Surveillance/EWARN in Emergencies

Disease Control in Humanitarian Emergencies (DCE)
Department of Epidemic & Pandemic Alert and Response (EPR)

World Health Organization
Definition

“Surveillance is the ongoing systematic collection, collation, analysis and interpretation of data, and dissemination of information to those who need to know in order that action may be taken”
PH surveillance in emergencies

- As soon as possible
- Only principal health problems during emergency phase
- Limit to PH matters which can and will be acted upon
- Keep simple and flexible to respond to new health problems
- Keep data analysis at level where action occurs (field)
## Methods of data collection – where does surveillance fit

<table>
<thead>
<tr>
<th>Objective</th>
<th>Assessment</th>
<th>Survey</th>
<th>Surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid appraisal</td>
<td>Medium-term appraisal</td>
<td>Continuous appraisal</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Assessment</th>
<th>Survey</th>
<th>Surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualitative</td>
<td>Quantitative</td>
<td>Quantitative</td>
<td>Longitudinal trends</td>
</tr>
<tr>
<td>Cross sectional &quot;snapshot&quot;</td>
<td>Cross sectional &quot;snapshot&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method</th>
<th>Assessment</th>
<th>Survey</th>
<th>Surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observational</td>
<td>Sample with survey instrument</td>
<td>Periodic, standardized data collection</td>
<td></td>
</tr>
<tr>
<td>Secondary source</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Objectives of surveillance in emergencies

1. Early detection of outbreaks requiring action (EWARN)
2. Monitor health trends for appropriate PH action
3. Monitor programme performance
4. Monitor workload at health facilities to optimise allocation of resources
What are the components of an EWARN?

- List of diseases/events
- Case definitions
- Surveillance network
  - Which facilities collect data? Exhaustive vs. sentinel
- Reporting procedures
  - What is reported?; active vs. passive; frequency; data transmission
- Alert and epidemic thresholds
- Alert verification process
- Laboratory needs
- Analysis and feedback
- Outbreak preparedness
- Outbreak response

Early detection

Identification, confirmation

Rapid response
What are the components of an EWARN?

List of diseases/events

Case definitions

Surveillance network
  - Which facilities collect data? Exhaustive vs. sentinel

Reporting procedures
  - What is reported?; active vs. passive; frequency; data flow

Alert and epidemic thresholds

Alert verification process

Laboratory needs

Analysis and feedback
Group work 1

What diseases would you include in an EWARN...

● In Goma?

● After an earthquake in Afghanistan?

● In southern Somalia?
List of Diseases

- Based on risk assessment
- About 10-12
- Criteria related to present or potential health burden
  - Severe (High CFR)
  - Frequent (Many cases or high incidence)
  - Action / response possible
  - Available "reliable" data / information
  - E.g. Yes to acute diarrhoea, yes to meningitis, no to scabies
  - E.g. Yes to Acute Flaccid Paralysis (eradication programme)
- Register ONLY ONE (most important) diagnosis per patient
- Count only *new* cases not follow-ups
### E.g. Morbidity Surveillance Form - Darfur

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>0 - 4 yrs</th>
<th>5 yrs and above</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>males</td>
<td>females</td>
<td></td>
</tr>
<tr>
<td>Acute watery diarrhea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute bloody diarrhea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute respiratory infection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspected meninigits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute jaundice syndrome</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin disease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster unknown events</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injury/accident</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unexplained fever</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other/unknown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals by age and sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total &lt;5 yrs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The table provides a sample of diagnoses and their counts across different age groups and sexes.
MORBIDITY (DISEASE) Surveillance

Potential data sources

● Hospitals (inpatient)
● Health centres / clinics (outpatient)
● Community FPs
● Laboratory
● Other sources

Limitations

● Tip of iceberg
● Mobile populations
● Unknown /changing denominators
What are the components of an EWARN?

