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### Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AFRO</td>
<td>WHO Regional Office for Africa</td>
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<td>AMRO</td>
<td>WHO Regional Office for the Americas</td>
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<tr>
<td>ARO</td>
<td>Alert and Response Operations</td>
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<td>CDC</td>
<td>US Centers for Disease Control and Prevention</td>
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<tr>
<td>CEO</td>
<td>chief executive officer</td>
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<td>DSE</td>
<td>Disease Surveillance and Epidemiology</td>
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<td>DSR</td>
<td>Disease Surveillance and Response</td>
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<td>EC</td>
<td>European Commission</td>
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<td>ECDC</td>
<td>European Centre for Disease Prevention and Control</td>
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<td>EMRO</td>
<td>WHO Regional Office for the Eastern Mediterranean</td>
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<tr>
<td>EOC</td>
<td>Emergency Operations Centre</td>
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<td>EOC-NET</td>
<td>The Public Health Emergency Operations Centre Network</td>
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<td>EPR</td>
<td>Epidemic and Pandemic Alert and Response</td>
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<td>ERF</td>
<td>Emergency Response Framework</td>
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<td>EURO</td>
<td>WHO Regional Office for Europe</td>
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<td>EWRS</td>
<td>early warning and response system</td>
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<td>GCR</td>
<td>Global Capacities, Alert and Response</td>
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<td>GDACS</td>
<td>Global Disaster Alert and Coordination System</td>
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<td>HERCC</td>
<td>Health Emergency Response Command Center</td>
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<td>HERM</td>
<td>Health Emergency Risk Management Framework</td>
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<td>HHS</td>
<td>US Health and Human Services</td>
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<td>HPA</td>
<td>Health Protection Agency</td>
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<td>HQ</td>
<td>headquarters</td>
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<td>IAEA</td>
<td>International Atomic Energy Agency</td>
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<td>ICS</td>
<td>Incident Command System</td>
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<td>ICT</td>
<td>information and communication technologies</td>
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<td>IEC</td>
<td>Incident and Emergency Centre</td>
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<td>IHR</td>
<td>International Health Regulations</td>
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<td>IMS</td>
<td>Incident Management System</td>
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<td>ITT</td>
<td>Information Technology and Telecommunication</td>
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<td>MDE</td>
<td>minimum data elements</td>
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<td>MoH</td>
<td>ministry of health</td>
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<td>NCP</td>
<td>National Centre of Public Health</td>
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<td>NDAC</td>
<td>National Disaster Operations Centre</td>
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<td>NECC</td>
<td>National Emergency Coordination Centre</td>
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<td>NIMS</td>
<td>National Incident Management System</td>
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<td>NIR</td>
<td>Aileen Plant National Incident Room</td>
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<td>OCHA</td>
<td>Office for Coordination of Humanitarian Affairs</td>
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<td>OSOCC</td>
<td>On-Site Operations Coordination Centre</td>
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<tr>
<td>PED</td>
<td>Emergency Preparedness and Disaster Relief</td>
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<td>RO</td>
<td>Regional Office</td>
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<tr>
<td>SEARO</td>
<td>WHO Regional Office for South-East Asia</td>
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<td>SHO</td>
<td>Strategic Health Operations</td>
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<td>SHOC</td>
<td>Strategic Health Operations Centre</td>
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<tr>
<td>SITREP</td>
<td>situation report</td>
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<td>SOC</td>
<td>Secretary's Operations Center</td>
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<td>SOP</td>
<td>standard operating procedure</td>
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<tr>
<td>TC/AC/VC</td>
<td>teleconference /audio conference/video conference</td>
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<tr>
<td>TOR</td>
<td>terms of reference</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
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<td>UNITAR</td>
<td>United Nations Institute for Training and Research</td>
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<td>UNOSAT</td>
<td>UNITAR Operational Satellite Applications Programme</td>
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<td>WG</td>
<td>working group</td>
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<td>WPPO</td>
<td>WHO Regional Office for the Western Pacific</td>
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Executive summary

Public health emergency operations centres (EOC)\(^a\) play critical roles and are becoming more and more important for effective international collaboration and coordination in preparing for and responding to the increasing occurrence of public health emergencies.

World Health Assembly Resolution WHA65.23 Implementation of International Health Regulations (IHR), requests the Director-General to build and strengthen the capacities of the Secretariat to perform fully and effectively the functions entrusted to it under the IHR, in particular through strategic health operations that provide support to countries and to regional and trans-regional networks in detection, reporting and assessment of, response to, and capacity strengthening in public health emergencies.

To ensure that all public health EOCs have the capacity to perform core supporting functions for effective responses to public health risks and emergencies, especially those of international concern, the World Health Organization (WHO) Department of Global Capacities, Alert and Response (GCR) established the Public Health Emergency Operations Centres Network (EOC-NET) and organized a consultation meeting on public health EOC collaboration on 19–20 November 2012 in Geneva, Switzerland. The meeting brought together 38 stakeholders from nine States Parties, seven regional and international organizations, WHO headquarters and all six WHO Regional Offices to share experiences and lessons learned, and to launch the EOC-NET.

The meeting participants identified the major roles and challenges of public health EOCs, validated the need for EOC-related data and information standards, and agreed on the EOC-NET objectives and key working areas.

The major roles of public health EOCs

Public health EOCs play critical roles in preparedness and responses to public health emergencies. A competent EOC can support the collaboration and coordination of many preparedness and response activities and be the centre for the coordination of activities during any multi-disciplinary, multi-jurisdictional response.

Public health EOCs in States Parties to the IHR and in regional and international organizations use different terminologies, structures, procedures, information communication tools, and have various ranges of functions. The common components of an EOC include effective

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\(^a\) Public health emergency operations centres (EOC) are central locations where strategic management of public health emergencies (or events that may constitute public health emergencies) is conducted. EOCs provide support functions to coordinate responses and resources during major events or emergencies. EOCs are also referred to as strategic health operations centres, command centres, situation rooms, and crisis management centres.
communications equipment and facilities, information management systems and standards, competent staff, effective command systems, appropriate procedures, as well as tools, training and exercises. The major roles of an effective public health EOC include:

- Managing, coordinating and collaborating with emergency responses through provision of information and communication technology (ICT) tools and services, the provision of a central meeting space and the coordination and direction of strategic and technical meetings and/or teleconferences.
- Conducting information management and sharing functions such as information collecting, integrating, coordinating, displaying, distributing and storing, providing situation reports, and managing information flow.
- Enabling response-related decision-making, operations, liaison, risk communication, deployment management, emergency personnel staffing, logistics and planning functions.
- Preparing for future emergency responses through the carrying out of daily functions such as surveillance, risk assessment, early warning, emergency team and resource management, development of standards, guidance and tools, preparation of plans and technical protocols, and the carrying out of emergency preparedness reviews, exercises and training.

