Event Based Surveillance

Module 4: Registration and Reporting of Events

Module 4 Learning Objectives

4.1 Define the objectives and process of event registration

4.2 Describe key data elements and outbreak metrics to capture by an event management system

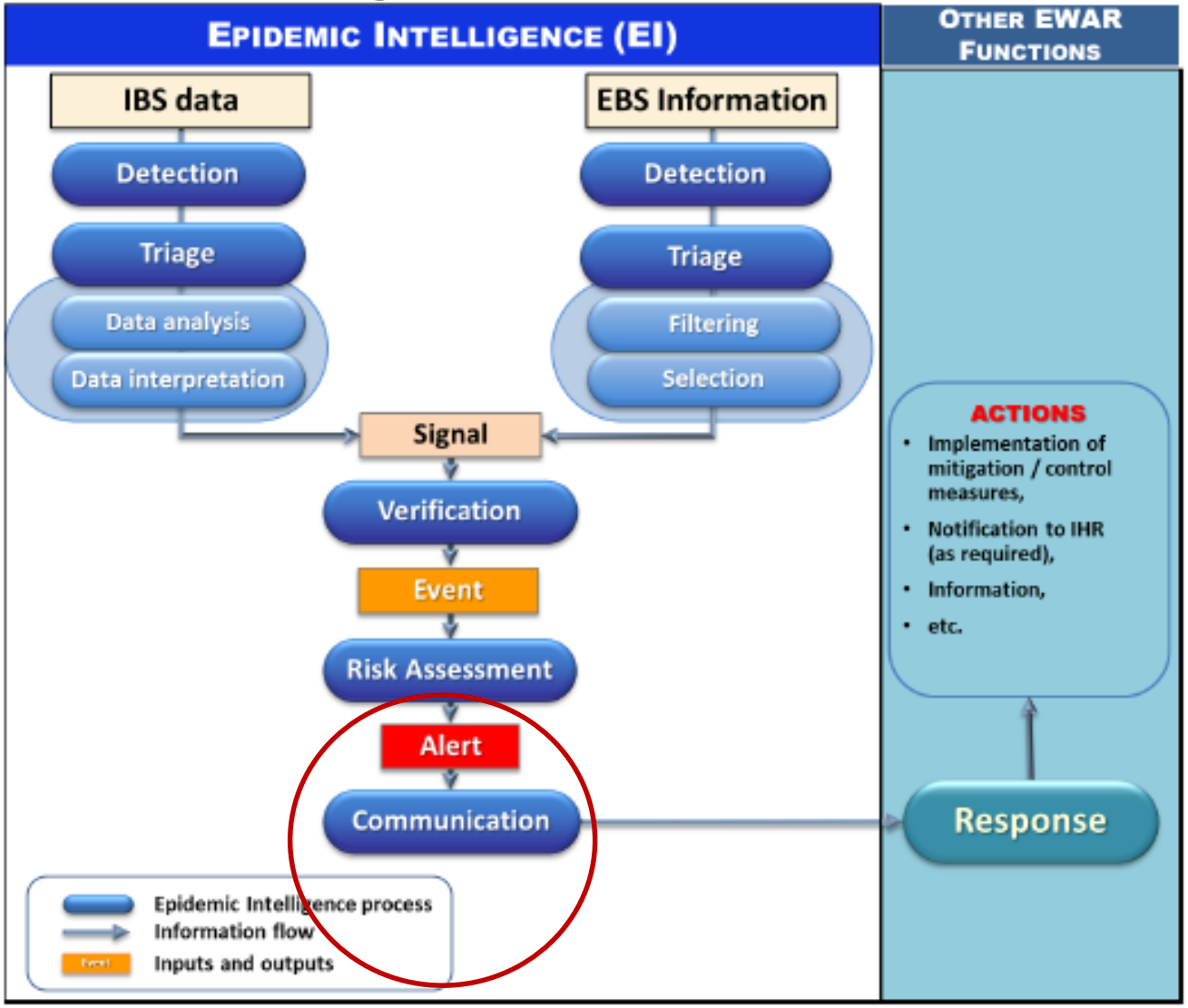
4.3 Describe the objectives and process of event reporting

