Surveillance in humanitarian settings

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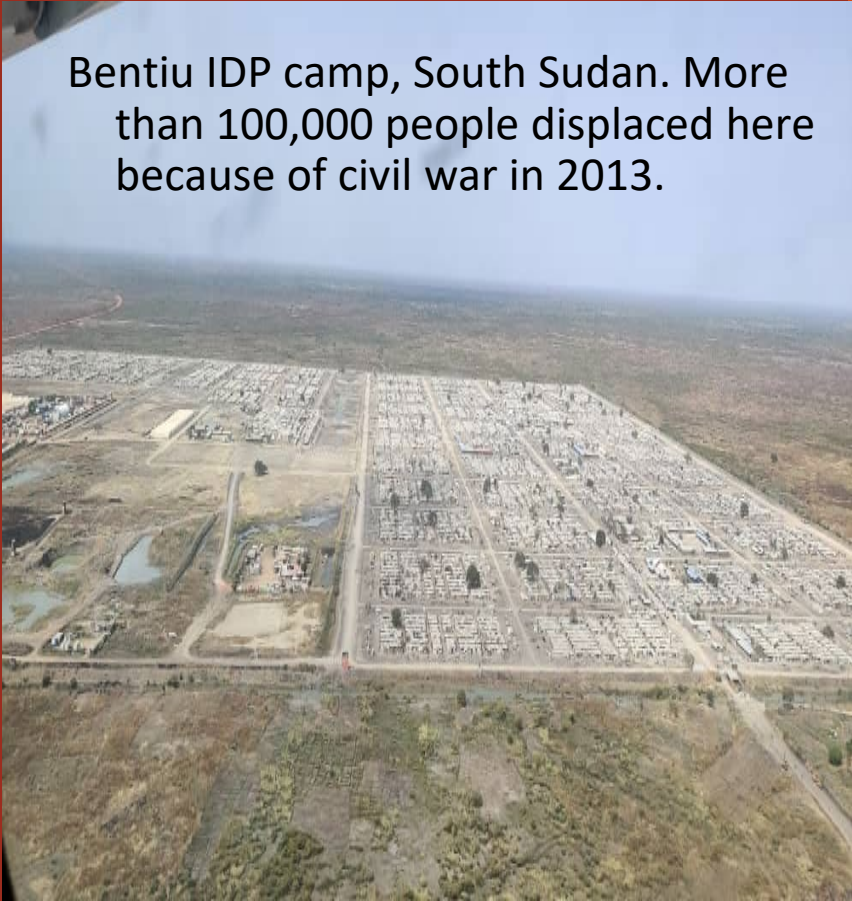
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(Based on previous presentations by Elburg van Boetzelaer, with small changes)

MEDECINS SANS FRONTIERES

I have humanitarian situation here. I am the field epi/epidemiologist. What shall I do?

Bentiu IDP camp, South Sudan. More than 100,000 people displaced here because of civil war in 2013.

Questions to park for later discussion

- ❖ Do I need to implement a surveillance system? I don't know.
  - ■ Do I need to understand the context in detail and know what others are doing ? Y/N
  - ■ Is there a duplication or is there any other system? Does the need for surveillance still stand? and why?

- ❖ If yes, What type of surveillance do I need for this humanitarian setting. I don't know.
  - ■ Let me see what would better work here? EBS/CBS/FBS/ new innovations??

- ❖ What about the resources I have?
  - ■ HR/transportation/response needed and capacity

- ❖ Do I need to collaborate with other actors? With who? Shall I engage with them and make collaboration? Do I need agreement?

- ❖ What am I going to do with the data I collect?
  - ■ How am I going to use it?
  - ■ What is the public health importance?
  - ■ What action is feasible?
  - ■ How am I going to respond?

- ❖ How would I know if I have the best surveillance system?

- ❖ How would I measure the outcome/impact of the surveillance system?

- ❖ Do I need to disseminate the results?

- ❖ Do I need to provide feed backs?

Objectives of this session

After this session you should be able to:

- Describe the importance of public health surveillance

- Describe the aims of public health surveillance in general

- Define the public health impact of a problem

- Define and describe different types of surveillance

- Define case definitions for surveillance

Definition of surveillance

"The **systematic ongoing collection**, collation and **analysis** of data for public health purposes and the timely **dissemination** of public health **information** for **assessment** and **public health response** as necessary."

-World Health Assembly 2005

But, what is humanitarian setting?

?Refugees who have displaced from an other country

?Massive internal displacement

?Population in war affected areas
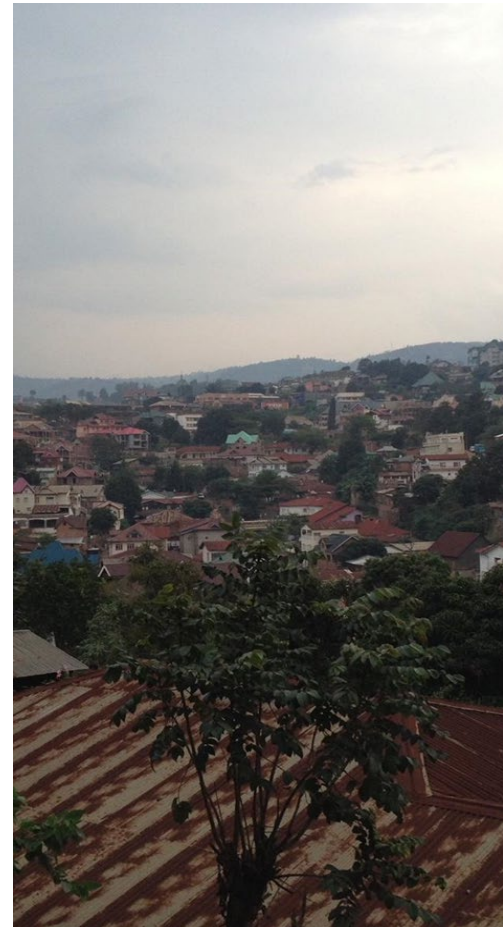
?Natural disasters

?Extreme poverty

?Combination of the above

?Detention centers

An area where the population needs humanitarian support!!

