

Original Research

Received 01 June 2026

Revised 23 July 2026

Accepted 07 Aug 2026

Natural Resources for Human Health 2026, Vol. 6 (15s): 634–647

KEYWORDS:

Digital Transformation; Healthcare Incident Reporting; Patient Safety; Quality Improvement; Reporting Culture; Strategic Leadership; Underreporting.

The State and Future of Healthcare Incident Reporting Systems in African Healthcare Organizations

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ABSTRACT: Incident reporting systems are very important for better care and more patient safety, but they have a lot of problems. These aspects of organisational culture can result in underreporting, insufficient feedback for reporters, and protracted data analysis. Reporting systems that work well allow healthcare organisations to detect systemic hazards, conduct investigations of adverse events, and take preventive action. Although the increasing use of electronic methods of reporting, barriers remain, and strong leadership and commitment to digital transformation are required. Improvement will require a holistic, systems perspective that addresses underreporting of events and turns raw data into useful information. Developing user-friendly systems that facilitate interaction with healthcare workers without adding to their burden is crucial. Attitude change from blame to organisational learning should be facilitated, alongside two-way information flow and multidisciplinary teamwork. Participation of leaders in the development of reporting systems with a “human-centred” perspective is a crucial enabler of sustainable improvements in patient safety. This review specifically synthesizes evidence on incident reporting systems in African healthcare organizations, situating it within relevant global comparators (e.g., Austria, Spain, Norway, Estonia) and identifying where African-context evidence is thin.

1. INTRODUCTION

Review question and scope: This review asks: what organizational, cultural, technological, leadership, and policy factors shape the effectiveness of healthcare incident reporting systems in African healthcare organizations, and how do these factors compare with the wider global literature? The synthesis focuses on hospital and outpatient healthcare settings and covers both paper-based and electronic incident reporting systems.

The African evidence discussed in the cited literature represents studies from Benin, Egypt, Ethiopia, Ghana, Mali, Nigeria, Rwanda, South Africa, Sudan, Tanzania, Tunisia, Uganda, and Zambia [8]. These countries reflect the geographical coverage reported in the published African integrative review and are presented here as the settings represented in the available evidence, not as the result of a newly conducted systematic search or as an exhaustive map of all African countries.

It is evident that healthcare institutions around the world are shifting towards an integrated model that focuses on delivering safe and quality healthcare services. This shift is widely regarded as an important measure of how effective health care delivery is [1–3]. A major part of this shift is centered around developing and utilizing incident reporting systems that are considered an

integral part of delivering safe health care [4]. Although initially developed to capture adverse incidents, near misses, and other risks occurring during health care delivery, such systems are now used for other purposes as well, including identifying potential risks to organizations [5]. Error management is no longer just a reactive response to the consequences of error; it has become an essential component of a broader strategic approach to building learning organizations capable of addressing the growing complexity of healthcare environments [1, 2]. In this context, the role of incident reporting systems has shifted from being merely an administrative process to an analytical one, offering insights into errors in process design, communication, training, and the work environment, through documentation, analysis, and feedback of the associated data [4, 5].

This reporting strategy draws inspiration from high-risk industries such as nuclear energy and aviation, which have long relied on systematic, non-punitive reporting to reduce risk and build organizational resilience by learning from small mistakes before they escalate into catastrophic failure. A substantial body of literature supports the view that reporting processes designed to surface mistakes offer valuable opportunities to reduce risk and improve safety culture in healthcare settings [1, 3]. Nevertheless, although incident reporting systems are widely regarded as a cornerstone of patient safety initiatives, their actual value and measurable impact remain the subject of ongoing scientific debate [2].

The assumption that more reports automatically translate into safer care is not well supported by the evidence. For example, a study from a Spanish university-affiliated tertiary hospital (2016–2019) reported an increase of more than six thousand events annually but observed a limited overall effect on the organization [4]. The fact that reporting is now almost ubiquitous, while its downstream effect remains uncertain, suggests that the reporting culture and the learning processes built around it matter more than volume alone [4].

Underreporting remains one of the most persistent obstacles to making these systems effective. Many incidents are never reported because healthcare workers — nurses in particular — fear being held liable, are too busy, find electronic systems inefficient, or doubt that reporting changes anything in practice. In Cairo, surveyed nurses cited lack of time and the absence of clear feedback as the main reasons for not reporting [2]. In the published African systematic review and meta-analysis, Fekadu et al. estimated a pooled prevalence of patient-safety incident-reporting practices of 48% (95% CI 40–56%), with very high between-study heterogeneity ($I^2=98.75\%$) [8]. This pooled estimate should not be interpreted as a uniform rate for all African facilities because the included studies differed in country, setting, participants, definitions, and measurement methods. Even in higher-income settings such as Austria, critical incident reporting is not universal, and there is considerable variance in what is reported and how it is handled [1]. As shown in Figure 1.

