



EAST AFRICAN COMMUNITY



Short Certificate Course in Pandemic Preparedness Using a **One Health** Approach

Guidance for University Academic Professionals
September 2023 | 2nd Edition

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Definition of Key Terms

“**Course**” means a series of lectures and practicals on a particular subject, in this case pandemic preparedness with a One Health approach

“**Credit hour**” is the equivalent of a minimum of 16 instructional hours in a period of study

“**Curriculum**” refers to any documented programme of study

“**Lecture hour**” means a period of time equivalent to one hour and represents one such instructional hour in lecture form

“**One Health approach**” refers to the approach for designing and implementing programmes, policies, legislation and research in which different sectors communicate and work together to achieve better public outcomes

“**Pandemic**” means an epidemic of an infectious disease that are spread through human populations across geographical regions globally

“**Pandemic preparedness**” means planning to mitigate the effects of pandemics

“**Programme development**” means planning and writing out a curriculum for a specific group

“**Risk analysis**” is a decision-aiding method that involves hazard identification, risk assessment, risk management and risk communication

“**Short course**” is defined as a training stint in a specific professional area lasting at least five days

“**Public Health Surveillance**” refers to the ongoing systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health

“**Topic**” means the main subject participants talk about for a given time in the course.

List of Abbreviations

CDC	Centers for Disease Control and Prevention
CLO	Course Learning Outcomes
Covid-19	Coronavirus disease 2019 (COVID-19)
EAC	East African Community
FAO	Food and Agricultural Organization of the United Nations
GHSA	Global Health Security Agenda
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
IDRC	International Development Research Centre
IPC	Infection Prevention and Control
OH	One Health
PPOH	Pandemic Preparedness One Health
SOPs	Standard Operating Procedures
UNEP	United Nations Environment Programme
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization
WOAH	World Organisation for Animal Health
WTO	World Trade Organization

01.

Short Certificate Course in Pandemic Preparedness using a One Health Approach

■ Programme Title

This programme shall be called a “Short Certificate Course in Pandemic Preparedness Using a One Health Approach”.

■ Introduction

The Short Certificate Course in Pandemic Preparedness Using a One Health Approach is an innovative, generic, professional and interdisciplinary course for key personnel and future experts in pandemic preparedness and management.

The purpose of this course is to provide critical knowledge and skills to potential diverse responders of infectious diseases whenever and wherever they occur in East Africa. The course structure contains introductory topics, describing the problem of pandemics, emerging and re-emerging threats of pandemics, the science behind pandemics and solutions to the problems including communication, preparedness, infection prevention and control and resource mobilisation.

The emphasis of this course is on the One Health approach, including all relevant sectors and disciplines, serving as the most appropriate approach to handling the complex problem of pandemics. It is expected that the course will stimulate participants to broaden their knowledge and skills on

pandemic preparedness and response and enhance their attitude towards handling complex problems around pandemics.

The global experience of emerging and re-emerging disease threats including Covid-19, Ebola and Marburg has provided an opportunity to review the course that was first developed in 2018.

This 18-topic course is designed to equip learners with knowledge, attitudes and skills and create a critical mass of professionals with the ability to prepare for and respond to pandemics in the region using a One Health approach.

Universities may adapt the course to fit their needs, purpose, taking national priorities into account were deemed necessary.

■ Course Philosophy

The short certificate course described rests on the philosophy that pandemic preparedness and response is a science that can be learned and personalised to serve the purpose of supporting communities.

Responses to pandemic threats are complex, dealing with unforeseen circumstances and requiring individuals to possess competencies such as planning, selecting appropriate modes of response, mobilising and utilising resources and engaging the affected communities in ways that are effective and achieve optimum results. This course is based on the understanding that responders and the affected communities are all capable of constructing knowledge to resolve threatening pandemic situations using a One Health approach.

■ Rationale for the Course

Under this section, needs assessment, market survey and justification for the course are presented.

The need for the course and its review

The Ebola Virus Disease with an average fatality of 50% has been reported repeatedly in the region (1976 in South Sudan and DRC, 2014-16 in West Africa's Guinea, Sierra Leone and Liberia) and in 2022 in Western and Central parts of Uganda. On a smaller scale the Crimean-Congo Haemorrhagic Fever and Yellow Fever have also been reported.

Human populations in East Africa may get disease attacks from animals, overcrowding and malnutrition. Furthermore, poor access to health

services and poor infection control and hygiene practices will lead to even higher disease and death rates. Pandemics affect everybody from the lowest level to the teams that mount the actual response. While the household requires knowledge of the transmission of infectious diseases and the socio-cultural aspects that encourage spread of pandemics, the technical expert and manager need to be reminded of the ethical aspects involved, the government officer the respective policies. Leadership, governance, community engagement as well as the engagement of multiple sectors and agencies also contribute specifically towards pandemic preparedness and response.

This course was first developed in 2018. Later in December 2019, the first case of novel coronavirus (nCoV) was detected in China, a Public Health Emergency of International Concern (PHEIC) was declared on 30th January 2020 and a pandemic on 11th March 2020. The COVID-19 pandemic was a global outbreak of the novel coronavirus; an infectious disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It required a complex approach involving many sectors, disciplines, at all levels (One Health approach) to control. Lessons learnt in response to the Covid-19 outbreak in 2019 and the Ebola outbreak in Uganda in 2022 have been used to improve this curriculum.

Problem Assessment

During the 2014/2016 Ebola virus disease outbreak in West Africa, nearly 30,000 people were infected, out of which 11,000 lost their lives. Personnel from the East African region were requested to assist in Liberia. The West African experience demonstrated the importance of having a human resource pool trained and prepared and the need to have efficient coordination amongst multiple players in responding to disease outbreaks. Tackling epidemics requires close cooperation among various disciplines and sectors as is advocated in the One Health approach.

In an evaluation of the workforce within the region, very few universities offered short and practical courses which deliver knowledge and skills required for pandemic preparedness and response using a One Health approach.

At the regional level, the East African Community (EAC) Council of Ministers, which brings together several sectors, adopted the One Health approach in the management of disease outbreaks and approved the

establishment of the One Health platform as per decision EAC/CM 35/ Decision 64.

At the global level the Quadripartite, a collaboration of four international agencies (FAO, UNEP, WHO, WOA), launched the One Health Joint Plan of Action in October 2022 in Berlin. The plan includes six action tracks and describes concrete measures on how to ensure wellbeing at the human, animal, plant and ecosystem interface. It addresses many crucial aspects, such as how to develop resilient health systems, how to reduce risks from emerging or re-emerging zoonotic epidemics and pandemics, better assessment and management of food safety risks, and curbing antimicrobial resistance.

Stakeholder Engagement in the Curriculum Development

Arising from the expression of interest by the EAC member states, a stakeholder meeting to brainstorm on the curriculum content for pandemic preparedness using One Health was held in Entebbe, Uganda on the 30th and 31st of July 2018.

Stakeholders included: universities from East Africa, the Interuniversity Council of East Africa (IUCEA), national curriculum regulatory authorities/commissions, ministry of education representatives from partner states and the EAC Secretariat education desk among others attended. An outcome of the Entebbe meeting was the formation of an Experts Working Group (EWG) whose terms of reference were the development for a curriculum for the PPOH course for the EAC and included the support of Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the Heidelberg University in Germany. The course curriculum was finalised in December 2018 and followed by a pilot and stakeholder meetings to evaluate the pilot, supported by GIZ.

Members of the EWG were appointed to draft this curriculum. They were drawn from universities of the partner states. The EWG was given the mandate to incorporate the IUCEA and other individuals whose expertise may be deemed necessary.

To update the course, three review meetings were held on the following dates: the first meeting was on 28th - 30th June 2022, the second (virtual) meeting was on 29th - 30th November 2022 and the third meeting was on 30th - 31st January 2023 in Arusha.

Justification for the Course

A need for training in pandemic preparedness was identified as there was no known short course on pandemic preparedness using a One Health approach in any of the East African universities. Out of Africa, pandemic preparedness courses are scarce and based only on Influenza training for pandemic responders. This course takes cognizance of the fact that 60% of human infectious diseases originate from animals. Hence there is a need to adopt an integrated approach of sourcing participants from the human, animal and environmental disciplines.

■ Goal of the Course

The goal of this short course is to enhance the knowledge, attitudes and skills of learners in order to enable their effectiveness as responders to pandemics.

■ Course Objectives

This course seeks to lead to the learning of:

1. The nature of outbreaks, epidemics, pandemics and strategies of response whenever they occur using a One Health approach in the region
2. Preparedness for pandemics within the region
3. Detection, case management, risk and crisis communication
4. Mobilising partners, communities and resources required to investigate and control outbreaks, epidemics and pandemics.

■ Expected Learning Outcomes

By the end of the course, the learners should be able to:

1. Describe concepts in pandemics and One Health
2. Justify the case for pandemic preparedness using a One Health approach in East Africa
3. Design a model for pandemic preparedness for effective response in an East African situation
4. Discuss strategies for social and resource mobilisation to counter pandemics in East Africa.

02.

Academic Regulations for the Course

■ Duration of the Course

This is largely a full-time intensive course designed to be delivered for over 3 weeks face to face or 9 weeks as an online/hybrid course. Each teaching institution and regulators defines what a unit is and what practicum/field visits mean. Lecturers may choose to adapt the provided material (ppts).

■ Admission Requirements

To qualify for admission into the Pandemic Preparedness using a One Health (PPOH) approach course, the applicant must be a holder of a bachelor's degree from a university accredited by their country's accreditation body.

■ Credit Transfer

No credit transfers or course exemption should be allowed in this course.

■ Course Requirements

For successful completion of the course, learners and lecturers will be expected to fulfil specific obligations:

1. Student obligations:
 - a. Register for topics as outlined in the programme
 - b. Maintain regular engagement in the learning activities as required. Such activities include scheduled lecture attendance, group discussions, prescribed and individual/group projects. Learners will be expected to attend a minimum of 80% of the

lectures (class attendance) given. This is irrespective of whether the course is delivered virtually, hybrid or face-to-face.

c. Attend practical/field visits for the selected modules.

2. Lecturer obligations:

a. Provide topic outline, objectives and content at the commencement of the course

b. Provide opportunities for interaction with learners whether online or face-to-face

c. Provide professional/academic guidance to learners

d. Keep records of students' attendance and performance on all tasks assigned.

e. Supervise field activities/practicum if planned

Mode of Delivery

- ▶ Didactic modules will include face-to-face lectures, virtual, use of problem-based learning
- ▶ Review of relevant case studies and practical exercises
- ▶ E-Learning strategies may be used, the ODL method will use both hard and soft copy materials that are modelled for self-study
- ▶ Overviews shall be used to outline the areas to be covered in the course and to explain principles and concepts of the various courses
- ▶ Small group discussions/seminars shall serve the purpose of clarifying areas found difficult by students during their reading
- ▶ Power points for all modules exists and may be used or be adapted for use.

Examination Regulations

Partner states mid-level/university regulations for examinations of short certificate course shall apply to this course.

Assessment and Examination Procedures

Learner achievement shall be assessed based on the following:

1. Mandatory class attendance minimum	80%
2. Learner participation in group discussions	10%
3. Practical /field studies	10%
4. Total score	100%

Grading System

Learners will earn a certificate of attendance for this course listing all the topics attended.

Classification

There shall be no classification of the certificate.

Award of Certificate

A certificate of attendance for the **“Short Certificate Course in Pandemic Preparedness Using a One Health Approach”** will be awarded to candidates who successfully fulfil all requirements regarding attendance and participation.

Quality Assurance

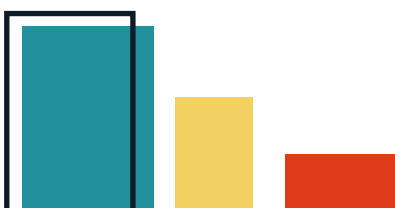
Quality assurance shall be ascertained through regular audits, course evaluations by participants and self-assessments.

