



Assessment of four common underfive children illnesses Routine Health Management Information System data for decision making at Ilemela Municipal Council, Northwest Tanzania: A case series analysis



Severin Kabakama^{a,*}, Sospatro Ngallaba^a, Richard Musto^c, Stephanie Montesanti^b,
Eveline Konje^a, Coleman Kishamawe^d

^a Catholic University of Health and Allied Sciences, Mwanza, Tanzania

^b School of Public Health, University of Alberta, Canada

^c University of Calgary, Cumming School of Medicine, Canada

^d National Institute for Medical Research, Mwanza Campus, Tanzania

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ABSTRACT

Background: In 2012, The Tanzania Ministry Of Health introduced the revised Routine Health Management Information System (RH MIS) modules and registers, and introduced the open source software for data collection at the district council level. Despite a series of data collection tools revisions, the quality of data collated from both public and private primary health care facilities has not been investigated.

Methods: A case series study design was conducted on underfive children outpatient registers and monthly reports on malaria, acute respiratory infections, acute diarrhoea and pneumonia from 10 randomly selected health facilities. The data was entered into excel software and exported to stata version 11 for analysis. The data was analyzed for completeness, timely report submission and reporting accuracy.

Results: The Study found that 62% of the expected data was complete. Around 40% of the facilities submitted reports on time. Private health facilities submitted monthly reports late compared to the public facilities (p -value = 0.039). There was 26% over-reporting of diagnosis. Health centres tended to over-report more diagnoses by 11 times higher than the dispensaries. In addition, private owned health facilities tended to over-report more diagnoses by 6 times higher than public owned health facilities.

Conclusion: The RH MIS data collected through out patients department (OPD) registers on four common underfive children's illnesses at ilemela municipality were of unsatisfactory quality in light of allocation of resource allocations in the comprehensive council health plan.

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1. Introduction

The World Health Organization (WHO) describes information systems as 'pivotal' in the improvement of the quality of health services [1]. The health information system is an integrated effort to collect, process, report and use health information and knowledge to influence policy-making, programme action and research [2]. The quality of the data collected is important for health management, determining community health needs, monitoring of unusual disease trends and outbreaks, and priority setting in health care [3–5]. Furthermore, the analyzed data is a key input for decision makers as they allocate human and financial resources [6,7].

Despite this vital role the Routine Health Management Information System (RH MIS) plays in health management, the data collected is not reliable in most low-income countries, as it is often incomplete due to under reporting and missing data elements and data sets [6–8].

Data quality can be characterized by five dimensions, which include accuracy, timeliness, comparability, usability and relevance [9]. The quality of data is dependent upon the inputs (health workers' technical skills and organizational factors) and the process (data processing, transmission and quality checks) [7,10,11]. In addition, other factors beyond health worker control such as heavy patient workload, staff shortages and lack of diagnostic equipment, can compromise the data quality [12–14]. All these factors contribute to the poor quality of monthly reports submitted to the Council Health Management Team (CHMT) in Tanzania. As a

* Corresponding author at: P.O.Box 1464, Mwanza, Tanzania.
E-mail address: skabaka@yahoo.com (S. Kabakama).

result, the allocation of financial and human resources may not be informed by the true morbidities in the municipality [8,11,15].

Tanzania is planning on extending the District Health Information System (DHIS2) software to all health facilities. It is important, therefore, to determine the quality under the current system, so as to identify where improvements can be made in preparation for the introduction. Using data quality dimensions of completeness, timeliness and accuracy [9], this study examined the quality of RHMIS data of four common underfive childhood illnesses at one of the newly established municipalities in Tanzania, soon after the revised guidelines and registers were introduced.

The four underfive illnesses: malaria, acute respiratory tract infection (ARTI), acute diarrhoea and pneumonia, are included in the study due to their public health importance. According to the Tanzania Health Sector Strategic Plan mid-term review conducted in August 2013, the four diseases contributed up to 71% of the 16 million underfive children Out-Patients Department (OPD) attendances reported in 2012 [16]. Malaria contributed 33%, ARTI 29% and acute diarrhoea 9.0% [16]. The data is more or less similar to the rates provided in 2009 by the Tanzania Annual Health Statistics Abstract produced by the Ministry of Health and Social Welfare [17].

