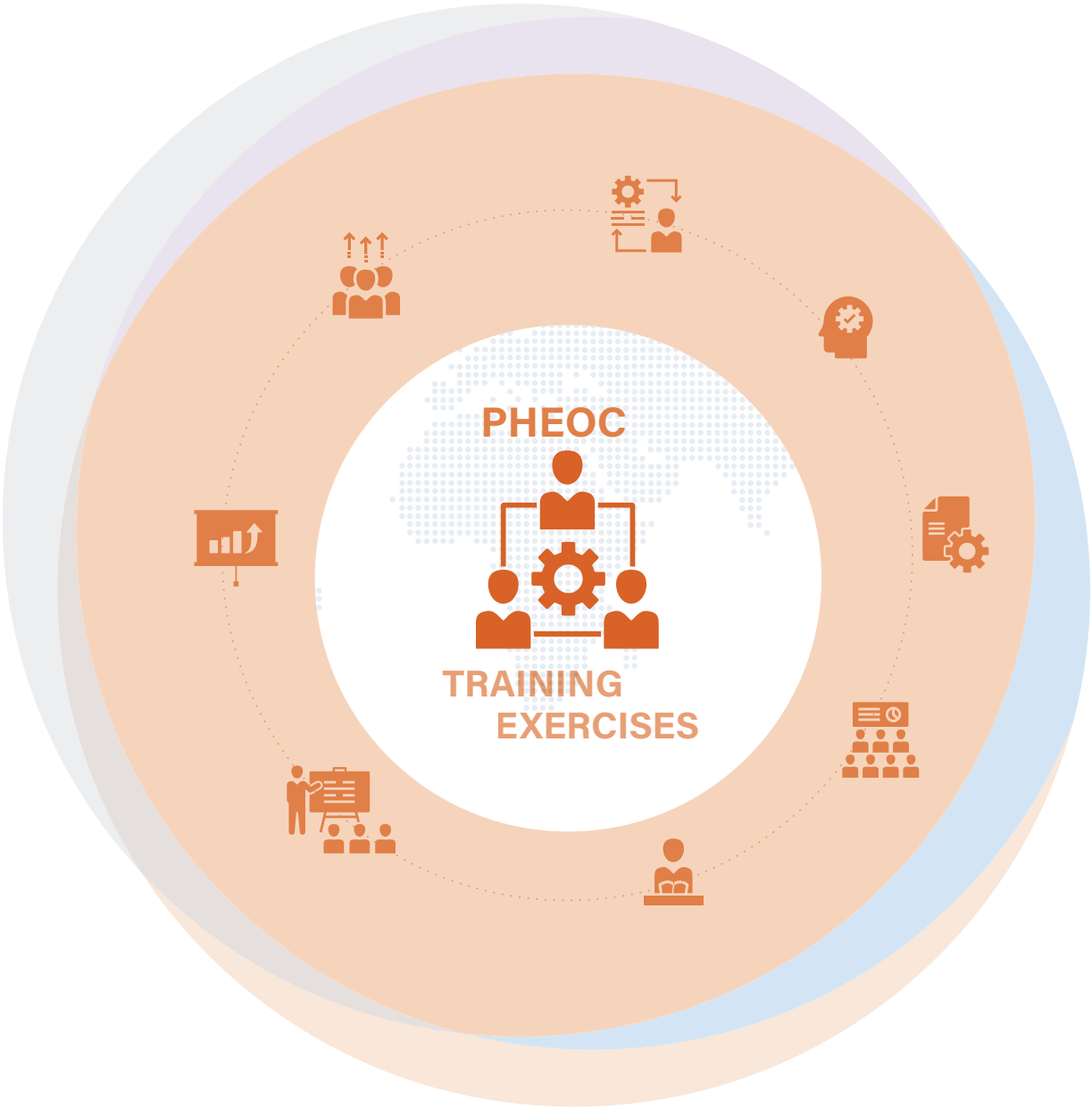
World Health Organization

Handbook for Developing a Public Health Emergency Operations Centre

Part C: Training and Exercises



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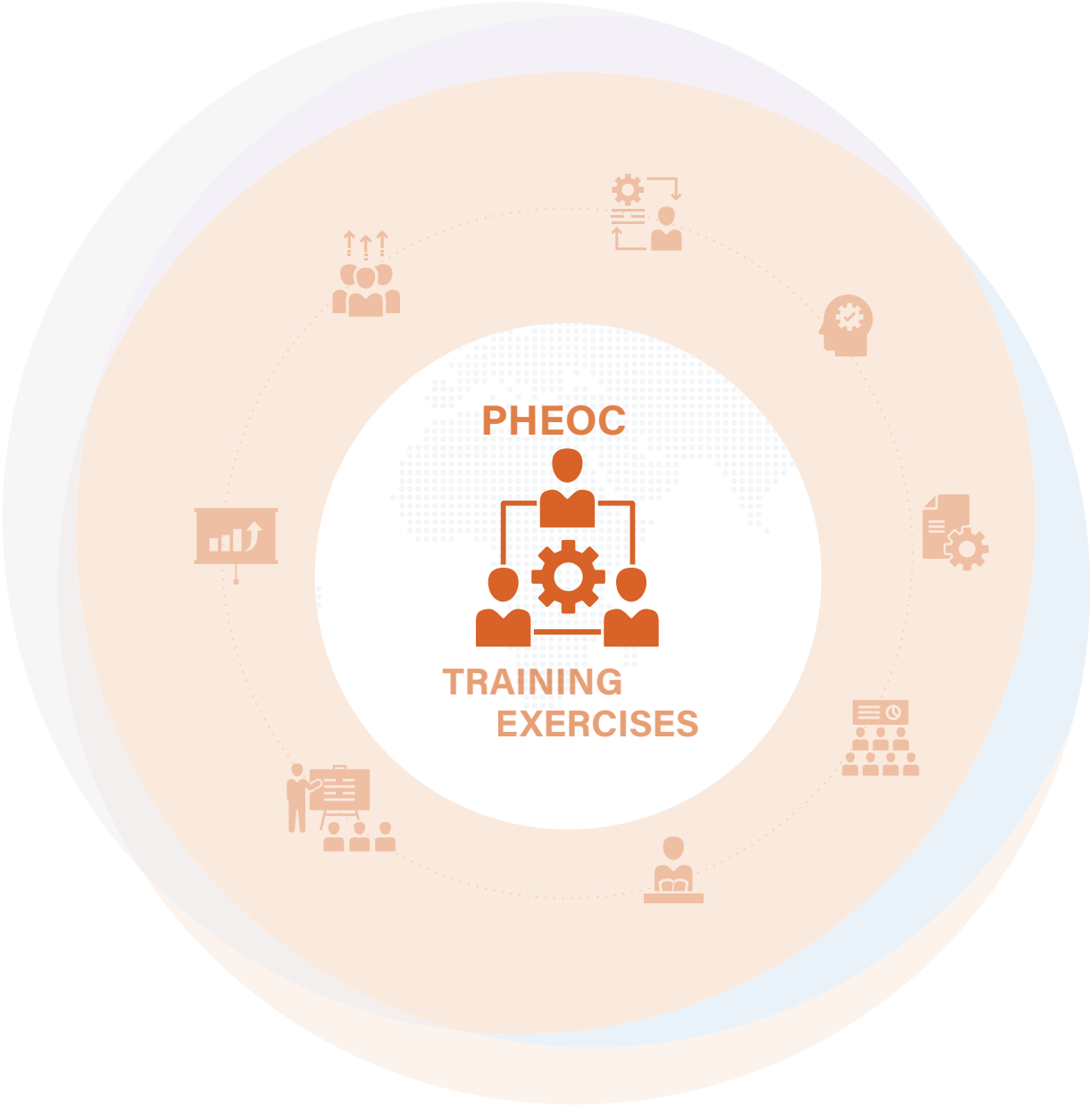

Handbook for developing public health emergency operations centre. Part C: training and exercises

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Contents

Key references

a. Framework for a Public Health Emergency Operations Centre. Geneva: World Health Organization; 2015 (**http://www.who.int/ihr/publications/9789241565134_eng/en/**, accessed 19 April 2018).

b. Summary report of systematic reviews for public health emergency operations centres. Geneva: World Health Organization; 2015. (http://www.who.int/ihr/publications/9789241509787_eng/en/, accessed 19 April 2018)

c. WHO simulation exercise manual. Geneva: World Health Organization; 2017 (**http://www.who.int/ihr/publications/WHO-WHE-CPI-2017.10/en/**, accessed 19 April 2018).

d. Exercise development guide for validating influenza pandemic preparedness plans. Manila: World Health Organization Regional Office for the Western Pacific; 2006 (**http://www.wpro.who.int/emerging_diseases/documents/EDTed_DRAFT1_Exercise_Development_Guide/en/**, accessed 19 April 2018).

e. Homeland security exercise and evaluation program (HSEEP). Washington (DC): United States Federal Emergency Management Agency (FEMA); 2013, updated 2016 (**https://www.fema.gov/media-library/assets/documents/32326**, accessed 19 April 2018).

f. Handbook on simulation exercises in EU public health settings. Solna: European Centre for Disease Prevention and Control; 2014 (**https://ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/Simulation-exercise-manual.pdf**, accessed 19 April 2018).

g. Handbook on evaluation of exercises. Karlstad: Swedish Civil Contingencies Agency (MSB); 2011 (**https://www.msb.se/RibData/Filer/pdf/25885.pdf**, accessed 6 August 2018).

h. Managing exercises – Handbook 3. Australian Emergency Management Handbook Series. Canberra: Australian Institute for Disaster Resilience; 2014.

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The handbook was developed on the basis of the **Framework for a public health emergency operations centre** (the Framework"), the findings of systematic reviews, and expert consultations. The lists of contributors to the PHEOC systematic reviews and development of the Framework are available in the following documents on the WHO website:

- A systematic review of public health emergency operations centres (EOC), December 2013[1]
- 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, July 2015[2]
- Framework for a public health emergency operations centre[3]

This document, the handbook Part C, was written and revised by Mr David Knaggs, with contributions by Mr Paul Cox, Dr Eric Sergienko, Mr William Douglas, Mrs Tamara Niemi, Dr Jian Li, Mr Peng Du, Dr Yan Niu, and experts who participated in the following two EOC-NET working group meetings:

1. EOC-NET working groups meeting, 17–19 October 2016

The following experts reviewed in depth the first draft of handbook Part C (in alphabetical order): Dr Abdurrahman SKM M.Kes, Mr Marshal Bickert, Dr Abdoulaye Bousso, Dr Daouda Coulibaly, Dr Pangiotis Efstathiou, Mr Nevashan Govender, Mr Nicolas Isla, Mr David G. Knaggs, Dr Issa Makumbi, Dr Wessam Mankoula, Dr Eric Sergienko, Dr Felipe Cruz Vega. Further suggestions and contributions were provided by (in alphabetical order): Mr Johnathan Abrahams, Ms Tammy Allen, Dr Anurak Amornpetchsathaporn, Mr Vincent L. Anami, Dr Tao Chen, Mr Paul Cox, Mr Kevin Crampton, Dr Foday Dafae, Dr Enrico Davoli, Mr William Douglas, Dr Peng Du, Dr Ahmed Ali Yakoub Elkhobby, Dr Joan Karanja, Dr Hyo-Jeong Kim, Dr Jian Li, Dr Nikolay Lipskiy, Mr Jered Markoff, Mr Cyril Molines, Mr Joel Myhre, Ms Yan Niu, Mr Mark

1 See: http://www.who.int/ihr/publications/9789241565134_eng/en/ (accessed 5 August 2018).

2 See: http://www.who.int/ihr/publications/WHO_HSE_GCR_2014.1/en/ (accessed 5 August 2018).

3 See: http://www.who.int/ihr/publications/9789241509787_eng/en/ (accessed 5 August 2018).

Nunn, Dr Ali Okhowat, Dr Christopher Perdue, Dr Vason Pinyowiwat, Dr Tran Dai Quang, Dr Norhayati Rusli, Mr Peter Rzeszotarski, Dr Sohel Saikat, Mr Khaled Shamseldin, Mr Curtis Sizemore, Dr Mustafa Bahadir Sucakli, Dr Kokou Tossa, Mr Nicolas Wojnarowski, Dr Nevio Zagaria, Dr Teresa Zakaria. The list of participants is contained in Annex 9.

