

Assessment of health-system crisis preparedness

Croatia

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2011

Abstract

In 2008, with the support of the European Commission Directorate-General for Health and Consumers, WHO launched the project, "Support to health security, preparedness planning and crises management in European Union, EU accession and neighbouring (ENP) countries", with the aim of improving preparedness for public health emergencies in countries of the WHO European Region. One of the objectives of the project was to test the tool being developed for use in assessing the capacity of health systems for managing crises. The tool, which is based on the WHO health-system framework, was piloted in planning and crises-management assessments carried out in 2007–2008 in Armenia, Azerbaijan and the Republic of Moldova under the joint EC–WHO project, "Support to health security and preparedness planning in EU neighbouring countries". The experience gained in these countries and during a second round of assessments carried out in Kazakhstan, Poland and Ukraine in 2009–2010 contributed to the finalization of the tool. In October 2010 and July 2011, assessments were carried out in Turkey and Croatia respectively. This report presents an evaluation of the level of preparedness of the Croatian health system to deal with crises, regardless of cause. It also examines the risk-prevention and risk-mitigation initiatives of the country. While the main focus is on the national level, some attention has been paid to intercountry cooperation on crisis-management capacity and to the links between the various levels of government.

Keywords

Process assessment (health care)
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Risk management
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Delivery of health care – organization and administration
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Introduction

In recent decades, there has been an increase in the occurrence of emergencies and disasters worldwide, and in the severity of their impact on the countries affected, those of the WHO European Region being no exception. This development emphasizes the importance of the role of health systems in the overall cycle of disaster preparedness, risk mitigation, response and recovery.

Strengthening health-system crisis preparedness and building the necessary core capacities required to implement the International Health Regulations (IHR) (1) are complex tasks. To strengthen the leadership of the health sector in planning for crises in conjunction with other sectors as a continuous process with an all-hazards approach, it is crucial to have a clear understanding of the country's situation and political commitment and to establish sustainable crisis-management and health-risk-reduction capacities.

There is much at stake. Health crises and the human suffering they cause can jeopardize the progress made towards the sustainable development of health systems and the achievement of the United Nations' Millennium Development Goals. Preparedness is the key to preventing this result.

A health system that has anticipated the health needs of people in crisis situations is able to respond effectively to these needs, save lives and prevent such events from escalating into security crises. This report analyses the preparedness of the Croatian health system for crises. It provides key facts on its capacity to manage crises, which can be used by policy-makers, and contributes to the existing evidence on the preparedness of health systems for crises.

Background

Global health security

The United Nations Commission on Human Security established that good health and human security are inextricably linked and that illness, disability and avoidable death are critical pervasive threats to human security (2). The Commission identified the three main health challenges as: conflict and humanitarian emergencies; infectious diseases; and poverty and inequity.

The statistics show a steady rise in the number of disasters¹ worldwide, many of which are attributed to climate change. In the past 20 years, disasters have killed over three million people and adversely affected over 800 million.

Not only are the established infectious diseases spreading more quickly (for example, multidrug-resistant tuberculosis (TB) and HIV/AIDS are increasingly becoming a threat to health security) but new diseases are also emerging at a faster rate than ever before (one or more per year since the 1970s). Nearly 40 diseases now exist that were unknown a generation ago.

Natural and man-made disasters, depending on their magnitude and the vulnerability of the populations they affect, can have a devastating effect on the health status in both the short and long terms. This is often aggravated by economic loss, which also has a negative impact on the health status and, therefore, on the economy in the health sector as a whole.

Increasingly, disaster management is becoming a priority in countries. The reasons for this are the following.

- The economic and political implications of disasters, particularly outbreaks of communicable diseases, and their effect on trade and tourism can be enormous. Low-income countries are clearly the most vulnerable to these negative effects.
- The effects of climate change have serious implications for global health security. In addition to the consequences for the health of individuals, environmental changes may well result in mass-population movement and competition for scarce resources, leading in turn to conflict and political instability.
- States Parties to the revised IHR (2005) (1), which came into force on 15 June 2007, are legally bound to meet their requirements.

Governments, particularly in low-income countries, are often loath to invest in strategies aimed at disaster prevention and/or risk reduction and there is an overall tendency to under-invest in the health sector. Statistics show that, on average, the lower the GDP of any particular country, the smaller the percentage invested in health (3).

Health security in the WHO European Region

Between 1990 and 2010, approximately 47 million people in the Region were directly affected by natural disasters that resulted in over 132 000 deaths (Table 1). This does not include the wars and

¹ For inclusion in the OFDA/CRED International Disaster Database (EM-DAT), an event has to result in at least ONE of the following: 10 or more deaths; 100 or more people affected; the declaration of a state of emergency; a call for international assistance.

violent conflicts that have killed over 300 000 people in the Region over the last 20 years. Other severe events of the recent past include the Chernobyl nuclear power plant accident in 1986, which the United Nations estimates affected several million people, and the Marmara earthquake that killed nearly 18 000 people and injured close to 45 000 people in Turkey in 1999.

Table 1. Crises (excluding conflicts) and their consequences in the WHO European Region, 1990–2010

Type of event	Number of events	Number of deaths	Total number affected	Economic damage (US\$ thousands)
Accidents	719	19 424	163 117	13 751 707
Drought	36	2	15 875 969	15 488 309
Earthquake	107	22 002	5 702 222	38 649 449
Epidemic	59	676	216 043	n/a
Extreme temperature	159	81 457	3 452 957	16 865 750
Flood	442	4 221	12 437 525	90 666 061
Mass movement ^a	59	2 298	199 181	1 594 389
Storm	315	1 730	8 861 009	76 582 849
Volcano	4	0	7 000	19 600
Wild fire	77	345	1 295 267	10 768 811
Total	1 977	132 155	48 210 290	264 386 925

^aMass movement includes: avalanche, landslide, rockfall and subsidence events.

Source: EM-DAT: The OFDA/CRED International Disaster Database (4).

Since 1990, a series of violent wars and conflicts in the Region have had vast political, social and human consequences. Armed conflict in Bosnia and Herzegovina, Croatia, Serbia, including Kosovo (in accordance with United Nations Security Council resolution 1244/1999), Slovenia and the former Yugoslav Republic of Macedonia resulted in an estimated 125 000 fatalities and the displacement of up to three million people. The break-up of the former Soviet Union brought about a number of violent episodes in Azerbaijan (Nagorno-Karabakh), Georgia (Abkhazia and South Ossetia), the Republic of Moldova (Transnistria), the Russian Federation (Chechnya, Ingushetia, North Ossetia and Dagestan) and Tajikistan, causing the loss of an estimated 200 000 lives.

The recent civil unrest in Kyrgyzstan, where the mass displacement of populations also affected neighbouring countries, underlined the importance of ensuring that national health systems are equipped to respond effectively to the health-security aspects of violence-related crises.

A number of serious terrorist attacks have taken place in the Region in the last fifteen years including those that occurred in France (Paris, 1995), Spain (various ETA bombings; Madrid train attack, 2004), Turkey (various) and the United Kingdom (London, 2005). Reportedly, more than five times as many attacks have been thwarted in Belgium, France, Germany, Italy, the Netherlands, Spain and the United Kingdom, and the list of failed or aborted attempts is probably longer than we may ever know (5).

International Health Regulations

The need to strengthen capacity for emergency preparedness and response, particularly in low-income countries, is firmly based on current trends and statistics and supported by a wide

variety of literature on global warming, environmental hazards, bioterrorism and re-emerging and emerging diseases, particularly severe acute respiratory syndrome and avian influenza. The level of international concern about this need is reflected in an increasing amount of media coverage and the establishment of various commissions, committees and international coordinating bodies (e.g. the United Nations International Strategy for Disaster Reduction, the United Nations Commission on Human Security and the WHO Health Action in Crises Programme) to address issues related to emergency preparedness and response.

Growing concern about national, regional and international public health security led to the adoption of the revised IHR by the 58th World Health Assembly in May 2005. These provide a new legal framework for strengthening surveillance and response capacity and protecting the public against acute health threats with the potential to spread internationally, affect human health negatively and interfere with international trade and travel.

The revised IHR (2005) have a much broader scope than the first edition (1969), which focused on the international notification of specific communicable diseases. States Parties to IHR are now obliged to assess and notify WHO of any event of potential international public health concern, irrespective of its cause (whether chemical, biological, radiological or nuclear (CBRN)) and origin (whether accidental or deliberate). The criteria for assessing the international public health implications of any given event are outlined in the algorithm presented in Annex 2 of the IHR. These include health-related events that are unusual or severe, may have a significant impact on public health, may spread across borders, and may affect freedom of movement (of goods or people).

For effective implementation, States Parties (with WHO support) were also required to develop a national IHR implementation plan by June 2009 and to meet national core-capacity requirements by June 2012. How this can be achieved, particularly in low- income countries, is not yet fully envisaged.

Cross-cutting issues related to disaster preparedness and response

Effective crisis preparedness and response is governed by a number of cross-cutting (strategic) principles that WHO encourages Member States to adopt. These relate to the all-hazards approach, the whole-health approach, the multidisciplinary (intrasectoral) approach, the multisectoral approach and the comprehensive approach.

The all-hazards approach

The concept of the all-hazard approach acknowledges that, while the sources of hazards (natural, technological and societal) vary, the resulting challenges to the health system are broadly similar. Thus, regardless of the cause of a hazard, activities relating to risk reduction, emergency preparedness, response, and community recovery are implemented along more or less the same model. Experience shows that the various essential response actions have a substantial number of generic elements (health information, emergency operations centre, coordination, logistics, public communication, etc.), and that prioritizing these generates synergies to better address the hazard-specific aspects.

The whole-health approach

The whole-health approach promotes the concept that the emergency-preparedness planning process, the overall coordination procedures, and the surge and operational platforms should be led and coordinated by emergency coordination bodies at the central and local levels involving all the relevant disciplines of the health sector and dealing with all potential health risks.

The multidisciplinary (intrasectoral) approach

Health systems are defined as comprising all the organizations, institutions and resources that are devoted to improving, maintaining or restoring health. This includes public and private initiatives (for example, by NGO and international agencies) and action at the central, local, population and military levels – from tertiary care to local community health care – all of which may have a role to play during a crisis. WHO, therefore, encourages transparency and interoperability in the planning process and promotes the involvement of all disciplines and all levels of the health system to ensure a coordinated and effective response, making the best use of often scant resources and ensuring that plans are appropriate and feasible.

The multisectoral approach

Health-sector and national plans for disaster preparedness and response need to be linked to avoid confusion, prevent duplication of effort and make the best use of resources. This is important not only during a crisis but also as part of prevention, reduction and mitigation strategies. Other governmental departments, private enterprises and commercial organizations can play an important role in reducing the negative health effects of, for example, inappropriate urban development and use of land, poor agricultural practices and inadequate legislative procedures. Although not directly responsible, ministries of health need to ensure that health is not overlooked in the push for greater profits and economic growth, and to advocate a multisectoral approach in dealing with

health issues. However, multisectoral planning continues to be a challenge in many countries as governmental departments often prefer to develop their own individual plans, in parallel with other key partners.

The comprehensive approach

The economic consequences of a crisis can be enormous and the reduction, prevention and mitigation of the related risks are priority areas that increasingly need to be taken into consideration when planning national crisis preparedness, mitigation and response. Therefore, WHO encourages Member States to develop and implement strategies for the different aspects of crisis preparedness, bearing in mind that they are not separate entities but overlap with each other in scope and timeframe. They can be summarized as follows.

- *Prevention, reduction and mitigation* activities aim to reduce the likelihood or impact of a disaster and, in the health sector, are devoted mainly to ensuring the functionality of the health facilities and key installations in the aftermath of a disaster.
- *Preparedness* requires a multidisciplinary, multisectoral planning process to strengthen the capacity and capability of systems, organizations and communities so that they can better cope with emergencies.
- *Response and recovery* action covers a wide range of activities implemented during and after an emergency, which have specific humanitarian and social objectives linked to long-term strategic goals and *sustainable development*.

For programmatic purposes, WHO has designed specific activities aimed at preventing, mitigating and preparing for emergencies, disasters and other crises. For the purpose of this document, the following definitions apply (6).

- *Risk reduction* involves measures designed either to prevent hazards from creating risks or to lessen the distribution, intensity or severity of hazards. These measures include flood-mitigation works and appropriate land-use planning. They also include vulnerability-reduction measures, such as awareness-raising, improving community health security, and relocating or protecting vulnerable populations or structures.
- *Emergency preparedness* is a programme of long-term activities, the goals of which are to strengthen the overall capacity and capability of a country or a community to manage all types of emergencies efficiently and bring about an orderly transition from relief through recovery and back to sustained development. It requires the development of emergency plans, the training of personnel at all levels and in all sectors, the education of communities at risk and the regular monitoring and evaluation of all measures taken.

In 2007, DG SANCO and the WHO Regional Office for Europe embarked on a joint project to develop a standardized assessment tool, which would support Member States in objectively evaluating the preparedness of their health sectors to respond to natural and man-made disasters, taking all functions of the health system into consideration. Other aspects for inclusion in the evaluation were priority health risks and the interoperability of public health emergency plans. The project was coordinated by the Regional Office.

A multidisciplinary team of experts in the areas of disaster preparedness, communicable diseases and environmental health worked together to elaborate, refine and pilot the tool. Baseline assessments were conducted in Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Poland, the Republic of Moldova, Turkey and Ukraine. Comprehensive reports were delivered to the beneficiary countries highlighting strengths, weaknesses and gaps in organizational, legal and policy frameworks for planning national health-system preparedness. Furthermore, in collaboration with

the ministries of health and the key stakeholders in these countries, a framework was developed for strengthening the preparedness of health systems.

Within the Biennial Collaboration Agreement for 2010–2011 between the Regional Office and the Ministry of Health and Social Welfare of Croatia, it was agreed to conduct an assessment of the preparedness of the country's health system for crisis. The assessment was carried out in July 2011.

Country overview

Fig.1. Map of Croatia



Source: Map No. 3740 Rev. 6. United Nations Department of Peacekeeping Operations, Cartographic Section, January 2008

Geography

Croatia is located in south-eastern Europe bordering the Adriatic Sea, Bosnia and Herzegovina, Hungary, Montenegro, Serbia and Slovenia. Most of the approximately 1200 islands (including islets, ridges and rocks) of the Adriatic Sea lie off the coast of Croatia.