African Incident Reporting Systems vs. WHO Standards

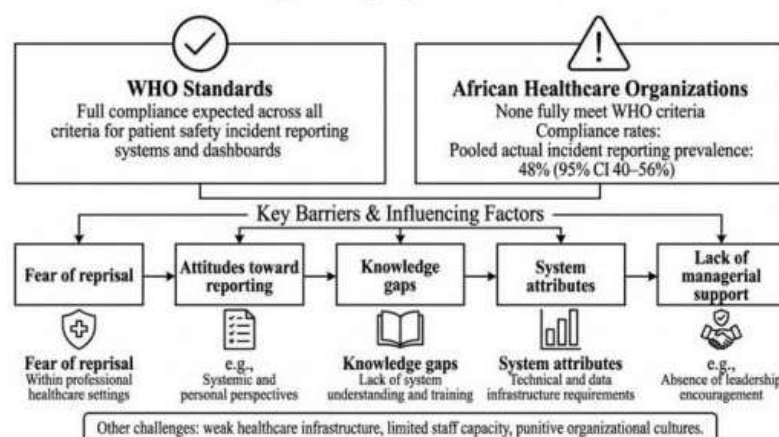


Figure 1. Conceptual framework of incident reporting systems in African healthcare vs. WHO standards.

The success of any reporting system ultimately depends on organizational culture. A punitive culture leads people to deny mistakes, whereas a just culture — one that distinguishes between human error and reckless behavior — increases trust and participation [4]. Organizational leadership matters not only for setting policy but also for resourcing data analysis, building team capability, and acting on reporting outcomes [5].

New analytical challenges have emerged alongside the growth in data volume produced by reporting systems. Thousands of reports must be manually reviewed, consuming significant resources and often yielding only rudimentary analysis. To identify recurrent patterns and latent indicators in narrative reports, healthcare organizations are increasingly exploring artificial intelligence and natural language processing, while retaining human oversight to ensure contextual accuracy and appropriate decision-making [1, 3].

Looking forward, incident reporting systems are expected to become more closely integrated with wider quality management, accreditation, and clinical governance activity, forming part of the information infrastructure that supports strategic decisions [2]. The trend points toward a more proactive approach using predictive analytics to flag potential issues before they escalate, tighter integration with electronic health records, better user interfaces, and greater patient involvement as active partners in safety [5, 6].

2. METHODS

Healthcare incident reporting is slowly shifting from paper to digital, but both methods still have a foothold in everyday practice. Electronic systems are spreading, yet paper-based reporting persists, especially where resources are tight or technology is unreliable. Digitization generally helps — reporting becomes more consistent, data easier to access, and incidents shared faster — but cultural and organizational barriers persist regardless of platform. Paper reporting, meanwhile, brings its own problems: delays, lost forms, and limited capacity for analysis. Even with strong momentum toward digital systems, overcoming these deeply rooted barriers remains a stubborn problem [2].

2.1 Search Strategy and Eligibility Criteria

A transparent, integrative literature search was conducted up to January 2026 using PubMed/MEDLINE, Scopus, Web of Science, and CINAHL. The search focused on four conceptual blocks: (1) patient safety and harm (patient safety, adverse event, medical error, near miss, unsafe care); (2) reporting and learning (incident report, error report, safety report, reporting system, reporting and learning system, safety culture, organizational learning); (3) healthcare settings (healthcare, hospital, clinical, health service, nurse, physician, healthcare professional); and (4) African scope (Africa, African, and the names of African countries). A reconstructed conceptual Boolean structure was: (patient safety OR adverse event OR medical error OR near miss) AND (incident report OR error report OR reporting system OR learning system OR safety culture) AND (healthcare OR hospital OR clinical OR health service) AND (Africa OR African).

The conceptual structure above is reported to make the review question and evidence boundaries transparent. It is not presented as a verbatim database export: the original database-specific search strings, date-by-date search history, filters, and complete search log were not available for reconstruction. Accordingly, this article uses the search as an integrative evidence-identification approach rather than claiming a fully reproducible systematic search or a new pooled estimate. Reference lists of relevant reviews and primary studies were also checked to identify additional sources, and evidence from outside Africa was retained only when clearly labelled as comparative context.

Sources were eligible for the integrative synthesis when they addressed one or more of the following: patient-safety incidents, adverse events, near misses, medical-error reporting, patient-safety incident reporting and learning systems, reporting culture, psychological safety, leadership, reporting-system usability, feedback, or organizational learning in healthcare. Direct contextual evidence was defined as empirical research or an African policy/guidance document concerning a healthcare setting in an African country. Reviews and international studies were included only when they clarified concepts, reporting-system design, psychological safety, or implementation issues and were explicitly labelled as comparative context. Sources were excluded when they were unrelated to healthcare incident reporting or patient safety; addressed only adverse drug reactions or immunisation side effects without a broader reporting-system connection; were editorials, commentaries, letters, conference abstracts, protocols, or non-evidence opinion pieces; or did not provide information relevant to the review question. Where multiple publications described the same evidence, the most complete or authoritative source was retained.

