Emerging zoonotic diseases and the One Health approach: An overview
Overview

• Epidemics and pandemics usually result from the (re)emergence of a zoonotic disease at the community level and localized transmission, then amplification and international spread.

• Humans are driving environmental changes that increase the risks of zoonotic diseases emerging and spreading.

• A One Health approach to emerging zoonotic diseases mobilizes multiple sectors, disciplines and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems, while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development.

• The Quadripartite of four agencies for One Health have a Joint Plan of Action, including actions to reduce the risks posed by emerging zoonotic diseases.
From a zoonotic disease to a pandemic
Examples of zoonotic diseases & outbreaks
Example: COVID-19 - Cluster 5

- This cluster of human cases reported in Denmark in November 2020, known as “cluster 5”, was the most significant spillback event of SARS-CoV-2 in WHO European Region.

Sources:
https://www.nytimes.com/2022/01/19/magazine/spillback-animal-disease.html
https://pubmed.ncbi.nlm.nih.gov/36751428/?t=text=Furthermore%20SARS%20SARS-CoV-2%20in%20humans
What is the One Health approach?

Definition by the One Health High Level Expert Panel:

One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems.

It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent.

Source: https://www.who.int/news/item/01-12-2021-tripartite-and-unep-support-ohlep-s-definition-of-one-health
The rationale for One Health

- 70-80% of (re-) emerging infectious diseases are known to be of zoonotic origin

Drivers — changes at the human-animal-environment interface

- Deforestation
- Biodiversity loss
- Climate change
- Intensive farming and agriculture
- Pollution
- Urbanization
- Global mobility
- Migration

Drivers include: Deforestation, Biodiversity loss, Climate change, Intensive farming and agriculture, Pollution, Urbanization, Global mobility, Migration.
What is the Quadripartite?

• From Tripartite (OIE, FAO, WHO), to Quadripartite [FAO, UNEP, WHO, WOAH (Founded as OIE)]

17 March 2022: Strengthened partnership to accelerate coordinated strategy on human, animal and ecosystem health.

Quadripartite MoU - a legal and formal framework for the four organizations to tackle the challenges at the human, animal, plant and ecosystem interface using a more integrated and coordinated approach.

Key activities:
• Inclusion of UNEP
• Joint vision and commitment
• Support to countries
• Whole of society approach
• Synergies and overlaps
• Mobilize investment
The One Health Joint Plan of Action

Desired impact:

A world better able to prevent, predict, detect and respond to health threats and improve the health of humans, animals, plants and the environment while contributing to sustainable development.

Link: https://www.who.int/publications/i/item/9789240059139
Focus on action track 2: reducing the risk of emerging zoonotic disease

- **Understanding the drivers of (re-)emerging zoonotic diseases** including and related processes and pathways, ecosystem degradation, land-use and habitat change, environmental and climatic factors, as well as harvesting, farming and trade in wild and domestic animals;

- **Developing risk mitigation measures**, including the maintenance of resilient healthy ecosystems, early interventions aimed at reversing or halting environmental degradation and biodiversity loss, the regulation of farming and trade in wildlife and wild animal products, and the reduction of spillover risks at key animal value-chain points and wildlife–domestic animal–human interfaces, including live animal markets (traditional markets);

- **Enhancing sustainable and targeted One Health surveillance**, early warning and response mechanisms in ecosystems, targeting animal–human–environment interfaces and key animal value chain points.
  
  - The focus will be on known (re-)emerging zoonotic diseases previously identified to have epidemic and pandemic potential, while also considering “Disease X”, caused by a yet unknown zoonotic pathogen and with the potential to develop into a future epidemic/pandemic.
Example with avian influenza

- H5N1 high pathogenicity avian influenza, pandemic H1N1 2009 animal influenza and H7N9 low pathogenicity avian influenza have highlighted the potential for animal origin influenza viruses to evolve into global public health threats.
- WOAH and FAO established in 2005 a global network on animal influenza.
- OFFLU provides a robust mechanism for the exchange of information between human and animal health sectors, through:
  - TIPRA - risk assessment
  - WHO vaccine virus selection for zoonotic influenza (pandemic preparedness)
  - Situation monitoring, information sharing and rapid risk assessment
  - Mapping risk assessment gaps of influenza viruses with pandemic potential
  - Harmonized diagnostic and antigenic characterization protocols
What is one way that COVID-19 has changed Quadripartite organizations' One Health approach to emerging zoonotic diseases and epidemic and pandemic preparedness and response?

- **FAO:** One Health has become one of FAO's 20 priority programmes, the One Health approach has been mainstreamed across different divisions and departments including those focused on the environment (such as the forestry department).

- **IFRC:** IFRC is supporting implementation of the One Health approach through programs in more locations globally, integrating the approach with communities.

- **WHO:** An advisory group has been established, the One Health High Level Expert Panel (OHHLEP), composed of 26 experts that have the responsibility to update the scientific evidence on One Health and to advise the Quadripartite.
What is one way that COVID-19 has changed Quadripartite organizations' One Health approach to emerging zoonotic diseases and epidemic and pandemic preparedness and response? Contd.

- **WOAH:** WOAH sees One Health as a governance approach, a lesson learned from the COVID-19 pandemic, and recognizes the need to involve political entities globally and nationally to adopt the One Health approach for emerging zoonotic diseases.

- **UNEP:** As part of COVID-19 response, UNEP developed an evidence-informed assessment report on the risk of future zoonosis outbreak called: “Preventing the next pandemic”. The UNEP strategy 2022-25 also integrates the One Health approach.
Key issues

• The Quadripartite is **supporting implementation** of One Health for health emergency preparedness and response at global, regional and country levels.

• Leveraging **sources of data** that each Quadripartite organization can access, in order to further the joint implementation of the One Health approach.

• Finding and addressing **gaps in research, data and evidence**

• Alongside the Quadripartite, institutions at all levels and individuals can **support the One Health approach**, for example by adopting environmentally sustainable behaviours.
Useful links

• **EPI-WIN webinar recording 31 May 2023:** Emerging zoonotic diseases and the One Health approach: A webinar series overview

• WHO One Health Initiative: [https://www.who.int/europe/initiatives/one-health](https://www.who.int/europe/initiatives/one-health)

• OH Joint plan of action: [https://www.who.int/publications/i/item/9789240059139](https://www.who.int/publications/i/item/9789240059139)

• Open WHO OH course: [https://openwho.org/channels/onehealth](https://openwho.org/channels/onehealth)


• UNEP: [https://www.unep.org/news-and-stories/opinion/one-health-one-planet](https://www.unep.org/news-and-stories/opinion/one-health-one-planet)


• Further EPI-WIN webinars and Updates on One Health will follow in 2023 as part of the **EPI-WIN Emerging zoonotic diseases and the One Health approach series:** [https://www.who.int/teams/epi-win](https://www.who.int/teams/epi-win)