SESSION 15. QUALITY ASSESSMENT AND ASSURANCE IN THE CIVIL REGISTRATION AND VITAL STATISTICS SYSTEM

UNITED NATIONS STATISTICS DIVISION
Expert Group Meeting on Management and Evaluation of Civil Registration and Vital Statistics Systems
New York, UNHQ, 20-24 February 2017
Evaluation is essential

Vital Statistics System

Live births
Deaths
Fetal deaths
Marriages
Divorces
Annullments
Judicial separations
Adoptions
Legitimation
Recognition

Health services
Certification of cause of death

Civil Registration, including population registers
Principles:
1. Compulsory
2. Universal
3. Continuous
4. Confidentiality

Courts
Judicial institutions

Vital Statistics
Compilation
Processing
Validation
Quality control
Dissemination

National IDs’ Electoral lists Passports...

Complementary/Interim sources
Population census Surveys Sample registration areas

Additional administrative sources
Coronary Police Registries Health records

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Adequately funded evaluation activities are essential
- For improving systems that have deficiencies
- For maintaining systems that function satisfactorily

Strong mandate in Sustainable Development Agenda
- Indicator 16.9.1: Percentage of children under 5 whose births have been registered
- Indicator 17.19.2: Proportion of countries that... (b) have achieved 100 per cent birth registration and 80 per cent death registration
- Other 9 indicators that use CRVS data as input
Quality basic framework in the P&R

**Quality assurance**
- Encompasses each stage of CRVS operations
- All vital events are registered without duplication
- All related information is recorded
- Information is compiled, validated and processed
- Vital statistics are released in timely manner

**Quality assessment**
- Specific studies for specific questions
- Coverage of registration of vital events
- Accuracy of variables
- Overall functioning of sub-systems
- Can be ad hoc or regular exercises
1. Completeness
   * Every vital event is registered
   * Statistical report is filed for every registered event
   * Coverage error

2. Accuracy

3. Availability

4. Timelines
Standards of quality in the P&R

1. Completeness

2. Accuracy
   * Every data item is filled
   * Data items are accurately filled
   * Content error

3. Availability

4. Timelines
1. Completeness

2. Accuracy

3. Availability
   * Data and statistics are available to users in a friendly format
   * Difficult to satisfy, as demands have grown

4. Timelines
1. Completeness

2. Accuracy

3. Availability

4. Timeliness
   * CR: events are registered within time limit and statistical reports are filed according to schedule
   * VS: prompt dissemination
Quality assessment methods

Direct methods ➔ Matching of records

Indirect methods ➔ Demographic analysis
Quality assessment.

Direct methods

Matching of records

Match registration records with records from an independent source
Quality assessment.
Direct methods

Matching:

- **Birth registration with death registration**
  - limited to infants deaths
  - can be carried out routinely

- **With administrative records**
  - a variety of sources can be used
  - however, none is complete
  - useful to detect certain type of underreporting
Matching:

- **Lists from population censuses and surveys**
  - compiled from questions on births and deaths
  - can lead to an estimate of completeness
  - national or sub-national level

- **Dual records system**
  - a particular case of the lists
  - survey specifically to collect information on vital events
  - the two sources are confronted
### Matching basic logic:

<table>
<thead>
<tr>
<th>Civil Registration</th>
<th>Survey/Census</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>X</td>
<td>Matched</td>
</tr>
<tr>
<td>Case 2</td>
<td>X</td>
<td>Not in survey</td>
</tr>
<tr>
<td>Case 3</td>
<td></td>
<td>Not in CR</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>...</td>
</tr>
<tr>
<td>Case n-1</td>
<td></td>
<td>...</td>
</tr>
<tr>
<td>Case n</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case 4</td>
<td></td>
<td>Missing in both</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Result</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matched</td>
<td></td>
</tr>
<tr>
<td>Not in survey</td>
<td></td>
</tr>
<tr>
<td>Not in CR</td>
<td></td>
</tr>
<tr>
<td>Missing in both</td>
<td>??</td>
</tr>
</tbody>
</table>
Matching basic logic:

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<th>Civil Registration</th>
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<tbody>
<tr>
<td></td>
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<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>Matched</td>
<td>Not in CR</td>
</tr>
<tr>
<td>No</td>
<td>Not in survey</td>
<td>Missing in both</td>
</tr>
<tr>
<td>Total</td>
<td>M+NS</td>
<td>N</td>
</tr>
</tbody>
</table>