2. EOC-NET working groups meeting, 27–31 March 2017

Based on the discussions at the above October 2016 meeting, the three documents of the handbook were revised. The following experts reviewed the revised version of the handbook and analysed the alignment between Part A, Part B and Part C (in alphabetical order): Mr Johnathan Abrahams, Mr Marshal Bickert, Dr Abdoulaye Bousso, Dr Tao Chen, Mr Thierry Cordier-Lassalle, Mr Paul Cox, Dr Enrico Davoli, Mr Hani Ali Hafez Dodin, Mr William Douglas, Dr Peng Du, Dr Pangiotis Efstathiou, Dr Kai v. Harbou, Dr Leonardo G. Hernández, Dr Joan Karanja, Dr Pradeep Khasnobis, Mr Hakim Khenniche, Mr David G. Knaggs, Dr Ramesha Saligrama Krishnamurthy, Dr Jian Li, Dr Qun Li, Dr Nikolay Lipskiy, Mr Jered Markoff, Mr Reuben Mccarthy, Mr W. Chuck Menchion, Dr Yan Niu, Dr Ngoy Nsenga, Mr Mark Nunn, Dr Ali Okhowat, Mr Homer Papadopoulos, Dr Christopher Perdue, Dr Jukka Pukkila, Dr Palliri Ravindran, Dr Karen Reddin, Dr Norhayati Rusli, Mr Peter Rzeszotarski, Dr Eric Sergienko, Mr Khaled Shamseldin, Dr Felipe Cruz Vega, Dr Chadia Wannous, Dr Teresa Zakaria. The list of participants is contained in Annex 10.

The document was further reviewed and approved by Dr Thomas Grein, Dr Richard John Brennan, Dr Michael J. Ryan, and Dr Peter Joseph Salama.

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1. Introduction

1.1 Background

In 2015, the World Health Organization (WHO) published the *Framework for a public health emergency operations centre* ("the Framework"). The Framework provides guidance to WHO Member States on the development of public health emergency operations centres, or PHEOCs, as part of their work to meet their commitments to the core capacity requirements of the International Health Regulations (IHR (2005)). The Framework is based on the findings of a series of systematic literature reviews and expert consultations.

Building on the Framework, the series of reviews and expert consultations, the Handbook for developing a public health emergency operations centre ("the handbook") has been developed to provide more detailed guidance for implementing the Framework. The handbook consists of three separate documents:

- *Handbook for developing a public health emergency operations centre Part A: Policy, plans and procedures ("the handbook Part A")*
- *Handbook for developing a public health emergency operations centre Part B: Physical structures, technology, and information systems ("the handbook Part B")*
- *Handbook for developing a public health emergency operations centre Part C: Training and exercises ("the handbook Part C").*

The handbook Part C describes the training, exercises and evaluation/review processes for a PHEOC.

1.2 Use of the handbook Part C

Generally, information given in the Framework is not repeated here, since the intent of the handbook is to support the Framework's implementation. Recognizing that each jurisdiction has unique characteristics in terms of governance, capacity, capability and vulnerability, the contents of the handbook are not intended to be prescriptive. The word "should" appears frequently and is intended to signal best or recommended practice, either to be adopted outright or to be adapted to a jurisdiction's context and circumstances.

The purpose of this handbook Part C is to provide practical guidance to the managers of PHEOCs for training and exercising PHEOC staff. It is hoped that it will also be a useful reference for sponsors[4] and/or sponsoring agencies for the conduct and evaluation of exercises.

More detailed information on how to conduct exercises, including templates, tools and checklists to support exercise implementation at all levels, can be found in the WHO *Simulation exercise manual*.

A rigorous and effective training and exercise programme is fundamental to developing the preparedness of PHEOCs and ultimately, through continuous improvement, to achieving a state of readiness to manage

4 Normally a senior manager from the agency conducting the exercise.

public health emergency events. All PHEOC staff should receive emergency management training and should regularly practise working as a team in response to simulated public health emergencies.

To be able to respond effectively, it is also important that PHEOCs adopt a common approach to preparedness; this is especially relevant in the event of a public health emergency of international concern (PHEIC).

Training

Activities and courses that are intended to develop and improve the knowledge, skills and abilities of emergency responders.

Exercise

A simulation of an emergency situation in order to 1) validate plans, 2) train staff or give them practice in carrying out their roles and responsibilities, or 3) test procedures.

1.3 Types of PHEOC

The mission of a PHEOC will reflect the public health security approach or intentions of senior policy-makers and leaders, outline necessary resource commitments and articulate overall goals and desired outcomes. The type of PHEOC chosen by a country will be influenced by tolerance of risk, availability of resources and whether the mission is subnational, national, regional or international.

Note: Risk is the relationship between a hazard or potential for harm and the vulnerability of a population to the hazard or potential for harm. Assessing risk and accepting a predetermined threshold of risk is a key aspect of emergency management.

The most important consideration is that the PHEOC should be appropriately scaled for its intended purpose and provides effective coordination and management control of national and/or subnational resource allocations without detracting from the necessary capacities for direct response.

1.3.1 Type A PHEOC

A type A PHEOC will be able to respond to a single national public health event or emergency in accordance with the requirements established within the IHR. These include a public health preparedness and response plan that has been validated through exercises, mapping of public health resources, trained staff for all response management functions and the capability to activate the PHEOC within 120 minutes.

A type A PHEOC will be sufficient for most countries. The additional resources required to operate and maintain type B or type C may, in fact, detract from the field resources required for an effective response.

1.3.2 Type B PHEOC

The type B PHEOC is able to respond to multiple subnational public health emergencies or to a single large-scale complex national public health emergency with expanded capabilities beyond those of the

type A PHEOC. The type B PHEOC can support other sectors of government in addressing public health component of a multisectoral incident. There may be the ability to support international operations. There is a dedicated cadre of staff including an PHEOC manager, operations watch staff, planners, logisticians, communications staff and information technology support.

1.3.3 Type C PHEOC

A type C PHEOC will be able to support multiple national, regional or international responses simultaneously and is able 1) to coordinate a whole-of-government response to a public health event, or 2) to manage the public health component of a whole-of-government response to any other incident with public health consequences. The type C PHEOC is intended for, and is likely to have experience in, managing highly complex, multisectoral incidents. Key capabilities and capacities are validated through extensive exercises or real-world experiences. There will be a robust and ongoing training programme that ensures that all core staff members function at an expert level. There will also be additional trained personnel for all positions in the Incident Management System, thus permitting sustained and continuous operations (24/7).

Note: The three types of PHEOC are not necessarily separate. Each may incorporate some characteristics of another (e.g. a type A may have some of the characteristics of a type B or a type C). These handbooks are chiefly concerned with the characteristics of a type A PHEOC, with some consideration of the capacities that would apply to types B and C.

1.4 Standards and best practice

This handbook draws on previous work by WHO and other agencies that support preparedness and response to public health emergencies. It complements the PHEOC Framework (particularly sections 7 and 8) and other related references and handbooks.

The handbook is based on the Incident Management System[5] and related standards and best practice, including:

- *ISO 22320:2011: Societal security – Emergency management – Requirements for incident response*
- *ISO 22300:2012: Societal security – Terminology*
- WHO Western Pacific Regional Office: Emergency Exercise Development, 2009
- *WHO Simulation Exercise Manual (February 2017) and associated tools and templates*
- US Centers for Disease Control and Prevention/Association of Schools of Public Health: *Global Public Health Emergency Management Core Competency Model*.

5 he National Incident Management System (NIMS) of the United States Federal Emergency Management Agency (FEMA).

2. Scope and objectives

2.1 Scope

Based on an all-hazards approach[6] to emergency management, this document:

- provides practical guidance for PHEOC managers and staff on how to plan, develop, manage and evaluate training and exercises;
- includes examples of best practice and describes requirements for training and exercises for a basic, standard and advanced PHEOC;
- adheres to relevant standards and agreements.

2.2 Objectives

The objectives of this document are as follows:

- Improve the efficiency and effectiveness of a PHEOC through the implementation of a training and exercise programme.
- Assist in the development and maintenance of core competencies of PHEOC staff.
- Establish a common foundation for PHEOC training and exercises.
- Implement continuous quality improvement and enhanced risk management through the establishment of a comprehensive training and exercise programme.

6 An all-hazards approach does not require planning for every possible eventuality. Rather, it means that all possible hazards should be considered as a part of a risk analysis.

3. The preparedness cycle

The United Nations Inter-Agency Standing Committee (IASC) Common Framework for Preparedness (the "Common Framework"): 1) supports the development of preparedness capacity using a systematic, country-level approach that collectively assesses capacity and need; 2) uses this assessment for the joint development of programmes and plans (including multisectoral synchronization of plans); and 3) implements these programmes and plans to strengthen preparedness.

Preparedness training and exercises for the PHEOC are part of this broader strategy that supports what can be characterized as a "preparedness cycle" (Figure1) which consists of planning, organizing and equipping, training and exercising, evaluating, and correcting and approving. Where possible, training and exercises should involve national and/or international actors, including the United Nations, the Red Cross/ Red Crescent Movement, nongovernmental organizations (NGOs) and bilateral cooperation partners.

Preparedness should be seen within an overall, nationally-led, disaster risk management (DRM) cycle that includes prevention, mitigation, preparedness, response, continuity of vital operations and recovery measures. Lessons learned from actual emergency responses will also feed into this cycle.

Figure 1. Emergency preparedness cycle

Note: The exercise management cycle (Concept, Plan, Conduct, Evaluation, Review) is addressed in detail in Section 5.1.

4. PHEOC training

Training is any activity that transfers or improves knowledge, skills and/or abilities through learning experiences, and which helps individuals achieve a given level of proficiency. Training can be performed for a number of reasons, including the need to maintain levels of competence and in response to changing circumstances.

4.1 Training programme

A suitable training programme should be designed, developed and periodically reviewed as successive groups of trainees progress from basic awareness through working-level knowledge and on to advanced levels of competence. A training programme comprises:

- needs assessment;
- goals and learning objectives;
- content, methods and materials;
- outcomes to be achieved;
- monitoring, evaluation and review.

