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Editorial

'Disease X'—time to act now and prepare for the next pandemic threat

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As the coronavirus disease 2019 (COVID-19) pandemic illustrates, current global public health systems are inadequately prepared for preventing zoonotic emerging infectious diseases (EIDs) threats. The WHO, in 2018, has included the 'PathogenX', in the list of priority pathogens with the potential to threaten global health security. PathogenX may be any type of microorganism and, although most of the 400 emerging pathogens are bacteria, experts believe that the next is likely to be a virus.[1]

In December 2019, PathogenX had taken the form of a new coronavirus named Severe-Acute-Respiratory-Syndrome-Coronavirus-2 causing COVID-19, illustrating that no country is aspired by new EIDs with pandemic potential.

The current pandemic is not necessarily the last or worst, since risk factors for the emergence of EIDs persist and increase, including population growth and aging, environmental contamination, climate change, loss of biodiversity, changing vector habitats and globalization. The WHO, public health bodies and governments across all continents have committed to improving preparedness for a future pandemic[2,3] based on the large body of evidence, from COVID-19.

Several international initiatives are going on, such as the definition of a pandemic pact, the update or amendment of the International Health Regulation and the European legislation, and the creation of international hubs. Particularly, the EU Member States aim to establish a European partnership on pandemic preparedness with a common long-term Strategic Research and Innovation Agenda, the Health Emergency Preparedness and Response Authority (HERA).[4]

At national level, the attention on EIDs preparedness is high as well. An example is the Italian strategic-operational preparedness plan to an influenza pandemic (Ministero della Salute, 2021). However, national preparedness needs to be further strengthened.

A comprehensive preparedness strategy should include actions aimed at:

i. reducing the risk of spillover and the consequent introduction and spread of EIDs in humans;
ii. accelerating and investing in humans and animals surveillance, to rapidly detect and sequence the infectious agent;
iii. implementing pharmaceutical and non-pharmaceutical measures, to contain a large-scale epidemic;
iv. strengthening research programs to shorten the time lag between the development and production of medical countermeasures (MCMs)[5]
v. develop COVAX or other facility to ensure better global coverage of new vaccines avoiding the inequality of availability and distribution, that has dogged the COVID-19 agenda.

Global preparedness strategies should be integrated and coherent with national frameworks, and based on a One-Health approach, including the contrast to the antimicrobial resistance, and the prevention of environmental changes.

A holistic approach is essential. The United Nations (UNEP 2020) call for a One-Health approach, to strengthening research with interventions at the environment–animal–human interface in preventing spillovers. This approach includes an integrated surveillance system, able to combine data from the existing information systems, and enhancing humans and animals surveillance, exploiting sources available and applying advanced analytic technologies. Data should be organized in risk evaluation tools.

Besides preventive aspects, 'DiseaseX' preparedness should also include public health measures implement once an EID has given rise to an epidemic/pandemic to mitigate the spread of the infection, such as the use of face masks and vaccine passports, and to strengthen and train the health sector. The COVID-19 experience showed different strategies of containment in different countries, ranging from large-scale lockdowns to the less restrictive. The choice of the containment strategy depends on the aims to be pursued, which may include health, moral, social, economic and political outcomes, with different degrees of priority among countries and among different timing of the response. The final strategic decisions are adopted at the political level, integrating international and national instances. Thus, the effective control of EIDs depends on mutual respect and understanding between politicians and health care professionals.

Research should provide tools and organizational approaches to strengthen healthcare services and to ensure system flexibility and resilience, and should accelerate the development and the production of vaccines, medications and diagnostics. One of the main aims of HERA is to address priority research and innovation gaps, focusing on threat assessment, identification of potential MCMs, innovative technologies and development of standardized research protocols.

The Biomedical Advanced Research and Development Authority is executing new partnerships and building a robust COVID-19 Portfolio for research.

Other initiatives are the international challenge of making a vaccine for a Pathogen X within 100 days, by the recognition of an emerging pathogen;[5] the preparedness plan of the National Institute of Allergy and Infectious Diseases.[1] The availability of a library of prototype vaccines designed on a group of viruses, considered possible PathogenX candidates, could accelerate the development and production of MCMs.

Finally, strong leadership and governance are needed at the international, regional and national levels, to strengthen preparedness.

It is now the time to leverage the recent experience of the COVID-19 pandemic, to plan the preparedness for the future, to update the global governance and legislation and to produce international guidelines for preparedness to respond to the next Disease X.

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