

## Editorial

# Diagnostic Errors in Low and Middle-Income Countries: Future Health and Economic Burden for Patient Safety

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## Editorial

Diagnostic error is one of the leading causes of medical malpractice resulting in an under recognized patient safety concern [1,2]. Moreover, the health burden has been expanded heavily due to diagnostic error in the past few decades. Globally, an estimated 94,000 -142,000 people died from 1990 to 2013 from adverse effects of diagnostic errors [3]. In developed countries experience ~850,000 diagnostic errors each year; that leads to huge health and economic burden [1]. It is also a rising burden of diagnostic error faced by low- and middle-income countries (LMICs) [4,5]. Whereas compounded through experiences of limited health care infrastructure, disappointingly trained health workforce as well as inappropriate health facilities has significantly contributed to the low quality of health services in LMICs [4]. However, affordability to acquire medicines and access to adequate health care remains a barrier for the people with LMICs while diagnostic error that leads to wrong treatment creates an additional health and economic burden. Regarding the disease patterns, it has been shifted remarkably from communicable to Non-communicable disease accompanied with socioeconomic progress in LMICs [6] due to epidemiological transition attributed by the emerging magnitude of chronic and degenerative diseases. The burden of NCDs accounted for 86% and 37% for high-income and low-income countries respectively in 2008, while it has been assumed to be raised unto one-half of the disease burdens by 2030 indicating NCDs as growing concerns for LMICs [4,6,7]. However, children and elderly are suffered more due to infectious and parasitic diseases and caused a major share of disease burden for LMICs. On the other hand, non-communicable disease (NCD), comprising cardiovascular disease, diabetes, stroke, and chronic pulmonary diseases, has been contributing to increasing patient health burden due to diagnostic error rapidly in LMICs [4,7].

The World Health Organization (WHO) recently prioritized patient safety areas strengthening in primary health care addressing the consequences of diagnostic error, especially for LMICs [8].

A diagnostic error is any mistake or failure in the diagnostic procedure leading to a misdiagnosis, a delayed diagnosis, or a missed diagnosis [9]. It can be considered 'missed' (no diagnosis like as patient missed at different care appointments alarming symptoms), 'wrong' (incorrect diagnosis was completed prior to the true diagnosis) or 'delayed' (the necessary information to make the diagnosis was available earlier) [9,10]. However, it is difficult to determine the three; missed and wrong scenarios, and delayed diagnosis. The evolution of diagnoses over time generally formulates it challenging to isolate a diagnostic error considering the definitions and dimensions. In addition, the diagnostic course can also expand across various providers and in different surroundings [10]. On the other hand, there are no standard guidelines for 'timely' diagnosis for the mainstream of patient health conditions [11].

Diagnostic errors occur from the three different contributing causes such as cognitive errors related to faulty data gathering (Figure 1), faulty information processing and faulty metacognition; systems causes linked to availability and functioning of medical equipment and connection between different practitioners into the health care system [9,12].

Furthermore, different no-fault causes derived from the related to unusual/silent presentation of disease, inconsistent/confusing description from patient, uncooperative patient, limitations of current medical knowledge and failure to arrive at correct diagnosis despite doing the right thing [9,12]. Earlier study found that diagnostic errors has been dominated by cognitive errors (74%) compared with the system errors (65%), however, only 7% through no-fault errors [12].

Diagnostic error might have potential impact on illness, casualty, disability and death which are avoidable and also facing the serious allegations in health platform in LMICs [5,13]. Additionally, inappropriate uses of medicines as a consequence of misdiagnosis might reduce the treatment effectiveness to a great extent [12]. The absence of active public health law and inadequate monitoring, and, in addition to speedy commercialization of healthcare is the leading cause of deterioration of the health care system where patients and patient's family suffers more as a consequence [13]. Furthermore, the limited treatment opportunities have become more expensive and less effective; the clinical outcome and economic expenses due to diagnostic errors are significantly making additional burden to the patients household [14]. The additional medical and non-medical expenses due to diagnostic errors that can further expand ahead of the patients whose bad situations are misdiagnosed and may directed to poverty.