The climate of the Croatian islands and coastal areas is Mediterranean while that of the inland areas is temperate continental. Summers are hot with low overall humidity levels in spite of frequent rain showers; winters are cold and snowy. Sea temperatures never fall below 10 °C in winter and can be as high as 26 °C in August due to warm currents.

The local terrain is quite diverse given the size of the country. There are flat plains along the Hungarian border and low mountains and highlands near the Adriatic coastline. Croatia's positioning gives the country the geopolitical advantage of being linked to other EU and south-eastern European countries through three pan-European transport corridors. (7)

Government

Croatia is a parliamentary democracy with a president elected by popular vote for a five-year term and eligible for a second term. The leader of the majority party or the leader of the majority coalition is usually appointed prime minister by the president and approved by the parliamentary assembly.

The legislative branch is the unicameral Assembly or Sabor. Members are elected from party lists by popular vote and serve four-year terms.

Administrative levels

Croatia is subdivided into 20 counties (županije) and one city-county (grad): Bjelovarsko-Bilogorska, Brodsko-Posavska, Dubrovacko-Neretvanska (Dubrovnik-Neretva), Istarska (Istria), Karlovačka, Koprivničko-Krizevačka, Krapinsko-Zagorska, Licko-Senjska (Lika-Senj), Medimurska, Osječko-Baranjska, Požeško-Slavonska (Požega-Slavonia), Primorsko-Goranska, Sibiensko-Kninska, Sisacko-Moslavacka, Splitsko-Dalmatinska (Split-Dalmatia), Varazdinska, Viroviticko-Podravska, Vukovarsko-Srijemska, Zadarska, Zagreb (city), Zagrebacka.

The counties and the lower-level municipalities (opcine) and towns (gradovi) are self-governed and the heads of their administrative units are elected by the people. They are responsible for the organization, planning, financing and use of protection and rescue operational forces within the competence of their local governments.

Population

According to the preliminary results of the 2011 census, the number of inhabitants in Croatia was 4 290 612 on 31 March. These data are not comparable to the results of the 2001 census, as the methodology has in the meantime been aligned with international standards. According to the 2001 census, Croatia's population totalled 4 437 460; a data comparison would, therefore, indicate a loss of 146 848 inhabitants. This is actually the result of changes in the statistical definition of total population. If the latest methodology had been used for the 2001 census, the resulting number of inhabitants would have been almost the same as that of the 2011 census.

The City of Zagreb has 792 875 inhabitants (18% of the entire population) followed by the county of Split-Dalmatia with 455 242 inhabitants. The counties of Lika-Senj and Požega-Slavonia are least populated with 51 022 and 78 031, respectively. Apart from Zagreb, only Osijek, Rijeka and Split have populations of over 100 000 (107 784, 128 736 and 178 192, respectively). The complete and final results of the 2011 census will be released at the beginning of 2012 and information on the population's ethnic and religious structure will be made available in the first half of that year.

According to the final results of the 2011 census, Croats made up 89.6% of the total population (an increase of 14.8% since 1991), while the proportion of ethnic minorities shrank from 14.9% to 7.5 % and that of the Roma community increased by 52.4% to 0.2%. The ethnic Albanian community also showed an increasing trend. (8)

Economy

Once relatively wealthy, Croatia's economy suffered badly during 1991–95 as output collapsed and the country missed the early waves of investment in central and eastern Europe that followed the fall of the Berlin Wall. Between 2000 and 2007, however, Croatia's economy began to improve slowly with a moderate but steady growth of between 4% and 6% in GDP led by a rebound in tourism and credit-driven consumer spending (Table 2). Inflation over the same period was tame and the national currency (Kuna) remained stable. Nevertheless, difficult problems, including a stubbornly high unemployment rate, a growing trade deficit and uneven regional development, still

need to be resolved. The state retains a large role in the economy as privatization efforts often meet stiff public and political resistance. While macroeconomic stabilization has largely been achieved, structural reforms are lagging because of deep resistance on the part of the public and a lack of strong political support. The industrial sector is dominated by shipbuilding, food processing, and the production of pharmaceuticals, information technology, biochemicals and timber. Tourism is a notable source of income during the summer period; for example, in 2008, over 11 million foreign tourists generated revenue of € 8 billion.

Table 2. Overview of the economy of Croatia, 2000 and 2009

Indicators	2000	2009
GDP (billions current US\$)	21.5	63.0
GDP growth (annual %)	3.8	-5.8
Gross national income (GNI) per capita, Atlas Method (US\$)	5 200	13 770
Inflation, GDP deflator (annual %)	4.6	3.34

Source: The World Bank Group, 2012 (9).

The EU accession process should accelerate fiscal and structural reform. While the long-term prospects of economic growth are good, Croatia will face significant pressure as a result of the global financial crisis. Croatia's high foreign debt, anaemic export sector, strained state budget, and over-reliance on tourism revenue will result in a greater threat to economic stability over the medium term. (10)

Environment

The main environmental concerns in Croatia relate to: air pollution from metallurgical plants causing acid rain, which is damaging the forests; coastal pollution from industrial and domestic waste; landmine removal; and reconstruction of the infrastructure consequent to the 1992–95 civil strife (Table 3).

Table 3. Environmental factors, Croatia, 2000–2007

Indicators	2000	2007
CO ² emissions (tons per capita)	4.57	5.6
Agricultural land (% of land area)	20.89	21.48
Energy consumption (per capita kg of oil equivalent)	1759	2101
Consumption of electrical power (kWh per capita)	2850	3737

Source: The World Bank Group, 2010 (9).

Croatia is party to a number of conventions, such as the Convention on long-range transboundary air pollution, the Convention on biological diversity, the Convention on climate change (including the Kyoto Protocol), the Convention to combat desertification, the Basel Convention on hazardous waste, the Convention on the law of the sea, the Convention on the prevention of marine pollution by dumping of wastes, the Convention for the protection of the ozone layer, and the Ramsar Convention on Wetlands. (7)

Health system

Croatia fares well in the provision of health care and health-care results, but spends 7.8% of GDP on health, more than other countries with similar income levels. Generous health benefits and almost universal health coverage have put significant pressure on public expenditure. (11)

The health-care system in Croatia is centrally controlled. The state owns national health institutes, independent clinics, hospital clinics, and clinical hospital centres. County governments own general and specialized hospitals, primary health centres, institutes for emergency medicine, institutes for public health and polyclinics. The Ministry of Health and Social Welfare carries out administrative and other tasks in connection with the:

- protection of the population from infectious and non-infectious diseases and from ionizing and non-ionizing radiation;
- control of food and other items in everyday use with respect to health safety;
- optimal use of health-care potential;
- construction of/investment in the health-care system;
- establishment of health-care institutions and private practices;
- organization of state and professional examinations and specialist training for health-care personnel;
- granting of primarius titles;
- classification of health-care institutions (e.g. as referral centres, clinics, hospital clinics or hospital clinical centres);
- provision of guidance to the Croatian Health Insurance Institute, the Croatian Red Cross and chambers;
- inspection of health-care institutions and private practices;
- evaluation of health-care employees' performance;
- registration of drugs;
- inspection of processes leading to the production and distribution of drugs and health products;
- production, distribution, use and disposal of poisons and narcotics;
- inspection of persons, activities, buildings, offices, spaces, facilities and equipment to safeguard against conditions which could be harmful to human health;
- sanitary inspection of international traffic at state borders.

It is estimated that almost 85% of all health expenditure is covered by public funds. An estimated 91% of these come from health insurance contributions, which are compulsory for all employees and employers. The Croatian National Institute for Health Insurance is responsible for the budget comprising these contributions. Self-employed citizens are required to pay their own contributions in full. Vulnerable groups, such as old-age pensioners and those with low incomes, are exempt from payment.

Patients are free to register with doctors of their choice. There is a growing trend towards private practice, including private nursing and diagnostic facilities and privately owned pharmacies.

Hospitals are financed mainly through contracts with the Croatian Health Insurance Institute. They are categorized as national, regional, county or local hospitals.

Every municipality has a health centre plus a network of primary health care (PHC) units. Health centres provide a wide range of PHC services to the population, including dental care, gynaecological and paediatric care, and occupational-health, laboratory and radiology services, as well patronage to the local pharmacies through medication prescriptions. In addition, they are bound to provide emergency treatment, diagnostic services and health education. Remote rural health centres also offer specialist outpatient care, which is supervised by a hospital. Some also provide maternity and short-term in-patient facilities. Most pharmacies are privately owned and supply both prescription and over-the-counter medicine.

Currently, emergency medical services (EMS) are provided by 18 county institutes for emergency medicine, 3 services for emergency medicine (in Zagreb and the Koprivnica-križevci and Varaždin counties) and 30 acute-care hospitals. The uneven topographic distribution of EMS has led to a reform process to render the provision of emergency medical care more efficient and to improve the distribution of emergency medical teams across Croatia. This process is being supported by the World Bank.

The demographic trend in Croatia resembles recent trends in other countries throughout Europe (Table 4). Currently, more than 17% of the population are aged 65 years and over. The leading causes of death (75%) in 2008 were circulatory diseases (591.2/100°000) and neoplasms (299.3/100°000). These were followed by injuries and poisonings (68.4/100 000), diseases of the digestive system (54.8/100 000) and diseases of the respiratory system (50.7/100 000).

Table 4. Health indicators, Croatia, 2000 and 2008

Indicators	2000	2008
Life expectancy at birth (total, years)	73	76
Under-5 mortality rate (probability of dying by age 5 per 1000 live births) both sexes	8.4	5.47
Maternal mortality ratio (per 100 000 live births)	6.8	6.8
Total fertility rate (per woman)	1.7 ^a	1.4

^aData from 1990.

Sources: Croatian Central Bureau of Statistics, 2009 (12); World Health Statistics, 2010 (13).

According to the ECDC, Croatia has a low-level HIV epidemic with a rate of <10 newly diagnosed cases of HIV infection per million population per year. TB incidence in the country remains stable (22.9/100 000 in 2008). (14, 11)

Main hazards and health threats in Croatia

Potential disasters in Croatia are mostly associated with natural hazards, such as extreme weather conditions, earthquakes, wild fires and floods (Table 5) (Annex 1). The chemical, petroleum and petroleum-refining industries pose further threats.

Table 5. Natural disasters in Croatia 1990–2010

Type of disaster	Event details	Number of events	Number killed	Total number affected	Damage (US\$ 000)
Drought	Drought	1	-	-	330 000
Earthquake (seismic activity)	Earthquake (ground-shaking)	1	-	2 000	-
Extreme temperatures	Cold wave	1	-	-	-
	Extreme winter conditions	1	5	-	-
	Heat waves	2	828	200	240 000
Floods	Unspecified	1	-	1 200	-
	General floods	5	-	1 960	80 000
Storm	Local storm	1	2	-	-
Wildfire	Forest fires	5	13	26	37 750

Source: EM-DAT: The OFDA/CRED International Disaster Database (4).

Potential technological hazards are industrial explosions and fires, chemical and nuclear accidents and terrorist attacks. Four major transportation accidents have taken place in the last 20 years with over a hundred victims. Since 1996, trans-shipment at the Port of Rijeka has gradually increased to around twelve million tons of potentially hazardous cargo per year. The Port of Rijeka offers the shortest land-transport distance to Belgrade in Serbia and Budapest in Hungary and is located less than 25 kms from the border (Slovenia) to EU countries in an area that is highly dependent on tourism. During the tourist season in 2008, Croatia had over 11 million visitors, thus contributing to the threat of communicable diseases.

For the period 2011–2016, the Crisis Medical Centre of the Ministry of Health and Social Welfare has predicted weather anomalies, the importation of infectious diseases, and forest fires as the main hazards, and earthquakes and nuclear accidents as potentially extreme situations.

Communicable diseases' threats

Owing to Croatia's geographical position, climate and tourism, communicable diseases pose a threat with an intermediate risk of vector-borne diseases. In 2010, the first autochthonous transmission of dengue fever occurred in Croatia. Since then, many efforts have been targeted towards controlling any further outbreaks of disease. Croatia is a member of the European Network for Diagnostics of Imported Viral Diseases (ENIVD).

Mission objectives and deliverables

The objective of the assessment was to support the Ministry of Health and Social Welfare in identifying the strengths and weaknesses of, as well as gaps in, the current preparedness of the health system for crises.

The Ministry of Health and Social Welfare would receive a comprehensive report on the findings of the assessment team highlighting the strengths and weaknesses of, as well as gaps in, the present health security and crisis management framework in Croatia and proposing recommendations for strengthening Croatia's health system for crisis preparedness and response.

Methods

Assessment design and participants

A multidisciplinary team of five international and national experts carried out the assessment in Croatia from 4 to 9 July 2011 in cooperation with counterparts from the Ministry of Health and Social Welfare and the WHO Country Office, Croatia (Annex 2). Using the standardized toolkit for assessing health-system capacity for crisis management, developed by the Country Emergency Preparedness Programme of the WHO Regional Office for Europe, the team adopted an all-hazards, multisectoral approach to evaluating the preparedness of the health system for crises.

The areas of expertise of the team members included generic disaster-preparedness planning and response, hospital disaster-preparedness planning, mass-casualty management and public health, implementation of the IHR, and communicable diseases' surveillance and response.

Semi-structured and informal interviews were carried out with representatives of key stakeholder institutions, including:

- the Ministry of Health and Social Welfare and related departments;
- other government ministries with responsibilities in disaster preparedness and response;
- health facilities and institutions;
- national NGO (Annex 3).

Assessment form

The assessment form, which includes all the essential attributes and indicators to be evaluated, is sectioned according to the six functions (building blocks) of the WHO health-system framework (Table 6).

Table 6. The WHO health-system framework

Functions	Overall goals/outcomes
Leadership and governance	Improved health (level and equity)
Health workforce	Responsiveness
Medical products, vaccines and technology	Social and financial risk protection
Health information	Improved efficiency
Health financing	
Service delivery	

WHO defines **health systems** as comprising all the resources, organizations and institutions that are devoted to producing interdependent actions aimed principally at improving, maintaining or restoring health. Further information on health systems can be found in the following documents: *The World Health Report, 2000* (15), *Everybody's business: strengthening health systems to improve health outcomes* (16) and *The Tallinn Charter: health systems for health and wealth* (17).

