NCD surveillance systems

Branka Legetic, MD, MPH, PhD
PAHO-WHO Regional Adviser on
Prevention and control of NCDs
outline

• Public health surveillance
• Surveillance system
• Key factors for effective surveillance system
• Proposal for building surveillance system in Americas
• Examples
Public Health surveillance

“Public health surveillance is the systematic and ongoing reccompilation, analysis and interpretation of data of specific events used for planning, executing and evaluating of public health practice”.

Within Public Health response to chronic diseases:

Surveillance is stated as necessary element for further development and expansion of comprehensive approach that would allow countries to address chronic non communicable diseases from a public health perspective.
Surveillance system

- is a coordinated sequence of activities among one or more committed organizations designed to carry out surveillance of a disease or diseases and their risk factors, determinants or preventive interventions, in the most effective and efficient means possible.
Purpose and Use of Chronic Disease Surveillance system

- Monitoring Health Events
  - Detect Changes in Disease and Risk Factor Occurrence and Distribution
  - Follow Secular Trends and Patterns of Diseases and Risk Factors
  - Detect Changes in Health Practices
- Link to Public Health Action
  - Investigation and Control
  - Planning
  - Evaluating Prevention & Control Measures
- Stimulating PH Research
Scenarios

- Integrated information systems
  - Mortality
  - Morbidity
  - Health services (PHC and hospital)
  - Programs
  - Other sectors

- Public Health Surveillance
  - CD and CNCD
  - Sentinel sites
  - Population Health studies

- Developed units for analysis of health situation
  - Use of GIS

- Information used for decision making
  - Information systems disconnected and undeveloped
    - Mortality
    - Programs
  - Routine surveillance
    - CD
  - Analysis poor and fragmented
  - Decision making regardless to available information
Examples of existing surveillance systems

- Infectious diseases
  » Tuberculosis and other reportable diseases
  » West Nile Virus
  » SARS

- Vaccination status
  » Immunization Registration Information System

- Chronic disease surveillance
  » Cancer Registry

- Injury surveillance
  » Trauma registries

- Environmental health
  » Air/water quality index

- Occupational health
  » professional disease registers
## Similarities and differences between acute and chronic disease surveillance

<table>
<thead>
<tr>
<th>Purpose:</th>
<th><strong>ACUTE</strong></th>
<th><strong>CHRONIC</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor trends</td>
<td>Emphasis on weekly, monthly variations to identify outbreaks</td>
<td>Emphasis on trends</td>
</tr>
<tr>
<td>Describe a problem</td>
<td>Focus on individual</td>
<td>Focus on population</td>
</tr>
<tr>
<td>Estimate burden</td>
<td>Short time frame</td>
<td>Longer time frame</td>
</tr>
<tr>
<td>Evaluate programs for prev. &amp; control</td>
<td>Rapid response</td>
<td>Planned response</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DATA:</th>
<th><strong>ACUTE</strong></th>
<th><strong>CHRONIC</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>Reliance on notification by health-care providers/laboratories</td>
<td>Greater use of existing databases (vital statistics, hospital discharges)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Analysis:</th>
<th><strong>ACUTE</strong></th>
<th><strong>CHRONIC</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive statistics</td>
<td>Emphasis on data counts</td>
<td>Emphasis on rates, population means</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data dissemination</th>
<th><strong>ACUTE</strong></th>
<th><strong>CHRONIC</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>regular</td>
<td>More frequent</td>
<td>Less frequent</td>
</tr>
</tbody>
</table>
From surveys to surveillance

Survey
• One time- research driven
• Theory based
• Focused on categories/ health issues
• Goes into depth on categories/ health issues

Surveillance
Public health driven
A theoretical
Focus on multiple health issues
Looks at broad trends and patterns across health issues

Surveys do not address change in the burden
Key factor for effective surveillance is a systems approach
Ideal surveillance system

• Simple (structure & operation)
• Flexible (accommodate new issues and technology and reporting requests)
• Acceptable (generate willingness to participate)
• Sensitive (capture all cases and monitor trends)
• Representative (for individuals in the territory it covers)
• Timeless (from collecting info to delivery and health care change)
• Stable (reliable operate to provide info when requested)
• Collaborative (aspects achieved through partnering and consensus)
• Coordinated (approach through agreements)
Ideal Surveillance system

Improved health of the population

Action Based on Information

Policies Programs Services

Population information

Indicator

Data collection

Analysis

Product & dissemination

Management Coordination/Collaboration Legislation & Regulation

Indicator → Data collection → Analysis → Product & dissemination

Data collection

Analysis

Product & dissemination

Population information

Improved health of the population

Action Based on Information

Policies Programs Services

Management Coordination/Collaboration Legislation & Regulation
How to establish a surveillance system

- Establish goals
  - Develop case definitions
  - Select appropriate personnel
  - Acquire tools and clearances for collection, analysis, and dissemination

- Implement Surveillance system

- Evaluate surveillance activities

R Brownson, D. Petitti: Applied Epidemiology, Theory & Practice
How to monitor/evaluate the public health surveillance system

Need to cover three dimensions:

1. NCD data
   - E.g. mortality, morbidity, risk factors, determinants

2. Public Health Practice data
   - E.g. policies, health system performance, services etc

3. the dynamic link between 1 and 2
   - Indicators that 1 is being based on evidence from 2 = closing the loop
Link evidence with program planning!

