AI-Driven Healthcare Fraud Detection

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Abstract

The Bangladesh hospital, clinic and diagnostics center also have a shadow economy in the corridors. As the government is spending more money on healthcare, the truthful situation is that almost 73 percent of all health sales in Bangladesh are still directly paid by patients. Among this great ocean of out of pocket costs, there are certain underwater financial obstacles, be it large bills, informal payments, often called speed money or tips that constitute systemic barriers and place disproportionately on the poor.

Access to healthcare is not just availability to healthcare to millions of people, but an uphill battle against financial drainage that destroys the right to healthcare.

The battle against healthcare corruption is becoming dynamic in 2026 in Bangladesh. Paper-based audits, as much as they are needed, cannot be used to maintain the level and complexity of the current healthcare transactions. Machine learning, in particular, and Artificial Intelligence (AI) can be seen as an increasingly powerful instrument in uncovering irregularities in the organization and restoring its integrity. By redefining corruption as a measurable data anamorphosis as opposed to just a moral shortcoming, AI can help healthcare systems to see red flags that are not visible to a manual auditor and will reduce financial leakage before it hurts the most vulnerable groups.

In Bangladesh, healthcare fraud is hardly ever a one-time dramatic heist. Instead, it occurs as death by a thousand cuts, which is gradually depleting resources of patients, providers, and health programs in general. A popular trend is the phantom billing cycle. Without a single Electronic Health Record (EHR) system in place, diagnostic centers and clinics can submit charges that are based on tests or services that they never provided. The presence of these phantom transactions is usually not brought into attention, it silently swells up the expenses and constrains the resources to assist real patients. On the same note, the issue is also worsened by practices like upcoding and unbundling. Upcoding is the intentional overcoding of a routine procedure by the provider as a complex one, whereas unbundling consists in subdivision of an integrated procedure into various things to achieve the highest insurance or government reimbursement. Individually,

each case is said to be minor, but when combined, they turn out to be a significant financial burden to the healthcare system.

Informal payments, possibly the most widespread of the problems, the shadow tax on the poorest households. It has been reported that in Bangladesh, low-income families have been found paying a large portion of their monthly income on healthcare which is usually much higher than what higher-income families pay. They are often undocumented and informal payments made to gain access to allegedly free services or avoid queuing at the counter or get favors. These practices are not only demoralizing of equity, but also of public health institutions. To the patients, financial and psychological strain of moving into these invisible costs can be disabling to the patients and creates impediments to immediately seeking care where health outcomes are directly influenced by these impediments.

AI, specifically the anomaly detecting models and supervised classification models, has been found to have impressive capabilities to detect the patterns of fraud that human supervision fails to uncover. Challenges Isolation Forests, e.g. are more concerned with the outliers than with the modeling of normal behavior. Fraudulent transactions are generally very small and sparse and the Isolation Forest algorithm isolates frauds by counting the number of splits necessary to divide a transaction out of the whole dataset. This method has been found in experimental applications on large-scale diagnostic data to detect suspicious billing spikes with a very high accuracy of about 91%. AI can be used to prioritize cases, as the large amounts of unstructured billing data can be converted into actionable intelligence by identifying unlikely transactions, thereby causing the investigator to focus on cases that are likely to result in an action.

The less-obvious challenge is informal payments which can be in the form of cash and have a little or no direct trace digitally. Nevertheless, AI is capable of finding indirect signatures, or rather, digital footprints in the surrounding data of operations. As an example, mismatches in wait time of patients, i.e., a situation when some group of patients is always served faster than others with the same medical conditions can suggest the possibility of informal payment. Equally, anomaly detection can be used to help identify cases when supplies or medications billed to patients are indicated as unused in hospital inventory systems, indicating that patients were compelled to obtain their own materials outside. Mapping these latent patterns, AI converts the hitherto non-observable systemic inequity into an observable, actionable data point.