According to the type of PHEOC infrastructure (A, B or C), a tiered training programme will be required to include permanent EOC staff, rostered EOC staff, and staff of the Ministry of Health and other relevant agencies.

> **Note: Training should be conducted with the frequency required to establish and maintain the functional requirements of the PHEOC** *(See Section 6)*.

4.2 Typical staff competencies

Staff competencies should be aligned with the functions of the PHEOC, and should include at least the following:

- **Leadership** (e.g. understanding of enabling legislation and regulations, where applicable, and the ability to communicate these to others).
- **Emergency management frameworks** (e.g. knowledge of the Incident Management System).
- **Emergency management functions** (e.g. knowledge of the PHEOC plan, policies, procedures and guidelines, as well as risk assessment).
- **Information technology/information systems** (see Handbook Part B, Chapter 4).

- **Emergency management communications** (e.g. crisis and emergency risk communication, media and public communications, alert notifications, information-sharing).
- **Partnership and collaboration** (e.g. developing and maintaining relationships with internal and external partners).
- **Training development and facilitation** (e.g. analysis of training needs, instructional strategies).
- **Evaluation** (e.g. assessing needs and capacities, recommending actions to address identified gaps, programme and performance evaluation).

More detail on the core competencies required for essential PHEOC functions is provided in Annex 1.

4.3 Types of training

PHEOC training can be geared to an individual (involving personal study and participation in courses, seminars and workshops) or to an organization (involving training and exercise activities that enhance learning opportunities for all PHEOC staff).

Training relevant to personnel working in a PHEOC includes:

- training in the Incident Management System used in the PHEOC;
- training in the specific function the person is expected to fulfil within the PHEOC, including leadership training;
- training on the application of subject matter expertise to public health emergency management.

4.3.1 Individual training

Whatever the type of training, clear learning objectives must be set when developing a training programme. Training objectives should always address knowledge, skills and abilities.[7] Many recognized types of training are designed to build the knowledge, skills and abilities that staff require to function effectively in a PHEOC. These include:

- classroom-based courses;
- e-Learning courses;
- participation in planning and development of PHEOC operating procedures;
- internships, fellowships and orientation sessions;
- site and field assignments that provide training through experience, including lessons identified during real emergencies;
- participation in exercises, peer-to-peer learning, coaching, mentoring and team-building;
- combinations of the above.

Note: A table listing the knowledge, skills and abilities required by individuals for essential PHEOC functions is included in Annex 2.

7 Knowledge = theoretical or practical knowledge of a subject related to the performance of a function. Skills = observable proficiencies developed through training or experience.
Abilities = competence to perform an observable behaviour, or a behaviour that results in an observable product.

4.3.2 Organizational training

Organizational training[8] should reflect the all-hazards approach to public health emergency preparedness. This requires that personnel are competent in a broad spectrum of potential emergencies and are trained to address the worst hazards, consistent with the principles of risk-based planning. Such training can be single- or multi-agency and can be conducted at international, national or subnational levels. Interagency cooperation, interoperable communications and the use of available resources at all levels are essential elements for an effective response to an emergency.

Exercises that encompass the entire emergency management cycle, especially joint exercises involving partners and other agencies, help familiarize PHEOC personnel with emergency plans and allow different agencies to practise working together as teams.

4.4 Training needs assessment

A training needs assessment – both at organizational/institutional level and for individuals – proceeds from 1) assessment of the knowledge, skills and abilities that people require in order to work effectively in a PHEOC, and 2) the training needs and existing opportunities for collaboration with partners and other sectors.[9] These needs are then compared with known or identified shortfalls in order to formulate training objectives.

The needs assessment may be conducted through:

- self-reporting;
- instructor observations;
- student presentations;
- exercises;
- regular reviews conducted by PHEOC management;
- evaluation of a response (after-action review).

Note: A template for documenting a training needs assessment is provided in Annex 3.

4.5 PHEOC training curriculum

A training curriculum should be prepared and maintained for those persons who will staff the PHEOC and those who will be supported by it.[10] The curriculum should include information on training goals, prerequisites, logistics and equipment requirements, trainee and trainer identification, time and place of training and the assessment process.

It is important to define specific learning objectives before developing a training curriculum. The objectives should be clear statements of what each learner is expected to know and should be able to do after completing the course.

8 Organizational training is training to support the EOC's objectives and to meet the training needs that are common across functional areas and support groups.

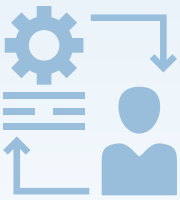
9 See section 7.1 on Framework for a PHEOC.

10 It is important that all agencies involved in the public health emergency response are familiar with the Incident Management System and its constructs.

Annex 4 provides suggested training packages for 1) an introduction to emergency management and the Incident Management System in the PHEOC, and 2) advanced emergency management and PHEOC operations.

4.6 Training evaluation

Evaluation methods should be defined early in the development of a training programme. These will allow instructional designers to find out whether learning objectives have been met and how well courses have been received. Possible evaluation methods include pre-tests, post-tests, observations, presentations, examinations, exercises and self-reports.



5. PHEOC exercises

Exercises

Exercises are controlled, objective-driven activities used for testing, practising or evaluating emergency management processes, procedures or capabilities.

5.1 General

Exercises are used to:

- develop competence in roles and responsibilities of PHEOC staff;
- validate policies, plans, and procedures, as well as the training curriculum;
- test and strengthen the capabilities of functional areas and of the PHEOC as a whole.

Exercises simulate real situations[11] to test and evaluate PHEOC plans and procedures (though not the responders). Exercises help identify gaps and weaknesses in response plans and help to increase the team's confidence in its ability to respond effectively to emergencies.

The following operational elements should be considered for inclusion in a PHEOC exercise:

- organization/management (putting the Incident Management System into practice);
- activation, escalation and deactivation procedures for the PHEOC plan and emergency response plan;
- adherence to plans and procedures;
- ability of staff to communicate effectively (i.e. practice of internal and technical communications);
- coordination and transfer of information between sections of the Incident Management System; and other response entities
- evaluation of teamwork and decision-making;
- practice and evaluation of public risk communication strategies;
- assessment of needs and utilization of resources, including information and communications technologies (ICT).

11 An exercise is a practice activity that places participants in a simulated environment, requiring them to function in the capacity expected of them in a real event.

5.2 Types of exercise

The type of exercise to be conducted will be determined by its objectives. The selection of an exercise should also take account of the overall schedule for exercise and training.

There are two broad types of exercise – discussion-based and operations-based. In practice, the various exercise types described here may be modified and/or combined in order to meet specific objectives or when resources are limited.

5.2.1. Discussion-based exercises

Discussion-based exercises familiarize participants with current plans, policies, agreements and procedures, or may be used to develop them.

a. Orientation exercises

Orientation exercises are usually conducted as informal discussions and are intended to familiarize players with plans, roles and standard operating procedures, with the emphasis on matters relating to coordination and responsibility. The objective of an orientation exercise should be to identify potential improvements through discussion. Orientation exercises can take the form of seminars or workshops focused on existing processes and case studies. Orientation exercises are the least complex and least costly type of exercise and should be regarded as the minimum prerequisite for reviewing and validating existing plans or plans in development.

Two common variations of an orientation exercise are seminars and workshops. Both of these are based on relatively informal guided discussions:

- **Seminars** are intended to orient participants to authority structures, strategies and plans, policies, protocols, resources, legislation, concepts and ideas. Seminars are also used to give an understanding of interagency or inter-jurisdictional capacities and capabilities.
- A **workshop** has some of the characteristics of a seminar, but with a more defined focus that usually includes the preparation of a product (e.g. a policy, procedure, plan or component of a plan).

b. Table-top exercises

Table-top exercises (sometimes called TTX) are group discussions about a simulated emergency response. They are normally conducted as meetings in a conference setting or a stress-free environment. Led by a facilitator, personnel assigned to the PHEOC are challenged with simulated emergency situations (scenarios) through prepared messages (injects) and problem statements that focus on potential problem areas that have been determined beforehand. Without the pressure of time constraints, table-top exercises examine and evaluate PHEOC plans, procedures and event-specific responses to emergency situations. The emphasis should be on problem-solving rather than spontaneous decision-making. Table-top exercises can vary in complexity and length. This level of participation should be considered the minimum for evaluating coordination and for problem-solving capabilities of the PHEOC.

c. Use of gaming

The use of online video to enhance simulation in emergency management exercises is a significant recent development. Widespread use of the Internet has provided the means to make simulation games and exercises more powerful and accessible. So-called "serious" games complement simulated events and computer-based simulations. Although relatively costly to produce, the games are designed to be both

contextual and interactive. Online games can be readily adapted to suit exercise goals and can be used by participants in different geographical locations.

5.2.2 Operations-based exercises

Operations-based exercises validate plans, policies, agreements and procedures, clarify roles and responsibilities, and identify resource gaps in an operational environment.

a. Drills

Drills are used to train in specific skills and develop cooperation as a limited part of larger organizational responses. Drills help participants to develop confidence in applying skills by using PHEOC operating procedures in a simulated emergency response. Drills are commonly used to test a specific function or process, such as alert and notification, information flow, activation of the emergency plan or other skills.[12]

b. Functional exercises

A functional exercise is designed to practise and evaluate plans, procedures and policies. Functional exercises are more complex than a table-top exercise and demand more comprehensive planning and longer preparation. During a functional exercise, all available tools, technologies and procedures are tested as if a real event were taking place, enabling both strategic and operational issues to be evaluated at the designated PHEOC. A functional exercise may simulate field activities but will not involve the deployment of resources.

Advancing from a table-top exercise to a functional one challenges participants in three ways:

- Simulation is interactive, requiring participants to respond to each other in the roles designated to them in the PHEOC and in event-specific plans.
- A functional exercise is conducted under time constraints that are similar to, or even more challenging than, those encountered in a real event.
- The exercise is usually conducted in the PHEOC facility, so the tools and technologies that are used and evaluated are those normally used in an emergency.

This form of exercise can be very effective as it reproduces stressful situations under time pressure and therefore is more realistic. Functional exercises enable evaluation of the interoperability between different agencies or sectors. Where applicable, participants should include partners and other agencies involved in an emergency response.

The planning, organization and commitment of resources (people, time and material) required for a successful functional exercise should not be underestimated. Sufficient time must be allowed for preparation, documentation, conduct, evaluation and reporting (See section 5.5.7).

c. Full-scale exercises

A full-scale exercise may be appropriate for evaluating the full operational capability of the emergency preparedness and response procedures and systems of the PHEOC.