Course Evaluation

The PPOH course shall be subjected to course/instructor evaluation by course participants to improve course content, instructional processes, reference materials and assessment procedures. Whether to review or not will be decided based on feedback from stakeholders. Changing stakeholder requirements and changed higher education dynamics would be major determinants.

Student Evaluation of Learning Material

Learners will be invited to evaluate teaching material, lecturer and methodology from time to time. The purpose of student evaluation of



resources used will be to obtain feedback on course content to improve the future delivery of services. The evaluation will be done using an on-line questionnaire to assess, among other things, organisation, presentation, layout and clarity of content.

■ Management and Administration of the Course

Following the pilots at the request of the EAC, and the review, which were supported by GIZ, the subsequent implementation should be managed by universities/schools in the East African region.

■ Topic Coding

The topics offered in this course shall be coded PPOH 100-117 in a series.

■ Duration and Structure of the Course

The course includes 57-units overview (each unit equates to 5 hours; 285 hours) and 30 hours practical field trips (each unit equates to 10 hours, 300), totalling 585 hours spread over a nine-week period and could be delivered virtually and/or three weeks face-to-face. Each institution may adapt the length of each topic and choose the most appropriate tools (lectures, practical field trips, self-study, etc.).



03.

Course Structure and Learning Outcomes

Table 1: Course Structure

CODE	Topic	Overviews Each unit 5 hours	Practical/field Each unit 10 hours	Total hours	Total Cumulative hours
PPOH 100	Introduction to Pandemic Preparedness and One Health	3	0	15	15
PPOH 101	Planetary Health, Climate Change and Pandemics	4	2	40	55
PPOH 102	Impact of Pandemics on Socio-Economic Sectors	4	0	20	75
PPOH 103	Nature and Occurrence of Pandemics	4	3	45	120
PPOH 104	Culture, Community Engagement and Pandemics	3	0	15	135
PPOH 105	Policy, Leadership and Governance in Pandemics	3	0	15	150
PPOH 106	Pandemic Preparedness Planning	3	2	35	185

CODE	Topic	Overviews Each unit 5 hours	Practical/field Each unit 10 hours	Total hours	Total Cumulative hours
PPOH 107	Detection, Identification and Monitoring of Pandemics	3	4	55	240
PPOH 108	Risk and Crisis	3	2	35	275
PPOH 109	Gender and Ethics in Pandemics	3	2	35	310
PPOH 110	Partnerships and Resource Mobilisation in Pandemics	3	0	15	325
PPOH 111	Biotechnology, Biosafety, Biosecurity and Pandemics	4	3	50	375
PPOH 112	Systems Thinking in Pandemic Preparedness and Response	3	0	15	390
PPOH 113	Antimicrobial Resistance and Pandemics	3	3	45	435
PPOH 114	Water Sanitation and Hygiene in Pandemics	3	4	55	490
PPOH 115	Mental Health and Pandemic Response	3	0	15	505
PPOH 116	Food Safety, Security and Nutrition in Pandemics	3	3	45	550
PPOH 117	Infection Prevention and Control in Pandemics	3	2	35	585
18 topics		57	30	585	585

■ Table 2: Course Learning Outcome (CLO) Matrix

LEARNING OUTCOMES	Topics
CLO 1 Describe concepts in pandemics and One Health	POH 100 POH 102 POH 103 POH 106 POH 112
CLO 2 Justify the case for pandemic preparedness using a One Health approach in East Africa	POH 101 POH 102 POH 107 POH 111 POH 113
CLO 3 Design a model for pandemic preparedness for effective response in an East African situation.	POH 104 POH 105 POH 106 POH 108 POH 110 POH 112 POH 115
CLO 4 Discuss strategies for social and resource mobilization to counter pandemics in East Africa.	POH 107 POH 108 POH 109 POH 114 POH 115 POH 116

04. Topic Description

PPOH 100: Introduction to Pandemic Preparedness and One Health

■ Purpose

This topic enables learners to understand basic concepts of pandemics and the One Health approach.

■ Objectives

1. Concepts of pandemics and pandemic preparedness
2. Drivers of pandemics
3. The One Health approach to pandemics
4. Barriers and prospects of the One Health approach to pandemics

■ Expected Learning Outcomes

At the end of this topic, the learner should be able to:

1. Define concepts in pandemics and the One Health approach
2. Discuss drivers of pandemics
3. Describe the One Health approach in pandemics
4. Explain barriers and prospects of the One Health approach applied in pandemics

■ Content

Common terms and concepts: epidemic, epizootic, outbreak, pandemic, panoptic, zoonosis, endemic, enzootic, mode of transmission, incubation period, morbidity, mortality, surveillance, environment, ecosystem, planetary health.

Emerging and re-emerging pandemic threats: drivers and impacts of pandemics, emergence, re-emergence, spread and response to pandemics threats.

One Health (OH) concept and practices: history of OH, OH approach, OH and its application, barriers to success and prospects of OH, requirements for optimal application of OH.

Drivers of pandemics: human population/movement, animal farming, movement, imports and exports and environmental (climate change, pollution, deforestation); social factors (inequality, politics, access to antibiotics and other medicines); cultural factors (beliefs, development).

Barriers to One Health: communication, coordination, early warning systems or lack of them, in-country capacity (including human resources and labs, culture, finance and funding, leadership).

■ Mode of Delivery

This includes lectures, problem-based learning using interactive tutorials, video shows, small group discussions and written assignments, plenary presentations, case studies, experiential learning through independent/reflective study and online peer discussions using video clips and conferencing, case study and case series, table-top exercises.

■ Instructional Materials

Materials: lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy document/guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, white board, markers and flipcharts, LCD, printers, Internet access for e-resources, PDAs, mobile phones.

■ Core Reference Materials

Ibrahim, S. (2020). The pandemic century: A history of global contagion from the Spanish flu to COVID-19. *Malaysian Orthopaedic Journal*, 14(3), 209.

Deem, S. L., Lane-deGraaf, K. E., & Rayhel, E. A. (2018). *Introduction to One Health: An Interdisciplinary Approach to Planetary Health*. Wiley-Blackwell.

World Health Organization (2017, September 21). *One Health*. Retrieved August 22, 2023, from <http://www.who.int/features/qa/one-health/en/>

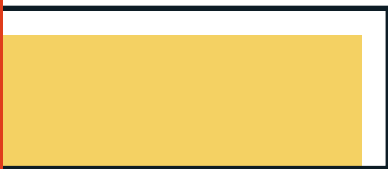
Semenza, J. C., Lindgren, E., Balkanyi, L., Espinosa, L., Almqvist, M. S., Penttinen, P., & Rocklöv, J. (2016). Determinants and Drivers of Infectious Disease Threat Events in Europe. *Emerging infectious diseases*, 22(4), 581–589. <https://doi.org/10.3201/eid2204>

■ Recommended Reference Materials

World Health Organization. (n.d.). Health Topics. Retrieved August 28, 2023, from <https://www.who.int/health-topics>

■ Duration and Structure of the Course

The course includes 57-units overview (each unit equates to 5 hours; 285 hours) and 30 hours practical field trips (each unit equates to 10 hours, 300), totalling 585 hours spread over a nine-week period and could be delivered virtually and/or three weeks face-to-face. Each institution may adapt the length of each topic and choose the most appropriate tools (lectures, practical field trips, self-study, etc.).



04. Topic Description

PPOH 101: Planetary Health, Climate Change and Pandemics

■ Purpose

This topic introduces learners to planetary health, climate change, pandemics, and their interrelations.

■ Objectives

This topic enables learning about:

1. Concepts and principles of planetary health and climate change
2. Interrelationships between ecosystems, animal and human health
3. Analysing far-reaching effects of animal and human interactions on the environment
4. Practical interventions that provide co-benefits for human and environmental health

■ Expected Learning Outcomes

At the end of this topic, the learner should be able to:

1. Explain concepts and principles of planetary health and climate change
2. Describe interrelationships between ecosystems, animal, and human health

3. Analyse far-reaching effects of animal and human interactions on the environment
4. Apply practical interventions that provide co-benefits for human and environmental health
5. Explain barriers and prospects of the One Health approach applied in pandemics

■ Content

Concepts: ecosystem, planetary health, OH, abiotic and biotic cycles, habitat, biodiversity, symbiosis, adaptation, ecology, biosphere; ecosystem, niche, toxins, function, disruption to the ecosystems on which human health depends include; biodiversity loss, climate change, freshwater depletion, deforestation, urban development; factors impacting on ecosystems; energy and nutrients flows; producers, consumers and decomposers; food chains; sustainability, biogeochemical cycles (carbon, nitrogen, phosphorus and sulphur); ecosystem health assessment.

Planetary Health: catalyst or exacerbation of animal and humanitarian crises, pollution of air and water, biodiversity loss, disruption of food production systems and changing patterns of diseases are affecting animal, human health and healthcare systems in relation to pandemics; analyses how acute climate-related shocks (e.g., floods, sea level rising) or chronic (e.g., drought and desertification) increase human mobility.

Climate change: climate change concept, threats to climate change, impacts of climate change; the relation between pandemics and climate change.

Adaptation and mitigation climate change, global resolutions, meteorology, forecasting and early warning. Human health impacts include increases in deaths related to extreme weather events, such as heatwaves, flooding, wildfires, infectious diseases, malnutrition, psychological distress and trauma and pollution-related illnesses. These health impacts are amplified in disadvantaged communities that are less able to adapt to environmental challenges. Global and regional frameworks on climate change. Anthropogenic activities and the environment.

■ Mode of Delivery

This includes lectures, problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations;

case studies, experiential learning through independent/reflective study and field visits and placements and online peer discussions using video clips and conferencing, case study and case series, tabletop exercises, field work.

■ Instructional Materials

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy document/guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, white board, markers and flipcharts, LCD, printers, Internet access for e-resources, PDAs, mobile phones.

■ Core Reference Materials

Haines, A., & Frumkin, H. (2021). *Planetary Health*. Cambridge University Press.

Ramanathan, V. (2020). Climate Change, Air Pollution, and Health: Common Sources, Similar Impacts, and Common Solutions. In Al-Delaimy, W., Ramanathan, V., Sánchez Sorondo, M. (Eds.), *Health of People, Health of Planet and Our Responsibility*. Springer. https://doi.org/10.1007/978-3-030-31125-4_5

Cole, J., Farlow, A., Quilley, S., Zywert, K., Foster, A., Messina, J., Milner, A., & Bartlett, H. (2019). *Planetary Health: Human Health in an Era of Global Environmental Change*. CABI Publishing.

Myers, S. S., & Frumkin, H. (Eds.). (2020). *Planetary Health: Protecting Nature to Protect Ourselves*. Island Press.

■ Recommended Reference Materials

350 Africa (n.d.). *8 ways climate change is already affecting Africa*. Retrieved August 22, 2023, from <http://350africa.org/8-ways-climate-change-is-already-affecting-africa/>

Charron, D. F. (Ed.). (2012). *Ecohealth Research in Practice - Innovative Applications of an Ecosystem Approach to Health*. Springer/IDRC.

RESPOND SEAHOHUN. (n.d.). *One Health Course Module Introduction*. Retrieved August 21, 2023, from <https://seaohunonehealth.wordpress.com/>

04. Topic Description

PPOH 102: Impact of Pandemics on Socio-Economic Sectors

■ Purpose

This topic introduces learners to the impact of pandemics on socio-economic sectors including migration, trade, agriculture, tourism, wildlife and others.

■ Objectives

This topic enables learning about:

1. Various sector roles in pandemics
2. Trade, travel, agriculture, and food security during pandemics
3. Sector roles in mitigating effects of pandemics

■ Expected Learning Outcomes

At the end of this topic, the learner should be able to:

1. Describe the roles of different sectors in pandemic prevention, preparedness and response
2. Discuss the effect of pandemics on trade, travel, agriculture and other sectors
3. Explain the impact of pandemics on lives and livelihoods

■ Content

Identification of various economic sectors driving and affected by pandemics; trade, agriculture, tourism, migration, wildlife: definition of terms and concepts; international trade and migration, globalisation and its associated processes (crowding, poor sanitation, travel and trade, intensive food production practices, and ecologic change) increase in the threat of pathogen emergence; mechanisms by which ecologic change drives processes of pathogenic emergence, facilitates zoonotic transfers, induces mutation, and permits the globalisation of antimicrobial drug resistance; negative economic impact of infectious disease. Movement of goods/trade policy and regulatory environment; the World Trade Organization (WTO) SPS agreement; EAC SPS protocol.

