PREZODE

Preventing zoonotic disease emergence

Missions, Outlook and Organization

International PREZODE initiative:
Preventing ZOonotic Disease Emergence

PREZODE focuses on preventing emerging diseases before they start spreading between humans. Prevention is one barrier to pandemic threats and complements preparedness and response (improved health systems and intervention strategies).

SIPPAKORN-YAMKASIKORN

Overview

PREZODE at a glance

PREZODE is an international initiative promoting prevention, early detection and resilience for a rapid response to emerging infectious diseases of animal origin.

Preventing ZOonotic Disease Emergence (PREZODE) is an international initiative based on the One Health approach, which embraces human, animal and environmental health as a whole. PREZODE aims to foster multilateral collaboration with and between countries, as well as with other initiatives, in order to promote prevention, early detection and resilience in response to emerging infectious diseases of animal origin. To that end, the initiative ambitions to improve ecosystem management and strengthen surveillance through multi-actor dynamics to maximize its impacts. PREZODE's main objective is to develop a research framework to understand macro processes and drivers leading to the emergence of zoonoses in a context of global change, and to co-design relevant solutions for the reduction of such risks and their early detection.

Zoonoses are infectious diseases transmitted between animals and humans. Zoonotic pathogens may be bacterial, viral, or parasitic. They account for nearly 75% of emerging infectious diseases. Their emergence is closely linked to human activities, such as deforestation, intensive agriculture, or biodiversity loss, which increase the risks of contact between human populations and infected animals. With global interconnections, any isolated emerging event can quickly turn into a local epidemic, and subsequently into a pandemic.

By taking a bottom-up and co-design approach based on scientific methods, PREZODE promotes the drafting of relevant public policies and actions for pandemic risk-reduction, while still ensuring the food security and livelihoods of the poorest communities. It will facilitate knowledge sharing and will provide a resource center for decision makers.

An international initiative

A worldwide community of members

PREZODE is a community of members: governments, scientists, decision makers, research and academic institutes and universities, civil society organizations, foundations and private companies.

Since its inception in January 2021, PREZODE has succeeded in establishing global multi-actor dynamics. Through its community of practice, PREZODE improves coordination and synergies, lessons learnt and best practice sharing. It strengthens and integrates knowledge, innovation, capacity building and operational actions. It deploys academic research, cross-sectoral collaboration in the field, and the engagement of operational actors on the frontline of epidemics, considering both livestock and wildlife.

As of January 2023, the PREZODE community comprises close to 200 signatory members[1] (decision making, research and academic, and civil society organizations) from 128 nations. Eighteen countries have also committed to the initiative: Belgium, Cambodia, Costa Rica, Cuba, Dominica, France, Guinea Conakry, Congo, Haiti, Laos, Madagascar, Mexico, Morocco, Senegal, Thailand, Vietnam, Uruguay, and Zimbabwe. Two local territories, Anguilla and Saint-Eustache, have also joined the initiative.

The initiative aims to enhance its dynamics through the enrollment of new members, thus engaging and ensuring efficient international cooperation.

PREZODE was launched in January 2021, during the One Planet Summit. The European Commission and the Quadripartite - Food and Agriculture Organization (FAO), World Health Organization (WHO), World Organization for Animal Health (WOAH) and United Nations Environment Programme (UNEP) - supported the initiative.

[1] Full list: prezode.org/Who-we-are/Members

"
200 members (institutions and governments) have joined PREZODE in just two years. Success in mitigating the risks of emergence of zoonotic diseases requires worldwide cooperation.
"

PIXABAY

Context

A continuous rise of zoonoses

Zoonotic disease emergence is linked to human activities bringing wildlife, domestic animals and humans into close contact, including encroachment into remaining natural habitats and transport of wildlife to urban centers.

Rabies, Severe Acute Respiratory Syndrome (SARS), Nipah virus, Influenza viruses, Zika disease, Yellow fever, Chikungunya, Ebola, Middle East Respiratory Syndrome (MERS-CoV), Rift Valley fever… In recent decades, the frequency and number of zoonoses have exponentially increased along with the number of sporadic spillover events, posing a significant threat to the global economy and public health The COVID-19 pandemic is the latest example.

