Information and Surveillance Systems for Refugee Populations

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Section A

The Need for Information and Data Collection
Definition of Surveillance

- **Surveillance** is the ongoing, systematic collection, analysis, and interpretation of health data, essential to the planning, implementation, and evaluation of public health practice.
- It includes timely dissemination of data to those who need to know.
Information in Humanitarian Emergencies

- Information is the backbone of all public health activities
  - Monitoring health services
  - Control of disease outbreaks
  - Program evaluation

- Although importance is recognized at one level, data collection is often done poorly in the field, although improving
Information May Be Simple

- Very basic information needed
  - *Numerators*—E.g., who’s affected or vulnerable, who’s experienced illness, etc.
  - *Denominators*—E.g., population size, population risk, vulnerable population, target group
Information May Be Simple

- Goal is not to understand full picture
  - But to have enough data to plan and implement emergency response
  - Initial information can be updated regularly from many sources
Phases in Information Needs

- Information needs differ for each phase of the emergency in terms of . . .
  - Type of data needed for decisions
  - Amount of information required
  - Frequency of collecting data
  - Methods of data collection
Methods of Data Collection

- Rapid assessments
  - Initially to establish baseline data
- Surveillance—Ongoing data collection
  - Health facility
  - Sentinel
  - Community health workers
Methods of Data Collection

- Intermittent population-based surveys
  - E.g., nutritional status, KPC
## Phases in Data Collection

| **Pre-Emergency Phase** | Pre-flight information on health status  
Rapid assessment surveys  
Establish a surveillance system |
|-------------------------|----------------------------------------------------------------------------------|
| **Emergency Phase**     | Rapid assessment surveys  
Baseline data                                                                      |
## Phases in Data Collection

<table>
<thead>
<tr>
<th>Phase</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Post-Emergency Phase</strong></td>
<td>Targeted population surveys or sampling</td>
</tr>
<tr>
<td></td>
<td>Consolidate surveillance</td>
</tr>
<tr>
<td><strong>Maintenance Phase</strong></td>
<td>Regular population-based surveys</td>
</tr>
<tr>
<td></td>
<td>Continue surveillance</td>
</tr>
<tr>
<td></td>
<td>Modify disease list</td>
</tr>
</tbody>
</table>

Continued
# Phases in Data Collection

<table>
<thead>
<tr>
<th></th>
<th>Emergency Phase</th>
<th>Post-Emergency Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration</strong></td>
<td>1–4 months</td>
<td>1 month–indefinite</td>
</tr>
<tr>
<td><strong>Collection of Data</strong></td>
<td>Mostly active</td>
<td>Passive and active</td>
</tr>
<tr>
<td></td>
<td>Largely qualitative</td>
<td>More quantitative</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Qualitative</td>
<td>Mostly quantitative</td>
</tr>
<tr>
<td><strong>Case Definitions</strong></td>
<td>Few</td>
<td>More</td>
</tr>
<tr>
<td></td>
<td>Simple</td>
<td>+/- case definitions</td>
</tr>
</tbody>
</table>
Rapid Assessment

- The initial rapid assessment
  - Begins when displaced persons arrive
  - Forms the basis of the surveillance system
The Assessment Team

- Team members have health care and epidemiological skills
- Collect background information
  - Maps, demographic/health data
- Require support personnel
  - Translators, data collectors, transport
Emergency Phase: Initial Information Needed

- Depends on decisions to be made
  - Demographic
  - Mortality
  - Morbidity
  - Nutritional status
  - Program monitoring
Emergency Phase: Additional Information

Background information

- Circumstances surrounding the flight
- Host/home country disease patterns
  - Host country treatment protocols and antibiotic resistance
- Usual level of health care received
- Social structure
Emergency Phase: Additional Information

- Environmental conditions
  - Climate and geography
  - Shelter and sanitation
Emergency Phase: Additional Information

- Resources available to host country
  - Among the refugees themselves
  - Within host country (emergency food and drug supplies, health personnel, health care capacity)
- Host country information system
Approach to Initial Assessment

- Quick survey for serious problems
  - May need convenience sampling
  - Gather as accurate data as possible
- Detailed survey if less urgent
  - Can use various sampling techniques
Demographic Information