Infectious disease spread by international trade; the SPS measures to reduce disease spread; Role of port health, immigration and customs; the impact of disease on trade; trade embargoes; trade-related aspects of intellectual property rights of the WTO; Global pathogen surveillance, diagnostic, and response networks; International politics and international relations and public health; Promotion of safe trade; Port health; Border control and quarantine. PESTEL (Political, Economic, Social, Technological, Ecological and Legal).

Globalisation and spread of epidemics; massive movement from rural areas to cities and poverty in peri-urban areas and epidemics. Global climate change and the spread of malaria, dengue fever and yellow fever. International regulations on trade, trade and movements, infections, aircraft and travellers as an integral part of the global surveillance network for emerging infections. Susceptibility patterns of pathogens in different regions; examples are SARS, Chikungunya, Influenza, animal vector movement, travel, Ebola.

Tourism and wildlife: spread of infectious pathogens; impact on tourism. Zoonosis; wildlife exchange of pathogens, emerging and re-emerging diseases, wildlife, human, and livestock interaction.

Agriculture: impact on the agriculture workforce; food and nutrition security.

■ Mode of Delivery

This includes lectures, problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations; case studies, experiential learning through independent/reflective study and field visits and placements and online peer discussions using video clips and conferencing, case study and case series, tabletop exercises.

■ Instructional Materials

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy document/guidelines)

Equipment: LCD projectors, laptops, white board, markers and flipcharts, LCD, printers, Internet access for e-resources, PDAs, mobile phones.

■ Core Reference Materials

Price-Smith, A. (2008). Risky Trade: Infectious Disease in the Era of Global Trade. *Emerging Infectious Diseases*, 14(10), 1678-1679. <https://doi.org/10.3201/eid1410.080835>

Global Influenza Programme (2009). *Pandemic influenza preparedness and response: a WHO guidance document*. World Health Organization. <https://www.who.int/publications/i/item/9789241547680>

Blake, A., & Sinclair, M. T. (2003). Tourism crisis management: US response to September 11. *Annals of Tourism Research*, 30(4), 813-832.

Breugelmans, J. G., Zucs, P., Porten, K., Broll, S., Niedrig, M., Ammon, A., & Krause, G. (2004). SARS transmission and commercial aircraft. *Emerging infectious diseases*, 10(8), 1502-1503. <https://doi.org/10.3201/eid1008.040093>

Brownstein, J. S., Wolfe, C. J., & Mandl, K. D. (2006). Empirical evidence for the effect of airline travel on inter-regional influenza spread in the United States. *PLoS med*, 3(10), e401. <https://doi.org/10.1371/journal.pmed.0030401>

Charrel, R. N., de Lamballerie, X., & Raoult, D. (2007). Chikungunya outbreaks--the globalization of vectorborne diseases. *The New England journal of medicine*, 356(8), 769-771. <https://doi.org/10.1056/NEJMp078013>

- Correia, J. D., Shafer, R. T., Patel, V., Kain, K. C., Tessier, D., MacPherson, D., & Keystone, J. S. (2001). Blood and body fluid exposure as a health risk for international travelers. *Journal of travel medicine*, 8(5), 263–266. <https://doi.org/10.2310/7060.2001.24033>
- Department of Migration Management, Migration Health Division. (2021). *Health, Border & Mobility Management – A Framework to Empower Governments and Communities to Prevent, Detect and Respond to Health Threats Along the Mobility Continuum*. International Organization for Migration. <https://publications.iom.int/books/health-border-and-mobility-management-framework-framework-empower-governments-and-communities>
- Hall, S. (2018). *Free and Safe Movement in East Africa Research to promote people's safe and unencumbered movement across international borders*. Open Society Foundations and African Center for Migration and Society. <https://www.alnap.org/help-library/free-and-safe-movement-in-east-africa>

■ Recommended Reference Materials

- Daszak, P., Cunningham, A. A., & Hyatt, A. D. (2000). Emerging infectious diseases of wildlife--threats to biodiversity and human health. *Science*, 287(5452), 443–449. <https://doi.org/10.1126/science.287.5452.443>
- Dimanche, F., & Lepetic, A. (1999). New Orleans Tourism and Crime: A Case Study. *Journal of Travel Research*, 38(1), 19–23. <https://doi.org/10.1177/004728759903800105>

04. Topic Description

PPOH 103: Nature and Occurrence of Pandemics

■ Purpose

This topic introduces learners to causation, spread and control of pandemics.

■ Objectives

This topic enables learning about:

1. Concepts and nature of pandemics
2. Disease causation and transmission
3. Interrelationship between host, agent and environment
4. Principles of control of pandemics

■ Expected Learning Outcomes

At the end of this topic, the learner should be able to:

1. Describe concepts and nature of pandemics
2. Explain disease causation and transmission
3. Analyse the interrelationship between host, agent and environment and
4. Discuss principles of the control of pandemics

■ Content

Definition of terms used in pandemics, epidemiologic triad, host factors, agent factors, environmental factors, the interrelationship

between host, agent and environment, factors influencing disease transmission, epidemiological concepts, levels of disease, zoonosis, epizootic and enzootic chain of infection, factors influencing disease transmission, routes of transmission, exposure to infectious agents, transmission, chain of infection and agents, infectious organisms and agents, transmission and modes of disease transmission, types of reservoirs, vectors, environmental factors, immunity, principles of control.

■ Mode of Delivery

This includes lectures: problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations, case studies, experiential learning through independent/reflective study and field visits and placements and online peer discussions using video clips and conferencing, case study and case series, tabletop exercises, field work. Learners should have the opportunity, if possible, to join epidemiologists in the field undertake outbreak investigation and control.

■ Instructional Materials

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (t, journals, and policy document-guidelines), field placements and field visits to research institutions

Equipment: LCD projectors, laptops, white board, markers and flipcharts, LCD, printers, Internet access for e-resources, PDAs, mobile phones, tools for outbreak investigation.

■ Core Reference Materials

Dicker, R. C., Coronado, F., Koo, D., & Parrish, R. G. (2012). *Principles of epidemiology in public health practice; an introduction to applied epidemiology and biostatistics. Self-Study Course*. Centers for Disease Control and Prevention (U.S.), Office of Workforce and Career Development. <https://stacks.cdc.gov/view/cdc/6914>

Gregg M. (2008). Communicating Epidemiologic Findings. In M. Gregg (Ed.), *Field Epidemiology* (3rd ed., pp. 249–261). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195313802.001.0001>

■ Recommended Reference Materials

- Bonita, R., Beaglehole, R., & Kjellström, T. (2006). *Basic epidemiology*. World Health Organization. <https://apps.who.int/iris/handle/10665/43541>
- Rothman, K. J. (2012). *Epidemiology: An Introduction*. Oxford University Press.
- Aschengrau, A., & Seage, G. R. (2013). *Essentials of epidemiology in Public Health* (3rd ed.). Jones & Bartlett Publishers.



04. Topic Description

PPOH 104: Culture, Community Engagement and Pandemics

■ Purpose

This topic introduces learners to the role of culture and community engagement in pandemic preparedness and response.

■ Objectives

This topic enables learning about:

1. The role of community and culture as it relates to pandemics
2. Role of the community and community structures during the various phases of pandemics
3. Community entry points and social mobilisation in pandemic response and management
4. Principles and challenges of community engagement in pandemic preparedness and management

■ Expected Learning Outcomes

At the end of this topic, the learner should be able to:

1. Describe the role of community/culture as it relates to pandemics
2. Explain the role of the community and community structures during the various phases of pandemics

3. Justify the need for community entry and social mobilisation in pandemic response and management
4. Discuss principles and challenges of community engagement in pandemic preparedness and management

■ Content

Community entry points: community settings, attitude, culture, organisational structure, infrastructure, approach, health seeking behaviour, indigenous knowledge and skills (e.g., community by-laws; impact of pandemics on communities; community response to pandemics; community education/sensitisation to pandemics; after action reviews of pandemics. Models of community and behaviour change, ethical considerations.

Culture and pandemics: beliefs, religions, mass gatherings, burials, superstitions, myths,

community dynamics, opinion leaders and influencers, power and relationships, sources of information, available resources, health seeking behaviour, indigenous and modern knowledge and skills (e.g., community by-laws; impact of pandemics on communities; community response to pandemics; community education/sensitisation to pandemics; community development agents and roles, social mobilisation, community engagement phases planning, implementation, challenges communities' involvement in pandemic preparedness and response.

■ Mode of Delivery

This includes lectures: problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations; case studies, role plays, skits, individual reflection, simulation exercises, experiential learning through independent/reflective study and field visits and placements; and online peer discussions using video clips and conferencing.

■ Instructional Materials and/or Equipment

Materials: lecture notes and slides, video clips, Handouts, case studies, Reference materials (textbooks, journals, policy document-guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, white board, markers and flipcharts, LCD, printers, Internet access for e-resources.

■ Core Reference Materials

- Owoyemi, A., Okolie, E. A., Omitiran, K., Amaechi, U. A., Sodipo, B. O., Ajumobi, O., Nnaji, C. E., & Okedo-Alex, I. N. (2021). Importance of Community-Level Interventions During the COVID-19 Pandemic: Lessons from Sub-Saharan Africa. *The American journal of tropical medicine and hygiene*, 105(4), 879–883. <https://doi.org/10.4269/ajtmh.20-1533>
- Berrian, A. M., Smith, M. H., van Rooyen, J., Martínez-López, B., Plank, M. N., Smith, W. A., & Conrad, P. A. (2017). A community-based One Health education program for disease risk mitigation at the human-animal interface. *One Health*, 5, 9-20. <https://doi.org/10.1016/j.onehlt.2017.11.002>
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). Sage.
- Dickmann, P., Kitua, A., Apfel, F., & Lightfoot, N. (2018). Kampala manifesto: Building community-based One Health approaches to disease surveillance and response-The Ebola Legacy-Lessons from a peer-led capacity-building initiative. *PLoS neglected tropical diseases*, 12(4), e0006292. <https://doi.org/10.1371/journal.pntd.0006292>
- South, J., & Phillips, G. (2014). Evaluating community engagement as part of the public health system. *Journal of epidemiology and community health*, 68(7), 692–696. <https://doi.org/10.1136/jech-2013-203742>
- Moore, T., McDonald, M., McHugh-Dillon, H., & West, S. (2016). *Community engagement: A key strategy for improving outcomes for Australian families* (CFCA Paper No. 39). Australian Government. Australian Institute of Family Studies. Child Family Community Australia. <https://nla.gov.au/nla.obj-341222833/view>

■ Recommended Reference Materials

- World Health Organization. (2018). *Managing epidemics: Key facts about deadly diseases*. <https://www.who.int/publications/i/item/managing-epidemics-key-facts-about-major-deadly-diseases>

04. Topic Description

PPOH 105: Policy, Leadership and Governance in Pandemics

■ Purpose

This topic introduces learners to policy, leadership and governance mechanisms in pandemic preparedness and response.