4.4 Describe key reporting products

4.5 Describe the utility of developing an EBS database and analyzing EBS performance

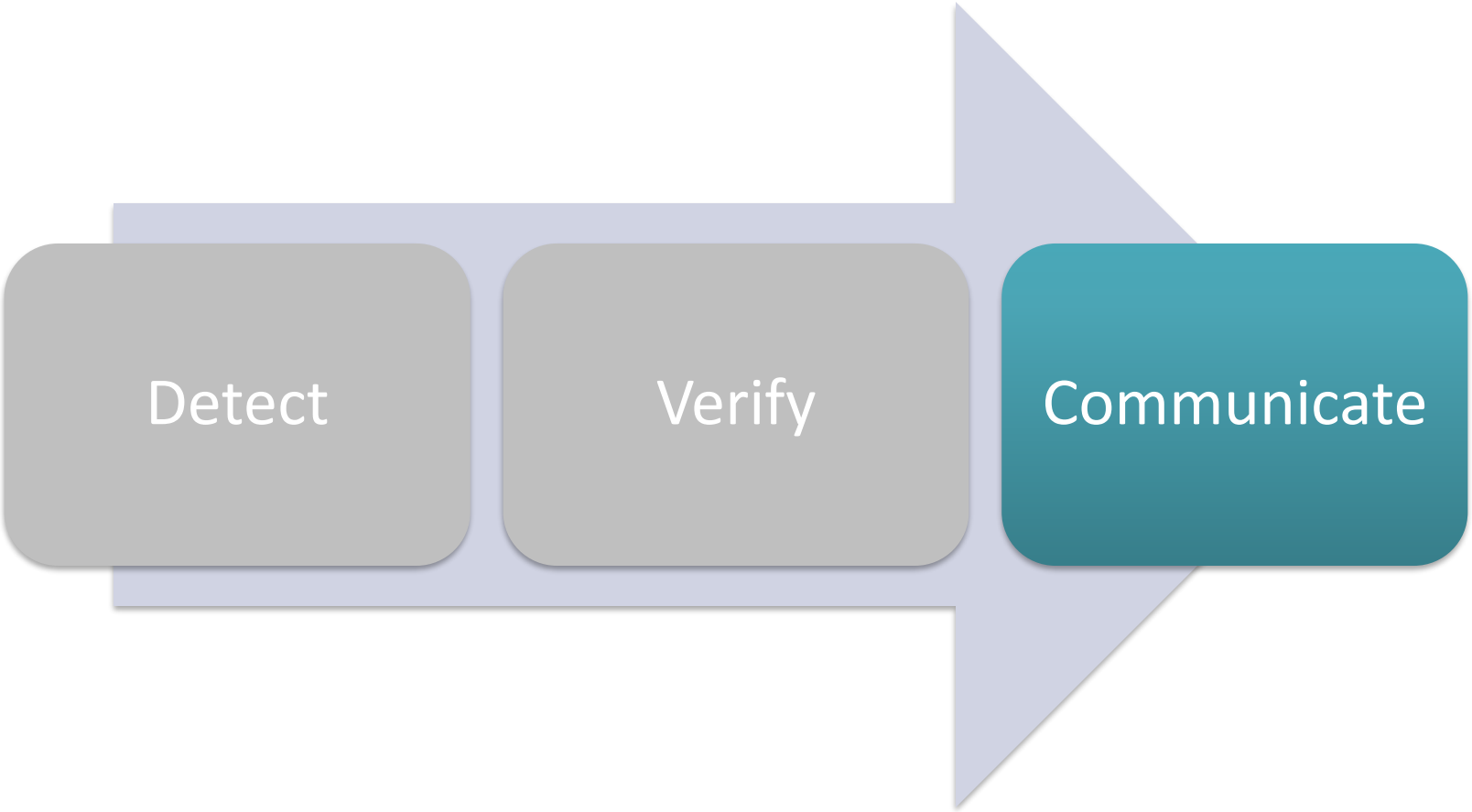
PROCESS:

Epidemic intelligence (EI) within EWAR



Reprinted with permission from WHO (2014)

Event-Based Surveillance in practice: Module 4 - Communicate



Defining what will qualify as an “EBS event” to be targeted and captured

Events related to occurrence of disease in humans	Events related to potential exposures for humans
• Clustered cases of disease • Unusual disease patterns • Unusual or excess deaths	• Zoonotic disease events • Accidental or deliberate pathogen release • Contaminated food or water • Toxic chemical releases • Radio-nuclear releases • Natural or manmade disasters

What criteria will define an “EBS event” to be targeted and captured?

Events that require prompt action

- Potentially related to an increased risk for public health
- Require urgent investigation
- Require rapid public health response to prevent spread

Events that pose known risks

- Events related to occurrence of disease in humans
- Events related to potential exposures for humans

Events prioritized by the country

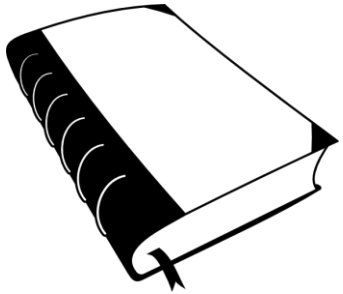
- Disease burden
- Resources and capacities to respond

DEVELOPING REPORTS

Information sharing for Early Warning and Response (EWAR)

DEFINITION:

Registration of Events



- The process by which health events are recorded in a standardized way with regular entries of items or details

Global commitment to standardizing outbreak documentation

SALZBURG
GLOBAL
SEMINAR

FINDING OUTBREAKS FASTER:
HOW DO WE MEASURE PROGRESS?
Session 613
November 4-8, 2018

Ending
Pandemics

Outbreak Milestones

COMMENTARY

FINDING OUTBREAKS FASTER

Mark S. Smolinski, Adam W. Crawley, and Jennifer M. Olsen

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
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

Defining and capturing timeliness metrics

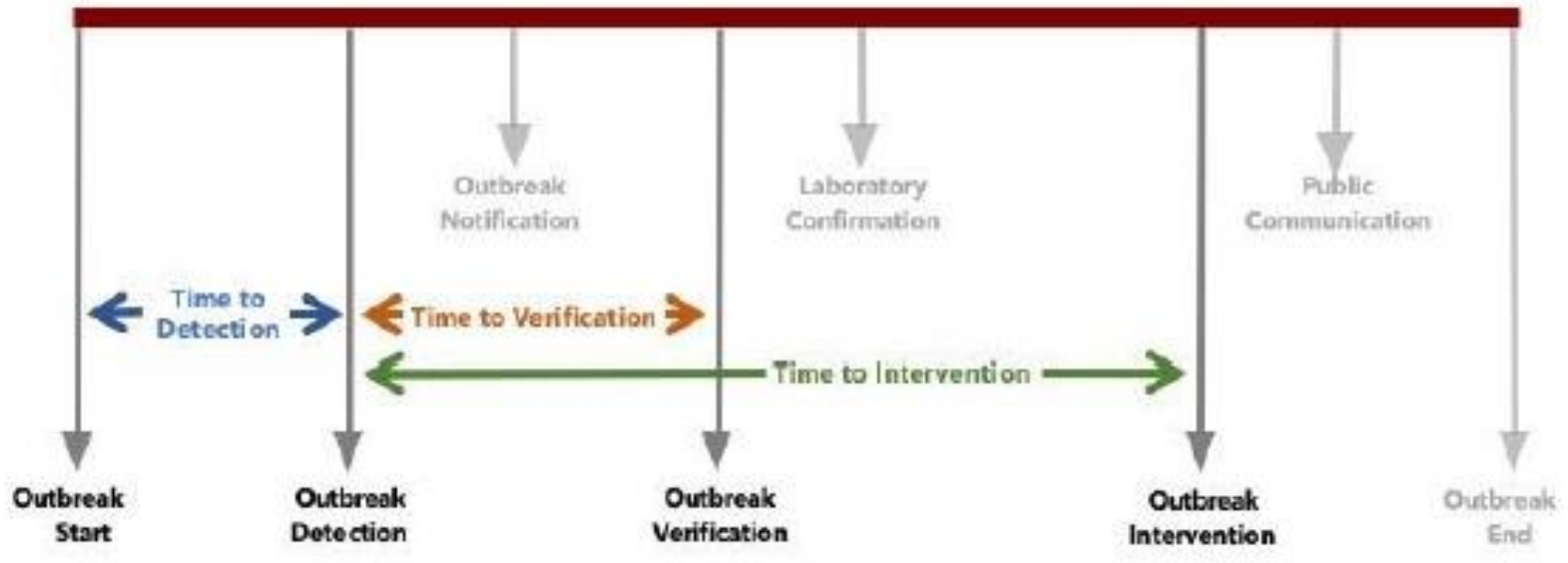
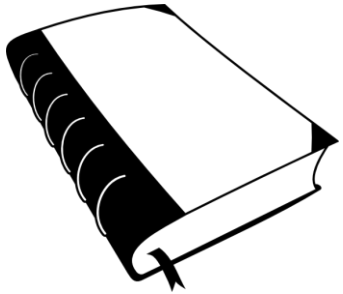