A full-scale exercise is designed to test many aspects of the PHEOC response and recovery activities. The exercise may include other national or international partners/agencies as well as the field deployment of personnel and resources. Full-scale exercises simulating public health emergencies require lengthy planning

12 WHO (2006) Exercise Development Guide for Validating Influenza Pandemic Preparedness Plans

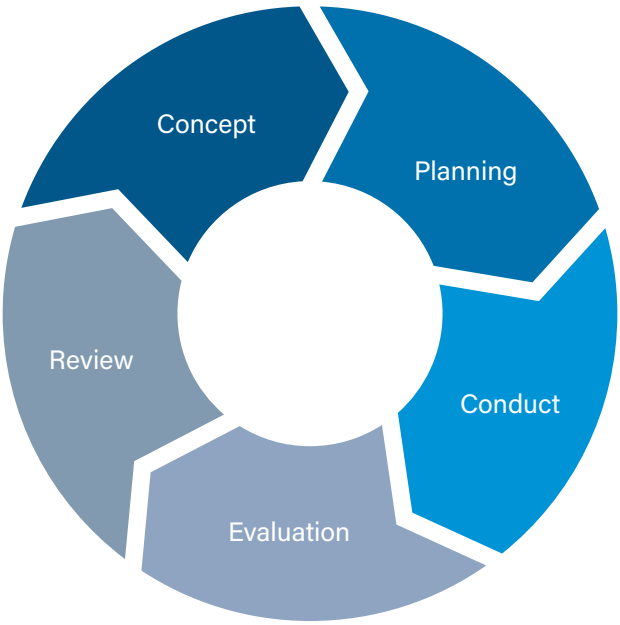
and preparation and therefore are likely to be held infrequently. In any case, full-scale exercises should be conducted only after the PHEOC has successfully completed table-top and/or functional exercises; they should be organized in a realistic setting and should include deployment of the resources required to coordinate and respond to the simulated event, without disrupting infrastructure or placing the public at risk.[13]

5.3 The exercise management cycle

Each exercise should build on previous exercises and events and should address specific capabilities in a cyclical process of increasing difficulty, complexity and refinement. This programme should be reviewed and amended as necessary, and at least on a quarterly basis. A typical exercise management cycle is shown in Figure 2.

The following sections describe the steps in planning and conducting operations-based exercises. Discussion-based exercises and drills do not require the same amount of detailed planning and effort, but the same principles apply. A detailed flowchart illustrating the design, development, conduct and evaluation of an exercise is provided in **Annex 5**.

Figure 2. Exercise management cycle



5.4 The exercise concept

An exercise concept paper should be prepared at the outset by the exercise planning team. The concept paper provides the senior leadership with a synopsis of the exercise, including the aim, objectives and intended scope. The paper states how the components will be structured and outlines the process for achieving the stated objectives.

The concept paper should be approved by senior management to indicate their commitment. Following approval of the concept, an exercise directive should be issued by the exercise sponsor, stating:

13 It should be noted that, when the EOC is not deployed forward, most of its functionality can be tested adequately by a functional exercise.

- what the exercise is intended to achieve;
- when and where the exercise is expected to occur;
- who will participate in the exercise;
- the availability of resources for the planning, conduct and evaluation of the exercise;
- the intentions regarding implementation of the recommendations and lessons identified in the final report of the exercise.

Note: The exercise directive constrains the scope of the exercise and prevents or minimizes any widening of the scope ("scope creep") which may undermine the achievement of the desired outcomes.

5.5 Exercise planning and development

The exercise planning team will be appointed by the exercise director. The planning team will normally be chaired by the exercise director or lead controller and should comprise persons directly involved in the design of the exercise, including the designated exercise lead evaluator and representatives of participating agencies.

The stages of planning and development of an exercise are outlined in Box 1.

Box 1: Stages in exercise planning and development

1. Prepare concept paper
2. Secure buy-in from senior management
3. Define aim, objectives and scope
4. Select the type of exercise
5. Appoint the exercise management team
6. Identify participants
7. Develop the scenario, narrative and events
8. Determine logistical requirements
9. Prepare an exercise management and control plan
10. Develop an evaluation plan
11. Prepare a participants' handbook
12. Check facilities and logistical arrangements
13. Brief controllers/facilitators and evaluators
14. Conduct management team rehearsals.

5.5.1 Setting the aim, objectives and scope

When planning an exercise, the first step is to set the aim, scope and objectives. The aim is what the exercise is intended to achieve overall, and the objectives are the tasks necessary and/or outcomes required to achieve the aim.

Exercise objectives not only define specific goals but also provide a framework for scenario development and exercise evaluation criteria. The exercise objectives must be:

- realistic in number (the fewer the better);
- clear, concise and simply stated;
- specific, measurable (or observable), achievable within available resources, relevant and time-bound (SMART).

Based on the objectives, the scope of the exercise defines the parameters within which the exercise will be conducted. Where necessary, it should state specific inclusions and exclusions. In other words, the scope of the exercise sets realistic limits on the personnel involved, the participation of various agencies, and the resources required to conduct the exercise.

Box 2 gives an example of the aim, objectives and scope of an exercise.

Box 2: Example of the aim, objectives and scope of an exercise

Aim:

To test the readiness of the PHEOC to respond effectively to a potential public health emergency in XYZ.

Objectives:

15. Evaluate the activation procedures of the PHEOC in response to a public health emergency.
16. Exercise the coordination and integration of internal and external response resources by the PHEOC.
17. Assess the ability to establish and maintain intra-agency and multi-jurisdictional communications.
18. Assess the adequacy of plans for the flow of public information and the interface with, and use of, the media.

Scope:

The scope of this exercise includes existing PHEOC staff and use of the procedures described in the PHEOC plan. The exercise will not include members of the public, higher levels of management within the Ministry of Health, or other government agencies.

5.5.2 The planning team

Well-written exercise objectives will ensure that the correct persons participate. Objectives should reflect the capabilities of participants (or players) who will be involved in an exercise. Care should be taken to ensure that those most affected by the outcomes are included in setting the objectives. Ideally, the designated exercise evaluator should be included in the process.

The planning team assigns roles and responsibilities in accordance with the exercise planning governance structure (Annexes 7B and 7C. The team identifies the functions required for the exercise and develops plans, strategies and resources such as:

- the exercise concept document (see Annex 7A);
- the aim, objectives and scope;
- scenario development and exercise inputs (exercise design and writing);
- a detailed budget proposal;
- a risk management strategy;
- an evaluation strategy;
- a media strategy;
- an observer programme;
- exercise plans and instructions (control plan, evaluation plan, logistics plan).

5.5.3 The writing team

Assembling a writing team is a key part of developing an exercise. Writing an exercise requires specialist skills and knowledge. For small exercises, the writing team may be drawn from the planning staff, but for larger exercises it may be drawn from several agencies and/or locations. Ideally, exercise writers should have formal training in writing exercises and relevant skills and experience in the subject matter on which the scenario is based.

5.5.4 Developing scenarios

The exercise scenario describes a series of hypothetical, but plausible, events that require participants to take specific actions. The scenario is based on the exercise concept approved by senior management. It should be derived from the exercise objectives and should test both the preparedness plans and the procedures and systems linked to them.

The scenario is the foundation for a successful exercise. In order for the scenario to be as realistic as possible, it is often necessary to consult experts on the threat presented in the exercise. Depending on the scale of the exercise, the scenario may be presented as a narrative followed by associated and linked events.

> **Note: During the planning process the scenario should be shared only with those who have a need to know.**

While achieving realism is important in public health emergency exercises, it will sometimes be necessary to exaggerate events such as clinical presentations and laboratory reports in order to propel the scenario and engage participants fully.

5.5.5 Exercise sequence of events

Events contained in the scenario should be set out by the exercise planning team in chronological order in a master scenario events list (MSEL) (Annex 7D). The MSEL is used to:

- provide a detailed description of the exercise events in the order of occurrence;
- link exercise messages (injects) to expected, observable actions that are linked to the exercise objectives;
- indicate the timing of each event;
- identify who is responsible for each task;
- provide the exercise control team (and the evaluation team) with a script for conducting the exercise.

5.5.6 Exercise injects

Exercise injects are used in many types of exercise and are particularly important in functional exercises. Injects are scripted messages that are "injected" by the exercise control team to provide participants with additional information in support of the evolving scenario events. Injects provide guidance to exercise controllers on the pace and direction of the exercise.

> **Note: Injects can take many forms, including simulated emails, telephone calls, news reports and briefings. They should be set out in chronological order and included in the exercise management handbook.**

Some injects will be critical to the achievement of exercise objectives and should be highlighted as such in the MSEL. Other injects can be held in reserve and used if the exercise is deviating from the desired path, or as deliberate distractions to challenge information processing capabilities.

Time management is an important function of the MSEL. Some exercises require time to be compressed. "Time jumps", when they are needed, must be managed carefully because they can reduce realism and disorient players.[14]

A suggested template for exercise injects is included at **Annex 7E**.

5.5.7 Resource requirements

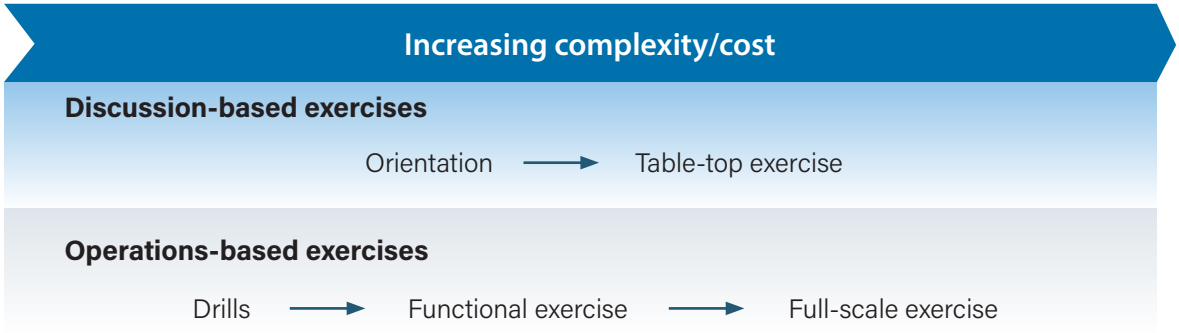
When planning an exercise, careful consideration should be given to the time and resource requirements – not only during the exercise itself but also for the related planning, preparation, evaluation and reporting. The materials, equipment and facilities required will be determined by those planning the exercise as they develop the scenario.

Discussion-based exercises require relatively modest resource commitments. Operations-based exercises are usually very resource-intensive and require careful management. In Figure 3 the types of exercises that can be conducted by a PHEOC are summarized in relation to their complexity and cost.

For more details on resources required for each exercise type see **Annex 4**.

14 A "time jump" is used to accelerate scenario events artificially in order to place players in a situation that will occur at a future point in time. Exercise play is halted briefly and then resumed by means of an inject denoting the change – a "jump" in the sequence of events.

Figure 3. Types of exercise in relation to complexity and cost



5.5.8 Exercise communication strategies

Prior to the start of an operations-based exercise, it is important to warn – and provide information and advice to – non-participating agencies and the public that an exercise is to take place. This will ensure that the conduct of the exercise is not interpreted as a real event.

5.5.9 Exercise documents

The exercise director should ensure that sufficient time is available to prepare exercise documents properly. Documentation provides information for the people involved in designing, conducting and evaluating the exercise.

Thorough documentation will also allow an exercise to be used more than once, providing a valuable return on time invested.

Exercise documentation is essential for a number of reasons:

- Verbal instructions may not be reliable.
- Documents form a permanent record of what has been planned and undertaken (due diligence and compliance) and may help when planning future exercises.
- Documents guide the running of the exercise and support succession planning.
- Documents help to foster commitment to the exercise.