Major challenges facing public health EOCs

It is crucial to ensure that public health EOCs are capable of providing effective communication and information tools and management systems, in order to support decision-making and implementation during emergency responses as well as during preparedness phases. The meeting participants identified the following challenges in building a competent public health EOC:

- Effective, timely and accurate operational information flow between EOC and field teams, between WHO Country Offices, States Parties, other UN agencies, and other partners during emergencies.
- Optimal ICT, funding, maintenance, staffing, networking levels, standard procedures for EOC activation, conducting evaluation and introducing best practices.
- EOC-related standards, procedures and tools available to support information management and interoperability.
- Continuous and effective training of personnel.

EOC-related data and information standards

EOC-related data elements that are not interoperable between and within information systems hinder timely responses to emergencies. Variation in EOC structures, procedures and tools, as well as disparate sources of data collection and information management, call for data standardization. Standards related to EOCs include data standards, information content standards, information exchange standards, entity identifier standards, privacy and security standards.
To support seamless exchange of data and information between multiple stakeholders in a timely manner, it is necessary to define, agree on and implement minimum data sets and data/information exchange standards, and to develop or augment an eHealth architecture for an EOC information exchange platform, based on health IT and health information data standards.

**Objectives and key working areas of EOC-NET**

The participants agreed that best practices need to be identified and implemented to ensure that minimum capacity requirements can be met in all public health EOCs to the highest standard possible and to effectively perform core functions during emergencies, and that consistent expert support should be provided to States Parties in building their public health EOC capacity. The agreed objectives and terms of reference (TOR) of EOC-NET meet the gaps/needs identified (see Annex 1). The objectives of the EOC-NET are to:

- Support States Parties in building their public health EOC capacity (including communication, information management, mobilization, coordination and collaboration with other partners, etc.) as part of their national emergency response framework.
- Share expertise, lessons and experiences in building, evaluating and utilizing EOCs for public health emergency responses.
- Identify key needs for information and communication technologies (ICT) and explore/test possible solutions.
- Identify the minimum data elements (MDE) and standards related to public health EOCs;
- Develop and make available common procedures and protocols for public health EOCs and promote best practices.
- Develop mechanisms and tools to support essential information gathering and sharing among relevant public health EOCs during health operations.
- Develop and implement EOC training programmes.

The participants agreed on priority areas of work for EOC-NET: 1) EOC infrastructure and ICT; 2) Public health EOC minimum data sets and standards; 3) Public health EOC procedures and tools; 4) Public health EOC training and exercises.

Four corresponding working groups will be established to conduct the activities surrounding each priority area of work.
Introduction

Article 13 of the *International Health Regulations* (IHR) requests that each States Party to the Regulations shall develop, strengthen and maintain the capacity to respond promptly and effectively within specific time frames to public health risks and public health emergencies of international concern. In addition, the sixty-fifth World Health Assembly Resolution 23 (2005) on IHR implementation requests the World Health Organization (WHO) Director-General to build and strengthen the capacities of the Secretariat to perform fully and effectively the functions entrusted to it under the IHR, in particular through strategic health operations that provide support to countries, regional and trans-regional networks of States Parties in detection, reporting and assessment of, response to, and capacity strengthening in public health emergencies.

Public health emergency operations centres (EOC)\(^1\) play critical roles and are becoming increasingly important for effective international collaboration and coordination in response to public health emergencies. WHO, with its global mandate, is taking a leading role in ensuring that all public health EOCs have the capacity to perform core supporting functions for effective responses to public health risks and public health emergencies, especially those of international concern.

The need for a public health EOC network was first highlighted at the Alert and Response Working Group meeting held in WHO headquarters in April 2011. The meeting proposed a network of public health EOC to enhance the necessary collaboration, and to support the need for interoperability and surge capacity across the organization.

In order to enhance collaboration and coordination in response to public health emergencies, and to support capacity building of public health EOCs, the WHO Department of Global Capacities, Alert and Response (GCR) established the Public Health Emergency Operations Centres Network (EOC-NET). GCR organized a EOC-NET consultation meeting on public health EOC collaboration on 19–20 November 2012 in Geneva, Switzerland.

The meeting brought together potential network members and key stakeholders to better understand related needs and gaps, to propose solutions for effective public health EOC collaboration, as well as advise on the next steps for EOC-NET. The meeting objectives were to:

- review major roles and challenges of public health EOCs in preparing for, and in response to, public health emergencies;
- share experiences and lessons learned with representatives;
- discuss health information standards related to public health EOC;

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\(^1\) Public health emergency operations centres (EOC) are central physical locations where strategic management of public health emergencies (or events that may constitute public health emergencies) is conducted. EOCs provide support functions to coordinate responses and resources during major events or emergencies. EOCs are referred to using various terms including ‘strategic health operations centres’, ‘command centres’, ‘situation rooms’, and ‘crisis management centres’.
• launch the EOC-NET;
• discuss EOC-NET terms of reference and work plans.

Thirty-eight participants attended the meeting, including ten experts from nine States Parties, seven experts from two regional and five international organizations, twelve staff members from six WHO Regional Offices (RO) and nine WHO headquarters staff members [see Annex 2].

Dr Keiji Fukuda, WHO Assistant Director-General, gave the opening speech. Mr Paul Cox, Team Leader, Strategic Health Operations (SHO), served as the meeting chairperson.

The participants exchanged views on the following aspects of EOC models/systems: organization structure, functions, infrastructure and technologies, policies, procedures and tools, experiences, challenges and solutions. There were 24 presentations and three group discussions [see Annex 3]. Those who were not able to be present at the meeting participated in the consultation, as possible, through e-mail and teleconferences.
Consultation proceedings

1. Opening of the meeting
2. Launch of EOC-NET
3. Keynote address
4. Updates on WHO EOCs
5. EOCs and emergency response systems in States Parties and other international organizations
6. Capacity building
7. EOC technical components
8. Public Health EOC network (EOC-NET): key areas of work
1. Opening of the meeting

In his opening remarks, Dr Keiji Fukuda emphasized the WHO ‘all-hazards’ approach in response to public health events and emergencies, whether caused by communicable disease outbreaks, food safety issues, humanitarian disasters or other threats.