■ Objectives

This topic enables learning about:

1. Basic concepts in leadership, management and governance
2. Stakeholder roles in pandemic prevention, preparedness and response
3. Legal and regulatory frameworks important in the management of pandemics
4. Ethical guidelines in pandemic response

■ Expected Learning Outcomes

At the end of this topic, the learner should be able to:

1. Describe basic concepts in leadership, management and governance
2. Map stakeholders and describe their roles in pandemic prevention, preparedness and response

3. Discuss legal and regulatory frameworks important in the management of pandemics
4. Describe ethical guidelines and challenges in pandemic response

■ Content

Common concepts, leadership, governance, managing conflicts in health emergencies. Partnerships in health emergencies; benefits of partnerships in control of pandemics, factors affecting partnerships in health emergencies; procedures in establishing partnerships. Collaborations in health emergencies; advantages of collaborations; rules and regulations for setting up collaborations. Stakeholder mapping, importance and the process; identification, analysis of expertise, willingness and value, mapping and prioritisation. Overview of relevant global sector policies; Global Health Security Agenda, International Health Regulations, Joint External Evaluations, Performance of Veterinary Services; ESR; Global Framework for the Progressive Control of Transboundary Animal Diseases; OH and quadripartite arrangements (WHO/FAO/WOAH/UNEP), Sendai framework; institutional arrangements (global, regional, national levels): Continental and regional policy institutions; Africa Centres for Disease Control and Prevention, African Union Inter-African Bureau for Animal Resources, EAC; national policy structures (highlighting certain policies in some countries); interrelationships between the different stakeholders and leadership; OH principles and concepts; OH approach; national policy and legal environment.

■ Mode of Delivery

This includes lectures: problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations; case studies, experiential learning through independent/reflective study and field visits and placements and online peer discussions using video clips and conferencing, case study and case series, tabletop exercises, field work, discussion One health animal human environment stakeholders as example of partnerships.

■ Instructional Materials and/or Equipment

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy document-guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, white board, markers and flipcharts, LCD, printers, Internet access for e-resources, PDAs, mobile phones.

■ Core Reference Materials

Nohria, N., & Khurana, R. (Eds.). (2010). *Handbook of leadership theory and practice*. Harvard Business Press.

Cole, G. A., & Kelly, P. (2004). *Management theory and practice* (6th ed.). Thomson Learning

■ Recommended Reference Materials

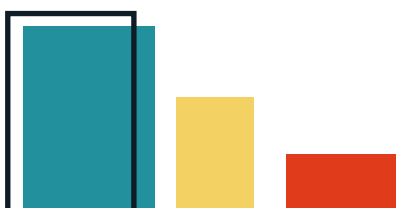
World Health Organization. (2022). *Joint external evaluation tool: International Health Regulations* (2005) (3rd ed.). <https://www.who.int/publications/item/9789240051980>

Centers for Disease Control and Prevention (U.S.). (2010). *Local public health governance performance assessment Instrument* (version 2). <https://stacks.cdc.gov/view/cdc/52707>

Kouzes, J. M., & Posner, B. Z. (2023). *The Leadership Challenge: How to Make Extraordinary Things Happen in Organizations* (7th ed.). Jossey- Bass.

World Health Organization. (n.d.). *Health System Governance*. Retrieved August 28, 2023, from https://www.who.int/health-topics/health-systems-governance#tab=tab_1

Galer, J. B., Vriesendorp, S., & Ellis, A. (2005). *MANAGERS who lead: a handbook for improving health services*. Management Sciences for Health. <https://msh.org/resources/managers-who-lead-a-handbook-for-improving-health-services/>



04. Topic Description

PPOH 106: Pandemic Preparedness Planning

■ Purpose

This topic introduces learners to foundational and contemporary aspects of preparedness toward effective response using a One Health approach.

■ Objectives

This topic enables learning about:

1. Concepts, principles and processes in pandemic preparedness
2. Components of pandemic preparedness planning cycles
3. Coordination and multidisciplinary players in pandemic preparedness
4. Training and tools in preparedness for effective response to pandemics

■ Expected Learning Outcomes

At the end of this topic, the learner should be able to:

1. Explain concepts, principles and processes in pandemic preparedness
2. Describe components of the pandemic preparedness planning cycle
3. Discuss coordination and multidisciplinary players in pandemic preparedness
4. Apply training and tools in preparedness for effective response to pandemics

■ Content

Definition of terms; pandemic preparedness, response, hazard, vulnerability, capacity, pandemic risk management, phases of pandemics, response capacity development, tabletop simulations, early warning. Pandemic preparedness planning cycle and related activities; mitigation, preparedness, prevention, response, and recovery. Causes and consequences of pandemics; surveillance, direct and indirect impact on people's health, impacts on health services, the role of agencies in preparedness and response, pandemic risk equation hazard, vulnerability, and capacity for resilience. Pandemic management tools: rapid needs assessment, camp profiling, emergency response plan, Hazard Capacity Vulnerability Analysis; Geographic Information System in pandemics, hazard mapping, forecasting, early warning and remote sensing systems. Environmental impact assessment, crisis management and triage. Cross-cutting issues in pandemics: Gender related issues, security and protection, vulnerable populations, environment. Control, command, communication plans and tools during pandemics: Standard Operating Procedures (SOPs), contact tracing, isolation and evacuation camps, camp coordination, camp management and incident command system.

■ Mode of Delivery

This includes lectures: problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations; case studies, experiential learning through independent/reflective study and field visits and placements; and online peer discussions using video clips and conferencing.

■ Instructional Materials

Materials: Lecture notes and slides, video clips, handouts, case studies, Reference materials (textbooks, journals, policy document-guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, white board, markers and flipcharts, LCD, printers, and Internet access for e-resources.

■ Core Reference Materials

Jamison, D. T., Gelband, H., Horton, S., Jha, P., Laxminarayan, R., Mock, C. N., & Nugent, R. (Eds.). (2017). *Disease Control Priorities: Improving Health and Reducing Poverty* (3rd ed.). The International Bank for Reconstruction and Development / The World Bank.

Katz, R. (2013). *Essentials of Public Health Preparedness*. Jones & Bartlett.

Landesman, L. Y., & Weisfuse, I. B. (2013). *Case Studies in Public Health Preparedness and Response to Pandemics*. Jones & Bartlett.

Fineberg H. V. (2014). Pandemic preparedness and response--lessons from the H1N1 influenza of 2009. *The New England journal of medicine*, 370(14), 1335–1342. <https://doi.org/10.1056/NEJMra1208802>

■ Recommended Reference Materials

Federal Emergency Management Agency. (1996). *Guide for All-Hazard Emergency Operations Planning*. <https://www.fema.gov/pdf/plan/slg101.pdf>

Emergency Management Institute. (2018, June 25). *An Introduction to the National Incident Management System*. U.S. Department of Homeland Security, Federal Emergency Management Agency. Retrieved August 24, 2023, from <https://training.fema.gov/is/courseoverview.aspx?code=IS-700.b&lang=en>

Centers for Disease Control and Prevention (U.S.) (2014). *Public Health Emergency Response Guide for State, Local, and Tribal Public Health Directors* (Version 2.0). <http://emergency.cdc.gov/planning/responseguide.asp>

04. Topic Description

PPOH 107: Detection, Identification and Monitoring of Pandemics

■ Purpose

This course will introduce learners to the basic principles of detection, identification and monitoring of pandemics and introduce the basic elements of outbreak investigation.

■ Objectives

This topic enables learning about:

1. Concepts and principles of disease surveillance
2. Steps in surveillance and outbreak investigation
3. Collection, analysis and interpretation of surveillance data and dissemination of information
4. Designing and evaluating a disease surveillance system

■ Expected Learning Outcomes

At the end of this topic, the learner should be able to:

1. Describe concepts and principles of disease surveillance
2. Outline steps required in surveillance and outbreak investigation
3. Collect, analyse, interpret data and disseminate surveillance information
4. Design and evaluate a surveillance system

■ Content

Terms used in disease surveillance: outbreak, cluster, mortality, morbidity, measurable factor, types of surveillance, active surveillance, passive surveillance, syndromic surveillance, integrated surveillance sentinel surveillance, event based surveillance; components of surveillance, scope and cycles of surveillance, surveillance methods; data and data sources in surveillance; interpretation of data and dissemination of information; ethical and legal issues in surveillance; sharing agreements, data management, storage and security, guidelines and policies for equitable sharing of data, data ethics and intellectual property, technical tools for data sharing, the diversity of data and their management, the identification of the components of good data management plans on how to support.

Outbreak investigation, conditions which lead to an outbreak, sources of outbreak information, purposes for outbreak investigation, steps for outbreak investigation, preparation, case definition, hypothesis, control measures and communication findings, including attack rates.

■ Mode of Delivery

This includes lectures: problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations, case studies, videos, experiential learning through independent/reflective study and field visits and placements and online peer discussions using video clips and conferencing.

■ Instructional Materials and/or Equipment

Materials: : Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy document-guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, white board, markers and flipcharts, LCD, printers, Internet access for e-resources.

■ Core Reference Materials

Nap, R. E., Meessen, N. E. L., Andriessen, M. P. H., & van der Werf, T. S. (2010). *Public Health in the 21st Century: Controlling Disease Outbreaks: The changing role of hospitals* (1st ed.). Nova Science Publishers.

Arias, K. M. (Ed). (2009). *Outbreak Investigation, Prevention, and Control in Health Care Settings. Critical Issues for Patient Safety* (2nd ed.). Jones & Bartlett.

Attridge, K. (2016). *The steps in outbreak investigation including the use of relevant epidemiological methods*. Faculty of Public Health. Retrieved August 24, 2023, from <https://www.healthknowledge.org.uk/public-health-text-book/disease-causation-diagnostic/2g-communicable-disease/outbreak-investigation>

Centers for Disease Control and Prevention. (2018). *Introduction to Epidemiology* (Public Health Training, PH 101 Series). Retrieved August 28, 2023, from <https://www.cdc.gov/training/publichealth101/epidemiology.html>

■ Recommended Reference Materials

Dicker, R. C., Coronado, F., Koo, D., & Parrish, R. G. (2012). *Principles of epidemiology in public health practice; an introduction to applied epidemiology and biostatistics. Self-Study Course*. Centers for Disease Control and Prevention (U.S.), Office of Workforce and Career Development. <https://stacks.cdc.gov/view/cdc/6914>

Teutsch, S. M., & Churchill, R. E. (2000) *Principles and Practice of Public Health Surveillance*. Oxford University Press.

Centers for Disease Control and Prevention (U.S.). (2001, July 27). *Updated guidelines for Evaluating Public Health Surveillance Systems: Recommendations from the Guidelines Working Group* (Morbidity and Mortality Weekly Report Vol. 50 No. RR-13). <https://www.cdc.gov/mmwr/pdf/rr/rr5013.pdf>

World Health Organization. (2019). *Health Emergency and Disaster Risk Management Framework*. <https://www.who.int/publications/item/9789241516181>

04. Topic Description

PPOH 108: Risks and Crisis Communication in Pandemics

■ Purpose

This topic introduces learners to basic terms, principles and approaches to effective risk and crisis communication in pandemics.

■ Objectives

This topic enables learning about:

1. Terminologies in risk and crisis communication
2. Principles and purpose of risk and crisis communication
3. Risk communication components and SOPs
4. Approaches to effective risk and crisis communication

■ Expected Learning Outcomes

At the end of this course, learners are expected to:

1. Define terminologies in risk and crisis communication
2. Describe principles and purpose of risk and crisis communication
3. Describe risk communication components and SOPs
4. Explain the approaches to effective risk and crisis communication

■ Content

Define terms: crisis, communication, risk, crisis communication, risk communication, hazard, risk assessment, One Health; principles and approaches; independence, timeliness, clarity, inclusiveness, approaches models; Lasswell model, mental models, situational crisis, types of crises, risk communication tools, risk communication tools; effective crisis communication, risk communication strategies, seven Cs of effective communication; barriers to risk communication; risk communication components and u in risk communication.

■ Mode of Delivery

This includes lectures, role play in crisis communication, problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations; case studies, experiential learning through independent/reflective study and field visits and placements and online peer discussions using video clips and conferencing

■ Instructional Materials and/or Equipment

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy document-guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, white board, markers and flipcharts, LCD, printers, and Internet access for e-resources.

■ Core Reference Materials

Hyer, R. N., & Covello, V. T. (2005, July). *Effective media communication during Public Health Emergencies: a WHO Handbook*. World Health Organization. <https://www.who.int/publications/i/item/effective-media-communication-during-public-health-emergencies-a-who-handbook>

Lundgren, R. E., & McMakin A. H. (2018). *Risk Communication: A Handbook for Communicating Environmental, Safety, and Health Risks* (6th ed.). WILEY Publisher.

