TITLE: LEARNING FROM HEALTHCARE COMPLAINTS: CHALLENGES AND OPPORTUNITIES

The number of complaints received by healthcare organisations from patients and families is on an upward trajectory[1]. For example, in 2023–2024 the NHS in England received 241,922 complaints[2], an increase of 5% on the previous year and 37% since 2013–2014. Moreover, while only 0.4% of NHS patient encounters result in a formal complaint, just 9% of patients who report poor healthcare experiences actually submit one[3].

Although the motivation for complainants can vary – for instance, some patients seek redress, and others want resolution of ongoing problems – they nearly always request organisational learning[4]. Furthermore while complaints can be incorrect or ill-intentioned, leading to concerns about their validity[5], the collective scale of the information they provide is hard to dismiss. They are, in effect, a massive rolling compendium of ethnographies from patients and families at the sharp end of treatment delivery, revealing perceived problems on their, often extensive, journeys through healthcare organisations.

The potential of healthcare complaints to support organisational learning is well established and has been studied internationally[4]. First, the importance of complaints as a data source is widely understood. Studies find them to provide user-centred and unvarnished accounts of end-to-end healthcare experiences, and, because patients are independent of the cultural factors that undermine staff reporting, they can reveal problems in quality and safety missed by hospitals[6 7]. Second, the validity of complaints has been demonstrated. They are associated with outcomes such as hospital mortality, reflecting their ability to provide high-validity information on safety incidents, and to capture real and important problems in treatment delivery[8 9]. Lastly, the ethical case for learning from complaints is clear. Complaints capture the voices and deliberately expressed priorities of vulnerable patients and

families, and offer a way for organisations to remain grounded in the needs and experiences of their users[10] .

Therefore, the question for policymakers and practitioners has moved beyond asking *whether* complaints should be used to improve quality and safety in healthcare, to *how* they should be used. In this issue, Hansen and colleagues[11] address this question through a scoping review of 54 studies that use complaint material with the aim of improving healthcare quality. They observe that complaints tend to be used primarily for monitoring quality rather than guiding quality improvement (QI) initiatives. Oftentimes the number, content and cost of resolving complaints is used to monitor and test the effectiveness of interventions aimed at improving care (e.g., on waiting times or staff attitudes).

Interestingly, 33 (61%) of the articles were published since 2015, highlighting how complaints are increasingly integrated into QI. In the subset of articles (n = 24) that reported using complaints material to initiate improvements, these drew on information about issues such as malpractice in maternity care, diagnostic delays, or problems in communication. Yet, while such efforts to learn from complaints were clearly laudable, they tended not to be based on validated or systematic analyses, and studies did not fully document how QI initiatives were undertaken.

The review therefore paints a picture of healthcare organisations wanting – and trying – to learn from complaints, yet perhaps finding it difficult to do so. Given the international nature of the review (with studies from 15 countries) this observation is likely replicated across healthcare systems globally: researchers, staff, and managers recognising the opportunity that complaints offer for improving services, but facing barriers in achieving this[12]. In particular, two interlinked challenges need addressing. The first relates to untangling the types of insight that complaints provide for improving quality and safety; the second concerns how these insights can be efficiently and reliably extracted.

UNTANGLING THE INSIGHTS THAT COMPLAINTS PROVIDE

For healthcare organisations to learn from complaints, it is important that the insights they provide on quality and safety are clearly delineated and explained. Yet doing so is not straightforward, as complaints report on issues that must be responded to at the individual level while also being learnt from at the institutional level[13]. Furthermore, complaints do multiple things: they voice concerns, describe healthcare journeys, ask questions, express dissatisfaction, initiate dialogue, prompt action, and even sometimes complain about complaint handling. This is different from, say, an incident report, and means that although complaints can provide quite distinct and diverse insights on quality and safety, these are challenging to isolate and extract[14]. Disentangling these insights is key for enabling learning in healthcare organisations, and I propose complaints to provide three core insights.

1. Incidents and problems

Most obviously, complaints provide concrete information on perceived quality and safety incidents: events where unintended harm occurred or nearly occurred, or healthcare delivery was poor. Examples include neglect, diagnostic mistakes, infection control lapses, malpractice, delays, or errors during procedures. As observed by the study of Hansen and colleagues, the value of this information is that it supplements rather than duplicates existing sources of information. This is because patients observe ‘blind spots’ difficult for healthcare staff to recognise or report on (e.g., mis-communication between hospital units, inaccurate patient notes), hot spots of emerging problems (e.g., in maternity care), and can enrich understanding of known events (e.g., diagnostic errors)[15].