“EOC are becoming increasingly important for effective international collaboration and coordination in response to the rising occurrence of public health emergencies. It is crucial to ensure public health EOCs are capable of providing effective information and communication (ICT) tools and management systems to support decision-making and implementation during emergency response and preparedness efforts. The EOC-NET should bring together EOCs for synergy – to share experience and lessons learned, and to improve the effectiveness and efficiency of EOCs. This will enable the world to deal with the challenges of public health emergencies more progressively.”
2. Launch of EOC-NET

In the increasingly mobile and interconnected world, public health events and emergencies have become more complex than ever, involving more and faster information sharing, less time to process all available data and evidence, and with higher expectations in relation to outcomes. Managing such events requires highly effective international collaboration and coordination.

Most response organizations have already established some form of EOC to support collaboration and coordination needs. During disasters and public health emergencies, these centres play indispensable roles, providing a hub for information gathering, analysis, dissemination and multidisciplinary responses. No single discipline, sector or jurisdiction is independent of others. Nevertheless, individual organizations are using distinct structures, procedures, information communication tools and terminologies. These differences create additional challenges to collaboration, as well as to effective, timely and accurate operational information sharing, which are critical to the success of collective responses.

As more countries and international agencies build/improve EOCs for public health event management, best practices must be identified and implemented in order to ensure that minimum capacity requirements can be met in all public health EOCs to the highest standard possible.

As many States Parties strive to build capacities required to comply with the IHR – for the detection and response to all hazards – there will be ongoing, continued efforts to build capacities in the areas of laboratories, communications, human resources, points of entry, and in other areas needed for event/emergency detection and response. The establishment of an EOC can support collaboration and the coordination among many such preparedness and response activities. An EOC can also be the centre for the coordination of activities during any multidisciplinary, multi-jurisdictional response.

Establishing the EOC-NET, in close collaboration with relevant partners and stakeholders, is intended as a step towards ensuring that States Parties have optimal information and expertise available when building and/or assessing national emergency collaboration and coordination networks for the management of IHR events and emergencies.

This EOC-NET will bring together States Parties, WHO Regional Offices and international response agencies to share and develop common tools, procedures and operational information. It also supports capacity building among States Parties, enabling a more efficient and effective response to events and emergencies that threaten global health security.

The development of the EOC-NET terms of reference [TOR] (see Annex 1) was the result of intensive consultation with WHO headquarters teams, the six WHO Regional Offices and international partners. Participants were invited to share further input on the TOR.
3. Keynote address

Sharing his experience with the Kenya National Disaster Operation Centre (NDOC), Mr Vincent Lee Anami identified some of the major challenges and common issues faced in management of emergency events.

The challenges include: political will and government support; a centralized early warning system; adaption of technology; relocation of the centre; establishment of mobile and satellite disaster operations centres; a 24/7 camera surveillance system connected to other cities and towns; and the coordinated recall of personnel back to their parent ministries and departments.

Some of the common issues encountered in the management of emergency events are largely due to a deficiency in:

- political recognition and support of emergency management;
- leadership related to qualifications or judgment;
- coordination, due to failures in cooperation;
- resources, due to failure of planning;
- planning, due to absence of commitment and continuity;
- support in risk and crisis communications.
4. Updates on WHO EOCs

In relation to organizational structure, the first level supervisor of a WHO EOC\(^2\) manager or focal point is responsible for outbreak alert and response or disaster/emergency management or information and communication technology. The structure by region is as follows:

- HQ SHOC is located with the Alert Response and Operations (ARO) unit, GCR;
- AFRO SHOC is located with Disease Surveillance and Response (DSR);
- AMRO/PAHO EOC is located with Emergency Preparedness and Disaster Relief (PED);
- EMRO SHOC is located with Information Technology and Telecommunication (ITT);
- EURO EOC is located with Alert and Response Operations (ARO), and the ICT focal point is located with Information and Communications Technology (ICT);
- SEARO SHOC is located with Disease Surveillance and Epidemiology (DSE);
- WPRO EOC is located with Emerging Disease Surveillance and Response (ESR).

Key points raised during the regional presentations included:

- The physical size, level of advancement and sophistication of ICT equipment and software vary across WHO EOCs. EURO is planning to build an EOC in the ‘United Nations (UN) City’ in Copenhagen, Denmark. WPRO is currently upgrading its EOC.
- The WHO EOCs support an all-hazards emergency approach. All EOCs serve as central hubs during emergency responses. They provide central meeting spaces, ICT tools and services for managing, coordination and collaboration of emergency responses, and information management (i.e. collection, display and storage) for events and emergency responses. During non-emergency periods, they also provide teleconference/audio conference/videoconference services.
- AMRO EOC, SEARO SHOC and WPRO EOC provide direct logistical support for verification and response to disease outbreaks.
- AMRO EOC introduced ‘HOPE’, an on-line platform that links key partners (ROs, sub-regional advisors, Country Offices, States Parties, and other health agencies) for disaster responses.
- WPRO shared information on standard operating procedures (SOP) and EOC policies (incident management system, regional emergency, IHR duty officer, human resource emergency policy).
- Areas of concern for some EOCs continue to be: funding, maintenance, staffing, networking levels, interoperability for information sharing between EOC and field teams, between WHO Country Offices and States Parties during emergencies, SOP for EOC activation, etc.

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\(^{2}\) EOCs are named in different ways by various parts of the organization: EOC (by AMRO, EURO and WPRO), or Strategic Health Operations Centres (SHOC) (by AFRO, EMRO, SEARO and WHO HQ).
5. EOCs and emergency response systems in States Parties and other international organizations

Five participants from Australia, China, Moldova, the United Kingdom and the United States shared experience in public health emergency response in the context of EOCs. One regional organization (European Commission) and two international organizations (International Atomic Energy Agency and the UN Office for Coordination of Humanitarian Affairs) presented the emergency management systems in their organizations.

The Aileen Plant National Incident Room (NIR) is located within the Australia Department of Health and Ageing. The emergency management system takes an all-hazards, comprehensive, integrated and flexible approach. The Australian Government’s response to emergencies uses multiple tiers of organizations and committees to coordinate the prevention, preparedness, response and recovery programmes to manage emergencies. The National Crisis Committee is the primary forum for coordinating a national response and for managing the national consequences of a crisis.