World Health Organization. (2015). *Effective communications: participant handbook: communications training programme for WHO staff*. World Health Organization. <https://www.who.int/publications/i/item/effec>

tive-communications-participant-handbook-communications-training-programme-for-who-staff

- National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Board on Global Health, & Forum on Microbial Threats. (2017). *Building Communication Capacity to Counter Infectious Disease Threats: Proceedings of a Workshop*. National Academies Press (US).
- Reynolds, B. (2004). *Crisis and Emergency Risk Communication by Leaders for Leaders*. U.S. Department of Health and Human Services/Centers for Disease Control and Prevention. <https://emergency.cdc.gov/cerc/resources/pdf/leaders.pdf>
- Böl, G.-F. (2016). Risk Communication in times of crisis: Pitfalls and challenges in ensuring preparedness instead of hysterics. *EMBO Reports*, 17, 1–9. <https://doi.org/10.15252/embr.201541678>
- Hasson, G. (2012). *Brilliant Communication Skills*. Pearson.

■ Recommended Reference Materials

- World Health Organization. (2017). *Communicating Risk in Public Health Emergencies: A WHO guideline for emergency risk communication (ERC) policy and practice*. <https://www.who.int/publications/i/item/9789241550208>
- Reynolds, B., Galdo, J., & Sokler, L. (2002). *Crisis and emergency risk communication*. Centers for Disease Control and Prevention.
- World Health Organization. (2005). *WHO outbreak communication guidelines*. <https://www.who.int/publications/i/item/WHO-CDS-2005.28>
- World Health Organization. (2005). *Outbreak Communication. Best practices for communicating with the public during an outbreak*. <https://www.who.int/publications/i/item/outbreak-communication-best-practices-for-communicating-with-the-public-during-an-outbreak>

04. Topic Description

PPOH 109: Gender and Ethics in Pandemics

■ Purpose

This course introduces learners to gender and ethical issues in pandemic preparedness and response.

■ Objectives

This topic enables learning about:

1. Concepts and principles of gender and ethics
2. Gender roles in pandemics preparedness and response
3. Tools for conducting gender analysis during pandemic preparedness and response
4. Mainstreaming gender and ethical considerations, during pandemic preparedness and response
5. Challenges and strategies of gender and ethical issues during pandemic preparedness and response

■ Expected Learning Outcomes

At the end of this topic, the learner should be able to:

1. Describe concepts and principles of gender and ethics
2. Outline gender roles in pandemics preparedness and response
3. Explain tools for conducting gender analysis during pandemic preparedness and response
4. Mainstream gender and describe ethical considerations during pandemic preparedness

5. Discuss challenges and strategies during pandemic preparedness and response

■ Content

What is gender; gender concepts, gender blind, gender awareness; gender sensitivity, gender equality; gender equity, gender justice; gender mainstreaming; intersectionality; importance of gender in pandemics preparedness and response; gender issues in pandemics prevention, outbreak, management; identifying gender gaps; advocacy; transformative leadership in engendering pandemics; ethical considerations in pandemics. Gender roles; gender analysis, gender disaggregated data, concepts and tools: Gender Analysis Matrix; social network analysis; access and control over resources; communication profile; SWOT analysis; gender continuum; gender mainstreaming. Ethics: ethical principles, ethical values (equity, equality, respect in access of resources, treatment and care), discrimination.

■ Mode of Delivery

This includes lectures: problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations; case studies, role plays, skits, individual reflection, simulation exercises, experiential learning through independent/reflective study and field visits and placements; and online peer discussions using video clips and conferencing.

■ Instructional Materials

Materials: Lecture notes and slides, video clips, handouts, case studies, Reference materials (textbooks, journals, policy document-guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, white board, markers and flipcharts, LCD, printers, Internet access for e-resources.

■ Core Reference Materials

European Institute for Gender Equality. (2016, October 18). *Institutional Transformation Gender mainstreaming toolkit*. Publications Office of the

European Union. Retrieved August 24, 2023, from <https://eige.europa.eu/publications/institutional-transformation-gender-mainstreaming-toolkit>

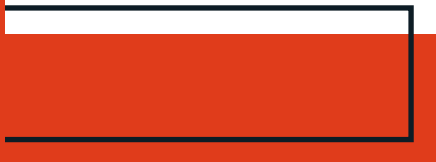
Amuguni, J., Mugisha, A., Kyewalabye, E., Bagnol, B., Talmage, R., Bikaa-ko, W., & Naigaga, I. (2018). EnGENDERing One Health and addressing gender gaps in Infectious disease control and response: Developing a Gender, One Health and Emerging Pandemics threat short course for the public health workforce in Africa. *Advances in Social Sciences Research Journal*. 5(5), 467-479.

International Organization for Migration. (2017). *Assessing Population Mobility Dynamics and Patterns for Public Health Emergency Preparedness and Response*. https://www.iom.int/sites/g/files/tmzbd1486/files/our_work/DMM/Migration-Health/mhd_infosheet_population_mobility_mapping_intro_2017.pdf

■ Recommended Reference Materials

World Health Organization. (2007). *Addressing sex and gender in epidemic-prone infectious diseases*. https://apps.who.int/iris/bitstream/handle/10665/43644/9789241595346_eng.pdf

Institute of Medicine (US) Forum on Microbial Threats. (2010). *Infectious Disease Movement in a Borderless World: Workshop Summary*. National Academies Press (US).



04. Topic Description

PPOH 110: Partnerships and Resource Mobilisation in Pandemics

■ Purpose

This topic will introduce learners to knowledge and skills on how to map, engage and coordinate partners and resources for pandemic in prevention, preparedness and response.

■ Objectives

This topic enables learning about:

1. Categories of partnerships in pandemics
2. Coordination mechanisms for pandemics
3. Laws and by-laws governing partnerships in pandemics
4. Approaches and steps of resource mobilisation for the management of pandemics

■ Expected Learning Outcomes

At the end of this course, learners are expected to:

1. Outline categories and mandates of partners in pandemic prevention, preparedness and response
2. Explain coordination mechanisms for pandemics
3. Practice laws and by-laws governing partnerships

4. Describe approaches and steps of resource mobilisation for the management of pandemics

■ Content

Concepts in partnership and resource mobilisation for prevention and mitigation of pandemics; identification of resources and resource owners for pandemic preparedness and mitigation; categorisation of multi-sectoral and multi-disciplinary partnerships for pandemic preparedness and mitigation; importance of partnership and resource mobilisation; strategies for resource mobilisation; the principles and ethical aspects of partnership and resource mobilisation, challenges in partnership and mobilising resources; mechanisms and tools for resource mobilisation; monitoring and evaluation of resources and partners; development of proposals with partners for resource mobilisation in prevention and mitigation of pandemics.

■ Mode of Delivery

This includes lectures: problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations; case studies, experiential learning through independent/reflective study and field visits and placements; and online peer discussions using video clips and conferencing.

■ Instructional Materials and/or Equipment

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy documents/guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, white board, markers and flipcharts, LCD, printers, Internet access for e-resources.

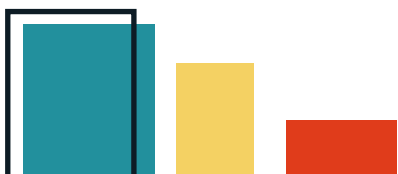
■ Core Reference Materials

Food and Agriculture Organization of the United Nations. (2012): *A Guide to Resource Mobilization*. <https://www.fao.org/3/i2699e/i2699e00.pdf>

- World Health Organization: Regional Office for South-East Asia. (2016). *Resource Mobilization Orientation: Facilitator's Manual*. <https://apps.who.int/iris/bitstream/handle/10665/252767/facilitator.pdf?sequence=1&isAllowed=y>
- International Federation of Red Cross and Red Crescent Societies. (2021). *A Red Cross Red Crescent Guide to Community Engagement and Accountability*. https://www.ifrc.org/sites/default/files/2021-11/20211020_CEAGuidelines_NEW1.pdf

■ Recommended Reference Materials

- United Nations Central Emergency Response Fund. (2017). *Approach to Resource Mobilisation and Communications*. <https://cerf.un.org/sites/default/files/resources/Approach%20to%20Resource%20Mobilisation%20and%20Communications%202017.pdf>
- Consultative Group on International Agricultural Research. (2014). *Resource Mobilization Strategy: Working Document*. https://cgspace.cgiar.org/bitstream/handle/10947/3267/CGIAR%20Resource%20Mobilisation%20Strategy_21_October.pdf
- Catholic Relief Services. (2016). *Robust and Sustainable Resource Mobilisation: Building Comprehensive Strategies for Resource Mobilisation Success*. <https://ics.crs.org/node/420-Robust%20and%20Sustainable%20Resource%20Mobilization%20Training%20Manual.pdf>
- NCSBN. (2020, June 23). *Practice/Academic Partnership During the COVID-19 Crisis* [Video]. YouTube. <https://www.youtube.com/watch?v=SPL7ojjfyCs>
- CSEBristol. (2013, July 05). *Working in Partnership* [Video]. YouTube. https://www.youtube.com/watch?v=ZPutB_B4Ku8
- TEDMED. (2018, August 20). *Why partnership is at the core of effective health-care* [Video]. YouTube. <https://www.youtube.com/watch?v=JfXY-6rJGHQ>
- Food and Agriculture Organization of the United Nations. (2014, June 17). *RM Action Planning - What are the key ingredients of a resource mobilization action plan?* [Video]. YouTube. <https://www.youtube.com/watch?v=4Dh-jF5GpqVg&t=10s>
- World Health Organization. (2021, December 21). *World Health Assembly Decides to Negotiate Global Accord on Pandemic Preparedness and Response* [Video]. YouTube. <https://www.youtube.com/watch?v=YNfLFGOnBOI>



04. Topic Description

PPOH 111: Biotechnology, Biosafety, Biosecurity and Pandemics

■ Purpose

This topic will enhance the learning of prevention of pandemic threats, protection, and control and provide a global public health response to international spread of diseases.

■ Objectives

This topic enables learning about:

1. Practical techniques and skills appropriate to the biosciences taking into consideration safety and security (biorisk management)
2. Key emerging technological developments
3. The role of bioeconomy in addressing societal challenges
4. Importance of responsible research as well as the necessity of biosecurity measures.

■ Expected Learning Outcomes

At the end of this module, the learners will be able to:

1. Identify and classify the biological risks and be able to comprehend the scale and impact of accidental release and intentional misuse of biological agents

2. Describe the importance of responsible research as well as the necessity of biosecurity measures
3. Discuss the importance of bioeconomy in addressing societal challenges
4. Analyse biosafety and biosecurity measures in laboratory management.

■ Content

Definitions of the terms Biosafety, Biosecurity, Bioeconomy and Biotechnology concerning genetic Engineering and biotechnology, Evolution in using synthetic genomics, and Synthetic genomes. Overview of synthetic biology and its application, technological developments in life science, development and application, Application of Bio-Economy-Agriculture, Health, Industrial and Environmental sector. East African Community bio-economy strategy and policies, Packaging and Shipping/Sample handling/Labelling of infectious materials; (the transport chain, Road regulations, Air transport, Railway transport, Transport by Sea, Transport by Post, Air Mail, Public Transport),

Potential Risks for Synthetic Genomics/Dual Use issues in Biotechnology, Biological weapons and Bioterrorism, International regimes related to dual-use aspects (Chemical, biological, radiological and nuclear (CBRN), weapons of mass destruction (WMD), UN Security Council Resolution 1540, Biological Weapons Convention 1970), Cartagena Protocol on Biosafety to the Convention of Biological Diversity, Global Health Security Agenda. How biotech can be used to develop new products, methods and organisms for human, animal and plant health for preparing and responding to pandemics. Measures to prevent the introduction of pathogens and reduce their spread to humans, animals, plants and the environment in order to prepare and respond to pandemics. Protection of the community, workers and the environment from accidental exposure or unintentional release of infectious agents, toxins and other biological hazards.

