

Managing Health Risks during the Balkans Floods

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Abstract

Floods have always had and will continue to have significant consequences for society. In May 2014, there was widespread flooding in the Balkans affecting Bosnia and Herzegovina, Croatia and Serbia. The aim of this article is to show that resilient and proactive health systems that anticipate needs and challenges are more likely to reduce risks and respond effectively during emergencies, saving lives and alleviating human suffering. The method draws on multiple sources of information, including a Balkan case study questionnaire survey with public health professionals involved in response to floods (n = 18) from three affected countries, and focus group discussion results (n = 43) presented at the meeting on “Prevention, preparedness and response to reduce or avoid health effects of flood events”, held in Bonn, Germany, in October 2015. The proposed range of measures to protect population health, organized around flood prevention, preparedness, response and recovery listed issues and considerations largely corresponds to the identified needs by Member State requests, following the Balkan country experiences. The consideration of lessons for early warning, preparedness and response and the integration of research results would lead to improved preparedness measures to better prevent flooding risks. Experiences in the WHO European Region point to a need to shift the emphasis from disaster response to long-term risk management.

Keywords

Managing Flooding, Health Risks, Resilient Health System, Balkans, Population Health

1. Introduction

The WHO European Region, which comprises 53 countries, is one of the World Health Organization's (WHO) six regions across the world. In this Region, approximately 400 floods have killed more than 2000 people, affected 8.7 million persons and caused at least €72 billion in losses in the period 1991-2015 [1]. The largest numbers are found in south-eastern Europe, eastern Europe and central Europe [2]. Flooding has devastating effects for health, human lives and livelihoods and represents an environmental risk globally. Floods affect people directly through drowning and injuries and after the event through displacement, the destruction of homes, water shortages, infectious diseases and financial loss. The stress to which flood victims are exposed can also affect their mental health, and effects can persist a long time after the event. Disruption of services, including health services, safe water, sanitation and transportation ways, plays a major role in vulnerability. Flooding of health facilities results in increased patient admissions and difficulty in providing emergency and routine medical and nursing care for patients with chronic diseases due to interruption of business and loss of infrastructure [3] [4] [5] [6].

The effectiveness of any plan depends on the ability of policy-makers and those responsible for implementation to deliver useful, timely, accessible, consistent and trustworthy information to their target audience, and especially to high-risk populations. Adoption, government approval and integration into existing plans are crucial steps.

Implementation of the plan and its elements can be incorporated into a disaster-planning cycle as: longer-term development and planning; preparation; prevention; specific responses; recovery and monitoring; and evaluation. A national plan is helpful but implementation requires local-level components.

At least 60 people were killed in massive floods in the Balkan countries in May 2014. From 11 to 19 May 2014 the cyclone Tamara led to severe floods across the affected countries: Bosnia and Herzegovina, Croatia and Serbia. Overall, more than 2 million people were affected and 85,000 were displaced through the event [7] [8].

The objectives of the study were to describe the public health measure on preparedness for floods before the event and gaps and lessons learned afterwards in three countries affected by floods in the Balkans in May 2014; and to identify flood-specific emergency response framework(s) in other Member States of the WHO European Region.

2. Methods

This article draws on multiple sources of information, based on consolidated criteria for reporting qualitative research [9], including both a focus group discussion, presented by the participants at the meeting on "Prevention, preparedness and response to reduce or avoid health effects of flood events", held in Bonn, Germany, in October 2015, and a case study questionnaire survey with

selected participants from Bosnia and Herzegovina, Croatia and Serbia.

2.1. Focus Group Discussion

Recruitment and sample: 43 meeting participants from 23 Member States and three international organizations were voluntarily divided into three focus groups during the meeting. The groups all addressed the same list of questions, first in relation to flood prevention and preparedness, then flood response and recovery regarding measures to protect population health. It was expected to identify:

- flood specific emergency response frameworks;
- the core elements of flood prevention, preparedness, response and recovery actions in the health sector and other sectors to reduce or avoid the health effects of flood events; and
- future support needs for strengthening Member State capacities for effective flood health preparedness and response.