Some specific diagnostic errors such as disappointment to accurately identify infectious disease or recognize mental illness in people with the diagnosis were missed, although also potentially many others with whom that person comes in contact. Although

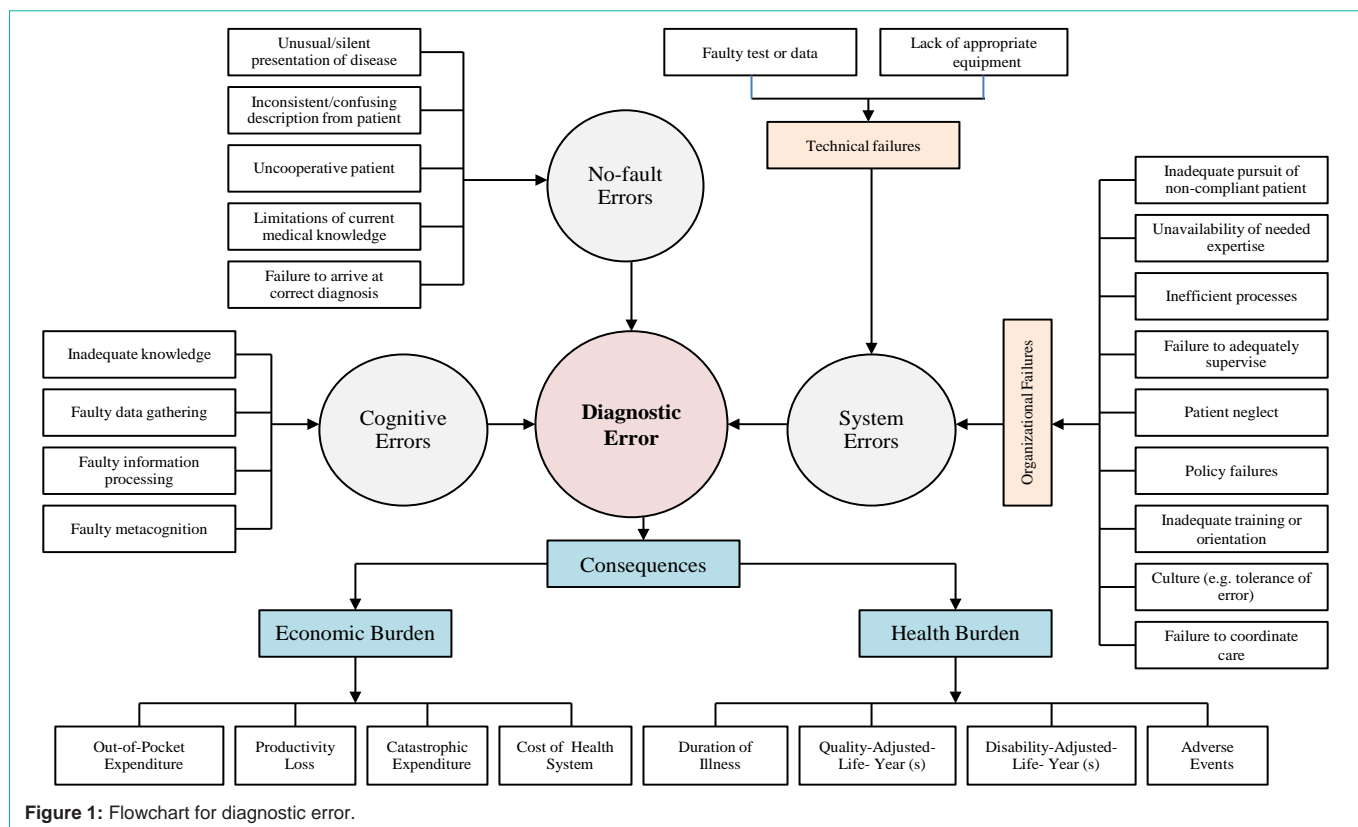


Figure 1: Flowchart for diagnostic error.

pulmonary embolism and stroke are the most common misdiagnosed conditions, however, a number of patients affected through a misdiagnosed for communicable diseases such as HIV infection that might be greater than non-communicable diseases [15]. This type of misdiagnosis for the communicable disease could bring a serious threat to public health worldwide that would also raise the health challenges. Without an uncertainty, the growing virulence and resistance of universal pathogens additional amplify the threat that the misdiagnosis of patients will consequence in broad adverse effects for others. The increasing multidrug-resistant pathogens that breakdown to accurately and quickly diagnose communicable infection has a greater network impact.