- Critical denominator—total population
- Population structure
  - Age distribution
  - Number of males and females

Source: U.S. Census Bureau, International Data Base.
Demographic Information

- Vulnerable groups
  - Unaccompanied minors
  - Female-headed households
- Rate of new arrivals and departures
Section B

Population Size and Sampling
Problems in Estimating Population Size

- Estimating population size difficult
  - Increasing situations where counting is not allowed
  - General lack of information
  - Lack of confidence in results
Problems in Estimating Population Size

- Many reasons not to have numbers
- Results may be manipulated
  - By refugees
  - Agency
  - Or host country
Direct Estimation of Population Size

1. Count number of arrivals
2. Aerial photographs
3. Calculate with GPS
4. Count total number of dwellings
5. Random sampling of households
6. Indirect methods
7. Full registration
Count New Arrivals

- Count the number of people entering an area (bridge, road, or buses)
Aerial Photographs

- On-the-ground sampling at same time as over-flight
- Check for empty huts, moving population
- Refugee population must be distinct from local population
Calculate with GPS

- Calculate the circumference of a settled area with GPS
- Estimate household densities within area
- Carry out a household census on selected samples
Count Total Dwellings

- For a small settlement, estimate the mean household occupancy and composition
- In a sub-sample, calculate the household size
Random Sampling of Households

- To estimate the number of households
  - Draw a map, estimate size
  - Draw grids to create sections
Random Sampling of Households

- Count the number of households in a proportion of the sections
Random Sampling of Households

- Calculate mean household census and composition for a sample
- Can use a more formal cluster sampling approach
  - Where population is self-settled and lack registration
Full Registration

- Registration process for refugees
  - Collect demographic data
  - Issue registration cards

Continued
Full Registration

- Takes months to organize/conduct
- Subject to multiple registrations
  - Follow up sample of registrations to determine percent invalid
Indirect Estimation of Population Size

- Count the number of children under five years (or less than 110 cm)
  - They average 15–20% of total population
Indirect Estimation of Population Size

- Use number of immunizations given
  - Calculate coverage rates
  - Estimate total-under-five population
Section C

Indicators
Emergency Phase: Mortality Indicators

- Mortality can be reported as . . .
  - Crude mortality rate (CMR)
  - Age and sex-specific mortality rate (particularly for children)
  - Cause-specific mortality rate
  - Case fatality rate (CFR)
Crude Mortality Rate

- CMR of 1/10,000 persons/day delineates the phases of emergency
- Calculated as
  - Deaths/10,000 persons/day during acute phase
  - Deaths/1,000 persons/month during post-emergency phase
- Consider age-specific and gender-specific mortality rates
Emergency Phase: Morbidity Indicators

- Incidence rates (attack rates)
- Age and sex-specific incidence rates for primary causes of disease
  - Especially among children
- Cause-specific morbidity rates
  - Case definition critical
Emergency Phase: Morbidity Indicators

- Reporting initially very simple
  - Morbidity register in Goma, 1994, started with three diseases
Post-Emergency: Health Information System

- Morbidity and mortality indicators
- Disease-specific surveillance
- Nutritional surveillance
- Environmental health indicators
- Program monitoring indicators
- Reproductive health indicators
- Violence/human rights abuse indicators
Morbidity Indicators

- Primary diagnosis
- Age-specific incidence rates
- Sex-specific incidence rates
- Relation to season
- Changes in CFR (cholera CFR)
- Reportable diseases
- Hospital referrals
Disease-Specific Surveillance

- **Priority diseases**
  - Measles, malaria, ARI, diarrhoea, meningitis
  - Monitor for antibiotic resistance
- **Other diseases**
  - STI, TB
- **Location-specific disease outbreaks**
  - Sleeping sickness
Nutritional Surveillance

- Periodic assessment of under-fives
  - Commonly use WFH or MUAC
- Acute malnutrition reported as:
  - Moderate if
    > -2Z (<80% WFH)
  - Severe if
    >-3Z (<70% WFH)
Nutritional Surveillance