List of diseases/events

Case definitions

Surveillance network
  ● Which facilities collect data? Exhaustive vs. sentinel

Reporting procedures
  ● What is reported?; active vs. passive; frequency; data transmission

Alert and epidemic thresholds

Alert verification process

Laboratory needs

Analysis and feedback
Case definitions

Sensitivity versus specificity

● In crises, we want sensitivity above all
  – Better to have false alerts than to miss outbreaks or detect them late

● We don't want to measure the exact number of cases: all we want is to observe trends

Simple (i.e. reflects available diagnostic tools)

● Syndromic
  – EWARN case definitions are there to generate alerts: we can then come in with more specific, complicated tests to confirm or refute the alert

● Can have more than one level, e.g. suspected / probable / confirmed

Standardised

Harmonised with national routine case definitions if possible

● But not at any price!
We are in SS. What case definition will allow us to detect an outbreak of type 1 *Shigella dysenteriae* as soon as possible?

What case definition will allow us to confirm an outbreak of type 1 *S. dysenteriae*?
Group work 2

To detect an outbreak of type 1 *Shigella dysenteriae* as soon as possible?

- Diarrhoea with visible blood in the stools
  - Very sensitive, though nonspecific (bloody diarrhoea could be to non-epidemic shigella, amoebiasis, chronic conditions…)

To confirm an outbreak of type 1 *S. dysenteriae*?

- Diarrhoea with visible blood + positive stool culture
  - Very specific (if it's not really type 1 *S. dysenteriae*, we will almost always get a negative result)
## Keep case definitions simple

<table>
<thead>
<tr>
<th>Disease</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles</td>
<td>Fever + Rash + Cough <em>or</em> Runny nose <em>or</em> Conjunctivitis</td>
</tr>
<tr>
<td>Malaria</td>
<td>Fever in child under 5 yrs (in endemic areas)</td>
</tr>
<tr>
<td></td>
<td>Fever last 48 hours + positive lab test (adults)</td>
</tr>
<tr>
<td>Acute Watery Diarrhea</td>
<td>3 or more loose 4 stools in 24 hours, without blood</td>
</tr>
<tr>
<td>Lower Respiratory Infection</td>
<td>Cough or difficult breathing + fast breathing (x breaths/minute - dep.on age)</td>
</tr>
</tbody>
</table>

For other examples, refer to WHO case definitions
What are the components of an EWARN?

List of diseases
Case definitions

Surveillance network
- Which facilities collect data? Exhaustive vs. sentinel

Reporting procedures
- What is reported?; active vs. passive; frequency; data transmission

Alert and epidemic thresholds
Alert verification process
Laboratory needs
Analysis and feedback
Surveillance network

Any curative health facility
### Surveillance network

<table>
<thead>
<tr>
<th>Exhaustive</th>
<th>Sentinel</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All health facilities in the region participate</td>
<td>• Only a few selected health facilities (aim for good quality, geographic spread)</td>
</tr>
<tr>
<td>• More expensive</td>
<td>• Less expensive</td>
</tr>
<tr>
<td>• Higher requirements for supervision</td>
<td>• Sufficient to show trends</td>
</tr>
<tr>
<td></td>
<td>• May detect outbreaks late</td>
</tr>
</tbody>
</table>

Either way, don't include just hospitals or just remote health posts
Sentinel sites will show trends...
...but they may detect outbreaks late
Surveillance Network

In Banda Aceh, Indonesia (2005):

ACEH BARAT DAYA DHO
ACEH BARAT DHO
ACEH BESAR DHO
ACEH UTARA DHO
ANZAC FIELD HOSPITAL
ASSOC OF MED DR OF ASIA
BIDDOKES POLDA ACEH
CARE INTERNATIONAL
CHINA MEDICAL TEAM
CATHOLIC RELIEF SERVICE
CHINA INTS & RESCUE TEAM
DANISH EMERG MOB HOSP
EGV BERLIN OFFSHORE
ESTONIAN MEDICAL TEAM
FOOD FOR THE HUNGRY INTL
GERAKAN IBU PEDULI ACEH
GLOBAL CARE BANDA ACEH
GERMANY ARMED FORCES
GJAF JAPAN LAMARA CLINIC
GLOBAL RELIEF
HOLLAND HORIZON
HUMANITARIAN FIRST
INT OFFICE OF MIGRATION
INDO PLANNED PARENTHOOD