Leadership and governance (also called stewardship) is arguably the most complex function of any health system; it is also the most critical (18). Successful leadership and governance require strategic policy frameworks that are combined with oversight, coalition-building, accountability and appropriate regulations and incentives (18). In relation to crisis management, this means ensuring that national policies provide for a health-sector crisis-management programme. Effective coordination structures, partnerships and advocacy are also needed, as well as relevant, up-to-date information for decision-making, public-information strategies and monitoring and evaluation.

Health workforce (human resources for health) includes all health workers engaged in action to protect and improve the health of a population. "A well-performing health workforce is one, which works in ways that are responsive, fair and efficient, to achieve the best health outcomes possible, given available resources and circumstances" (18). This necessitates the fair distribution of a sufficient number and mix of competent, responsive and productive staff. A preparedness programme aims to ensure that such staff represents an integral part of the health workforce by conducting training-needs assessments, developing curricula and training material and organizing training courses.

A well-functioning health system ensures equitable access to essential **medical products, vaccines and technologies** of assured quality, safety, efficacy and cost-effectiveness, and their scientifically sound and cost-effective use (18). Medical equipment and supplies for prehospital activities, hospitals, temporary health facilities, public health pharmaceutical services, laboratory services and reserve blood services needed in case of a crisis also fall under "medical products, vaccines and technologies".

A well-functioning **health information system** is one that ensures the production, analysis, dissemination and use of reliable and timely information on health determinants, health-system performance and health status (18). A health information system also covers the collection, analysis and reporting of data. This includes data gathered through risk and needs assessments (hazard, vulnerability and capacity) and those relating to early-warning systems and the overall management of information.

A good **health-financing system** ensures the availability of adequate funds for the health system, and its financial protection in case of a crisis. In addition to providing funds for essential health-sector crisis-management programmes, it ensures that crisis victims have access to essential services and that health facilities and equipment are adequately insured for damage or loss.

Service delivery is the process of delivering safe and effective health interventions of high quality, both equitably and with a minimum waste of resources, to individuals or communities in need of them. The crisis-preparedness process provided by the WHO health-system framework (16) makes it possible to review the organization and management of services, ensure the resilience of health-care facilities and safeguard the quality, safety and continuity of care across health facilities during a crisis.

The six sections of the assessment form (structured according to the functions of the WHO health-system framework (16)) are broken down into the “key components” of a health-sector crisis-preparedness programme (Table 7).

Table 7. Key components of the WHO health-system framework, by function

Functions	Key components
Leadership and governance	<ul style="list-style-type: none"> Legal framework for national multisectoral emergency management Legal framework for health-sector emergency management National multisectoral institutional framework for multisectoral emergency management Institutional framework for health-sector emergency management Health-sector emergency-management programme components
Health workforce	Human resources for health-sector emergency management
Medical products, vaccines and technology	Medical supplies and equipment for emergency-response operations
Health information	<ul style="list-style-type: none"> Information-management systems for risk-reduction and emergency-preparedness programmes Information-management systems for emergency response and recovery Risk communication
Health financing	National and subnational strategies for financing health-sector emergency management
Service delivery	<ul style="list-style-type: none"> Response capacity and capability Emergency-medical-services (EMS) system and mass-casualty management Management of hospitals in mass-casualty incidents Continuity of essential health programmes and services Logistics and operational support functions in emergencies

Certain attributes are considered essential for the successful implementation of each key component. There are 51 essential attributes; they are listed according to the key components of each of the six WHO health-system framework functions (Annex 4).

The assessment is facilitated by questions relating to each of the essential attributes. Assessors are required to answer each indicator-related question by choosing “yes”, “partially” or “no”, and to justify the answer given. This information forms the basis of a detailed narrative assessment report, which can be used to develop a plan of action to address gaps identified and monitor progress during follow-up assessments.

Recording and analysis of results

Accuracy of the facts

Transcripts were prepared as soon as possible after the interviews and on-site assessments and shared with the other interviewers present to allow for additions and corrections and ensure a

common understanding of the facts. The WHO Country Office in Croatia was asked to clarify, where possible, any contradictory information and to provide additional information where necessary.

Feedback

The team met, when possible, at the end of each day to share information, discuss the findings of the day and plan future interviews.

Triangulation and report-writing

A further analysis of the information was carried out following the mission, when all the transcripts had been received by the report writer. Using a triangulation system, the responses of those interviewed were compared for differences in viewpoint on the key issues of the WHO health-system framework, as well as in the interviewers' interpretations of the information received. It should be noted that qualitative research techniques, such as textual analysis of the transcripts or transactional analysis of the interviews themselves, were not used.

Structure of the report

The report has been structured in accordance with the structure of the assessment form.

Findings and recommendations

The authors recognize that the organizations, institutions and health-care facilities visited during the mission are components of a national, integrated health-care system with operational and management realities that change over time and from country to country. The capacity for crisis management in the health sector of Croatia was evaluated against the benchmarks and indicators of the WHO health-system crisis-preparedness assessment tool, which is based on formal research and consultations.

The report is not intended to judge the comprehensiveness and effectiveness of the current system but rather to revisit it with the WHO health-system framework in mind and to propose modifications as far as financial and other constraints will permit. Thus – solely in relation to the tool – the authors describe strengths and weaknesses perceived and provide recommendations for the consideration of the Ministry of Health and Social Welfare.

1. Leadership and governance

Key component 1.1	Legal framework for national multisectoral emergency management
Essential attributes:	<ol style="list-style-type: none"> 1. Laws, policies and procedures relevant to national multisectoral emergency management 2. National structure for multisectoral emergency management and coordination

The Constitution of Croatia, national laws, decrees, regulations and guidelines describe and regulate the structure of and the roles, responsibilities and managerial authority relating to most aspects of crisis management at the national and subnational levels. *In accordance with the common legal practice in Croatia, all national-level legislation is published in the Official Gazette.* Interministerial cross-cutting coordination (for example, regarding national security) is also regulated by the Constitution and the acts on local and regional self-government.

In Croatia, the key legal document regulating disaster management is the Protection and Rescue Act adopted in 2004 (Official Gazette 174/04) and amended in 2007 and 2009 but there is no specific policy or strategy related to disaster risk reduction. It defines the organizational structure, competencies and main goals of the executing agencies and institutions, as well as the rights and responsibilities of citizens, non-citizens and foreigners in the area of civil defence. Furthermore, the Protection and Rescue Act and supporting legislation describe in detail the rights and obligations of individual participants in protection and rescue operations, agreements on cooperation between the National Protection and Rescue Directorate and volunteer associations regarding protection and rescue, and includes acts relating to the Croatian Red Cross, the Croatian Mountain Rescue Service, fire-fighting and protection against natural disasters. The national laws, policies and regulations provide the different stakeholders and partners with a strong foundation on which to operate and interact.

In addition, there is legislation, which defines responsibility for risk reduction and emergency planning at the national and subnational levels. For example, the Act on the Organization and Jurisdiction of Government Administration and the Decree on the Internal Organization of the National Protection and Rescue Directorate comprise the national operational emergency management entity.

The legal framework applies to all concerned governmental bodies at the national, county and municipal levels. Response to a disaster is carried out according to the subsidiarity principle under the responsibility of those in charge at the county and lower levels.

Currently, the existing legal framework does not address disaster risk reduction and disaster prevention and mitigation in Croatia. The Protection and Response Law equates activities in these areas with those aimed at eliminating the consequences of disasters. Within this framework, the national protection and rescue system and its key actor, the National Protection and Rescue Directorate, are oriented more towards preparedness for rescue and emergency response than disaster prevention.

International intervention is governed by political agreements. Acts on the ratification of bilateral agreements on protection and rescue exist between Croatia and, for example, Austria, Bosnia and Herzegovina, France, Germany, Hungary, Montenegro, Poland, the Russian Federation and Slovenia.

Regional cooperation includes initiatives, such as the Disaster Preparedness and Prevention Initiative for South-east Europe, the South-east Europe Defense Ministerial (SEDM) process, and the Civil Military Emergency Preparedness Council for South-east Europe.

At the international level, Croatia collaborates with the EU, the North Atlantic Treaty Organization (NATO), and the United Nations, and is a State Party to the *IHR (1)*. *The country has adopted The Hyogo Framework for Action 2005–2015: Building the resilience of nations and communities to disasters (19) and regularly submits progress reports.*

Key component 1.2	Legal framework for health-sector emergency management
Essential attributes:	3. Laws, policies, plans and procedures relevant to health-sector emergency management 4. Structure for health-sector emergency management and coordination 5. Regulation of external health-related emergency assistance

The Constitution guarantees the right of all Croatian citizens to health care and protection. In order to implement this right, the Health Care Act (Box 1) was adopted in 1993, establishing that health-care services should be delivered equitably, continuously and in accordance with the priorities of the population. The aim of the Act is to ensure that integrated health services, including those related to prevention, environmental issues and health education are easily and equally accessible to everyone.

Box 1. The Health Care Act

This Act defines the principles and measures of health care, the rights and obligations of people using health care, the bodies responsible for social welfare aimed at protecting the health of the population, and the content and organizational forms of health-care services, and the supervision of their delivery.

The provisions of this Act and of the subordinate legislation shall also govern the healthcare services provision in the Ministry of Defence and the Armed Forces unless another special law stipulates otherwise.

The Ministry of Health and Social Welfare is formally and legally designated to lead the health sector in national disaster management. The Ministry undertakes activities according to a national disaster plan that mandates an all-hazards, multidisciplinary approach to risk reduction and crisis management. It is a member of the national multisectoral emergency-management committee and of similar structures at the subnational levels.

In extraordinary circumstances, such as disasters and epidemics of major proportion, Articles 57 and 165 of the Health Care Act authorize the Ministry of Health and Social Welfare to take measures and initiate activities not defined by the Act. Such action includes mobilizing and organizing response, deciding work methods, scheduling the work of those involved and relocating workers in certain health-care institutions, which for some workers could be for the entire duration of the crisis event.

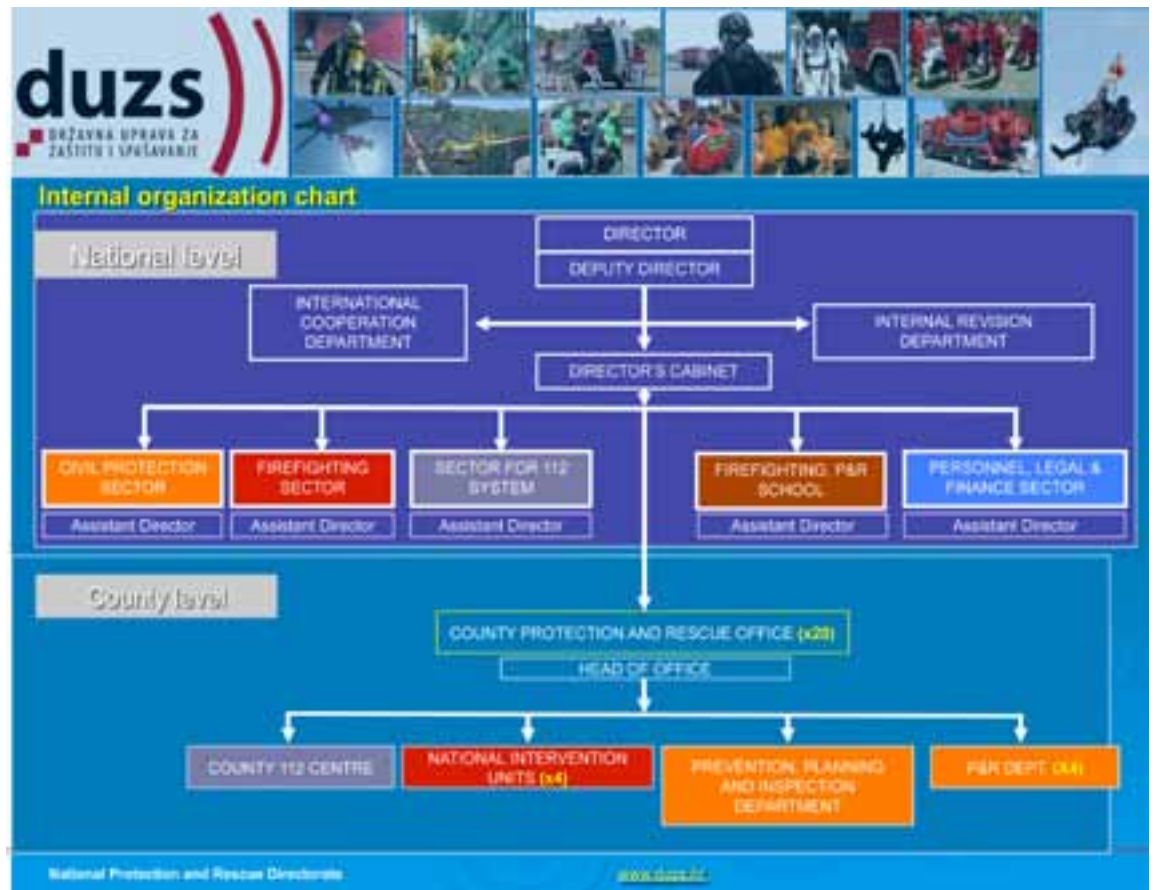
External emergency health-related assistance is regulated exclusively at the national level.

Key component 1.3	National institutional framework for multisectoral emergency management
Essential attributes:	6. National committee for multisectoral emergency management 7. National operational entity for multisectoral emergency management

The Government of the Republic of Croatia is responsible for the management and efficient functioning of the protection and rescue system in the event of a disaster. At the same time, the responsibilities related to disaster risk reduction, prevention and mitigation are widely distributed among various institutions within the state administration. The organization and structures established at the national level are generally mirrored at the subnational levels.

There is no leading agency for disaster risk reduction. The National Protection and Rescue Directorate contributes to the overall coordination of activities to reduce the risk of disaster, which are very diverse both at the legislative and the organizational/institutional levels. Several ministries and governmental entities are involved and responsible for different aspects of disaster prevention and mitigation (Fig. 2). The role of the National Protection and Rescue Directorate has focused primarily on preparedness for response and recovery.

Fig. 2. National Protection and Rescue Directorate (DUZS): internal organization chart



Note: P&R School = Protection and Rescue School.

Source: National Protection and Rescue Directorate of the Republic of Croatia.

The Croatian Platform for Disaster Risk Reduction was established in 2009 as a permanent forum for the exchange of opinions, proposals and information about achievements in the area of disaster risk reduction. It is coordinated by the National Protection and Rescue Directorate. The first conference of the Platform (Zagreb, 2009), concluded that, in developing risk assessment methodology, the science and technology applied should be state-of-the-art, especially in relation to early-warning systems.

