Pandemic surveillance
The need for sustained surveillance

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The pandemic is not over

Cumulative reporting of cases/deaths

- 435,626,514 confirmed cases
- 5,952,215 confirmed deaths

![Diagram showing COVID-19 cases reported weekly by WHO Region and global deaths as of 27 February 2022.](image)

[See Annex 2: Data, table, and figure notes for more details.]
Careful assessment & monitoring of variants remains critical
SARS-CoV-2 infections in animals: The risks

- Several species in the proximity of humans are susceptible to SARS-CoV-2 and have potential to form virus reservoirs -especially in farms or other spaces where larger groups of animals reside in close proximity
- Novel animal hosts have the potential to drive virus evolution
- There is an urgent need to increase surveillance in risk species, as well as sequencing to identify the formation of reservoirs early and to monitor viral evolution
Countries face different situations, challenges and scenarios for ending the emergency phase and for achieving sustained COVID-19 control.

Current and Previous Strategy

Current Epidemiology

Population demographics and risk factors for severity

Population immunity from vaccination and/or infection

Access to life saving tools

Capabilities to implement in communities and across all pillars

Operational readiness and agility to adjust actions and surge as needed

Public trust, societal engagement and unrest

End the public health emergency of COVID-19 in 2022

Reduce and control
Incidence of SARS-CoV-2 infection

Optimizing National and International Strategies and operational readiness

Protect individuals (especially the vulnerable) from exposure and reduce risk of future variants
- Vaccination development and deployment
- Vaccination coverage and effectiveness
- Vaccination uptake and adherence
- Vaccination strategies and interventions

Reduce disease mobility, mortality and long-term consequences of infection to a minimum
- Protect those most vulnerable with full scale of effective vaccines (75% by June 2022)
- Early diagnosis and effective clinical management of symptomatic disease (especially in at-risk groups in all countries)
- Better understanding and therapeutic options for treatment
- Protect HCWs and return normal health systems

Prevent, Diagnose and Treat Coronavirus Disease (COVID-19)

Health, Economy, Politics, Human rights, Acceptance

Prevent, Diagnose and Treat Coronavirus Disease (COVID-19)
Upcoming technical consultation on surveillance

Dr Boris Pavlin, WHE/WRE, COVID-19 Epidemiology Pillar Lead
Consultation 1: Urgent surveillance needs during the current COVID-19 pandemic

- Informal dialogues with WHO ROs and Member States
- Review current objectives, achievements and challenges in WHO-HQ COVID-19 surveillance, 2 years into the pandemic
- Adjust short term objectives of SARS-CoV-2 surveillance for Member States, through internal and external review and consensus
- Timeframe: target March 2022
- Output: updated COVID-9 Public Health Surveillance interim guidance, target April 2022
Leveraging Existing Systems : GISRS

Dr Wenqing Zhang, Unit Head Global Influenza Programme, WHE/WPE /EPP
Existing network for Influenza surveillance: GISRS

**Global Influenza Surveillance and Response System (GISRS)**

- Global **foundation** for influenza surveillance, preparedness and response
- Currently 158 institutions in 124 Member States
- Global **public health model** for 70 years
- **Institutionalized capacity** in countries
  - Laboratory & diseases surveillance integrated
  - Response mechanisms exercised very season in epidemics
  - Enormous commitment from Member States and support from international agencies and partners

*Year-round cycle from specimens to public health products*
Integration of multiple viruses in a single platform

- **2002:** SARS-CoV-1 was identified by GISRS
- **Since 2015:** RSV is being integrated into GISRS influenza surveillance system in some countries. It has strengthened GISRS surveillance capacity in *pediatric populations*
- In the Region of the Americas: a **panel of respiratory viruses** integrated into GISRS
Leveraging GISRS for COVID-19 pandemic response

GISRS in action since day 1 of SARS-CoV-2 detection
Genetic sequence data sharing: GISAID EpiFlu™ → EpiCoV™

COVID-19 response
- Global SARS-CoV-2 virus detection quality (~ 90%) national labs for SARS-CoV-2
- Global COVID-19 surveillance reporting platform
- Shipping SARS-CoV-2 viruses