INDO DISASTER MED RESC C
INDONESIAN NATIONAL ARMY
INT COMMITTEE OF THE RC
INTERNATIONAL MED. CORPS
INTL COMITTEE RED CROSS
INT FED RED CROSS
ISLAMIC FOUND OF TORONTO
IRC NAGAN RAYA
IRC/CARDI
JESUIT REFUGEE SERVICE
JAPAN RESCUE TEAM
KOREAN EMERGENCY ASSOC
LHOKSEUMAWE DHO
MALAYSIAN RED CR SOCIETY
MALTESER GERMANY
MEDECINS DU MONDE FRANCE
MEDICOS DEL MUNDO SPAIN
MER-C INDONESIA
MERCY RELIEF SINGAPORE
MERCY RELIEF SINGAPORE OP
MERLIN
Mitra PEDULI
MSF BELGIUM
MSF FRANCE
MSF HOLLAND

MERCY MALAYSIA
MEXICAN GOVERNMENT
NORTH WEST MED TEAM
NORTHWEST MEDICAL ACT
OBOR BERKAT INDO A.BARAT
OPEN HAND
OUTP AND MOBILE CLINIC
PAN ECO SWISS MED TEAM
PANECO/YEC MEDICAL TEAM
PERDHAKI
PKBI
INDONESIAN RED CROSS SOC
PHILIPPINES MED TEAM
PORTUGUESE HOSPITAL
PROJECT CONCERN
INTERNATI
PROVINCIAL HEALTH OFFICE
PUB HEALTH KUTA BARO
PAN ECO SWISS MED TEAM
SPANISH COOPERATION
SAVE THE CHILDREN
SHEEP
TEAM ALBANIA
TDH ITALY
WALHI ACEH BARAT
YAKKUM EMERGENCY UNIT
YAYASAN SOSIAL KREASI
ZAINOEL ABIDIN GNRL HSPTL
Stakeholders in EWARN

MoH (National, Provincial, District levels)
- Coordination
- Data collection and data entry

WHO
- Coordination
- Data entry and analysis
- Presentation and dissemination of results

NGOs
- Data collection
- Communications
- Logistics
- Control measures
What are the components of an EWARN?

List of diseases
Case definitions
Surveillance network
  ● Which facilities collect data? Exhaustive vs. sentinel

Reporting procedures
  ● What is reported?; active vs. passive; frequency; data transmission

Alert and epidemic thresholds
Alert verification process
Laboratory needs
Analysis and feedback mechanisms
Reporting procedures

What should clinics report for each event?

- "Deaths"
- "Cases"
- "Cases by age group (0, 1-4y, 4-9y, 10-14y...), gender, village of origin, degree of severity (mild; moderate; severe; fatal) and treatment prescribed"

Keep it simple!

- If you're not going to analyse it, don't waste people's time
### A. Outpatient WEEKLY Surveillance Reporting Form

**Morbidity (disease) and Mortality (death)**

*Bring to Provincial MOH or to WHO Office every Monday*

<table>
<thead>
<tr>
<th>Aceh Province</th>
<th>District:</th>
<th>Sub district:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town/Village/Settlement/Camp:</td>
<td>……………………………………</td>
<td></td>
</tr>
<tr>
<td>Population size</td>
<td>&lt; 5 years</td>
<td>………………… &gt; = 5 years</td>
</tr>
<tr>
<td>Type of Health Facility:</td>
<td>Fixed,</td>
<td>Mobile with fixed catchments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobile with varying catchments</td>
</tr>
<tr>
<td>Supporting agency:</td>
<td>……………………………………</td>
<td></td>
</tr>
<tr>
<td>Name and telephone number of reporting officer:</td>
<td>……………………………………</td>
<td></td>
</tr>
</tbody>
</table>

**Week from Monday: _____/_____/2005 to Sunday_____/_____/2005**

<table>
<thead>
<tr>
<th>Report the number of CASES</th>
<th>MORBIDITY (cases)</th>
<th>MORTALITY (deaths)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;5 years</td>
<td>≥5 years</td>
</tr>
<tr>
<td>A TOTAL CONSULTATIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B TOTAL DEATHS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C Pregnancy related death</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D Neonatal deaths (&lt;28 days)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E Acute watery diarrhoea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Bloody diarrhoea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G Malaria conf by rapid test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H Other Fever &gt;38.5°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I Suspected Measles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J Acute respiratory infection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K Acute jaundice syndrome</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L Meningitis</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Write 0 (zero) if you had no case or death during the week for one of the syndrome listed in the form.
- Deaths might have occurred in the health facility or might have been reported from the community.
- Be careful to report only the deaths that occurred during the week.
- Deaths should be reported only in the mortality section, NOT in the morbidity section.