Civil protection is organized at all levels, from community to national, as a back-up to the protection and rescue system. The establishment, development (equipment and training) and engagement of the civil protection forces are the responsibility of the director of the National Protection and Rescue Directorate at the national level, and the heads of the self-governing units at county and municipal levels. The former has clear terms of reference defining its mandate, responsibilities and authority. The Government of Croatia, which is responsible for the management and efficient functioning of the protection and rescue system in the event of a disaster, allocates resources for staff and equipment.

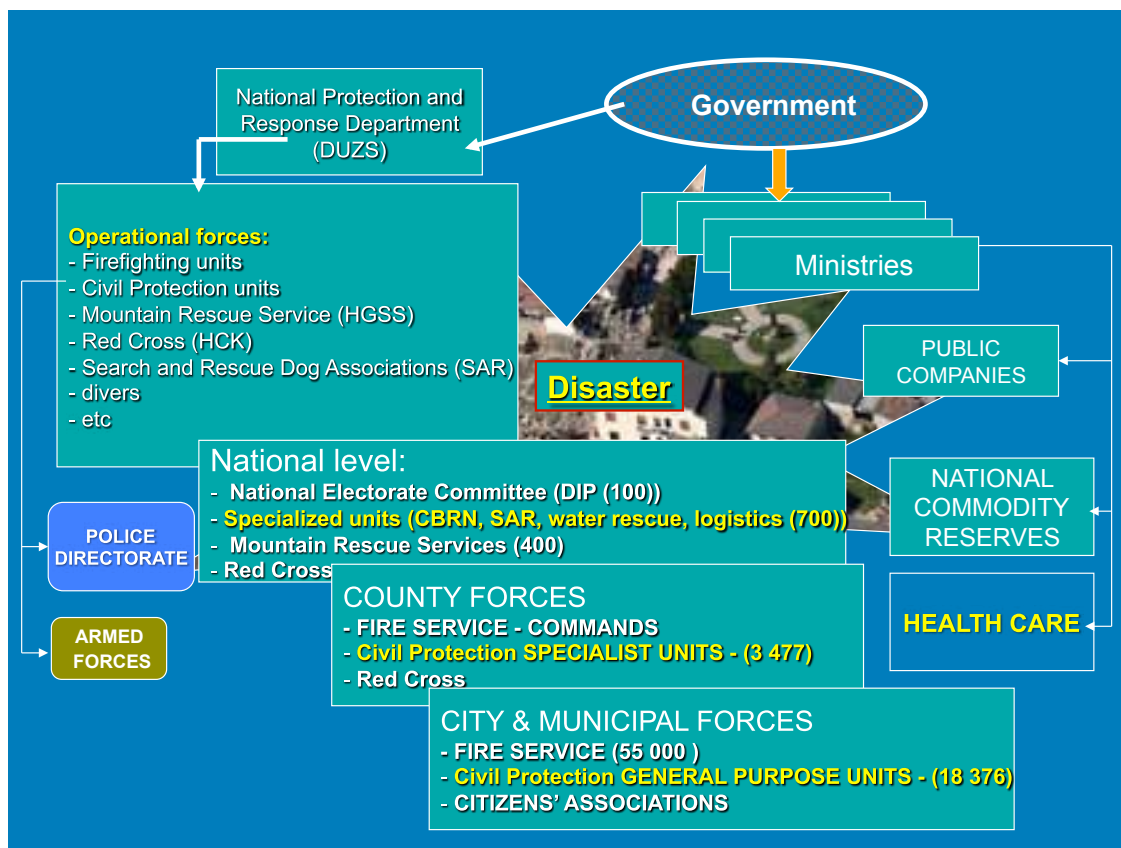
The National Protection and Rescue Directorate is responsible for formulating and implementing policy on and directing all activities relating to crises. It also coordinates the activities of associated ministries, other governmental organizations and NGOs in the event of a national or major emergency. With a view to providing an integrated and coordinated protection and rescue system, the Civil Protection sector, the Fire Fighting Sector, and the sector for the 112 System are represented in the Directorate.

At the national level, the National Protection and Rescue Directorate is responsible for:

- conducting annual risk assessments;
- carrying out biannual revisions of the national protection and rescue plan (which includes details of the type and quantity of the state commodity reserves and equipment necessary for protection and rescue operations, and requirements for the development of protection and rescue technology);
- monitoring and analysing data on the risks and consequences of disasters and major accidents;
- maintaining a unified database on the operational forces and resources for and measures taken in the area of protection and rescue;
- coordinating, managing and taking direct command of operational forces in the case of disasters and major accidents;
- notifying and alerting the population about specific hazards and incidents,
- conducting training programmes, drills and simulation exercises for those participating in protection and rescue operations.

The National Protection and Rescue Directorate receives input to the national protection and rescue plan from the national partners, which include the different ministries, the State Office for Radiological and Nuclear Safety, the Croatian Red Cross, the Mountain Rescue Service, the Fire Fighting Association and others (Fig. 3).

Fig. 3. Organization of emergency response in the Republic of Croatia



Source: National Protection and Rescue Directorate of the Republic of Croatia.

The organization of emergency response at the national level is mirrored at the subnational level. The National Protection and Rescue Directorate provides the same services in the counties, where the heads of administration are responsible for disaster and emergency preparedness, and mitigation and response, and request national support in major events.

The Ministry of Defence, the Ministry of the Interior and the National Protection and Rescue Directorate coordinate the participation of the Armed Forces of Croatia and the police in protection and rescue activities.

Key component 1.4	National institutional framework for health-sector emergency management
Essential attributes:	8. National committee for health-sector emergency management 9. National operational entity for health-sector emergency management 10. Mechanisms of coordination and partnership building

The institutional framework for health-related emergency management comprises, on the one hand, the National Protection and Rescue Directorate, which provides the operational response with the help of teams from the Ministry of Health and Social Welfare and, on the other hand, the Ministry itself, which provides strategic leadership and, increasingly, operational coordination.

In line with Article 164 of the Health Care Act, “A crisis staff of the ministry (hereafter: the crisis staff) shall be set up to manage and coordinate the activities of health-care institutions and private health workers in the event of a crisis...”, a crisis medical centre has been instituted in the Ministry of Health and Social Welfare on the basis of experience gained in health-sector organization during crises (primarily during the conflict of 1991–1995).

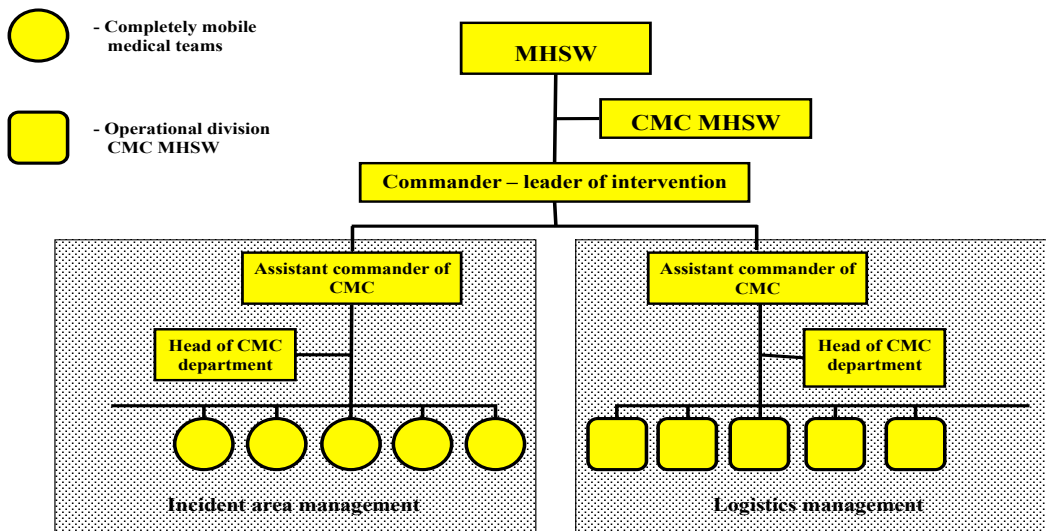
A dedicated public health crisis-management board proposed in the national generic integrated plan for coordinated action in health crises (2010) had not yet been established at the time of the assessment. However, the functions of such a board were being carried out by a multidisciplinary committee (headed by the State Secretary), which meets in the Ministry of Health and Social Welfare on a weekly basis to provide guidance on all policy matters. Members are representatives of the directorates, governmental organizations and NGOs, such as the Red Cross Mountain Rescue, the Croatian Institute of Toxicology and Antidoping, the Croatian Institute for Telemedicine and the Stampar School of Public Health.

The Crisis Medical Centre (Fig. 4) is the administrative unit responsible for providing political and strategic leadership on the health aspects of processes related to crisis management. At the same time, it functions as the operational emergency-management entity responsible for risk-reduction, preparedness and response activities.

The Crisis Medical Centre was established to coordinate the activities of self-governing units at local level and, to this end, it has established health departments in every county. Organizationally, it is a governmental body for managing crises and catastrophes, acting as a link between other governmental bodies, local governments and technical organizations. It has a few standing members who regularly follow up on activities and it can, at any time, engage other experts as needed and in accordance with established partnership mechanisms. Currently, the Telemedicine Department of the Ministry of Health and Social Welfare, which is equipped with a modern communications system, acts as the disaster coordination and communication centre for health-related matters.

Croatia's vast experience in emergency preparedness and response is reflected in its efficient and well-functioning emergency-response system. National health-care crisis-management policy is generally not well known outside the Crisis Medical Centre and there is no common operational framework in place (for the EMS, police and fire-fighters). Although this poses no problem in normal circumstances, it could do so during mass-casualty events. Therefore, and also in the light of the global evolution of different threats (adverse weather conditions, terrorist attacks, frequent mass gatherings, imported diseases, tourism, etc.), the Crisis Medical Centre is moving towards establishing a national integrated emergency response programme, which includes all phases of emergency management (risk reduction, preparedness and response) and needs to be coordinated at the national level.

Fig. 4. Structure of the Crisis Medical Centre, Ministry of Health and Social Welfare



Notes: MHSW = Ministry of Health and Social Welfare; CMC = Crisis Medical Centre.

Source: Ministry of Health and Social Welfare of the Republic of Croatia.

The key responsibilities of the Centre will continue to be the overall leadership of health-related emergency-management processes and the coordination of activities in this area. This includes establishing a policy and technical framework at the national level, overseeing its implementation at local level, convening meetings of different actors, facilitating information exchange, agreeing on strategies in response to assessments, planning joint action, assigning tasks and responsibilities and agreeing on mechanisms for follow-up, evaluation and revision.

The Centre is also responsible for developing and updating guidelines and standard operating procedures (SOPs). Thirty have already been developed by a task force of health experts chaired by the Head of the Crisis Medical Centre and will soon be available to all health facilities on the Ministry of Health and Social Welfare website. The SOPs define, for example, the action to be taken to register and validate an incident, declare a state of emergency, and activate the response system

Although the Ministry of Health and Social Welfare may not currently have sufficient resources (staff, equipment and funding) to fulfil its broadening mandate, including a 24/7 communication system, it is able to draw on a broad range of expertise through partnership and coordination mechanisms.

Key component 1.5	Components of national programme on health-sector emergency management
Essential attributes:	11. National health-sector programme on risk reduction 12. Multisectoral and health-sector programmes on emergency preparedness 13. National health-sector plan for emergency response and recovery 14. Research and evidence base

In accordance with the Protection and Rescue Act, the National Protection and Rescue Directorate is updating the national disaster preparedness plan on the basis of the annual national vulnerability assessment. The act requires other ministries to develop risk assessments in their areas of responsibility, while those in charge at the county and lower administrative levels are responsible for developing draft protection and rescue plans (i.e. disaster-preparedness plans) for submission to their respective administrative units at the national level.

Responsibility for health-related disaster-risk-reduction activities, and most of the mitigation, preparedness planning and recovery activities, have been transferred to the county and municipal levels. These activities are implemented according to their specific hazard profiles. The county and municipal authorities are responsible for the functioning of local key public services, such as infrastructure, care of the elderly and other vulnerable populations, health services and public information services, as well as for the coordination of these services during emergencies.

In Karlovac and Zagreb, the assessment team visited emergency-management structures, which provide all the components of an emergency-preparedness programme on a day-to-day basis: coordination, emergency-response planning, training and education, simulation exercises, public information and response to emergency events.

Within the framework of its emergency-preparedness programme, the Ministry of Health and Social Welfare has started to assess the structural, non-structural and functional safety of hospitals in the light of the *WHO Hospital Safety Index (20)*. At the time of the assessment, six hospitals had already been rated and relevant recommendations proposed.

In 2010, the Crisis Medical Centre developed the “National generic integrated plan for coordinated action in health crises”, a strategic document, which will serve as an umbrella instrument in harmonizing plans at the subnational level. This plan delineates the roles and responsibilities of the Centre, other governmental entities, and health facilities.

At the subnational level, county health administrations are required to develop their response plans to feed into the county multisectoral response plan, which is tested and updated annually. For example, in Zagreb (city level), response plans are developed in cooperation with other sectors, such as those for social welfare and civil protection. These plans include evacuation procedures, surge-capacity planning and risk assessments.

As yet, there is no template for response plans at any level (national, county or health-facility). The Croatian Public Health Institute can be requested by the Ministry of Health and Social Welfare to conduct research on specific topics and provide evidence to assist in further planning and policy development.

Recommendations on leadership and governance

Emergency preparedness in Croatia is a national priority; hence, the Ministry of Health and Social Welfare may consider revising the related legal requirements with a view to adopting a programme approach. This would ensure that all health-sector disciplines are taken into consideration and

involved in crisis preparedness activities. The relevant components, such as risk reduction, preparedness and response, are already very well established in Croatia. The implementation of a national multisectoral emergency-preparedness programme in a coherent, coordinated and participatory manner would also ensure sustainability since such programmes are supported by several funding and implementing partners (e.g. diverse ministries).

The Ministry of Health and Social Welfare may also consider extending the scope of the “National generic integrated plan for coordinated action in health crises” so that it could complement the national multisectoral plan and serve as an umbrella management tool for local governments and response agencies. The extended plan should define national-level responsibilities relating to, among others, resource mobilization, coordination among different jurisdictions and on cross-border activities, national security and foreign assistance.

