What is required for global viral surveillance network?

Subhash Morzaria
Ex FAO/UN, Independent Consultant

WS 304
1st December, 2020
Prince Mahidol Awards Conference, 2021

Overview

1. Why do we need a different surveillance system for pre-empting pandemics?

2. What are existing systems – strengths and weaknesses for dealing with emerging pandemic threats

3. What should a surveillance system look like for early detection of viral threats and their advantages

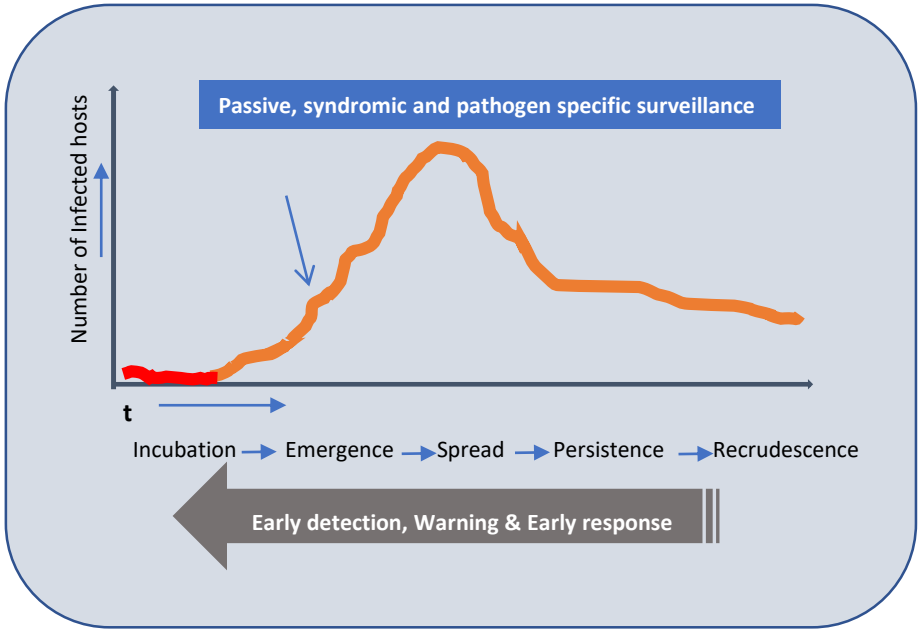
4. Opportunities and challenges of these systems

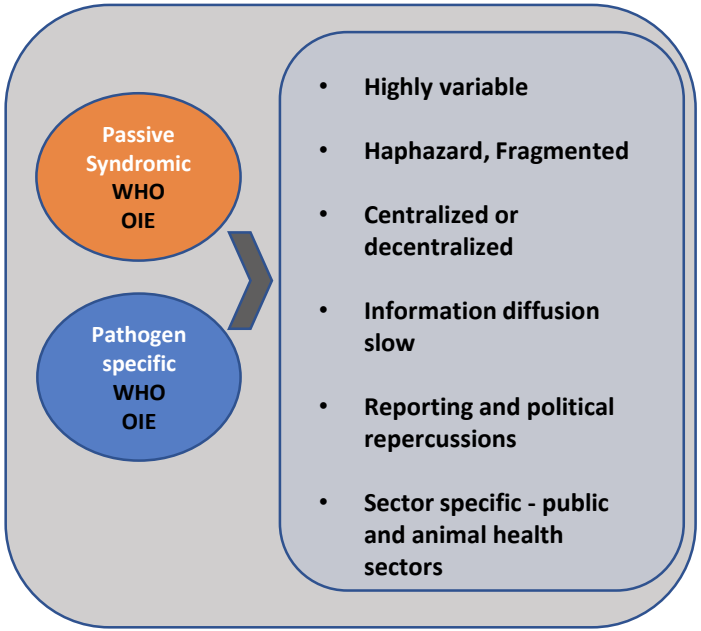
5. Conclusions

Why a different surveillance system for pre-empting pandemics?