Case definitions for surveillance are presented on the back.

### B. OUTBREAK ALERT

At any time you suspect any of the following diseases, you should alert the Surveillance Coordination by sending an SMS or phone to 0813 1716 7865 (Indonesian) or 0813 1949 6754 (English), with maximum information on time, place and number of cases and deaths.

- Acute watery diarrhoea / Cholera
- Bloody diarrhoea
- Measles
- Increase in malaria
- Typhoid
- Tetanus
- Hepatitis
- Dengue fever
- Meningitis
EWARN Weekly Reporting Cycle

Health Center in Mossei Camp, South Darfur
Source: CDC
EWARN Reporting Area

Geographic Distribution of Participating Health Units
EWARN System, Greater Darfur, Sudan

as of 27 August 2004
Reporting procedures

Active versus passive

- **Active**: EWARN contacts facilities and gets data
  - **Active case finding** is something else: community health workers actually go out into the community to detect and count cases (only done for very severe epidemics)

- **Passive**: EWARN waits for clinic data

Frequency of data reporting

- Daily for severe epidemics
- Weekly otherwise
What are the components of an EWARN?

List of diseases
Case definitions
Surveillance network
  ● Which facilities collect data? Exhaustive vs. sentinel
Reporting procedures
  ● What is reported?; active vs. passive; frequency; data transmission

Alert and epidemic thresholds
Alert verification process
Laboratory needs
Analysis and feedback
Thresholds

- **Severity of situation** (CMR — 1/10000/day; <5 yrs — 2/10000/day)
- **Alarm systems (outbreaks)** (e.g. doubling of weekly incidence compared to weekly average of previous 2-3 weeks)
- **Detection of a case of potentially severe outbreak-prone disease** (cholera, meningitis, measles...
Alert and epidemic thresholds

Different quantitative options:

- **Absolute**
  - Alert = A cluster (e.g. >=5) of acute jaundice cases reported by the same facility
  - Epidemic = 1 case of measles / cholera in a camp
  - Epidemic = doubling of meningitis cases in a 3-week period in a population of <30 000 people

- **Incidence-based**
  - Epidemic = 15 meningitis cases per 100 000 people per week in a population of >=30 000 people

- **Statistical**
  - Malaria: incidence more than X standard deviations higher than the Y-yearly average...

Context-specific

- Rural settings not the same as crowded ones

The EWARN team *must* figure out whether thresholds are exceeded and is responsible for declaring epidemics

- We shouldn't wait for individual clinics to phone us up
What are the components of an EWARN?

- List of diseases
- Case definitions
- Surveillance network
  - Which facilities collect data? Exhaustive vs. sentinel
- Reporting procedures
  - What is reported?; active vs. passive; frequency; data transmission
- Alert and epidemic thresholds
- Alert verification process
- Laboratory needs
- Analysis and feedback
Group work 3

We are in southern Sudan. What should we do if we receive the following alerts?

- A clinic phones in with their data: last week they saw 19 cases of whooping cough (not included in the list of diseases).

- [An NGO phones up:] "Someone came into our OPD vomiting blood this morning. We are starting an Ebola information campaign in the community."

- [Your surveillance officer reports:] "The main hospital in Juba exceeded the alert threshold for acute watery diarrhoea last week, but most of the patients were adults."
Alert verification process

Standard operating procedures

● When to perform an on-site visit
● Maximum acceptable delay: e.g. < 3 days after alert is issued
● Who takes part in the visit

Typical activities:

● Review cases with clinicians
● Verify whether cases are clustered in time and space
● Visit households
● Examine patients
  – Take medical histories, look at vaccination records
  – Perform rapid tests
  – Collect blood / stool / CSF samples (e.g. on Cary-Blair medium for suspected diarrhoeal pathogens)
What are the components of an EWARN?