2.2 Study Selection and Reviewer Roles

The available literature was identified by reviewing the search results and reference lists of relevant sources against the eligibility criteria described above. Because the original screening file, deduplication record, full-text exclusion log, and reviewer-level audit trail are not available, this integrative narrative review does not report a PRISMA flow count, a fabricated number of

screened records, or a number of independent reviewers. Instead, the synthesis transparently distinguishes evidence directly situated in African healthcare settings from international comparative evidence. A future systematic update should prospectively register the protocol, preserve the database export and deduplication file, use at least two independent screeners, document full-text exclusion reasons, and report a PRISMA 2020 flow diagram.

2.3 Quality Appraisal and Synthesis

The evidence was organized by study setting, reporting-system type, barriers, enablers, leadership, culture, digital transformation, and patient-safety outcomes. This article did not perform a new study-level CASP or JBI appraisal because the original extraction and appraisal dataset was unavailable. Instead, the methodological quality and limitations reported by the published reviews were considered when interpreting their findings, and direct empirical evidence was distinguished from policy documents, reviews, and international comparative studies. Findings were synthesized narratively and thematically rather than pooled statistically. The 48% reporting-prevalence estimate is attributed to the published African meta-analysis by Fekadu et al. [8] and was not recalculated in this article.

2.4 Evidence Base and Synthesis Overview

This integrative narrative review summarizes the characteristics and findings of major published African reviews, selected African empirical studies, relevant policy or guidance documents, and clearly labelled international comparative sources. No new PRISMA flow counts, study-level CASP/JBI ratings, or pooled effect estimates are reported because the original extraction and appraisal dataset is unavailable. The evidence is therefore interpreted according to its source type, setting, methodological limitations, and relevance to the review question. The 48% estimate is reported as the result of the published African meta-analysis by Fekadu et al. [8], not as a new estimate calculated in this article.

3. RESULTS: THEMATIC EVIDENCE FROM THE INTEGRATIVE SYNTHESIS

3.1 Fear of Blame

The fear of possible retribution remains one of the obstacles preventing proper incident reporting in healthcare. Health professionals may withhold reports because of potential consequences, including possible legal action, which makes reporting feel risky. In a blame culture, mistakes are concealed, which precludes learning and continuous improvement. Creating a supportive environment where mistakes become a source of growth has been shown to increase reporting [3].

3.2 Time Constraints

Time limitation is another major barrier. Health professionals work under constant pressure, with clinical duties prioritized above activities such as incident reporting; a cumbersome reporting system further discourages use [3].

3.3 Occurrences Kept Secret

A further driver of underreporting is reluctance linked to confidentiality concerns. In hierarchical organizations especially, staff may conceal information to avoid the problems associated with reporting. Promoting openness and building trust are effective ways of addressing this [8].

3.4 System Usability Problems

Inadequate system usability is a major technical barrier: difficult interfaces, poor usability, and system bugs discourage reporting. User-oriented systems with simple interfaces and minimal data entry are associated with higher compliance [38].

3.5 Workload Demands

Heavy workload and understaffing are frequently cited reasons for not reporting. When workers are managing too many patients, reporting may seem secondary, resulting in missed opportunities to identify systemic problems. Addressing workload through better resource allocation and supportive management practices can improve reporting behavior [39].

3.6 Doubt About Benefits

Healthcare workers are also less likely to report an incident if they doubt it will help. Without feedback or visible change following a report, providers do not feel engaged in the process. Giving feedback and demonstrating that reports matter are therefore important [8].

As shown in Figure 2, fear, workload, technically flawed systems, and futility beliefs driving underreporting in healthcare incident systems are a common phenomenon internationally, ultimately undermining the core intent of these systems: improving patient safety.

