



UN Statistics
Division

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

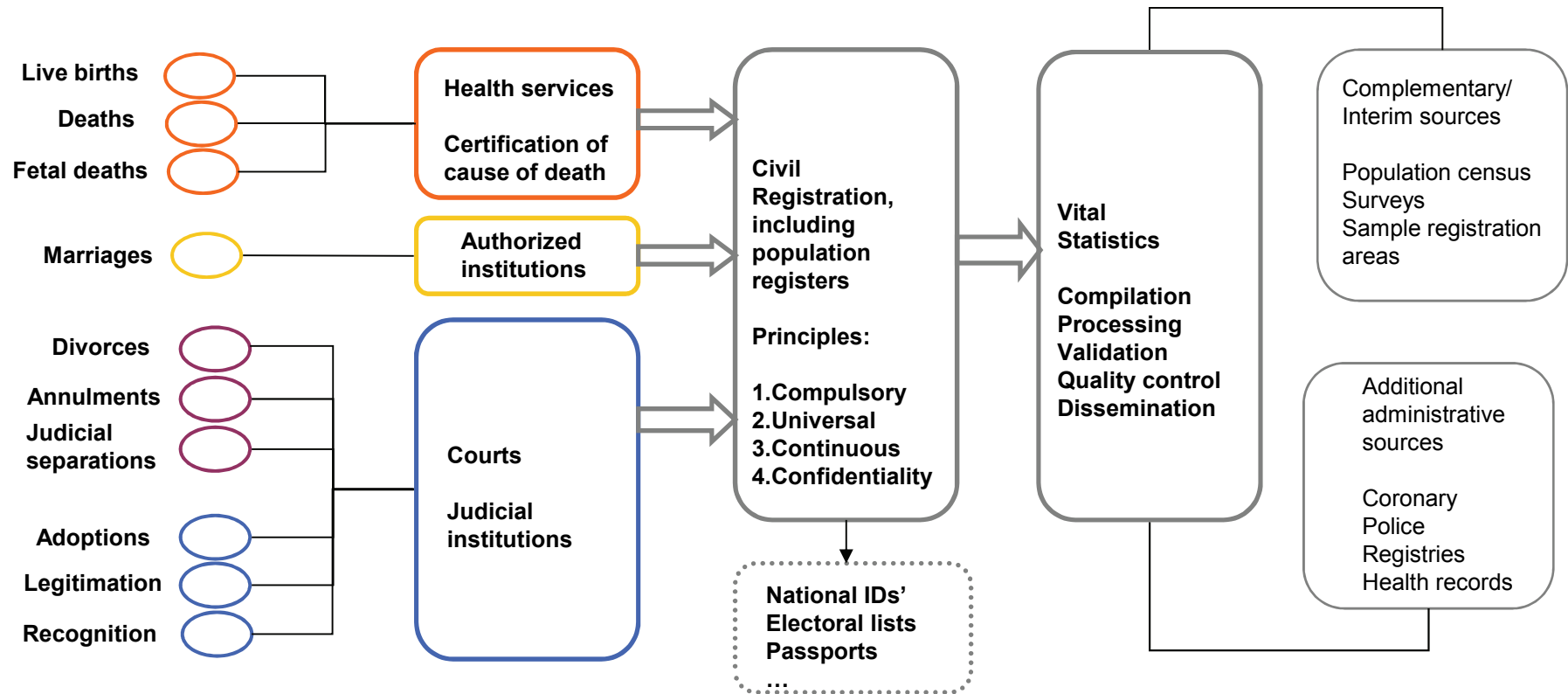
New York, UNHQ, 20-24 February 2017



Evaluation is essential



Vital Statistics System



Expert Group Meeting on Management and Evaluation of Civil Registration and Vital Statistics Systems

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Quality basic framework in the P&R



Adequately funded evaluation activities are essential

- For improving systems that have deficiencies
- For maintaining systems that function satisfactorily

Strong mandate in Sustainable Development Agenda

16 PEACE, JUSTICE AND STRONG INSTITUTIONS



17 PARTNERSHIPS FOR THE GOALS



- 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



Standards of quality in the P&R



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Standards of quality in the P&R



1. Completeness

- * Every vital event is registered
- * Statistical report is filed for every registered event
- * Coverage error

2. Accuracy

3. Availability

4. Timeliness



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.
Timeliness



Standards of quality in the P&R



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.
Timeliness



Standards of quality in the P&R



1. Completeness

2. Accuracy

4. Timeliness

* CR: events are registered within time limit and statistical reports are filed according to schedule

* VS: prompt dissemination

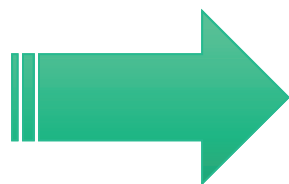
3. Availability



Quality assessment methods

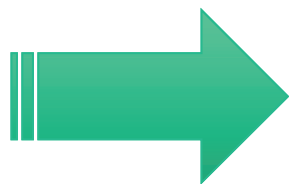


Direct methods



Matching of records

Indirect methods



Demographic analysis

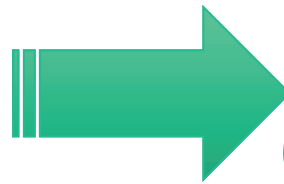


Quality assessment.