Unfortunately most of the humanitarian situations in the world are due to unstable political situations.

Purpose & importance of surveillance in humanitarian settings

Purpose

1. Detect: What is the problem?
2. Monitor: Is the problem changing over time?
3. Respond: What type of response is needed.

Importance

- Overcrowded settings
- Limited access to nutrition
- Poor water & sanitation
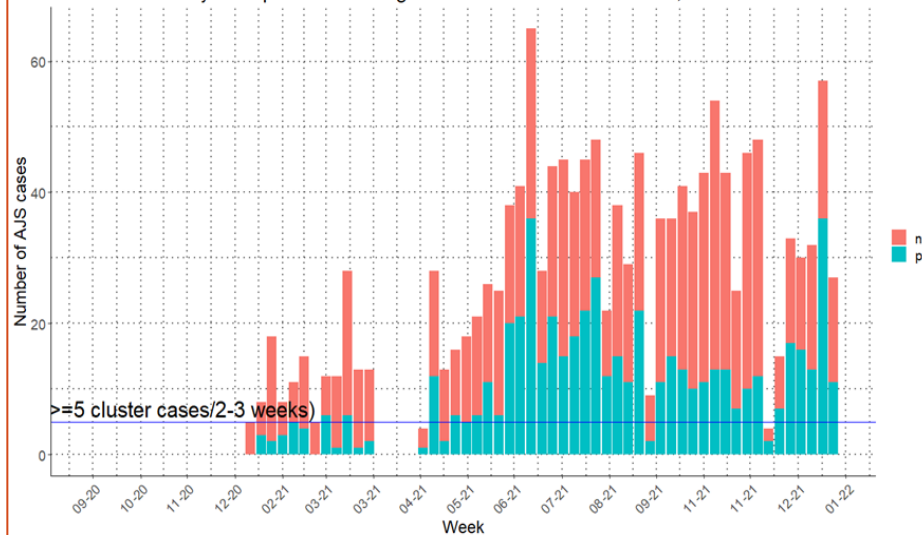- Limited access to health services
- Low vaccination coverage

Surveillance aim 1: Detect

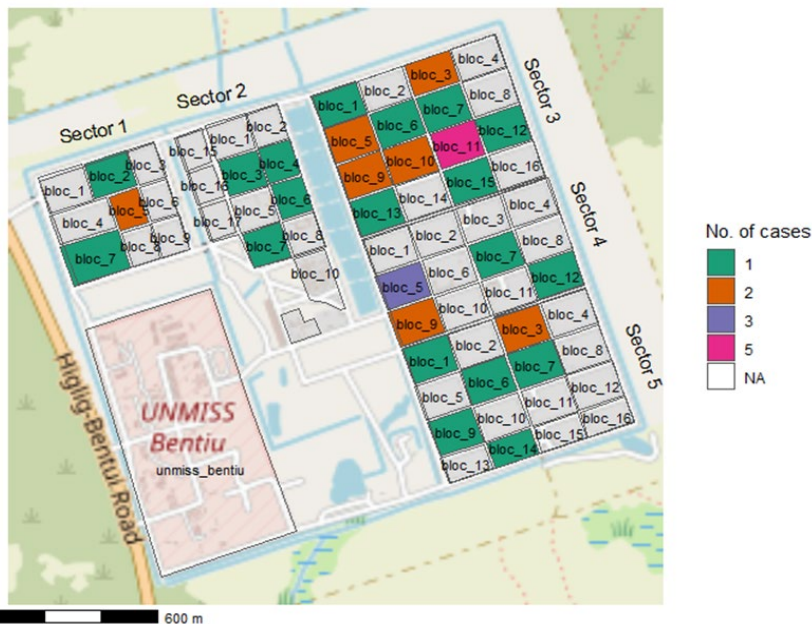**1. What is the problem?**

- Nature: Describe causative agent or syndrome
  - Clinical/severity
  - Typing, resistance

- Extent: Total burden and pattern of distribution in cases
  - Person: age, sex
  - Place: geographical

Number of weekly RDT positive and negative AJS cases in Bentiu PoC, 2019-2022

AJS cases in Bentiu PoC in the last 21 days, 2022

Source: MSF data from 2022 W02 to 2022 W04

Surveillance aim 2: Monitor

2. Monitor: Is the problem changing over time?

- Early warning system: Outbreak detection (more than expected)

- Longer-term time trends

- Geographical spread

- Changes in distribution (age, sex, exposures)

- Changes in pathogen (strain, resistance, severity)

- Decrease in incidence - effective prevention/control measures?

Surveillance aim 3:   Respond

❖ The main reason we collect data is for some action.

❖ Action could be of different forms:
- Physical response (WatSan, health promotion, …)
- Advocacy to other actors (Specially when the problem is acute and beyond the existing capacity)
- Change in systems

Setting up surveillance in humanitarian settings

- In most of the humanitarian settings, there are many actors doing different activities and a pile of data collection or parallel system that captures almost every thing.
        => Avoid duplication as much as possible.