UNDERREPORTING IN INCIDENT REPORTING SYSTEMS: CAUSES & REGIONAL CONTEXTS

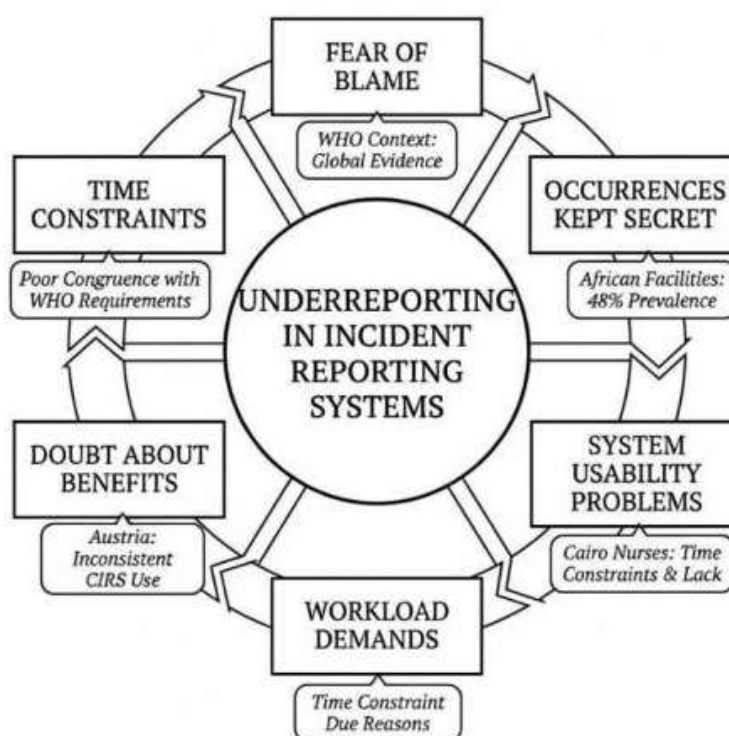


Figure 2. Obstacles to reporting accidents.

4. INCIDENT REPORTING SYSTEMS IN HEALTHCARE: FROM COMPLIANCE TO LEARNING SYSTEMS

Incident reporting systems in healthcare have evolved far beyond their former reputation as paperwork or busywork; they now serve as a front door to learning and improvement [9, 10]. What drives real effect is not the software or forms themselves but leadership, culture, and technology together. Employees who trust their leaders are more likely to speak up about errors or near-misses, helping build a safety culture that treats reporting and learning as a collective activity, in a fair environment where employees feel connected to their organization and contribute to continuous improvement [11–13].

When mistakes are severely punished, when staff and leaders are distant from one another, or when rules are unclear, people simply do not speak up. Fear of blame, unclear reporting guidelines, and absence of feedback are consistently identified as significant hurdles [14, 15]; in these environments, mistakes are hidden and opportunities to learn are lost.

Technology is also reshaping how reporting works: digital tools aim to make reporting easier, data collection more effective, and pattern identification more useful [12, 15]. However, digitization alone does not guarantee improvement — poorly designed technology simply lets reports accumulate without producing real change [10]; the actual benefit comes from turning data into decisions that improve the system as a whole [9].

Reporting systems function best as learning tools rather than as data repositories [10, 14]. Overcoming fear of blame, uncertainty about what to report, and inadequate follow-up requires visibly engaged and supportive leadership [13]; openness and consistent communication make reporting part of the culture rather than a bureaucratic hassle [11].

As reporting systems scale — even to national level — the focus is shifting from the volume of reports to the value of the information generated [10], moving from incident data toward organizational benefits that improve patient safety and quality of care [9]. In short, the state of the art in incident reporting is no longer about compliance alone, but about effective leadership, a just culture, and appropriate technology working together [10, 12]. As shown in Figure 3.



Figure 3. Five interrelated dimensions for transforming healthcare incident reporting systems.

5. THE EVOLUTION OF INCIDENT REPORTING

Incident reporting in healthcare rests on the simple premise that organizations learn best from their mistakes [11–13]. As referenced in the Introduction, high-stakes industries adopted systematic reporting long before healthcare did, and it was not long before healthcare took note [10, 17].

The rationale is straightforward: unless the causes of problems are known, they cannot be fixed [6, 11]. Data collection is no longer just paperwork; it is an essential tool for understanding how and why things go wrong, learning from mistakes, and making patients safer — learning from every near-miss, not merely filing paperwork [9, 12, 13].

Early reporting systems focused primarily on capturing what had occurred — harm that had happened and near misses that had not — encouraging healthcare workers to notice risks and unusual events, and building a base-level database of incidents [10, 14, 17]. Over time, reporting expanded from national programs to individual hospitals, and then to specialized areas such as medication errors and surgical complications [18].

Counting reports alone was never going to be sufficient. Early on, the number of reports was treated as a proxy for safety culture [11], but a reporting system in place does not by itself improve safety [12]; the benefit lies in analyzing reports, identifying what went wrong, and learning from it [9, 13] — moving from reports to understanding, and then to improvements that make a difference [14].

The best reporting systems do more than collect information; they are part of how an organization learns and improves [10, 17], tying reporting directly to analysis, prevention, and process redesign so the same mistakes are not repeated [18]. This is the key to a true safety culture — one in which success means using events to improve care, not merely reporting them [11, 12].

Progress has not been without setbacks: not all incidents are reported, reports are sometimes incomplete, analysis can be slow, and translating lessons into practice remains difficult [9, 13]. New technologies, more sophisticated data analysis tools, and early-warning systems are helping organizations extract more value from the information they collect [10, 14]. Overall, incident reporting in healthcare has progressed from basic record-keeping toward a tool for real learning and change, with each reported incident representing an opportunity for improvement [11, 17].

