System Design Barriers to HIS Data Use in Low and Middle-income Countries: A Literature Review

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Summary

The ability of low and middle-income countries (LMICs) to monitor and measure their progress toward sustainable development health goals is dependent on design, implementation and use of a robust national health information system (HIS). Improved health system performance is directly linked with the use and quality of routine data in a country’s HIS. However, studies have reported several types of barriers that hamper data quality and data use in a national health system of LMICs. To better understand these barriers, we have conducted a systematic review of the scientific literature. The objective of this literature review was to synthesize and summarize the system design-related research and implementation gaps affecting data quality and data use in decision-making. The review made an effort to answer two key questions: (i) what does the published literature tell us about HIS design barriers to data use in LMICs? (ii) What, if any, are the main research and implementation gaps?

The review methodology included a two-pronged search strategy. Under the first strategy, electronic searches were performed in the PubMed, Web of Science, Embase, and Global Health scientific databases. After removing duplicates and papers with no abstract, a total of 307 abstracts (Appendix I) were selected for detailed review. The second search strategy involved consultation with an expert from the MEASURE Evaluation project who has extensive experience on routine data use issues in LMICs. Based on the consultation with the expert and a review of abstracts from the electronic search, a total of 18 papers were selected for full-paper review (Appendix II).

This report provides a comprehensive bibliography of the references identified through the literature review. Future work will include an analysis of these findings and a discussion regarding any implications to HIS data use and design.
Appendix I. Publications identified from electronic search for review

(1) Typhoid fever surveillance and vaccine use, South-East Asia and Western Pacific Regions, 2009-2013. Weekly Epidemiological Record 2014;89(40):429.


(6) Accorsi S. Special session Countdown to 2015 in Ethiopia Countdown to 2015: challenges and perspectives in achieving the Millennium Development Goals in Ethiopia. Articles from the 13th World Congress on Public Health 2013:7-12.


(35) Bandyopadhyay K, Iyer RK. A conceptual model for the adoption of disaster recovery planning by health maintenance organizations. ; 1997.


(39) Bazavan M, Dimitriu R. Medical informatics training programme to support the Romanian health care management information system. Int J Med Inf 1998;50(1-3):145-150.

(40) Bazavan M, Dimitriu R. Medical informatics training programme to support the Romanian Health Care Management Information System. Stud Health Technol Inform 1997;43 Pt B:717-721.


(48) Bhattacharya M, Shahrawat R, Joon V. Understanding level of maternal and child health indicators used in Health Management Information System among peripheral level health functionaries in two districts of India. Journal of Health Informatics in Developing Countries 2012;6(1):385.

(49) Biswas KK, Kabir M, Sidique AB, Mizan S. Monitoring helps services to reach the poor: The urban primary healthcare project in Bangladesh. BMC Proceedings 2012;6.


(70) Damtew ZA, Moges AS. From multiple register to family folder: the transition of data collection and reporting tools for health extension workers in Ethiopia. Journal of Health Informatics in Developing Countries 2013;7(2):99.

(71) de Costa A, Diwan V. 'Where is the public health sector?' Public and private sector healthcare provision in Madhya Pradesh, India. Health Policy 2007;84(2/3):269.


(120) Iluyemi A, Briggs J, Fitch T. Electronic health records in developing countries, integrating with mobile technology and legacy systems for community based health workers: Organisational and end-users' issues. ; 2007.


(127) Ishfaq M, Lodhi BK. Role of GIS in social sector planning: can developing countries benefit from the examples of primary health care (PHC) planning in Britain? J Community Health 2012;37(2):372.


(130) Jeffers Ms, Flores-Ayala R. Continuous household surveys to produce high quality, low cost, and timely nutrition surveillance data. Annals of Nutrition and Metabolism 2013;63:89.


(222) Nyamtema AS. Bridging the gaps in the Health Management Information System in the context of a changing health sector. BMC medical informatics and decision making 2010;10:36.


(255) Scott JS. Community health MIS: They who have the data make the rules. Comput Healthc 1993;14(7):22; 23, 25, 28.


(261) Sharma A, Rana SK, Prinja S, Kumar R. Quality of health management information system for maternal & child health care in Haryana state, India. PLoS ONE 2016;11(2).


(264) Simba DO, Mwangu MA. Factors influencing quality of health management information system (HMIS) data the case of Kinondoni district in Dar es Salaam Region, Tanzania. 2006.


(288) VANHARTEVELT JHW. Information Management in International Development as an Area for Information-Services with a Case in the Field of Health-Care in Ghana. International Forum on Information and Documentation 1993 oct;18(3-4):32-36.


(292) Experience implementing a point-of-care electronic medical record system for primary care in Malawi. : Waters, E., Neno District Hospital, Neno, Malawi; 2010.


(294) Westberg J. Making a difference: An interview with Theo Lippeveld - Revitalizer of routine health information systems. Education for Health: Change in Learning and Practice 2007;20(2).


## Appendix 2. List of publications selected for full-paper review

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<tr>
<th>#</th>
<th>Title</th>
<th>Authors</th>
<th>Journal/ Publication</th>
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<tbody>
<tr>
<td>1</td>
<td>Improving the use of health data for health system strengthening</td>
<td>Tara Nutley and Heidi W. Reynolds</td>
<td>Glob Health Action 2013, 6: 20001 - <a href="http://dx.doi.org/10.3402/gha.v6i0.20001">http://dx.doi.org/10.3402/gha.v6i0.20001</a></td>
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<tr>
<td>5</td>
<td>Results Data Initiative: Findings from Ghana</td>
<td>Development Gateway</td>
<td>Available at <a href="http://www.developmentgateway.org/assets/post-resources/RDI-Ghana.pdf">http://www.developmentgateway.org/assets/post-resources/RDI-Ghana.pdf</a></td>
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<tr>
<td>9</td>
<td>Data Demand and Information Use in the Health Sector-Case Study Series</td>
<td>MEASURE Evaluation</td>
<td>Available at <a href="https://www.measureevaluation.org/resources/publications/sr-08-44">https://www.measureevaluation.org/resources/publications/sr-08-44</a></td>
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<td><strong>Papers recommended by expert</strong></td>
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<td>10</td>
<td>A Conceptual Framework for Data Demand and Information Use (DDIU) in the Health Sector</td>
<td>MEASURE Evaluation</td>
<td>Available at <a href="https://www.measureevaluation.org/resources/publications/ms-06-16a">https://www.measureevaluation.org/resources/publications/ms-06-16a</a></td>
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<td><strong>Full-paper from electronic search</strong></td>
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<td>16</td>
<td>Key influences in the design and implementation of mental health information systems in Ghana and South Africa.</td>
<td>Ahuja S, Mirzoev T, Lund C, Ofori-Atta A, Skeen S, Kufuor A.</td>
<td>Global Mental Health 2016 apr;3:e11.</td>
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