- Sometimes there might be some systems looking in to specific thing that needs to be complemented.

- No gold standard design

- Context-specific

Setting up surveillance: Yes or No?

1. What is the public health importance of the problem?

2. Is the problem amenable to public health action?

3. Is it feasible to take public health action on the data?

What is the public health importance of the problem/system?

- Measures of frequency
- Measures of severity
- Disparities or inequities
- International or national prioritization
- Public health importance
- Costs
- Public concerns
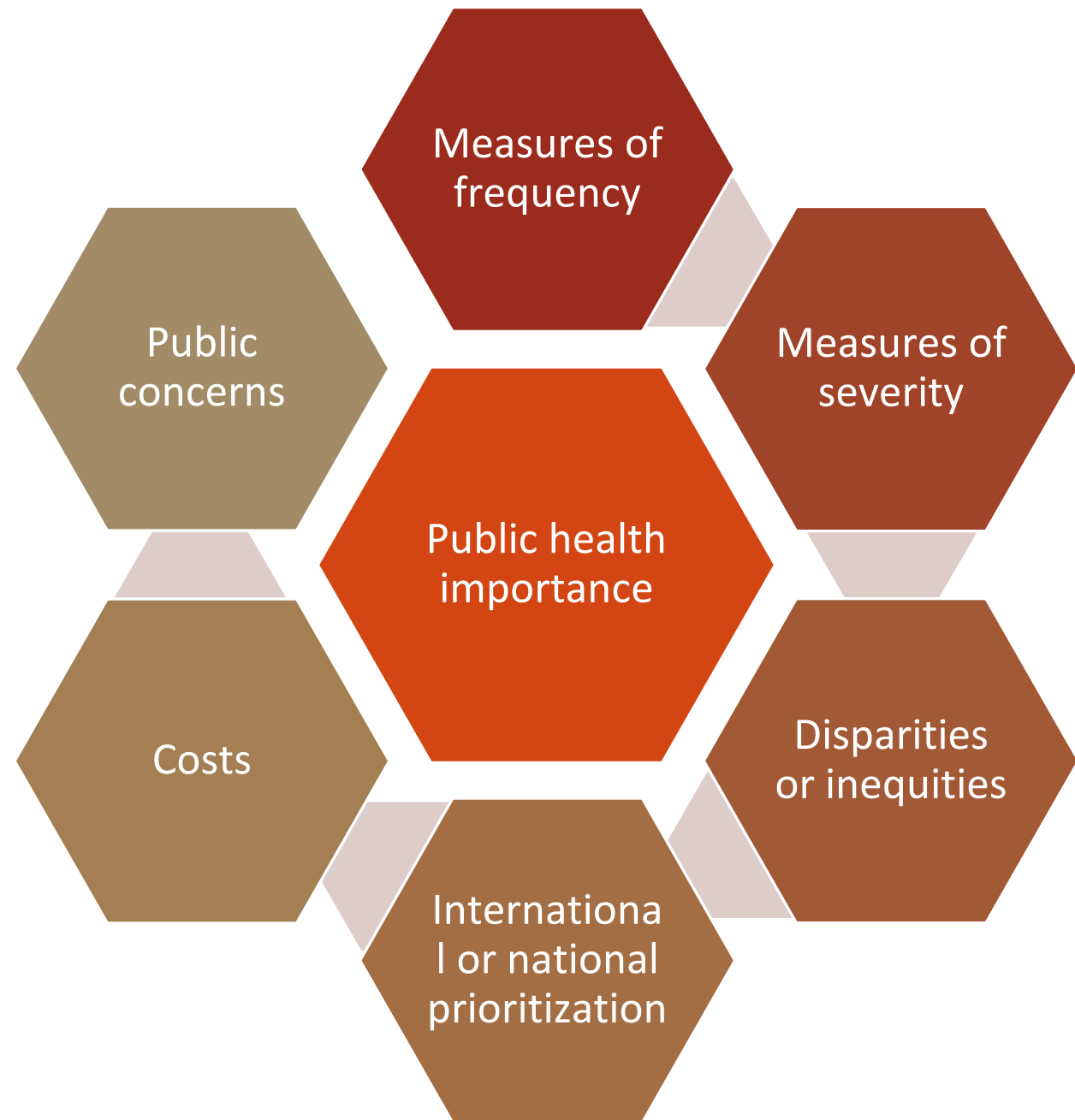
"Public health action"??

- Vague term
- Context-specific
- Could include:
  - Outbreak control:
    - Control measures for individual cases
    - Population level prevention and control measures
  - Targeted health services
  - Policy and guidance
  - More in-depth case investigations or research

Types of surveillance

Community-based *vs* Facility-based

Indicator-based *vs* Event-based

Passive *vs* Active

Exhaustive *vs* Sentinel

Syndromic *vs* Case-based

Community-based *vs* Facility-based

COMMUNITY BASED SURVEILLANCE

- Surveillance data collected at community level
- Typically by community members
- "Community" case definitions
- Typically supplements (not replace) facility-based surveillance
- Linkage to health care facilities crucial
- Can be resource intensive
- More sensitive, less specific
- Early warning/outbreak detection at community level
- Especially useful in populations with limited access to health care facilities

FACILITY BASED SURVEILLANCE

- Surveillance data collected at health facility level
- By health care providers
- "Traditional" case definitions
- Less resource intensive
- Part of routine data collection and reporting
- Less sensitive, more specific
- May not capture outbreaks early on
- May fail to detect community cases that do not seek healthcare

