening.

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

Strengths/best practices

- Switzerland has a sampling and measurement organization.
- Switzerland has radioactivity information centres and a dedicated hotline for use in emergencies.
- The skills and knowledge of the employees manning the hotline are regularly updated.
- General emergency exercises are held every two years to ensure coordinated interventions.

Areas which need strengthening/challenges

- The frequency and scope of drills should be enhanced, and especially the medical treatment/management components.
- A simplified radiological intervention information document would add value.
- Monitoring the readiness of the services involved in the intervention (in addition to the general exercises).

Appendix 1: JEE background

Mission place and dates

Bern, Switzerland and Vaduz, Liechtenstein; October 30-November 3, 2017.

Mission team members:

- Ute Enderlein (Team Lead), Programme Area Manager for Country Health Emergency Preparedness and IHR, WHO Regional Office for Europe, Denmark
- Mika Salminen (Team Lead), Director, Department for Health Security, National Institute for Health and Welfare, Finland
- Jan Eyckmans, Head of Communications, Belgium Federal Public Service for Health, Food Chain Safety and Environment
- John Alan Haines, UNITAR Associate Fellow, UK
- Silvia Kreindel, FAO
- Indra Linina, Latvia State Emergency Medical Service
- Mark Nunn, independent technical writer and editor
- Saara Raulo, Head of Zoonosis Centre, Finland
- Ute Rexroth, Robert Koch Institute, Germany
- Martin Richter, Federal Information Centre for Biological Threats and Special Pathogens, Robert Koch Institute, Germany
- Irshad Shaikh, WHO Regional Office for Europe
- Noa Tamir-Hasdai, Director of the National Health Emergency Operation Room, Israel Ministry of Health
- Candice Vente, International Public Policy Organization

Objective

To assess the capacities and capabilities of Switzerland and Liechtenstein relevant to the 19 technical areas of the JEE tool, providing baseline data to support their efforts to reform and improve their public health security.

The JEE process

The JEE process is a peer-to-peer review. The entire external evaluation, including discussions around the scores, the strengths, the areas that need strengthening, best practices, challenges and the priority actions should be collaborative, with JEE 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 lead 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

This mission covered two independent countries in one mission: Switzerland and Liechtenstein. Liechtenstein, a population of just under 38,000 people, depends heavily on the support of Switzerland, which is legally documented in the Zollvertrag between both countries.

During the JEE mission, representatives of both countries were available to explain the 19 technical areas to the assessment team as they applied to both nations. The team and the country representatives decided that one JEE assessment report would be produced, but that where relevant, scoring would be done separately for each country. In cases where Liechtenstein is directly dependent on Switzerland because of a lack of its own capacities, or where mutual agreements render them unnecessary, separate scores for Liechtenstein would not be provided.

The self-assessment documents of Switzerland and Liechtenstein were delivered to the external experts approximately two weeks before the mission.

Prior to the mission, the team leads hosted two teleconferences with the JEE organizers from Switzerland and the WHO JEE coordinators of the WHO Regional Office for Europe (Copenhagen), and a further teleconference with the external assessment team.

On the Sunday before the JEE meeting started, the team leads met with the Swiss organizers to finalise the agenda and discuss logistics. Later that day, the JEE external experts met to discuss the format and objectives for the JEE, and to review the agenda.

The assessors were hosted by the Bundesamt fuer Gesundheit in Bern, and all national experts for Switzerland and Liechtenstein presented their technical areas there.

A visit to Liechtenstein took place on Wednesday and Thursday of the JEE week, to obtain a better understanding of issues particular to the country. No other functional sites were visited during the week.

Limitations and assumptions

- The evaluation was limited to one week, which limited the amount and depth of information that could be managed.
- It is assumed that the final report of this evaluation will be publically available.
- The evaluation is not an audit. Information provided by Switzerland and Liechtenstein will not be independently verified but will be discussed and the evaluation rating mutually agreed to by the host countries and the evaluation team. This is a peer-to-peer review.

Key host country participants and institutions

Switzerland: Federal Office of Public Health

- Guido Barsuglia
- Sabine Basler
- Michael Bel
- Andreas Birrer
- Timo Büttler
- Emanuel Christen
- Corinne Corradi
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- Mirjam Mäusezahl
- Christophe Murith
- Laurence Perroud
- Samuel Roulin
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- Daniel Storch
- Pascal Strupler
- Karin Wäfler
- Mark Witschi

Switzerland: Food Safety and Veterinary Office

- Jürg Danuser
- Markus Kaufmann
- Kathrin Nägeli
- Jennifer Saurina
- Heinzpeter Schwermer
- Flurina Stucki
- Hans Wyss

Switzerland: Other institutions

- Frédéric Eynard, Geneva Airport
- Rudolf Farnner, Zürich Airport
- Line Girardin Bueche, BABS National Emergency Operations Center
- Michael Hösli, BAFU
- Andreas Kronenberg, anresis.ch
- Hugo Kupferschmidt, Tox Info Suisse
- Urban Müller Freiburghaus, BABS Federal Crisis Staff
- Sabine Ragot, BLW
- Dominique Rauber, BABS National Emergency Operations Center
- Mirko Saam, Inscience
- Christian Schärer, Swissmedic
- Jürg Schnetzer, Swissmedic
- Rudolf Stoller, Swissmedic
- Simon Tschurr, EDADEZA