GISRS capacity leveraged
- EQAP* (GISRS annual function since 2007)
- NICs (National Influenza Centres of GISRS)
- FluMart (GISRS reporting platform)
- Shipping Fund Project (GISRS virus shipping mechanism since 2005)

* EQAP: External Quality Assurance Program of WHO
Sentinel surveillance for SARS-CoV-2 using GISRS

- Integration of SARS-CoV-2 with influenza surveillance
- Using existing sentinel surveillance systems of influenza
- Addressing public health needs of non-COVID-19 simultaneously
- Building sustainability with GISRS

Standardized algorithms

Quantitative guidance

Standardized tools

- EQAP 2020&2021; 2022 ongoing
- Multiplex PCR reagents for GISRS
- Lab supplies for LMICs
- Reporting tools
- Trainings & daily support
100 countries have integrated COVID-19 surveillance into GISRS sentinel systems as of 14 Mar 2022:
- 89 countries with smoothly functioning integrated surveillance

Virus detection:
- 23 out of 26 WHO COVID-19 Reference labs are members of GISRS
- 224 labs from 176 countries, areas and territories participated in the WHO EQAP for SARS-CoV-2.

Sequencing: GISRS laboratories in 106 Member States generated & shared genetic sequence data

GISRS capacity leveraged to COVID-19 pandemic response
Sentinel surveillance for SARS-CoV-2 using GISRS
- monitoring relative co-circulations of SARS-CoV-2 and influenza in community

- Monitoring relative co-circulations of influenza and SARS-CoV-2 in community
- Influenza started during COVID-19 pandemic since week 40 2021, and under the radar screen of GISRS
Sentinel surveillance for SARS-CoV-2 using GISRS
- efficiency

- Sentinel surveillance needs significantly reduced resources than universal surveillance for monitoring trends of virus circulation in community
  - Country A: 142 vs 218,260* specimens weekly – **1500 times less specimens**
  - Country B: 44 vs 11,505** specimens weekly – **300 times less specimens**

*Data from week 10/2020; **Data from week 13/2021
In summary

• Thanks to Member States’ support to GISRS
• GISRS demonstrated, through COVID-19 pandemic, its:
  o resilience leveraging rapidly national and global capacity from influenza to non-influenza
  o surge ability e.g. testing 340 specimens per week/country in 2019 to 10,000 in 2020
  o feasibility of monitoring SARS-CoV-2 and influenza at the same time
  o ability to maintain vigilance to emerging threat of influenza pandemic - 155 cases of zoonotic influenza infection detected so far during COVID-19 pandemic
• GISRS sentinel surveillance takes systematic approach from specimens, to virus detection and genetic sequencing, connecting disease monitoring.
• Strong sentinel surveillance is a critical component of broader surveillance operation and complements other surveillance models.
• GISRS system is country-owned with year-round functioning capacity in countries. GISRS surveillance will continue –a public health need driven by the persistent threat of influenza pandemics and seasonal epidemics.
Pandemic Surveillance the way forward

Dr Sylvie Briand, Director Epidemic and Pandemic Preparedness and Prevention, WHE/WPE/EPP
Considerations on Pandemic surveillance

• Many pathogens could cause the next pandemic. However, respiratory viruses pose specific challenges for surveillance:
  • high and rapid transmission (short incubation period)
  • often pre-symptomatic or asymptomatic transmission
  • non-specific symptoms
  • evolving pathogens

• It is easier to scale up existing systems than to build a brand-new surveillance system during pandemic situation

• There is a need to maintain the gains of the COVID-19 pandemic AND expand existing systems to include current and future viruses of concern.
Surveillance systems provide information for decision-making like a car dashboard

- Speed of the car
- Position
- Engine problem,
- Need for fuel, oil, water, …

- Spread of the disease
- Geographic distribution of the disease
- Impact on the health, health systems
- Allocation of resources
Comprehensive pandemic surveillance through connected systems