■ Mode of Delivery

This includes lectures: problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations; case studies, experiential learning through independent/reflective study and field visits and placements; and online peer discussions using video clips and conferencing, case study and case series, tabletop exercises, field work

■ Instructional Materials and/or Equipment

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy document-guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, white board, markers and flipcharts, LCD, printers, Internet access for e-resources, PDAs, mobile phones. We shall also engage international experts in the fields of synthetic biology, biosafety and biosecurity, bioterrorism, UN Security Council Resolution 1540 and the Biological Weapons Convention.

The assessment will be pre and post-test, group assignments, participation in the discussion forum and individual assignments.

■ Core Reference Materials

World Health Organization. (2006, September). Biorisk management: *Laboratory biosecurity guidance*. <https://www.who.int/publications/i/item/biorisk-management-laboratory-biosecurity-guidance>

World Health Organization. (2020). *Laboratory Biosafety Manual* (4th ed.). <https://www.who.int/publications/i/item/9789240011311>

International Organization for Standardization of Medical Service. (2019). *ISO and health: Great things happen when the world agrees*. <https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100343.pdf>

Republic of Kenya. Ministry of Public Health and Sanitation & Ministry of Medical Services. (n.d.). *Laboratory Biosafety and Biosecurity Policy Guidelines*. <https://internationalbiosafety.org/wp-content/uploads/2019/08/Kenya-Biosafety-Guidelines.pdf>

■ Recommended Reference Materials

International Biological Threat Reduction, Sandia National Laboratories & The International Federation of Biosafety Associations. (n.d.). *Laboratory Biosafety and Biosecurity Risk Assessment Technical Guidance Document*. <https://www.aam.org.ar/descarga-archivos/Laboratory-Biosafety-Biosecurity-Guidance.pdf>

Centers for Disease Control and Prevention (U.S.). (2011, April 15). *Guidelines for Biosafety Laboratory Competency* (Morbidity and Mortality Weekly Report Supplement/Vol. 60). <https://www.cdc.gov/mmwr/pdf/other/su6002.pdf>

Association of Public Health Laboratories. (2016). *Enhancing Biosafety and Biosecurity in the Nation's Public Health Laboratories: A Report of the APHL 2016 Biosafety and Biosecurity Survey*. <https://www.aphl.org/aboutAPHL/publications/Documents/PHPR-2016-Biosafety%20Report-Jun17.pdf>



04. Topic Description

PPOH 112: Systems Thinking in Pandemic Preparedness and Response

■ Purpose

This topic seeks to facilitate learning of the inter-relationships among system elements, and the interactions of systems in complex, unpredictable environments to influence outcomes in pandemics and emergencies.

■ Objectives

This topic enables learning about:

1. Systems thinking, core concepts of its theories and characteristics, and their application in One Health interventions
2. Systems thinking skills and tools in mapping One Health problems and create solutions to problems with practical strategies useful for field investigations
3. One Health systems thinking skills to improve inter-professional, inter-discipline and cross-sectoral collaboration on key disease surveillance and outbreaks
4. Systems thinking skills to improve multi-sectoral cooperation among national, regional and international government health officials along with multilateral health agencies in One Health interventions

Expected Learning Outcomes

At the end of this course the learner should be able to:

1. Define systems thinking, the core concepts of its theories and characteristics, and their application in One Health interventions
2. Apply systems thinking tools for mapping One Health problems and create solutions to problems with practical strategies useful for field investigations
3. Demonstrate One Health systems thinking to improve national, regional and international, inter-professional, inter-disciplinary and cross-sectoral collaboration on key disease surveillance and outbreaks

Content

In this topic, learners should be introduced to systems thinking, why use systems thinking, health systems applications: health systems frameworks and the problem of implementation, pathways: the problem of scaling up, where systems thinking helps: understanding the types of problems, theories, methods and tool, systems thinking in practice - understanding and engaging with stakeholders, network analysis, participatory impact pathways analysis and summary. System conceptualisation and mapping, basic components, causal loop diagrams: sources of data, strengths and weaknesses. Using stock and flow principles for simulation, advancing the application of systems thinking with the One Health approach.

Mode of Delivery

This includes lectures: problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations; case studies, experiential learning through independent/reflective study and field visits and placements; and online peer discussions using video clips and conferencing.

Instructional Materials and/or Equipment

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy document/guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, white board, Markers and flipcharts, LCD, printers, Internet access for e-resources.

■ Core Reference Materials

Bradley, D. T., Mansouri, M. A., Kee, F., & Garcia, L. M. T. (2020). A systems approach to preventing and responding to COVID-19. *EClinicalMedicine*, 21, 100325. <https://doi.org/10.1016/j.eclinm.2020.100325>

Brown, G., Reeders, D., Cogle, A., Madden, A., Kim, J., & O'Donnell, D. (2018). A Systems Thinking Approach to Understanding and Demonstrating the Role of Peer-Led Programs and Leadership in the Response to HIV and Hepatitis C: Findings From the W3 Project. *Frontiers in Public Health*, 6, 231. <https://doi.org/10.3389/fpubh.2018.00231>

Chakraborty, I., & Maity, P. (2020). COVID-19 outbreak: Migration, effects on society, global environment and prevention. *The Science of the total environment*, 728, 138882. <https://doi.org/10.1016/j.scitotenv.2020.138882>

■ Recommended Reference Materials

Maani, K. E., & Cavana, R. (2000). *Systems Thinking and Modelling: understanding change and complexity*. Pearson.

Dickey, C., Holzman, E., Bedford, J., Manoncourt, E., Shirky, C., Petit, V., Guirguis, S., Bloch, K., & Obregon, R. (2021). Behavioral Communication Strategies for Global Epidemics: An Innovative Model for Public Health Education and Humanitarian Response. *Health Promotion Practice*, 22(4), 448–452. <https://doi.org/10.1177/1524839920916465>

World Health Organization. (2020). *Global surveillance for COVID-19 disease caused by human infection with novel coronavirus (COVID-19)*. https://www.who.int/docs/default-source/coronaviruse/2020-03-20-surveillance.pdf?sfvrsn=e6be6ef1_2

Patiño-Lugo, D. F., Vélez, M., Velásquez Salazar, P., Vera-Giraldo, C. Y., Vélez, V., Marín, I. C., Ramírez, P. A., Quintero, S. P., Castrillón Martínez, E., Pineda Higueta, D. A., & Henandez, G. (2020). Non-pharmaceutical interventions for containment, mitigation and suppression of COVID-19 infection. *Colombia medica (Cali)*, 51(2), e4266. <https://doi.org/10.25100/cm.v51i2.4266>

Meadows D. H. (2008). *Thinking in Systems: A Primer*. Chelsea Green Publishing.

04. Topic Description

PPOH 113: Antimicrobial Resistance (AMR) and Pandemics

■ Purpose

This topic introduces learners to antimicrobials and factors influencing the emergence of antimicrobial resistance, and interactions that lead to the emergence of antimicrobial resistance from a One Health perspective.

■ Objectives

This topic seeks to enable learning about:

1. Common terminologies in AMR
2. Factors leading to the emergence, spread of AMR and its implications
3. One Health Approach in combating AMR
4. AMR prevention policies

■ Expected Learning Outcomes

At the end of this course the learner should be able to:

1. Define common in AMR terminologies
2. Discuss factors leading to the emergence, spread of AMR and its implications

3. Describe One Health approaches in combating AMR
4. Advocate for AMR prevention policies

■ Content

Definition of terms: Antimicrobial resistance (AMR); antimicrobials; antibiotics; AMR surveillance; One Health approach. Drivers of AMR; AMR burden; justification for AMR; Introduction to and use of antimicrobials; emergence of AMR and its implications on humans, animals and the environment; detection, surveillance and prevention and control of AMR; Importance of rational use and prescribing of antibiotics/antimicrobials to both animals and humans; national, regional, and international laws enacted, and policies formulated to combat antimicrobial resistance, antimicrobial stewardship. National and Global Action Plan in combating AMR.

■ Mode of Delivery

This includes lectures: problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations; case studies, experiential learning through independent/reflective study and field visits and placements; and online peer discussions using video clips and conferencing.

■ Instructional Materials and/or Equipment

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy document guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, whiteboard, markers and flipcharts, LCD, printers, and Internet access for e-resources.

■ Core Reference Materials

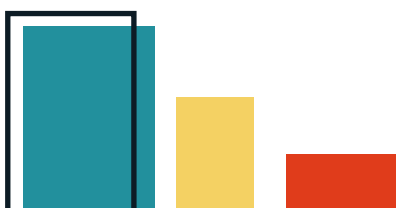
Jonas, O. B., Irwin, A., Berthe, F. C. J., Le Gall, F. G., Marquez, P. V. (2017, April 28). *Drug-resistant infections: a threat to our economic future* (Vol. 2). HNP/Agriculture Global Antimicrobial Resistance Initiative, World Bank Group. <http://documents.worldbank.org/curated/en/323311493396993758/final-report>

- Berkner, S., Konradi, S., & Schönfeld, J. (2014). Antibiotic resistance and the environment--there and back again: Science & Society series on Science and Drugs. *EMBO reports*, 15(7), 740–744. <https://doi.org/10.15252/embr.201438978>
- Getahun, H., Smith, I., Trivedi, K., Paulin, S., & Balkhy, H. H. (2020). Tackling antimicrobial resistance in the COVID-19 pandemic. *Bulletin of the World Health Organization*, 98(7), 442–442A. <https://doi.org/10.2471/BLT.20.268573>
- Taylor, E., Gregory, R., Bloom, G., Salama, P., & Balkhy, H. (2019). Universal health coverage: an opportunity to address antimicrobial resistance?. *The Lancet. Global health*, 7(11), e1480–e1481. [https://doi.org/10.1016/S2214-109X\(19\)30362-6](https://doi.org/10.1016/S2214-109X(19)30362-6)
- Vekemans, J., Hasso-Agopsowicz, M., Kang, G., Hausdorff, W. P., Fiore, A., Taylor, E., Klemm, E. J., Laxminarayan, R., Srikantiah, P., Friede, M., & Lipsitch, M. (2021). *Leveraging Vaccines to Reduce Antibiotic Use and Prevent Antimicrobial Resistance: A World Health Organization Action Framework*. *Clinical infectious diseases: an official publication of the Infectious Diseases Society of America*, 73(4), e1011–e1017. <https://doi.org/10.1093/cid/ciab062>

■ Recommended Reference Materials

- Alsan, M., Schoemaker, L., Eggleston, K., Kammili, N., Kolli, P., & Bhattacharya, J. (2015). Out-of-pocket health expenditures and antimicrobial resistance in low-income and middle-income countries: an economic analysis. *The Lancet. Infectious diseases*, 15(10), 1203–1210. [https://doi.org/10.1016/S1473-3099\(15\)00149-8](https://doi.org/10.1016/S1473-3099(15)00149-8)
- World Health Organization, Food and Agriculture Organization of the United Nations & World Organization for Animal Health. (2020). *Technical brief on water, sanitation, hygiene (WASH) and wastewater management to prevent infections and reduce the spread of antimicrobial resistance (AMR)*. <https://www.who.int/publications/i/item/9789240006416>
- World Health Organization. (2015). *Global action plan on antimicrobial resistance*. <https://www.who.int/publications/i/item/9789241509763>
- United Nations. (2016, September 21). *High-level Meeting on Antimicrobial Resistance* [Press Release]. <https://www.un.org/pga/71/event-latest/high-level-meeting-on-antimicrobialresistance/>