The NIR is activated as requested during public health emergencies. A major function of the NIR is to coordinate national emergency responses: to cooperate and collaborate on decision-making with other government agencies, states and territories who have primary response responsibilities, to coordinate information, and to deploy resources. The NIR uses an Incident Management System (IMS) that has a built-in mechanism for sharing information between stakeholders using XML standards featuring interoperability, flexibility and adaptability. The NIR has many SOPs and systems applied in response to emergencies.

The Health Emergency Response Command Center (HERCC) of the China Ministry of Health (MoH) utilizes a four-tier system of national emergency response platforms for public health emergency responses: root emergency platform; county level platform; provincial level platform; and state level platform. The HERCC links together the national emergency response command system, the health information system, and the health emergency response command system.

HERCC operates continuously and during events/emergencies. Its primary ongoing function is for planning and preparedness: surveillance, risk assessment, early warning, exercises and training, emergency team and resource management, preparedness planning and technical protocol management. Its primary function during events/emergencies is to launch and terminate emergency response mechanisms: data analysis and assessment, deploying teams and resources, consultation and decision-making support, taking action/decision implementation, evaluation, etc.
Major challenges facing HERCC include: establishing optimum connection with mobile health emergency response units, improving the management of HERCC, and establishing or improving related standards, procedures and tools.

The Moldova National Centre of Public Health (NCP) is in the process of setting up the National Public Health Emergency Operations Centre. The NCP is appointed by the MoH as the national IHR focal point and the coordinator of preparedness, responses and management of public health emergencies. The NCP is implementing a national surveillance electronic system, a new electronic reporting system for surveillance of communicable diseases and public health events. The NCP has established rapid response teams in cooperation with experts from the health system for unexpected and unusual public health events and emergencies.

The NCP faces the following challenges:

- Developing and adjusting the public health EOC according to requirements, SOP for data collection and management in public health events.
- Improving collaboration and avoiding competition with the MoH operations centre.
- Setting up and maintaining the early warning and rapid response systems (EWRS) and updating the list of events for MoH emergency notification.
- Revising standard case definitions for priority infectious diseases.
- Continuing to implement the real-time electronic surveillance system.
- Training of personnel in accordance with international standards.

The primary functions of the United Kingdom National Emergency Co-ordination Centre (NECC), located in the Health Protection Agency (HPA), include:

- Supporting the Incident Director to direct and coordinate the agency’s response strategy and operations.
- Advising on policy as directed by the NECC Chief Executive Officer (CEO).
- Managing information.
- Liaising with MoH and other government departments and agencies, and implementing tasking.
- Providing situation reports (SITREP) briefings to the CEO and other senior staff.
- Providing logistical and resource support for HPA responders.
- Providing a forward-looking perspective on issues that may arise.
- Coordinating and directing strategic meetings and/or teleconferences.
- Managing the information flow to the public domain via the media and other stakeholders.
- Producing specialized briefing papers for use by agency representatives.

The NECC is activated for both event management and emergency response. Similar structures exist at regional and divisional levels.

The United States national public health emergency response system comprises the National Incident Management System (NIMS), the Incident Command System (ICS), the National Response Framework (NRF), the Public Health and Medical Services Emergency Support Function managed by the Department of Health and Human Services (HHS), and the Secretary’s Operations Center (SOC). The SOC serves as the national IHR focal point.
The functions of the EOC of Centers for Disease Control and Prevention (CDC) include situational awareness, operations, risk communications, logistics, emergency personnel staffing, planning, training, exercising and evaluation. Examples of specific tasks performed by staff within the CDC EOC are to:

- Inform, coordinate, and enable CDC's response activities 24/7, 365 days per year.
- Enable the activation of the EOC and serve as the crisis action team for all operational coordination.
- Provide all audiovisual, communications, and administrative support for the EOC and alternate operating facilities by maintaining equipment and providing support to all users of these facilities.
- Provide situational awareness of all operationally relevant information for CDC leadership and HHS.
- Provide CDC with a global all hazards situation awareness capability to improve information sharing, support unity of effort and enhance decision support by implementing knowledge management capabilities and processes to support CDC response operations.
- Develop, coordinate and implement plans of action, SOPs and other protocols with internal and external partners.
- Enhance preparedness of staff by conducting training on procedures.
- Coordinate and manage all aspects of response preparedness and full-scale exercise activities with internal and external partners.
- Provide continuous logistics support (i.e. material, transportation and support services) to deploying or deployed CDC personnel, including those working in the EOC, in support of CDC outbreak and emergency response activities.
- Provide emergency personnel staffing.
- Lead CDC's emergency communications for all-hazards preparedness and response by ensuring that timely, consistent, targeted and actionable information reaches the public and stakeholders during emergencies.

The European Commission (EC) has established an Early Warning and Response System (EWRS) to bring together the EC and the competent public health authorities in each States Party, and to promote cooperation and coordination for the prevention and control of communicable diseases. EWRS also supports the detection and management of communicable disease threats.

The Office for the Coordination of Humanitarian Affairs (OCHA) has a Global Disaster Alert and Coordination System (GDACS) and an on-line disaster coordination platform called the 'Virtual On-Site Operations Coordination Centre’ (OSOCC).

GDACS has two web-based platforms: disaster alert and humanitarian impact estimations, and disaster coordination. GDACS provides open access to the disaster alert and humanitarian impact estimations platform. The disaster coordination platform is activated minutes after a disaster occurs. It enables real-time information exchange and moderated discussions. The access is password protected and only open to disaster managers. Virtual OSOCC is used in disasters and simulation exercises.

Challenges faced by the two OCHA systems are: defining their participants and scope; their roles as ‘decision support’ versus ‘command and control; improving interoperability; providing products and
procedures; advocating for standardization, which improves predictability; improving frequency of use; conducting evaluations; and introducing best practices for evolution of the systems.

The Established International Framework for Emergency Preparedness and Response of the International Atomic Energy Agency (IAEA) is composed of various protocols and operational arrangements, such as the Emergency Notification and Assistance Technical Operations Manual and the Joint Radiation Emergency Management Plan of the International Organizations. The IAEA Incident and Emergency Centre (IEC) is the global focal point for international preparedness and response to nuclear and radiological safety or security related incidents, emergencies, threats or events of media interest. The primary functions of the IEC are:

- notification and official information exchange through officially designated contact points;
- provision of public information in timely, clear, correct and easily understandable ways;
- assessment of potential emergency consequences and prognosis of possible emergency progression;
- provision of assistance and coordination, on request;
- coordination of inter-agency responses, to achieve synergy and speak with ‘one voice’.