Figure 1. The eight outbreak milestones shown in the above figure are for illustrative purposes only as the actual sequencing may vary. For example, laboratory confirmation may occur simultaneous to outbreak verification. In another case, public communication may be the first outbreak intervention. As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

DEFINITION:
Reporting of Events



- The process by which health events and health risks are brought to the knowledge of the health authorities.

Event classifications – using EBS information to recommend action

Discard	Monitor	Respond	Close
No immediate risk to human health.	Potential exists for serious consequences and a response may become appropriate.	Field investigations or control measures are needed to interrupt transmission.	No further action is needed.

Adapted from WHO (2014)

Information of interest is not the same as information for action

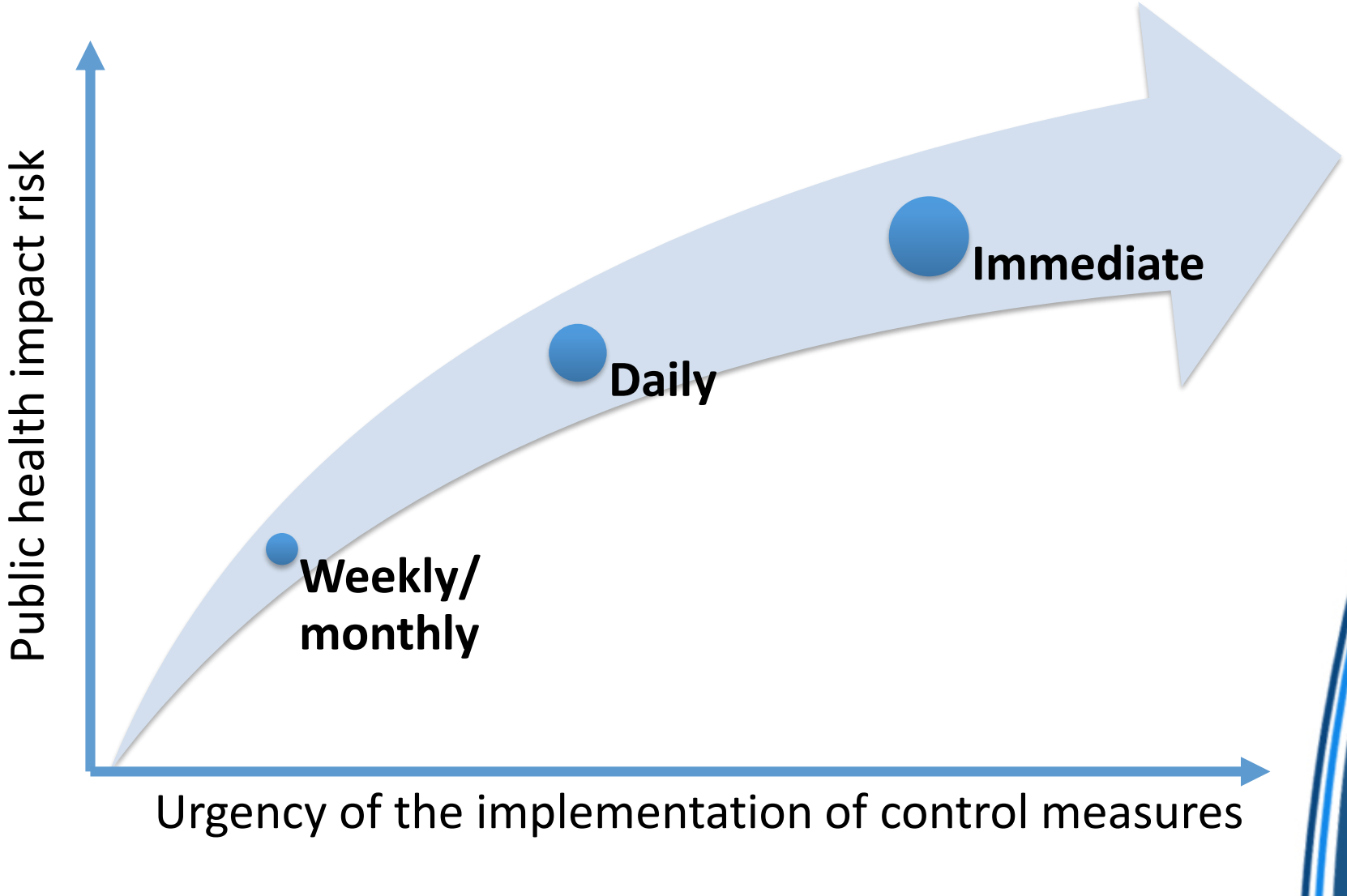
Information for situational awareness

- Public health events of interest to specific stakeholders

Information for action

- Public health events that may require investigation and control measures

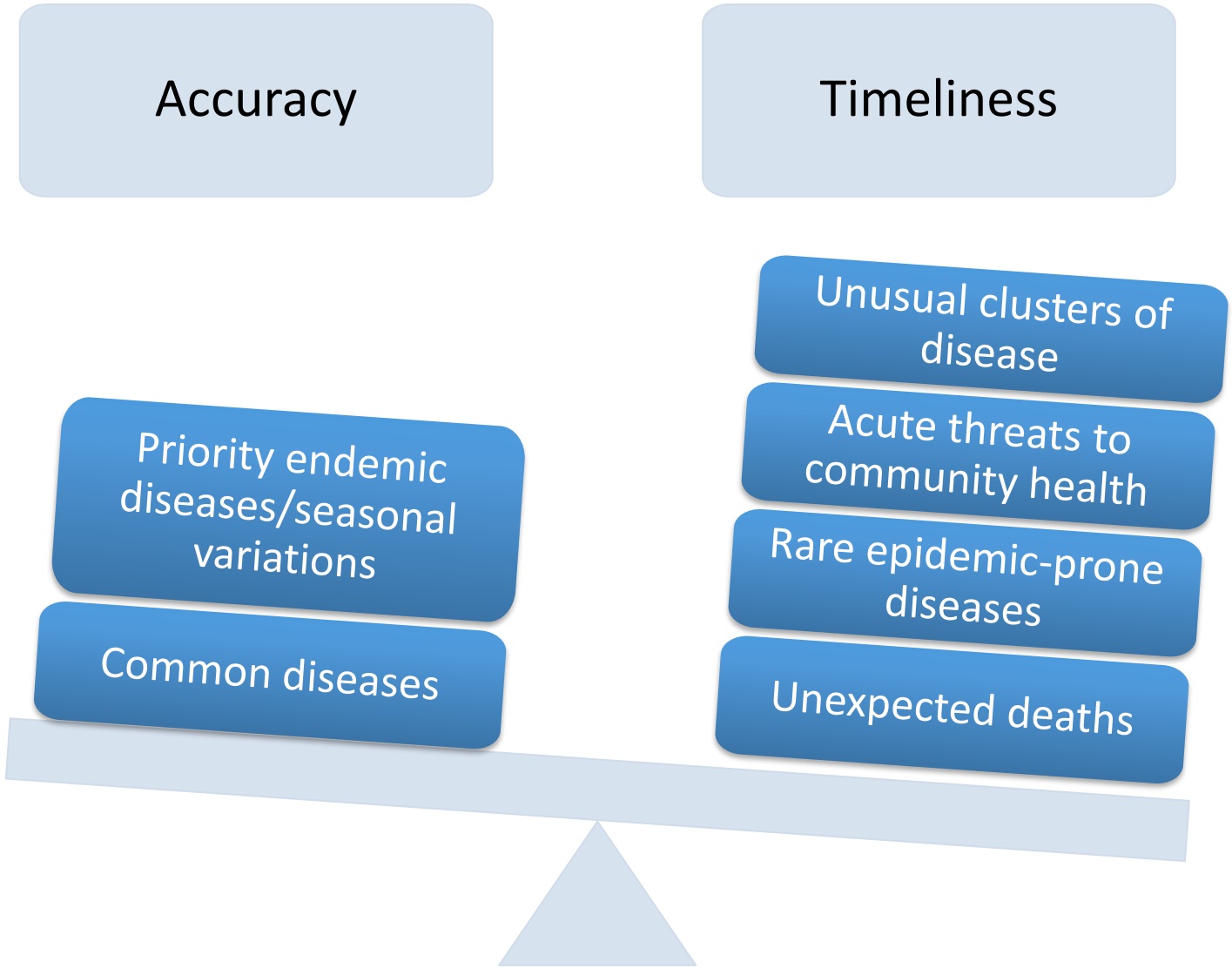
Frequency of reports should correspond to the urgency of responding to various threats



Reporting frequency depends on the urgency of responding, audience, and purpose

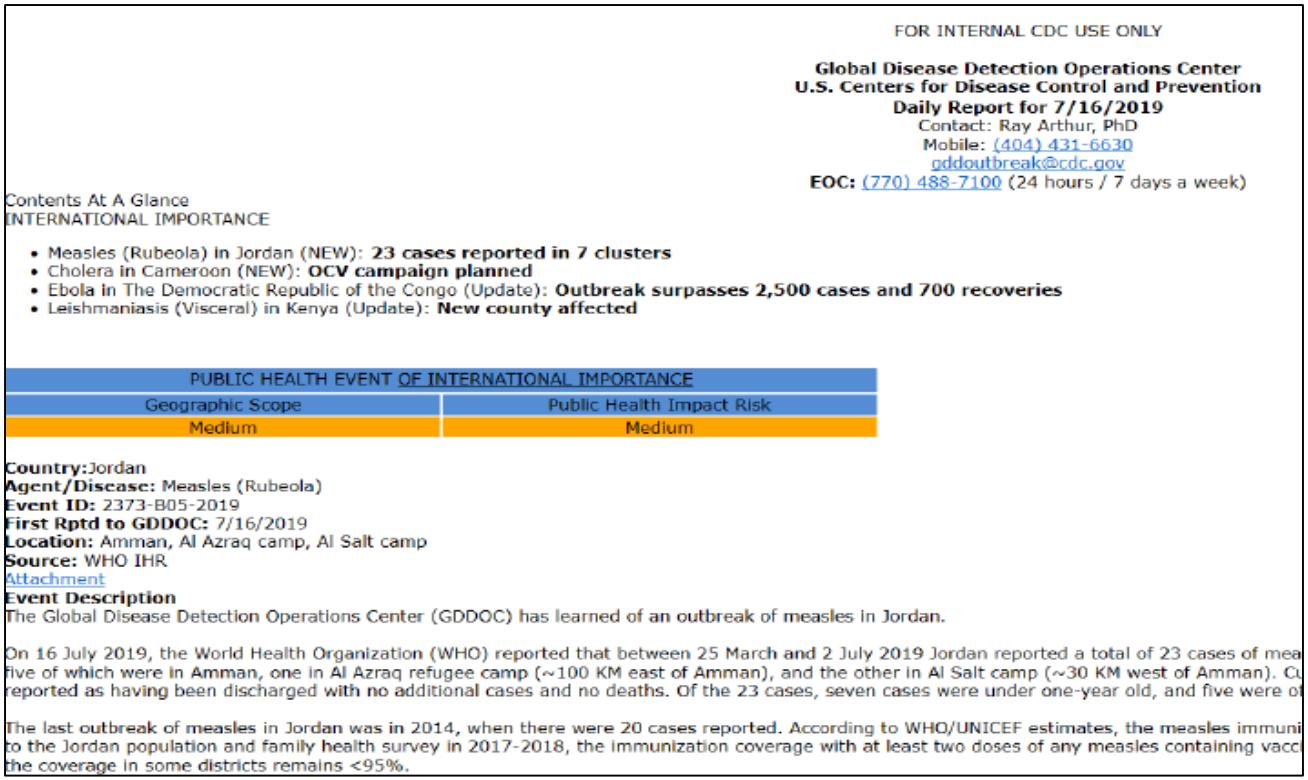
Type of report	Frequency
EBS Daily Report - Time-sensitive bullet points to leadership - Critical Information Requirement type, or "flash" report	Daily
EBS Map (if applicable)	Daily or weekly
Weekly summaries for immediate leadership (if applicable)	Weekly (on Thursdays)
Monthly bulletin for organizational leadership (if applicable)	Monthly