The challenge for healthcare organisations is distilling this information into action. Analyses should focus on: (1) identifying the most severe or harmful/potentially harmful

incidents reported in complaints, particularly those uniquely identified by patients; (2) specifying the most prevalent forms of problem being raised, and where they occur; and (3) distinguishing between 'low hanging fruit' that can be easily addressed (e.g., an equipment failure), and systemic issues that require coordinated effort to resolve (e.g., diagnostic procedures). These steps can help to ensure that learning is centred on the issues with the greatest safety implications, those affecting many patients, and that organisations demonstrate responsiveness to complaints whilst also addressing systemic challenges.

2. Safety culture

More subtly, complaints provide insight into safety culture, which broadly relates to values, norms and common practices for ensuring safe treatments[16]. For example, complaints can reveal issues in norms for how hospital staff communicate, attitudes toward safety (e.g., dismissing concerns), or entrenched practices for rule-breaking (e.g., in hygiene control). Such insights are drawn from analyses of complaints that operate at an aggregated level, rather than focussing on specific incidents.

By analysing the number and severity of broad complaint types, such as those relating to poor communication or consistently poor-quality care, healthcare organisations can derive insight on the cultural factors shaping outcomes. Following theory on 'single-loop learning' and 'double-loop learning' [17], this is important because if incidents in safety and quality stem from cultural issues, they will be difficult to address without cultural change (e.g., around attitudes, reporting behaviours, or how staff are supported). Cases such as the Mid-Staffordshire scandal in England emphasise this, as complaints were not only triggered by and revealing of dysfunctions in hospital safety culture, but attempted to correct these dysfunctions and bring them to the attention of leaders[13].

3. Learning

Less commonly discussed, complaints also provide valuable 'meta-data' on a healthcare organisation's capacity to address and learn from problems in safety and quality, along with the cultural issues that underlie these problems. This is because insights for improving quality and safety are not only revealed by the content of complaints, but by organisational responses to them. For example, if hospitals keep receiving complaints on the same topic over time (e.g., poor medication safety practices), or if leaders respond defensively to feedback – for instance not resolving complaints or downplaying the issues they raise – this may indicate problems in either the attitudes or systems used to monitor and improve quality and safety.

The above capability is sometimes referred to as 'corrective culture'[18], which relates to an organisation's ability to continuously learn and adapt in response to problems. How healthcare organisations address complaints provides insight on this, revealing strengths and areas for improvement. For example, if complaints about a specific issue cease, or the overall profile of complaints shifts – becoming more numerous but less severe – this may reflect greater openness to feedback and the presence of effective learning processes.

ANALYSING AND GENERATING INSIGHTS FROM COMPLAINTS

The second challenge in learning from complaints is practical: how should healthcare organisations analyse and generate reliable and valid insights from healthcare complaints? This problem lies in the unstandardised, complex, and textual nature of complaints. If complaints are on average a thousand words[8], an organisation such as the English NHS will have received approximately a quarter of a billion words of feedback in the past 12 months. Although, as Hansen and colleagues observe[11], well-established methods such as the Healthcare Complaints Analysis Tool[15] exist to manually analyse complaints, the resource

implications are challenging. For example, assuming it takes one hour to analyse a complaint (for responding to it and drawing insights), this amounts to roughly 95 years (35,000 hours) of staff time. The scale of data introduces further issues, such as how reliability of coding is ensured, data is aggregated, and insights for improvement prioritised.

AI-augmented complaints analysis

The solution for the above problem will partly reside in recent advances in artificial intelligence (AI) capabilities for analysing text. These developments are fundamentally changing how organisations manage textual data. This is because natural language processing algorithms can be used to score and code near-limitless amounts of textual data, and surface high-relevance segments for qualitative analysis. For complaints analysis, developments in AI are potentially revolutionary because they can support staff to read and classify complaints, assist them to generate improvements, and provide real-time and dynamic analyses that feed into quality and safety monitoring indicators for leaders.

Concretely, three approaches may be used to support complaints analysis at both the local and organisational level. First, concept classifiers, which identify and quantify the use of particular phrases or terms in a text, can be used to identify the presence of very specific conditions, events, or phenomena[19]. Second, word embeddings, a technique that measures the semantic similarity of words or sentences to target concepts, can be used to identify and surface text on particular topics (e.g., incident reporting), and scale the severity of this[7]. Third, large language models, which generate meaning from human language, can be used to interrogate complaints and probe emerging trends or recurring observations (e.g., suggestions for improvement)[20]. Table 1 provides further information and examples.