Indicator-based *vs* Event-based

INDICATOR-BASED SURVEILLANCE

- Specific diseases or health events using case definitions
- Reporting of individual cases
- Formal sources of reporting
  - Health care providers
- Structured and standardized data collection
- Less sensitive, more specific
- Easier to quantify detection and trends

EVENT-BASED SURVEILLANCE

- Broader formulated events that are a public health risk
- Reporting of clusters/symptoms/death
- Informal & formal sources of reporting
  - Community members, media, health providers
- Needs verification to assess true public health risk and response
- More sensitive, less specific
- Good for early warning of potential health events that warrant timely action

Passive *vs* Active

PASSIVE SURVEILLANCE

- The data comes to you
- Surveillance part of routine reporting
- For example from hospitals, laboratories
- Event-based surveillance (only contact me if event X, Y, Z occurs)
- Less resource intensive
- Risk of missing cases or events (except in a string EBS)

ACTIVE SURVEILLANCE

- Data actively sought
- Data collection specially set up
- Example: from hospitals, community based surveillance
- Weekly phone calls, meetings, home visits
- Can be resource-intensive
- Less risk of missing cases (Depending how much resource you have)

Exhaustive *vs* Sentinel

EXHAUSTIVE SURVEILLANCE

- Includes **all:**
  - Health facilities or health care providers (facility based surveillance
  - Laboratories (lab based surveillance)
  - Households (community based surveillance)

- Severe diseases

- Lower frequency diseases

- Can be resource intensive

- More generalizable

- Less risk of missing cases

SENTINEL SURVEILLANCE

- Includes **selected:**
  - Health facilities or health care providers (facility based surveillance
  - Laboratories (lab based surveillance)
  - Households (community based surveillance)

- Less-severe diseases

- High frequency diseases

- Less resource intensive

- Less generalizable

- Risk of missing cases

Syndromic *vs* Case-based

SYNDROMIC SURVEILLANCE

- Case definitions based on clinical features without any clinical or laboratory diagnosis

- For early detection

- Based on existing activity data, real-time collection, analysis and interpretation of data

- For example: number of cases of diarrhea as a proxy for cholera, or "rash illness" as a proxy for measles or Acute Jaundice syndrome (For hep E), Syndromic STI Surveillance

- More sensitive, less specific

CASE-BASED SURVEILLANCE

- Case definitions based on clinical or laboratory diagnosis

- Specific indicators, targets a defined health-related event

- For example: meningitis, measles, tuberculosis

- Less sensitive, more specific

Common existing surveillance tools

International

Covid-19 tracker dashboard

National level

- IDSR/EWARN reporting (widely used specially in resource limited countries)

- National nutrition and food security monitoring (Many countries)

Case classification pyramid

Confirmed cases

Probable cases

Suspected cases

Population at risk
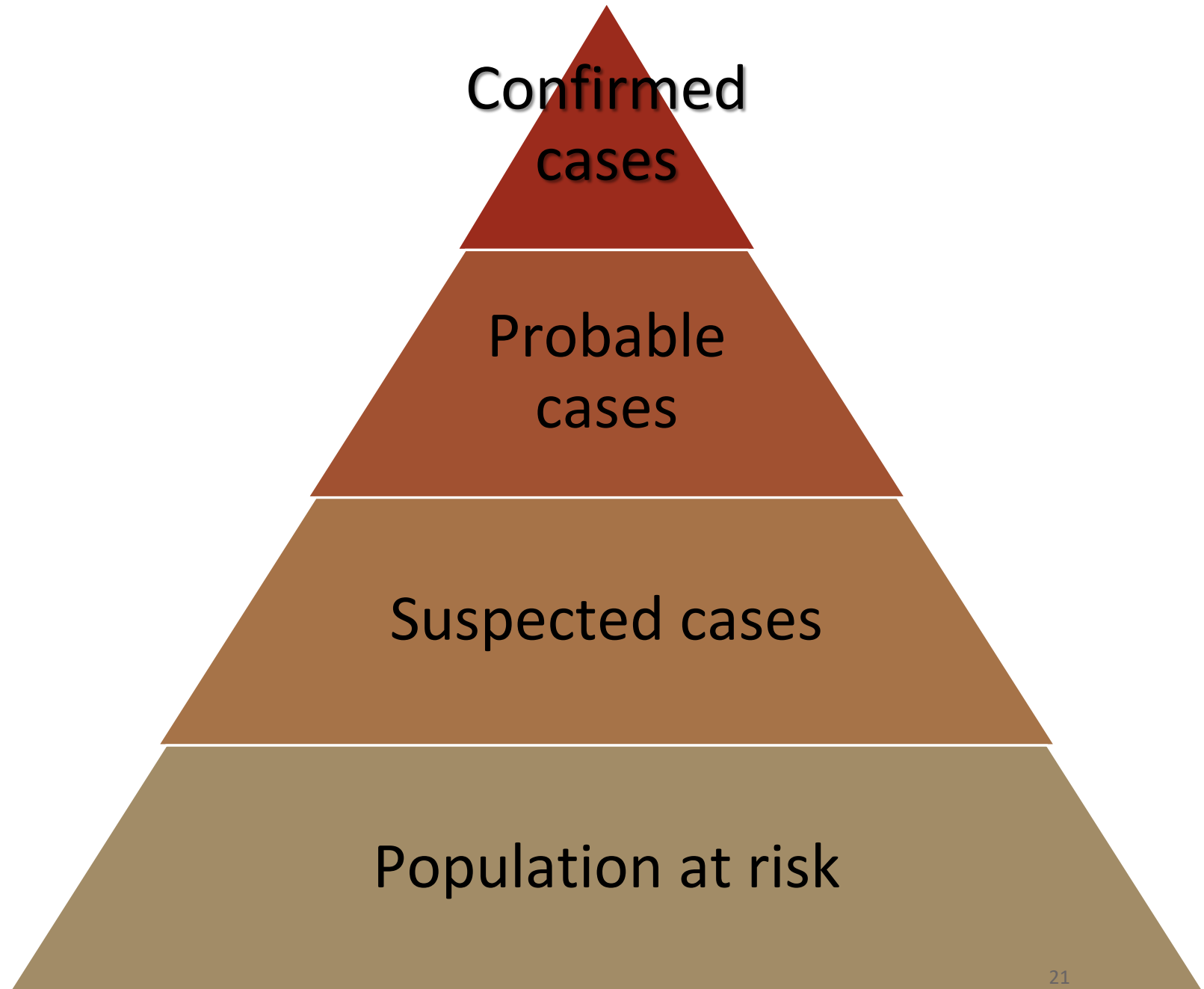
Surveillance case definitions