A national mass-casualty management policy, including the management of pre-hospital medical operations, medical surge capacity, medical triage, and the networking of EMS systems, could facilitate the implementation of nationwide standards.

2. Health workforce

Key component 2.1	Human resources for health-sector emergency management
Essential attributes:	15. Development of human resources 16. Training and education

The Ministry of Health and Social Welfare is in charge of defining health specializations, organizing specialist training and state and professional examinations for health-care personnel, and granting the title of Primus Inter Pares. There is a human-resources plan and a database of staff, which includes details of their specialties. The Ministry of Health and Social Welfare reports a health-workers:population ratio of 270:100 000, which is below the EU average (350:100 000).

With a view to better aligning education with the health sector’s needs, the Croatian Institute for Emergency Medicine recently finished mapping all EMS workers and creating a database of staff and volunteers with details of their knowledge, competencies and skills.

Courses exist for each professional specialty spanning from one-day courses to Master’s Degree programmes. Topics include emergency medicine, emergency management, utilization and maintenance of equipment, search and rescue, assessment of functional and non-functional mitigation, first aid, hospital management, and basic disaster awareness.

EMS teams, fire-fighters and volunteers receive training in emergency response at the Protection and Rescue School of the National Protection and Rescue Directorate’s Fire Fighting sector. The Croatian Red Cross offers similar courses to doctors, nurses, paramedics, managers, civilians, fire-fighters, community volunteers and staff of private companies. The curricula for these courses are approved by the Ministry of Science, Education and Sport.

Training courses are also provided by the Croatian Mountain Rescue Services and the county-level EMS centres, which have their own curricula. For example, the Education Department of the Institute of Emergency Medicine in Zagreb, which has four staff members, provides courses for physicians, nurses, and drivers, as well as for other institutions/companies (e.g. the fire and rescue services, embassies, pharmacies, airlines, etc.).

The Andrija Stampar School of Public Health, as part of the Zagreb Medical School, offers programmes on public health disciplines leading to a Master’s Degree (MPH), and is planning to introduce one on administration and management.

“Public health in emergencies” is a compulsory course for undergraduate medical students. At postgraduate level, this course is compulsory for those specializing in public health or epidemiology. Master’s-Degree courses in nursing, public health and disaster management also exist.

Simulation exercises and drills are compulsory at all levels. They take the form of:

- table-top exercises, such as the “Mass-casualty incident hospital”, organized jointly by the European Society for Trauma and Emergency, the Croatian Urgent Medicine and Surgery Association and the Ministry of Health and Social Welfare;
- multisectoral exercises organized on an annual basis in one county;
- drills organized in health facilities.

The content of the curricula would seem to be standardized but the delivery of training is not harmonized. Currently, training plans are developed at the national level by the Croatian Institute of Emergency Medicine for all EMS staff, thus promoting a harmonized approach throughout the country.

Recommendations on health workforce

The Ministry of Health and Social Welfare may consider conducting an analysis to determine training needs (e.g. CBRN training) with a view to ensuring that the necessary skills are available for carrying out specific health-related tasks connected with crisis preparedness and response. Gaps in skills that could be dealt with through training or recruitment should be identified.

National competencies should be identified, post descriptions reviewed and career development in disaster management defined.

A national course on public health management in emergency situations could be developed with the support of WHO.

Existing training curricula and material should be reviewed and harmonized and a common terminology used, as defined in the Protection and Rescue Act.

The intention to include nursing staff in planning and training for emergency preparedness and response, which is most commendable, should be followed up.

3. Medical products, vaccines and technology

Key component 3.1	Medical supplies and equipment for emergency-response operations
Essential attributes:	17. Medical equipment and supplies for prehospital and hospital (including temporary health facilities) activities and other public health interventions 18. Pharmaceutical services 19. Laboratory services 20. Blood services

The National Protection and Rescue Directorate is responsible for conducting national risk analyses and, based on the results, organizing warehouses containing strategic reserves of essential supplies at the national and subnational levels.

The Ministry of Health and Social Welfare is responsible for the regular provision of pharmaceuticals and medical and laboratory supplies to its health facilities. The Ministry can also provide resupplies to national and subnational health facilities in the event of an emergency.

The Ministry has no warehouses for buffer and emergency stocks. Health facilities are required to ensure the availability of these stocks, as well as of food, water and fuel. Buffer and emergency stocks include antibiotics, chemical antidotes, antitoxins, life-support medications, equipment for intravenous administration, airway-maintenance supplies, and medical and surgical items. Supplies and equipment required in an influenza pandemic, such as antiviral drugs, personal protective equipment for medical staff, vaccines, and laboratory diagnostics equipment, are also stored.

Procedures for requesting, accepting or refusing medicines, personnel, field hospitals and other services (donations) provided by international partners are in place and under the authority of Ministry of Health and Social Welfare.

Essential laboratory services are supplied and basic laboratory testing (e.g. complete blood count, chemistry profiles, electrolyte tests, blood-gas analyses, and blood culture and sputum examination) carried out by the national or county laboratories, also in an emergency situation. Establishing laboratories at scenes of disasters is not foreseen. However, mobile testing units are available.

Though the laboratory facilities visited by the assessment team were modern and of a high standard, the former reported a lack of equipment. Some serve as regional reference laboratories, and procedures exist for the rapid sharing of specimens, including cross-border transport to international reference laboratories. Collection and shipping follow international standards. As emergency-response plans are not yet being developed routinely, there are no SOPs for laboratory facilities in an emergency or disaster situation.

The Ministry of Health and Social Welfare has authorized the Croatian Red Cross to promote blood donation among the public and to recruit and retain non-remunerated blood donors. Blood services are currently located in hospitals. In order not to overburden the hospital facilities and their budgets, it is planned to establish three independent regional centres to be supervised by the Croatian Institute of Transfusion Medicine, which is responsible for collecting, processing and delivering blood. It was reported that essential supplies and equipment and sufficient quantities of blood are available and that all blood donations are registered. The laboratories of the Institute are ISO-certified. Emergency SOPs for blood collection do not yet exist but there are well-established routine procedures.

Recommendations on medical products, vaccines and technology

The Ministry of Health and Social Welfare may consider supporting the development of SOPs for laboratories in emergency situations. These should define essential laboratory services, such as conducting complete blood counts, chemistry profiles, electrolyte tests, blood-gas analyses and blood cultures, as well as procedures for diagnosing samples of potential chemical and bacterial threats quickly and accurately. Laboratory services should be tested regularly and included in exercises and drills.

A regulation or policy on disaster stocks and the pre-positioning of pharmaceuticals, medicines and equipment could be developed by the Ministry of Health and Social Welfare to ensure streamlined procedures for contracting supplies and services in an emergency, including technical specifications, prices, delivery times and reliability of pre-identified goods.

4. Health information

Key component 4.1	Information-management systems for risk-reduction and emergency-preparedness programmes
Essential attributes:	21. Information system for risk assessment and emergency-preparedness planning 22. National health information system 23. National and international information-sharing 24. Surveillance systems and IHR core capacity

Risk assessments are conducted at the county and municipal levels and coordinated by the Crisis Medical Centre. A national profile is available for hydro-meteorological risks, such as heat waves, floods and storms. However, the profile for emergencies and disasters is not yet complete as some technological hazard maps are lacking and those that are available are not complemented by vulnerability maps.

The disease-surveillance system in Croatia is regulated by legislation, including: the Health Care Act, the Act on the Protection of the Population from Infectious Diseases, the Ordinance on the Reporting of Communicable Diseases, and the Mandatory Immunization, Seroprophylaxis and Chemoprophylaxis Ordinance. In accordance with this legislation, the Croatian National Institute of Public Health, a technical institution comprising national reference and B3-level laboratories, acts as an epidemiological reference centre for the Ministry of Health and Social Welfare. The Institute also covers disease prevention and control, acting as an information centre for the reporting and monitoring of diseases, and oversees the preventive and anti-epidemic measures taken by various actors in the health-care system, from family doctors to clinical hospitals. This includes the epidemiology services within institutes of public health that are specially equipped to collect all health data countrywide.

The Croatian National Institute of Public Health was established to provide laboratory services in connection with the protection of public health in Croatia. In addition, the subnational public health institutes (20 at county level and one at city level) and their 113 field units report directly to the National Institute of Public Health and to their respective county health administrations. Private health institutions are required to report in the same way.

In Croatia, the epidemiological basis for disaster policy in relation to communicable diseases and injury, and the allocation of resources to implement it, is strong. Ideally, the epidemiology of each prevalent hazard should be known, i.e. mortality, fatality and lethality rates by age and sex for both the national and the county levels. Post-event morbidity patterns for communicable and noncommunicable diseases by hazard, age and sex should also be readily available. Trends in these data could be used as a basis for setting policy, (re)designing training programmes, procuring equipment, allocating funding priorities, directing research, etc., as well as for monitoring and evaluation. Epidemiology plays a fundamental role in crisis management.

The Croatian National Institute of Public Health functions as the national IHR focal point and is the contact point for the laboratory services of the Early Warning and Response System (EWRS) and the Rapid Alert System for Food and Feed (RASFF). Diagnostic capacity for many emerging and re-emerging diseases (e.g. Hantavirus, West Nile virus, Dengue fever and sandfly-borne diseases) is in place. However, the Croatian National Institute of Public Health shares information about risks with EU Member States, the European Commission, the European Centre for Disease Prevention and Control (ECDC) and WHO.

Use of IHR core capacities to support information and event management

Croatia participated in the IHR (1) revision process and, since the adoption of the updated version of the Regulations in 2007, has been actively implementing their principles with respect to international reporting and communication. The early-warning-and-response function in the country is supported by a surveillance system. However, little effort has been made to test the established routine practices, many of which are not yet supported by emergency SOPs, and a low level of experience in event management at points of entry was reported. However, it is planned to assess and develop IHR core capacities with the aim of designating points of entry. A list of the ports authorized to issue ship sanitation certificates has been submitted to WHO. Priority diseases have been defined and are being monitored. Surveillance includes emerging diseases, such as vector-borne diseases. Public health threats originating from sources other than communicable diseases are monitored and analyzed by the responsible experts in the public health institutes at both the national and country levels.

With the coming into force of the revised IHR in 2007 (1), States Parties committed themselves to assessing the ability of their national structures and resources to meet the minimum requirements regarding national core capacities for surveillance and response, as specified in Annex 1 of the Regulations, and to ensure that these capacities are present and functioning throughout their territories by 2012.

According to IHR, WHO has the mandate to provide States Parties with the appropriate tools, guidance and support to help them achieve these goals. For this purpose, a framework for monitoring IHR core capacities (i.e. *Checklist and indicators for monitoring progress in the development of IHR core capacities in States Parties (21)*) was developed based on the consensus views of technical experts from WHO Member States, technical institutions and partners at global level and WHO. This framework identifies the capacities required to implement IHR, i.e. eight core capacities, capacities at points of entry and capacities for responding to IHR-relevant hazards (biological (including infectious, food safety and zoonoses), chemical and radionuclear).

The framework was used to evaluate IHR core capacities in Croatia as part of the overall preparedness assessment. The following is a summary of the findings.

Core capacity 1. National legislation, policy and financing

The IHR have been translated into the national language and the stakeholders in the health sector are highly aware of them. There is no specific IHR legislation in place. IHR-related roles and responsibilities within the public health system are defined on a daily basis.

Further details regarding national legislation, policy and financing can be found under “1. Stewardship and governance”.

Core capacity 2. Coordination and national-focal-point communications

Croatia has designated the Epidemiology Department of the National Public Health Institute as IHR National Focal Point (NFP). The NFP is strongly involved in all aspects of IHR implementation at all levels. Links to other sectors are strong, as both the national and the county public health institutes have experts on various fields and hazards within their organizations. National coordination and national and international communication in non-emergency and emergency situations function well and are supported by multisectoral emergency and contingency plans, which enable a coordinated response.

Further details regarding coordination and communication can be found under key component 1.1, "National institutional framework for multisectoral emergency management".

Core capacity 3. Surveillance

Surveillance in Croatia is set up in a systematic way and covers the entire country. The surveillance capacity seems to allow the detection and communication of all public health risks in a timely manner. Procedures for risk assessment are not supported by SOPs but defined on a day-to-day basis.

Further details regarding surveillance can be found under key component 4.2, "Information-management systems for risk-reduction and emergency-preparedness programmes".

Core capacity 4. Response

The response capacity in Croatia is well developed though not fully coordinated among all stakeholders. Hospitals do not have emergency response plans, nor do they have contingency funds. Diagnostic and treatment standards in hospitals are high but the latter are not always able to function as centres of excellence since, in many cases, they are non-functional compounds that have been built over several decades. The capacities for quarantine and the prevention of infection in hospitals during emergencies have not yet been developed.

Further details regarding response can be found under key component 6.1, "Response capacity and capability".

Core capacity 5. Preparedness

Assessments of national IHR core capacities are conducted annually and the results shared with WHO. The IHR NFP plans to develop an SOP template for emergency plans at points of entry. Priority risks are assessed on a regular basis.

Further details regarding preparedness can be found under key component 4.1, "Information management systems for risk reduction and emergency preparedness programmes".

Core capacity 6. Risk communication

Risk communication should be a multilevel, multifaceted process aimed at helping stakeholders define risks, identify hazards, assess vulnerabilities and promote community resilience. This process promotes capacity-building with a view to coping with an unfolding public health emergency. The principles of risk communication are well understood and promoted by the public health stakeholders in Croatia. There is no general risk-communication strategy or plan.

Further information regarding risk communication can be found under key component 4.3, "Risk communication".

Core capacity 7. Human resources

Strengthening the knowledge, skills and competencies of public health personnel is critical for the effective implementation of IHR. Croatia has been working to this end through appropriate training and development. Generally, health-care workers in Croatia are skilled and linked to international peers and expert networks. Assessments of human-resource capacity and training needs, and to locate possible critical gaps, have not been carried out.

Further information regarding human resources can be found under key component 2.1, “Human resources for health-sector emergency management”.

Core capacity 8. Laboratory

Staff is trained and able to support the function of several laboratories as regional reference laboratory. The role of laboratories during emergencies is not clearly defined.

Further information regarding laboratories can be found under key component 3.1, “Medical supplies and equipment for emergency response operations”.

