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Q&A: Future pandemics are inevitable, but we can reduce the risk

Coronavirus will not be the last pandemic in our lifetime. Scientists warn the threat posed by zoonoses – infectious diseases that jump from animals to humans – is on the rise. And the risk of a new pandemic is higher now than ever before.

16 December 2021 - By JONATHAN SMITH

Our search for answers led us to a scientist leading a Europe-wide system to detect future pandemic risks. Prof. Máire Connolly said: 'The most likely scenario for the next pandemic is a new strain of influenza like the H7N9 "bird flu" virus, or a newly identified virus such as another novel coronavirus.'

In an interview, Prof. Connolly, who coordinates the pandemic preparedness and response project PANDEM-2 under the EC's security research work programme, and follows the earlier PANDEM project, explains why we're under threat of another pandemic.

'Over the last 100 years the world has experienced 4 influenza pandemics, with an occurrence every 15-30 years and with an annual probability of between 3% to 7%,' For a new pandemic to happen, a new virus must emerge to which the general population has little or no immunity, must replicate in humans and transmit readily from one person to another, causing the disease to spread across the globe.' said Prof. Connolly who teaches at NUI Galway's School of Medicine.

Drawing on her expertise in health security, disease surveillance, and emerging infectious diseases, as well as her experience working on pandemic preparedness at the World Health Organization (WHO), Prof. Connolly talks to us about the possibility of a new pandemic and how we can guard against it.

Edited excerpts of the interview follow.

Where could the next pandemic come from??

Large intensive livestock farms can result in “spillover infections” from animals to people while greater movement of animals and animal products have also contributed to the threat from emerging diseases. New strains of avian influenza circulate in wild birds across the world every year. Intensive poultry farming practices increase the risk of infection of domestic birds by wild birds and subsequent transmission to poultry workers.

Encroachment into virgin forests for mining and timber can also expose humans to pandemic prone pathogens, for example Ebola.

Other sources include the amplification of diseases in healthcare settings at the outset of a pandemic where infection prevention and control measures are inadequate, increased spread in dense overcrowded cities, and poor biosecurity measures in laboratories conducting research on high-risk pathogens leading to accidental release.

The advancement of technology and information on development of bioweapons is increasing the risk of deliberate release of a biological agent as another possible scenario.

What about climate change? Can a warming climate increase the likelihood of another pandemic?

Climate change is directly linked to a higher risk of a pandemic as rising temperatures enable mosquitoes, ticks, and other disease-carrying insects to proliferate, adapt to different seasons and invade new territories.

For example, flooding due to extreme weather creates new breeding grounds for mosquitoes, making the spread of dengue fever more likely. Melting permafrost can release pathogens from animal carcasses like the anthrax outbreak in the Yamal Peninsula, Siberia in 2016.

Sounds simple: protecting nature to prevent future outbreaks. Can you give us some examples about what this look like on the ground?

Yes. Reducing droughts or floods would reduce the risk of population displacement and the associated risk of disease outbreaks. Reducing the demand for meat and supporting more sustainable farming would lower greenhouse gas emissions and could decrease the risk of emerging infectious disease.

Additionally, monitoring of weather data to identify geographical areas at risk of disease emergence would support early warnings of future pandemics.

Concerning the “spillover infections” you mentioned earlier, what can we do to prepare?

The health of the human population is closely related to animal health - this is underlined by the fact that over the last 30 years, 75% of emerging diseases have been zoonoses. Therefore, effective preparedness and response at all levels is needed to protect the health of citizens and animals alike.

Can we prevent a new infection jumping the species barrier?

Yes, we can reduce the risk by regulating the trade in wild animals and bushmeat, particularly live animals in wet markets, and through early detection of spillover events in high-risk areas.

Other measures involve better regulation of poultry farming with rapid detection and reporting of sick birds, and the surveillance of wild birds. This would aid detection of avian influenza and reduce the risk of its introduction into domestic birds and poultry farms.

The spread of infection can also be prevented by rapid reporting of clusters of cases of unknown diseases in hospitals in countries at risk of disease emergence or “hot zones.” Rapid reporting can also be used to quickly and effectively prompt implementation of containment measures where needed.

Meanwhile, investments in information technology at Member State, EU and global levels will ensure access to accurate real-time data for pandemic response.

Can you tell us more about the PANDEM-2 project and who will benefit?

The goal of PANDEM-2 is to identify, map and integrate data from multiple sources into a coherent pandemic-management database and to develop an extensive dashboard for pandemic preparedness training and response. The dashboard compiles data sources on the social, economic and health-related impacts of a pandemic.

We are also creating planning tools and training materials, as well as scenarios based on novel influenza, Ebola and ‘Disease X,’ or novel coronavirus, for use in cross-border pandemic response exercises.

While advances have been made in the areas of diagnostics and therapeutics, there remains a need for information management tools and a common platform for cross-border collaboration on pandemic preparedness and response.

The PANDEM-2 project will incorporate lessons learnt during the current COVID-19 pandemic and build international best practice into the areas of modelling, simulations, pandemic communications, contact tracing and training.

PANDEM-2 will help pandemic managers in public health agencies, first responders, laboratory technicians and hospital managers. Advances in visual and data analytics will support pandemic managers in critical decision-making and ultimately benefit EU citizens by reducing the impact of future pandemics.

What would you highlight as the key results for PANDEM and PANDEM-2?

Our research has shown the importance of trust, leadership, and counteracting disinformation and misinformation. What is required is a two-way communication with the public with access to accurate real time data and social media analysis to measure public sentiment and support for pandemic control measures. The project will ultimately provide the tools to effectively support this requirement in the future.

Advances in diagnostics and next generation sequencing data will help to determine the spread and transmission chains of pandemic prone pathogens and guide future pandemic control measures. The project’s pandemic management database and comprehensive dashboard will help to coordinate this information into an accessible source.

What is the latest news from your project?

Most recently, PANDEM-2 has been fortunate to collaborate with leading organisations from around the world to further advance the project. We are working with colleagues from the European Centre for Disease Prevention and Control (ECDC) on contact tracing, and WHO colleagues are providing input on our findings relating to pandemic communications and the infodemic.

The Defence Forces in Ireland are also providing valuable insights into the role of the military in future pandemic responses in areas such as contact tracing, testing, vaccination rollout, logistics and critical infrastructure protection.

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The Health Emergency preparedness and Response Authority

We must be ready for the next health crisis. That is why the European Union has established the Health Emergency preparedness and Response Authority (HERA), to detect biological and other health threats soon after they emerge, evaluate their impacts and identify potential counter measures. HERA will have dedicated capacities for horizon scanning and foresight, and will contribute to reinforcing global epidemic surveillance. HERA will therefore be a crucial centrepiece for a strong European Health Union.

The EU's research and innovation framework programmes have funded a variety of research projects working on preparedness and response to epidemics, including the PANDEM and PANDEM-2 projects. This work will be continued under the new programme, Horizon Europe, under which the new European Partnership on Pandemic Preparedness will be funded.

More info

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