- World Health Organization, Food and Agriculture Organization of the United Nations, World Organization for Animal Health, United Nations environment programme. (2022). *Global database for the Tracking Antimicrobial Resistance (AMR): Country Self-Assessment Survey (TrACSS)*. Retrieved August 25, 2023, from <https://amrcountryprogress.org>
- World Organisation for animal Health. (2022). *Annual report on antimicrobial agents intended for use in animals* (6th ed.). <https://www.woah.org/app/uploads/2022/06/a-sixth-annual-report-amu-final.pdf>
- Nielsen, L. R., Alban, L., Ellis-Iversen, J., Mintiens, K., & Sandberg, M. (2020). Evaluating integrated surveillance of antimicrobial resistance: experiences from use of three evaluation tools. *Clinical microbiology and infection: the official publication of the European Society of Clinical Microbiology and Infectious Diseases*, 26(12), 1606–1611. <https://doi.org/10.1016/j.cmi.2020.03.015>
- Sandberg, M., Hesp, A., Aenishaenslin, C., Bordier, M., Bennani, H., Bergwerff, U., Chantziaras, I., De Meneghi, D., Ellis-Iversen, J., Filippizi, M. E., Mintiens, K., Nielsen, L. R., Norström, M., Tomassone, L., van Schaik, G., & Alban, L. (2021). Assessment of Evaluation Tools for Integrated Surveillance of Antimicrobial Use and Resistance Based on Selected Case Studies. *Frontiers in veterinary science*, 8, 620998. <https://doi.org/10.3389/fvets.2021.620998>
- Sumpradit, N., Chongtrakul, P., Anuwong, K., Pumtong, S., Kongsomboon, K., Butdeemee, P., Khonglormyati, J., Chomyong, S., Tongyoung, P., Losiriwat, S., Seesuk, P., Suwanwaree, P., & Tangcharoensathien, V. (2012). Antibiotics Smart Use: a workable model for promoting the rational use of medicines in Thailand. *Bulletin of the World Health Organization*, 90(12), 905–913. <https://doi.org/10.2471/BLT.12.105445>
- ReAct. (2016). *Antibiotic smart use, Thailand: Involving community to curb antibiotic resistance*. <https://www.reactgroup.org/wp-content/uploads/2016/10/Antibiotic-Smart-Use-project-case-study.pdf>
- World Health Organization. (2021, March 4). *Strengthening laboratory capacity to combat antimicrobial resistance in Uzbekistan: a collaborative mentoring programme*. Retrieved August 25, 2023, from <https://www.who.int/news/item/04-03-2021-strengthening-lab-capacity-to-combat-amr-in-uzbekistan-a-collaborative-mentoring-programme>



04. Topic Description

PPOH 114: Water, Sanitation and Hygiene (WASH) in Pandemics

■ Purpose

This topic will introduce learners to appropriate ways of improving water quality, sanitation and hygiene to prevent emerging pandemics threats using a One health approach.

■ Objectives

This topic enables learning about:

1. The importance of WASH in preventing emerging pandemics
2. WASH principles for safe water, sanitation, and hygiene in disease control
3. The One Health approach in preparing and responding to WASH-related disease outbreaks in households, communities, and vulnerable populations
4. Gender roles and responsibility in preparing and responding to WASH-related disease outbreaks

■ Expected Learning Outcomes

At the end of the topic, learners should be able to:

1. Explain the importance of WASH in preventing emerging pandemics

2. Apply WASH principles to safe water, sanitation and hygiene to prepare and respond to pandemics
3. Utilise the One Health approach in preparing and responding to WASH-related disease outbreaks in households, communities and vulnerable populations
4. Describe the importance of gender roles and responsibility in preparing and responding to WASH-related disease outbreaks

■ Content

One Health definitions and Concepts, application of One Health in promoting water Quantity, Quality and Accessibility and its use in preventing the spread of water sanitation related diseases

Role of the One Health approach in promoting safe water, sanitation and personal hygiene, community water hygiene and environment health; Role of One Health in ensuring food safety and hygiene, human health, animal health and environmental health, and prevention of poor WASH related diseases. Application of One Health in managing water resources and wastes

Definitions and Concepts: water; water sources; water treatment; Water quality and quantity in preparing and responding to pandemics; Water sanitation, supply, application of WASH in promoting water Quantity, Quality and Accessibility, sanitation; the importance of sanitation in preventing the spread of water-borne diseases; hygiene and promotion; hygiene and gender; hygiene and households; the impact of efficient water hygiene in promoting community and environmental health; Role of WASH in ensuring food safety, hygiene and prevention of poor WASH-related diseases. Application of WASH principles; Hygiene promotion; water supply, excreta management; vector control; solid waste management; WASH in pandemic preparedness; managing water resources and wastes, promoting good hygiene and practices, ways of managing the water chain and sanitation in an integrated manner.

■ Mode of Delivery

Interactive lectures, problem-based learning using interactive tutorials, small group discussions, written assignments, plenary presentations, and case studies; experiential learning through independent study and field

visits, field works and placements, and online peer discussions using video clips and conferencing. For experiential learning learners will visit water treatment plants, water bodies, abattoirs, livestock farms and sanitation facilities in schools, hospitals and other public places to learn about WASH and how those sites prepare and respond to pandemics.

■ Instructional Materials and/or Equipment

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy documents/guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, whiteboard, markers and flipcharts, printers, Internet access for e-resources, mobile phones.

■ Core Reference Materials

Sphere Association. (2018). *The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response* (4th ed.). <https://sphere-standards.org/handbook-2018/>

Bartram, J., & Cairncross, S. (2010) Hygiene, sanitation, and water: forgotten foundations of health. *PLoS Med*, 7, e1000367. <https://doi.org/10.1371/journal.pmed.1000367>

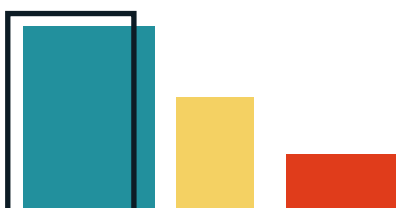
Doocy, S., Lyles, E., & Tapis, H. (2022, June 22). *An Evidence Review of Research on Health Interventions in Humanitarian Crises: 2021 Update*. <https://www.elrha.org/researchdatabase/the-humanitarian-health-evidence-review-2021-update/>

Campbell, O. M., Benova, L., Gon, G., Afsana, K., & Cumming, O. (2015). Getting the basic rights - the role of water, sanitation and hygiene in maternal and reproductive health: a conceptual framework. *Tropical medicine & international health: TM & IH*, 20(3), 252–267. <https://doi.org/10.1111/tmi.12439>

Fewtrell, L., Kaufmann, R. B., Kay, D., Enanoria, W., Haller, L., & Colford, J. M., Jr (2005). Water, sanitation, and hygiene interventions to reduce diarrhoea in less developed countries: a systematic review and meta-analysis. *The Lancet. Infectious diseases*, 5(1), 42–52. [https://doi.org/10.1016/S1473-3099\(04\)01253-8](https://doi.org/10.1016/S1473-3099(04)01253-8)

■ Recommended Reference Materials

- Curtis, V., & Cairncross, S. (2003). Effect of washing hands with soap on diarrhoea risk in the community: a systematic review. *The Lancet. Infectious diseases*, 3(5), 275–281. [https://doi.org/10.1016/s1473-3099\(03\)00606-6](https://doi.org/10.1016/s1473-3099(03)00606-6)
- Watson, J. A., Ensink, J. H. J., Ramos, M., Benelli, P., Holdsworth, E., Dreifelbis, R., & Cumming, O. (2017). Does targeting children with hygiene promotion messages work? The effect of handwashing promotion targeted at children, on diarrhoea, soil-transmitted helminth infections and behaviour change, in low- and middle-income countries. *Tropical medicine & international health*, 22(5), 526–538. <https://doi.org/10.1111/tmi.12861>
- Branz, A., Levine, M., Lehmann, L., Bastable, A., Imran Ali, S., Kadir, K., Yates, T., Bloom, D., & Lantagne, D. (2018). Chlorination of drinking water in emergencies: A review of knowledge to develop recommendations for implementation and research needed. *Waterlines*, 36(1), 4–39. <http://www.jstor.org/stable/26600781>
- World Health Organization. (2016). *Guidelines on Core Components of Infection Prevention and Control Programmes at the National and Acute Health Care Facility Level*. <https://www.who.int/publications/i/item/9789241549929>
- World Health Organization. (1999). *Guidelines for Safe Disposal of Unwanted Pharmaceuticals in and after Emergencies*. <https://www.who.int/publications/i/item/guidelines-for-safe-disposal-of-unwanted-pharmaceuticals-in-and-after-emergencies>
- World Health Organization & United Nations Children’s Fund. (2021). *Global progress report on water, sanitation and hygiene in health care facilities: Fundamentals first*. <https://www.who.int/publications/i/item/9789240017542>
- Coughlin, L. L., Schurer, J. M., Umubyeyi, C., Sijenyi, S., Arif, K., Niyonkuru, V. U., Byiringiro, E., Lutz, N., Korukire, N., Murcott, S., & Amuguni, H. J. (2022). A One Health evaluation of water, sanitation, and hygiene (WASH) services in Butaro Sector, Rwanda. *Journal of Water, Sanitation and Hygiene for Development*, 12(3), 286–301. <https://doi.org/10.2166/washdev.2022.204>
- Preparedness&Response & USAID. (2018). *Multisectoral Coordination that works: Building Effective, Sustainable Mechanisms to Prevent, Detect, and Respond to Public Health Threats*. <https://assetify-dai.com/resource-library/pandr-multisectoral-coordination.pdf>



04. Topic Description

PPOH 115: Mental Health and Pandemics

■ Purpose

This is an introductory topic on how pandemics impact mental health and introduces learners to tools and strategies for the prevention of and response to mental health challenges in pandemics.

■ Objectives

This topic enables learning about:

1. Key terms and concepts in mental health
2. Recognition of mental distress amongst healthcare providers and vulnerable groups in pandemics
3. Causes, risks and impact of mental distress in pandemics
4. Tools in the diagnosis and management of mental health disorders

■ Expected Learning Outcomes

At the end of this module, learners should be able to:

1. Define key terms and concepts in mental health
2. Recognise mental distress amongst healthcare providers and vulnerable groups in pandemics
3. Discuss causes, risks and impact of mental distress in pandemics
4. Apply tools in the diagnosis and management of mental health disorders in pandemics

■ Content

Definition of terminologies and concepts: mental health, stress, emotional distress, somatic symptoms, anxiety, depression, post-traumatic stress disorder, human rights violations, psychological first aid, sexual and gender-based violence. Stressors and conditions that Impact mental health: death of loved ones, isolation, loss of employment, illness, fear, poverty, culture and myths around communicable diseases, comorbid conditions, displacement, and stigmatisation. Populations at risk: those with pre-existing conditions, the impoverished, those with genetic predisposition, extremes of age, women, people living with disabilities, people with drug substance abuse, those in quarantine, and the stigmatised. Tools in diagnosis of mental health problems: Depression Anxiety Stress Scale, Generalised Anxiety Disorder Screener, Addiction Severity Index, Post-Traumatic Stress Disorder Checklist, Behavioural Assessment Tools, Revised Children's Anxiety and Depression Scale. Support tools in managing mental health conditions and referral: psychologist, psychiatrist, medications, telehealth, government programmes, support groups, employee assistance programmes, alcohol and drug abuse clinics, social protection, digital mental health tools, self-care, support of health workers, coping mechanisms. Psycho-social support: normal reactions to abnormal events, five principles of psychosocial support (ensure and promote safety, calm, personal and collective efficacy, connectedness, hope), psycho-social support activities, psychological first aid (prepare, look, listen, link) including at the household level.

■ Mode of Delivery

Interactive lectures, problem-based learning using interactive tutorials, small group discussions, written assignments, plenary presentations and case studies; experiential learning through independent study and field visits, field works and placements, and online peer discussions using video clips and conferencing.

■ Instructional Materials

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy document/guidelines), institutional placements and field visits

Equipment: projector, laptop, Internet access, markers & flip charts.