- Stunting—Indicates long-term problem
- Weight gain patterns at under-five clinic
- Screening for micronutrient deficiency
Food Security Indicators

- Per capita food distribution
- Number receiving supplementary feeding
- Food basket content
Food Security Indicators

- Household food reserves
- Market prices
Environmental Health Indicators

- Water supply
  - Quality
  - Quantity available
  - Individual consumption
  - Distance it is carried

- Sanitation
  - Latrines—ratio to population, usage
  - Solid waste disposal
Program Monitoring Indicators

- Health facility access indicator
  - U-5 children seen
  - Antenatal clinic attendance, TT doses given, FP services
Program Monitoring Indicators

- EPI coverage and drop-out rates (DPT1–DPT3)
- Health worker performance—quality indicators
Section D

Establishing a Surveillance System
Objectives of Surveillance System

1. Determine what resources are needed
2. Determine what health status is
3. Set program priorities
4. Detect and monitor outbreaks
5. Assess effectiveness of programs
6. Determine quality of services
7. Allow donors to anticipate particular needs
Establishing a Surveillance System

1. Build initial assessment data
2. Train from people to collect/analyze/use data
   - One person responsible for directing
3. Define the information to be collected
   - Only that which will be acted upon
4. Design quality checks for information
5. Identify program objectives—coverage, KAP, access to services
Establishing a Surveillance System

6. Establish case definitions for common diseases
7. Develop and test surveillance forms
8. List data sources for each indicator
9. Establish data analysis and reporting procedures
10. Review function of the surveillance system periodically
Establish Standard Case Definitions

- Develop case definitions for . . .

  - Diarrhea
  - Measles
  - Malaria
  - Cholera
  - STIs

  - ARI
  - Dysentery
  - Meningitis
  - Hepatitis
  - Micronutrient deficiencies
## Examples of Case Definitions

<table>
<thead>
<tr>
<th>Malaria</th>
<th>Fever and periodic shaking, chills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles</td>
<td>Fever, cough, rash, conjunctivitis</td>
</tr>
<tr>
<td>Watery diarrhea</td>
<td>More than three watery stools per day, but no blood or rice-water in stools</td>
</tr>
<tr>
<td>LRTI</td>
<td>Fever, cough, rapid breathing (more than 50 breaths per minute)</td>
</tr>
</tbody>
</table>
Surveillance Forms

- Develop simple, standardized forms . . .
  - Total adult, under-fives, male, female
  - Weekly mortality forms
  - Weekly morbidity forms
Example of Simple Morbidity Form

<table>
<thead>
<tr>
<th>Cause</th>
<th>0-4 yrs Male</th>
<th>0-4 yrs Female</th>
<th>5+ yrs Male</th>
<th>5+ yrs Female</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARI</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Diarrhea</td>
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<tr>
<td>Malaria</td>
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<tr>
<td>Malnutrition</td>
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<tr>
<td>Measles</td>
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<tr>
<td>Other</td>
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<tr>
<td>Repeat Cases</td>
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<tr>
<td>TOTAL</td>
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</tbody>
</table>
Sources of Information

- Health facilities
  - OPD
  - Under-five clinics
- Community
- Population surveys
  - Periodic—e.g., during an outbreak
- Grave sites
Data Analysis

- Don’t collect data for the sake of it
  - Examine and interpret it to make appropriate and timely changes
- Establish data analysis procedures
- Train staff to do simple analysis
  - Calculate rates, draw tables, compare to previous season
Data Reporting

- Determine frequency of reporting
  - Daily during epidemic
  - Less frequently in post-emergency
- Determine information flow and feedback process
  - Epidemiologic bulletin or meetings
  - Encourage informal feedback
Dissemination of Data

- Who gets?
  - Health coordinators
  - Host country health system
  - Refugee leadership
- Who follows up?
- Who documents?
Flow of Information

International

National/Regional

Project Team

Field Health Worker

Displaced Population

Information Flow

Feedback
Evaluation of Surveillance System

- Periodically review the information system function
  - % deaths reported as “unknown”
  - % morbidity reported as “other”
  - Assess use of case definitions
  - Compare diagnosis to treatment
  - Use of information for decision making