Activities to Improve Immunization Data Quality in the American Region

SAGE

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Geneva, Switzerland
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Immunization Data Quality

It is considered a priority for PAHO and Member States
Common Data Inconsistencies

- NUMERATORS
  - Year-to-year difference (>10%) in DTP3 doses
  - Negative DTP1-DTP3 drop-out rates
  - Negative DTP2-DTP3 drop-out rates

- DENOMINATORS
  - Year-to-year difference (>10%) in denominators
  - Differences >10% between country denominator and UN average live birth estimate
  - More BCG/DTP1 doses administered than denominator

From TAG 2009, abstract book
TAG reaffirms the recommendation (since 2002) that systematic and periodic assessment of coverage data accuracy, consistency, completeness, and timeliness should become a regular activity within national immunization programs.

- This assessment should be conducted within the context of regular on-going evaluation and supervisory activities.

Monitoring numerator trends by month and year and calculating drop-out rates between all doses, including DTP2, and monitoring denominator variations should be done systematically at all levels.

Immunization programs should be aware of the conduction of surveys that, among other health indicators, calculate vaccination coverage in order to ensure that questionnaires are adequate and interviewers properly trained to assess vaccination status, and that the results are internally consistent between biologicals.
Countries using **national computerized nominal immunization registries** should document their experiences, successes, and lessons learned in order to share them with other countries – Re-issued in 2011

PAHO should continue supporting countries to improve their immunization data quality by **promoting the evaluation of the quality of their immunization data and information systems.**

- PAHO should also support the implementation follow-up of the recommendations resulting from such assessments.

PAHO’s immunization program should **develop guidelines regarding coverage monitoring and data quality**, and **establish strategic alliances** with entities specializing in vital statistics and demography to promote the generation and availability of accurate denominators figures to calculate vaccination coverage.
Data Quality “Self”-Assessments (excludes audits)

- 2005: Costa Rica
- 2006: El Salvador, Uruguay*
- 2007: Honduras*
- 2008: Guatemala, Grenada*, Guyana*
- 2009: Suriname, El Salvador*, Paraguay
- 2010: Bolivia*, Nicaragua*, Jamaica
- 2011: Argentina*. Belize, Paraguay*

* As part of the EPI evaluation
<table>
<thead>
<tr>
<th>No correlativo</th>
<th>Comunidad</th>
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<th>Td</th>
<th>Otros Grupos de Edad</th>
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<tbody>
<tr>
<td>1</td>
<td>Água Central</td>
<td>1a</td>
<td>1</td>
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<td>8</td>
<td>La Timba</td>
<td>1a</td>
<td>1</td>
<td>1</td>
</tr>
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<td>9</td>
<td>Princes</td>
<td>1a</td>
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<tr>
<td>11</td>
<td>Vila do Rio</td>
<td>1a</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Ladriena</td>
<td>1a</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>Lima Larga</td>
<td>1a</td>
<td>1</td>
<td>1</td>
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**Otros Grupos de Edad**

<table>
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<tr>
<th>Td</th>
<th>1</th>
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<tbody>
<tr>
<td>1a</td>
<td>1</td>
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</tbody>
</table>

**TOTAL**

| 121 | 107 | 83 | 121 | 107 | 83 | 121 | 57 | 6 |

**SPONSABLE:**

**FIRMA:**

**V.G.B.**
Quality Index by Component Health Center Level, DQS Example 1, 2006 vs. 2009

Health Units: 57%

Health Units: 75%
DQS 2006 DTP-Hib-HepB 3

Social Security

Others

Private

NGO

5 Regions

27 Intermediate levels (SIBASI)

Monthly Report

Monthly Report

Daily Registry

Central Level

97%

74%

HEALTH UNIT

Pan American Health Organization

Regional Office of the World Health Organization
DQS 2009 DTP-Hib-HepB3

Web-based System

Social Security

Others

Private

NGO

5 REGIONS
17 SIBASIS

Monthly Report

Monthly Report

Monthly Report

Daily Registry

93%

98%

DQS 2009 DTP-Hib-HepB3

Social Security

Others

Private

NGO

5 REGIONS
17 SIBASIS

Monthly Report

Monthly Report

Monthly Report

Daily Registry

93%

98%

Pan American Health Organization
Regional Office of the World Health Organization
Quality Index by Region
Paraguay, 2009 and 2011