List of diseases
Case definitions
Surveillance network
  ● Which facilities collect data? Exhaustive vs. sentinel
Reporting procedures
  ● What is reported?; active vs. passive; frequency; data transmission
Alert and epidemic thresholds
Alert verification process
Laboratory needs
Analysis and feedback
Laboratory needs

This needs to be set up from the start, not as needs arise:

- Make sure specimen collection material and SOPs are in place locally
  - Cold chain
  - Shipment arrangements
- Might need to establish a small field laboratory capable of doing the most important tests (e.g. cholera, shigella, rotavirus, meningitis, YF, malaria...)
  - Or strengthen existing local labs
- Identify referral laboratories
  - Antibiotic susceptibility
  - Quality control
Laboratory needs

[Photos courtesy of Tim Healing]
What are the components of an EWARN?

- List of diseases
- Case definitions
- Surveillance network
  - Which facilities collect data? Exhaustive vs. sentinel
- Reporting procedures
  - What is reported?; active vs. passive; frequency; data transmission
- Alert and epidemic thresholds
- Alert verification process
- Laboratory needs
- Analysis and feedback
Data analysis & feedback

1. Analysis

- Gathering and aggregation of data
- Validation
- Data description according to time, place, population: tables, figures (templates)
- Calculation of indices: rates, ratios, percent...
- Looking for trends, crossing of thresholds

2. Feedback

- Presentation at coordination meetings, weekly bulletin
Validation

- Missing entries (zero cases or forgot to enter?)
- Unusually high numbers
- Proportional morbidities within expected range
- Cases of an event occurring for first time since reporting started
- Duplications
- Expected distribution for that community
Data description

1. Describe cases/deaths in terms of
   - Time
   - Place (location of health facility or catchment area)
   - Population (of catchment area)
   - Priorities
**Group work 4:**

**What conclusions can be drawn from this table?**

**What other information do you want to know?**

Cases and deaths of six major health events reported from 5 HOSPITALS (NO HEALTH CENTRES), 2 week period, southern Sudan 1997.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Cases</th>
<th>Deaths</th>
<th>CFR %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever/malaria</td>
<td>960</td>
<td>48</td>
<td>5%</td>
</tr>
<tr>
<td>ARI</td>
<td>720</td>
<td>108</td>
<td>15%</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>982</td>
<td>109</td>
<td>11%</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>181</td>
<td>98</td>
<td>54%</td>
</tr>
<tr>
<td>Anaemia</td>
<td>120</td>
<td>12</td>
<td>10%</td>
</tr>
<tr>
<td>Meningitis</td>
<td>7</td>
<td>4</td>
<td>57%</td>
</tr>
<tr>
<td>Measles</td>
<td>4</td>
<td>2</td>
<td>50%</td>
</tr>
<tr>
<td>Other</td>
<td>240</td>
<td>24</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2519</strong></td>
<td><strong>405</strong></td>
<td><strong>16%</strong></td>
</tr>
</tbody>
</table>
Answers group work 4

- Diarrhoea, Fever/malaria most common causes of admission then ARI.
- Diarrhoea, ARI and Malnutrition represent 78% of all registered deaths.
- The CFR of diarrhoea and malnutrition and are unusually high (severe forms or inadequate care?)
- Diarrhoea, measles and meningitis represent danger of extension. This information should be completed (trends, what kind of diarrhoea, meningitis, investigate measles cases …).

Useful additional information
- Population numbers
- Health centre data too
- Age distribution of cases and deaths
- Weekly data?
- Rates → trends over time
Group work 5:
What conclusions can be drawn from this table?
What other information do you want to know?