The amount of documentation and the detail required will vary considerably, depending on the size and complexity of the intended exercise (see **Annex 6**). Exercise documentation can be grouped by:

- planning documents;
- management documents;
- evaluation documents.

Note: Guidance on the preparation of selected exercise documents is provided in Annex 6. More detailed guidance can be found in WHO's Simulation exercise manual (see Section 5.8).

5.6 Conduct of the exercise

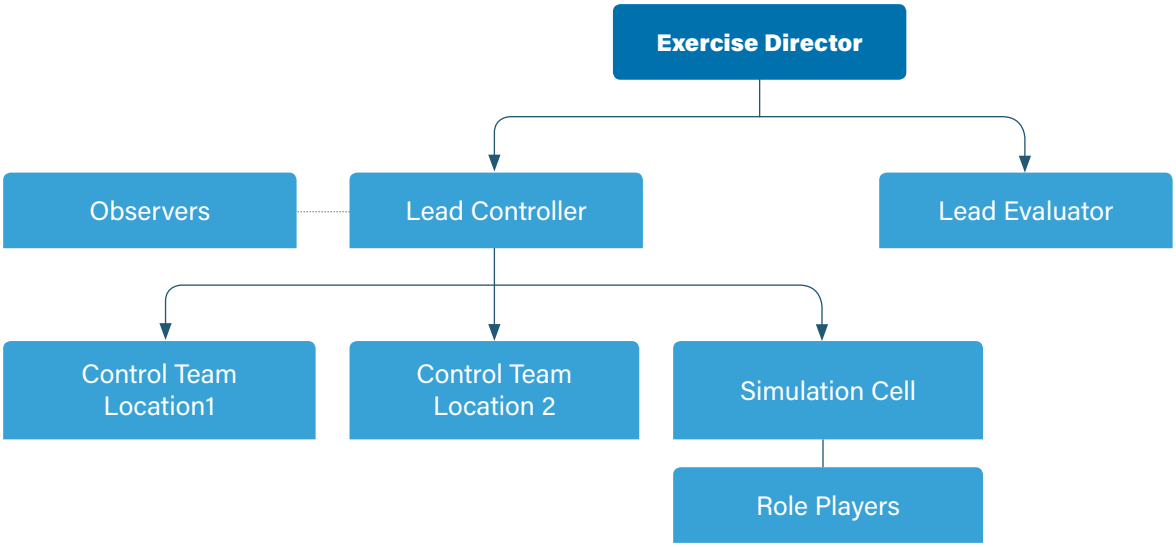
Regardless of the size or type of exercise, a team should be appointed to manage its conduct and evaluate its outcomes against its objectives. The team may vary from a single facilitator assisted by note-takers (for a discussion-based exercise) to a structured management team led by an exercise director (for a functional or full-scale exercise).

5.6.1 Roles and responsibilities of the management team

Many roles and responsibilities have to be performed during an exercise and will vary considerably according to the type and complexity of the exercise (Figure 4). The roles described here relate to a functional exercise:

- **Exercise director**. The exercise director provides strategic oversight and direction for the planning, conduct and evaluation of the exercise. The exercise director is responsible for approving the aim, objectives and supporting documentation, including the concept document, exercise plan and exercise instructions. In smaller exercises the exercise director may also be the lead controller.
- **Controllers**. The lead controller reports to the exercise director. The controllers are responsible for monitoring the flow of the exercise and for ensuring that it is conducted in accordance with the scenario and the established timelines.
- **Facilitators**. In discussion-based exercises facilitators are responsible moderating the discussion, providing injects and ensuring that objectives are thoroughly explored within the time available.
- **Role players.** Role players who simulate roles not performed by participants may be included in the exercise control team. Role players may be organized into dedicated simulation cells.
- **Evaluators**. These are the persons who observe and record the response of the players during the exercise and evaluate effectiveness on the basis of the aim and objectives. The lead evaluator reports to the exercise director. The evaluators are responsible for conducting post-exercise debriefings.
- **Observers**. Observers are usually invited guests who, at the discretion of the exercise director or the exercise sponsor, may be invited to submit their observations as part of the evaluation process. Observers have no official role in the conduct of the exercise.

Figure 4. Exercise management organigram



5.6.2 Controlling the exercise

The lead controller reports to the exercise director. Each exercise event site requires at least one controller who reports to the lead controller. Controllers are responsible for:

- conducting a thorough briefing of all exercise participants (players) prior to the exercise;
- managing all exercise activities to ensure achievement of the objectives;
- safety and risk management during the conduct phase, in accordance with the approved plans;
- managing the MSEL, including role-playing where required;
- managing "exercise time", including time compression and time jumps;
- simulating activities not performed by the participants;
- contributing to the exercise after-action report.

For discussion-based exercises, the facilitator will fulfil the majority of the roles described above.

5.7 Evaluation of the exercise

Evaluation is the cornerstone of any exercise. It comprises observing and recording activities, comparing performance and outcomes against objectives, and identifying strengths and weaknesses.

5.7.1 The evaluation process

The evaluation process includes selection of the lead evaluator, development of exercise evaluation guides, recruitment, training, assigning evaluators, development and finalization of evaluation documentation (including recommendations for improvement), and conduct of a pre-exercise briefing for controllers and evaluators.

The evaluation team gathers all data from the exercise that has been conducted and determines whether the objectives were met. Overall performance, operational effectiveness, quality control, capabilities, strengths, weaknesses, and areas for improvement are all identified. Through observation – one of the main methods of evaluation – exercise evaluators may assess the following:

- plans, policies and procedures used during the exercise;
- achievement of the aim and objectives of the exercise;
- roles and responsibilities of the participants;
- performance of participants in relation to the aim and objectives;
- strengths and weaknesses;
- effectiveness of control, coordination and decisions made in relation to the information available during the exercise;
- information shared with other agencies and the public;
- improvements noted from past exercises.

Ultimately, evaluation will assess the extent to which participants perform actions expected from plans/procedures, gaps identified in the plans, and corrective actions needed to address both.

5.7.2 Post-exercise debriefings

Debriefings are an important exercise evaluation tool. An immediate debriefing should be conducted by the evaluator(s) at the exercise site(s) at the end of the exercise, giving participants the opportunity to provide feedback (including successes and challenges observed) while it is fresh in their minds.

At the start of any debriefing the facilitator should clearly state its aim and objectives. A debriefing may seek to:

- analyse the exercise to determine what worked well, what did not work well and areas for improvement, without apportioning blame;
- address specific questions that arise from the achievement or non-achievement of objectives;
- acknowledge good performance;
- seek constructive information;
- focus on improving procedures and training;
- explore the appropriateness and effectiveness of the exercise;
- record relevant information to enable reports to be compiled;
- summarize major points and suggest follow-up action.

A second, more formal debriefing for representatives of key participating agencies and the exercise management team should be conducted shortly after the end of the exercise. This is designed to identify areas of weakness as well as positive outcomes. Post-exercise debriefings are usually conducted by the exercise director or lead evaluator.

5.7.3 After-action debriefing

The after-action debriefing involves all people assigned to the PHEOC and focuses on the PHEOC's functioning during the exercise. This is often called a "hot wash". It is commonly handled by the head of the planning section and is usually oral. It takes place immediately upon conclusion of the exercise and the decision to deactivate, while information and impressions are still fresh in peoples' minds.

The purpose of post-exercise debriefings and evaluations is to capture ways to improve the functioning of the PHEOC and its plans and procedures, to provide evidence for needed improvements, and to identify additional staff training needs. The two broad methods used to evaluate the functioning of a PHEOC are 1) standards-based evaluation and 2) capabilities-based evaluation.

A standards-based approach requires prior articulation of standards and asks questions of each PHEOC management element:

- What met or exceeded standards?
- What partially met standards?
- What failed to meet a standard?
- Were the failures due to the standard being unachievable, or were they indicative of a need for more training?

The review process mirrors the process undertaken following a real emergency. The response evaluation for a larger event will involve all significant partners, is more structured and may occur a few days or weeks

later. It involves a meeting of all participants where actions, outcomes and issues are reviewed and formal recommendations are noted for future action. This is best accomplished using an independent evaluator.[15]

5.7.4 Evaluation report

An evaluation report, sometimes referred to as the after-action report, provides feedback to participating organizations on their performance during the exercise. All findings of the evaluation (actions taken or not taken and observations) must be included or summarized in the after-action report since this is considered a "timeline" of the exercise. The after-action report should also include 1) strengths and 2) areas for improvement observed by the exercise management staff and participants. The draft evaluation report should be reviewed by the exercise management team and, at their discretion, with all participants and officials, so that comments can be provided before the final report is issued.

The suggested contents of an exercise evaluation report are included at **Annex 7G**.

5.7.5 Implementing corrective action

The final phase of an exercise is improvement planning. Exercises should be regarded as an opportunity for an organization to change before a crisis occurs, rather than afterwards.

Following the evaluation phase, the strengths and weaknesses that are identified and the recommendations proposed are used to develop a set of improvements based on capability gaps. These improvements should then be translated into specific corrective actions within a plan for continued improvement of the PHEOC. The plan will include assignment of tasks and schedules for tracking progress and assessing the impact of corrective actions.

5.8 WHO Simulation exercise manual

WHO has prepared a *Simulation exercise manual*, which aims to:

- support decision-making on which type of simulation exercise to use;
- support users in key steps in planning, designing, implementing and evaluating simulation exercises;
- provide guidance, templates, tools and checklists to support implementation of the exercise at all levels (global, national, regional and community);
- ensure consistency in conducting and designing exercises across the public health community.

Exercise support repository. The manual includes a repository of templates, tools and checklists to support exercise planning, implementation and evaluation at all levels. The Simulation exercise manual, together with supporting templates, tools and checklists, may be accessed via the WHO website.[16]

+ **WHO Simulation Exercise Manual**

15 See: Handbook for Public Health Emergency Operations Centres, Part A: Policy, plans and procedures (section 11.2).

16 See: http://www.who.int/ihr/publications/WHO-WHE-CPI-2017.10/en/ (accessed 6 August 2018).

6. PHEOC training and exercise programme

A programme of training and exercises should be established to ensure that there is a coordinated and integrated approach to building, sustaining and delivering the core capabilities of the PHEOC. A well-planned and developed programme helps to ensure that training and exercise events are consistent, progressive and focused on common goals that complement and build on each other. The programme should blend training and exercise to ensure that interest levels of participants are maintained and to reflect lessons from previous exercises as well as from actual emergencies.

6.1 Establishing the programme

The following steps should be taken to establish an effective training and exercise programme in the context of a training needs assessment:

- There should be regular review of plans and procedures, as well as analysis of previous training and exercise after-action reports, in order to identify areas requiring improvement.
- The purpose, scope, objectives and timeline of the programme should be agreed.
- Types of exercise should be selected appropriate to the training needs assessment.
- Senior-level commitment should be obtained for the allocation of resources (financial, equipment, facility-related).
- Exercise locations should be agreed and participants should be briefed on their respective roles and responsibilities.
- The outcomes of the exercise programme objectives and of the training needs assessment should be evaluated.

Each exercise should build on previous exercises and events. The programme should be reviewed and amended as necessary, at least every 3 months.