6. THE PERSISTENT CHALLENGE OF UNDERREPORTING

Reporting systems are integral to the modern approach to patient safety, designed to systematically collect data on errors, near misses, and adverse outcomes from the daily activities of healthcare workers [20, 21], helping organizations detect underlying risks, assess process weaknesses, and implement interventions to mitigate future harm [22]. Despite this central role, reporting systems still experience real limitations in effectiveness — most notably that the majority of adverse events are not reported at all [7]. This narrows the reliability and completeness of the data available for analysis and undermines the scope of patient safety risk that reporting can actually capture [24].

Fekadu et al. reported a pooled prevalence of patient-safety incident-reporting practices of 48% (95% CI 40–56%) across the studies included in their African systematic review and meta-analysis, with very high heterogeneity ($I^2=98.75\%$) [8]. This estimate belongs to that external meta-analysis and was not recalculated in the present article. It should not be interpreted as a uniform rate for all African healthcare organizations because the included studies differed in country, setting, participant group, event definition, denominator, and measurement method.

A significant driver of underreporting concerns organizational and human factors, including fear of legal culpability, punishment, or reputational harm [20]. Doctors, nurses, and allied health professionals may avoid recording incidents if they believe they, or a colleague, will be held personally at fault. A learning-oriented safety culture is fundamentally incompatible with a culture of caution, secrecy, and defensive practice fostered by this fear [21].

This dynamic is well documented in the psychological-safety literature. Edmondson's classic study of medication-error reporting in hospital nursing units found that higher-performing teams reported more errors than lower-performing teams — not because they made more mistakes, but because team members felt psychologically safe enough to disclose them [45]. This reframes reporting rate itself as a potential marker of team climate rather than of underlying error frequency, which is directly relevant to interpreting reporting statistics from African facilities in this review.

Workload and time constraints also make underreporting more likely. In a fast-moving clinical environment, reporting is often perceived as tedious and bureaucratic relative to more pressing clinical demands, and the disconnect between real-world workflow and organizational expectations contributes to incomplete incident documentation [23].

Weak feedback loops compound an already strained reporting system [7]. When healthcare workers receive no actionable feedback — no visible changes to procedures or policy — they come to feel their reporting effort is wasted, and disengage from reporting altogether [24]. Reporting behavior is also shaped by professional role, with nursing staff often contributing a disproportionate share of reports relative to physicians, introducing occupational bias into the dataset [25]. Collectively, these factors compromise the validity of incident reporting datasets for estimating true error prevalence, comparing organizations, or tracking longitudinal safety improvements [20].

Ultimately, the central problem is organizational capacity to translate reported information into action [21]. Investigations of reported incidents are often superficial, hindered by limited resources, limited analytical capacity, or the absence of multidisciplinary evaluation models [22]. In healthcare organizations, investigations are often limited by resources and analytical capacity, leading to temporary fixes such as awareness or training rather than sustained system change [23].

Addressing these issues requires a comprehensive approach [22]: a culture of blame-free learning in which reporting mistakes is a positive step toward better care [13]; reporting systems that are easy to use and do not add to clinical workload; robust feedback that shows reporters what happened and what changed as a result [7]; in-depth, multidisciplinary incident analysis that examines systemic and organizational factors rather than relying on superficial awareness or training interventions [25]; and proactive use of collected data for organizational learning, decision-making, and policy refinement rather than letting it sit unused [25]. The economic consequences of adverse events should also be considered when prioritizing improvement actions [30].

7. CULTURAL BARRIERS IN HEALTHCARE INCIDENT REPORTING SYSTEMS

Incident reporting systems face difficulties that go beyond technical and physical issues. At the root of these difficulties lies a complex web of cultural dynamics that shapes staff attitudes toward errors and responsibility [13, 31], including but not limited to fear of punishment and the professional identity and sense of belonging of staff members [5].

7.1 Fear of Blame: More Than Just Punishment

Fear of blame is not a fleeting emotion but a deeply ingrained culture that shapes staff behavior and decision-making [3]. Where reporting errors is perceived as evidence of incompetence and a reputational risk, reporting is inherently fraught [27, 29]; individuals recognize that reporting can carry direct and indirect career consequences and stigma [28], reinforcing silence and non-reporting, and perpetuating a cycle in which risks remain hidden and patients remain at risk [4].

7.2 Lack of a Just Culture: Differentiating Error from Recklessness

Without a just culture, speaking up about a mistake feels like inviting punishment rather than solving a problem [29]. A just culture helps organizations differentiate human error, at-risk behavior, and reckless behavior [32]; without it, staff struggle to separate professional responsibility from the risk of punishment, and speaking up becomes a threat to identity rather than a route to resolution [32]. In such environments, trust in leadership and transparent practice are key to motivating reporting, with leaders acting not only as managers but as catalysts for safety [5].