Reporting frequencies strike a balance between timeliness and accuracy of information



Daily and urgent reports should contain content needed for decision making

- Daily reports
  - Standard template for content
  - Published at the same time each day
  - Standard distribution list and dissemination mechanism



FOR INTERNAL CDC USE ONLY

Global Disease Detection Operations Center
U.S. Centers for Disease Control and Prevention
Daily Report for 7/16/2019
Contact: Ray Arthur, PhD
Mobile: (404) 431-6630
gddoutbreak@cdc.gov
EOC: (770) 488-7100 (24 hours / 7 days a week)

Contents At A Glance
INTERNATIONAL IMPORTANCE

- Measles (Rubeola) in Jordan (NEW): **23 cases reported in 7 clusters**
- Cholera in Cameroon (NEW): **OCV campaign planned**
- Ebola in The Democratic Republic of the Congo (Update): **Outbreak surpasses 2,500 cases and 700 recoveries**
- Leishmaniasis (Visceral) in Kenya (Update): **New county affected**

PUBLIC HEALTH EVENT OF INTERNATIONAL IMPORTANCE	
Geographic Scope	Public Health Impact Risk
Medium	Medium

Country: Jordan
Agent/Disease: Measles (Rubeola)
Event ID: 2373-B05-2019
First Rptd to GDDOC: 7/16/2019
Location: Amman, Al Azraq camp, Al Salt camp
Source: WHO IHR
Attachment
Event Description
The Global Disease Detection Operations Center (GDDOC) has learned of an outbreak of measles in Jordan.

On 16 July 2019, the World Health Organization (WHO) reported that between 25 March and 2 July 2019 Jordan reported a total of 23 cases of mea
five of which were in Amman, one in Al Azraq refugee camp (~100 KM east of Amman), and the other in Al Salt camp (~30 KM west of Amman). Cu
reported as having been discharged with no additional cases and no deaths. Of the 23 cases, seven cases were under one-year old, and five were o

The last outbreak of measles in Jordan was in 2014, when there were 20 cases reported. According to WHO/UNICEF estimates, the measles immuni
to the Jordan population and family health survey in 2017-2018, the immunization coverage with at least two doses of any measles containing vacc
the coverage in some districts remains <95%.

Preparing the Daily Report: Communicating confidence

- EBS information may be incomplete or from only a single source

- The EBS Unit Daily Report should use consistent approaches and terminology to characterize confidence in the assessment
  - Ranking scales (for example, low/medium/high)
  - Describing the status of the investigation
  - Describing the source(s)

Basic information needed for an EBS report

- New or updated report?
- Who provided the information?
- When did they provide it?
- What is the event about? (Don't forget the key outbreak milestones!)
  - **Outbreak Start**
  - **Outbreak Detection**
  - **Outbreak Notification**
  - **Outbreak Verification**
  - **Laboratory Confirmation**
  - **Outbreak Intervention**
  - **Public Communication**
  - **Outbreak End**
- Who/How many are affected? Cases/deaths
- Where are they located?
- What is being done about it and by whom?
- Background information
- Will there be future reports on this event?
- Source documentation

Example of a CDC EBS report – Key elements

- The Global Disease Detection Operations Center (GDDOC) has learned of an outbreak of **measles in Romania**.
- On **21 September 2016** the **Romanian Ministry of Health (MOH)** reported that in the **first eight months of this year,** they have recorded **675 confirmed cases of measles in 23 counties, with two deaths.** A third suspected measles death was reported but is undergoing final confirmation. The two confirmed and one suspected deaths all occurred in children younger than one year, which is under the age of routine measles vaccination. The MOH attributes the resurgence of measles to failure of some parents to adhere to the routine vaccination schedule.
- **The National Institute of Public Health recommends vaccinating children in the affected areas of the country at the age of seven months with resumption of the normal vaccination schedule at one year of age.**
- In **2015 Romania reported only seven confirmed cases** of measles and no deaths. Measles vaccination coverage has gradually declined from a high of 98% in 2000 - 2002, to 86% in 2016. Officials report that there is no shortage of MMR vaccine in the country.
- GDDOC will **continue to follow** this outbreak and report updates as they become available.