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



Quality assessment.

Direct methods



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



Quality assessment.

Direct methods



Matching basic logic:

	Civil Registration	Survey/ Census	Result
Case 1	X	X	<i>Matched</i>
Case 2	X		<i>Not in survey</i>
Case 3		X	<i>Not in CR</i>
...			...
...			...
Case n-1			
Case n			

Result	Count
<i>Matched</i>	
<i>Not in survey</i>	
<i>Not in CR</i>	

<i>Missing in both</i>	<i>??</i>
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Case 4			<i>Missing in both</i>
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Quality assessment.

Direct methods



Matching basic logic:

Survey /Census	Civil Registration		Total
	Yes	No	
Yes	<i>Matched</i>	<i>Not in CR</i>	$M+NR$
No	<i>Not in survey</i>	<i>Missing in both</i>	
Total	$M+NS$		N

Chandrasekaran-Deming formula

$$N = \frac{(M + NS) * (M + NR)}{M}$$

$$\text{Overall undercoverage} = \frac{\text{Missing in both}}{N}$$

$$\text{CR undercoverage} = \frac{NR + \text{Missing in both}}{N}$$



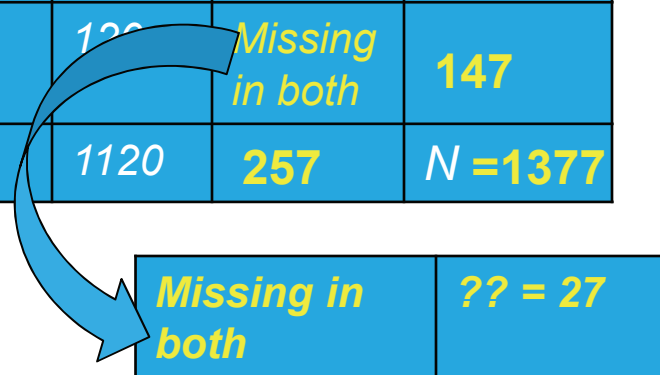
Quality assessment.

Direct methods



Matching basic logic:

Survey/ Census	Civil Registration		Total
	Yes	No	
Yes	1000	230	1230
No	120	Missing in both	147
Total	1120	257	N = 1377



Chandrasekaran-Deming formula

$$N = \frac{(1000 + 120) * (1000 + 230)}{1000}$$

$$N = \frac{(1120) * (1230)}{1000} = 1377.6$$

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

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



Quality assessment.

Indirect methods



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

Demographic analysis

- **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*
 - *Tools for Demographic Estimation* (online and print update of *Manual X*, <http://demographicestimation.iussp.org/>)



Discussion on whether Direct or indirect



	Advantages	Limitations
Direct methods	<ul style="list-style-type: none">• More accurate assessment of registration completeness• May indicate sources of under or overregistration• Can be applied at any geographical level	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Prompt assessment of vital statistics completeness• Several can be applied at various geographical levels	<ul style="list-style-type: none">• Some have assumptions that may not hold• Some require reliable data from two censuses• Accuracy is affected by the degree of census completeness



Discussion on whether Direct or indirect



Choosing the appropriate method depends on:

- **Objectives**
- **Degree of precision**
- **Time frame**
- **Type of event**
- **Resources**



Guidelines. Methods for assessing completeness and coverage of CR



- 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)
 - Process mapping
 - Geographical coverage
 - 2. Methods for quality assessment (data)
 - Completeness
 - Accuracy
 - Availability
 - Timeliness
- **Theoretical approaches**
 - **Pros, Cons, Assumptions**
 - **Operational challenges, measurement**
 - **Country examples**



Chapter IV. Methods for assessing completeness and coverage of CR



- 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)
 - Process mapping
 - Geographical coverage
 - 2. Methods for data quality assessment (Direct and Indirect)
 - Completeness
 - Accuracy
 - Availability
 - Timeliness
- **Theoretical approaches**
 - **Pros, Cons, Assumptions**
 - **Operational challenges, measurement**
 - **Country examples**



Gracias **Thank You**
Merci **Спасибо**
شكرا 谢谢



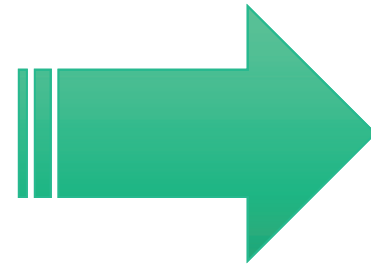
Quality assessment.

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**



Direct methods. Practical example: Health services of the state of Queensland, Australia

Some results

- 2.7% of Perinatal Data records could not be linked to Registration data.
- Significant differences in linkage according to ethnic groups

Indigenous mothers

15-18% undercoverage

Non-indigenous mothers

1.8% undercoverage

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

<https://www.health.qld.gov.au/hsu/peri/underreg.pdf>



Direct or indirect ?



- **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**