- Facility based surveillance cases definitions

- Community case definitions

- A set of uniform criteria used to define a disease, health event or condition for public health surveillance

- Enable public health officials to classify and count cases consistently across reporting jurisdictions and over time

- Consistency is more important than complete accuracy

- Not a clinical definition

- For infectious and non-infectious conditions

Requirements for case definitions

- Clearly defined

- Simple and appropriate to the situation

- Stable over time*

- May need to be categorised by the level of certainty: confirmed, probable or possible

- Must balance competing needs for sensitivity and specificity

Components of surveillance case definitions

- Person ➡ Who?

- Place ➡ Where?

- Time ➡ When?

- Clinical and/or laboratory criteria ➡ What?

  Sources of case definitions:

- National Ministry of Health

- WHO

- NGOs – MSF, IFRC

Example surveillance case definitions: Meningitis

ROUTINE HEALTH FACILITY SURVEILLANCE

- Any child aged 0-59 months admitted to a sentinel hospital conducting surveillance with sudden onset of fever (> 38.5 °C rectal or 38.0 °C axillary) and one of the following signs: neck stiffness, altered consciousness with no other alternative diagnosis, or other meningeal sign

Or

- Every patient aged under 5 years of age hospitalized with a clinical diagnosis of meningitis

COMMUNITY BASED SURVEILLANCE

- A case with fever and a strong headache and a stiff neck

During an outbreak: more specific case definition, to include:
- Time
- Place
- Person

Data collection

Versus

Collaboration and feedbacks

Cholera cases investigation Cox's Bazar

Hep E response in SSD

- Usually public health events are controlled by multiple interventions.

- Those interventions are specialties or responsibilities of different actors.

- Proper engagement is needed
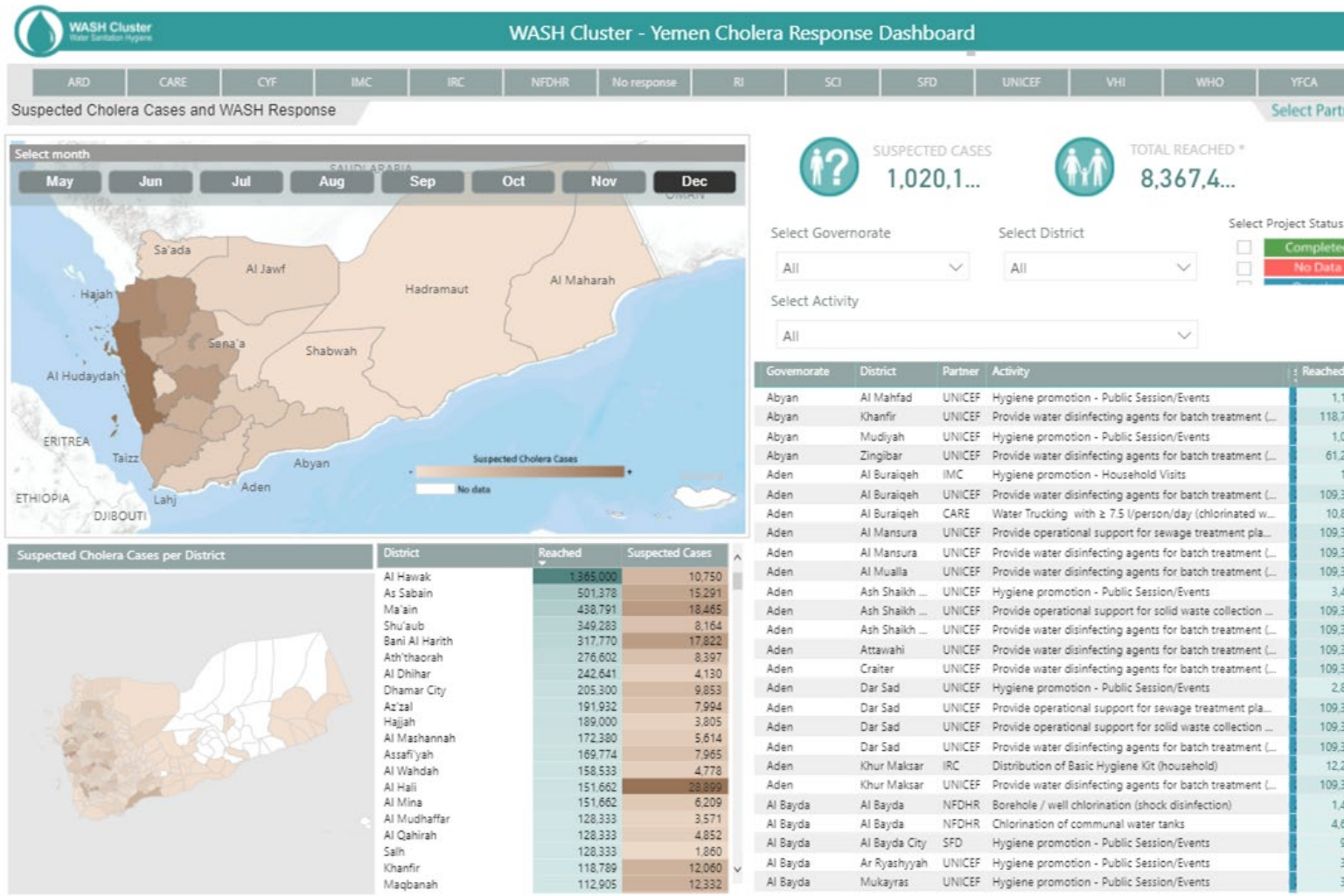
Dissemination