GDDOC Daily Map

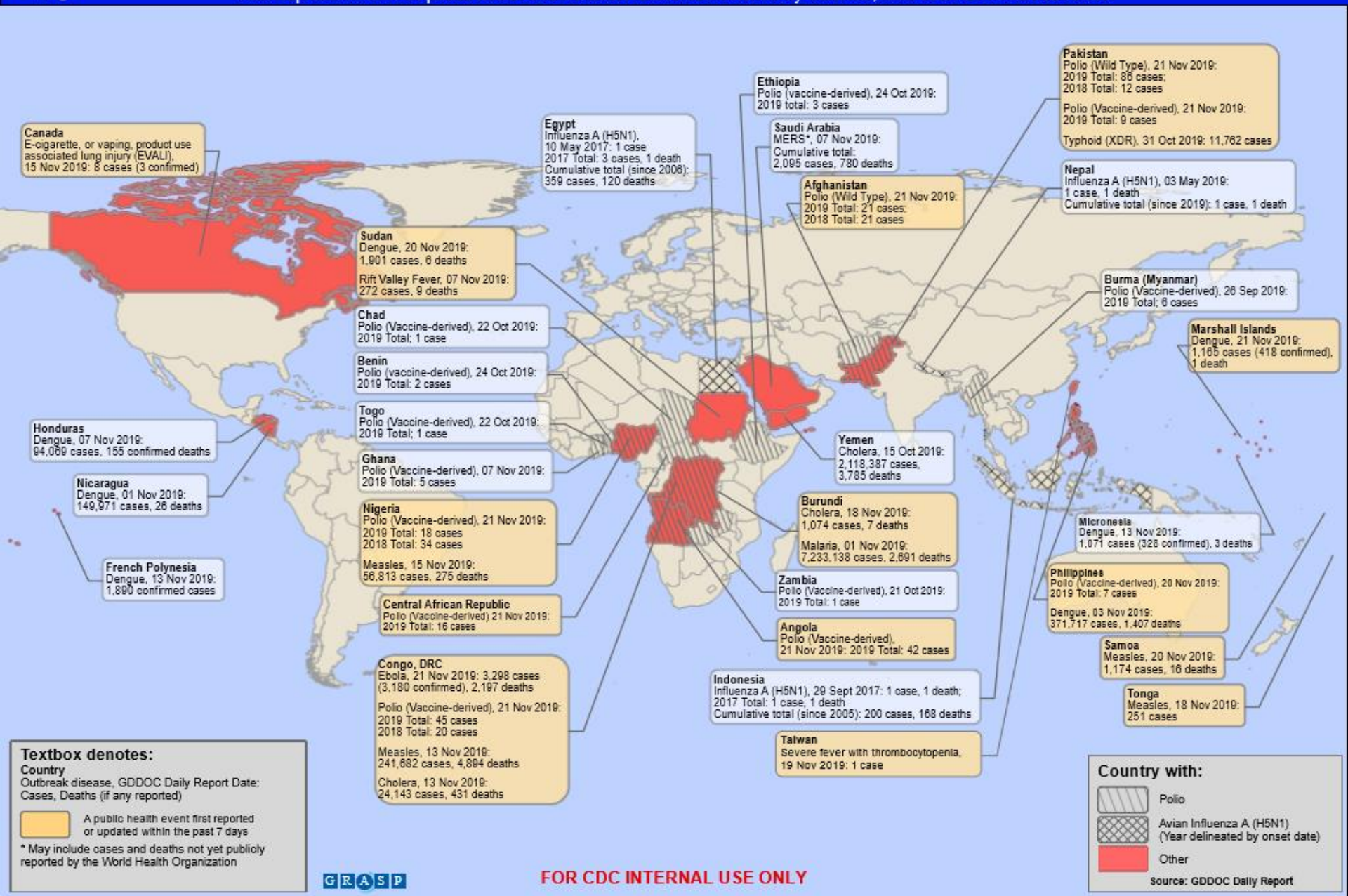
- **What**
  - Global Map depicting active (verified) events under surveillance, depicting:
    - Country (location)
    - Disease
    - Date of (most current) Report
    - Epidemiologic info (counts)
    - Events reported in past 7 days
  - Tangible product of Global Disease Detection Operations Center (GDDOC), Event Based Surveillance (EBS)

Global Disease Detection Operations Center (GDDOC)

Public Health Events of International Importance Under Surveillance

22 November 2019

The map shows verified public health events under active surveillance by GDDOC; data as of 21 November 2019



GRASP

FOR CDC INTERNAL USE ONLY

GDDOC Daily Map

- **Why**
  - Analyst tool
  - Communication tool (internal to CDC)
  - Public relations tool (presentations by leadership, SMEs, etc)
  - On screen, pictorial / cartographic depiction of our work
- **Who / How**
  - Analysts compile daily list of data
  - GIS experts create daily map
  - Recipients include:
    - Program SMEs
    - CDC leadership
    - Select HHS leaders

COMMUNICATIONS PROCEDURES

Information sharing for Early Warning and Response (EWAR)

The information collected and analyzed for EWAR must be shared with key partners

Who needs to know?

Who needs to act?

Why is the information important to share?

An SME list for should be developed and routinely updated for disease-specific POCs

- The EBS Unit should ask partners across sectors and levels to identify technical resource persons who will serve as main points of contact for EWAR on a 24/7 basis

Name of designated office	Name of responsible individual	Email address Phone numbers Fax numbers

Information collected by EWAR should be systematically classified by type of access

Confidential

- Shared only within EWAR organization

Restricted

- Shared with national and state/provincial partners

Public

- Shared with everybody

Various tools may be used to share information with the team, partners, and the public

Examples of communications support include:

