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Assessing and improving EHRs data quality through a socio-technical approach

Samuel Darko-Yawson*and Gunnar Ellingsen

Telemedicine and ehealth research group UIT – The Arctic University of Norway, 9038 Breivika, Tromsø, Norway

Abstract

The implementation of Electronic Health Records (EHRs) in developing countries is considered a means for improving data quality and high quality care. However, existing research, indicate that EHRs have recorded greater quantity of bad data instead of improving the quality of data. The reasons for this is not exactly clear. Accordingly, this paper takes a broader socio-technical approach to explore the issues in more detail. The paper explores the relationship between EHRs and quality at the Pentecost Hospital Madina-Ghana by using an interpretative research approach. The result of our study indicates that the EHRs introduced at the hospital have so far had limited effect on data quality and that context-related challenges are the major pitfalls identified in the study. Based on a socio- technical approach the paper discusses the need to; consider users and technology as intertwined, how technology changes practice and how it formalizes roles and responsibilities in the process, why it requires collaborative work and why realistic goals as opposed to exaggerated expectation.

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Keywords: Electronic Health Record system (EHRs); Data Quality; socio-technical approach; Ghana.

1.Introduction

The implementation of Electronic Health Records (EHRs) in developing countries is considered a means for improving data quality and high quality care. Owing to this, governments in developing countries are investing hugely in EHRs in an attempt to improve healthcare and the general performance of public healthcare facilities[1]. However, evidence from the growing body of literature has suggested that the introduction of EHRs, has led to the recording of a greater quantity of bad data instead of improving the quality of data being recorded.[2, 3, 4] Essential to

* Samuel D.Yawson. Tel.: +4740992006.
E-mail address: alonzy1b1@gmail.com

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the problem appears to be that EHRs is implemented and used in a variety of different and complex systems made up of different users with different data interest to generate information that serves as input to healthcare decision. Hence, in order for higher quality to be achieved, the web of interactions always entails humans (social systems) solving problems with limited resources (technical systems) and working around imperfect processes[5] to enhance overall outcome. Along these lines, several studies have shown that defining the data quality seems to be almost as elusive as measuring it, hence there is no single accepted definition for data quality and seems to be shaped by various use contexts. In this study, we take a socio-technical approach to examine the problems more broadly where we also take into account the particular context the EHR is implemented.

We zoom in on one developing country Ghana in Africa, being one of the few African countries that have implemented a substantial amount of EHRs the recent years. Some projects produced both locally and international with the ultimate goal of generating health information to facilitate health intervention and policy building.[6] However, with no existing studies in Ghana as at October 2015, pinpointing exactly how the EHRs has improved quality in healthcare data. The following research questions were addressed by the study: What is the relationship between EHRs, quality and the contexts where it supposed to be used? And how has EHRs been a data quality enabler to healthcare delivery in Africa-Developing countries and what are the implications for implementation strategies of EHRs?

2. Literature review on quality, EHRs and socio-technical systems

Defining and describing EHRs data quality is a key to maintaining and improving it. Ever since the Institute of Medicine[7] described the so-called "quality chasm" in health care, data quality improvement has become an important policy issue. However, studies have shown that there is no clear definition for data quality because quality itself is not straightforward not to think of defining quality for data. There are a variety of views on its meaning and some debate as to what degree quality is measurable. The World Health Organization (WHO) suggests: Quality is a process of meeting the needs and expectations of patients and health service staff.[8] However, while some authors delineate data quality as "Fit for Use" others see data of high quality when it accurately represents what is constructed in the real world it referring to. For example, Chisholm[9] argues that the extent to which the data actually represents what it intended to represent", is more appropriate for defining data quality as "Not just Fitness for Use". This can also be recognized with Orr k.[10] who delineates data quality as "the measure of the agreement between the data views presented by an information system and that same data in the real-world". Deducing from this, the current study although agrees to the above definition, adds to suggest that; data quality is the degree to which the data reality in use evenly meets data expectation, its intended user needs and objective with Conformance to establish quality Standards or properties. In this definition, data reality represents how data exists in the real world settings, evenly of data means free from biased and, data expectation represents the desired features that are required by users for the various operations and decisions. Lastly, the conformance to establish quality standard represent the data ability to comply with established standards and properties. However, based on this description, data can be referred to as poor if the reality of the data does not meet it purposes hence not in usage. As such, the EHRs quality data requirements are also a reflection of data quality properties and component. In much of the literature, quality has been defined through properties including: relevance, accuracy, timeliness, reliability and completeness.

However, a socio-technical approach to the notion of quality also includes the human dimension. A socio-technical approach acknowledges that the system is made up of people, tools, and conversations joined together.[11] Hence, organizational or technical systems cannot be designed independently of each other.[5] The reason being that, the health care environment is multifaceted, implying that different groups use various technologies in complex ways.[12] As such, AHIMA[13] identified that with the introduction of EHRs unlike the PBRs (Paper Based Record system), the role of data quality no longer rest largely on Health Information Management (HIM) professionals, but everyone from administrative and support staff responsible for specialty applications to direct caregivers who document inpatient records will be tasked with ensuring data quality.[13] Again, in a study of three interconnected organizational EHR systems, Payton[14] also concluded with a clear emphasis on the significant role played by physicians in achieving EHR data quality. However, studies suggest that users are often thwarted with apprehension emanating from shift from PBRs to EHR. Hence, users' reluctance to adapt to new technology[15] has led to the poor usage leading to EHRs inability to achieve data quality. This, in turn, suggests that an EHRs should be educated in the lens of the ANT (Actor Network Theory) which delineates information system (EHRs) as an actor with proactive role and users being the other actor within which the EHRs is used so as to better integrate with users'