In addition to detection, AI can support governance reform, which entails introducing accountability into healthcare systems. The audit and administrators can prioritize investigations and allocate resources efficiently by identifying anomalies in real time to understand the cases at risk and prioritize them. Bringing the number of informal payments down has a direct effect of reducing the amount of out-of-pocket payments by the poorest patients, putting the country in a step forward to Universal Health Coverage. Meanwhile, maintaining transparency is a way to promote institutional trust: as soon as patients know that billing is being tracked by AI systems without regard to the personal factor, they will be more willing to

comply and feel satisfied with the current state of public healthcare.

Notably, healthcare fraud is a challenging problem that evolves. With the advances in mechanisms of detection, fraudulent activities take new dimensions. In response to this development, AI models continue to add more and more reinforcement learning, and systems can learn new patterns and modify in real time. Such a dynamic strategy would ensure that AI is not destroyed by the ever changing nature of fraud in 2026, that it keeps up with new fraud strategies and that predictive accuracy is constantly being improved.

Structural integration of AI technologies is the way to the clean and transparent healthcare system in Bangladesh. It is important to establish central repositories of transactions that can combine both billing data on the public and the private provider. These national databases that are anonymized ensure advanced analytics and protect patient privacy. Technology and policy need to work together, and AI-generated red flags should be viewed as a valid reason to investigate the matter regardless of the absence of an external legal framework that legitimizes such issues. Moreover, by combining AI with mobile applications (e.g. bKash or Nagad), patients will be able to report any discrepancies on the fly, which creates useful ground-truth data that will constantly update fraud detection algorithms.

Community engagement is important besides institutional reforms. Through enabling patients to be part of monitoring and reporting, AI-based systems can close the divide between the formal auditing systems and user lived experiences. This participatory practice supports the validity of the AI interventions which establish a vicious cycle of detection, responsibility, and citizenship. As an illustration, mobile reporting tools can be used to instantly verify billing anomalies, the response team can react quickly on the situation, in addition to informing patients on their rights and what safeguards are in place to ensure their rights are not violated.

Ethical aspect of AI-based fraud detection has also to be taken cognizance of. These technologies are mighty, but not fallacious. Models sometimes give false positives, or declare proper transactions as suspicious, or false negatives, and fail to detect the fraud cases. Hence, AI needs to be positioned as an addition to human monitoring as opposed to the substitution thereof. Human-in-the-loop protocols, where AI generated alerts are audited by trained auditors, can be used to ensure that the intervention is correct and context-sensitive and fair. This type of protocols strikes a balance between the effectiveness and scale of AI with the compassion and discretion, which is available to human control.

With machine learning, data integration, legal rethinking and community engagement, Bangladesh will be able to turn healthcare fraud detection into a systemic protection. It is a holistic approach: The AI detects anomalies, policies make response formats, and community involvement is ensured to make sure that interventions are based on lived experience. All these measures, combined, can lower the financial obstacles, enhance the quality of the provided services, and regain the integrity of the health institutions of

people.

To sum up, informal payments and healthcare fraud are a silent yet significant problem of the Bangladesh health system that interferes with the access, equity, and trust. With the help of artificial intelligence, anomaly detection, supervised classification, and adaptive learning models, you can reveal all these hidden metrics and restore the transparency. A healthy nation in the age of Smart Bangladesh is not characterized by how well it is able to treat its disease, but rather the ability to achieve how every Taka that it distributes or spends on health really helps the patient. Incorporating AI as a digital sentinel, Bangladesh is not just destroying fraud, but changing the culture of accountability in healthcare to make integrity, equity and efficiency automatic to the system. With 2026 approaching, technology, policy, and community engagement are getting married and represent a trend that gives us a way to a healthcare system where financial exploitation is reduced, access is increased, and people entrust their lives. Along with this vision, AI will not be just a tool; it will become the overseer of justice, the watchdog of transparency, and an initiator of structural change, which will open the way to a fairer and more efficient healthcare environment.