The role of IAEA is to develop standards, guidance and tools, conduct emergency preparedness reviews, strengthen both capacity building and IAEA’s in-house and inter-agency preparedness.
6. Capacity building

The WHO Emergency Response Framework (ERF) is a common operational platform for the organization’s work in both humanitarian and public health emergencies. The ERF goals are to strengthen WHO leadership, enhance coordination, increase predictability and demonstrate accountability. The major components of ERF include WHO’s core commitments, risk assessment, grading, critical functions, performance standards, response procedures, policies on surge and ‘no regrets’, and leadership of the organization’s response to emergencies.

WHO EOCs serve as a platform to implement and incorporate the ERF policy through providing the following functions during emergency responses:

- Record events, assessment results and grading decisions.
- Act as a forum for policy, managerial and operational decision-making, including re-purposing of WHO assets.
- Coordinate day-to-day operations and core services.
- Manage meetings, information and communication.
- Coordinate technical working groups.
- Coordinate and monitor deployment of staff, logistics etc.
- Monitor WHO Performance Standards in responses.

WHO EOCs should also support readiness through:

- Readiness plan (at all levels of WHO) and checklists.
- Institutional surge policy.
- Staff re-purposing plan.
- Organizational chart and hierarchy, task sheets and deliverables related to critical functions (‘Event manager’ and ‘Event supporting team’ manuals).
- SOPs.
- Simulations and exercises.
- Regular training.
- Multi-emergency configuration.
- Contingency planning at country level.

WHO is currently developing the Health Emergency Risk Management (HERM) Framework. The aim is to develop standards in emergency risk management and provide technical support to address capacity gaps in order to ensure that all countries meet minimum capacity requirements dictated

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3 ‘Surge policy’ means to guide and ensure the rapid deployment of appropriate experts from within the organization (staff) as well as externally (through stand-by partners, consultants and others) to enhance health sector response capacity in emergencies.

4 At the onset of all emergencies, WHO ensures that predictable levels of staff and funds are made available to the WHO Country Offices, even if it is later realized that less is required, with full support from the organization and without blame or regret. This policy affirms that it is better to err on the side of over-resourcing the critical functions rather than risk failure by under-resourcing.
by instruments such as the IHR and the Pandemic Influenza Preparedness (PIP) Framework. HERM identifies the essential components of health emergency risk management, including policies and resources, planning and coordination, information and knowledge management, health infrastructure and logistics, health and related services, and community HERM capacities.

WHO WPRO manages public health emergencies under the Asia Pacific Strategy for Emerging Diseases and IHR. WPRO held the Informal Consultation on EOC and Response Logistics in Philippines [2012] and holds annual meetings of the Technical Advisory Group to assess current capacities, identify regional needs, and provide technical assistance to States Parties in building EOCs. The strategy is to build and operate a regional EOC and to develop SOP, training, as well as a framework for technical assistance in the region.
7. EOC technical components

a. Operational Satellite Applications Programme

The Operational Satellite Applications Programme (UNOSAT), developed by the United Nations Institute for Training and Research (UNITAR), focuses on researching and applying solutions in geospatial information, satellite data/imagery analysis, and integrated systems (GIS, navigation, geopositioning). It is moving towards near real-time imagery access and analysis for public health emergency operations support as a complement to field inspection and presence, and can be readily integrated with other geo-located field information in GIS.

b. Virtual EOC

A ‘virtual EOC’ is software that provides access to EOC data electronically. Virtual EOC software is needed to create a permanent record of key operational information during an incident response, to access operational information securely from anywhere, to support day-to-day activities in an EOC, and to share operational information with response partners.

The following criteria are suggested when choosing virtual EOC software:

- combine the strengths of static documents and standard web applications;
- web-based so it can be accessed from anywhere;
- supports synchronized web servers in multiple locations (for widely dispersed organizations);
- supports saving and working with data offline, synchronizing with the main server when online;
- supports selective information sharing (access control);
- supports data sharing with other information systems using open standards;
- supports use on mobile devices;
- incorporates situation mapping of data;
- enhances daily operations, not just emergency response.

In 2012, virtual EOC software WebEOC was used to manage and share operational information between WHO AFRO and WHO Headquarters during several outbreak responses, enabling effective flow of operational information between Headquarters and the AFRO EOC.

c. Health data and health information standards

Reliable health information systems are essential for timely responses to public health events and emergencies. Equally, EOC-related data elements that are not interoperable between and within information systems hinder timely responses to emergencies.
Challenges of data acquisition and management from disparate sources call for common data architecture and data standardization. Timely and seamless flow of operational information requires harmonized and interoperable data elements between and within systems.

A minimum (essential) data set and corresponding data/information exchange standards should be defined and agreed to support seamless exchange of data and information between multiple stakeholders in a timely manner, in addition to development and/or augmentation of an eHealth architecture for EOC information exchange based on health IT and health information data standards.
8. Public Health EOC network (EOC-NET): key areas of work

During the meeting, group discussions focused on three questions related to the operational scope of EOC-NET: 1) What is needed for an effective response and where can public health EOCs specifically help? 2) What are the essential key components of an EOC in terms of building core capacities? 3) What essential operational information do EOCs need to share and what are some potential ways of doing so?

**Group 1.** The focus of this group was public health EOC training and assessments. The group concluded that the required core capacities for EOCs include:

- Obtaining political commitment and support of key stakeholders.
- Developing operations framework/terms of reference.
- Having a defined management structure.
- Applying minimum acceptable data/information exchange standards, including the ability to share related information on international data and communications networks.
- Developing contingency plans/business continuity plans.
- Training capacity for both staff and stakeholders.
- Evaluation.
- Simulation, table top exercises, communication exercises.

**Group 2.** With a public health EOC procedures and tools focus, the group suggested taking common approaches for all EOCs and building capacities to support countries in dealing with all-hazard emergencies. The group proposed the following essential EOC procedures and tools:

- Standards of triggering criteria for setting functional levels of operation at the international, regional and local levels, and an activation checklist.
- Recommendations on scope, governance, command systems, EOC functions, minimum human resources, emergency logistics, best practices of public health EOCs, and linkages to national emergency plans and animal health.
- Procedures for international notification.
- Recommendations on minimum information-gathering tool for emergencies.
- Task management tools.
- Tools for emergency exercises.
- Guidelines for use of an EOC during and outside of a crisis.