Hospital and health centre admissions from February 10, 1997 to 1 March 17, 1997

<table>
<thead>
<tr>
<th>Date</th>
<th>Fever/Malaria</th>
<th>Diarrhoea</th>
<th>ARI</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-Feb-97</td>
<td>450</td>
<td>152</td>
<td>350</td>
</tr>
<tr>
<td>17-Feb-97</td>
<td>530</td>
<td>178</td>
<td>398</td>
</tr>
<tr>
<td>24-Feb-97</td>
<td>448</td>
<td>141</td>
<td>379</td>
</tr>
<tr>
<td>03-Mar-97</td>
<td>368</td>
<td>234</td>
<td>450</td>
</tr>
<tr>
<td>10-Mar-97</td>
<td>512</td>
<td>325</td>
<td>495</td>
</tr>
<tr>
<td>17-Mar-97</td>
<td>483</td>
<td>542</td>
<td>575</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Pop</th>
</tr>
</thead>
<tbody>
<tr>
<td>07-Mar</td>
<td>60000</td>
</tr>
<tr>
<td>08-Mar</td>
<td>62000</td>
</tr>
<tr>
<td>09-Mar</td>
<td>65000</td>
</tr>
<tr>
<td>10-Mar</td>
<td>68000</td>
</tr>
<tr>
<td>11-Mar</td>
<td>72000</td>
</tr>
<tr>
<td>12-Mar</td>
<td>84000</td>
</tr>
<tr>
<td>13-Mar</td>
<td>86000</td>
</tr>
<tr>
<td>14-Mar</td>
<td>90000</td>
</tr>
<tr>
<td>15-Mar</td>
<td>92000</td>
</tr>
<tr>
<td>16-Mar</td>
<td>95000</td>
</tr>
</tbody>
</table>
Answers group work 5

- Increase in diarrhoea proportionally greater than increase in population.
- The large number of deaths and increasing admissions due to diarrhoea suggest that you may be dealing with an outbreak.
- Description of the diarrhoea (watery, bloody…).
- Age distribution of cases and deaths.
Analysis - Morbidity indicators

- **Incidence of disease** (new cases/population/week) with graph including previous weeks to show trend. This can be assessed also by age group and location.

- **Proportional morbidity** (% of cases of disease of total cases).

- **Count or "cases"** of any potentially epidemic disease.

- **Case fatality ratio** or CFR (deaths/cases by disease expr as %) – indicator of case management (or poor access/arriving too late)

- **Attack rate** during outbreaks (cumulative incidence of epidemic disease in population over a period of time)
No denominators?

Some info on trend can be gauged through:

Age-specific proportional morbidity (% cases of a disease in <5 versus ≥5 years) over time

Ratio of health events (1 epidemic-prone event / 1 stable event) over time.
Incidence per x population by week
Diarrhoea by Age Group Kossovar refugees, Albania Week 15-19, 1999

Age-specific proportional morbidity

Ratio of Diarrhoea/Cardio-vascular
Leading Causes of Morbidity in Under 5:
- ARI: 20%
- Bloody Diarrhea: 5%
- Severe Malnutrition: 3%
- Susp. Malaria: 15%
- All other: 57%

Leading Causes of Morbidity in >=5 yrs:
- ARI: 14%
- Bloody Diarrhea: 5%
- Injuries: 4%
- Susp. Malaria: 16%
- All other: 61%
Measles Outbreak Darfur
May-September 2005

Measles cases

Week Beginning

# of Cases

- May 23
- June 6
- June 20
- July 4
- July 18
- Aug 1
- Aug 15
- Aug 29
- Sept 12
- Sept 26

Vaccination Campaign
Bloody diarrhoea and Acute Jaundice cases
Morni Camp, West Darfur

![Graph showing the trend of bloody diarrhoea and acute jaundice cases in Morni Camp, West Darfur over a period of 38 weeks. The graph compares the number of AJS cases and bloody diarrhea cases weekly.]
### Acute Jaundice (Hepatitis E)
Darfur camps weeks 27-38, 2004

<table>
<thead>
<tr>
<th></th>
<th>Under 5 years</th>
<th>5 years and over</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>1,232</td>
<td>7,678</td>
</tr>
<tr>
<td>Deaths</td>
<td>7</td>
<td>105</td>
</tr>
<tr>
<td>CFR</td>
<td>0.6%</td>
<td>1.4%</td>
</tr>
<tr>
<td><strong>Attack Rate</strong></td>
<td><strong>0.7%</strong></td>
<td><strong>0.7% (0.13% - 9.1%)</strong></td>
</tr>
</tbody>
</table>
Spot maps (magnitude, location and movement): August 1, 2004 (Week 30)

n = 330
August 15, 2004 (Week 32)
n = 734
Feedback

What do you think of the following information flowcharts?