Land-use change and degradation, unsustainable agricultural practices, deforestation, among other factors, have increased the human imprint on nature, causing land biodiversity loss, thus seriously threatening ecosystem balances at the human-animal-plant–environment interface. These risks are worsened by the extension of urban areas, international trade and travel, including transboundary movement of animals, as well as climate crises. As the planet heats up, infectious diseases that were once confined to warm latitudes geographically expand. Vector-borne diseases – such as Crimea Congo Hemorrhagic Fever, Rift Valley fever, West Nile virus, etc. – are now being found in new areas.

To tackle risks of spillover and prevent pandemics, international and multi-sectoral collaboration is critical for understanding zoonosis emergence, for early detection and reduction of risks.

Key figures

Based on extrapolation, scientists estimate a minimum of 320,000 mammalian viruses awaiting discovery.

(Anthony et al. 2013). A Strategy To Estimate Unknown Viral Diversity in Mammals, https://doi.org/10.1128/mBio.00598-13

Some pathogens can be transmitted by more than one pathway. A report estimates that 42% of all zoonotic pathogens are transmitted through oral transmission, 42% via vector-borne transmission, 36% by airborne transmission, 29% by direct contact, and 24% via contact with a contaminated environment or fomite.

(Loh et al., Vector Borne and Zoonotic Diseases https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4507309/

>
Deforestation, causing drastic changes in the balance of ecosystems and increasing risks of zoonosis emergence.

IRD / JEAN-MARC PORTE, LENGGURU 2014

Vision

Prezode objectives

PREZODE foresees a world where the risk of new zoonotic pandemics is reduced, land management practices are sustainable, while food security, healthy diets and livelihoods are preserved through the coordination of research programs, the sharing of knowledge and the deployment of efficient and relevant operational policies.

The COVID-19 crisis has shown the absence of an efficient early warning system, limited collaboration between stakeholders, and a major gap between scientific knowledge and policy making. Optimal action relies on strategies co-designed by local actors on the frontline, along with scientists, decision makers and stakeholders involved in zoonosis risk management.

A common framework to foster collaboration and impact

PREZODE proposes a scientific framework for implementing and conducting research and operational projects, and for developing and coordinating surveillance systems to prevent zoonotic risks, with a global objective of maximizing their impact. To reach this goal, the initiative is building on joint programs between members, on collaboration with international partners and on securing funding to ensure that the approach is sustainable.

Strengthening knowledge

PREZODE is developing a collaborative platform for sharing knowledge from past, current, and future projects and for capitalizing on activities in different regions of the world. It aims to strengthen and integrate knowledge, innovation, capacity building and operational actions seeking to jointly reduce risk and rapidly detect the emergence of zoonotic diseases in countries, regions and globally.

A resource center

PREZODE intends to be a resource center to provide decision makers with tools and information to enable evidence-based public policies. PREZODE will highlight local examples of ecosystem management strategies to reduce zoonotic emergence risks and encourage economic sustainability.

By 2030, PREZODE will have helped to reduce the upward trend of emerging zoonoses through preventive actions designed jointly with all relevant stakeholders.

> One of PREZODE's objectives is to assess the impacts of agricultural, land use and infrastructure development projects on the risks of diseases emergence for humans, livestock and wildlife.

KAAN DURMUŞ

Paradigm shift

An innovative co-designed approach to ensure effective prevention

PREZODE efforts focus on preventing risk emergence at the source, by co-designing risk reduction and early detection solutions with and for the local communities and actors on the frontline of the risks. Taking a One Health approach, PREZODE strengthens the dialog between science-society and policy makers, from local to global levels. To foster commitment and relevance, the initiative itself was co-designed with all its members.

Experts estimate the cost of reducing risks to be 100 times less than the cost of responding to pandemics[1] similar to COVID-19. To avoid the recurrence of a pandemic with devastating consequences, it is crucial to embrace an effective and integrated prevention strategy.

The PREZODE initiative promotes approaches based on systems-thinking. Prevention of zoonotic diseases requires an understanding of all factors that allow pathogens to cross the species barrier.

Research activities will focus on the risks of emergence linked to local and global changes, the development of sustainable prevention strategies through livestock and/or ecosystem management, and the development of early warning systems from local to global. More especially, research will target zoonotic pathogens that could emerge, infectious diseases that have already emerged or re-emerged. All types of pathogens circulating on all continents are addressed, from wildlife to domestic animals, from terrestrial to aquatic environments. Similarly, all the different transmission pathways between animal species and human populations will be considered.

> "Preventing the emergence of zoonotic diseases is a cross-sectoral issue that encompasses many concerns, such as biodiversity loss, livestock management, animal consumption practices, agricultural development, land use and climate change, as well as human behavior and exposure."