Table 1. Potential applications of AI-augmented text analysis for drawing insights from healthcare complaints

Incidents and Problems	*Concept Classifiers.* Identify and code the presence and frequency of specific words or phrases describing particular types of incidents and problems in complaints (e.g., handover errors). These analyses are relatively basic, but can provide high-level overviews of complaint data (e.g., frequency of certain events within a trust) and isolate relevant text segments for qualitative investigation and developing solutions. *Word Embeddings.* Evaluate and score each sentence or complaint based on whether it relates to safety incidents or specific problem types (e.g., communication). These more advanced analyses can assist coders by pre-scoring text for classification, surfacing paragraphs or letters most relevant for analysis, and supporting overall evaluations of healthcare organisations (e.g., measuring the focus of complaints on quality concerns). *Large Language Models (LLMs).* Analyse and summarise key or frequently reported observations from patients and families about incidents and problems. LLMs can also be used to generate potential solutions or recommendations based on complaint content. Suggestions or analyses must be reviewed and validated by humans to ensure appropriateness and contextual understanding.
Safety Culture	*Concept Classifiers.* Calculate the prevalence of words and phrases related to aspects of culture within individual complaints or across healthcare organisations (e.g., references to safety, staff attitudes, or cultural norms more broadly). A high frequency of terms can serve as a basic indicator of potential cultural issues (e.g., poor staff attitudes), and surrounding text qualitatively analysed to explore the underlying causes. *Word Embeddings*. Score the degree to which culture, or specific aspects of it (e.g., speaking-up), is discussed in each sentence or complaint. These analyses can also grade the severity of the text (e.g., using sentiment analysis) and generate organisation-level evaluations of how prominently cultural issues feature in complaints. Text identified as highly relevant can be surfaced for qualitative investigation. *Large Language Models*. Evaluate and rate the extent to which individual and aggregated complaints focus on safety culture, and summarise the key issues being raised. LLMs can also generate potential solutions based on the concerns expressed, though outputs must be reviewed to ensure relevance and accuracy.
Learning	*Concept Classifiers*. Less useful for analysing organisational learning, but can be applied to assess whether written responses to complaints are open and engaging. For example, by detecting words that indicate listening or phrases that demonstrate acknowledgement of the issues raised. *Word Embeddings.* Score the defensiveness of written responses to complaints. For instance, by identifying language that invalidates concerns, psychologises patient feedback, or evades issues. Analyses can provide an overall assessment of defensiveness at the organisational-level and highlight individual complaints that may not have been effectively addressed. *Large Language Models.* Evaluate whether the issues raised in complaints have been meaningfully engaged with in written responses to them, and whether any solutions have been proposed. These analyses can help assess the quality of learning from complaints.

AI algorithms should not replace humans in coding, interpreting, responding to, and learning from complaints, but instead can help them to analyse complaints, and discern insights for monitoring and improvement. This will require AI-supported dashboards that

allow staff to easily interface with and categorise complaints, the development of new skills for coding complaints, sense-checking data, and analysing trends, and also education on the underlying algorithms so that staff can interpret and challenge outputs.

The benefits of technological advances in AI will simultaneously reduce the resources needed to analyse complaints, potentially improving reliability and standardisation of analysis, and enable the integration of data across organisations longitudinally. It will also allow the linking of high-level scores for profiling the complaints sent to a hospital or system (e.g., on the pattern and severity of safety incidents) to the underlying textual data within complaints, thereby supporting solutions for improving quality and safety. Human oversight remains key to avoid analyses become overly superficial or too formulaic, which would hinder learning.

CONCLUSIONS

The scoping review by Hansen and colleagues shows that whilst healthcare organisations are increasingly trying to use complaints to improve quality and safety, applications need development. To realise the opportunities of healthcare complaints for learning, healthcare organisations must address two challenges. The first is to manage the complexity of complaints by clearly identifying the types of insights they offer about quality and safety, and how these can be learnt from. The second is overcoming the unstructured and textual nature of complaints by harnessing advances in AI for analysing and generating insights from the data. Solving these challenges will improve the efficiency and quality complaints analysis, and help to ensure that the insights and perspectives of patients and families are listened to and learnt from. Learning from complaints is not only a means to improve quality and safety, but an ‘acid test’ of a healthcare organisation’s corrective culture.

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