**Group 3.** Focused on EOC infrastructure, and information-sharing mechanisms. The group concluded that:

- EOCs can help with sharing of information for decision-making and management of resources.
This information should be timely, accurate and relevant. An ideal process would include:
collection of information from different sources and forwarding to EOC, validation, verification,
recording/storing, analysis/processing, and distribution or routing.

- There are some existing standards relating to EOC infrastructure. The EOC-NET should conduct
  standards reviews and adapt existing standards to public health agencies, and develop a
document based on the review and adaptation, to be used as an assessment tool for existing
EOCs in countries and organizations.

- In terms of IHR core capacities 4, 5, and 6 (i.e. for preparedness, response and risk
  communications respectively), EOCs can enable the development and exercising of plans, and
train emergency responders (points of entry, rapid response, etc.).

- The core components required for any functional EOC include staff, ‘stuff’ and systems [i.e.
trained EOC personnel, the EOC facility and its associated equipment, and the policies, plans
and procedures needed to operate the EOC].

Effective and trustful partnership, agreed network vision and objectives, as well as TORs/priorities,
effective risk management, sound operational plan and timely implementation are critical to
successful management of the EOC-NET.

Risks associated with the EOC-NET include the following: varying participant expectations and
required outcomes; inadequate initial trust within the network; lack of effective/consistent
leadership and management for the network; lack of necessary funding and human resources;
unable to enrol most appropriate participants or experts due to lack of resources [e.g. time,
funds and/or expertise]; unable to communicate effectively due to language/international time
differences and email system restrictions; failure to involve professional assistance and expertise
[e.g. legal, financial, procurement and risk management] in managing the network at the right
stage; external participants breach WHO rules on telecommunications, data protection, conflict of
interest, copyright, etc.; and the network collaboration parties include experts and observers from
the private sector.

Working with EOC-NET participants, the Secretariat will develop tools and measures to mitigate
these risks, such as effective communication and management mechanisms for EOC-NET,
establish working groups (WG) and define respective roles and responsibilities of participants, and
coordinate work plans and activities of EOC-NET.

To achieve the objectives of EOC-NET, the Secretariat proposed four WGs:

a) Infrastructure, technologies and multi-format information exchange platform.

b) Minimum data elements (MDE) and standards.

c) EOC common procedures and protocols.

d) Public health EOC training and exercises.

Terms of reference and structures for these WGs will be discussed and defined with potential EOC-
NET participants. Following discussions during the meeting, a fifth WG [focusing on public health
EOC terminology] was removed from the list and agreement was reached that the work will be
conducted by the minimum data elements and standards working group. The meeting participants
agreed that these four areas should be the key areas of work of the EOC-NET.
Annex 1: EOC-NET Terms of reference

Article 1: Name

The Public Health Emergency Operations Centre Network (EOC-NET) is established with the vision and objectives stated in Article 3 and 4 of these Terms of reference.

Article 2: Status

The EOC-NET is administered by the World Health Organization ("WHO") through its Department of Global Capacities, Alert and Response (GCR). The EOC-NET is not an independent legal entity but a collaborative mechanism between the interested parties including WHO and the EOC-NET participants. The operations of the EOC-NET shall in all respects be administered in accordance with the WHO Constitution, WHO's Financial and Staff Regulations and Rules, Manual provisions, and applicable policies, procedures and practices.

Article 3: Vision

WHO constitution, Article 2.d. requests that the Organization: “In order to achieve its objective, the functions of the Organization shall be: [...] (d) to furnish appropriate technical assistance and, in emergencies, necessary aid upon the request or acceptance of Governments”.

The IHR (2005) Article 13 requests that each State Party shall develop, strengthen and maintain the capacity to respond promptly and effectively to public health risks and public health emergencies of international concern.

Sixty-fifth World Health Assembly Resolution 23 on Implementation of International Health Regulations (IHR) (2005) requested the WHO Director-General to build and strengthen the capacities of the Secretariat to perform fully and effectively the functions entrusted to it under the IHR (2005), in particular through strategic health operations that provide support to countries.

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5 The EOC-NET concept and terms of reference were developed by Paul Michael Cox and Jian Li, with contributions from colleagues at WHO headquarters: Isabelle Nuttall, Richard John Brennan, Najeeb Al Shorbaji, Armand Bejuttluahu, Maurizio Barbeschi, Patrick Anthony Drury, Sergey Romualdovich Eremin, Erika Garcia, Michelle Shameem Gayer, Fernando Gonzalez-Martín, Ramesh Krishnamurthy, Jered Markoff, Issa Matta, Bruce Jay Plotkin, Mark Simpson; the WHO African Regional Office: Stella Anjuangwe, Benido Impouma, Kalula Kalambay, Yaya Duwa Sanyang, Senait Tekeste; the Regional Office for the Americas: Maria Almiron, Jean-Luc Poncelet, Leonardo Hernandez Galindo; the WHO Regional Office for the Eastern Mediterranean: Emad Marji, Khaled Shams, Alexandra Simon-Taha; at the Regional Office for Europe Jukka Tapani A Pukkila, Ana Paula Coutinho, Dennis Faix, Gerald Rockenschaub, Cyril Molines; the WHO Regional Office for South-East Asia: Richard Brown, Sanjeev Kashyap, Jan-Erik Larsen, Roderico Ofrin; the WHO Regional Office for the Western Pacific: Ailan Li, Chin-Kei Lee, Remy Prohom, and Panu Saaristo of the International Federation of Red Cross and Red Crescent Societies. The TOR were further developed by participants of the EOC-NET consultation meeting, as listed in Annex 2.
regional and trans-regional networks of States Parties in detection, reporting and assessment of, response to, and capacity strengthening in public health emergencies. The same Sixty-fifth World Health Assembly in resolution 20 requested WHO lead the UN Health Cluster and “to provide a faster, more effective and more predictable humanitarian response by operationalizing the Emergency Response Framework”.

The EOC-NET is established to meet the above requirement, with the vision that all public health emergency operation centres (EOC) will have the capacity to perform core supporting functions to ensure effective response to public health risks and public health emergencies and especially those of international concern.