- SARI and ILI Sentinel Systems
- Animal-human interface
- Event-based surveillance
- Complementary systems
- Special Studies

- Circulation trends
- Severity
- Clinical information
- Genetic changes
- Impact/interventions
- Novel viruses
- New variants
- Outbreaks
- Clusters of concern
- Impact/interventions e.g vaccine coverage
- Hospital capacity
- Absenteeism
- Transmission
- Seroprevalence e.g. Unity studies
Sentinel SARI and ILI surveillance systems

- Sentinel ILI (Influenza Like Illness) and SARI (Severe Acute Respiratory Infection) surveillance monitors the circulation of seasonal respiratory pathogens, and their impact.

- Quality data can be obtained from a few well-run sites. Not every case needs to be identified, results can be extrapolated to the entire population.

- Small amounts of good data are better than large amounts of bad data!

- Sentinel sites should be selected to be representative of population under surveillance and practically feasible in terms of logistics and acceptance. The number of sentinel sites is based on resources.
Temporarily enhancing sentinel SARI and ILI systems during a pandemic

More information during a pandemic on:
- Subnational monitoring
- High risk group monitoring
- Additional variant monitoring
- Clinical monitoring
- Vaccine Effectiveness monitoring
- Child pneumonia monitoring, etc.
SARS-CoV-2 sequencing capability

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Data Source: World Health Organization
Map Production: WHO Health Emergencies Programme
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Global genomic surveillance strategy for pathogens with pandemic and epidemic potential

Goal
Genomic surveillance is strengthened and scaled for quality, timely and appropriate public health actions within local to global surveillance systems

Objectives
- Objective 1: Improve access to tools for better geographic representation
- Objective 2: Strengthen the workforce to deliver at speed, scale and quality
- Objective 3: Enhance data sharing and utility for streamlined local to global public health decision-making and action
- Objective 4: Maximize connectivity for timely value-add in the broader surveillance architecture
- Objective 5: Maintain a readiness posture for emergencies

Strategic actions
- Advocate for the value of genomic surveillance with policy makers
- Map and monitor capability and capacity landscape
- Deliver contextualized and sustainable technology solutions
- Stimulate innovation and research to address local to global needs
- Shape a sustainable and quality market to maximize access
- Roll-out training packages in genomics and bioinformatics
- Promote communities of practice and knowledge exchange
- Implement external quality assessment programs
- Strengthen programs for workforce development and retention
- Develop consensus on data and meta data standards
- Establish data sharing and access principles
- Ensure data sharing agreements
- Harmonize norms, standards, benchmarks and reference materials
- Make the use of genomics routine in surveillance practice
- Facilitate data, specimen and information sharing
- Increase network linkages at local, regional and global levels
- Implement targeted collaboration with One Health partners
- Strengthen networks in routine, epidemic and pandemic contexts
- Test the surge and stretch of genomic surveillance systems
- Establish or sustain joint projects to maintain capacities
- Implement inter- or after-action reviews to strengthen practices
• Member States have leveraged existing systems well during the current pandemic

• Multiple, complementary surveillance systems are needed to meet all needs

• Sentinel surveillance should be expanded during a pandemic (more sites) but with scalable capacity to meet additional objectives during a pandemic, without disrupting trend monitoring.

• The type and amount of data to be collected may vary throughout the pandemic and during interpandemic periods

• Standard protocols are needed for additional critical surveillance systems and studies. Standardization across countries allows for comparison and better understanding of the epidemiological characteristics

• We need to adopt new technologies (e.g. genomic sequencing) and surveillance innovations (e.g. participatory surveillance) from the current pandemic experience
Aim: leveraging and enhancing existing systems to ensure sustainable surveillance of SARS-CoV-2, Influenza and other respiratory viruses.

- identify priority public health questions/decisions
- determine how sentinel surveillance, and specific additional complementary surveillance systems and/or special studies, would best address these questions;
- define priority 2022 actions for further system establishment or enhancement; and
- understand and help countries overcome barriers as they enhance and establish the necessary surveillance systems that are sustainable over time.
Thank You