- Data Interpretation
- Program Evaluation
- Program Dissemination
- Program Planning
- Program Implementation
- Program Analysis
- Program Collection (assessment)
- Information Analysis
- Information Collection (assessment)
- Data Collection (assessment)
USE of surveillance info: for negotiating with different audiences and in different scenarios

- with mayors
- With local health authorities
- With decision makers
- With academics and investigators
- With media
- With community and civil society
PAHO Regional Strategy and Plan of Action on an Integrated Approach to the Prevention and Control of Chronic Diseases

Development and strengthening of Country capacity for surveillance of chronic diseases, their consequences, RF, and impact of PH interventions


Monitoring NCDs and their determinants and evaluate progress at the national, regional and global levels

http://www.paho.org/cnccd_surveillance
To be established, as a matter of urgency, the programs necessary for research and surveillance of the risk factors for NCDs with the support of our Universities and the Caribbean Epidemiology Centre/Pan American Health Organization (CAREC/PAHO);”
Proposal for building NCD surveillance systems in the Americas

- **Core level** The existing resources will be in use and will include the collection, analysis of core/existing information strengthening quality, reliability and timeliness.

- Content of this level will be developed in collaboration with key countries and those that are part of the unfinished agenda.

- **Expanded level** is focused on obtaining and analyzing the information that will be collected with realistic projection of increase or reallocation of resources.

- Content of this level will include regular and periodic data collection of health determinants and biological RF using PAHO-WHO instrument(s) and methodology.
Proposal for building NCD surveillance systems in the Americas - cont

• **Desirable** level includes obtaining and analyzing the desired information that remains beyond the reach of most countries and their available resources.

• Content of this level will include data on health determinates, policy and program evaluation, information and analysis of effectiveness for fine-tuning of intervention programs.

This approach facilitate collection of selected data, production of reliable indicators, levels of analysis in order to establish groups or areas of priority for NCD control, develop national Info base and participate in the Global and regional Info bases.
Summary:

• Invest and support development of accurate, timely systems

• Essential NCD surveillance includes
  – Vital statistics (with reliable cause of death)
  – Risk factors (e.g., GATS for tobacco; examination surveys)
  – Environmental exposures (e.g., nutrition, air quality)
  – Policy and program implementation status

• Investment in capacity building (e.g., practical epidemiology) and public health institutions
To urge member States to:

Strengthen or establish surveillance systems for monitoring and evaluation of NCD policies and programs to determine their effectiveness and impact on health and development, and to guide resource allocation.
NATIONAL HEALTH REPORTING SYSTEM, SURVEY AND SURVEILLANCE

Table 1: National reporting system on health, studies, and NCD surveillance

<table>
<thead>
<tr>
<th>Study Area</th>
<th>2005*</th>
<th>2010*</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Information System that encompasses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCD and principal risk factors</td>
<td>21</td>
<td>26</td>
</tr>
<tr>
<td>Inclusion of NCD in the system of annual health reporting</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Studies that include risk factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco consumption</td>
<td>5</td>
<td>26</td>
</tr>
<tr>
<td>Alcohol consumption</td>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td>Hypertension</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Overweight and obesity</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>Inadequate diet</td>
<td>19</td>
<td>16</td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>NCD Registries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>13</td>
<td>24</td>
</tr>
<tr>
<td>Diabetes</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>Cardiac events</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Stroke</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Hypertension</td>
<td>20</td>
<td>29</td>
</tr>
<tr>
<td>Methodology of implemented Pan American STEPS</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Risk factor surveillance system?</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

* 28 of 36 countries reported in 2005, and 31 of 36 in 2010
Examples
*Framework for NCD surveillance system:

- Canada, US, Brazil
- Aruba:

EPSEA
Health Information System Aruba
Project: Research and Integration
Information Sources

Countries with advances on functioning as the system:
Chile, Argentina, C Rica, Cuba, Mexico, Bahamas

Sub regional developments- harmonicization
CAREC, MERCOSUR
NCDs Surveillance system: Brazil

Information

Risk / protective Factors
- Population based survey on Health service use (PNAD*)
- School based RFs survey (PNAD*)
- Telephone based RF Studies (VIGITEL)

Morbidity
- Cancer registers population based
- Cancer register Hospital based

Mortality
- Hospital information system
- Primary Health care information system APAC*
- Main cause of death
- Underline cause of death

* PNAD: Pesquisa Nacional por Amostras de Domicílios
* APAC: Autorização de Procedimentos de Alta Complexidade
Exercise
Please visit:

www.paho.org/cnccd_surveillance

Thank You