WARNINGS
BRIEFING NOTE

INFECTIOUS DISEASE WARNINGS

Multi-sectoral integration

Key Points

- Emerging infectious diseases are driven by social and environmental factors.
- Warnings need to work across sectors and scales to ensure they address the contexts of their emergence and lead to earlier prevention.

State of the Art

COVID-19 was not an isolated event. Numerous studies estimate that emerging infectious diseases (EIDs) have been rising for at least the last 60 years. EIDs, of which 60% originate in animals, are highly influenced by human activities' impact on the environment [1]. Among these are agricultural intensification and livestock production, resulting in land-use change, deforestation, and anti-microbial agent use. They impact ecosystems and transmission pathways between animals and humans, increasing the risk of transmission between species [2,3].

Even though the need for integration across disciplines is clear, many warning systems for these diseases fail to monitor and include animal and environmental health data in their risk assessments. Organisations and governments tend to be divided into sectors and tend to work in silos. As a result, they fail to conceptualise and address EIDs as part of a complex and interdependent system.

Core Needs

To be effective, infectious disease warnings need to address the complete picture and contexts of the emergence of infectious diseases. They need to integrate natural sciences, social sciences, and humanities in their design and risk assessments, as well as action mechanisms. Multi-sectoral integration will support them to switch from a responsive approach that waits for the disease to reach the population before starting to monitor the risk, to an anticipatory approach that maps and addresses the many, varied social and environmental drivers of these diseases, helping to safeguard human, animal, and environmental health.

Guidance

- Risk assessments need to integrate epidemiological, animal health, environmental, and social data.
- Rather than focusing on detection and prediction, they should be connected to anticipatory strategies addressing the factors leading to spillovers.
- Engaging the public in the design of the system, and supporting them to lead their own warnings, ensures that warnings are context specific and aligned with the needs of the population.
- There needs to be a greater emphasis in building bridges between environmental and public health sectors in order to improve warning abilities to prevent disease outbreaks such as Ebola and Avian Flu.
- Invest! The cost of preventing the next pandemic is under 2% of the cost of COVID-19.
- Integrate prevention, preparedness, readiness, and response for more effective warnings.

Anticipation Hub

Global Disaster Preparedness Center

UCL WARNING RESEARCH CENTRE
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Anticipatory Action Framework

The United Nations Office for the Coordination of Humanitarian Affairs (OCHA) developed a toolkit that offers agencies, non-governmental organisations, and governments practical guidance on how to build an anticipatory action framework. It includes guidance on how to assess the scope and scale of a hazard, set up an anticipatory team, develop trigger mechanisms and activation protocols, and commit to funding [4].

Community-based engagement

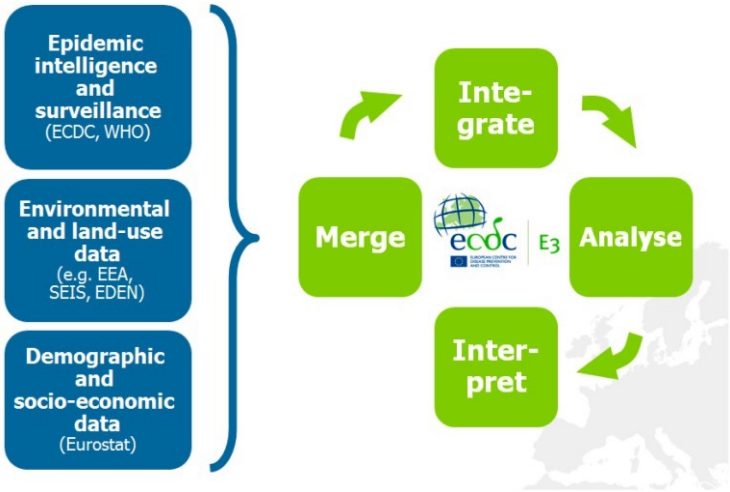
Community-based engagement is also an essential part of anticipatory action. One key mechanism for it is community-based surveillance. Communities engage and are trained in case definitions and transmission patterns for effective interventions (e.g. cholera, dengue, malaria) and standardised reporting systems (e.g. SMS applications). An example of a successful system is the Red Cross' community-based surveillance (CBS) for epidemic preparedness developed in Sierra Leone, Indonesia, and Uganda, which demonstrated high levels of accuracy of true alerts, and timeliness rates of less than 24 hours [5,6].

European Environment and Epidemiology Network (E3 Network)

The E3 Network was developed by the ECDC to support anticipatory action against environmental public health threats. For example, from 2009 to 2012 Greece was having re-emergent cases and epidemics of malaria.

To help guide malaria control efforts in Greece, the E3 network attempted to delineate areas suitable for malaria transmission. They characterised the environmental and climatic profiles of areas with active transmission cycles, which included warm temperatures and intensive irrigated agriculture, to predict areas at risk of malaria re-emergence in Greece.

They produced a disease risk map which enabled the disruption of malaria transmission in 2013, through targeted surveillance, vector control activities, and awareness raising among the general population and health workers in areas suitable for transmission based on malaria risk factors [7].



The concept of the European environment and epidemiology (E3) network [7].

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