Tanzania has significantly reduced underfive mortality to 81 per 1000 live births in 2010 [13]; however more deaths due to malaria, acute diarrhoea and pneumonia could be prevented. Of the 16 887 hospital reported underfive deaths in 2012, 30.4%, 18.9% and 4.7% were due to malaria, ARTI/pneumonia and diarrhoea diseases respectively [14,16]. Globally, the three diseases accounted for more than one third of the death toll in same year; 10%, 9% and 17% of 6.6 million underfive deaths were due to malaria, acute diarrhoea and pneumonia respectively [18,19]. Almost 70% of these preventable deaths happened in sub-Saharan Africa and Asia.

1.1. RHMIS in decision making in Tanzania context

Paper based RHMIS has been in use since 1994 [20]. According to independent evaluators, it was found to be unreliable, fragmented and with limited feedback mechanism. The Health Information Systems Program (HISP) and partners helped in the development and rollout of the second version of RHMIS countrywide in 1998 [21]. The data management improvement process continued from 2002 to 2007, including standardization of datasets and redesigning of data formats; yet the quality of data did not meet stakeholder's expectations despite huge investments [22–24]. The currently used third version of RHMIS popularly known as *Mfumo wa Taarifa za Uendeshaji wa Huduma za Afya* (MTUHA) III (in Kiswahili) was finalized and released in 2012 [23].

The management of health services in Tanzania is very hierarchical; from the dispensary, to the health centre, to the district, to the region, up to the national level. However, each recognized health facility records patients consultations into paper registers and extracts monthly summaries, using an agreed upon format, to the district RHMIS focal person. At the district level, the monthly summaries from each facility are uploaded to the DHIS2 for electronic transmission to the regional and national data warehouse. Tanzania started using internet-based-open-source in 2012, but only from the district up to the national level [25], behind Kenya (2011), Ghana (2012) and Uganda (2012). Despite being among the developers of the system, financial problems and a lack of political commitment contributed to the delay [25,26].

The services data from the primary health care facilities, which account for 97% (Health Centres are 9% and Dispensaries 88%) of the total number of health facilities in Tanzania, is the main source of data for the planning of routine service delivery [5,16], complemented by demographic health surveys and population and housing census. Planning and resource allocation begins by

undertaking the situation analysis using the locally generated RHMIS and other epidemiological data generated by monthly reports. From these reports, the summarized information is then uploaded into a planning and reporting software called PlanRep3 to generate the district/council health plans.

2. Methods

2.1. Study design

A case series study was conducted retrospectively on the underfive OPD data collected by private and public health facilities from October 2013 to March 2014. Implementation of MTUHA version III in this municipality began in September 2013. The study received ethics approval from Bugando Medical Centre (BMC) and Catholic University of Health and Allied Sciences (CUHAS) joint ethical committee (Ref. CRED/014/2014)

2.2. Study population

The study involved underfive children OPD consultation records available in the registers with four diseases (malaria, acute respiratory diseases, acute diarrhoea and pneumonia) from October 2013 to March 2014. OPD register was selected for the study because all 42 health facilities in the Ilemela municipality conduct outpatient services. This allowed for comparisons across health facilities and comparisons among variables.

2.3. Sampling procedure

There are 42 health facilities in the Ilemela municipality, comprised of 1 hospital, 7 health centres and 34 dispensaries. Twenty six (7 health centres and 19 dispensaries) out of 42 health facilities were eligible for inclusion in the study because they consistently reported to the CHMT from October 2013 to March 2014. The hospital was excluded as it does not belong to the primary health care group of services. Ten (2 health centres and 8 dispensaries) out of 26 health facilities (7 health centres and 19 dispensaries), which are about 43% of the eligible facilities, were randomly selected for the study [Fig. 1]. The sample follows the WHO and UNICEF guideline for small area health system studies [27]. To give equal chance for the health facility to participate in the study, the lottery technique was used to randomly select 10 health facilities after segregating them, first by level of the facility (health centres and dispensaries) and secondly ownership (private and public). All underfive children's diagnoses of interest recorded into the registers were included in the study.

2.4. Data collection

All OPD registers from October 2013 to March 2014 were studied. Actual diagnoses rather than children were counted, such that a child with more than one diagnosis was counted more than once. The diagnoses included were: malaria, acute respiratory tract infection, acute diarrhoea and pneumonia. The management and resources allocation is based on disease conditions rather than the number of children. Also, the monthly reports are according to diagnoses rather than discrete number of patients. Tanzania adopted the International Classification of Diseases (ICD 10) in classifying and reporting the above 4 disease conditions in RHMIS [23]. ARTI and pneumonia were both recorded and reported as separate items in the registers and monthly reports. All 15 data elements per patient's diagnoses as they appear in the register were entered on an excel sheet in a similar format to the registers. The same process was repeated until the full six months period was completed.

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