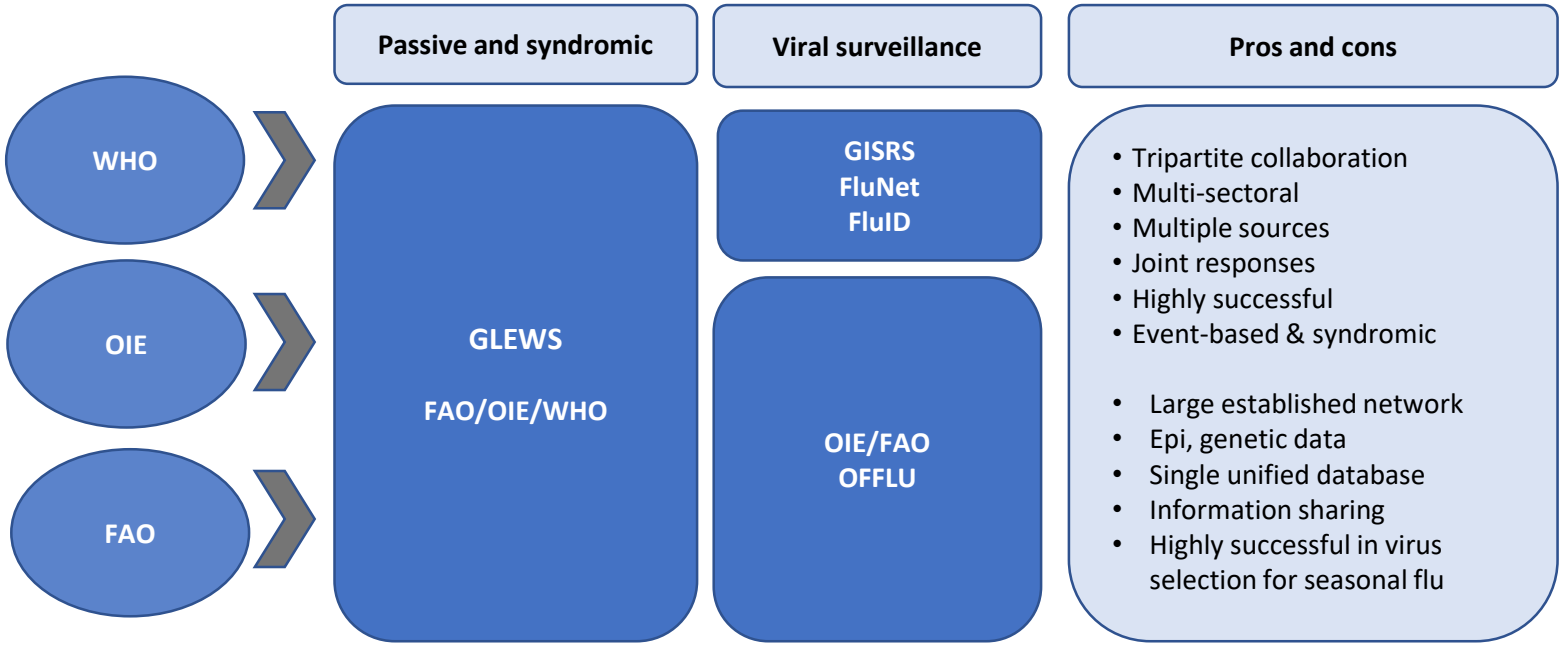
- All recent epidemics or pandemics from wildlife to humans
- Over a million zoonotic viruses yet to be discovered. Anyone of these can emerge anytime, anyplace with unpredictable impacts
- Current global disease tracking and monitoring systems dependent on information from countries and their ability to share timely information
- Early disease outbreak reporting not a guarantee for coordinated action. Existing systems are unable to cope with a potentially epidemic and pandemic virus
- Significant opportunity to expand the scope of existing surveillance systems and networks with new technologies and virus discovery programmes