- Indicators (with targets/alert thresholds)

- Tables/Graphs

- Data sharing with MoH/NGOs

- Daily/weekly/monthly epi bulletins

- Annual reports

- Dashboards

Too often forgotten: communication with population under surveillance!

Performance evaluation of surveillance system

- Think about monitoring and evaluation of your surveillance system before you start implementing

- Surveillance system attributes to monitor:
  - Timeliness
  - Data quality
  - Stability
  - Flexibility
  - Acceptability
  - Simplicity
  - Representativeness
  - Sensitivity
  - Positive Predictive Value (PPV)

Example of community based surveillance: Cox's Bazar, Bangladesh

Cox's Bazar Mega Camp
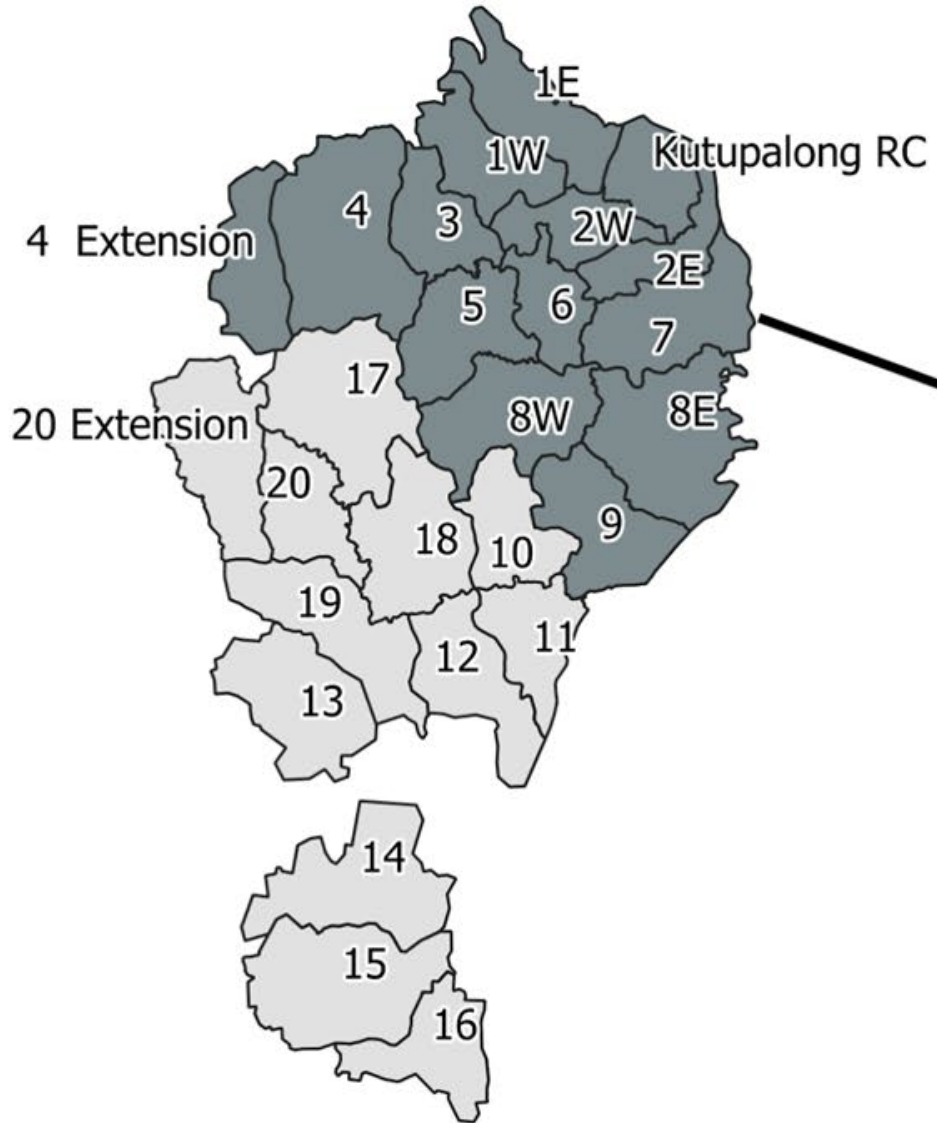
Community based surveillance in Cox's Bazar megacamp, Bangladesh

- Purpose of surveillance:
  - Early detect any outbreaks
  - Monitor population movement
  - Provide targeted health promotion visits