Points of entry

The IHR include specific provisions relating to points of entry (ports, airports and ground-crossings). States Parties are committed to nominating selected certain points of entry and to developing and strengthening their IHR core capacities. Health services at points of entry are supervised by the respective county public health institute (as the competent authority) and are, thus, firmly integrated in the health sector and linked to the national level. Croatia has communicated to WHO a list of the ports authorized to issue ship sanitation certificates. Plans to assess and designate certain points of entry are underway.

Key component 4.2

Information management systems for emergency response and recovery

Essential attributes:

- 25. Rapid health-needs assessment
- 26. Multisectoral initial rapid assessment
- 27. Emergency reporting system

Initial rapid health-needs assessments at multisectoral level are coordinated by the National Protection and Rescue Directorate at the lowest relevant administrative level and have the full involvement of the health sector.

Epidemiological institutions are not formally included in rapid health-needs assessments but participate if requested. There are no trained teams at the national or subnational levels to conduct these assessments.

The Service 112 Sector of the National Protection and Rescue Directorate is the established mechanism for the continuous collection and sharing of general risk information. Service 112 reports on all risks and hazards and, if necessary, alerts citizens, legal entities, administrative bodies, rescue services, respective civil protection forces and the relevant section of the Directorate. Service 112 also keeps records on hazards, accidents and disasters, maintains the service centre, and coordinates decision-making and information-sharing.

Key component 4.3	Risk communication
Essential attributes:	28. Strategies for risk communication with the public and the media 29. Strategies for risk communication with staff involved in emergency operations

The components of a risk communication strategy for the public, the media and staff at the national and subnational levels are in place (e.g. predefined coordination mechanisms, dissemination procedures, trained spokespersons and telecommunications equipment).

Recommendations on health information

Consideration could be given to training additional health-sector personnel in conducting rapid health-needs assessments with a view to enabling the provision of efficient, effective medical care and public health services to all victims and affected communities. Rapid health-needs assessment includes anticipation of the extra resources required to enable the mobilization of sufficient surge capacity to meet the health needs. The Stampar National Institute should be involved as an active partner in building a national team for the rapid assessment of health needs to provide the background information, new key data, etc., necessary for planning.

The Ministry of Health and Social Welfare might consider supporting the institutionalization of rapid health-needs assessment teams at the national and county levels by developing national policy in this area, implementing guidelines and defining investigation procedures, which include templates for damage and health-needs assessments.

In addition to the current efforts being made to control vectors and maintain specific diagnostic capacity, it could be useful to develop multisectoral contingency plans in response to the threat of vector-borne diseases.

The Ministry of Health and Social Welfare could consider developing emergency SOPs for the IHR-related points of entry.

5. Health financing

Key component 5.1	National and subnational strategies for financing health-sector emergency management
Essential attributes:	30. Multisectoral mechanisms of financing emergency preparedness and management 31. Health-sector financing mechanisms

National budget funds are allocated to the National Protection and Rescue Directorate according to the national planning and budget plan and benchmarks from previous years. Counties receive lump sums from the national budget and their relevant administrations allocate them according to their annual plans.

The Ministry of Health and Social Welfare has no set budget for a risk-reduction crisis-preparedness programme; it allocates funds to this end on an annual basis. The budget for recovery and investment, for example, is covered by Ministry funds.

Contingency funding does not exist as a singular budget line but is included in the overall ministerial lump sum.

There is no budget for the following aspects of risk reduction and crisis preparedness: assessment of critical health facilities for structural vulnerabilities with a view to risk reduction; insurance of

critical health facilities; research; and monitoring and evaluation. Staff development, however, is funded from the Ministry's budget.

Recommendation on health financing

It is acknowledged that the Government of Croatia is highly committed to emergency preparedness, allocating substantial amounts from the national budget to this end. Nevertheless, the global economy is contracting and the Ministry of Health and Social Welfare cannot rely on current resources in the medium to long term. Therefore, it is strongly recommended that mechanisms be found to ensure funding for research and that sustainability and cost-effectiveness be proposed as research areas.

6. Service delivery

Key component 6.1	Response capacity and capability
Essential attribute:	32. Subnational health-sector emergency response plans 33. Surge capacity for subnational health-sector response

Although county-level multisectoral response plans specify the role of the health authorities in emergencies, there is no separate, standardized plan for health-sector response, neither for the county nor for the health-facility levels. The hospitals visited (Dubrava Clinical Hospital, Karlovac General Hospital and Rijeka Clinical Hospital Centre) demonstrated response plans that could be used as a direct management tool. However, they were not full-scale hospital emergency response plans and the formats and details varied. Nevertheless, response mechanisms and detailed SOPs do exist based on expertise gained during 1991-1995, for activating response and for command, control and coordination, respectively. Even agreements between different service providers are in place.

The surge capacity of the Croatian health sector was reported to be well developed. During large-scale events, EMS medical rescue teams can be mobilized and the Ministry of Health and Social Welfare has a fully equipped field hospital, which can be made available. As yet, it has not needed to be deployed. Hospitals can be tasked with providing medical staff for rescue teams. This is an ad hoc rather than an established system. Land, sea and medical air evacuations are provided by the national forces.

Reportedly, hospital in-patients can be fairly quickly triaged, distributed to other hospitals or sent home in case of mass-casualty events. Extra beds are available and hospitals carry enough stocks (including generators and fuel) to last from three to ten days. A function-based hospital network, which may substantially contribute to enhancing the medical surge capacity of essential hospital services, is not yet in place. The roles, responsibilities and contact details of the different personnel are included in the hospital plans. Personal protection equipment against communicable diseases was reported to be stored in the hospitals.

According to the Croatian National Institute of Public Health, the surge capacity of the public health laboratories is sufficient and routine procedures and capacities meet the needs of emergency situations. A team can be available at short notice in any of the counties.

Buffer stocks (including essential medicines and medical supplies, generators, emergency stockpiles for cold-weather emergencies, tents, laboratory consumables, etc.) have not been established and have, therefore, not been pre-positioned by the health sector.

Dispatching patients to other countries was not considered necessary. Any cross-border collaboration in emergencies would be decided by the National Protection and Rescue Directorate or the Ministry of Foreign Affairs.

Essential attribute:	34. Management of prehospital medical operations 35. Management of situations involving mass-fatality and missing persons
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Currently, the EMS is being reformed under the guidance of the Croatian Institute for Emergency Medicine, which was founded in 2009 and is supported by a World Bank loan. The aim was that the Institute should function as an umbrella for EMS. The 4 emergency medical institutions and 82 emergency departments of the health centres and hospitals cover only 37% of the country and 63% of the population. EMS also handles a large volume of home visits, most of which take the form of out-of-hours non-emergency PHC services. It runs the EMS clinics, such as the one visited in the Zagreb EMS health facility, providing out-patient services both to the public in general and to patients brought in by ambulance. In addition, it has crews dedicated to providing non-emergency transportation for kidney dialysis.

To enhance geographical and technical coverage, the planned reorganization of EMS includes the:

- establishment of 21 county institutes of emergency medicine with fully equipped dispatch units (18 of which are already operational);
- procurement of 128 equipped vehicles, defibrillators, respirators and other resuscitation equipment and, if EU structural funds are available for 2014–2020, two helicopters and six speedboats for emergency medicine;
- development of regulations on specialist training for nurses, medical technicians and medical doctors and on the education of up to 1200 EMS workers in the next two years;
- development and implementation of an emergency medical information system for the 21 county institutes of emergency medicine.

In spite of the geographically uneven distribution of EMS, pre-hospital medical operations for routine emergencies are well organized and coordinated through the 112 system. Croatia aims at having a unified 112 number and steps to this end are being taken. Calls made to the ambulance services are free of charge. Ambulances are dispatched through a central dispatch system at country level. For example, in Zagreb, the dispatch centre and ambulances are equipped with highly sophisticated medical and communication equipment, facilities for maintenance of equipment and buffer stocks. Staff is well trained, and exercises and drills are performed regularly. However, EMS is not prepared for chemical incidents and there is no provision for decontamination. The same applies to psychosocial support for rescue staff; having the team and fitness centre in the EMS building in Zagreb is considered sufficient.

The system for managing situations resulting in mass fatality and missing persons is adequate, although the role of hospitals is not clearly defined. Mechanisms for body recovery, body storage and preservation, the identification process (especially visual identification) and the organization of viewing areas were reported to be in place.

Key component 6.2	EMS system and mass-casualty management
Essential attribute:	36. Capacity for mass-casualty management

The capacity and capability for response to the health consequences of mass-casualty incidents is reported to be very well developed, albeit (and fortunately) not tested in recent years. The strategic planning for such a major incident is the responsibility of the Crisis Medical Centre, which can activate the system and provide coordinated surge capacity.

Dedicated hospitals have large quantities of equipment for resuscitation or life-saving procedures and SOPs exist for adapting additional rooms to help cater for mass casualties. The triage reception areas of the Dubrava Clinical Hospital, for example, were clearly designed to manage daily emergencies as well as mass-casualty incidents. The same does not apply to the Rijeka Clinical Hospital, which suffers from space constraints and is planning to relocate.

Medical response teams are organized (as part of the advanced medical services) on a purely ad hoc basis in specific situations, such as the visit of Pope Benedict XVI to Zagreb in June 2011. As yet, there is no permanent, institutionalized system in place that could contribute actively to the efficient management of medical pre-hospital operations in mass-casualty situations. As part of the Ministry of Health and Social Welfare, the Croatian Institute of Emergency Medicine is planning to develop SOPs for pre- and in-hospital emergency management, and related training programmes for EMS personnel.

Key component 6.3	Management of hospitals in mass-casualty incidents
Essential attributes:	37. Hospital emergency-preparedness programme 38. Hospital emergency response and recovery plans

The components of an emergency-preparedness programme, such as planning, exercises, training, information management and communication, as well as the development of response and contingency plans, would seem to exist at the hospital level in varying degrees. Some have sets of SOPs, others only have fire-evacuation plans or less.

In the health facilities visited by the assessment team, the preparedness and response function is under the responsibility of the director. Staff is assigned related activities in addition to their usual responsibilities and in accordance with SOPs.

The non-structural and functional safety of hospitals is not routinely assessed and the capacity and skills for carrying out an immediate assessment of the structural, non-structural and functional safety of hospitals after an emergency event have not been developed.

Key component 6.4	Continuity of essential health programmes and services
Essential attributes:	39. Continuous delivery of essential health and hospital services 40. Prevention and control of communicable diseases and immunization 41. Mother-and-child health care and reproductive health 42. Mental health and psychosocial support 43. Environmental health 44. Chronic and noncommunicable diseases 45. Nutrition and food safety 46. Primary health care 47. Health services for displaced populations

Croatia has commendable capacity and capability for response in the form of its pre- and in-hospital emergency medical system, which places increasing focus on preparedness and risk-mitigation activities. Although there is a system for monitoring public health, there are no specific disaster-related preparedness plans for monitoring specific programmes (e.g. on reproductive health, nutrition and psychosocial support) that could be put into effect during a response. The functional networking of hospitals has not yet been conceptualized and there is no mechanism for sharing staff in major emergencies or in connection with the transfer of patients.

The management of lifelines (shelter, food and water) for internally displaced or other crisis-affected persons is under the responsibility of the county authorities. The county health administrations deploy teams to assess water quality, sanitation and the risk of communicable diseases, and to implement the necessary monitoring activities. The communicable-diseases-surveillance and early-warning systems continue to function in a crisis situation. It was not clear, however, whether the public health laboratories have the capacity to provide laboratory support through their substations so that hospitals are able to continue their services.

Mental-health and psychosocial support to high-risk groups, such as children, is provided by the public health institutes at the county level.

Key component 6.5	Logistics and operational support functions in emergencies
Essential attributes:	48. Emergency telecommunications 49. Temporary health facilities 50. Logistics 51. Service-delivery support function

The set-up and availability of emergency logistics and support functions clearly represent one of the strengths in Croatia. The National Protection and Rescue Directorate, with all its partners, and the Armed Forces can provide highly sophisticated and well-equipped back-up services, including mobile communication centres, communication back-up, radio communication (VHF), Internet services and satellite telephones. The Ministry of Health and Social Welfare has developed a telemedicine capacity to provide immediate guidance on medical treatment for acute cases to public health centres in isolated places (e.g. on remote islands). This capacity uses modern IT and is already functional in routine emergencies. It could prove to contribute greatly to the efficient management of mass-casualty incidents in the future, for example, by serving as a virtual emergency operations centre for the health sector and as a link between the national and county levels.

Recommendations on service delivery

To optimize service delivery, the Ministry of Health and Social Welfare may wish to consider developing a national hospital emergency-response plan for external emergencies and a contingency plan for internal emergencies and special situations. Action to this end could be to:

- create a national drafting committee to prepare a template of the national hospital emergency-response plan (possibly based on the WHO template);
- hold a two-day preparatory workshop for the members of the committee;
- prepare guidelines for hospitals on how to use the template to develop their hospital emergency-response plans;
- identify a mechanism for use by the Ministry of Health and Social Welfare (or the authority in charge) in validating the hospital emergency-response plans.
- If requested, WHO could provide support in the implementation of these activities.

The Ministry may also wish to consider including standardized non-structural and functional vulnerability (in addition to structural vulnerability) in hospital safety assessments and hospital

preparedness activities using the *WHO hospital safety index. Guide for evaluators*² (20).

It would be beneficial to develop national policies on mass-casualty management, medical triage, advanced medical posts, the provision of medical care in situations caused by hazardous material and threats, and the management of decontamination in the field, in ambulances and in hospitals. These policies could feed into the national health-sector emergency-response plan

In emergency situations, staff and victims alike are unavoidably faced with mental-health and psychosocial issues. The Ministry of Health and Social Welfare may wish to consider adopting an integrated approach to addressing the most urgent of these.

² According to WHO, evaluating the *structural safety* of a facility involves assessing its structure (type, materials and previous exposure to natural and other hazards) to determine whether it meets the standards required of a facility to be used in providing services to the population, even in cases of major disaster, or whether it would be possible to impact the facility in a way that would compromise its structural integrity and functional capacity.

Evaluating the *non-structural safety* of a facility includes verifying the stability of its non-structural elements (e.g. supports, anchors, secure storage) and whether the equipment involved would be able to function during and after a disaster. It also includes assessment of: critical networks (e.g. water, power and communications systems); heat, ventilation and air conditioning (HVAC) systems in critical areas; equipment for medical diagnoses and treatment; architectural elements, such as facings, doors, windows and cantilevers (to determine their vulnerability to water and the impact of flying objects); access to the facility, and internal and external traffic; lighting systems, fire-protection systems, false ceilings and other components. Evaluating *organizational or functional safety* includes looking at the organization of hospital management in general, as well as the implementation of disaster plans and programmes, the resources available for disaster preparedness and response, the level of staff training and preparedness of the staff for disasters, and the safety of the priority services that allow the hospital to function.