Puente Hayes
Caaguazu
Misiones
Cordillera
Neembucu
Itapúa
Boquerón
Central
Guairá
Capital
Amambay
Canindeyu
Alto Parana

IC_Región 2011  IC_Región 2009

Fuente: encuestas evaluación de calidad del datos 2009 y 2011
DPT3/Penta3 by data source, Paraguay 1995-2010

*National coverage survey, 2011 preliminary data
Denominators – Paraguay

- Census projections from a 2002 census
  - Until 2008 the disaggregation by single years was done by the Department of Statistics, MOH
  - Health Regions adjusted population among their municipalities
  - Unclear fertility rate – census projections done using 3.1 (3.2 census 2002, 2.9 survey 2004, 2.5 survey 2008)

- In 2009, a multi-sectoral commission was created (Census office, EPI, MOH Statistics)
  - To review projections and used standardized methodology for age disaggregation and municipal distribution.
Denominators - Honduras

- 2007 EPI Evaluation/DQS Recommendations:
  - Create a national expert committee on demography and population issues to analyze denominators
  - Assess denominators used by the EPI

- Committee:
  - Ministry of Health (Statistics, EPI)
  - National Statistics Institute (INE)
  - UN Pop Division, UNICEF, USAID, PAHO, Red Solidaria

- INE decides to adjust the population

- CELADE (Demography Center of ECLAC)’s support facilitated through PAHO

To read more, visit PAHO’s Immunization Newsletter, Feb 2010. Available at www.paho.org/inb
Honduras – Results

Differences between children < 1 year and 1-4 yrs before and after INE adjustment
Honduras 2004-2008

<table>
<thead>
<tr>
<th>Year</th>
<th>&lt; 1 year Before</th>
<th>&lt; 1 year Adjusted</th>
<th>Difference</th>
<th>1-4 years Before</th>
<th>1-4 years Adjusted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>195,826</td>
<td>187,087</td>
<td>8,739</td>
<td>757,750</td>
<td>809,522</td>
<td>-51,772</td>
</tr>
<tr>
<td>2005</td>
<td>197,159</td>
<td>182,320</td>
<td>14,839</td>
<td>770,870</td>
<td>789,386</td>
<td>-18,516</td>
</tr>
<tr>
<td>2006</td>
<td>197,208</td>
<td>182,067</td>
<td>15,141</td>
<td>855,867</td>
<td>762,634</td>
<td>93,233</td>
</tr>
<tr>
<td>2007</td>
<td>198,222</td>
<td>181,506</td>
<td>16,716</td>
<td>855,867</td>
<td>740,513</td>
<td>115,354</td>
</tr>
<tr>
<td>2008</td>
<td>199,400</td>
<td>180,677</td>
<td>18,723</td>
<td>870,910</td>
<td>726,276</td>
<td>144,634</td>
</tr>
</tbody>
</table>

*Rapid coverage monitoring post follow-up campaign coincided with coverage data using adjusted denominators

…But, reporting >100% for 2010

*Departamento de Estadistica/SS
Regional Workshops with WHO & UNICEF

- **2005**: Harmonization exercise – Washington DC
- **2006-2008**: Regional participation in WHO/UNICEF estimates process
- **2008**: Guatemala and El Salvador invited to a global meeting in Geneva
- **Mid-2009**: Dominican Republic, El Salvador, and Peru – workshop in Washington DC
- **Mid-2010**: Belize, Costa Rica, Jamaica, and Paraguay – workshop in San Jose, Costa Rica
- **Mid-2011**: Ecuador, Mexico, and Panama – workshop in Panama
Other Related Activities

- Workshops on data analysis and data quality (Brazil)
- Exploring the use of a more aggregated geographical level to “stabilize denominator” (Brazil-CDC)
- Linking nominal registries to inventory management systems
- Exploring the use of information and communication technologies (ICTs)
  - Context of PAHO’s eHealth strategy
- Promotion of rapid coverage monitoring at local level
Looking to the Future – TAG Recommendations 2011

- TAG welcomes the progress on the development and implementation of **national computerized nominal immunization registries** (NIRs) in the Region.