Liechtenstein

- Andrea Leibold, Office of Public Health
- Marina Jamnicki Abegg, Office of Public Health
- Brigitte Batliner, Office of Public Health
- Raphael Goritschnig, Office of Environment
- Daniel Huber, Food Safety and Veterinary Office
- Peter Malin, Food Safety and Veterinary Office

Supporting documentation provided by host country⁷

National legislation, policy and financing

- Implementation of the IHR (both French and English versions)
- Agreement on the exchange of information on pandemic influenza and health risks (between governments of Switzerland and France)*
- Tripartite agreement between FR, SWI, and the EU Organization for Nuclear Research*
- Swiss Constitution, Art. 118 on the Protection of Health
- Swiss Federal Act on Combating Communicable Human Diseases (Epidemics Act) - September 28th 2012 (French) - RS 818.101
- Swiss Animal Health Ordinance - RS 916.40
- Swiss Federal Act on Protection against Dangerous Substances and Preparations
- Swiss general disaster ordinance: Ordinance on Protection against Major Accidents
- Agreement between Liechtenstein and Switzerland (SR 0.818.103.151.4)
- Liechtenstein Health Act
- Liechtenstein Civil Protection Act
- Treaty between Switzerland and the Principality of Liechtenstein concerning the assembly of the Principality of Liechtenstein with the Swiss customs territory (29 mars 1923)

IHR coordination, communication and advocacy

- National Focal Point Handbook**
- OFSP Crisis Management Manual* (Ministry of Health)

Antimicrobial resistance

- Swiss national strategy against antibiotic resistance
- Swiss national strategy against healthcare-associated infections
- Swiss Antibiotic Resistance Report 2016
- Swiss guidance on appropriate antibiotic use in the veterinary sector
- Swiss national Research Programme 72

Zoonotic diseases

- Animal health statistics 2016, Switzerland
- "Foodborne transmission of *Listeria monocytogenes* via ready-to-eat salad: A nationwide outbreak in Switzerland, 2013-2014"
- Rapid Alert System for Food and Feed form
- Report form foodborne outbreaks*
- Surveillance of animal diseases and zoonoses 2014

⁷ * Provided in French
** Provided in German

Food safety

- FAQ about foodborne illnesses in health facilities and the food industry*
- List of professional contacts/specialists**
- Analysis of clustered cases of infections due to microbial contamination of food (form for cantonal enforcement bodies)*
- Burden of disease of acute gastroenteritis in Switzerland (study project): <https://www.aramis.admin.ch/Texte/?ProjectID=37945>

Biosafety and biosecurity

- Inter-cantonal exchange of specialists in the field of biotechnology and genetic engineering: Implementation Assistance
- Biosafety cabinet status, duties and responsibilities
- Information for the request for analysis and transport of clinical samples*
- Microbiological safety cabinets guidelines
- Operational safety concepts according to containment ordinance
- Ordinance on protection against major accidents (French and English versions)
- Safe transport of biological materials
- Safety measures in medical microbiology diagnostic laboratories
- Ordinance on handling organisms in contained systems
- Transport of biological substances and organisms**
- Recommendations of the Swiss Expert Committee for Biosafety

Immunization

- FOPH website
- Swiss immunization plan*
- Swiss immunization plan**
- Vaccine coverage**
- Notification office
- National Vaccination Strategy*
- National Vaccination Strategy, short version (English)

National laboratory system

- Federal Act for the Control of Transmissible Diseases and respective ordinances*
- Law on epizootics *
- Federal Act on Foodstuffs and Utility Articles and respective ordinances. *

Real time surveillance

- Law on Epidemics and related ordinances
- Ordinances of the Federal Department of Home Affairs on the Declaration of Observations of Communicable Diseases in Humans**
- Mandatory reporting system
- Swiss Sentinel Surveillance Network "Sentinella" (see also the Swiss Influenza Pandemic Plan).

Reporting

- OIE meeting invitation letter

Workforce development

- N/A

Preparedness

- Federal Management of Civilian Resources*
- Optimum protection of the Swiss population and its living conditions against atomic (nuclear and radiological, A), biological (B) and chemical (C) risks and threats* (ABC)
- Order on the territorial missions of the army*
- Order on military aid in case of national disaster*
- Order on alerts, alarms, and the national radio security network*
- Order on the organization of interventions in case of ABC events and natural disasters*
- Order on the National Central Alarm*
- Order on emergency protection in the neighbourhood of nuclear facilities*
- Order on the protection against major accidents*
- Order on radioprotection*
- Federal law on the fight against human communicable diseases*
- Reference scenarios for ABC events*
- Manual of situation monitoring for coordinated action between partner organizations protecting the population*
- Annexes for above manual*
- Manual for members of civilian leadership bodies*
- What risks are threatening Switzerland? Disasters and emergencies in Switzerland 2015*
- Technical report on risk management, 2015*
- Technical report on risk management, 2015**
- Military documents: symbols, tactical graphics and civilian symbols
- Emergency response plan in case of a nuclear power plant accident in Switzerland*
- Pandemic plan*
- Swiss plan for pandemic influenza*

