ORCA RESEARCH BRIEF

IMPROVING THE QUALITY OF ROUTINE HEALTH INFORMATION SYSTEM DATA FOR BETTER DECISION-MAKING

KEY POINTS

- **ORCA was a capacity building project running from June 2018 to June 2020. It was initiated by the Ministry of Health (MOH), Ethiopia. 36 experts from the MOH and two key government institutions analysed data from the routine Health Management Information System (HMIS) and suggested ways to improve its quality.**

- **Data on maternal health including antenatal care, skilled birth attendance and postnatal care were consistent, both over time and when compared with external sources.**

- **The coverage of several indicators was higher in the routine HMIS than in the Ethiopian Demographic and Health Surveys. This may be due to issues with the size of the targeted population or over-reporting in the HMIS.**

- **Data on individual vaccinations were consistent over time. However, data on fully vaccinated children showed lower coverage in the Ethiopian Demographic and Health Surveys than in the routine HMIS.**

- **Data on deaths in the first week of life were of poor quality, with only one in eight such deaths reported in the routine HMIS.**

- **The uncertainty of population estimates used for calculating the coverage of health services contribute to quality problems of the HMIS data.**

Based on our comparisons, only one death out of eight that occur in the first week of life was reported in the HMIS.

EXECUTIVE SUMMARY

In Ethiopia, extensive data from all parts of the health system are collected in the routine Health Management Information System (HMIS). If correct and complete, this up-to-date information is valuable for decision-makers to set priorities and steer resources in the health care system. We analysed existing information from the HMIS and compared this with external sources of information, such as the Demographic and Health Surveys.

We conclude that there is a variation in the quality of the data reported in the HMIS. Data on immunizations and maternal health were relatively consistent, both over time, between similar indicators and when compared with survey data. The quality of data on child nutrition, malaria, and tuberculosis was lower. Most notably, the data on neonatal mortality was highly incomplete and we estimate that only one in eight deaths in the first week of life was reported in the HMIS. We also noted that many indicators had coverages well over 100% which could be due to errors in the estimated size of the target populations. There were also regional differences in the quality of HMIS data.

We suggest to align the definitions of indicators with those used by the Demographic and Health Surveys to better enable comparisons of the coverage of health services. We also recommend further triangulation with survey data, primarily the Demographic and Health Surveys. Finally, we suggest addressing the issues of population estimates, as the current uncertainty makes data on the coverage of health interventions unreliable.

A health worker enters information into the register in Mekele. Photo by Christopher Smith/ IDEAS 2019

ABOUT THE STUDY

The ORCA participants were selected from among analysts at the Ministry of Health, Ethiopia, the Ethiopian Public Health Institute and the Ethiopian Pharmaceutical Supply Agency. The participants chose to work in six thematic groups: Maternal Health, Neonatal Survival, Immunisation, Child Nutrition, Malaria and Tuberculosis. To analyse data quality, the thematic groups selected 19 routine HMIS indicators and compared their definitions in terms of numerators and denominators with those used in the Demographic and Health Surveys. The ORCA participants analysed three dimensions of quality: completeness, internal consistency and external consistency. Completeness was defined as the presence of data for the month reported. Internal consistency was analysed in three ways: first, we looked for months with data that were considerably higher or lower than the average (outliers); secondly, the latest year's data were compared with the average of the preceding three years to analyse consistency over time; and thirdly, consistency between related indicators that could be expected to have a logical relationship was analysed. The design was inspired by a WHO Desk Review Toolkit. Finally, we compared HMIS data with information from external surveys to evaluate external consistency.