Concluding remarks

The capacity for crisis management in the health sector of Croatia was evaluated against the benchmarks and indicators in the *Toolkit for assessing health-system capacity for crisis management. Part 1. User manual (22)*. Findings were based on document research, interviews and selected site visits; recommendations were formulated in conjunction with the Ministry of Health and Social Welfare.

Croatia has the proven capacity to respond to national disasters, including mass migration. The strong commitment of the Ministry of Health and Social Welfare to crisis preparedness is reflected in the ongoing reform of its management and coordination structure towards institutionalizing and expanding it and further developing the health-sector emergency-response plan (“National generic integrated plan for coordinated action in health crises”), as well as in the allocation of substantial national budget funds to this area.

The emergency-response system in Croatia is based on a strong legal framework and seems to be moderately well staffed and equipped. Regulations and detailed instructions at the national and county levels define, among others, coordination bodies, designation of authority and the roles and responsibilities of collaborating partners.

Hospital capacity would seem to be adequate in terms of number of beds, availability of trained staff and accessibility to equipment, contingency supplies and modern medical technology. The current EMS are equipped with staff, ambulances (many with full resuscitation capacity), contingency stocks, dispatch centres, etc., but these resources are unevenly distributed in the country. Therefore, guided by the National Institute of Emergency Medicine, the EMS system is undergoing a reform process towards a geographically even distribution of resources with 21 county-level dispatch systems connected to the national emergency number (112).

Preparedness activities are ongoing. These include community and staff training, as well as exercises and drills carried out jointly by different institutions, usually at the health-facility and county levels. Health-promotion activities, which are usually conducted by the institutes of public health at the county level, include emergency response and awareness-raising. A strategy exists for risk communication and public information during emergency situations.

Croatia has amassed vast experience in delivering medical aid in disaster situations. This experience should be shared and used in joint capacity-building activities in the WHO European Region. In this connection, WHO could contribute by sharing with the Ministry of Health and Social Welfare its experience in developing public health and emergency-management courses for national and international managers.

The Ministry of Health and Social Welfare could aim at enhancing the emergency-preparedness programme approach to ensure that all disciplines of the health sector are taken into consideration and involved in crisis-preparedness activities. The implementation of a national integrated emergency-preparedness programme requires sufficient and well-equipped staff to develop standardized health-sector emergency-preparedness plans as management tools for counties and health facilities and to formulate policies on education, training, accreditation, research, etc., which would reduce ad hoc activity in the area of emergency preparedness.

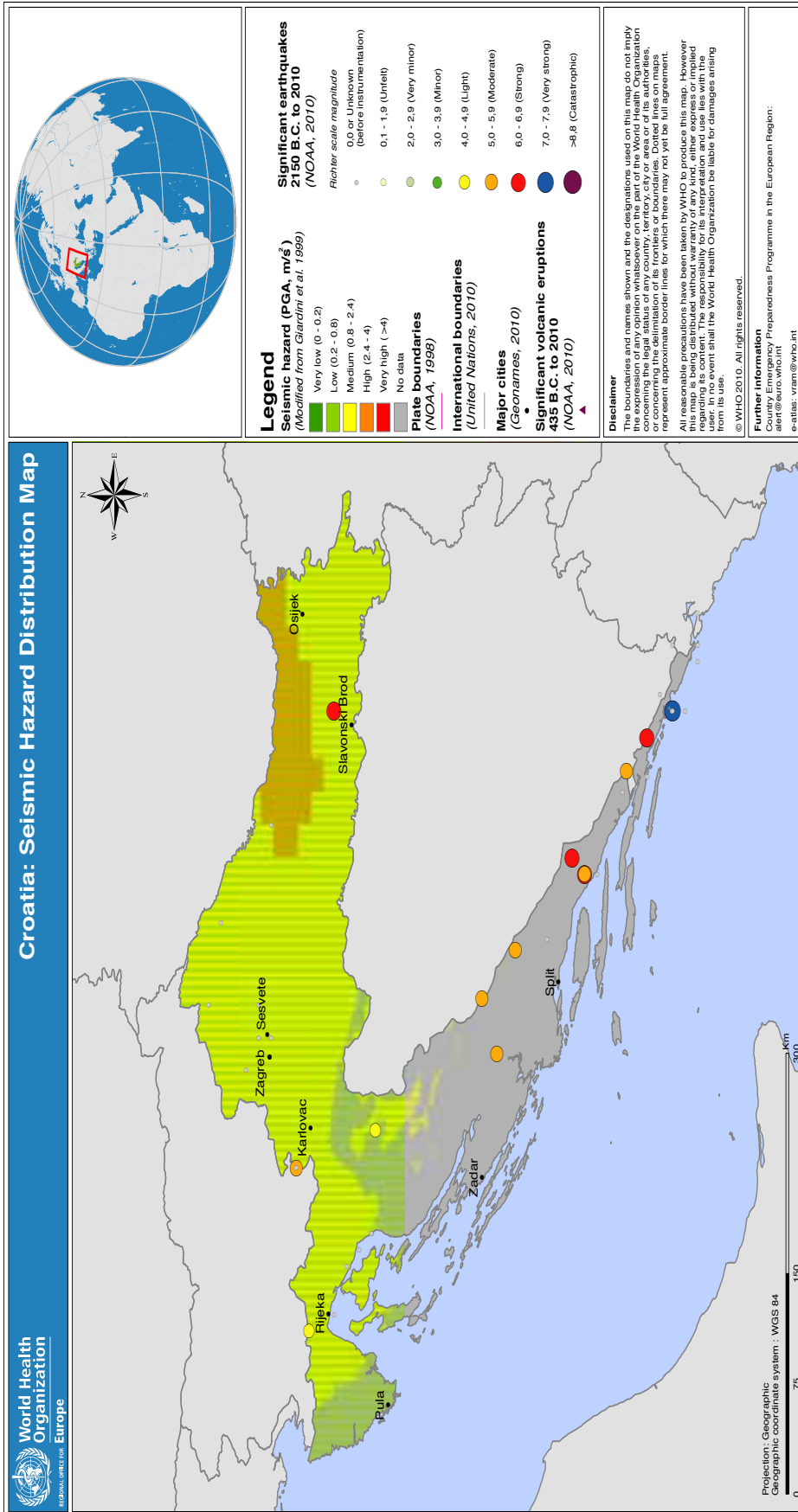
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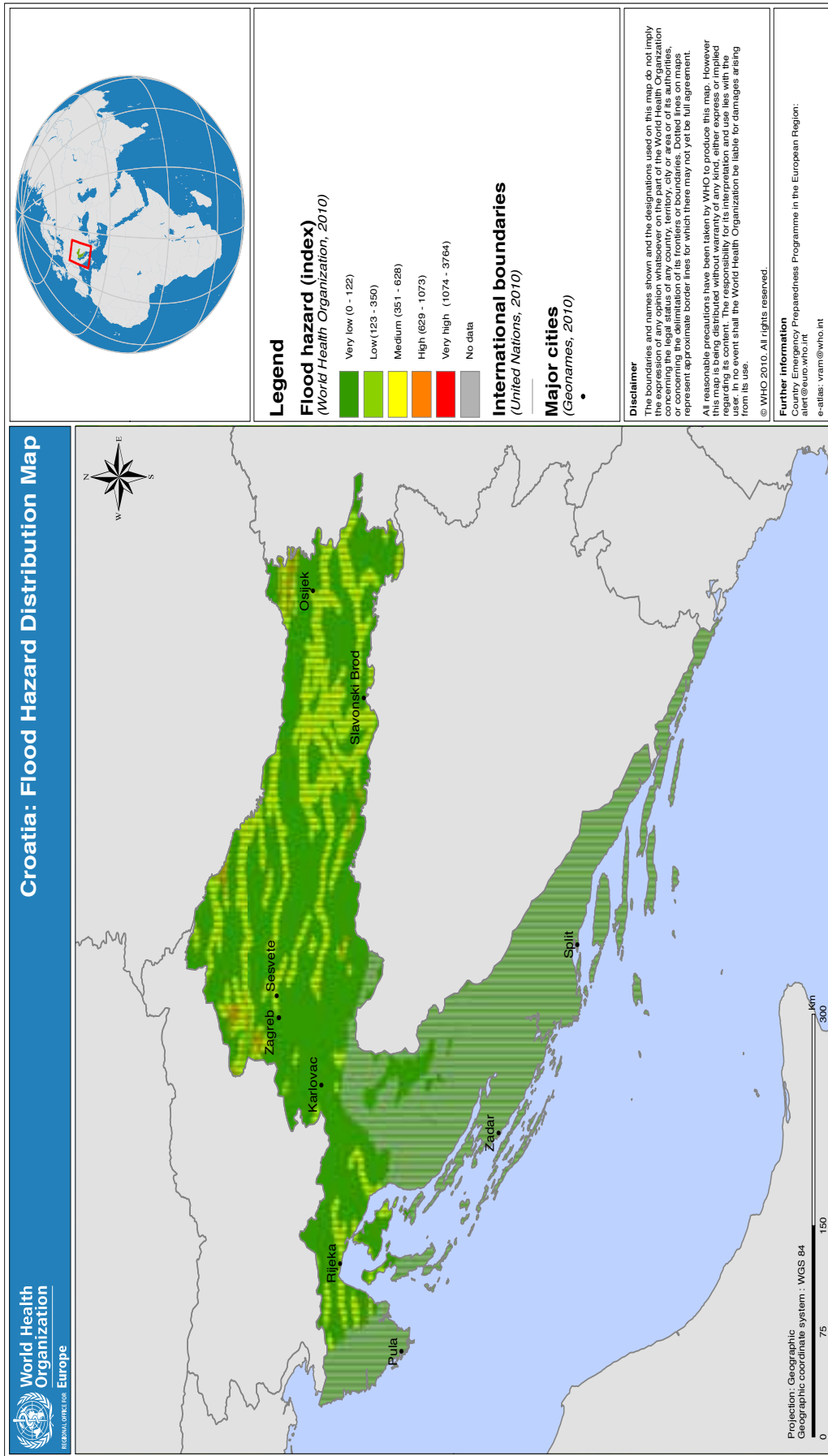
Annex 1. Hazard distribution maps

Map 1. Seismic hazard distribution in Croatia



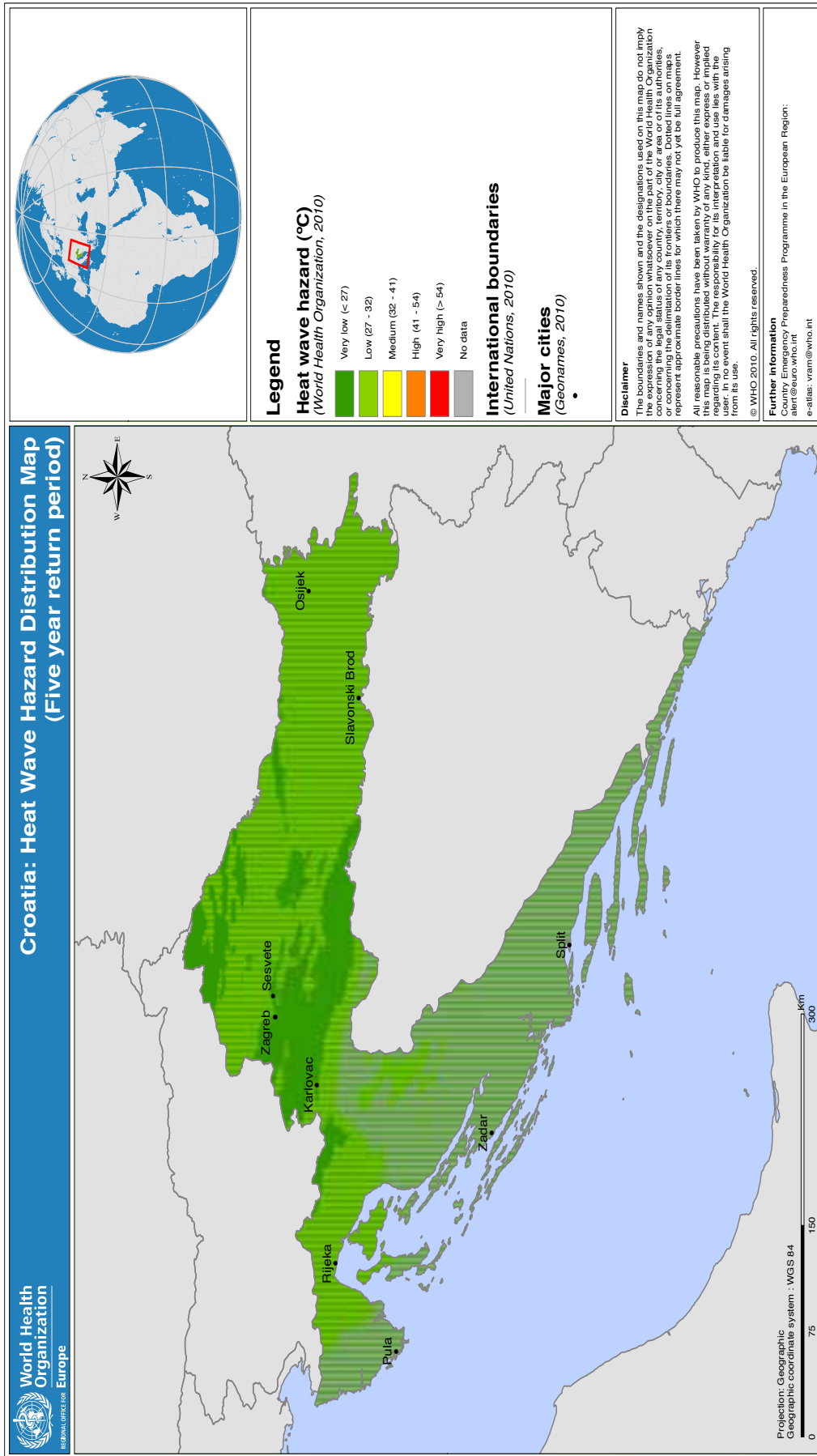
Note. Maps and dataset created in 2010 and representative of that year. PGA = Peak Ground Acceleration; NOAA = National Oceanic and Atmospheric Administration. Data sources for this map are: Adapted from Giardini D et al (1); Significant Earthquakes Database (SED) (2); Tectonic Plate Boundaries Database (3); United Nations International and Administrative Boundaries Resources (4); GeoNames geographical database (5); Significant Volcanic Eruptions Database (6).