2.2. Case Study Questionnaire Survey

A semi-structured questionnaire with 10 open and closed questions was sent to meeting participants from Bosnia and Herzegovina, Croatia and Serbia. During 2016, each of these country representatives organized a discussion with selected people (n = 18), mostly involved in flood-related public health activities in their respective countries. In other longitudinal analyses the temporal period post flood has been pinpointed as a time during which much change occurs [10]. The questions asked for information on:

- Preparedness: what was in place before the floods?
- Public health response:
 - which measures were triggered?
 - what worked, what failed, what was missing?
 - what are the “results” (damage/prevented damage)?
- Recovery
 - public health measures;
 - gaps;
- Evaluation and experiences: success, difficulties, gaps.

The discussions were analysed and submitted as a summary of the completed questionnaires.

3. Results

3.1. Results of Focus Group Discussion

The summary of the focus group’s discussion highlights that flood warning mechanisms and early warning systems are available in WHO European Region Member States; however, for all systems there is need for accuracy and greater lead time.

Furthermore, an elaborated flood risk map would make meteorological and

hydrological warnings more useful. Flood warnings could be issued directly to responders and/or households. Regional as well as cross-border early warning systems may be useful.

The needs for non-health-specific as well as for health-specific information flows were identified. It is necessary to plan in advance, test and evaluate prevention and preparedness measures, including specific activities, roles and responsibilities, and to raise awareness of the plan.

All-hazard simulation exercises (“flood-day”) were suggested to be carried out once per year, in which a flooding scenario is integrated for planning and to educate the public and health services. It is important to integrate local information into existing national risk assessments.

Important public health measures for flood response and recovery were listed: rescue and evacuation (evacuation centers); surveillance (sanitary/hygienic/epidemiologic); water, sanitation, and hygiene (including waste management); disinfection, pest control; mental health; management of dead bodies; care for vulnerable population groups (chronic illness, migrants, pregnant women); health services continuity; reproductive and sexual health; risk communication; information management including media (top-down, bottom-up and horizontal approach—with other organizations); business continuity management; NGO management; horizon scanning of how the crisis is likely to evolve; flexibility to address unexpected issues/events; and management of international or bilateral aid.

Emergency plans should detail how funds for disaster response will be managed. Emergency contingency funds or retroactive reallocation of budgets are options to secure funding for emergency and disaster response.

The main problems occurring during recovery are related to financing, waste management, displacement, mental health issues, mold, re-establishment of infrastructure, insurance, managing donations, subsidence, restoring damaged health facilities, reduced capacities of health facilities, lacking health human resources, and fatigued health staff.

Important pillars identified for monitoring and evaluation are:

- An integrated information system for collection of data and its analysis;
- The key elements of a response and having an appropriate/matching checklist;
- A specific form of reporting with a defined set of indicators.

Methods for monitoring and evaluation include supervisory visits, self-assessments and external evaluations.

The main messages from the focus groups discussions are listed in **Box 1**.

3.2. Results from the Questionnaire

Overall, all three affected countries have a legal basis for the formulation of disaster preparedness and response measures. Actual public health preparedness and response plans, however, exist in varying stages of development prior to the

Box 1. Key messages.

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- Shifting emphasis from disaster response to disaster risk management and preparedness for a crisis to reduce negative health effects;
 - Establishing a unified management system for public healthcare activities in order to improve the efficiency and effectiveness of actions at the national level;
 - Education and training of competent employees of PH institutions on the implementation of disaster management response plans in situation of extreme urgency;
 - Establishing of resource management (database, human and material capacities, stock update, timely procurement);
 - Definition and clear division of responsibilities;
 - Establishing of clear communication pathways and providing timely and accurate information;
 - Defining budget position.
-

serious flood event in May 2014. Results in the areas of governance and coordination in response are summarized in **Table 1**.

In all countries, disease surveillance and data collection, situation analysis and rapid health needs assessment took place through Institutes of Public Health. Essential health data were collected during the extreme event and long term disease surveillance was in place across all countries. The summarized results in the areas of priority areas in response and evaluation and lessons learned showed common priorities as: provision of safe drinking water; disease surveillance for infectious diseases; removal of animal carcasses; mosquito spraying and pest control; waste water and waste disposal; and information and communication campaigns for the public (**Box 2**).