STUDY RESULTS

Almost all indicators were similar or measured only in a slightly different way, for example, definitions of a skilled birth attendant, between routine HMIS and the Demographic and Health Surveys. The most important difference was that the Demographic and Health Surveys used the international definition of neonatal mortality, which is a death in the first month (day 0-28). In contrast, the indicators in the HMIS measure early neonatal death, which is death in the first week (day 0-6). Very few early neonatal deaths were reported in the HMIS compared to the findings from the surveys. Based on the data from the EDHS, we estimated that only one in eight neonatal deaths was reported in the HMIS when
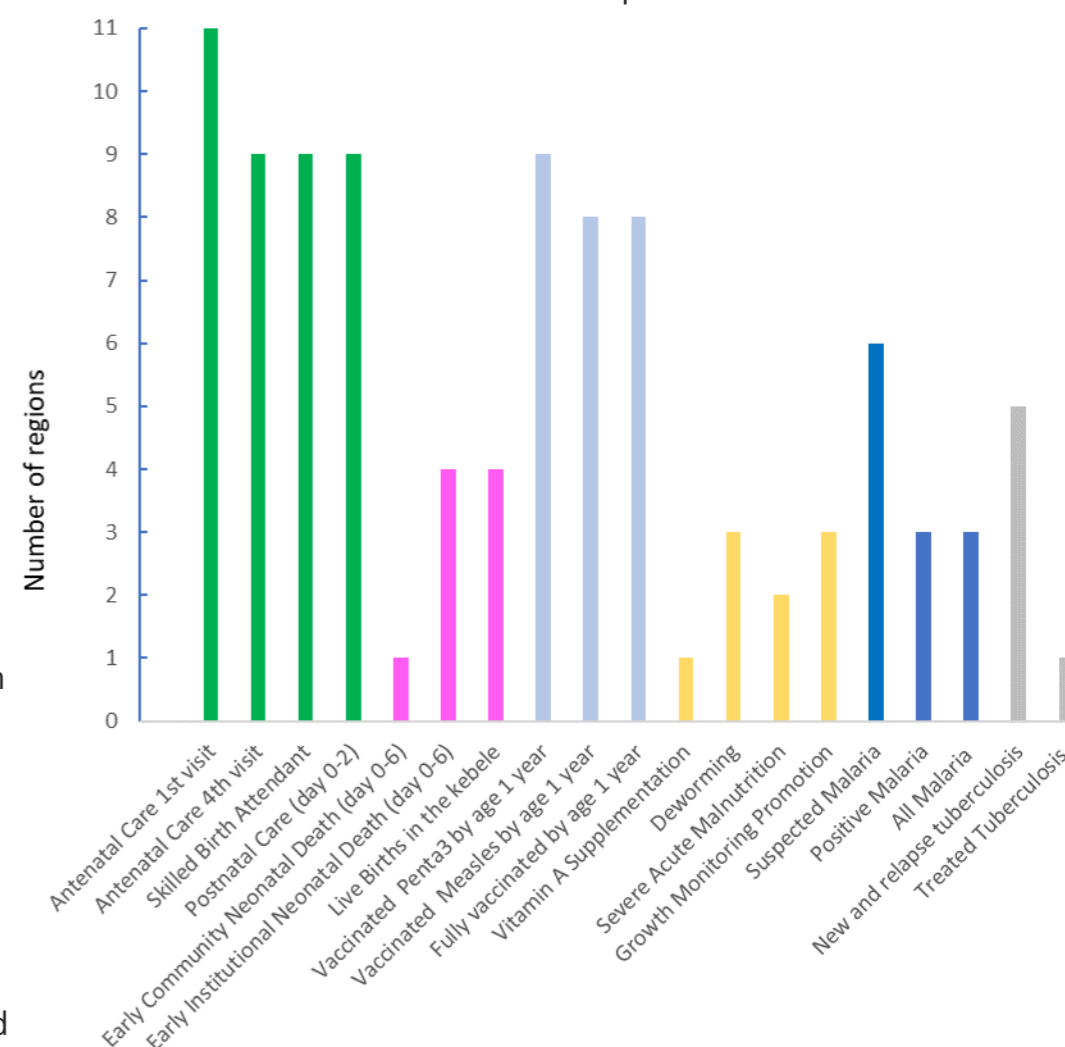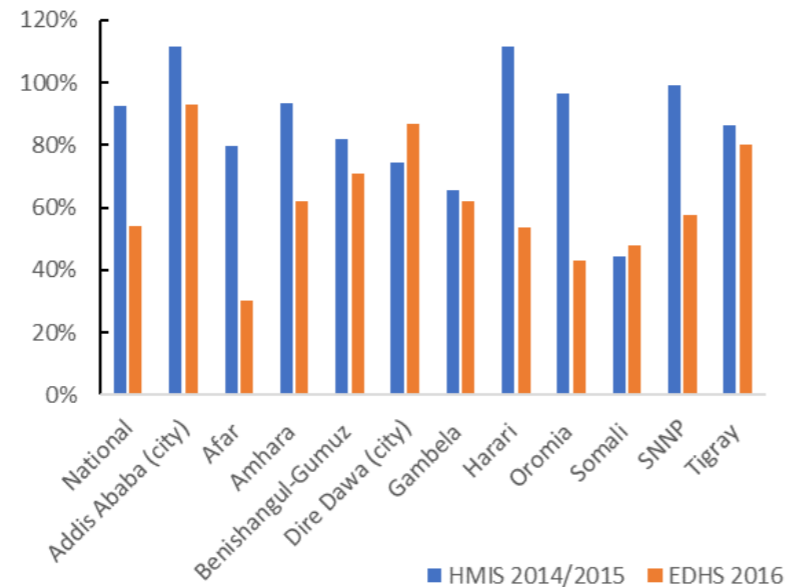