Even though most emerging infectious diseases in humans are of zoonotic origin, the current dogma focuses on post-spillover preparedness to control disease spread within the human population, rather than preventing spillover at the source.

[1] Source: World Bank.

> PREZODE aims to strengthen the capacities of regional actors for diagnosis, knowledge sharing, and data management related to epidemiological, socio-economic, and environmental dynamics.

COMACCROSS_BATTAMBANG/CIRAD

RD/PIERRE BECQUART/ MISSION MÉKAMBO, EBOSURSY, GABON / SURVEILLANCE OF VIRUS EBOLA

"PREZODE is based on a paradigm shift. The initiative promotes prevention through bottom-up co-designed approaches."

- Infectious agents do not stop at borders, so preventing the emergence of zoonotic diseases must be inclusive and requires international collaboration. However, one size does not fit all: the prevention of zoonotic disease emergence must be based on local contexts, i.e., the constraints and needs of local communities and frontline actors who are implementing health strategies. Co-construction lies in fundamental principles for integrating local specificities into national and international health policies, raising awareness and generating strong and sustained commitment.

Key figures

Prevention costs for 10 years would be only about 2% of the costs of the COVID-19 pandemic.
(Dobson et. al., cit PREZODE Strategic Agenda).

The COVID-19 pandemic was estimated to have cost more than US $11.7 trillion just for 2020.
(Strategic Agenda 8.1).

PREZODE innovation lies in a paradigm shift: promoting a co-design process, engaging all stakeholders, from local to international levels in the prevention of emerging risks: local communities, health professionals (from the animal, human, and environmental sectors), researchers, field operators, along with decision makers from both the private and public sectors.

<
The development of sustainable prevention strategies through livestock and ecosystem management will be promoted among the research activities within the PREZODE framework.

Global perspective

An integrated initiative in line with the One Health approach

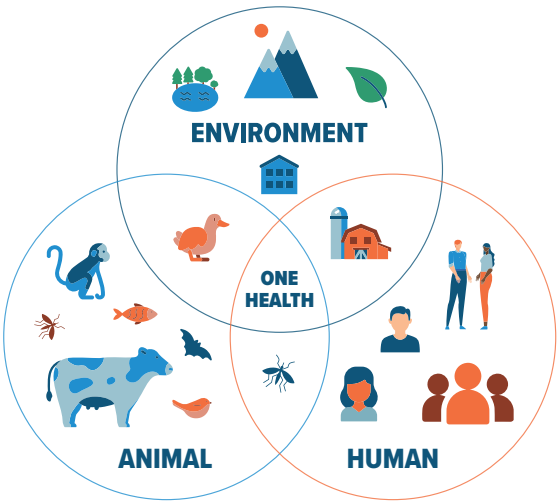
One Health is an integrated, unifying approach that aims to sustainably balance and optimize human, animal and ecosystem health.

While topics encompassing health, food, water, energy and the environment are very broad with sector-specific and specialist concerns, collaboration across sectors and disciplines contributes to an overall approach: One Health. This approach is crucial for efficient prevention of zoonotic disease emergence and makes it possible to grasp the full spectrum of disease control – from disease prevention to detection, preparedness, response, and management – and to improve and promote health and sustainability.

The PREZODE strategy embraces the One Health approach

The PREZODE initiative fulfills this holistic perspective. Doing so will enable the development of strategies that intend to minimize the exposure of human populations to zoonotic pathogens and, ultimately, foster zoonotic disease prevention.

Over the past few decades, different actors and scientific fields have worked in a holistic and transdisciplinary approach to health, in response to zoonotic diseases. UN agencies have adopted the One Health approach to tackle influenza pandemic threats since 2007 (Verona Tripartite declaration). The Quadripartite Alliance (involving the World Health Organization, the Food and Agriculture Organization, the United Nations Environmental Programme, and the World Organization for Animal Health) mainstreams One Health in order to be better prepared to prevent, predict, detect and respond to global health threats and promote sustainable development. In 2020, the Quadripartite set up the One Health High Level Expert Panel (OHHLEP) to produce policy recommendations on the prevention of and response to future health crises and to inform citizens about the issues at stake. PREZODE aims to support both OHHLEP and the Quadripartite with scientific evidence to promote and implement the prevention of pandemic threats.



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 interdependent. The approach 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.
(OHHLEP, 2021)

BEN TRAVELING

Action

A strategic, scientific and operational Agenda

The Strategic Agenda defines the research and operational roadmap of the PREZODE initiative.