6.2 Implementing the programme cycle

The training and exercise programme cycle should commence with relatively simple training and exercises that involve all functional areas of the PHEOC, and progress to more complex exercises – potentially involving participation by other partners and agencies.

A rolling training programme will need to take staff turnover into account and must ensure that all staff regularly refreshed their knowledge and skills in emergency response.

The training programme should include:

- The contents of the plan (e.g. How is the PHEOC plan invoked? What are the key decision-making processes? Who else needs to be involved?)
- The individual's role in implementing the plan (e.g. What is expected of them? How do they fit into the wider picture?)
- Key skills and knowledge required in crisis response.

An effective training programme uses a combination of exercise types to accomplish exercise-specific objectives and programme goals. The programme begins with basic exercises that test specific elements and then gradually progresses to exercises that take greater resources and time, and which become more complex. Although each type of exercise can be carried out as a single activity, greater benefit can be achieved through a building-block approach that exposes programme participants to gradually increasing levels of complexity. For instance, a series of exercises may begin with an executive-level (orientation) seminar followed by a table-top exercise to address the strategic coordination of multiple organizations and levels of government. The table-top exercise can then be followed by a series of drills to validate refined plans, and a functional exercise that may include various levels of government and nongovernmental organizations. Only then should a full-scale exercise be contemplated.

An example of a PHEOC exercise programme cycle, suggesting frequency of exercises for types 1, 2 and 3 PHEOCs, is provided in **Annex 8**.

Annexes

1. Public health emergency management core competencies
2. Required knowledge, skills and abilities for essential PHEOC functions
3. Training needs assessment template
4. Suggested PHEOC training package
5. Flowchart for the design, development, conduct and evaluation of a table-top exercise
6. Exercise documentation
7. Exercise documentation guide
   - 7A EXERCISE CONCEPT DOCUMENT
   - 7B EXERCISE PLAN TEMPLATE
   - 7C EXERCISE CONTROL INSTRUCTIONS
   - 7D TEMPLATE FOR A MASTER SCENARIO EVENTS LIST (MSEL)
   - 7E TEMPLATE FOR EXERCISE INJECTS
   - 7F SUGGESTED CONTENTS OF A PARTICIPANT HANDBOOK
   - 7G SUGGESTED CONTENTS OF AN EVALUATION REPORT
8. Indicative PHEOC exercise programme cycle
9. List of participants EOC-NET working groups meeting 17–19 October 2016
10. List of participants EOC-NET working groups meeting 27–31 March 2017

Annex 1: Public health emergency management core competencies[17]

1. Leadership

1.1 Develops strategic plans to define the organization's vision, mission, values, structure, goals, objectives, performance measures, outcomes, resources, budget and continuous quality improvement methods to align with the people and processes and to build capacity.

1.2 Aligns activities with the organization's vision, mission, values, goals and strategies.

1.3 Applies knowledge of change management principles to impact organizational development and improvement.

1.4 Builds interdisciplinary teams to generate solutions collaboratively.

1.5 Applies leadership methods when interacting with partners, teams and staff.

1.6 Applies self-control and composure to manage relationships constructively and with professionalism while under pressure during a crisis.

1.7 Applies decision-making and problem-solving methods to develop solutions to problems and to adjust systems accordingly.

2. Emergency management frameworks

2.1 Demonstrate comprehensive knowledge of public health emergency management (e.g. WHO Framework for Public Health EOCs, the International Health Regulations, national preparedness frameworks and national incident management systems).

2..2 Apply knowledge of public health and emergency management authorities, including laws, regulations, guidelines, treaties and other policy documents, and acts within the scope of those authorities.

3. Emergency management functions

3.1 Conducts threat and hazard identification and risk assessment.

3.2 Develops strategic and operational plans using key planning principles.

3.3 Assesses and coordinates emergency management operations to maintain an in-depth comprehension of the operational environment to anticipate, identify and report public health threats.

3.4 Integrates foundational emergency management principles into public health systems within the respective Ministry of Health.

3.5 Synthesizes and shares information and data to inform decision-making across public health emergency management organizational functions.

3.6 Conducts logistics and resource management activities.

3.7 Demonstrates knowledge of public health emergency management technologies and systems.

4. Emergency management communication

4.1 Integrates crisis and emergency risk communication principles into all stages of an incident.

4.2 Manages and shares information across internal and external public health partners.

4.3 Applies comprehensive knowledge of emergency alert systems to ensure crisis information and guidance are delivered to partners, stakeholders and the public.

4.4 Applies knowledge of interoperable and integrated communication strategies to facilitate information sharing during an emergency.

5. Partnership and collaboration

5.1 Collaborates with governmental and nongovernmental organizations to ensure coordination of preparedness and response activities.

5.2 Develops and maintains relationships within internal teams and external partners.

5.3 Collaborates with individuals, teams and partners to obtain feedback, solve problems and handle challenges within an emergency management environment.

5.4 Applies knowledge of partner organizations' capabilities, mission, roles, responsibilities and priorities when developing public health emergency standards, guidelines and protocols.

6. Training development and facilitation

6.1 Applies systematic methods to analyse training needs, and to design and develop educational briefings, presentations and materials.

6.2 Develops instructional strategies and methods to use for achieving training goals and objectives, including examples and practice activities.

6.3 Delivers emergency management training according to the instructional strategies.

7. Evaluation

7.1 Develops tools, metrics and methods for evaluating progress towards preparedness and response objectives.

7.2 Evaluates capacities and provides recommendations to address identified gaps.

7.3 Evaluates processes and procedures to assess preparedness and response actions.

7.4 Applies exercise programme management principles to validate and improve operational capability.

7.5 Applies evaluation methods to assess levels of learning that occur as a result of training presentations, briefings and materials.

7.6 Develops strategies and tools to ensure sustainability of the Emergency Management program.

17 United States Centers for Disease Control and Prevention (CDC) Global Emergency Management Capacity Development Branch Core Competency Model.

Annex 2: Required knowledge, skills and abilities for essential PHEOC functions[18]

Policy

- Identify current health trends and gather information that can inform options for policies, programmes and services.
- Recognize the value of having an incident command structure during an emergency.
- Identify limits to legal knowledge, skills and authority and identify key system resources, including legal advisors for consultation on matters that exceed those limits.
- Describe the legal authorities related to the distribution and dispensing of medical supplies and the effect of a state and/or federal emergency or public health declaration on those authorities.

Planning

- Contribute to the development and implementation of the organizational strategic plan and emergency plans.
- Gather appropriate information for evaluating policies, programmes and services.
- Apply strategies for continuous quality improvement.
- Verify the credibility of information sources.
- Use analytical tools to analyse information and recommend specific actions.

Command

- Demonstrate an ability to set and follow priorities, and to maximize outcomes based on available resources.
- Demonstrate an ability to fulfil functional roles in response to a public health emergency.
- Develop staff by providing professional development opportunities for individuals and teams (e.g. training, mentoring, peer advice, coaching) and encouraging use of these opportunities.
- Manage organizational change to modify practices in response to change (e.g. social, political, economic and/or scientific changes).
- Facilitate collaboration with internal and external emergency response partners.
- Demonstrate advanced problem-solving skills under emergency conditions.
- Utilize staff and technology to maintain situational awareness.
- Distinguish the roles of staff involved in collecting and disseminating information for audiences (e.g. coordinator, public information officer, technology/IT departments, etc.).
- Distinguish routine from urgent management information.
- Classify information for internal and external audiences.
- Clarify the roles of team members in the Incident Management System.

18 See Annex 6 of the WHO Framework for Public Health Emergency Operations Centres.

- Summarize the roles and responsibilities of public health personnel in a variety of public health emergencies and in the Incident Management System.
- Demonstrate commitment to the safety of personnel by employing protective behaviours according to changing conditions, personal limitations and threats.
- Categorize and evaluate potential threats and emergencies.
- Describe the relationship between protective measures and behaviours and the reduction of risk of injury or illness for personnel.
- Employ practices to minimize exposure to dangerous agents and hazards during an emergency.
- Know and act within the scope of national, state, tribal and/or local statutory and regulatory authority during public health emergencies and through state and/or national declarations of emergency.

Operations

- Interpret and communicate procedures in emergency operations plans related to information management.
- Recognize information that is potentially relevant to the identification and control of an emergency and report it through the chain of command.
- Know, and manage or apply, decontamination or disinfection procedures as necessary.
- Use information technology in accessing, collecting, analysing, using, maintaining and disseminating data and information.
- Use informatics standards.
- Apply ethical principles in accessing, collecting, analysing, using, maintaining and disseminating data and information.
- Determine quantitative and qualitative data and information.
- Collect, analyse and interpret data to determine validity and reliability.
- Practise process improvement.

Communications

- Differentiate between risk communication and emergency crisis communication.
- Prepare and deliver messages using the principles and guidelines of crisis and risk communication.
- Demonstrate cultural sensitivity as essential in communicating with diverse populations.
- Convey information to professionals, personnel and the public using a variety of approaches (e.g. reports, presentations, press releases, emails, social media, etc.).
- Communicate effectively in writing and orally, in person and through electronic means, with linguistic and cultural proficiency.
- Maintain relationships with diverse community partners to assist with communicating preparedness planning and population-specific messages.
- Verify the credibility of information and sources.

Logistics

- Support information systems development.
- Administer procurement procedures and protocols, particularly those most relevant to public health.
- Perform IT systems operations and maintenance.
- Use inventory management systems.
- Plan and implement distribution systems.
- Know hazardous materials regulations.
- Practise supply chain management.
- Know human resource policy, procedures, recruitment and rostering practices.
- Provide or administer facilities maintenance services.
- Develop and maintain a database of contact persons, experts, facilities, inventory, etc.
- Utilize records management systems that satisfy agency standards for important documents and financial records.
- Distinguish between different types of electronic information and sources.
- Describe and utilize the financial planning, budgetary and cash flow processes of the agency.
- Design and implement financial plans for assigned operational projects.
- Prepare proposals for funding (e.g. to foundations, government agencies, corporations, etc.).
- Negotiate contracts and other agreements for programmes and services.
- Process compensation claims (incentives, insurance, expenses).

Annex 3: Training needs assessment template

Role/ position title	Name	Responsibilities	Competency (knowledge, skills, abilities)	Training needs	Planned dates	Remarks
Incident manager						
PHEOC facility manager						
Public communications officer						
Operations staff						
Planning staff						
Logistics staff						
Finance and administrative staff						

Annex 4: Suggested PHEOC training package

Overview

The capabilities and capacities listed in Annex 1 can be built with a training programme that will 1) offer staff the opportunity to gain the skills required to perform their tasks within the response structure and 2) provide opportunities for other staff to develop the skills to function as surge support in an emergency response.

Training courses

Course 1: Introduction to emergency management and Incident Management System in the PHEOC

This course is designed for those responsible for, and involved in, the establishment of a PHEOC. It explains and explores the principles and practice of emergency and disaster management and the role of the PHEOC in response to a public health emergency. The course is built around the following thematic areas:

Principles of emergency management

- Definition of key terms and concepts.
- The emergency mitigation and management process:
  - mitigation
  - preparedness
  - response
  - continuity of vital operations
  - recovery.
- The Emergency Response Plan, addressing multiple threats and hazards.
- Current national emergency management practices and stakeholders.
- Identification of necessary legislation, plans and procedures as they relate to public health emergencies.
- Description of the role PHEOCs play in emergency management:
  - fixed versus temporary PHEOCs
  - national, subnational and local levels
  - field level.

