The use of routine case record data to evaluate quality of inpatient hospital care for newborns and children in Kenya
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Summary

QoC measurement is vital to quality improvement initiatives with the availability of high quality data being central to these assessments. Data only becomes information if it is used, therefore, systems that collate and allow for analysis of data will be essential to allow QoC work at a wider scale. However these systems will be more informative if approaches are developed and tested for 'high volume' data collection with a potential of integrating them into the routine Health Information System (HIS). In this PhD thesis, I have demonstrated how case record data may be used to evaluate quality of care in routine hospital settings in Kenya. In doing this i argue that we need to promote the availability of quality data and its effective use as one means to promote improvement in services provided in Kenyan hospitals.

In chapter 1 I outline the global regional and national perspectives of quality of care assessment using routine records. I give a background to literature on quality of care measurement and the various approaches, either using structure, process or outcome, and the strengths and weaknesses of each. I highlight the gains made in HIC countries and what lessons LICs can learn from these experiences. I then explore and report the state of quality of care in LICs using lessons and experiences from Kenya and other places to illustrate how much has been achieved and the challenges faced. I then look at the ability of routine health information systems in LICs to support quality of care monitoring. I conclude based on this literature that building improved data collection and analysis is vital to quality improvement initiatives at scale. However, routine health information systems are inadequate to evaluate care at present as they collect aggregate patient data that do not allow patient level quality of care assessment. Therefore to reliably report on quality of in-patient hospital care we need to collect patient level data that can allow measurement and analysis of both process and outcome indicators. Finally I briefly state the objectives of the different studies undertaken in this thesis.

I explore the utility of case records for quality of care monitoring in chapter 2. First in chapter 2a I use a convenience sample of newborn and severe malnutrition case records as these face similar challenges in the delivery of care, contribute to a large proportion of mortality in the under-five’s, and have simple evidence-based low cost interventions. I then proceed to evaluate the utility and ability of routine case records to evaluate the effect of an intervention in a tertiary hospital in chapter 2b. In chapter 2c we report the progress over time for various quality indicators using data retrieved from case records across surveys undertaken in a period of 11 years. I conclude that routine data is inadequate for a number of quality of care assessment indicators and interpretation can be confounded by poor documentation.
However, I demonstrate that the use of a standardized admission record form greatly improves documentation and enables improved monitoring of a number of quality indicators.

Mortality is one of the key outcomes of concern to stakeholders. In chapter 3, I explore the utility of routine data in exploring factors associated with mortality. In chapter 3a, I examine the association of mortality with day of admission (weekend or weekday) and whether these associations are also evident in the process of care indicators on weekends or weekdays. In chapter 3b, using a large dataset from 12 hospitals I explore the variation in mortality across sites and factors associated with mortality. I conclude that routine data may be used to identify risk factors for mortality but interrogation of the data for potential biases will be key. I make the case for the continued use of the identified risk factors as these are associated with mortality and might provide the basis for future risk adjustment efforts. I also demonstrate the use of multiple imputation and propensity scores in these analyses as approaches to overcome some of the biases in routine observational data.

In previous literature care has been reported to vary greatly across regions, places (hospitals) and healthcare providers. In chapter 4, I explore the value of case record review data as a means to examine variability in quality of hospital care. I use data from a cross-sectional survey of 22 hospitals. In chapter 4a, I present descriptive results by hospital and pooled across a group of process indicators to illustrate variation across hospitals and indicators. In chapter 4b, I use hierarchical models to illustrate that most of the variability observed in care can be attributed to the hospital/organizational level with less variability explained by the clinician level. I conclude that such analyses may help direct efforts to improve quality at the appropriate system level.

In chapter 5, I discuss the findings of my work in the light of wider literature. Although wider literature and some of the work in chapter 2 illustrate that the quality of routine data can be poor, in the subsequent chapters I demonstrate that it is possible to evaluate care and undertake secondary research using routine data in LICs especially when feasible efforts are made to work with clinicians to improve documentation. I recommend the use of standardized admission record forms to improve quality of data as one, basic approach. Finally I demonstrate the value of collecting data across a large number of sites and over a long period of time in describing variation and risk factors associated with mortality, work which has not been undertaken in a similar way in the past in LICs.

In chapter 6, I conclude that QoC work in LIC is possible at a wider scale but will be more informative if approaches are developed and tested for ‘high volume’ data collection with a potential of integrating
this into the routine health information system. A probable approach in LICs would be to develop intermediary electronic data capture systems which would not only provide data but also a learning platform on how best to deploy electronic medical records in LICs.