Released in January 2023, this Strategy details the knowledge gaps in research to be filled and the operational activities to be targeted over the next ten years. It also provides a global impact pathway on how PREZODE will contribute to preventing emerging zoonotic diseases and how the impact of the PREZODE initiative will be assessed: including solutions required to settle political and socio-cultural issues.

The Strategic Agenda is the result of a very broad multi-disciplinary participatory consultation, the largest co-design process implemented so far on preventing emerging infectious disease risks, following an impact-based methodology. This consultation took place between January 2021 and June 2022, gathering more than 1000 professionals (researchers, relevant stakeholders, policy makers) from different countries (128 countries covering 10 geographical regions[1]), resulting in over 6000 contributions.

The PREZODE scientific framework is based on five pillars; the Strategic Agenda details research gaps and operational needs for each pillar, which are summarized in main categories below:

Pillar 1: Understand zoonotic risks and risk activities

- What are zoonotic emergence risks and a risk interface?
- Who are the players (bugs, hosts, and their environment) and what mechanisms are involved in zoonosis emergence?
- What are the main drivers leading to zoonotic disease emergence?
- How can zoonotic disease emergence risks be anticipated?

Pillar 2: Co-design solutions to reduce zoonotic risks

- Using ecosystem conservation to reduce pathogen circulation between wildlife and domestic animals
- Regulating and tracing activities related to wildlife
- Innovative livestock management and agriculture systems
- Design of urban space
- Interconnection between all the different approaches and actor engagement.

Pillar 3: Strengthen early warning systems to detect zoonotic risks

- Assessment of current surveillance systems and practices

[1] Central Africa, Europe, Indian Ocean, Latin America and the Caribbean, Northern Africa/Middle East, Southern Asia, Southeast Asia/East Asia and the Pacific, Southern and Eastern Africa, USA/Canada, Western Africa.

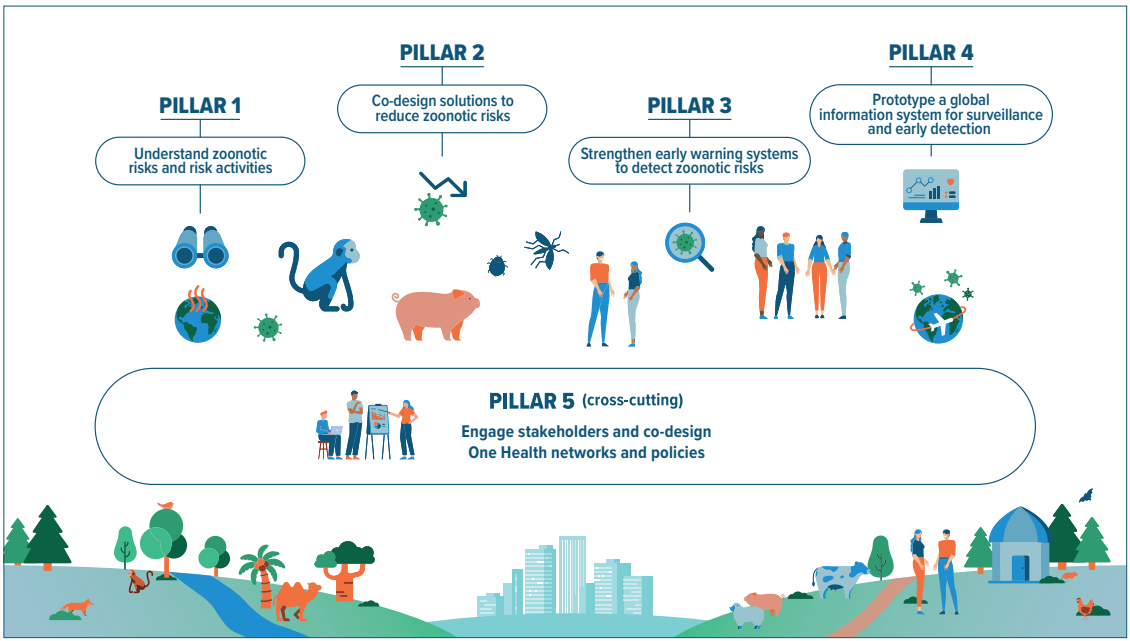
- Context-specific and user-based surveillance systems
- Innovative surveillance protocols and diagnostic tools
- Community-based prevention and early warning systems.