■ Core Reference Materials

Chen, J., Farah, N., Dong, R. K., Chen, R. Z., Xu, W., Yin, J., Chen, B. Z., Delios, A.Y., Miller, S., Wan, X., Ye, W., & Zhang, S. X. (2021). Mental Health during the COVID-19 Crisis in Africa: A Systematic Review and Meta-Analysis. *International Journal of Environmental Research and Public Health*, 18(20), 10604. <https://doi.org/10.3390/ijerph182010604>

Galea, S., Merchant, R. M., & Lurie, N. (2020). The Mental Health Consequences of COVID-19 and Physical Distancing: The Need for Prevention and Early Intervention. *JAMA internal medicine*, 180(6), 817–818. <https://doi.org/10.1001/jamainternmed.2020.1562>

■ Recommended Reference Materials

IASC Reference Group on Mental Health and Psychosocial Support in Emergency Settings. (2007). *IASC Guidelines for Mental Health and Psychosocial Support in Emergency Settings*. Inter-Agency Standing Committee. <https://interagencystandingcommittee.org/iasc-task-force-mental-health-and-psychosocial-support-emergency-settings/iasc-guidelines-mental>

World Health Organization. (2021, January 8). *Mental health preparedness and response for the COVID-19 pandemic. Report by the Director-General*. https://apps.who.int/gb/ebwha/pdf_files/EB148/B148_20-en.pdf

World Health Organization, War Trauma Foundation & World Vision International. (2011). *Psychological First Aid: Guide for field workers*. https://www.who.int/mental_health/publications/guide_field_workers/en/

04. Topic Description

PPOH 116: Food Safety, Security and Nutrition in Pandemics

■ Purpose

This topic introduces learners to approaches for ensuring that foods are safe and nutritious for consumption and for prevention of malnutrition in pandemics.

■ Objectives

This topic enables learning about:

1. Terms in food safety, security, and nutrition in pandemics
2. Food security and nutrition challenges emerging during pandemics (food types, adulterated foods, expired foods as well as contaminants and hazards thereof).
3. Food safety and quality assurance approaches and programmes for prevention and management of foodborne pandemics
4. Appropriate nutritional needs and interventions for vulnerable populations during pandemics

■ Expected Learning Outcomes

At the end of this module, learners should be able to:

1. Define terms in food safety, security and nutrition in pandemics

2. Identify food security and nutrition challenges emerging during pandemics (food types, adulterated foods, expired foods as well as contaminants and hazards thereof)
3. Identify food safety and quality assurance approaches and programmes for the prevention and management of foodborne pandemics
4. Determine appropriate nutritional needs and interventions for vulnerable populations during pandemics

■ Content

Nutritional composition of food/food groups; nutritional needs of different population groups; malnutrition causes and interventions; nutrition assessment, Food and nutrition responses and interventions (food quality, appropriateness, and acceptability, targeting, distribution and delivery, food use), nutrition vulnerability; nutrition in emergencies: definition of terms nutrition, malnutrition, food security, food aid management, supplementation, primary production, macro and micronutrients, food hygiene and safety. A description of food chains (with special emphasis on foods of animal origin like beef, pork, poultry, milk, egg, and fish). Common and emerging contaminants of food. Hazards associated with food; chemical, microbiological and physical hazards in foods; approaches to prevention of food contamination: good agricultural practices; good animal husbandry practices, good manufacturing practices, food hygiene principles; food handlers; food quality assurance schemes; food risk assessment, standards and legislation; foodborne diseases and contaminants; international trade facilitation agreements on food safety; legal requirements. Food security definition and analysis, primary production, general food security, income and employment and access to markets, food security assessment tool in disaster, livelihoods, nutrition assessments, nutrition assessment checklist, correction of malnutrition in disaster, surveillance and monitoring malnutrition in disaster, minimum standards in food aids management, availability, access, and use. Approaches to food security: national and international food statistics (Kenyan case); Food security - definitions and principles, threats to food security policy, intervention measures; food policy impact on dietary choices, case studies - chronic energy deficiency, African food battles. Strategy and stakeholders: policy negotiation and strategy development; international agencies in food and nutrition. Structural adjustment programmes and their impact on food and nutrition policy.

■ Mode of Delivery

Interactive lectures, problem-based learning using interactive tutorials, small group discussions, written assignments, plenary presentations and case studies; experiential learning through independent study and field visits, field works and placements, and online peer discussions using video clips and conferencing. Practical on nutritional assessments.

■ Instructional Materials and/or Equipment

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy documents/guidelines), institutional placements and field visits; practicum.

Equipment: projector, laptop, Internet access, marketers & flip charts.

■ Core Reference Materials

Sphere Association. (2018). *The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response* (4th ed.). <https://sphere-standards.org/handbook-2018/>

Schmidt, R. H., & Rodrick, G. E. (2003). *Food safety handbook*. John Wiley & Sons.

Fukuda, K. (2015). Food safety in a globalized world. *Bulletin of the World Health Organization*, 93(4), 212. <http://dx.doi.org/10.2471/BLT.15.154831>

Aiyar, A., & Pingali, P. (2020). Pandemics and food systems - towards a proactive food safety approach to disease prevention & management. *Food security*, 12(4), 749–756. <https://doi.org/10.1007/s12571-020-01074-3>

■ Recommended Reference Materials

Garcia, S. N., Osburn, B. I., & Jay-Russell, M. T. (2020, January 28). One Health for Food Safety, Food Security, and Sustainable Food Production. *Frontiers in Sustainable Food Systems*, 4(1). <https://doi.org/10.3389/fsufs.2020.00001>

Fung, F., Wang, H. S., & Menon, S. (2018). Food safety in the 21st century. *Biomedical journal*, 41(2), 88-95. <https://doi.org/10.1016/j.bj.2018.03.003>

Ma, N. L., Peng, W., Soon, C. F., Hassim, M. F. N., Misbah, S., Rahmat, Z & Sonne, C. (2021). Covid-19 pandemic in the lens of food safety and

security. *Environmental research*, 193, 110405. <https://doi.org/10.1016/j.envres.2020.110405>

Ejeromedoghene, O., Tesi, J. N., Uyanga, V. A., Adebayo, A. O., Nwosisi, M. C., Tesi, G. O., & Akinyeye, R. O. (2020). Food security and safety concerns in animal production and public health issues in Africa: A perspective of COVID-19 pandemic era. *Ethics, Medicine and Public Health*, 15, 100600. <https://doi.org/10.1016/j.jemep.2020.100600>

Raposo, A., Ramos, F., Raheem, D., Saraiva, A., & Carrascosa, C. (2021). Food safety, security, sustainability and nutrition as priority objectives of the food sector. *International Journal of Environmental Research and Public Health*, 18(15), 8073. <https://doi.org/10.3390/ijerph18158073>



04. Topic Description

PPOH 117: Infection Prevention and Control (IPC) in Pandemics

■ Purpose

This topic introduces learners to essential skills and practice of infection prevention towards controlling infectious diseases.

■ Objectives

This topic enables learning about:

1. Key terms and principles of infection prevention and control (IPC)
2. Types of personal protective equipment
3. The practice of donning and doffing
4. The importance of IPC in controlling infections

■ Expected Learning Outcomes

By the end of this topic the learner should be able to:

1. Describe key terms and principles of infection prevention and control
2. Explain types of personal protective equipment
3. Demonstrate donning and doffing
4. Discuss the importance of IPC in controlling infections

■ Content

Key terms in IPC: infection, antibiotics, antimicrobials, isolation, quarantine, vaccination, prophylaxis, goals of IPC; standard precautions, introduction to infection prevention control; healthcare-associated infections; principles of IPC; standard precautions; healthcare waste management; disinfection, sterilisation and aseptic techniques; moments of hand hygiene; personal protective equipment types and indications; post exposure prophylaxis; quarantine and isolation; IPC guidelines, elements and components; administrative controls and policies for IPC; healthcare-associated infection surveillance; rational use of antimicrobials during pandemics, One Health approaches in IPC, IPC in anthrax.

■ Mode of Delivery

This includes lectures: problem-based learning using interactive tutorials, small group discussions and written assignments, plenary presentations; case studies, role plays, skits, individual reflection, simulation exercises, experiential learning through independent/reflective study and field visits and placements; and online peer discussions using video clips and conferencing.

■ Instructional Materials and/or Equipment

Materials: Lecture notes and slides, video clips, handouts, case studies, reference materials (textbooks, journals, policy document/guidelines), institutional placements and field visits

Equipment: LCD projectors, laptops, whiteboard, markers and flipcharts, LCD, printers, Internet access for e-resources.

■ Core Reference Materials

World Health Organization. (2019). *Minimum requirements for infection prevention and control*. <https://www.who.int/publications/i/item/9789241516945>

World Health Organization. (2016). *Guidelines on Core Components of Infection Prevention and Control Programmes at the National and Acute Health Care Facility Level*. <https://www.who.int/publications/i/item/9789241549929>

- Mugerwa, H., Byarugaba, D. K., Mpooya, S., Mirembe, P., Kalyango, J. N., Karamagi, C., & Katamba, A. (2013). High Prevalence of tuberculosis infection among medical students in Makerere University, Kampala: results of a cross sectional study. *Archives of public health (Archives belges de sante publique)*, 71(1), 7. <https://doi.org/10.1186/0778-7367-71-7>
- Ogwang, M., Paramatti, D., Molteni, T., Ochola, E., Okello, T. R., Ortiz Salgado, J. C., Kayanja, A., Greco, C., Kizza, D., Gondoni, E., Okot, J., Praticò, L., Granata, V., Filia, A., Kellar Ayugi, H., & Greco, D. (2013). Prevalence of hospital-associated infections can be decreased effectively in developing countries. *The Journal of hospital infection*, 84(2), 138–142. <https://doi.org/10.1016/j.jhin.2013.02.016>
- Bagheri Nejad, S., Allegranzi, B., Syed, S. B., Ellis, B., & Pittet, D. (2011). Health-care-associated infection in Africa: a systematic review. *Bulletin of the World Health Organization*, 89(10), 757–765. <https://doi.org/10.2471/BLT.11.088179>

■ Recommended Reference Materials

- Republic of Uganda, Ministry of Health. (2013). *Uganda National Infection Prevention and Control Guidelines*. <http://library.health.go.ug/monitoring-and-evaluation/quality-assurance-improvement/uganda-national-infection-prevention-and>
- Republic of Uganda, Ministry of Health. (2007). *The National Policy Guidelines on Post Exposure Prophylaxis for HIV, Hepatitis B and Hepatitis C*. <http://library.health.go.ug/sites/default/files/resources/The%20National%20Policy%20Guidelines%20on%20Post%20exposure%20prophylaxis%20for%20HIV%20Hepatitis%20B%20and%20hepatitis%20C.pdf>
- Republic of Kenya, Ministry of Public Health and Sanitation & Ministry of Medical Service. (2010). *National Infection Prevention and Control Guidelines for Health Care Services in Kenya*. http://guidelines.health.go.ke:8000/media/infection_control_policy.pdf
- World Health Organization. (2017). *One Health: Q&A*. Retrieved August 25, 2023, from <https://www.who.int/news-room/q-a-detail/one-health>
- World Health Organization. (n.d.). *Supporting countries with national action plan implementation*. Retrieved August 25, 2023, from <https://www.who.int/activities/supporting-countries-with-national-action-plan-implementation>

Brown, K., & Rasmussen, K. (2019, July 9). *The Sustainable Development Goals in 2019: people, planet, prosperity in focus*. United Nations Foundation. Retrieved August 25, 2023, from <https://unfoundation.org/blog/post/the-sustainable-development-goals-in-2019-people-planet-prosperity-in-focus/>



Acknowledgements

The review of the Pandemic Preparedness with One Health approach (PPOH) short course has been undertaken by the East African Community (EAC) Secretariat in cooperation with universities of the six EAC Partner States engaged in the original course. It has been implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH through the Global Programme for Pandemic Prevention and Response, One Health (GP PPOH) on behalf of the Federal Ministry for Economic Cooperation and Development.

December 2023

Imprint

Published by:

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Registered offices Bonn and Eschborn, Germany
Friedrich-Ebert-Alle 36, 51111 Bonn
T +49 228 4460-30 80

Webpage:

[One Health: preventing and combating pandemics worldwide - giz.de](https://www.giz.de/en)
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Editor:

Anja Leetz, John Tabu, Mercy Naliaka and Franziska Reiland

Proofreading, final editing:

Liva Haensel

Design/layout:

FLMH, Berlin

Photo credits/sources:

Dr. John Tabu Simiyu

Year of publication:

2023