Article 4: Objectives

The EOC-NET aims to achieve the following objectives:

• To support States Parties in building their public health EOC capacity (including communication, information management, mobilization, coordination and collaboration with other partners, etc.) as part of their national emergency response framework;
• To share expertise, lessons and experiences in building, evaluating, exercising and utilizing EOCs for public health emergency response;
• To identify key needs of information and communication technologies (ICT) and explore/test possible solutions;
• To identify the minimum data set (MDS) and standards related to public health EOCs;
• To develop and make available common procedures and protocols for public health EOCs and promote best practices;
• To develop mechanisms and tools to support necessary information gathering and sharing among relevant public health EOCs during health operations; and
• To develop and implement EOC training programmes.

Article 5: Participants

The EOC-NET may comprise public health EOCs of States Parties and WHO, including WHO headquarters, Regional Offices, and Country Offices.

Based on needs, WHO may invite other inter-governmental organizations, non governmental organizations and other partners who have active involvement in preparing for and responding to public health risks and public health emergencies.

Article 6: Secretariat support

Subject to the availability of sufficient human and financial resources for this purpose, secretariat and planning support for the EOC-NET will be provided by WHO, acting through the GCR Department (hereinafter referred to as the “Secretariat”).
Article 7: Communication resources

The participants of the EOC-NET may utilize face-to-face meetings and electronic communication platforms for the exchange of information related to the work of the EOC-NET.

The need for face-to-face meetings of the EOC-NET will be determined by the Secretariat that will, in its discretion, convene such meetings and develop the related meeting agenda.

Teleconferences will be coordinated by the Secretariat as needed and can be hosted by participants as agreed.

EOC-NET participants will have access to the EOC-NET e-working space that supports on-going communication among EOC-NET participants.

Article 8: Publications

Any publication on the work of the EOC-NET is subject to WHO's rules on publications and will be published by WHO in accordance with its usual procedures and practices.

As a general rule and subject to its discretion, WHO shall be responsible for issuing publications about EOC-NET activities. All decisions about the preparation and dissemination of publications concerning EOC-NET activities shall be made by WHO. For the avoidance of doubt, dissemination of EOC-NET materials will only be made by WHO or as decided on a case-by-case basis by WHO.

Copyright in any publication made by WHO shall be vested in WHO. This also applies if the work is issued by WHO and is a compilation of works by EOC-NET participants or is otherwise a work prepared with input from one or more EOC-NET participants.

Any publication about EOC-NET activities by an EOC-NET participant shall be subject to review and approval by WHO prior to its issuance and shall contain appropriate disclaimers as decided by WHO, including that the content does not necessarily reflect the views or stated policy of the EOC-NET or the Secretariat.

Article 9: Confidentiality

The participants of the EOC-NET agree:

To maintain confidentiality of information shared among EOC-NET participants, except when explicitly indicated otherwise by WHO;

To maintain confidentiality about views of the various participants and the deliberations of the EOC-NET, except with regard to agreed statements and reports issued by WHO or with the consent of WHO; and
Not to make public statements about EOC-NET activities or public statements on behalf of WHO or any members of the EOC-Net unless specifically requested to do so by the secretariat.

**Article 10: Termination**

Any participant of the EOC-NET has the right to withdraw from participation in the EOC-NET subject to the orderly conclusion of any on-going activities. The involvement of any participant shall terminate if and when this participant ceases to meet the criteria set forth in Article 5 or no longer subscribes to the objectives of the EOC-NET as described in Article 4.

WHO has the right to cease the administration of the EOC-NET, subject to three months’ prior written notice to all EOC-NET participants and subject to the orderly conclusion of any on-going activities.

In addition, WHO has the right to terminate the participation of any EOC-NET participant at any time.

**Article 11: WHO Name and emblem**

Without the prior written consent of WHO, no participant shall in any statement or material of an advertising or promotional nature, refer to its relationship with WHO or use name and emblem of WHO.

**Article 12: Amendments**

These terms of reference may be amended by WHO.
Annex 2: Meeting participants

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6 This list comprises the participants who attended the meeting. HQ observers from HSE/ADGO, GCR, and PEC/ERM are not included.
Consultation meeting | Geneva, 19–20 November 2012

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Other UN agencies

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WHO Regional Office for Europe (EURO)

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SHOC Room Focal Point
SE/DSE Disease Surveillance and Epidemiology (WHO/WP/RGO/DSE)
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<thead>
<tr>
<th>WHO Regional Office for the Western Pacific (WPRO)</th>
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<tbody>
<tr>
<td><strong>Mr Xavier Dufrenot</strong>&lt;br&gt;Technical Officer – Logistics&lt;br&gt;Emerging Disease Surveillance and Response&lt;br&gt;Division of Health Security and Emergencies</td>
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<tr>
<td><strong>Dr Keiji Fukuda</strong>&lt;br&gt;Assistant Director General&lt;br&gt;Health Security and Environment Cluster (HSE)</td>
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<tr>
<td><strong>Mr Paul Cox</strong>&lt;br&gt;Team Leader, Strategic Health Operations Centre&lt;br&gt;Alert and Response Operations Unit&lt;br&gt;Department of Global Capacities, Alert and Response (GCR/ARO/SHOC)</td>
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<tr>
<td><strong>Dr Michelle Gayer</strong>&lt;br&gt;Coordinator, Surge &amp; Crisis Support (SCT) Unit&lt;br&gt;Emergency Risk Management &amp; Humanitarian Response (ERM) Department&lt;br&gt;Polio, Emergencies, Country Collaboration (PEC) Cluster (PEC/ERM/SCT)</td>
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<tr>
<td><strong>Dr Ramesh Krishnamurthy</strong>&lt;br&gt;Technical Officer, Knowledge Management and Sharing Innovation, Information, Evidence and Research Cluster (IER/KMS)</td>
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<tr>
<td><strong>Dr Vernon J. Lee</strong>&lt;br&gt;Adviser, Health Security and Environment Cluster (HSE/HEA)</td>
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<tr>
<td><strong>Dr Jian Li</strong>&lt;br&gt;Technical Officer, Strategic Health Operations Centre&lt;br&gt;Alert and Response Operations Unit&lt;br&gt;Department of Global Capacities, Alert and Response (GCR/ARO/SHOC)</td>
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<tr>
<td><strong>Mr Jered Markoff</strong>&lt;br&gt;Technical Officer, Strategic Health Operations Centre&lt;br&gt;Alert and Response Operations Unit&lt;br&gt;Department of Global Capacities, Alert and Response (GCR/ARO/SHOC)</td>
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<tr>
<td><strong>Dr Johannes Schnitzler</strong>&lt;br&gt;Medical Officer, Risk Assessment and Decision Support&lt;br&gt;Alert and Response Operations Unit&lt;br&gt;Department of Global Capacities, Alert and Response (GCR/ARO/ADS)</td>
</tr>
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</table>

| Mr Mark Simpson<br>Assistant (Multi Media)<br>Strategic Health Operations Centre<br>Alert and Response Operations Unit<br>Department of Global Capacities, Alert and Response (GCR/ARO/SHOC) |