[Diagram showing information flow between WHO HQ, EWARN team, Ministry of Health, District Health Office, Mission clinic, WHO Regional Office, WHO Country Office, and Health Cluster lead, with time intervals specified as Monthly, Weekly, Daily, and Bi-weekly.]
Dua puluh delapan (28) agensi yang terdaftar yang terlibat dalam pelayanan kesehatan telah mengembalikan formulir surveilans selama 4 minggu di tahun 2005, melaporkan 17.948 kasus periksa ke dokter dan 5 kasus kematian. Kematian yang terjadi tidak berkaitan dengan penyakit menular yang terdapat pada daftar dibawah ini. Tidak ada kematian neonatal atau ibu hamil yang dilaporkan.

### Indikator Spesifik Angka Kematian dan Kematian Penyakit

<table>
<thead>
<tr>
<th>Penyakit</th>
<th>0-4 tahun</th>
<th>5 tahun +</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diare Akut</td>
<td>323</td>
<td>0</td>
<td>323</td>
</tr>
<tr>
<td>Diare beranjak</td>
<td>20</td>
<td>60</td>
<td>80</td>
</tr>
<tr>
<td>Positif Malaria</td>
<td>3</td>
<td>48</td>
<td>51</td>
</tr>
<tr>
<td>Demam diatas 38.5ºC</td>
<td>105</td>
<td>227</td>
<td>332</td>
</tr>
<tr>
<td>Dizusppa compak</td>
<td>8</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>ISPA</td>
<td>724</td>
<td>3111</td>
<td>3835</td>
</tr>
<tr>
<td>Jaundice akut</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Meningitis</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Kewaspadaan Epidemiologis

- **Hepatitis E virus**: RDT IgM positif, pria berusia 26 tahun dengan jaundice akut di Lan Lhum, saat ini semakin membaik.

- **Mosquito**: tidak ada kasus kematian di Lampung, tetapi ada kasus yang dilaporkan oleh LSM di Aceh Utara.

- **Dengue**: telah dilaporkan dua puluh dua (22) kasus di Aceh Utara. Imunisasi menyeluruh telah dilakukan.

- **Tetanus**: tidak ada kasus tambahan yang dilaporkan.

- **Meningitis**: tidak ada kasus tambahan yang dilaporkan.

- **Shigella flexneri**: tidak ditemukan kasus pada minggu ini.

- **Shigella dysenteriae**: tidak ditemukan kasus yang dilaporkan.

### Surveilans Mingguan Angka Kematian dan Angka Kesakitan Pasien Rawat Jalan

- **Kematian akibat jaundice akut**: pria berumur 60 tahun, pada 3-4 Feb 2005 di Sua Beukah, Sompuyan, dekat Patek, Kab. Aceh Jaya, 04.4973N, 95.3088E. "Gejala sakit" terjadi pada anggota keluarga tetapi tidak ada informasi tentang gejalanya - tidak ada kasus tambahan yang dilaporkan.

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- **Meningitis**: tidak ada kasus tambahan yang dilaporkan.
Analysis and feedback
Epidemic preparedness and control

- Extension of risk assessment and EWARN
- Focus on the main epidemic threats (usually <5)

Preparedness involves:
- Stockpiling the right control tools
- Setting up links with labs (already covered under EWARN)
- Identifying resources, people and agencies
- Written contingency plans with clear roles, responsibilities and timelines

Control involves (see outbreaks session)
- Outbreak investigation
- Setting up an Outbreak Control Team
- Enforcing infection control procedures (avoid nosocomial infections)
- Deploying interventions!
Epidemic preparedness

Stockpiling

● Depends on risk assessment
  – Diarrhoeal disease kits
  – Malaria kit
  – Antibiotics, anti-toxins, vaccines

● How much? Consider:
  – Population size
  – Likely population groups affected (e.g. everyone for cholera)
  – Likely attack rates for a given population
  – Shelf life of drugs/other supplies
  – Ease of procuring more drugs/supplies
Rapid response

Requires

- Epidemic preparedness plans
- Coordination mechanism (OCT)
- Primary care providers, health services
- Disease-specific guidelines / case management protocols
- Identify laboratories, potential isolation facilities
- Stockpile of drugs, vaccines, sample collection material, personal protective equipment
- Community health education, social mobilisation
- Media and communication
Who Conducts Surveillance in Emergencies?