Outbreak tracking list

- EWAR staff
- Short list summarizing ongoing events
- Daily
- Electronic list

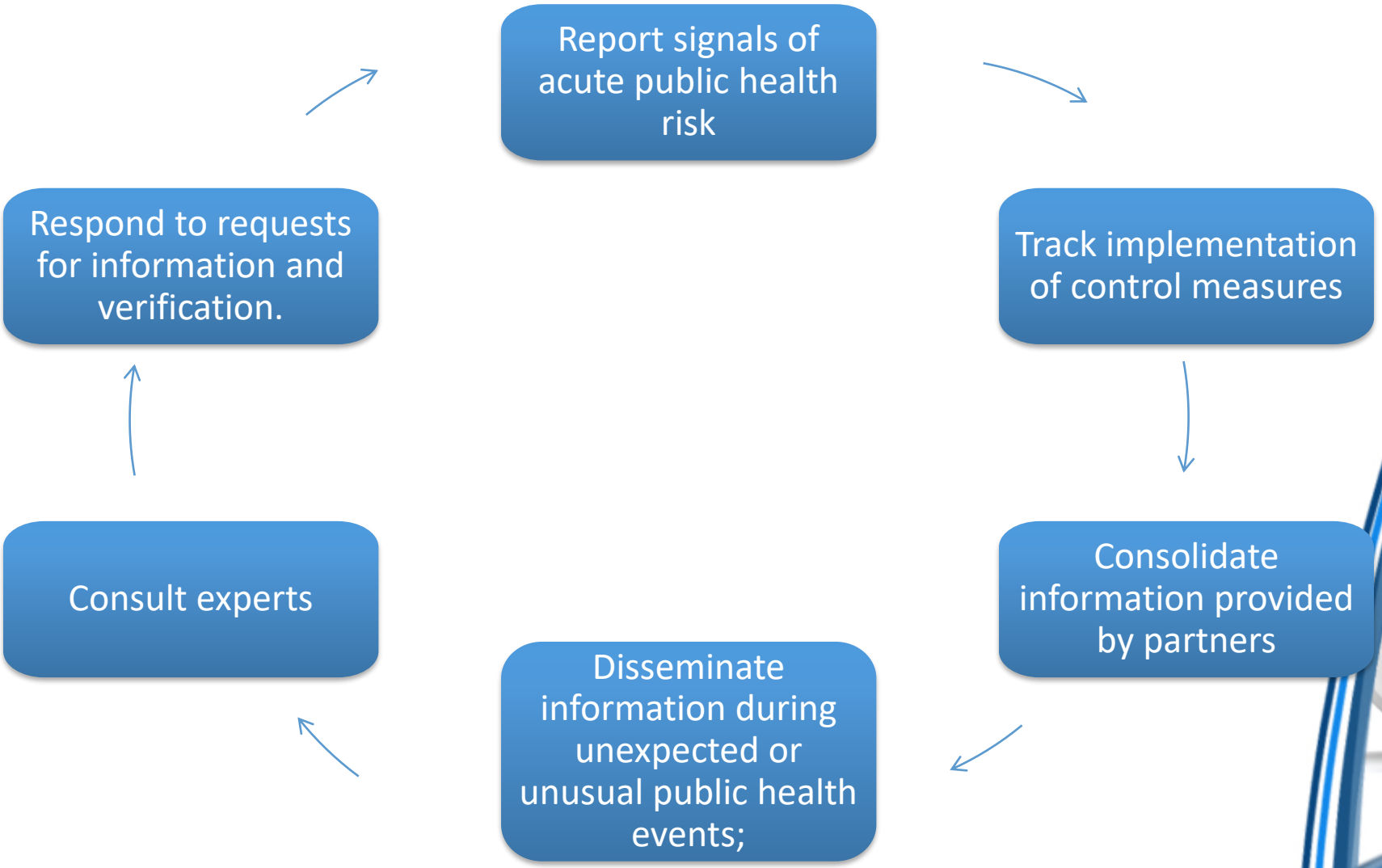
Newsletter

- Partners
- Update on ongoing events and international alerts of concern
- Weekly
- Brief summaries

Bulletin

- Surveillance stakeholders, policy makers, international partners
- Reviews of events and responses
- Quarterly
- Electronic/web-based

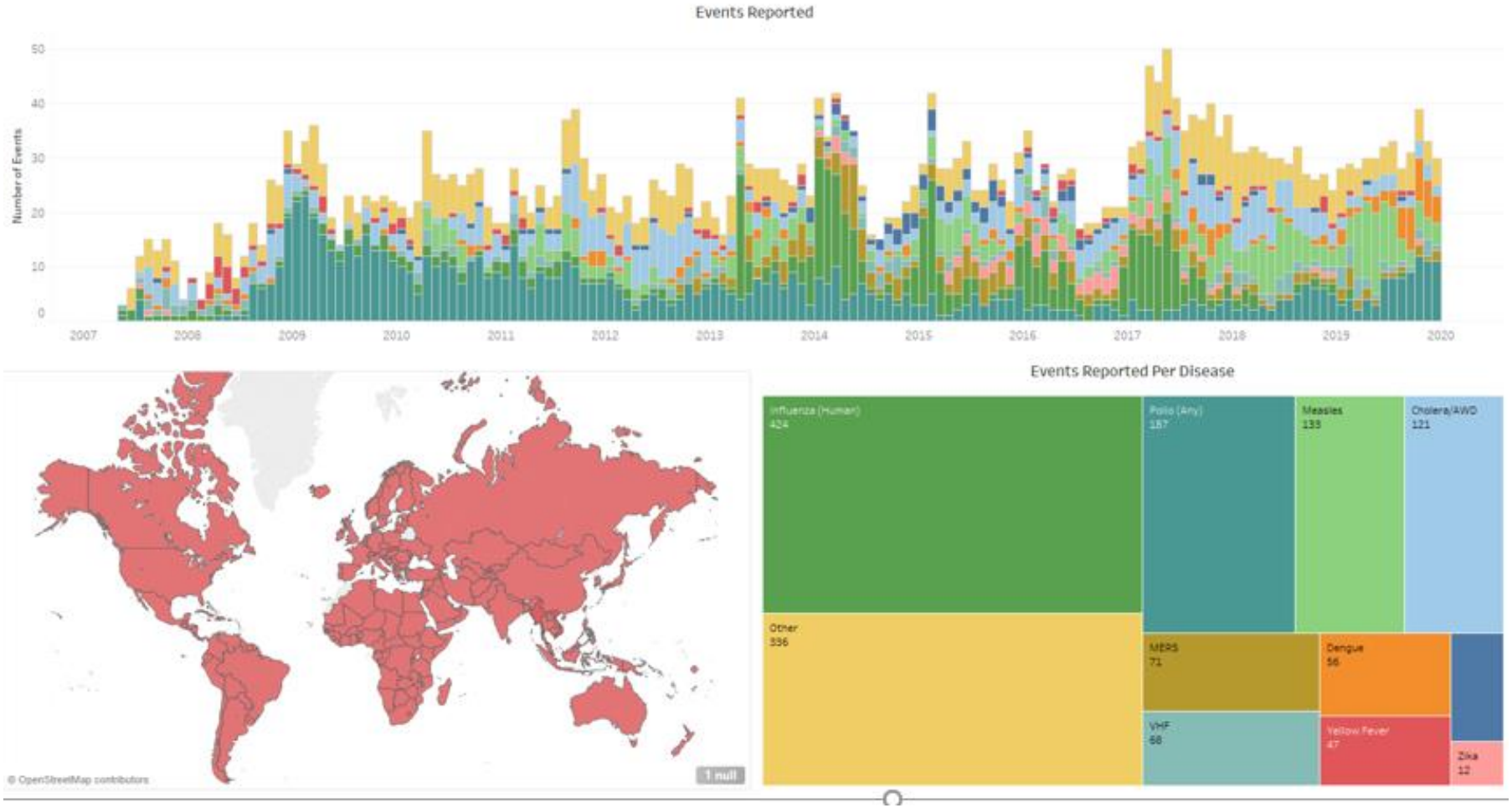
Established channels are used for bidirectional communications with partners