Pillar 4: Prototype a global information system for surveillance and early detection

- Interoperability and sustainability of surveillance systems and global standards
- Definition of the type of surveillance and objectives of global surveillance, and identification of relevant indicators and data
- Action plan related to global surveillance
- Infrastructures
- Optimizing efforts to avoid duplication.

Pillar 5 (cross-cutting): Engage stakeholders and co-design One Health networks and policies

- Community involvement
- Co-development of health networks and policies through reinforced dialog between science, civil society, and policy makers
- Policy engagement and awareness of stakeholders
- Dialog between science, civil society and policy makers
- Co-development and coordination of health networks
- Promoting One Health approaches and inter-sectoral collaboration.



SAJAD NORI

<

People may be infected by zoonotic pathogens through direct contact with infected animals, arthropod vectors (vector-borne diseases), indirect contact with the environment, objects (fomites), or surfaces that have been contaminated by zoonotic agents, or consumption (foodborne and waterborne diseases).

The Agenda impact pathways

→ By 2030, PREZODE should have:

- Contributed to reducing the upward trend of emerging zoonoses through preventive actions designed jointly with all relevant stakeholders.
- Enabled the implementation of efficient early warning systems for detection and rapid actions to counter emerging diseases from the local level to the global scale. Those early warning systems will have been developed through a bottom-up "One Health" approach; as a result, they will be interoperable and involve all stakeholders and communities, which raises awareness.

To achieve the PREZODE vision by 2030, its global community must come together to put in place sustainable prevention strategies against zoonotic diseases.

> "One PREZODE expectation is the strengthening and implementation of efficient early warning systems for detection and rapid actions to counter emerging diseases."

- Promoted the development of scientific methodologies to characterize innovative strategies for managing societies and their ecosystems, so as to limit the risk of zoonotic disease emergence and make them more resilient while ensuring food security.
- Developed and promoted synergies with regional and international initiatives focusing on the prevention of zoonotic diseases.
- Provided information, sustained, and supported a resource center available for decision makers to enable the implementation of public policies - including strengthening science-society-policy dialog.

The PREZODE Strategic Agenda will be revised every two years.

Organization

An international governance

PREZODE governance was adopted by its international member community in October 2022. PREZODE is administered by three main bodies – The General Assembly, the Steering Committee, and the Donors Committee – and is supported by an operational Secretariat, an Ethics Committee and a Scientific Advisory Board.

The General Assembly (GA) reviews and adopts the strategy and the deliverables of the initiative based on proposals formulated by the Steering Committee. It can make proposals for new projects or actions, or complementary activities to be taken up and further elaborated by the Steering Committee.The General Assembly, chaired by a President and a Vice-president, is composed of one representative for each member.

The Steering Committee (SC) defines and proposes the strategic orientations of the initiative and oversees its implementation. The Steering Committee includes 5 colleges:

- A Scientific college with five internationally acknowledged scientific experts representing each pillar of the initiative
- A Regions college, with one delegate from each PREZODE region
- A Civil Society college with three representatives from non-profit NGOs
- Four representatives of International Organizations
- One representative nominated by the Donors Committee.

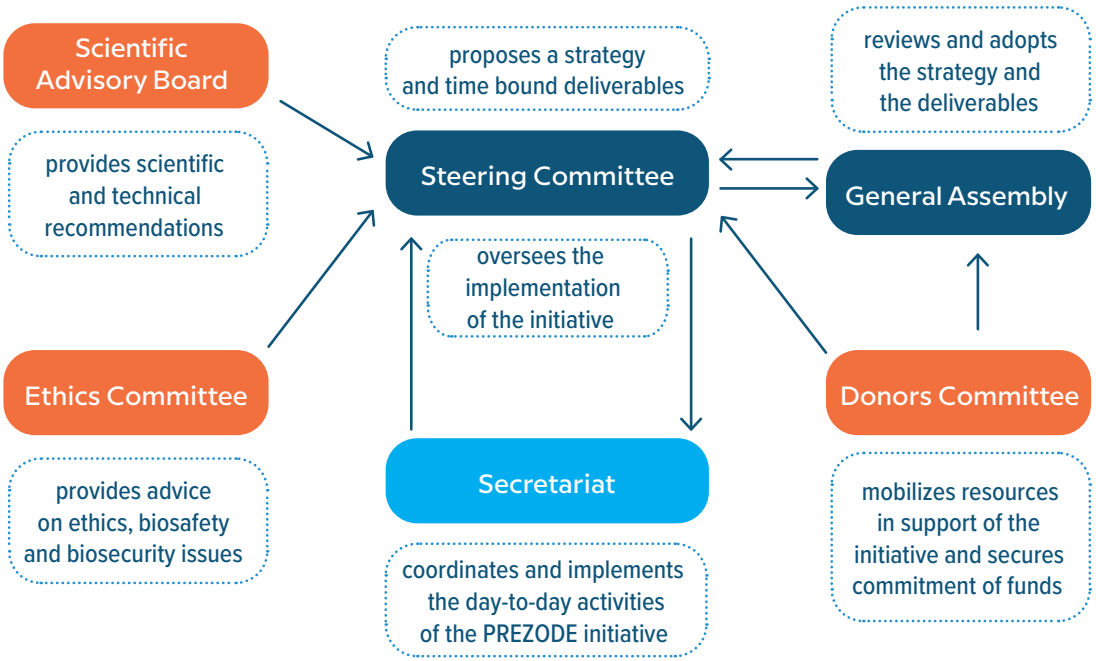
The Donors Committee includes representatives of public and private donors allocating funds to PREZODE-related projects and programs. It mobilizes resources in support of the initiative and secures the commitment of funds for research and for operational activities.

