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Systemic Analysis of a Large-Scale Organisation Failure in UK healthcare

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Abstract. Simple linear approach prevalent in the majority of healthcare incident analyses has been the target of criticism and is not felt to be effective in complex systems, such as healthcare. STAMP (System Theoretic Accident Modelling and Process) is felt to be a promising method for the improvement of healthcare incident analysis. This study, therefore, aims to explore the applicability pf STAMP in healthcare through the case study of the STAMP application to the large-scale organisational failure at Mid-Staffordshire NHS Trust between 2005-2009. The effectiveness of the STAMP applications was evaluated with feedback from healthcare stakeholders on the usability and utility of STAMP. Healthcare stakeholders were generally positive about the utility of STAMP in providing a system view and guiding consideration of interactions between system components. However, many felt it to be complicated method that would specialist expertise to apply. From the findings of the research, recommendations are made to improve STAMP and to assist future applications of STAMP in healthcare.

Keywords: Patient Safety Incident Investigation, STAMP and CAST

1   Background

Current healthcare incident analysis processes are felt to produce ineffective remedial actions, often focusing on the retraining of individuals and small policy change. Issues with the quality of incident analyses have been linked to the choice of analyst and analytical approach; with investigations conducted by clinical staff that lack safety expertise, using Root Cause Analysis (RCA), a method that often describes incidents as being the result of a linear chain of events [1, 2].

This research project aimed to investigate the applicability of Systems-Theoretic Accident Model and Processes (STAMP) in the analysis of patient safety incidents in UK healthcare. As an accident causation model and analytical approach, STAMP strongly embodies the concepts of systems theory and provides an analysis of human decision-making. Causal Analysis based on STAMP (CAST) may be used to guide the

analysis of patient safety incidents to consideration of system safety and sustainable solutions for patient safety issues. Nonetheless, the healthcare stakeholders that conduct incident investigations have very limited exposure to STAMP. For successful adoption in healthcare, STAMP would need to be introduced to, and accepted by, healthcare stakeholders. With this consideration, this research project aimed to apply STAMP in the analysis of patient safety incidents, involving healthcare stakeholders in the analysis and investigating their perceptions of STAMP.

2   Methods

The applicability of STAMP in healthcare was investigated through the large-scale organisational failure at Mid-Staffordshire NHS Trust between 2005-2009. The analysis in this study used the reports from the Healthcare Commission investigation (176 pages) [3], the independent investigation under the NHS act [4] and the public inquiry [5] as data. The first report consisted of two volumes (455 and 367 pages), the public inquiry report consisted of an executive summary (125 pages) and three volumes (692, 668 and 434 pages).
Causal Analysis based on STAMP (CAST) was applied in accordance with Leveson's published guidance [6] and using the organisational error taxonomy provided by Stringfellow [7]. An initial analysis was conducted by the author with the analysis outcomes discussed with another HFE researcher until an agreement was reached. The safety control structure and further analysis on safety-related responsibilities, context, unsafe decision and control actions, and mental model and feedback flaws at multiple levels of the control structure were carried out prior to the engagement with the healthcare stakeholders. The control structure was presented on an A3 sized page and further analyses were carried out with healthcare participants.

Eighteen healthcare professionals involved in patient safety work were recruited for interviews/workshop. Each interview/workshop started with a half-hour presentation on the STAMP background, concept and principles. The control structures (Figure 1) created by the researchers was validated by healthcare participants first and further CAST analyses (Figure 2) were facilitated. The participants' feedback on the usability and utility of STAMP were collected using a set of the statements/questions and a 5-point scale (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree).