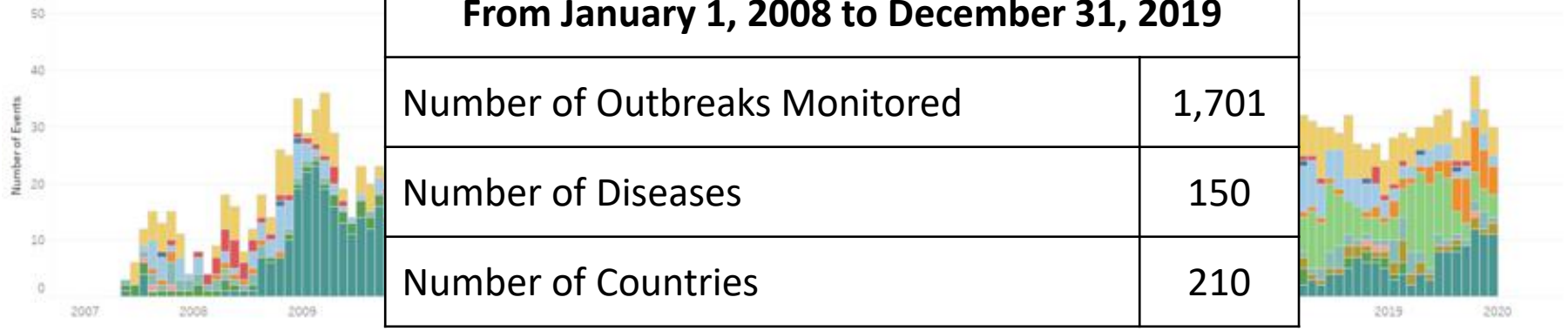
Business Intelligence (BI) tools to assess EBS performance

- Business intelligence (BI) loosely refers to tools that retrieve, analyze, and transform data into meaningful information that helps businesses make more intelligent decisions.
- BI tools cover a range of technologies
  - Tableau
  - Microsoft Power BI
  - Others

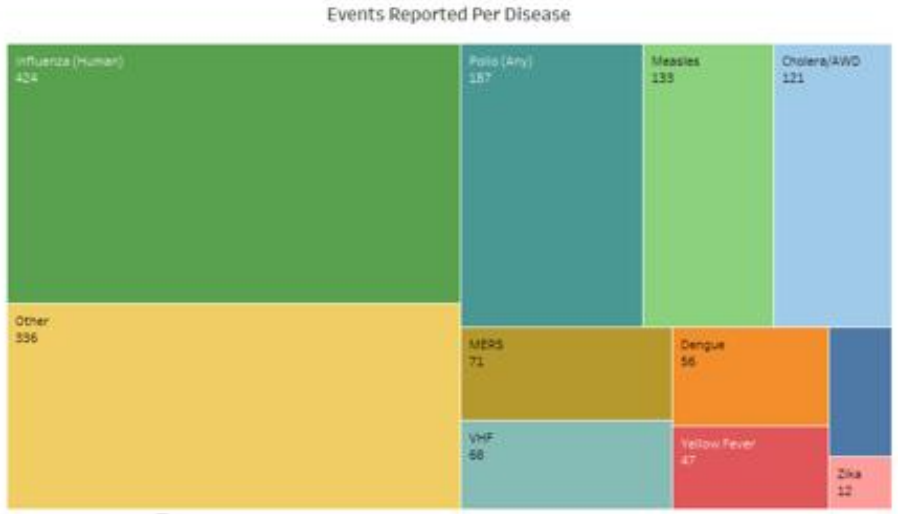
From January 1, 2008 to December 31, 2019, the GDDOC monitored **1,701 outbreaks** of **150 diseases** in **210 countries**



US CDC GDD Operations Center outbreaks monitored



From January 1, 2008 to December 31, 2019	
Number of Outbreaks Monitored	1,701
Number of Diseases	150
Number of Countries	210



Using your data!

Retrospective analyses of an EBS program

Health Security
Volume 15, Number 5, 2017 Mary Ann Liebert, Inc.
DOI: 10.1089/hs.2017.0004

What We Are Watching—Top Global Infectious Disease Threats, 2013-2016: An Update from CDC's Global Disease Detection Operations Center

Kira A. Christian, A. Danielle Iuliano, Timothy M. Uyeki, Eric D. Mintz, Stuart T. Nichol, Pierre Rollin, J. Erin Staples, and Ray R. Arthur

Thank you!

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