Map 2. Flood hazard distribution in Croatia



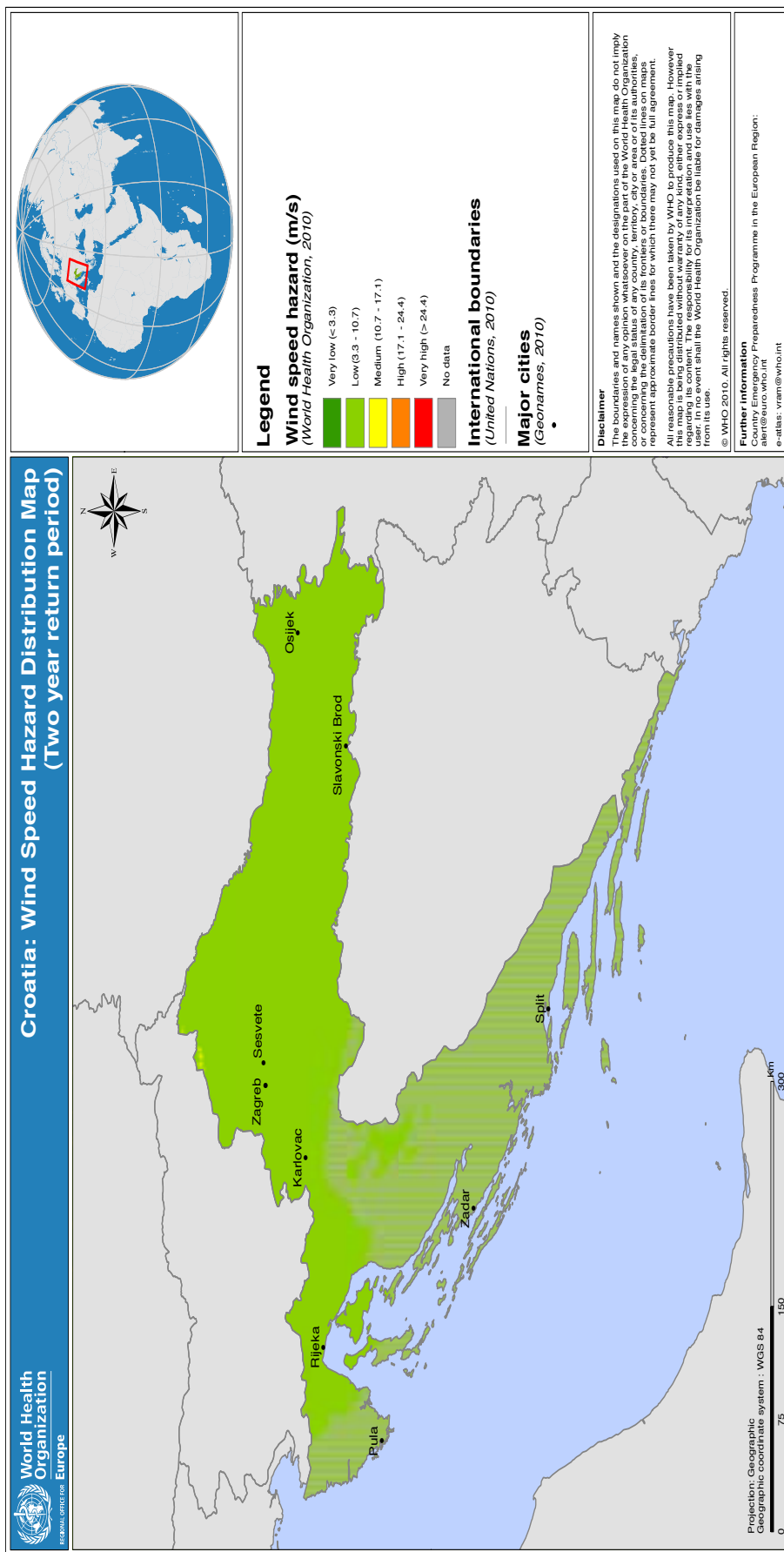
Note. Maps and dataset created in 2010 and representative of that year. Data sources for this map are: *The WHO e-atlas of disaster risk for the European Region. Volume 1. Exposures to natural hazards – Version 2.0 (7)*; United Nations International and Administrative Boundaries Resources (4); GeoNames geographical database (5).

Map 3. Heat-wave hazard distribution in Croatia



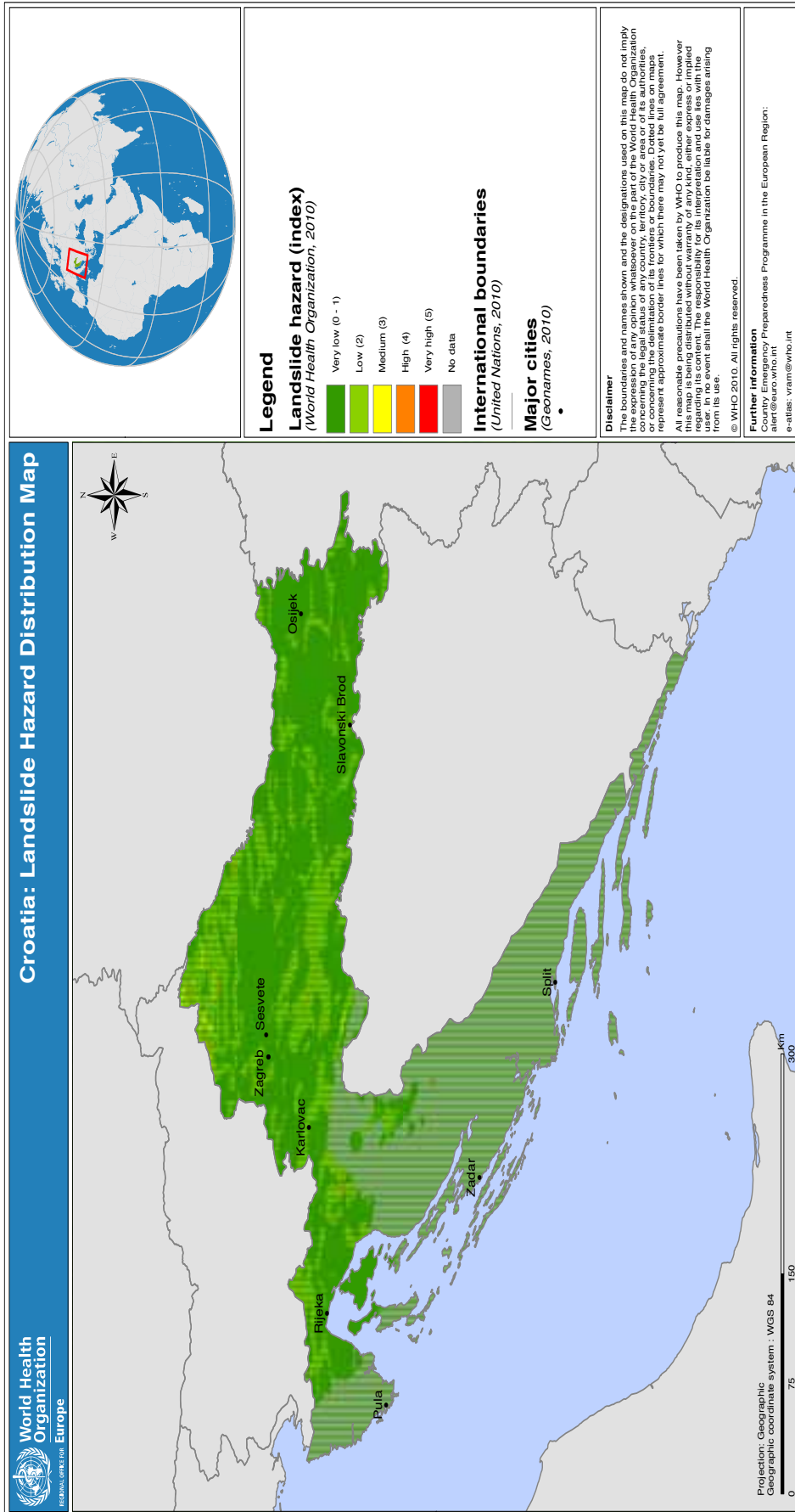
Note. Maps and dataset created in 2010 and representative of that year. Data sources for this map are: *The WHO e-atlas of disaster risk for the European Region. Volume 1. Exposures to natural hazards – Version 2.0 (7)*; United Nations International and Administrative Boundaries Resources (4); GeoNames geographical database (5).

Map 4. Wind-speed hazard distribution in Croatia



Note. Maps and dataset created in 2010 and representative of that year. Data sources for this map are: *The WHO e-atlas of disaster risk for the European Region. Volume 1. Exposures to natural hazards – Version 2.0 (7)*; United Nations International and Administrative Boundaries Resources (4); GeoNames geographical database (5).

Map 5. Landslide hazard distribution in Croatia



Note. Maps and dataset created in 2010 and representative of that year.
Data sources for this map are: *The WHO e-atlas of disaster risk for the European Region. Volume 1. Exposures to natural hazards – Version 2.0 (7); United Nations International and Administrative Boundaries Resources (4); GeoNames geographical database (5).*

References for maps

1. Giardini D et al. The GSHAP Global Seismic Hazard Map. *Annali di geofisica*, 1999, 42:1225–30.
2. Significant Earthquakes Database (SED) [online database]. Boulder, CO, National Oceanic and Atmospheric Administration, 2010 (<http://maps.ngdc.noaa.gov/viewers/index.html>, accessed 12 March 2012).
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4. United Nations International and Administrative Boundaries Resources [online database]. New York, United Nations, 2010 (<http://boundaries.ungiwg.org/>, accessed 12 March 2012).
5. GeoNames geographical database [online database]. Zurich, Geonames, 2010 (<http://www.geonames.org/>, accessed 12 March 2012).
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7. *The WHO e-atlas of disaster risk for the European Region. Volume 1. Exposures to natural hazards – Version 2.0*. Copenhagen, WHO Regional Office for Europe, 2011 (<http://www.euro.who.int/en/what-we-publish/abstracts/who-e-atlas-of-disaster-risk-for-the-european-region-the-volume-1-exposure-to-natural-hazards-version-2.0>, accessed 12 March 2012).

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Annex 4. Structure of the WHO toolkit for assessing health-system capacity for crisis management

WHO health-system function	Key components	Essential attributes	
1. Leadership and governance	1.1	Legal framework for national multisectoral emergency management	
	1.2	Legal framework for health-sector emergency management	
	1.3	National institutional framework for multisectoral emergency management	
	1.4	National institutional framework for health-sector emergency management	
	1.5	Components of national programme on health-sector emergency management	
	1.	1.	Laws, policies, plans and procedures relevant to national multisectoral emergency management
	2.	2.	National structure for multisectoral emergency management and coordination
	3.	3.	Laws, policies, plans and procedures relevant to health-sector emergency management
	4.	4.	Structure for health-sector emergency management and coordination
	5.	5.	Regulation of external health-related emergency assistance
	6.	6.	National committee for multisectoral emergency management
	7.	7.	National operational entity for multisectoral emergency management
	8.	8.	National committee for health-sector emergency management
	9.	9.	National operational entity for health-sector emergency management
10.	10.	Mechanisms of coordination and partnership-building	
11.	11.	National health-sector programme on risk reduction	
12.	12.	Multisectoral and health-sector programmes on emergency preparedness	
13.	13.	National health-sector plan for emergency response and recovery	
14.	14.	Research and evidence base	

WHO health-system function		Key components		Essential attributes	
2.	Health workforce	2.1	Human resources for health-sector emergency management	15.	Development of human resources
3.	Medical products, vaccines and technology	3.1	Medical supplies and equipment for emergency-response operations	16.	Training and education
4.	Health information	4.1	Information-management systems for risk-reduction and emergency-preparedness programmes	17.	Medical equipment and supplies for prehospital and hospital (including temporary health facilities) activities and other public health interventions
		4.2	Information-management systems for emergency response and recovery	18.	Pharmaceutical services
		4.3	Risk communication	19.	Laboratory services
5.	Health financing	5.1	National and subnational strategies for financing health-sector emergency management	20.	Blood services
				21.	Information system for risk assessment and emergency-preparedness planning
				22.	National health information system
				23.	National and international information-sharing
				24.	Surveillance systems
				25.	Rapid health-needs assessment
				26.	Multisectoral initial rapid assessment (IRA)
				27.	Emergency reporting system
				28.	Strategies for risk communication with the public and the media
				29.	Strategies for risk communication with staff involved in emergency operations
				30.	Multisectoral mechanisms of financing emergency preparedness and management
				31.	Health-sector financing mechanisms

WHO health-system function	Key components	Essential attributes
6.	Service delivery	
	6.1	Response capacity and capability
	6.2	EMS system and mass-casualty management
	6.3	Management of hospitals in mass-casualty incidents
	6.4	Continuity of essential health programmes and services
	6.5	Logistics and operational support functions in emergencies
		32. Subnational health-sector emergency-response plans
		33. Surge capacity for subnational health-sector response
		34. Management of prehospital medical operations
		35. Management of situations involving mass-fatality and missing persons
		36. Capacity for mass-casualty management
		37. Hospital emergency-preparedness programme
		38. Hospital plans for emergency response and recovery
		39. Continuous delivery of essential health and hospital services
		40. Prevention and control of communicable diseases and immunization
		41. Mother-and-child health care and reproductive health
		42. Mental health and psychosocial support
		43. Environmental health
		44. Chronic and noncommunicable diseases
		45. Nutrition and food safety
		46. Primary health care
		47. Health services for displaced populations
		48. Emergency telecommunications
		49. Temporary health facilities
		50. Logistics
		51. Service-delivery support function

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“New diseases are global threats to health that also cause shocks to economies and societies. Defence against these threats enhances our collective security. Communities also need health security. This means provision of the fundamental prerequisites for health: enough food, safe water, shelter, and access to essential health care and medicines. These essential needs must also be met when emergencies or disasters occur.”

– Dr Margaret Chan
WHO Director-General

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