- Countries and PAHO should continue **documenting and exchanging experiences** on the development and implementation of computerized NIRs.

- NIRs should aim at ensuring **interoperability** with other information systems.

- PAHO should work in **coordination** with other sectors and initiatives related to e-government, information and communication technologies (ICTs), birth registration, among others.
Conclusion

EPI can take care of numerator issues and serve as a catalyst for denominator revision when problems are suspected.
Acknowledgments

- Countries of the Americas
  - In particular, immunization programs
- PAHO Immunization colleagues
- PAHO Health Analysis and Statistics colleagues
- Global Immunization Division, CDC
- WHO colleagues
  - In particular, Marta Gacic-Dobo, Tony Burton
THANK YOU!

www.paho.org/immunization

Visit PAHO’s Immunization Newsletter: www.paho.org/inb
TAG Recommendations since 2002

- Systematic and periodic evaluation of data validity, consistency, completeness and timeliness of coverage data should become a regular immunization program activity

- **Supervision**, including administrative vaccination data and data quality monitoring

- **Rapid coverage monitoring** – as a management tool
## Summary of Potential Numerator Issues
### Countries with Pop. >500,000, LAC, 2002-2007

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Observations</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year-to year difference in DTP3 doses</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;5%</td>
<td>31/110</td>
<td>15/22</td>
</tr>
<tr>
<td>&gt;10%</td>
<td>14/110</td>
<td>7/22</td>
</tr>
<tr>
<td><strong>Negative DTP1-DTP3 drop-out rates</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>45/131</td>
<td>15/23</td>
</tr>
<tr>
<td>For 2 or more years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For 3 or more years</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Negative DTP2-DTP3 drop-out rates</strong>&lt;sup&gt;2,3&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>58/102</td>
<td>19/22</td>
</tr>
<tr>
<td>For 2 or more years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For 3 or more years</td>
<td></td>
<td></td>
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</tbody>
</table>

<sup>1</sup> One country excluded due to obvious errors in the number of DTP3 doses reported for most years. Only one country had reported a vaccine stock-out that explained change in year-to-year >10%.

<sup>2</sup> Not all DTP1 and DTP2 doses available for all years.

<sup>3</sup> One country did not report DTP2 doses for the study period.

From TAG 2009, abstract book
## Summary of Potential Denominator Issues
### Countries with Pop. >500,000, LAC, 2002-2007

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Observations</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year-to year difference in denominators&lt;sup&gt;4&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 5%</td>
<td>33/131</td>
<td>17/23</td>
</tr>
<tr>
<td>&gt;10%</td>
<td>15/131</td>
<td>7/23</td>
</tr>
<tr>
<td>Differences &gt;10% between country denominator and UN average live birth estimate&lt;sup&gt;4&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>37/135</td>
<td>17/23</td>
</tr>
<tr>
<td>For 3 or more years</td>
<td></td>
<td>4/23</td>
</tr>
<tr>
<td>More BCG doses administered than denominator&lt;sup&gt;5&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>27/129</td>
<td>9/22</td>
</tr>
</tbody>
</table>

<sup>4</sup> 2004 denominator data not available for two countries, 2005 denominator missing for one country

<sup>5</sup> One country does not give BCG. 2002 number of BCG doses missing for one country

From TAG 2009, abstract book
Old censuses – reduction in fertility rates in some, but also more countries reporting coverage >100% (for 2010)

The more local level, the more inexact the population estimate – districts with low coverage vs. districts with coverage >>>100%
  – Most districts are very small
PAHO strategies to improve vital statistics


- Initiatives: Several alliances to assess and improve health information systems in the Americas (HMN, MEASURE-Evaluation, USAID, HMN-TSP, PRISM)

- PAHO cooperation with CELADE (Latin America and Caribbean Demographic Center – ECLAC)
  - Data use, analysis and revision of population estimates and mortality tables