Figure 1. The number of regions and city administrations (in total 11) with consistency over time measured as the last analysed year's data in relation to the average of the previous three years for each of the 19 analysed indicators in the routine Health Management Information system.
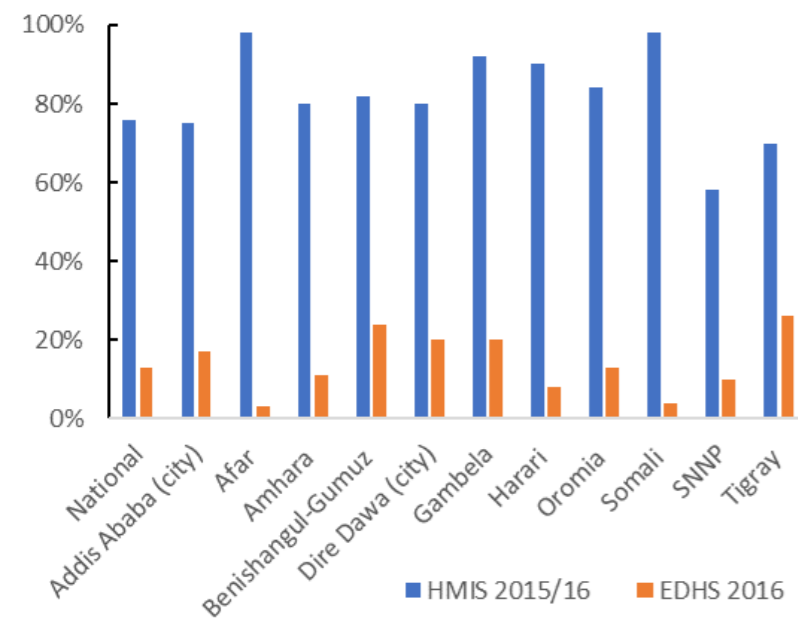
comparing data on mortality in the first week. Most indicators were complete, but there were some extreme outliers. The presence of outliers can sometimes be explained by modes of services delivery, like campaigns for deworming or vitamin A supplementation. The indicators on maternal health (antenatal care visit number one and four, delivery with a skilled birth attendant, and postnatal care) were highly consistent over time in almost all regions and city administrations (Figure 1).
 Coverage for some indicators was well over 100%, indicating that there were problems with the population estimates used as denominators. Consistency between related indicators was good for doses of

2a: coverage of vaccinations against measles

■ HMIS 2014/2015   ■ EDHS 2016

vaccines and number of vaccinated children, but less consistent for issued malaria drugs and cases of malaria, or tuberculosis drugs and cases of tuberculosis. In general, the external consistency when HMIS data was compared to survey data, was low (Figure 2).

■ HMIS 2015/16   ■ EDHS 2016

2b: coverage of deworming of children.

Figure 2: External consistency comparing the routine Health Management Information System data 2014/15 or 2015/16 with the Ethiopian Demographic and Health Survey 2016

CONCLUSION

Ethiopia is investing in the routine Health Management Information System (HMIS) to inform decision-making and policies. Despite improvements, there are discrepancies between data in the routine HMIS as compared to other sources, for example, the Demographic and Health Surveys. The routine HMIS has the advantage of continuously tracking indicators at all levels of the health system. Improving the routine HMIS is pivotal for efforts to achieve the overall goals of Universal Health Coverage as put forward by the United Nations General Assembly in 2012. Our suggestions for ways to improve the quality of routine HMIS data are stated below as implications and recommendations.

IMPLICATIONS AND RECOMMENDATIONS

- **Regular triangulation of routine HMIS data with data from surveys can serve as a reality-check for the HMIS data generated in the health system.**

- **The harmonisation of indicators between the routine HMIS and the Demographic and Health Surveys would enable comparisons of coverage of health services.**

- **Focusing on crucial indicators and reducing the complexity of indicators may simplify reporting and make data more reliable.**

- **Valid population data are instrumental for the quality of data on health services such as antenatal care and coverage of vaccinations. The use of real population data, which is often known locally, instead of projected estimates, would likely improve the quality of data.**

- **Aligning the HMIS indicators to encompass all mortality in the first month of life would likely be of great help for a focus on neonatal mortality.**

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**https://www.lshtm.ac.uk/research/
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