Assessing data quality of international health indicators
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BACKGROUND
The Pan American Health Organization, Regional Office for the Americas of the World Health Organization (PAHO/WHO) annually collects health indicators of WHO/PAHO Member States and publishes 55 core health indicators for 49 countries in ‘Health Situation in the Americas: Basic Indicators’. Measurement of data quality of indicators plays a crucial part in this. Quality varies widely between countries, which affects targeting and assessment of data-driven programs, the comparability of international indicators, as well as the credibility of the data product. PAHO/WHO/HA is working with countries of the Americas to strengthen health information systems (HIS) with a focus on comparable vital statistics.

OBJECTIVE
The aim of this work is to propose a conceptual framework for assessing the data quality of health indicators, based on infant mortality rate (IMR) reported from countries’ routine health information systems to PAHO. This data assessment is based on five dimensions:

- **Accuracy**: Compare to international estimates
- **Coverage**: Review mortality under-registration as proxy
- **Interpretability**: Review data of data (metadata)
- **Timeliness**: Analyze last available year in context of Americas
- **Consistency**: Compare to previously reported data

METHODS
IMR per 1,000 live births was used to test the framework based on countries with adequate and inadequate HIS: Cuba, the USA, Ecuador, Jamaica, and Paraguay. For each of the five dimensions, a simple measurement method was defined based on available data and sources. Each dimension was scored (from 1-3) and overall data quality was summarized in a radar graph to show the strengths and weaknesses of the indicator in the concept of multidimensionality. For assessment (Fig. 1-3), we used the latest reported year of IMR and compared it to previously reported data (consistency), to estimated IMR (accuracy), to mortality under-registration (coverage), reviewed available metadata (interpretability), and scored timeliness based on the last available year in the context of all the countries of the Americas.

RESULTS

<table>
<thead>
<tr>
<th>Country</th>
<th>Infant mortality rate, country reported</th>
<th>Mortality under-registration (%) 2013 (*2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuba</td>
<td>4.2 (2013)</td>
<td>0</td>
</tr>
<tr>
<td>Ecuador</td>
<td>8.6 (2013)</td>
<td>24.4</td>
</tr>
<tr>
<td>Jamaica</td>
<td>19.5 (2011)</td>
<td>14.5*</td>
</tr>
<tr>
<td>Paraguay</td>
<td>14.6 (2013)</td>
<td>27.5</td>
</tr>
<tr>
<td>USA</td>
<td>6 (2012)</td>
<td>1.7</td>
</tr>
</tbody>
</table>


CONCLUSIONS
The findings prove a replicable method to show the operational applicability and its usefulness for measuring data quality. Country workshop discussions have reinforced the conclusions that were the results of this assessment. Quality dimensions should be adapted and continuously modified as being part of a dynamic data quality assessment process. This approach could serve countries to evidence the quality of their health indicators and to further discuss strategies for improving and correcting data for known limitations.

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