Summary report of systematic reviews for public health emergency operations centres

Plans and procedures; communication technology and infrastructure; minimum datasets and standards; training and exercises

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This summary report was prepared by Rosalie Spencer and Mark Nunn, based on the reports of four systematic reviews conducted during November 2014 to April 2015. The systematic reviews were as follows: EOC plans and procedures; EOC communication technology and infrastructure; EOC minimum datasets and standards; and EOC training and exercises. The work of the systematic reviews and the development of the summary report were coordinated by World Health Organization (WHO) through its Public Health Emergency Operations Centre Network (EOC-NET)[1].

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Recognition is given to the authors of materials that were included in the above systematic reviews. Full lists of references for each review are included in this summary report.

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Note to the reader

In an effort to provide a full overview of the information on which this summary is based, separate reference sections are included for each of the reviews summarised. Each of these is identical to the reference section in the full version of the relevant review.

If an in-text reference is used in this summary, the reader is asked to consult the reference list relevant to the particular review under discussion at that point in the text.

[1] http://www.who.int/ihr/eoc_net/en/

Summary 1

A public health emergency operations centre (PHEOC) exists to coordinate information and resources in order to manage responses to public health events or emergencies.

Emergency operations centres (EOCs) are used in a variety of emergencies, including natural disasters; foodborne disease outbreaks; radio-nuclear events; bioterrorism; chemical incidents; mass gatherings; blackouts; humanitarian emergencies; and disease outbreaks or pandemics. They are employed at a variety of jurisdictional levels, and range from field EOCs to local, regional, national or international EOCs. Effective communication and coordination within and between EOCs and response agencies is critical to the successful management of an emergency.

The structure and function of EOCs varies across countries and organisations; they have different capacities and resources, and use different staff, terminologies, procedures and tools. These variations pose significant challenges to the interoperability that is essential to effective coordination between EOCs and responding agencies.

In 2012, WHO's Department of Global Capacities, Alert and Response (GCR) established the Public Health Emergency Operations Centre Network (EOC-NET)[2]. EOC-NET exists to support Member States as they strengthen their capacity for effective response to public health emergencies, in line with the requirements of the 2005 International Health Regulations.

EOC-NET has four working groups focussed on priority areas in public health emergency response:

1. The EOC Communication Technology and Infrastructure (CTI) working group, which provides guidance on minimum CTI requirements and assessment tools.
2. The EOC Minimum Data Sets and Standards (MDSS) working group, which develops guidance on minimum datasets, data structure, standards and common terminologies to ensure interoperability, effective data collection, display and exchange of operational information.
3. The EOC Procedures and Plans (P&P) working group, which identifies or develops generic procedures and plans, and standard operating procedures (SOPs).
4. The EOC Training and Exercises (T&E) working group, which develops training programmes and exercises for EOC personnel

In December 2013, WHO conducted a systematic review of public health emergency operations centres[3] , in collaboration with Emory University. This review documented best practices and barriers in establishing and using EOCs for effective responses to public health emergencies. This review has been followed by four more focussed reviews exploring key elements of EOCs: communication technology and infrastructure, minimum datasets and standards, plans and procedures, and training and exercises. The results of all five reviews will be used to inform the development of a series of guidance resources and recommendations for PHEOCs.

This report summarises the four focussed reviews.

1.1. Plans and procedures review

The core objective of the plans and procedures review was to identify and describe standards, regulations, planning frameworks, guidelines, plans and procedures related to public health emergency operations centres (PHEOCs). Other objectives were to identify and conduct in-depth documentation of the core components of PHEOCs.

The report recommends that planning frameworks for health emergencies should incorporate the following approaches and characteristics: risk management; all-hazards planning (plus hazard-specific planning where necessary); all agency approaches; prepared, resilient communities able to respond to disaster at local level; and a comprehensive approach incorporating risk prevention/mitigation, preparedness, detection (when communicable diseases are involved), response and recovery.

[2] http://www.who.int/ihr/eoc_net/en/
[3] http://www.who.int/ihr/publications/WHO_HSE_GCR_2014.1/en/

The cycle of emergency planning and preparedness should include assessment of an agency's capacity (resources) and capabilities (such as training and credentialing) to respond; building and maintaining the necessary capacities and capabilities; testing them in exercises and real events; and reporting on the response in after action reviews, ensuring that lessons learned are incorporated into emergency plans.

EOCs should use an incident management system that is modular, scalable and flexible; has plans and (tele) communications that are interoperable across agencies; uses terminology that is uniform throughout the system; uses incident action planning and management by objectives; has a manageable span of control (ideally 1:5); has a clear chain of command within agencies, and unified command across agencies; has clearly defined information flows; and considers how scientific/technical expertise fits into the chain of command.

At a minimum, EOCs should include roles responsible for command; operations; planning; logistics; finance/administration; intelligence; investigations; information management; communication (internal, inter-agency and risk communication); reporting/briefing; staff safety; and security. Depending on the type of emergency, public health functions – such as surveillance, data collection and analysis, epidemiology, laboratory, and disease control – ¬should also be included. More research is required into the best way to incorporate these public health functions into a traditional incident management system.

The review team investigated how the effectiveness of a PHEOC could be measured, but concluded that this topic also requires further research. EOC effectiveness tends to be measured using indicators of preparedness (e.g. is there an emergency plan, have staff been trained, etc.), rather than by the effectiveness of the response as demonstrated by actual outcomes (e.g. timely end to an outbreak of disease).

Though indicators of preparedness are more common, there are few specific accepted benchmarks or response time objectives (such as time taken to activate the EOC and recruit an incident management team). Useful benchmarks might include time taken to identify and control the cause of an outbreak; time taken to issue risk communication messages; existence of predefined processes for intra- and interagency communication flows and approvals; availability of decision support documents; and timely development of incident action plans once an emergency has arisen.

Priority topics for future research in the planning and procedures domain include how to adapt a traditional incident management system to include public health functions, and how best to measure the effectiveness of a public health emergency operations centre.

1.2. Training and exercises review

This review examined peer-reviewed literature, grey literature and web-based information resources to identify standards and best practices, describe current training programmes and exercises, and appraise their key components.

The capacity and skills of PHEOC staff are a key factor for effective management of public health