- Surveillance system:
  - Community based
  - Indicator based
  - Active
  - Exhaustive
  - Syndromic (community case definitions)

- Community based surveillance <u>supplemented</u> health facility surveillance

Community based surveillance in Cox's Bazar megacamp, Bangladesh

- Diseases under surveillance:
  - Acute watery diarrhea
  - Acute jaundice syndrome
  - Acute flaccid paralysis
  - Diphtheria
  - Measles
  - Meningitis

- Importance of clear and standardized case definitions

MSF-OCA – Epidemiological surveillance – BKL&KTP projects

Facility Based Surveillance
- Balukhali and Kutupalong clinics
- Line listing & immediate alert shared with epidemiologists:
  - *Suspected/probable/confirmed cholera & bloody diarrhea*
  - *AJS (Hepatitis A & E)*
  - *AFP*
  - *Diphtheria*
  - *Measles*
  - *Meningitis*

Community Based Surveillance (CBS)
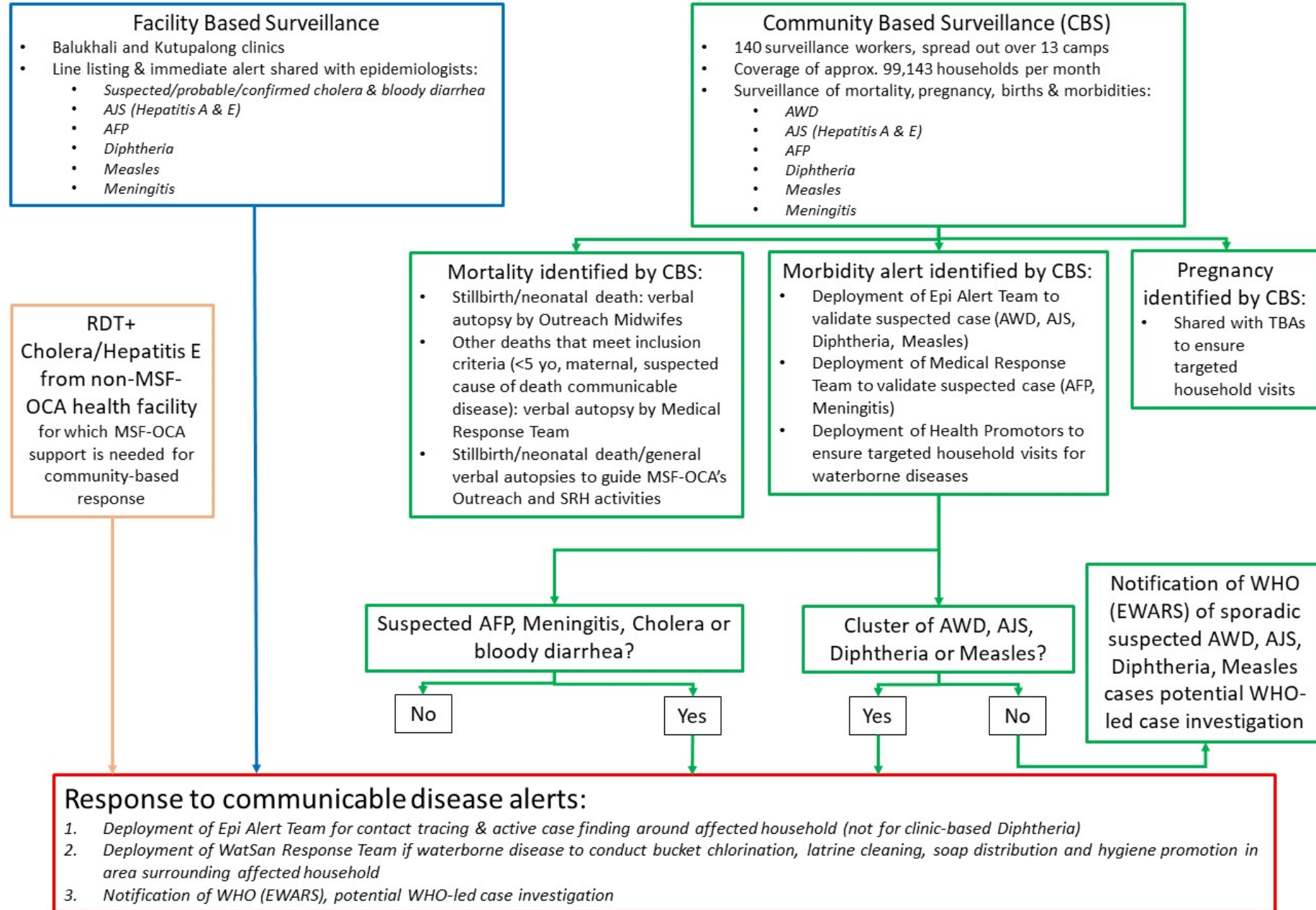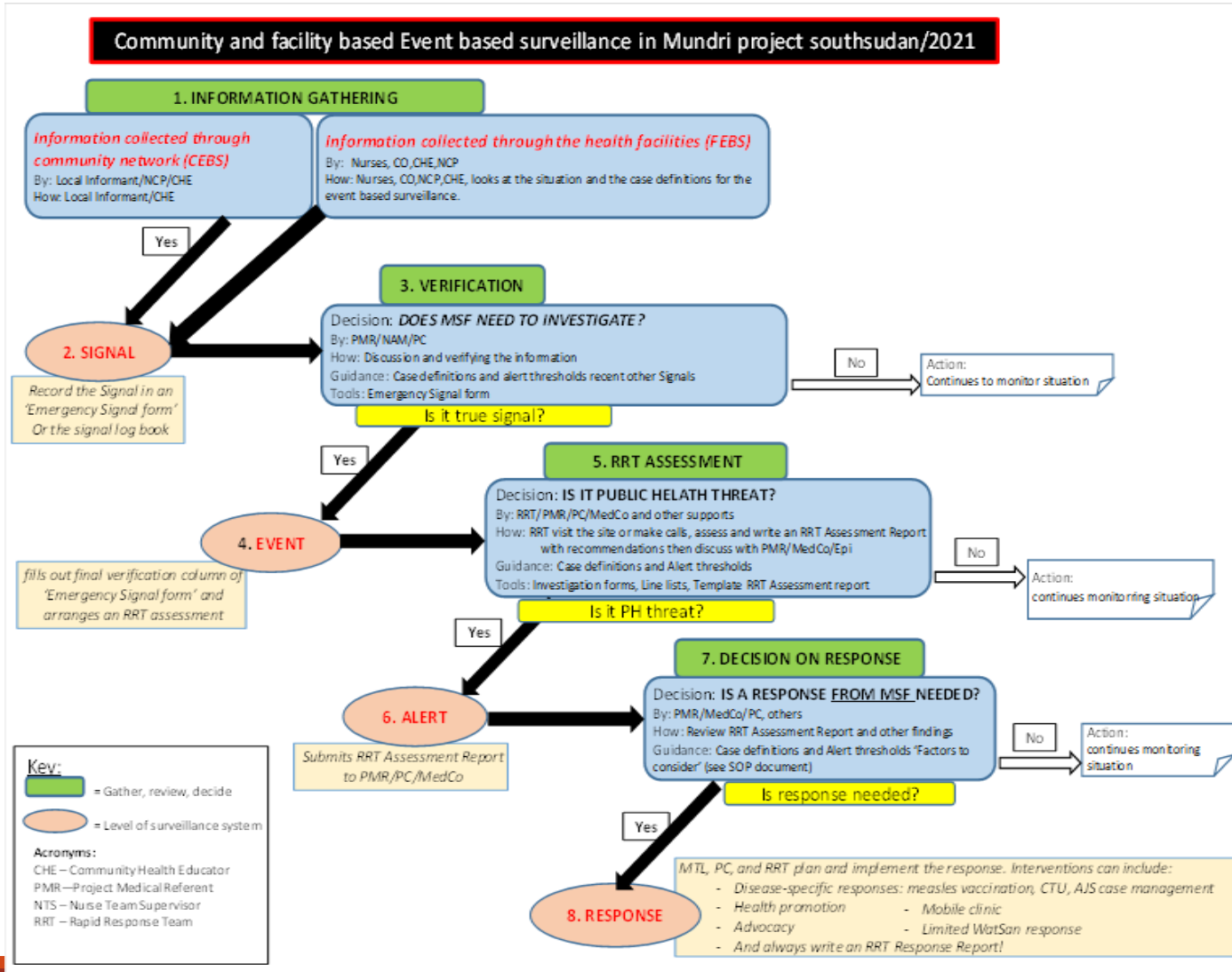- 140 surveillance workers, spread out over 13 camps
- Coverage of approx. 99,143 households per month
- Surveillance of mortality, pregnancy, births & morbidities:
  - *AWD*
  - *AJS (Hepatitis A & E)*
  - *AFP*
  - *Diphtheria*
  - *Measles*
  - *Meningitis*