Existing surveillance systems: national disease surveillance systems in humans & livestock





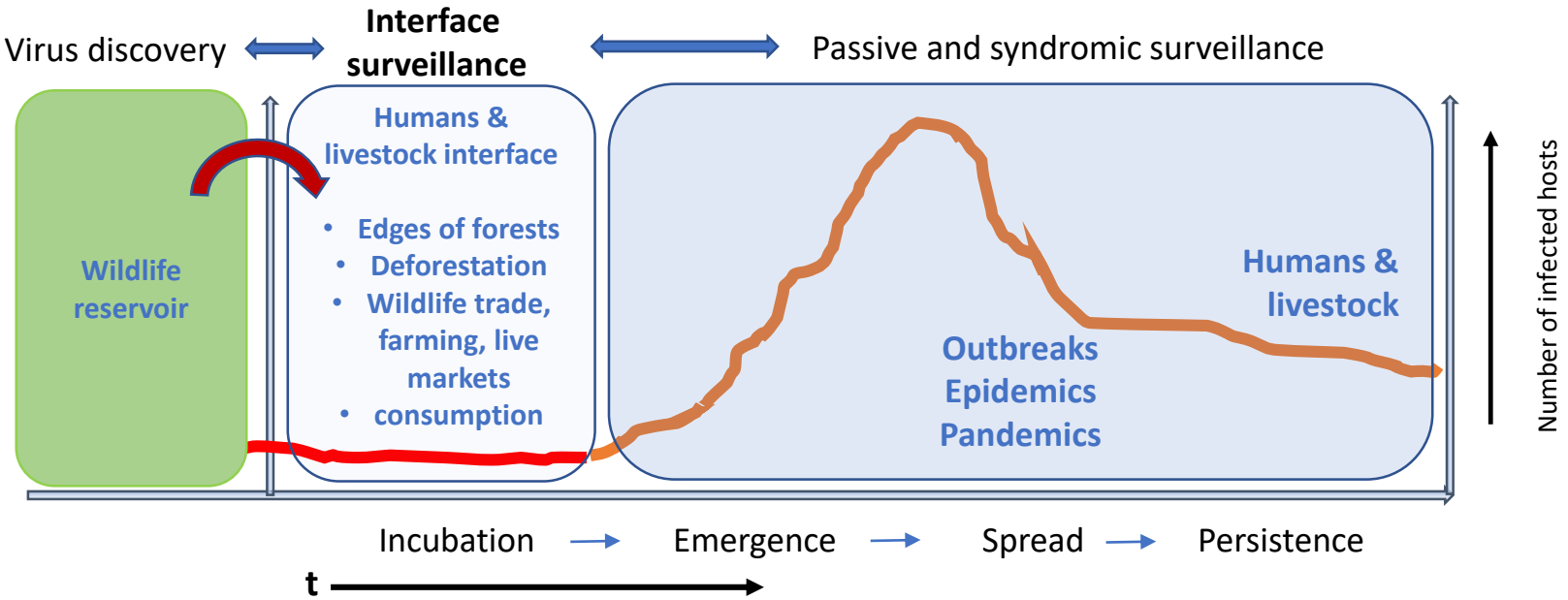
International surveillance and response systems



Expanding the existing influenza viral surveillance network for all zoonotic viruses

- Identifying viral spill over events from wild animals to livestock and humans well before they manifest into a localized outbreak is a pre-requisite for pre-empting pandemics
- There is no such system for active viral surveillance for priority list of viruses in any country
- Repeated cycles of new epidemics and pandemics in the last 20 years and their socio-economic impacts justifies new investments
- What could such a viral surveillance system and network look like?

