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# Improved Coordination, Collaboration and Communication Key to Prevent Zoonotic Outbreaks: Scientific Forum Concludes

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Lenka Dojcanova, IAEA Office of Public Information and Communication



([https://www.iaea.org/sites/default/files/styles/original\\_image\\_size/public/b.-scientific-forum-closing-.jpg?itok=7UfHGk1e](https://www.iaea.org/sites/default/files/styles/original_image_size/public/b.-scientific-forum-closing-.jpg?itok=7UfHGk1e))

The Scientific Forum attracted more than 100 participants and more than 3 000 viewers online. (Photo: D. Calma/IAEA)

Panellists of the Scientific Forum recognized the IAEA's Zoonotic Disease Integrated Action (ZODIAC) (/services/zodiac) initiative as one of the important and timely global initiatives for enhancing response preparedness to pandemics using nuclear and related techniques. Currently more than 140 countries are participating in the project and the IAEA has already initiated capacity building <sup>^</sup>

activities and procurement of equipment for ZODIAC National Laboratories in several countries. The session highlighted strong Member States support for ZODIAC and its approach of effectively complementing other global initiatives. Panellists concluded that closer coordination, collaboration, and communication towards scientific advancements in research, early detection and monitoring of zoonotic diseases are key in preventing or containing the next epidemic or pandemic such as COVID-19. These were the key conclusions of this year's Scientific Forum on how to prevent, prepare for and respond to the next epidemic or pandemic with the help of nuclear science.

"The COVID-19 pandemic and related issues we are confronted with, made us act together," said IAEA Director General Rafael Mariano Grossi closing the two-day Forum, an annual event held during the IAEA General Conference. "We need to keep this momentum."

Diseases of animal origin such as COVID-19 make up between 60 and 70 per cent of infectious diseases and affect 2.6 billion people every year, causing 2.2 million deaths on average annually. Since its outbreak, COVID-19 has caused 4.7 million deaths (<https://covid19.who.int/>).

"COVID-19 is a global crisis that demands a global response," said Thomas Mettenleiter, Co-Chair of One Health High-Level Expert Panel ([https://www.who.int/news/item/11-06-2021-26-international-experts-to-kickstart-the-joint-fao-oie-unep-who-one-health-high-level-expert-panel-\(ohhlep\)](https://www.who.int/news/item/11-06-2021-26-international-experts-to-kickstart-the-joint-fao-oie-unep-who-one-health-high-level-expert-panel-(ohhlep))) highlighting the important "three Cs approach", which stand for coordination, cooperation, and communication when applied to One Health — a multisectoral concept recognizing that the health of people is closely connected to that of animals and the environment.

During the Forum, decision makers and leading experts in virology, immunology, veterinary medicine and radiology agreed to further work together in exchanging information and data, expanding the capacity for testing and detecting diseases, building strong global and national surveillance systems for detecting and characterizing pathogens, and integrating innovative technologies into the national and global monitoring infrastructure.



“I was very happy to have listened to all speakers at the Forum. I do not see any doubt about what needs to be done, but we need to do it now,” said Mr Grossi in his closing remarks. “We all have a tremendous responsibility on our shoulders, and the IAEA is ready.”

The closing panel included the Resident Representatives to the IAEA from Belgium, France, Japan and the United States of America — countries which have so far donated more than US\$ 20 million towards areas such as the Veterinary Diagnostic Laboratory Network (VETLAB) (</services/networks/vetlab>) and ZODIAC, which helps national laboratories expand their technical, scientific and laboratory capacity to rapidly detect and control zoonotic diseases, and if needed quickly deliver equipment and know-how to countries.

“ZODIAC is not a project, it is not an idea, it is already delivering assistance as we speak. And we will and need to do much more,” Mr Grossi said, highlighting the importance of continuous collaboration with experts and other international organizations towards action.

To build further synergies, the IAEA has signed a Declaration of Intent with Preventing ZOonotic Disease Emergence (PREZODE) (</newscenter/pressreleases/iaea-and-prezode-pave-the-way-for-future-cooperation-to-prevent-zoonotic-diseases>), committing to closely working together in fighting such diseases that spread from animals to humans. “We need to make sure to build bridges together...and that everything that is being done is in a way that we are moving together in the same direction,” said Pierre Dussort, PREZODE Operational Manager.

