Finding Outbreaks Faster

How Do We Measure Progress?

Background

Partners across the globe are working to improve the capabilities needed in every country to stop emerging infectious diseases from expanding beyond their points of origin. Additionally, countries are reaching across national borders to improve regional cooperation to raise early alerts and thereby increase the chances of curbing spread. The risk of any local epidemic becoming a regional or global threat is a clear and present danger as long as we have weak links in our global health security chain.

The ongoing implementation of the International Health Regulations and the supporting actions of the Global Health Security Agenda are assisting countries in assessing their readiness to detect, verify and respond to disease outbreaks. To help with these and other efforts within countries to monitor quality improvement, Ending Pandemics began an effort in 2014 to define and test a handful of simple, quantitative metrics in 28 countries.[1] Retrospective analyses of 5-10 years highlighted gaps in surveillance and identified opportunities to improve timeliness of outbreak detection and response activities. Modifications to data collection practices and response protocols resulted from this work in several participating countries. Continuous monitoring of these metrics will provide the ability to track progress in near real-time and help guide investments in epidemic and pandemic preparedness.

[1] Smolinski et al. *Finding Outbreaks Faster.* Journal of Health Security. 2017

[2] Please refer to *Early detection, assessment, and response to acute public health events: Implementation of Early Warning and Response with a focus on Event-Based Surveillance (Interim Version),* World Health Organization, 2014.

Outbreak Timeliness Milestones

In 2018, in partnership with the Salzburg Global Seminar, Ending Pandemics convened representatives from 26 organizations (including national and international public health agencies, NGOs, universities, and foundations) working across the globe to revise the outbreak milestones based on lessons learned from the 28 implementing countries. Several days of in-depth discussion and spirited debate resulted in a set of eight outbreak milestones for use by both public health agencies and other interested organizations. The set of eight outbreak milestones can be used to calculate any number of key timeliness intervals that occur between select milestones.

Outbreak Milestones	Definition
Outbreak Start	Date of symptom onset in the primary case or earliest epidemiologically-linked case
Outbreak Detection	Date that the outbreak or disease-related event is first recorded by any source or in any system
Outbreak Notification	Date the outbreak is first reported to a public health authority
Outbreak Verification	Earliest date of outbreak verification through a reliable verification mechanism[2]
Laboratory Confirmation	Earliest date of laboratory confirmation in an epidemiologically-linked case
Outbreak Intervention	Earliest date of any public health intervention to control the outbreak
Public Communication	Date of first official release of information to the public from the responsible authority
Outbreak End	Date that outbreak is declared over by responsible authorities

Outbreak Timeliness Metrics

A set of standardized outbreak milestones allow countries and organizations to define and calculate relevant timeliness metrics to address their own needs. A timeliness metric is measured as the time interval between two relevant outbreak milestones. Some countries or partners may not have the capacity or intent to measure all the outbreak milestones, and therefore may not measure every possible time interval. While timeliness metrics may be defined differently by countries and organizations, maintaining consistent definitions over time will allow for valid comparisons to capture trends.

(continued on next page)

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SALZBURG GLOBAL SEMINAR

Ending Pandemics

Salzburg Global Seminar, Session 613 Participants

Diana Arsenian, *Graphic Facilitator*

Ray Arthur, *US Centers for Disease Control & Prevention*

Viduthalai Balagurusamy, *Directorate of Public Health and Preventative Medicine, India*

Donewell Bangure, *Africa Centers for Disease Control*

Philippe Barboza, *World Health Organization*

Silvia Bino, *Albania Institute of Public Health*

Meesha Brown, *PCI Media Impact*

Rebecca Bunnell, *US Centers for Disease Control & Prevention*

Hao-Yuan Cheng, *Taiwan Ministry of Health*

Adam W. Crawley, *Ending Pandemics*

Osman Dar, *Public Health England*

Fiona Davis, *Salzburg Global Seminar, Austria*

Vikki de los Reyes, *Philippines Department of Health*

Nomita Divi, *Ending Pandemics*

Jennifer Dunn, *Salzburg Global Seminar, Austria*

Angela Hilmers, *TEPHINET Secretariat*

Olga Jonas, *Harvard Global Health*

Maria Jose Sagrado, *Medecins Sans Frontieres, Spain*

Nirmal Kandel, *World Health Organization*

Rebecca Katz, *Georgetown University Center for Global Health Science and Security*