Active, risk-based, interface surveillance for early spill over events

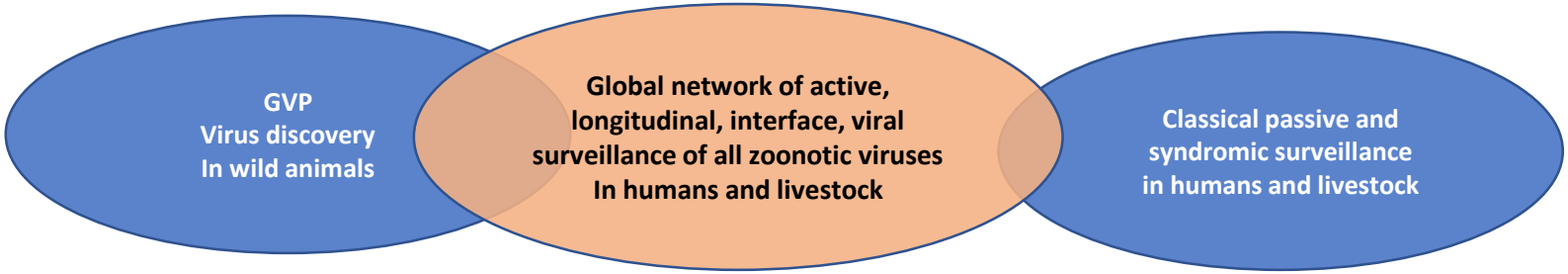


Surveillance Shift to the left

- Early detection/Warning and Early response
- Tackling disease emergence at source

Key elements of active viral surveillance

Synchronized across three sectors



WHAT ?

- All known and unknown viral threats
- Priority viral families
- WHO and other priority pandemic viruses
- GVP product of virus watch list
- Metadata on emerging risks

WHERE ?

- Interface surveillance
- Risk-based, guided by hot-spots
- Country based, country owned, global in nature
- Multiple level partnerships

HOW ?

- New technologies - molecular tools and NGS and metagenomics
- Digital tools for real-time reporting
- Big data, AI, modelling and forecasting
- International and regional coordination
- Capacity development
- Iterative, flexible, responding to risks

ONE HEALTH
multisectoral and transdisciplinary approach

Many challenges

- **Technical**
  - Sampling frames
  - Human resource capacity, field and laboratory infrastructure
  - Integrated data bases, management, analysis
- **Governance**
  - Policies, regulations and legislative framework for data sharing
  - Decision support tools e.g., joint risk assessment and criteria for action on spill over events
- **Coordination**
  - Buy-in from countries, regional organizations
  - Role of international technical agencies (FAO/OIE/WHO tripartite) and funders
  - Development partners

SHARED VISION, AGREEMENT IN PRINCIPLE AND HIGH LEVEL DIALOGUE

Many advantages

- **New information on novel viruses and risks**
  - Virus evolution and ecology
  - Evolving ecological, social, economic, political and behavioural risks
  - Large, unified datasets for sophisticated analysis and forecasting
  - Enhanced ability to detect early spill over events before they become emergencies
- **Building better**
  - Building on and enhancing existing systems (GISRS, FluID, OFFLU, etc), country networks, and national capacities (labs, field capacity, epi networks)
- **Capacity development**
  - Improved human resources and infrastructure for detection
  - Contributes to other capacity development global agenda such as IHR, PVS and GHSA
- **Operationalizing One Health**
  - Operationalizing/institutionalising OH at country, regional and international levels
  - Global partnerships governments, Development partners

Conclusions

1. Urgent need for enhancing existing surveillance systems that detect early spill over events in humans and livestock well before they manifest into a localized outbreak is a pre-requisite for pre-empting pandemics

1. International agencies (e.g. WHO, FAO, OIE tripartite) have an opportunity to play a leadership role in coordination, political support and policies

2. Part of a multi-pronged global effort on supporting preparedness, addressing ecological, socio-economic and other drivers of EIDs, and supporting R&D in new biomedical interventions such as therapeutics and vaccines

3. Significant resources needed – responsibility for financing and sustainability