Chandrasekaran-Deming formula

\[ N = \frac{(M + NS) \times (M + NR)}{M} \]

Overall undercoverage = \[ \frac{Missing \ in \ both}{N} \]

CR undercoverage = \[ \frac{NR + Missing \ in \ both}{N} \]
**Matching basic logic:**

<table>
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<th>Civil Registration</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>1000</td>
<td>230</td>
</tr>
<tr>
<td>No</td>
<td>120</td>
<td>147</td>
</tr>
<tr>
<td>Total</td>
<td>1120</td>
<td>257</td>
</tr>
</tbody>
</table>

**Chandrasekaran-Deming formula**

\[
N = \frac{(1000 + 120) \times (1000 + 230)}{1000} = 1377.6
\]

**Overall undercoverage**

\[
\text{Overall undercoverage} = \frac{27}{1377} = 1.96\%
\]

**CR undercoverage**

\[
\text{CR undercoverage} = \frac{230 + 27}{1377} = 18.6\%
\]

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Quality assessment.

Indirect methods

- Comparison of trends
- Delayed registration
- Questions on birth registration in surveys or censuses

- Comparison with census data
  - If at least two censuses: balancing equation, Lexis diagram
  - If only one census: compare aggregates

- Methods for incomplete data
  - Manual X


<table>
<thead>
<tr>
<th></th>
<th>Advantages</th>
<th>Limitations</th>
</tr>
</thead>
</table>
| **Direct methods**   | • More accurate assessment of registration completeness  
                     • May indicate sources of under or overregistration  
                     • Can be applied at any geographical level | • Accuracy is affected by the choice of the second source of records  
                     • True independency of the second source is unlikely  
                     • Matching criteria difficult to find if there is no ID number  
                     • If manual: time consuming  
                     • If automated: computer algorithms can get too complex  
                     • Cost |
| **Indirect methods** | • Prompt assessment of vital statistics completeness  
                     • Several can be applied at various geographical levels | • Some have assumptions that may not hold  
                     • Some require reliable data from two censuses  
                     • Accuracy is affected by the degree of census completeness |
Choosing the appropriate method depends on:

- Objectives
- Degree of precision
- Time frame
- Type of event
- Resources
A. Introduction

B. Considerations on quality of the Civil Registration System
   1. Importance of quality evaluation
   2. Confidentiality and privacy in the context of quality evaluation
   3. Uses of lessons learned from evaluation

C. Quality Framework of the Civil Registration System
   1. Methods for quality assurance (processes)
      o Process mapping
      o Geographical coverage
   2. Methods for quality assessment (data)
      o Completeness
      o Accuracy
      o Availability
      o Timeliness

Guidelines. Methods for assessing completeness and coverage of CR

• Theoretical approaches
• Pros, Cons, Assumptions
• Operational challenges, measurement
• Country examples
A. Introduction
B. Considerations on quality of the Civil Registration System
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   3. Uses of lessons learned from evaluation
C. Quality Framework of the Civil Registration System
   1. Methods for quality assurance (processes)
      o Process mapping
      o Geographical coverage
   2. Methods for data quality assessment (Direct and Indirect)
      o Completeness
      o Accuracy
      o Availability
      o Timeliness
      • Theoretical approaches
      • Pros, Cons, Assumptions
      • Operational challenges, measurement
      • Country examples
Gracias  Thank You
Merci  Спасибо
شكرًا  谢谢
Quality assessment.
Direct methods

Practical example: Health services of the state of Queensland, Australia

Primary source:
Perinatal Data Collection

Secondary source:
Birth registration

Linkage file:
file containing person identifiers from various admin. sources
Some results

• 2.7% of Perinatal Data records could not be linked to Registration data.

• Significant differences in linkage according to ethnic groups

<table>
<thead>
<tr>
<th></th>
<th>15-18% undercoverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indigenous mothers</td>
<td></td>
</tr>
<tr>
<td>Non-indigenous mothers</td>
<td>1.8% undercoverage</td>
</tr>
</tbody>
</table>

• Remote and very remote geographical areas also had high rates of under-registration

• If vital statistics are compiled fully from civil registration, both direct and indirect measure the quality of civil registration and vital statistics.
  • However, coverage and accuracy of vital statistics are also affected by the steps in the production

• When the two systems do not correspond completely, measures of quality of one system cannot be used to represent another