7.3 Feedback and Perceived Value: Bridging Effort and Outcome

Another major obstacle is the perception of gaining nothing from reporting [3]. Without tangible changes or results, reporting feels like a waste of time [13], contributing to a culture of silence [4]. Feedback is essential for sustaining engagement, since it lets reporters see the value of their contribution to the organization [29].

7.4 Hierarchical Structures and Professional Silos

Organizational structure and professional divisions strongly shape cultural barriers [5]. Strong hierarchy and professional silos create intangible obstacles around who can report, when, and how [31]; staff may resist reporting to someone from another professional group, or perceive reporting as outside the boundaries of professional conduct [13]. Immediate supervisors are often the single most influential factor in staff reporting behavior [31].

7.5 Cultural Transformation: Towards a Safe and Inclusive Environment

Addressing these cultural barriers requires reshaping organizational culture: redefining core values, improving transparency, securing solid leadership support, and building reporting systems that are both effective and secure [3, 13, 29]. Reporting should be reframed from a procedural exercise into a professional and ethical responsibility that contributes to patient safety and quality [4, 29].

8. GLOBAL VARIATIONS IN HEALTHCARE INCIDENT REPORTING SYSTEMS

Incident reporting varies significantly across healthcare systems worldwide, largely due to differences in infrastructure, legislative requirements, and cultural context [5, 6]. Some systems emphasize transparency, timely intervention, and feedback [3], while others face fear of punishment, low institutional trust, and inadequate resourcing for reporting and analysis [29, 32]. Effective reporting therefore depends on more than technology: it requires a health system's ability to adapt to different cultural and social settings and to build genuine motivation among leaders and staff [28].

In low- and middle-income countries, reporting systems often exist but are unevenly developed and poorly integrated across care levels, appearing more procedural than learning-oriented [14]. In high-income countries, reporting regulations, accountability structures, and tools are typically more advanced, but face different problems: standardizing data quality, sharing information across databases, and actually using reported data to improve safety [17, 33].

9. DIGITAL TRANSFORMATION IN HEALTHCARE INCIDENT REPORTING SYSTEMS

The effectiveness of a reporting system cannot be judged by the number of reports it receives [34, 35]; it should instead be judged by the system's ability to convert gathered information into knowledge that improves patient safety and care quality [38, 40]. Documenting errors alone does not guarantee fewer mistakes or safer care — the real value lies in an organization's capacity

to analyze data, extract lessons, and implement practical changes to clinical policy and procedure [38, 40]. Investigations of serious patient harm also illustrate the importance of structured learning processes and follow-through [37].

Education plays a crucial role in reporting-system effectiveness [40]. Gaps in practitioner knowledge about patient safety, risk management, and reporting can lead to inaccurate reporting [34], making capacity-building investment essential [35], with a consistent message that reporting is a tool for learning, not punishment.

Notable patient-safety improvements have often followed from prioritizing incident reporting at national level — through legislative policy that encourages reporting, funding for safety initiatives, and dedicated agencies to monitor and analyze reported incidents [37, 39, 41]. However, healthcare, social, cultural, and economic circumstances differ by country, meaning a centralized approach that succeeds in one country cannot be assumed to transfer directly to another without adaptation [35]. Balancing global best practice against local realities remains a common challenge, alongside underreporting, data quality, and translating findings into policy [35, 38]. It is the quality of the information obtained through reporting, not the quantity of reports, that raises the standard of patient safety and care [38, 40, 42]; adequate resourcing, training, national support, and local adaptation are all necessary for developing good reporting systems [39].

10. LEADERSHIP AND CULTURE

Reporting effectiveness ultimately comes down to two things: how leaders lead, and how the organization actually works day to day. Leadership shapes whether patient safety is treated as genuinely important or as another item on a checklist [11]. When leaders demonstrate openness and a willingness to learn from their own mistakes, others follow — knowing they can report without fear of reprisal [22]. When leaders are distant, inflexible, or quick to assign blame, reporting stalls, mistakes recur, and the system loses the opportunity to learn from them [44].

This is not achieved through policy documents and memos alone; it requires genuine connection with staff, modeling the desired behavior, and communicating why patient safety matters [22]. Leaders should be approachable, and staff should feel comfortable raising issues with them, with clear means to report easily.

Organizational culture matters just as much: where people feel safe to speak up and are not blamed for honest mistakes, reporting becomes a tool for genuine improvement [44]. Organizations that reward speaking up and act on what is reported are the ones people want to help make safer [11]. A strong reporting culture requires leadership at every level — senior leaders genuinely committed to safety, middle managers supporting the team day to day, and team leaders keeping the conversation going while preventing blame for genuine mistakes [10, 40]. Good leadership and culture ensure that reporting is not just about technology or process — people feeling safe enough to speak up is the key to lasting change in patient safety [10].

