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 inter-national 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	• Refers to the degree to which data correctly estimate that characteristics they are designed to measure
Coverage	• Refers to the complete list of eligible persons or units and not just a fraction of the list
Consistency	• Refers to comparability over time
Timeliness	• Refers to how up-to-date is data at the time of release
Interpretability	• Refers to the availability of metadata to interpret and use indicator correctly

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.

Fig. 1: Criteria to evaluate each dimension

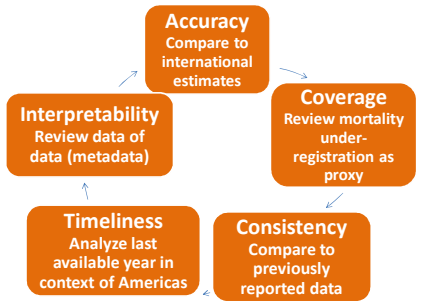
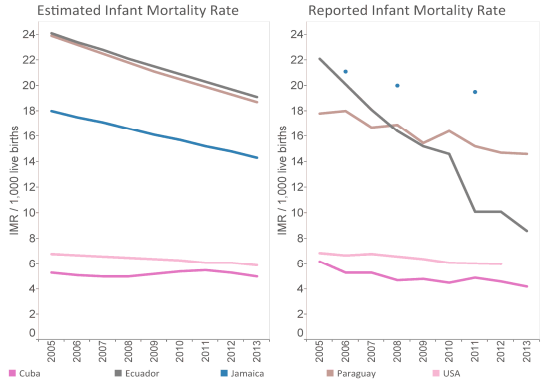


Fig. 2: IMR, reported, latest available year

country	infant mortality rate, country reported	mortality under-registration (%) 2013 (*2011)
Cuba	4.2 (2013)	0
Ecuador	8.6 (2013)	24.4
Jamaica	19.5 (2011)	14.5*
Paraguay	14.6 (2013)	27.5
USA	6 (2012)	1.7

Source: PAHO/WHO Basic Indicators 2015. Washington DC. USA, 2015.

Fig. 3: Inputs to measure accuracy and consistency, IMR from 2005-2013



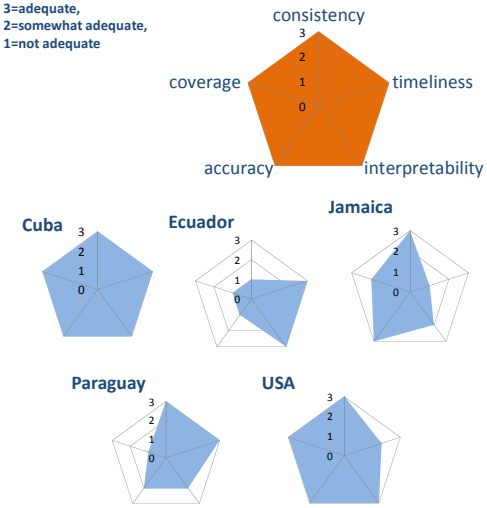
Sources:
Estimated IMR:
Interagency Group for Child Mortality Estimates (IGME). 16 Sept 2014 Update.
Data accessed 10 June 2015 at http://www.childmortality.org

Reported IMR:
Ministries of Health and Health submitted to PAHO/WHO. Refers to crude indicators.

RESULTS

Dimensions and scoring for IMR

3=adequate,
2=somewhat adequate,
1=not adequate



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.

CONTACT

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