3   Results

3.1   STAMP analysis

Figure 1 shows the safety control structure developed in the analysis providing an overview of the system. Due to the size of the control structure, a simplified diagram is provided. The further full CAST analysis is very detailed, so only one example at a governance level is provided in Figure 2.
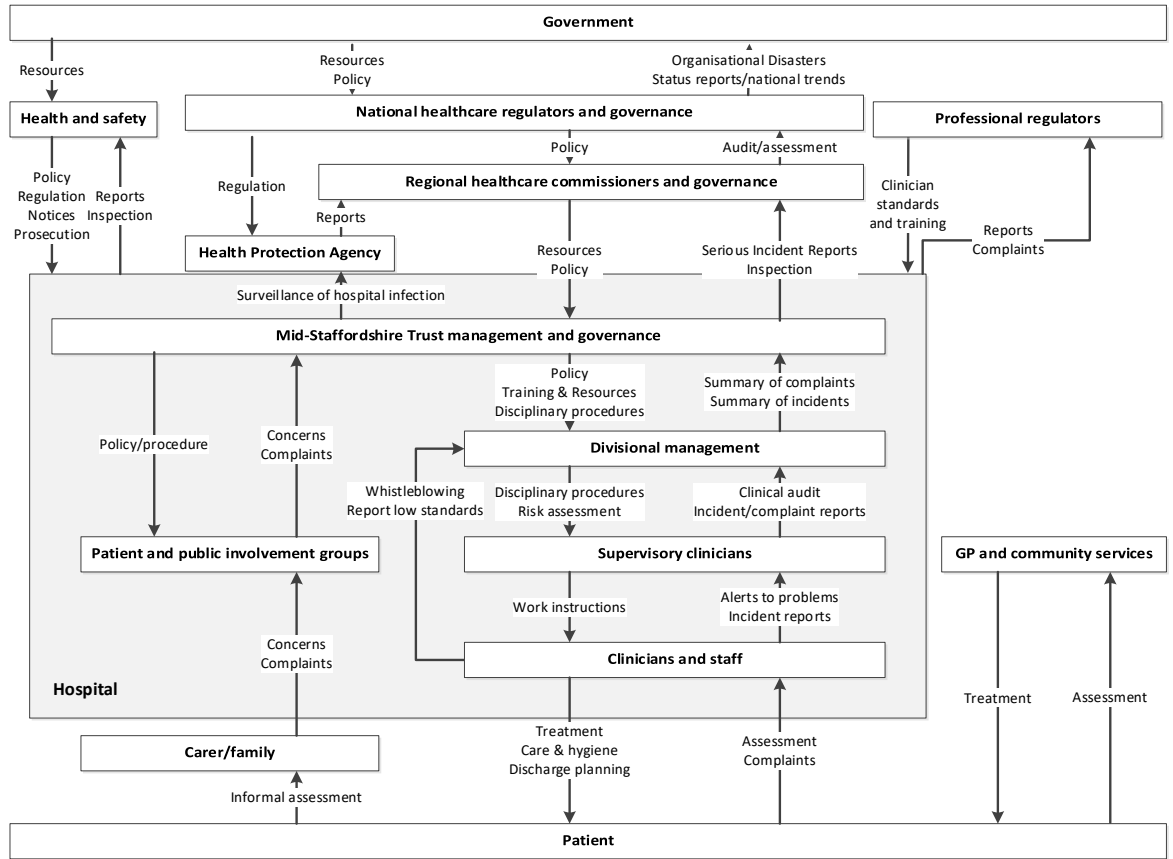
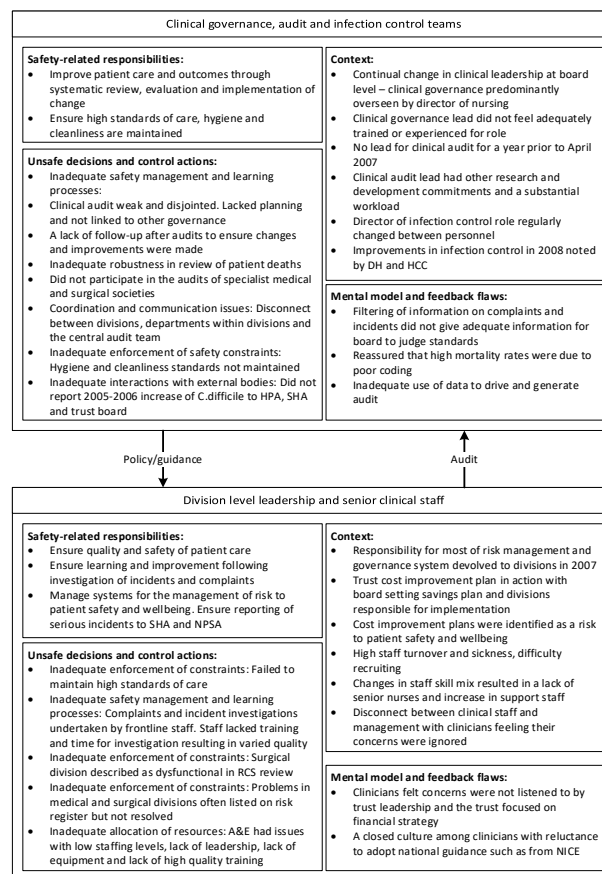**Fig. 1.** Mid-Staffordshire incidents control structure (simplified)