The Scientific Advisory Board, an independent body, provides scientific and technical recommendations to the Steering Committee and to the General Assembly.

The Ethics Committee, which is also independent, provides advice on ethics, biosafety and biosecurity issues in the field of preventing emerging zoonotic diseases, as well as advice on any ethical issue connected to PREZODE membership and activities.

The Secretariat coordinates and implements the day-to-day activities of the PREZODE initiative, supports the SC and the GA for the organization of meetings and reports. Namely, the secretariat:

- prepares draft proposals for the Steering Committee to discuss, validate and submit to the General Assembly
- supports the additional working groups, or operational committees, on specific topics
- ensures the availability of tools to facilitate coordination, collaboration and communication between members



- prepares communication materials to foster exchanges with external stakeholders, or potential partners
- supports the review and evaluation of the activities performed
- reports each year on its activities and on budget-related issues.

Membership:

- Any country, legal entity, or group of organizations being or willing to be involved in activities related to the One Health approach and to the prevention of zoonotic diseases can become a member of the PREZODE initiative.
- Becoming and being a member is voluntary and free of charge.
- The first step to apply for membership is to sign the PREZODE declaration of intent, which presents the scientific postulates and values promoted by PREZODE.
- The PREZODE Secretariat will contact applicants having signed the PREZODE declaration of intent to check their eligibility and to propose their membership for decision by the General Assembly.
- Eligible applicants will automatically acquire the status of observers before endorsement of their membership by the annual General Assembly meeting following their application.

Common values

As stated in the letter of intent, all members acknowledge, each with regard to their missions and mandates, the need to:

- Recognize that 75% of emerging infectious diseases are of zoonotic origin and that emerging disease events are accelerating, largely due to human impacts on nature.
- Recognize the complexity of the relationships existing between land use, food systems and environmental, human and animal health, and specifically the need to unravel the link between biodiversity pressures and emerging infectious diseases.
- Note that preparedness strategies are not primarily designed to prevent pandemics.
- Emphasize the need to mitigate the risks of emergence of zoonotic diseases.
- Emphasize the need to prevent pandemics before they emerge, while ensuring food and nutritional security, adapting to climate change, preserving biodiversity and natural resources, and alleviating poverty.
- Emphasize the need to improve knowledge and to develop reliable tools, by involving all the interested and concerned stakeholders.
- Recognize the need for efficient early warning systems for detection and rapid actions to counteract the emergence from local to global scale.
- Emphasize the need for robust and participatory emergence risk monitoring, supported by research and involving all stakeholders, research and field actors, policy makers, and public society through a “One Health” approach.
- Highlight the role of local communities and of all environmental, animal and human health stakeholders in reducing the risks of infectious disease emergence through their awareness and commitment.
- Call for concerted action and efficient use of existing financial mechanisms and resources to scale up and integrate research, innovation, capacity building and operational actions seeking to reduce the risk of zoonotic disease emergence.

BARTH BAILEY

PREZODE

Preventing zoonotic disease emergence

Contact

contact@prezode.org
communication@prezode.org

Twitter: @PREZODE_Intl
LinkedIn: PREZODE

prezode.org

COVER: ADITYA SAHOO • EDITION MARCH 2023