RDT+ Cholera/Hepatitis E from non-MSF-OCA health facility
for which MSF-OCA support is needed for community-based response

Mortality identified by CBS:
- Stillbirth/neonatal death: verbal autopsy by Outreach Midwifes
- Other deaths that meet inclusion criteria (<5 yo, maternal, suspected cause of death communicable disease): verbal autopsy by Medical Response Team
- Stillbirth/neonatal death/general verbal autopsies to guide MSF-OCA's Outreach and SRH activities

Morbidity alert identified by CBS:
- Deployment of Epi Alert Team to validate suspected case (AWD, AJS, Diphtheria, Measles)
- Deployment of Medical Response Team to validate suspected case (AFP, Meningitis)
- Deployment of Health Promotors to ensure targeted household visits for waterborne diseases

Pregnancy identified by CBS:
- Shared with TBAs to ensure targeted household visits

Suspected AFP, Meningitis, Cholera or bloody diarrhea?
- No
- Yes

Cluster of AWD, AJS, Diphtheria or Measles?
- Yes
- No

Notification of WHO (EWARS) of sporadic suspected AWD, AJS, Diphtheria, Measles cases potential WHO-led case investigation

Response to communicable disease alerts:
1. *Deployment of Epi Alert Team for contact tracing & active case finding around affected household (not for clinic-based Diphtheria)*
2. *Deployment of WatSan Response Team if waterborne disease to conduct bucket chlorination, latrine cleaning, soap distribution and hygiene promotion in area surrounding affected household*
3. *Notification of WHO (EWARS), potential WHO-led case investigation*

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Event based surveillance in South sudan

Ethically sensitive data collection??

? Verbal Autopsy

Main take aways

- Data for public health action:
  - If it is not actionable: do **not** collect it!

- Set clear aims and objectives of system
  - Why are you implementing it?

- Know what event you are counting
  - What is your case definition?

- What questions are you asking of data
  - How are you going to analyze your data and report it?

- Know what you will do with the answers
  - How will your data translate into action?

- Prioritize the monitoring and evaluation of the performance of your surveillance system

References

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