MOH/WHO has overall responsibility for coordination of activities.

UNHCR often manages surveillance in refugee camp situations.

Implementing partners (usually NGOs) actually carry it out – data collection and reporting, investigation, implementation of control measures.
WHO's role in EWARN implementation

WHO has overall **responsibility** to the health cluster for coordination of surveillance activities, data management, feedback, investigation & response

- Risk assessment to determine which diseases (*health events*) should be monitored
- Lead EWARN implementation on the field as soon as possible in collaboration with MOH and partners
- If possible, hand it over or reintegrate it with routine national surveillance systems after crisis is over

**MOH/WHO should and probably will be held accountable if:**

- There is humanitarian space to set up an EWARN and we don't
- We set it up late
- We ask for data without getting involved hands on
- We don't do anything useful with the data
- We don't evaluate the EWARN and learn lessons for the future
**EWARN: experience to date**

Recent experiences in Darfur, Pakistan (earthquake), Aceh (tsunami), Myanmar (cyclone)

- Review underway
- Not enough implementation in man-made crises
- It's very feasible

Urgent need for standardised guidelines

- Standardised does not mean the same diseases everywhere
- However, data entry and analysis software should probably be harmonised
SUMMARY
Steps in setting up surveillance

1. Talk to all the agencies in the field
   - Health assessment/risk prioritization
   - Future risks
   - Surveillance needs
Steps in setting up surveillance

2. Organize the system (i)
   - Define the elements of the surveillance
     - Which events/data
     - Case definitions
     - According to health structures/community
   - Identify sources of information
   - Define frequency/method of reporting
     - Daily/Weekly: acute phase of the emergency
     - Weekly: when CMR reduces
     - Immediately: if highly contagious disease
     - Feed-back on the same basis
Steps in setting up surveillance

2. Organize the system (ii)
   - Define the elements of analysis - which indicators/thresholds
   - Define the practical steps
     - Forms printing/distribution
     - Training - who does what
   - Elaborate principles and framework for response (information for action)
   - Assign roles and responsibilities in the surveillance system and response process
Steps in setting up surveillance

3. Organize the resources required

- Human resources
  - Data collection
  - Reporting
  - Data analysis and feedback

- Materials
  - Computers and printers
  - Communication
  - Stationery
  - Transport for investigation and response
Data must be

1. **Sensitive**

   Ability to detect events:
   - Syndrome-based rather than diseases
     - Acute respiratory infections
     - Diarrhoeas
     - Fever
   - **Deaths**
     - Number and causes
   - **May need to add or complete with**
     - Surveys
     - Qualitative information
Data must be

2. Simple
   - < 5 and ≥ 5
   - Sex
   - A few priority diseases or events (10-12 max)
   - Location (residence, health structure)
   - Reporter
Data must be

3. **Comparable**: standardised case definitions

4. **Clear**: thresholds and when/where to report

5. **Adapted** (context)

6. **Flexible**: blank lines

7. **Information for ACTION**
Monitoring activities not part of EWARN

1. In emergency phase, limit to top 10 activities
   - Distribution of water, sanitation, food, shelter
   - Measles vaccination
   - Nutrition / feeding programmes
   - Health services availability, capacity, utilisation, quality

2. Indicators
   - Litres H2O/person/day, #people/latrine, Kcal rations/person/day, m2 available/person etc
   - Measles vaccination coverage (%)
   - # children in SFC/TFC, average stay, cure/defaulter rates
   - HCFs per 10000 pop / % HCF with basic capacity / OPD consultation rate & IPD admission rate / CFR
Programme activities

3. Sources

- Distribution records
- Community
- Direct observation
- Health Information System
- Survey