## Five sessions – five ways how to address future pandemics

The Forum attracted more than 100 participants and more than 3 000 viewers online. Its opening session (</newscenter/news/preparing-for-zoonotic-outbreaks-scientific-forum-opens>) and five panel discussions were spread over a day and a half.



The **first session** dealt with the importance of various techniques for detecting pathogens and monitoring zoonoses, and the central role of scientific research and development. “We discover new diseases, characterize them and then we develop rapid diagnostic tools,” said Nischay Mishra, Professor of Epidemiology at the Columbia University Medical Center in United States of America. He distinguished between direct detection — molecular/genetic methods — and indirect detection using serology to detect the presence of antibodies as tools for pathogen discovery and characterization.

“As a first step, samples must be collected for monitoring and surveillance programmes...Analysis of the field samples is an important issue for the early detection of pathogens, therefore, the development of local research must be supported by capacity building and training,” said Markus Keller, Laboratory Director at the Federal Research Institute for Animal Health in Germany about the importance of information sharing and capacity-building for understanding and controlling zoonotic diseases.

The **second session** focused on the role of human-animal interactions in infectious diseases. Speakers explained that these diseases are transmitted in different ways, for example through animal bites, petting of animals or the consumption of undercooked meat. Once the diseases emerge, it is important to recognize the pathways through which emerging or re-emerging infections can lead to pandemics. One solution is building strong global and national surveillance systems, explained Christine Middlemiss, the Chief Veterinary Officer in the United Kingdom, emphasizing their use in monitoring potential emerging threats around the world.

Radiation techniques such as medical imaging can help determine the impact of zoonoses on human health and can be used for data analysis to support disease management. In the **third session**, Dina Hussein Salama, Head of the Radiology Department at the Egyptian Atomic Energy Authority explained the potential impact of radiomics — a method that extracts features from medical images using data-characterisation algorithms — and its use in the management of zoonotic diseases. Georg Langs, Head of the Computational Imaging Research Lab at the Medical University of Vienna in Austria talked about machine learning and how

“artificial intelligence allows us to put our observations into quantitative numbers, share them, and compare them across the world...and to detect new diseases and identify patterns for individual treatments.”

The **fourth session** entitled 'From Avian Flu to COVID-19 – the IAEA's Support to Countries' looked at the experience of Argentina, Azerbaijan, Botswana, Cameroon and the Middle East region in detecting, identifying and managing zoonoses such as Highly Pathogenic Avian Influenza (H5N1), Severe Acute Respiratory Syndrome (SARS-CoV-1), Middle East Respiratory Syndrome (MERS), Ebola, and the virus that causes COVID-19.

“Since 2006, the IAEA has been helping us build capacity in nuclear-based techniques,” said Samantha Letsholo, Principal Veterinary Officer and Head of the Virology Section at the Botswana National Veterinary Laboratory, the only veterinary institute responsible for diagnostics and surveillance of animal diseases in the country.

“We had little to no capacity before the IAEA started assisting us, and since then we have gone on to perform a lot of serological, molecular and food safety testing,” she said, adding that the assistance included training and equipment, also for COVID-19 testing.

In the fifth session, Christian Happi, Director of the African Centre of Excellence for Genomics of Infectious Diseases (ACEGID), alongside with the other panel members, emphasized the importance of being “on the offensive against zoonotic diseases as they directly threaten the very existence of our human species.”

## The way forward

The conclusions of the Scientific Forum will be a key input to the work of the IAEA in this area. The IAEA will continue to build partnerships with relevant global and regional initiatives including, the private sector, foundations and development banks and further strengthen its collaboration with the Food and Agriculture Organization (FAO), the World Health Organization (WHO) and the World Organisation of Animal Health (OIE).



“Let’s think about all those who lost someone, who are suffering and those who are ill. And let’s try to make COVID-19 be the one that made us work together, with one health [approach] and one mission: to deliver,” concluded Mr Grossi.

## International Atomic Energy Agency

Vienna International Centre, PO Box 100

A-1400 Vienna, Austria

Telephone: +43 (1) 2600-0, Facsimile +43 (1) 2600-7

✉ Official Email (</contact/official-mail>)

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