A clear definition of tasks and processes, amendments in budget allocation as well as further improvements according to evaluation results have been suggested to strengthen future preparedness for extreme events.

4. Discussion

In this study we have developed an analysis of identifying flood specific emergency response framework that explain, contribute to, and affect health impacts following a major flood event. These concern capacities for sense-making and coping with changed futures.

A survey conducted by the WHO European Region and Public Health England highlighted the gaps in the prevention of the health effects of floods and the availability of flood health response strategies or action plans, in a coordinated and systematic fashion. Several shortcomings in flood health prevention, preparedness, response and recovery have been observed, for example [6]:

- Health protection measures are often not considered explicitly in multisectoral all hazard emergency response plans and where they exist, mainly with respect to responding to the acute impacts.
- Health service operational analysis, for example hospital safety and functionality are often not integrated into multisectoral and multihazard risk assessments.

Box 2. Evaluation and lessons learned.

<p>Lack of:</p> <ul style="list-style-type: none"> • clear definition of roles, responsibilities and procedures; • communication pathways and coordination; • human and financial resources; • communication and information campaigns for the public. <p>(Identified barriers and gaps)</p>	<p>Lessons learned are being taken into account for:</p> <ul style="list-style-type: none"> • development and revision of disaster preparedness and response plans—also for management of other crises; • consideration of mental health issues in victims as well as for health professionals; • strengthening of communication pathways as well as communication campaigns. <p>(Changes since 2014)</p>
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Table 1. Results summary to complement and support evaluation across the health sector due to floods in affected countries: Bosnia-Herzegovina, Croatia and Serbia in May 2014.

Governance and coordination	
Legal basis/Existing plans	<ul style="list-style-type: none"> • Legal basis for the protection of the population exists; • Preparedness and response plans in different stages of development.
Budgeting	<ul style="list-style-type: none"> • Specific budget lines available, with specificity for Croatia*.
Cross-sectoral collaboration	<ul style="list-style-type: none"> • Defined lead agency established in all countries; lead not within Ministry of Health; several sectors clearly in-volved with a range of tasks; • Needed: clear definition of tasks and processes, budget allocation and consideration of evaluation.

*Amendment of the state budget to make provide Crisis Headquarters with funds for flood response.

- The provision of good and sufficient quality water and food, sanitation and hygiene, health precautions during clean-up activities, protective measures against communicable diseases and chemical hazards, surveillance activities for mortality and morbidity during and after the event, and measures to track and ensure mental health and well-being during floods and after flood events are often not planned for in advance.
- The health benefits or risks associated with long-term structural and non-structural measures are seldom considered.

Assessments of preparedness and response processes and measures led to the identification of specific strengths and weaknesses in each of the affected and responding countries. Strong lead agencies and networks together with multi-disciplinary and cross-sectoral collaboration contributed to an effective public health response. On the other side, the need was identified to more clearly define roles and responsibilities of actors and to improve procedures, coordination of activities as well as communication pathways among actors. Lessons learned are being taken into account in the revision of existing disaster preparedness plans and additions. Three areas receive special attention: mental health effects, communication and budget allocation.

Monitoring and evaluation during and after flood events allow for adjustment of interventions and improvement of plans and measures. This entails continued follow-ups for health impacts and short-, medium-, and long-term goals to

detect a range of effects. This also includes debriefs, surveillance, and research for the identification and discussion of lessons learned. Overall, all three affected countries have a legal basis for the formulation of disaster preparedness and response measures. Actual public health preparedness and response plans, however, exist in varying stages of development prior to the serious flood event in May 2014. A clear definition of tasks and processes, amendments in budget allocation as well as further improvements according to evaluation results have been suggested to strengthen future preparedness for extreme events.

The Emergency Support Team established at the WHO Emergency Operations Centre provided technical and operational support to all three countries through the WHO country offices. WHO emergency, environmental and communications experts were working closely with the WHO country offices and health authorities to address the countries' medium- and longer-term health needs in the aftermath of the disaster. The WHO Regional Office for Europe sent additional staff with expertise in emergency management and recovery to support the country offices in Bosnia and Herzegovina and Serbia in coordinating the emergency response and making the transition to recovery [7]. The European Union Civil Protection Mechanism was activated in response in Bosnia and Herzegovina and Serbia, with assistance offered by 23 participating countries.