- Request chain diagram during emergency*
- Emergency management organogram*
- Index of French/German/Italian/English abbreviations
- Population protection: Risk analysis and prevention, planning, training, and intervention*
- Civil Resource Management Federation**
- Regulation about the warning, alarm, and security radio network of Switzerland**
- Regulation on the organization of operations for ABC and natural events**
- Reference scenarios for ABC events**
- Manual of situation monitoring for coordinated action between partner organizations protecting the population**
- Annexes for above manual**
- Order on radioprotection*
- Federal law on the fight against human communicable diseases**
- Method for risk analysis of disasters and emergencies for Switzerland**
- Emergency response plan in case of a nuclear power plant accident in Switzerland**
- Pandemic plan**
- Swiss plan for pandemic influenza**
- Regulation about protection against accidents**
- Radiation Protection Ordinance**
- Regulation about military disaster relief**
- Fact sheet on resources management at federal level

Emergency response operations

- Swiss Army organograms**
- Request management during critical situation**
- Request management during critical situation*
- SANKO (Sanitary Service Coordination Group) organogram**
- SANKO organogram*
- SANKO activation scenarios**
- SANKO activation scenarios*
- Checklist for drawing up an operational plan of action in the event of an impending influenza pandemic**
- Health law for cantonal health authorities**
- Mask wear and pandemic – what applies? Which is the right disinfectant? **
- Pandemic plan for Canton of Solothurn: Annex to the Swiss Pandemic Plan 2006**
- Pandemic Planning: Office of Military and Civil Protection**
- Vaccination of State Personnel memo**

- ABC Processes after a nuclear power plant accident in Germany**
- Planning: Federal Civil Protection for a nuclear power plant accident in Switzerland**
- ABC response implementation graphic**
- Pandemic Control Strategy chart**
- Documentation Measures ABC for a power pole blackout scenario**
- Roles and responsibilities for slowly evolving events**
- Federal government roles and responsibilities for rapidly occurring events**
- Pandemic scenario**
- Pandemic influenza case study**

Linking public health and security authorities

- N/A

Medical countermeasures and personnel deployment

- Framework agreement completed between the Federal Department of Foreign Affairs and the Logistics Base of the Army**
- Instruction on security and security risk management in the Federal Department of Defence and Department of Foreign Affairs**
- Swiss Agency for Development and Cooperation: Humanitarian Aid Concept
- Rapid Response Management Handbook 2017**
- Medical Module Mother and Child
- Collaborative agreement on medical activities in humanitarian aid 2015-2017*
- SDC Security Instruction No. 16
- EDA/FDFA internal security guidelines
- ECHO-ERCC Host Nation Support Guidelines
- Exercise Control (ExCon) documents

Risk communication

- Ministry of Health Crisis Manual**
- Ministry of Health Crisis Manual*
- Crisis communications: Media Work of the Federal Chancellery concept and toolbox**
- Influenza Pandemic Communications Plan**
- FOPH and FSVO websites, campaigns and social media accounts

Points of entry

- Contact list of the airport network for travel medicine**
- Geneva Airport Tabletop exercise Evaluation Report (English and French)
- Zurich airport emergency planning working group**

- Zurich airport emergency exercise final report**
- Manual of the Geneva Airport Emergency Response Plan
- Emergency plan intervention scenario: sick or injured passenger on board an arriving or departing aircraft, or in the scenario of a diverted flight due to health issue*
- More than 5 serious wounds – intervention plan*
- Geneva Airport organogram*
- Guiding Principles for the Establishment of Emergency Plans to Manage events in the field of infectious diseases at Swiss international airports*
- Emergency Plan Zurich Airport
- Emergency plan Zurich airport: Infectious diseases response guidelines**
- Zurich airport organogram**
- Coordination of surveillance and control of Asian Tiger mosquito and other invasive alien mosquitoes in Switzerland: An orientation guide with recommendations to the Federal Office of the Environment and the cantonal and other relevant authorities**
- Geneva airport: operational procedure for a suspected case of Ebola on board an aircraft*
- Final report of a Swissair emergency response (virus) exercise**
- Evaluation of the Exercise BAG-BUG of 30th August 2006, Zurich Airport**
- Emergency Management Zurich Airport Epi Exercise final report**
- Service agreement between Zurich Airport and AMC Airport Medical Centre**

Chemical events

- Multilateral Agreement M287 under section 1.5.1 of ADR on the carriage of certain wastes containing dangerous goods
- Most recent Swiss OIE notification
- Agreement between Switzerland and Liechtenstein regarding IHR cooperation: RS 0.818.103.151.4
- Reports of evaluations in the area of communicable diseases*