11. DATA ANALYSIS AND LEARNING IN HEALTHCARE INCIDENT REPORTING SYSTEMS

The purpose of collecting incident data is to support learning and improve patient safety, but making sense of that data is complex. Good data analysis is what turns individual reports into meaningful evidence [25]. A major barrier to effective analysis is the data itself: reporting-system data is biased and unrepresentative of the true underlying rate of error, meaning it cannot reliably be used to calculate error rates, compare organizations, or assess change over time [25]. An increase in reported incidents does not necessarily indicate a worsening safety situation — it may instead reflect improved reporting behavior. Incident data is best used to identify local system hazards and to learn from rare events [22, 23].

Despite these limitations, meaningful analysis and insight remain possible. Classification systems such as the Health Information Technology Classification System (HIT-CS7) can help identify machine-to-software or use-related issues and track change over time in digital incidents [7], pinpointing where interventions in digital health systems can be targeted [24, 25]. The WHO recognizes reported incidents as an important information source, but emphasizes moving beyond individual reports to identify systemic trends, patterns, clusters of harm, and emerging sources of risk [12, 14]. Digital transformation offers an opportunity to capture more data, but the real challenge — and opportunity — is building more intelligent analytics that extract genuine information from that data and sustain organizational learning around patient safety [9, 19]. The hard part is moving beyond counting incidents to understanding cause and effect [23].

12. FUTURE DIRECTIONS IN HEALTHCARE INCIDENT REPORTING SYSTEMS

The proposals in this section are forward-looking. They should be interpreted as directions for future research and implementation rather than as established solutions demonstrated across African healthcare systems.

Incident reporting systems continue to evolve alongside advances in technology, growing understanding of human factors, and the ongoing pursuit of patient safety improvement [1]. Future research should examine whether advanced analytical methods, including artificial intelligence and machine learning, can help identify patterns in incident reports or support risk assessment beyond standard descriptive methods. These applications remain prospective in the present review: their accuracy, clinical usefulness, fairness, interpretability, and effects on reporting behaviour must be evaluated in real healthcare settings before they are used to guide preventive measures or policy [7, 9].

Any future use of AI or predictive analytics in this area should therefore be preceded by local validation and an explicit governance process. Human oversight must remain part of the decision loop because narrative incident reports contain contextual, linguistic, and organizational information that automated systems may misinterpret. Patient and staff confidentiality must be protected when free-text reports are processed, stored, or shared with external platforms; model bias, unequal performance across facilities, and the risk of punitive use should also be assessed. In many African healthcare organizations, strengthening data quality, infrastructure, workforce capacity, and trust may need to precede — rather than follow — AI adoption.

Tackling underreporting should remain a foundation for future work, including developing new methods to protect reporter safety, exploring reward programs, and creating multiple avenues for reporting [2, 8]. Greater standardization of reporting systems is also needed as digital transformation continues, addressing decentralized digital processes through standardized terminology, data definitions, and system interoperability that support data exchange and aggregation across health environments, jurisdictions, and countries [1, 18].

There is also growing recognition of the importance of patient and family involvement in reporting and learning from incidents; future work should explore how to actively involve patients and families in reporting, identifying, and learning from incidents to improve safety [16]. Ultimately, future incident reporting systems should be smart, integrated, and people-centric — not just collecting data, but supporting learning, building a true safety culture, and driving real improvements in patient outcomes [9, 19].

13. IMPLICATIONS AND RECOMMENDATIONS IN HEALTHCARE INCIDENT REPORTING SYSTEMS

A close review of existing healthcare incident reporting systems reveals three main areas of impact: theoretical frameworks, practical application, and policy development. The underreporting, data-usage, and cultural challenges identified throughout this review point to the need for a broader, coordinated solution enabling these systems to function as intended [22].

13.1 Theoretical Implications

The findings underscore the relevance of socio-technical systems theory to incident reporting: effectiveness depends not on technology alone but on people and their interaction with organizational culture [18, 20]. Underreporting also warrants greater attention from behavioral economics and psychological safety research, given the powerful disincentive created by fear of blame and retaliation [21]. Concepts such as trust, risk perception, and leader-member exchange within organizational justice provide useful frameworks for addressing these behavioral barriers [13, 25].

13.2 Practical Implications

Creating a Just Culture: The central practical challenge is moving from a punishment culture to a justice culture — distinguishing human error, at-risk behavior, and reckless behavior, and focusing on fixing problems rather than assigning blame for reasonable mistakes. Leaders should visibly model reporting as a learning opportunity, not an admission of guilt [25].

Improving System Design: Reporting systems need user-friendly digital interfaces, simplified forms, and mobile accessibility. Reducing administrative burden on frontline staff is associated with higher reporting rates [24].

Strong Feedback Loops: Organizations should ensure reporters receive feedback on outcomes. When reporters see that their reports lead to investigation and improvement, they are more likely to continue reporting [18].