Amy Kircher, *University of Minnesota*

Andrew Kitua, *Africa Preparedness & Response, USAID*

Christopher Lee, *Preventing Epidemics, Resolve to Save Lives*

Pia D. A. MacDonald, *RTI International*

Jas Mantero, *Ending Pandemics*

Kujtim Mersini, *Albania Food Safety & Veterinary Institute*

Vladimir Mikikj, *Macedonia Institute of Public Health*

Melinda Moore, *RAND Corporation*

Melissa Mueller, *University of Minnesota*

Afifah Rahman-Shepherd, *Chatham House*

Dominic Regester, *Salzburg Global Seminar, Austria*

David Saul Rodriguez Araujo, *Executive Secretariat of the Council of Ministers of Health of Central America*

Robert Salerno, *DAI Global Health*

Aïcha-Marceline Sarr, *Foundation Merieux*

Jan Semenza, *European Centers for Disease Control*

Clare Shine, *Salzburg Global Seminar, Austria*

Mark Smolinski, *Ending Pandemics*

Bao-Ping Zhu, *US Centers for Disease Control & Prevention*

Outbreak Timeliness Metrics *(Cont'd.)*

As a case in point, Ending Pandemics is using four outbreak milestones to define timeliness metrics relevant to monitoring the impact of our work. We define time to detection as the time interval between outbreak start and outbreak detection. Time to verification is defined as the time interval between outbreak detection and outbreak verification. And finally, time to intervention is defined as the time metrics between outbreak detection and outbreak intervention.

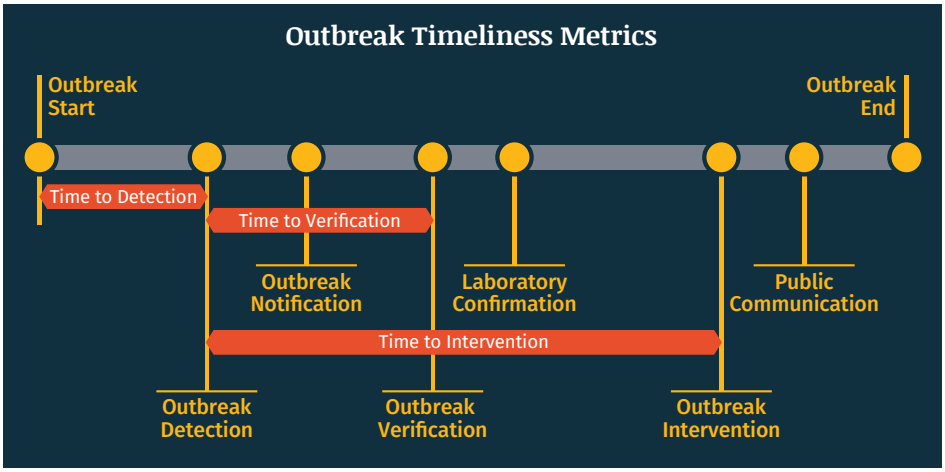

Figure 1. The eight outbreak milestones are ordered as shown for illustrative purposes as the actual sequencing may vary. For example, laboratory confirmation may occur simultaneous to outbreak verification. In another case, public communication may be the first outbreak intervention. As an example, Ending Pandemics' timeliness metrics are shown as the intervals between the relevant outbreak milestones.

Looking Ahead

The outbreak timeliness metrics allow for the impact of investments to improve disease detection and response to be measured through quantitative self-assessments. Their use may also capture performance improvements and help showcase progress in developing country-level surveillance capacity. These critical data points can be integrated into existing, routine disease surveillance systems, including outbreak reporting forms, event management systems, and after-action reports. Ending Pandemics is committed to working in concert with key stakeholders to advance the use of these metrics in countries around the world. As we advance these metrics for use in human health contexts, we will also expand this approach to include the animal health sector and environmental drivers, a critical step for ensuring the earliest detection and prevention of zoonotic threats to save lives and preserve livelihoods.