The role of the Incident Management System in emergency management

- Definition of key terms and concepts.
- Explanation of the main areas and functions of the Incident Management System.
- Management by objectives.
- Span of control.
- Action plans.
- Interagency and bilateral coordination.

PHEOC considerations

- The composition and role of the PHEOC steering committee.
- The PHEOC concept of operations.
- Risk/hazard vulnerability analysis.
- Functions to be performed.
- Number of staff required to operate the PHEOC.
- Space requirements.
- Funding requirements.
- Different functional layouts of the PHEOC.
- Requirements for information and communication technology.
- Data collection and analysis requirements.
- Equipment and supplies needed.
- Media and risk communication.

Learning objectives

- Demonstrate an understanding of emergency management principles and terms.
- Discuss the role of the PHEOC in the overall national emergency/disaster management and response structures.
- Describe current emergency management practices and the arrangements currently in place.
- Explain legal and regulatory elements relevant in an emergency.
- List the stakeholders involved in different emergency responses, including nongovernmental organizations and any bilateral or international support expected.
- Explain the rationale for implementing the Incident Management System in emergency responses.
- Describe the main functions within the response structure of the Incident Management System.
- List factors to be considered when establishing a PHEOC.

Course 2: Advanced emergency management and PHEOC operations

The course is intended to build on the skills and concepts of the first course, and give key individuals involved in managing a PHEOC more in-depth knowledge. The course is built around the following thematic areas:

Emergency management and the PHEOC

- The relationship between the Emergency Response Plan and the concept of operations.
- Grading of emergencies and linking them to PHEOC activation levels.
- Identifying interagency stakeholders and parameters for coordination.
- Definition of operational periods.
- Development of action plan.

The Incident Management System in action

- Strategic and tactical demands during an emergency, and how the Incident Management System can support meeting these demands.
- How and when the Incident Management System can be altered to expand or contract an emergency response.
- Incident Management System functions at different levels of the response.
- Staffing needs.
- Job action sheets.
- Coordination with the United Nations, Red Cross/Red Crescent Movement, nongovernmental organizations and bilateral partners.

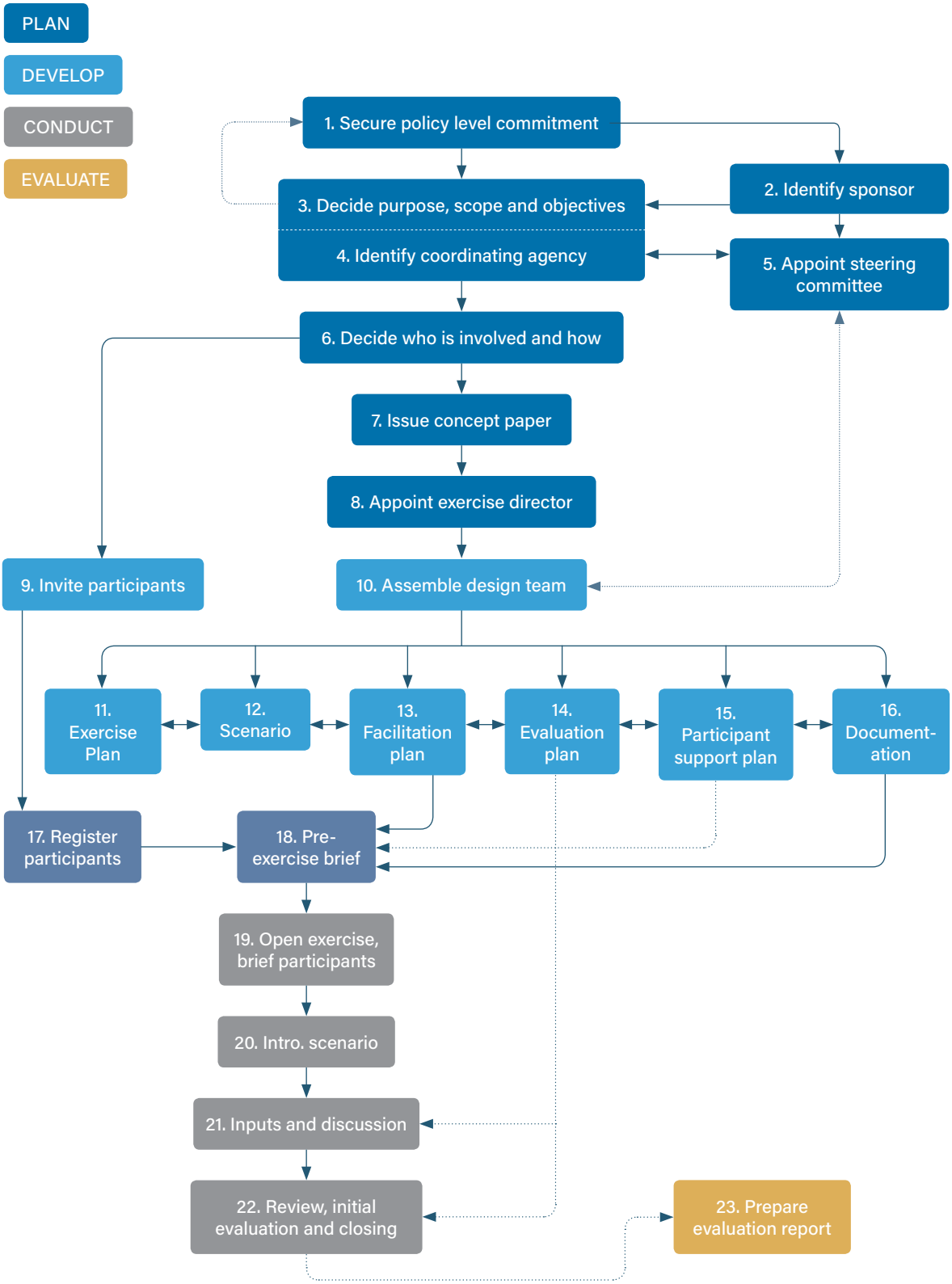
PHEOC operations

- Standard operating procedures: when they are needed and what they contain.
- PHEOC physical layouts.
- Information flow in and out of the PHEOC.
- Infrastructure and services.
- Data collection and storage processes.
- Staffing the PHEOC.
- Techniques for managing staff in a PHEOC environment.

Learning objectives

- Determine the level of activation required for the emergency.
- Identify the best functional layout for the PHEOC based on operational requirements.
- Develop a staffing plan for the functions of the Incident Management System.
- Identify needs for information and communication technology and data management.
- Explain the need for, and identify, key partners in interagency coordination.
- Demonstrate the ability to access the PHEOC and its resources.
- Complete a template for action planning.
- Develop job action sheets for the main functions of the Incident Management System.

Annex 5: Flowchart for the design, development, conduct and evaluation of a functional exercise



Notes on the flowchart:

Exercise planning

1. Secure policy-level commitment from senior management

- Leaders should demonstrate commitment to a programme of exercises to support the planning process.
- Policy-level commitment ensures that outcomes (evaluation) are applied to the improvement of preparedness.

2. Identify a sponsor

- An exercise sponsor should be appointed from the executive branch of the organization conducting the exercise.
- The sponsor provides a direct link between the exercise director and policy levels of the organization.

3. Decide purpose, scope and objectives

- The purpose of the exercise relates to the plan being validated and the outcomes expected.
- The scope defines the size of the proposed exercise. It will determine which organizations or agencies participate and which are excluded. Reference should also be made to any assumptions, artificialities or constraints.
- Objectives provide the foundation and guidance for development and evaluation of the exercise. They should be specific, observable and, as far as possible, measurable.

4. Identify the coordinating agency

- One organization or individual must be given responsibility for coordinating the exercise.

5. Appoint a steering committee

- A steering committee may be appointed with involvement from a number of agencies (stakeholders). The steering committee usually comprises a group of high-level stakeholders who are responsible for providing guidance and strategic direction.

6. Decide who is involved and how

- Participants should always include those who are involved in the execution of the plan being evaluated. It is usual to include a number of observers who have a professional, operational or policy interest in the outcome.

7. Issue an exercise concept paper

- The concept paper is usually a letter or memorandum from the head of the organization sponsoring the exercise. This document is used to gain support from the organization's management and from participants.

8. Appoint an exercise director

- The exercise director is assigned overall management responsibility and authority for the exercise. In a small exercise, the exercise director may also be the facilitator and/or evaluator.

9. Invite participants

- Letters of invitation should be sent well in advance to ensure that participating agencies are represented at the appropriate level.

10. Assemble the design team

- A design team will be formed to engage the interests of multiple stakeholders. The team creates the framework for the exercise.

Exercise development

11. Exercise plan

- The exercise plan provides the high-level "blueprint" for the exercise design and component plans.

12. Scenario

- The purpose of the scenario is to create a relevant and plausible narrative or script upon which to base evaluation of the plan.

13. Facilitation plan

- The facilitation plan contains instructions for the people who facilitate and control the exercise. It also includes the MSEL.

14. Evaluation plan

- This describes the standards and procedures to be used for evaluating the effectiveness of emergency management policies, plans and procedures during the exercise play.

15. Participant support plan

- The participant support plan Includes instructions for the coordination of exercise support activities and development of the exercise player handbook. The handbook should include:
  - the exercise purpose and objectives;
  - an overview of the scenario;
  - player responsibilities and functions to be performed during the exercise;
  - a schedule of player exercise briefings,
  - procedures for preparation of exercise generated messages, logs and reports;
  - PHEOC procedures;
  - modifications of standard PHEOC procedures to address simulation of functions (e.g. simulation cell representing agencies or persons not participating), including exercise telephone and email directories;
  - expected player actions;
  - administrative requirements, including those for safety and security;
  - recommended pre-exercise training events.

16. Documentation

- Documentation for the exercise may include:
  - a list of participants;
  - participants' handbook, including the programme of activities;
  - controller's handbook (restricted);
  - evaluator's handbook (restricted);
  - references (e.g. copies of plans, maps) and supporting material.

Exercise conduct

17. Register participants

- Name, title, organization, position, phone numbers, email.

18. Pre-exercise brief

- Ideally, a pre-exercise brief should be given well in advance in order to allow participants to prepare. A copy of the exercise plan, including the narrative (see below) might be issued at this point.

19. Open exercise, orientation brief

- The exercise should be opened by a senior manager or guest speaker.
- The orientation brief re-acquaints participants with the purpose, scope and objectives. It also covers the format, the roles of the exercise management team, and administrative arrangements.

20. Introduce scenario

- The first part of the scenario (narrative) provides the context for the start of the exercise. Subsequent events (scenario updates, normally organized into a number of sessions) are revealed to participants during the exercise.

21. Inputs and discussion

- Each update is accompanied by a number of problem statements designed to stimulate discussion. Some simulation and variations on inputs (e.g. formal messages, media stories) might be introduced here.