More specifically, the tools available for tracking and preventing diagnostic errors, like health information technology (HIT) were less complicated [4]. Advance in HIT recommends new instruments for measuring and reducing diagnostic errors; the authors would suggest developing a proper guideline to train personnel adequately about diagnoses. Central authorities, donor agencies or private foundations could allocate more customized funding for the study and for programs implementation. Furthermore authors also suggest for the root cause analysis to identify the appropriate causes regarding the errors for different clinical conditions; explain downstream of the health condition; and to specify associated factors such as provider, patient, and also associated health system factors that could have impact in reducing rates of diagnosis error as well as to encourage research and improvement in this context.

In summary, actively clinical acknowledge and attend to the growing health and economic costs for regarding diagnostic errors

which might to spot a significant opportunity to provide better care for patients and understand better financial performance designed for health systems to saving of lives, yield significant global health benefits especially in LMICs which might help to accomplish universal health coverage.

References

1. Ker K, Pj E, Lm F, et al. Caffeine for the prevention of injuries and errors in shift workers (Review). *Cochrane Database Syst Rev*. 2010.
2. Fiss T, Dreier A, Meinke C, et al. Frequency of inappropriate drugs in primary care: analysis of a sample of immobile patients who received periodic home visits. *Age Ageing*. 2011; 40: 66–73.
3. GBD 2013 Mortality and Causes of Death Collaborators. Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013 : a systematic analysis for the Global Burden of Disease Study 2013. *Lancet*. 2015; 385: 117–171.
4. Novak MT, Kotanen CN, Carrara S, et al. Diagnostic tools and technologies for infectious and non-communicable diseases in low-and-middle-income countries. *Health Technol (Berl)*. 2013; 3: 271–281.
5. Paul TR, Rahman A, Biswas M, et al. Medication Errors in a Private Hospital of Bangladesh. *Bangladesh Pharm J*. 2014; 17: 32–37.
6. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med*. 2006; 3: e442.
7. Checkley W, Ghannem H, Irazola V, et al. Management of NCD in Low- and Middle-Income Countries. *Glob Heart*. 2014; 9: 431–443.
8. Cresswell KM, Panesar SS, Salvilla S, et al. Global research priorities to better understand the burden of iatrogenic harm in primary care: an international Delphi exercise. *PLoS Med*. 2013; 10: e1001554.
9. Penney FT, Dalal AK. Understanding Diagnostic Error. *Hosp Med Clin*. 2013; 2: e292–303.

10. Singh H, Schiff GD, Graber ML, et al. The global burden of diagnostic errors in primary care. *BMJ Qual Saf.* 2016; 1–11.
11. Zwaan L, Singh H. The challenges in defining and measuring diagnostic error. *Diagnosis (Berl).* 2015; 2: 97–103.
12. Graber ML, Franklin N, Gordon R. Diagnostic Error in Internal Medicine. *Arch Intern Med* 2005; 165: 1493–1499.
13. Karim SMT, Goni MR, Murad MH. Medical Negligence Laws and Patient Safety in Bangladesh : An analysis. *J Altern Perspect Soc Sci.* 2013; 5: 424–442.
14. Croskerry P. Perspectives on Diagnostic Failure and Patient Safety. *Healthc Q.* 2012; 15: Spec No 50-6.
15. Johnson C, Fonner V, Sands A, et al. A report on the misdiagnosis of HIV status. Geneva, Switzerland, World Health Organization: 2015.