The severity and frequency of floods are increasing in many regions due to climate change and to land development processes, and will increase in the future by exacerbating existing environmental health exposures and risks [11] [12] [13]. The magnitude of the physical and human costs of such events can be reduced if adequate emergency prevention, preparedness, response and recovery measures are implemented in a sustainable and timely manner.

According to focus group participants from our study, weather warnings for extreme precipitation events exist in almost all European countries; however, specific flood warning is often not timely enough to allow proper action by the health system (e.g. evacuations of people at high risk). Gender sensitive approaches and approaches towards population groups with particular vulnerabilities (e.g. elderly, chronically sick, migrants) are often not considered in the planning phases. A series of elements that flood health preparedness plans should contain were listed: flood proofing of health facilities and health services, stockpiling of medicines, technologies and other necessary means, provision of safe water, sanitation and hygiene facilities, food security, social protection, and increased surge capacity. Special measures should target particularly vulnerable population groups. For the emergency medical response a good network of laboratories, including mobile laboratories, as well as mobile teams (e.g. infectious diseases/surgery/X-ray) in a modular system with an operations center are needed for fast mobile medical detachment and rapid redeployment. Continuing medical training supports capacity building. Regular surveys in regions at risk and emergency needs evaluation for health system services (evacuation needs, drugs and stock reserves) inform preparedness and response planning. Emergency

funds need to be ensured and continuous monitoring carried out.

Experiences in the WHO European Region point to a need to shift the emphasis from disaster response to long-term risk management. The approach should include health impact assessments of structural measures to combat flooding, building regulations in flood-prone areas and insurance policies. Flood health risk management—through developing flood health action plans—should therefore be considered multisectoral. Flood risk management is up to national/regional policies, which are supported by legislation. In the European Union for example, a number of directives are calling upon flood risk management in coordination with the Water Framework Directive [14] [15].

The new Health Emergencies Programme enables the WHO European Region to better support countries in building their capacity to manage risks from health emergencies caused by all hazards, including natural disasters [16]. A new developed document proposes a range of measures to protect population health, organized around flood prevention, preparedness, response and recovery [17]. It is accompanied by a range of information sheets with public health advice for health authorities, health professionals, local authorities and emergency managers. Overall, the listed issues and considerations largely correspond to the needs identified by Member States requests to the WHO Regional Office for Europe, following the experiences of the Balkan countries.

From the questionnaire results and the reported experiences in the three affected WHO Member States a range of recommendations for the development and improvement of disaster risk management and public health preparedness and response to extreme events such as floods can be deduced (**Box 3**).

Box 3. Recommendations for the development and improvement of disaster floods risk management.

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- While a legal basis for disaster preparedness and response is given in all countries, it could be reviewed to close identified gaps for the provision of important procedures and measures.
 - Flood preparedness and response plans should address all recommended elements.
 - Strengthened consideration and input of the health perspective in overall flood preparedness and response plans should be supported and advocated for.
 - Sufficient budgets need to be ensured and allocated to the health sector and other concerned sectors to be capable of acting in the case of emergencies.
 - Cross-sectoral collaboration needs to be strengthened and coordinated, already at the planning stage.
 - Surveillance, monitoring and evaluation, including data collection, need to be reviewed to include for example mental health effects.
 - Building public awareness and political will and health workforce education and capacity building are crucial.
 - Resilience of health infrastructure should be improved.
 - International and cross-border communication and collaboration proved important and could be fostered.
 - Suggestions for further research/investigations/assessments/analyses could be developed and taken into consideration.
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5. Conclusions

These steps and measures could guide the process of developing and improving public health preparedness and response plans for extreme events in the countries at risk. Generally, a wide, multisectoral all-hazards approach to emergency preparedness, translated into a plan that includes public health and health care sections is recommended [11].

A need exists to fill the knowledge gap of public-health vulnerabilities in existing flood-management practices and integrate health before, during and after the flood event. The consideration of lessons for early warning, preparedness and response and the integration of research results would lead to better consideration of health risks and prevention of disruption of health services.

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Disclaimer

The authors alone are responsible for the views expressed in this publication and they do not necessarily represent the decisions or policies of the World Health Organization.

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