Fig. 2. Clinical governance level analysis

3.2 Participant responses on usability of STAMP

Responses for STAMP's usability are presented in Figure 3, participants were more negative about the usability of STAMP than they were its utility, with 45% of participants disagreeing that it was easy to understand (72% neutral or negative) and 34% disagreeing that it was easy to apply (78% neutral or negative). Responses on usability are dependent on the way STAMP was presented and the time available to explain and demonstrate STAMP. Several participants made comments about needing more time and practice with the method, however, they were largely positive about the presentation of STAMP (56% positive responses) and the provision of templates in the control structure output (61% positive).
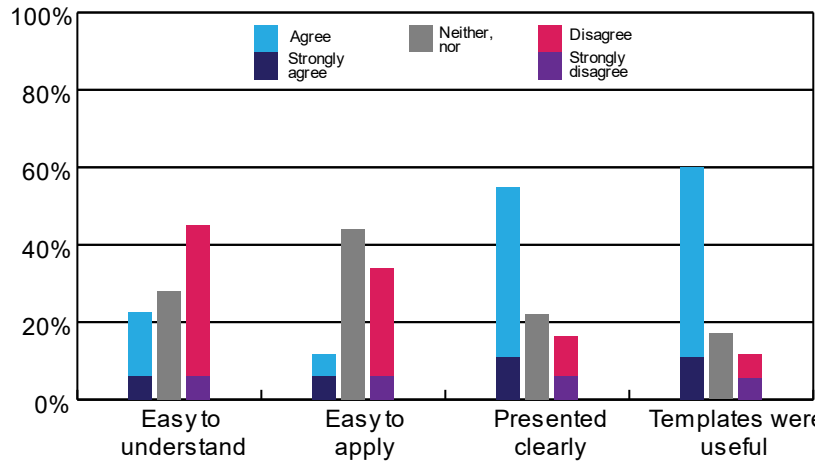
Fig. 3. Healthcare participants' perception on STAMP usability (n=18)

3.3 Participant responses on utility of STAMP

The scale-based responses on the utility of STAMP in healthcare are presented in Figure 4. Most of the responses were positive, particularly in terms of STAMP's relevance to healthcare and the method giving a different perspective, with 78% of participants giving a positive rating (agree or strongly agree). Participants were more negative about how useful the application of STAMP was in learning from the incident and in helping to make recommendations (17% disagreeing to both statements), the reasoning behind this is explored further in the answers to open-ended questions.
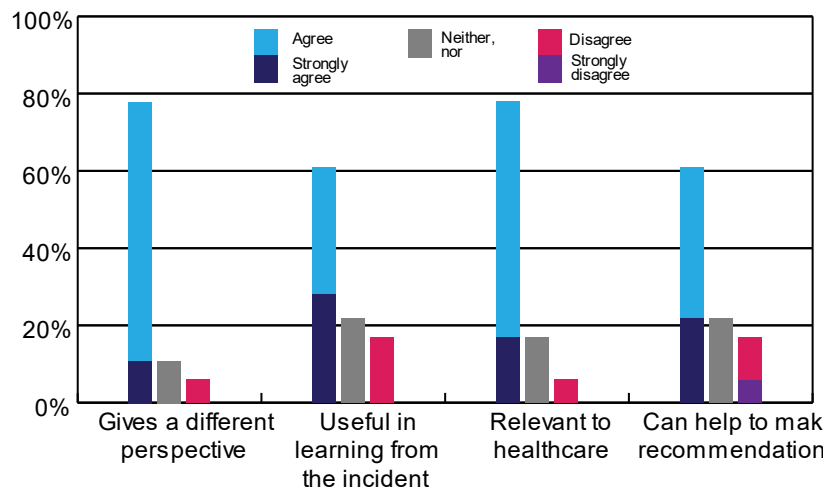

Fig. 4. Healthcare participants' perception on STAMP utility (n=18)

4   Discussion

The application of STAMP to the Mid-Staffordshire case organised the public inquiry data into a format of control-feedback structure and process models for human decision-making. STAMP was a good fit for the issues of vertical alignment within the hospital and connections to external organisations. STAMP was both descriptive and revealing in providing a way of organising and communicating the underlying system issues. One benefit of the use of STAMP was the visual output in the safety control structure diagram and process models, which allowed for discussion of the case with participants. Healthcare stakeholders were generally positive about STAMP's utility, but less positive about its usability. A main theme arising from the healthcare stakeholder comments regarded a system versus person perspective in viewing incidents and incident cause. In keeping with Reason's [8] warning for issues at the extremities of both a system and person perspective. Some participant comments displayed a wariness of the systems view of STAMP and the potential detraction from individual responsibility and professionalism that is highly valued in healthcare. Along with issues of underplaying the role of personalities and attitudes in safety management, there was a concern that a high-level system view may not consider the detail and nuances of healthcare work. Taking a system view the impact of personalities and attitudes could be considered as a failure of the system to effectively identify and control for these issues [9] but it may still be that a STAMP-based investigation overlooks these types of problems.

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