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<th>Administrative Support</th>
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<tr>
<td><strong>Mrs Marion Buch-Jorgensen</strong>&lt;br&gt;Secretary, Risk Assessment and Decision Support&lt;br&gt;Alert and Response Operations Unit&lt;br&gt;Department of Global Capacities, Alert and Response (GCR/ARO/ADS)</td>
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| Mrs Marion Buch-Jorgensen<br>Secretary, Risk Assessment and Decision Support<br>Alert and Response Operations Unit<br>Department of Global Capacities, Alert and Response (GCR/ARO/ADS) |

| Mrs Marion Buch-Jorgensen<br>Secretary, Risk Assessment and Decision Support<br>Alert and Response Operations Unit<br>Department of Global Capacities, Alert and Response (GCR/ARO/ADS) |
## Annex 3: Meeting agenda

Public Health Emergency Operations Centre (EOC) Network Consultation meeting on public health EOC collaboration


### Agenda

**Monday, 19 November 2012**

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<td>Registration</td>
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<tr>
<td>09:00–09:15</td>
<td><strong>Session 1: Welcome and launch of EOC-NET</strong></td>
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<tr>
<td></td>
<td>a) Introduction by Mr Paul Cox</td>
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<td>09:15–09:30</td>
<td>b) Remarks by Dr Keiji Fukuda, Assistant Director-General, Health Security and Environment Cluster</td>
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<td>09:30–09:50</td>
<td>c) Keynote speech: EOC and emergency response: Kenya Experience by Mr Vincent Anami</td>
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<td>09:50–10:10</td>
<td>d) Development of EOC-NET by Mr Paul Cox</td>
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<td></td>
<td>• Background and rationale</td>
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<td>• Terms of reference</td>
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<td>10:10–10:30</td>
<td>Coffee break</td>
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<td>10:30–11:15</td>
<td><strong>Session 2: EOC Systems</strong></td>
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<td>a) Update on the WHO EOC</td>
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<td>• HQ SHOC – Mr Jered Markoff</td>
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<td>• AFRO SHOC – Dr Tareke Constant Manzila</td>
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<td>• AMRO/PAHO EOC – Dr Leonardo Hernandez Galindo</td>
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<td>• EMRO SHOC – Mr Khaled Shamseldin Abou El Azm</td>
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<td>• EURO EOC – Dr Denis Faix</td>
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<td>• SEARO SHOC – Mr Sanjeev Kashyap</td>
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<td>• WPRO EOC – Mr Xavier Dufrenot</td>
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<td>11:15–12:30</td>
<td>b) Public health EOC in States Parties, regional and international organizations:</td>
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<td>• Australia Aileen Plant National Incident Room – Mrs Cath Patterson</td>
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<td>• China Health Emergency Response Command Center of MOH – Mrs Min Xu</td>
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<td>• Moldova Public Health Emergency Operations Center – Dr Stela Gheorghita</td>
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<td>• UK Overview of HPA EOC and Response Arrangement – Dr John Simpson and Ms Tina Endericks</td>
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<td>• USA Public Health Emergency Operations Centers – Mr Peter Rzeszotarski</td>
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<td>• Managing serious cross border threat to health at European Commission level – Dr Paolo Guglielmetti</td>
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<td>12:30–14:00</td>
<td>Lunch and networking</td>
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<td>14:00–14:30</td>
<td><strong>c) OCHA’s Global Disaster Alert and Coordination System (GDACS) and On-Line Disaster Coordination Platform Virtual OSOCC</strong></td>
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<td>Mr Thomas Peter</td>
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<td>14:30–15:00</td>
<td><strong>d) The IAEA’s established International Framework for Emergency Preparedness and Response</strong></td>
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<td>by Mr Florian Baciu</td>
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15:00–15:15 Coffee break

15:15–16:00 **Session 3: Capacity building**
   a) WHO Emergency Response Management Framework – Dr Michelle Gayer
   b) Essential components of health emergency risk management – Dr Vernon Lee
   c) WPRO regional strategy for EOC capacity building – Mr Steve Bice

16:00–16:30 Wrap-up of the day 1 and plan of day 2 – Mr Paul Cox

17:30–18:30 Reception and networking (outside SHOC)

18:30–19:00 SHOC on-site discussion

**Tuesday, 20 November 2012**

09:00–09:15 Recap of Day 1 and objectives of Day 2 – Mr Paul Cox

09:15–10:40 **Session 4: EOC technical components**
   EOC infrastructure and Virtual Operations Centre – Mr Jered Markoff and Mrs Senait Fekadu

10:40–11:00 Coffee break

11:00–11:30 UNITAR Operational Satellite Applications (UNOSAT) – Mr Einar Bjorgo

11:30–12:30 Lunch

13:30–15:30 **Session 5: EOC-NET key areas of work**
   Group discussion to answer three key questions:
   1. What is needed for effective response and where can EOC help?
   2. What are the key components of an EOC in terms of building core capacities?
   3. What essential operational information do EOC need to share and what are some ways of sharing it?
      • Group 1: Public Health EOC Training and Assessments, moderated by Mr Vincent Lee Anami and Mr Thomas Peter
      • Group 2: Public Health EOC procedures and tools, moderated by Dr Edgardo Arza and Mr Ian Clarke
      • Group 3: EOC Infrastructure, information sharing mechanisms, moderated by Mr Jered Markoff and Mr Peter Rzeszotarski

15:30–15:45 Coffee break

15:45–16:30 Reporting of group discussions
   • Group 1 by Mr Thomas Peter
   • Group 2 by Mr Ian Clarke
   • Group 3 by Mr Jered Markoff

16:30–16:45 Managing EOC-NET by Dr Jian Li

16:45–17:15 Wrap-up of the day and closing of the meeting by Mr Paul Cox
For more information, contact:
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