22. Review, initial evaluation and closing

- Evaluators will be provided with a description of expected actions for each of the problem statements, against which the level of preparedness may be evaluated.
- In order to facilitate the evaluation process, each session should include a review of key issues that have emerged. An initial evaluation, or exercise debrief, should be included at the end of the exercise activity.

Exercise evaluation

23. Prepare evaluation report

- The exercise evaluation team prepares the exercise evaluation report, or after-action report, which describes the planning, implementation and evaluation of the exercise. It should also list the findings and should recommend actions to address identified issues.

Annex 6: Exercise documentation

1. Exercise planning documents		
Type	**Purpose**	**Typical content**
1.1 Exercise concept paper	Establishes authority for the conduct of the exercise and provides a broad description of what is to be achieved.	▪ Background and requirements ▪ Exercise purpose, objectives and scope (inclusions, exclusions) ▪ Exercise management structure ▪ Scenario overview ▪ Key participating agencies ▪ Resource implications
1.2 Planning meetings – agenda and minutes	Minutes of planning meetings form useful background to support decisions and make writing subsequent exercises easier.	▪ Agreements reached ▪ Decisions taken ▪ Allocation of tasks and responsibilities ▪ Action items and deadlines
1.3 Exercise plan	Describes in detail the exercise design, lead-in activities, management, and plan for evaluation of actual outcomes. **N.B.** Updated during the planning process. Should not be distributed to participants.	▪ Detailed objectives and expected outcomes ▪ Details of exercise activities, including dates, milestones and sequence of events ▪ Composition of the management team ▪ Exercise participants ▪ Roles and responsibilities
1.4 Scenario and Master scenario events list (MSEL)	The type and size of the exercise will influence the required level of scenario development and documentation. **N.B.** Scenario documentation should be protected and clearly marked "EXERCISE ONLY".	▪ Detailed description of the scenario ▪ MSEL, including critical events, timings and description and sequence of injects ▪ Guidance to exercise controllers ▪ Information to support decision-making by participants – Role-playing – Background information and profiles

2. Exercise management documents		
Type	**Purpose**	**Typical content**
2.1 Exercise instructions (or participants' handbook)	To provide participants, exercise management staff, observers and other interested parties with the information they require in order to take part in the exercise. **N.B.** Exercise instructions should be issued well in advance of the exercise. They may need to be tailored to respective audiences.	▪ Joining instructions, including exercise scenario, exercise assumptions, time periods, and agencies conducting and participating in the exercise ▪ Exercise programme ▪ Contact information for exercise participants, simulation cell and exercise management teams ▪ Preparation required (e.g. understanding of the Incident Management System, pre-reading) ▪ Administrative arrangements ▪ Safety, security and emergency procedures
2.2 Exercise management handbook	**N.B.** Exercise management team only**.** Not to be issued to participants or observers.	Authorities, coordination and communications plan, safety information/briefing material, report scheme for exercise management and flow
3. Exercise evaluation documents		
Type	**Purpose**	**Typical content**
3.1 Evaluation guidelines	Evaluation guidelines are used by the exercise evaluation team to collect information and conduct a thorough evaluation of the exercise. The evaluation documentation will be prepared during the design phase of the exercise and may include a range of documents, checklists and/or templates provided to participants, facilitators, observers or evaluators to collect appropriate information.	▪ Instructions and checklists for evaluators, facilitators, participants and observers ▪ Expected actions for each inject ▪ Templates for recording actual outcomes ▪ Debriefing guides
3.2 Exercise (after-action) report	Provides feedback to participating organizations on their performance during the exercise. Data collected by the evaluation team (e.g. logistics, scenario, player activities, actions taken or not taken, observations) must be included or summarized in the report, as the report is the "timeline" of the exercise. The report should identify strengths and areas for improvement, followed by recommendations for remedial action.	▪ Description of the exercise and its outcomes ▪ A narrative of key events ▪ Summary of expected actions completed and not ▪ A summary of the outcomes, addressing the attainment of the exercise purpose and objectives ▪ Key observations and recommendations for further action, including observations, areas of strength and areas for improvement

Annex 7: Exercise documentation guide

ANNEX 7A – EXERCISE CONCEPT DOCUMENT

Exercise (insert name) concept document

Need

Summary of the need to conduct this exercise.

Overview

Short paragraph on what this exercise is to achieve.

What is the target audience?

Aim

One sentence.

Exercise objectives

Exercise scope

What is included; what is excluded.

Exercise outline

Type, styles, phases etc. No need for the scenario at this point. Could include the theme that it is proposed to use in order to meet the objectives.

Governance and management structure

Exercise director(s).

Organization chart and appointments for planning phase and outline for conduct phase.

Participating agencies

Public information

Strategic direction and responsibility for real and pseudo media.

What is the public message, if any?

Evaluation

Focus areas/approach.

Budget

Timeline

Point of contact

Approval / by / date

ANNEX 7B – EXERCISE PLAN TEMPLATE

The purpose of the exercise plan is to outline the method (with the exercise planning team's agreement) by which the exercise will be designed, conducted and evaluated. Suggested content for the exercise plan includes:

Section	Headings
Introduction	Background Aim of the exercise Objectives Standards/measures Scope References Participants Roles and responsibilities
Exercise format	Exercise name Exercise type Scenario (outline only)
Governance	Organizational structure of the exercise planning team
Programme of activities	Activities (including meetings, briefings, workshops, training etc.) Timings Locations
Exercise control	Exercise control (EXCON) staff (appointments and responsibilities) Briefings Documentation Communication Safety and security Media and visitors Exercise termination (and exit strategy)
Exercise evaluation	Purpose of evaluation Process of evaluation Exercise debriefs Exercise reporting

Section	Headings
Administration	Costs/budget Logistical requirements Travel and accommodation Catering
Attachments	Exercise outputs Exercise programme or timetable EXCON staff (responsibilities) Exercise briefings (rationale and content) Exercise facilities (diagrams and equipment details) Roles and responsibilities (checklist)

ANNEX 7C – EXERCISE CONTROL INSTRUCTIONS

Exercise (insert name)

EXERCISE CONTROL (EXCON)

EXCON staff (appointments and responsibilities)

EXCON facilities

Exercise briefings

Time zones

Communication

Media and visitors

Exercise termination (and exit strategy)

Exercise facilities (diagrams and equipment details)

ANNEX 7D – TEMPLATE FOR A MASTER SCENARIO EVENTS LIST (MSEL)

Inject #	Inject time	Exercise time	Event	Message from	Message to	Method	Expected action					Comments
							Management	Planning	Operations	Logistics	Finance/ administration	
Example 15	Day 1 1600	Day 1 2200	Second case confirmed. Patient isolated.	Forward Opscen	Opscen	Phone	MoH notified. Relevant staff informed.	_	_	Additional PPE dispatched.	_	Control to prompt participants if necessary.

ANNEX 7E – TEMPLATE FOR EXERCISE INJECTS

Event/information input

Inject number:		
Date/time of inject:		Time injected:
Means of injection:	phone/fax/email/ other	
From:		
To:		

Message:

(Insert enough detail to allow the person inputting the message to respond to any immediate enquiries that may come as a result of the input)

Attachments:

(Insert details of attachments that accompany the input)

e.g. Press release, report, newspaper article.

Instructions:

(Insert enough detail to help an exercise controller, facilitator or evaluator to follow up on the input, if required)

ANNEX 7F – SUGGESTED CONTENTS OF A PARTICIPANTS' HANDBOOK

Section	Headings
Introduction	Handling instructions (security classification)
Background information	Overview Aim Exercise objectives Exercise format Exercise context Exercise assumptions ▪ in-exercise/out-of-exercise areas ▪ no-go zones Guidance to participants
Situation	General idea Technical briefs/detail Maps
Exercise management	Exercise control ▪ facilitators ▪ evaluators ▪ points of contact Participants ▪ participating agencies ▪ which levels are playing ▪ how to interact with EXCON ▪ refer to exercise contact directory
Administration and logistics **Administration and logistics (continued)**	Exercise dates and locations Travel arrangements Safety and security ▪ risk Accommodation Climate conditions Dress code Entry and security procedures Catering Communications Points of contact Expenses ▪ incurring/approval of expenditure ▪ allowances and claims
Pre-exercise activity	Pre-exercise training Briefings Activity schedule

Section	Headings
Post-exercise activity	Debriefings Evaluation
Attachments	Communication instructions Timeline Contact directory Risk assessment or summary (if applicable)

ANNEX 7G – SUGGESTED CONTENTS OF AN EVALUATION REPORT[19]

Section	Headings
Background	General Exercise management Exercise aim Exercise scope Expected exercise outcomes Participating organizations
Evaluation report	Structure of the report Commentary (for each outcome) ▪ Objective ▪ Rationale for objective ▪ Observations ▪ Recommendations
Conclusion	Key findings Evaluator's recommendations and comments
Attachments	Consolidated list of recommended actions Glossary of terminology and acronyms Exercise diagrams

19 Adapted from: Australian Institute of Disaster Resilience. Handbook 3: Exercise management

Annex 8: Indicative PHEOC exercise programme cycle

Type of exercise	Factors to be considered	Format	Preparation and planning	Conduct and review	Frequency
Orientation exercise	A prerequisite for the conduct of other types of exercise. The orientation exercise should be conducted as required and may take the form of a workshop or seminar. Useful for familiarizing management and staff with aspects of existing plans or plans under development.	Informal, facilitated discussion/seminar with participants encouraged to ask questions. Duration: 1–3 hours	1–2 weeks	1 day	As required (min 6 monthly) Basic
Table-top exercise	Group discussions with emphasis on problem-solving rather than spontaneous decision-making. Larger table-top exercises may need to include facilitators and evaluators in order to be successful.	Structured, facilitated discussion based on a hypothetical scenario and conducted in a relaxed environment. Duration: from 3 hours to 1 day	2–3 weeks	1–2 days	6-monthly Basic
Drill	A drill can be led by a manager, supervisor, department head or exercise designer and can be conducted within a facility, in the field, or at the PHEOC or other operating centre.	Simplest of the operations-based exercises. Can be spontaneous. Duration: 1–6 hours	2–3 weeks	1 day	Regularly (minimum 3-monthly) Basic
Functional exercise	Involves creating a situation and facilitating a "real" response and is simulated to a significant level of detail, usually covering multiple functions. Requires extensive planning and preparation. Staff members need considerable experience with the functions being tested. A functional exercise is always a prerequisite to a full-scale exercise.	Conducted as an interactive, scenario-based exercise. Participants are required to respond to injects as they would in a real emergency, communicating and collaborating with each other in a realistic setting. Duration: 1–2 days	2–6 months	2–3 days	Annually Standard/ advanced

Type of exercise	Factors to be considered	Format	Preparation and planning	Conduct and review	Frequency
Full-scale exercise	Costly and time-consuming. All levels of personnel should take part. The PHEOC is activated, and command posts may be established. Simulation information is conveyed on paper, by telephone, through pseudo media and victims or others (simulated by role-players). Requires extensive planning and preparation.	A "dress rehearsal" for an emergency response. May Include other partners/ agencies and deployment of assets and personnel. Duration: 2–3 days	3–9 months	2–5 days	Once every 2 years Advanced

Annex 9: List of participants EOC-NET working groups meeting 17–19 October 2016

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