Ongoing Training: Continuous staff training should reinforce the goals, procedures, and benefits of incident reporting, emphasizing both the importance of patient safety and the non-punitive nature of the system [25].

13.3 Policy Implications

Standardization and Interoperability: National and international policy should encourage standardized terms, data definitions, and interoperable reporting systems, enabling comparison and shared learning across facilities, jurisdictions, and countries [19, 28].

Just Culture Policy: Policy should support building a just culture within healthcare organizations, including legal protection for staff who honestly disclose mistakes, and clear separation between data used for learning and data used for discipline [38, 39].

Promoting R&D: Governments and funders should support R&D in advanced data analysis for incident reporting and implementation science, including AI/ML methods for identifying hidden patterns and predicting risk, subject to the validation and oversight caveats noted in Section 12 [40].

Leadership Development Programs: Policymakers should support leadership-development programs to build safety culture, psychological safety, and effective use of reported data to inform systemic change [11, 13].

Addressing these theoretical, practical, and policy considerations can help healthcare organizations better leverage incident reporting as a cornerstone of patient safety and continuous quality improvement.

CONCLUSION

Incident reporting systems in healthcare do not receive nearly enough credit, even though they are essential for keeping patients safe and improving care. The literature broadly agrees on the core idea: learn from mistakes so they do not recur. Actually making these systems work well, however, remains a real struggle.

The same obstacles recur across settings. People underreport because they fear blame or are simply too busy; there remains a frustrating gap between collecting data and turning it into something useful; and organizational culture in many settings still makes genuine transparency difficult.

There is, however, a clear path forward. A just culture is needed — one in which reporting is seen as valuable to everyone's safety rather than as a personal risk. Simplifying the reporting process, providing real feedback, and using better data analytics all help, and leadership matters throughout: leaders must build trust, demonstrate that honest mistakes will not be punished, and push for openness for these systems to work.

For African healthcare organizations, the available evidence suggests that improving incident reporting requires more than adding technology. Management support, training, adequate staffing, usable reporting processes, confidentiality, timely feedback, and visible action on reported concerns are recurring organizational conditions associated with reporting and learning [8, 11, 13]. Evidence represented in the cited African literature includes South African specialized-care settings as well as studies from Ghana, Uganda, Ethiopia, and other countries; the limited country-specific evidence should not be treated as representative of the entire continent [8]. These conditions are consistent with the concept of psychological safety: healthcare professionals are more likely to speak up about errors and near misses when they expect respectful treatment and believe that reporting will lead to learning rather than automatic blame. Just-culture and psychological-safety interventions should therefore be adapted to each organization's legal, professional, linguistic, resource, and governance context while preserving fair accountability for reckless conduct.

This review has several limitations. First, it is an integrative narrative synthesis rather than a de novo systematic review or meta-analysis. The original database-specific search strings, search history, database export, screening log, full-text exclusion record, and study-level extraction/appraisal file were unavailable; therefore, no new PRISMA flow counts, CASP/JBI ratings, or pooled estimates are reported. Second, the 48% prevalence estimate is taken from the published African systematic review and meta-analysis by Fekadu et al. [8], with substantial between-study heterogeneity, and should not be interpreted as a uniform estimate for all African healthcare organizations. Third, an earlier unverified underreporting estimate was removed because its source population, outcome definition, and denominator could not be verified. Fourth, the African evidence is unevenly distributed across countries and settings, and findings from the published evidence should not be generalized to the entire continent.

Finally, evidence on psychological safety, leadership, organizational justice, and digital transformation includes international comparative studies; these sources, including work on ethnic health inequities [26], provide conceptual or comparative context and should not be interpreted as direct evidence from all African healthcare systems. These limitations support the need for a prospectively registered, reproducible, and country-sensitive systematic update.

Getting incident reporting right takes sustained effort across every dimension. It is not just about following rules — it is about understanding what makes people feel safe to report and what makes organizations actually learn from what is reported. Where healthcare teams build trust in the system, use good tools to analyze what happened, and ensure lessons lead to real change, they move closer to delivering safe, reliable care every day.

Acknowledgements

The authors thank their respective institutions — the Arab Academy for Science, Technology and Maritime Transport (AASTMT) and Nile University — for their support of this work.

Author Contributions

Conceptualization, S.E.E.G.; methodology, S.E.E.G. and S.Y.M.; investigation, S.E.E.G. and S.Y.M.; writing—original draft preparation, S.E.E.G.; writing—review and editing, S.Y.M. and M.S.M.; supervision, M.S.M. All authors have read and agreed to the published version of the manuscript.

Conflict of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

Ethics Statement

This article is a literature review that synthesizes previously published evidence. It did not involve the collection of new data from human participants or animals, and ethical approval was not required.

Data Availability Statement

No new data were generated for this review. All data supporting the discussion are available within the cited publications listed in the References section.

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