



## Policy and practice in the use of root cause analysis to investigate clinical adverse events: Mind the gap

Davide Nicolini<sup>a,\*</sup>, Justin Waring<sup>b</sup>, Jeanne Mengis<sup>a,c</sup>

<sup>a</sup> Warwick Business School, The University of Warwick, Coventry CV4 7AL, United Kingdom

<sup>b</sup> Nottingham University Business School, United Kingdom

<sup>c</sup> University of Lugano, Switzerland

### ARTICLE INFO

#### Article history:

Available online 26 May 2011

#### Keywords:

Patient safety  
Root cause analysis  
Incident investigation  
Policy translation  
Organizational learning

### ABSTRACT

This paper examines the challenges of investigating clinical incidents through the use of Root Cause Analysis. We conducted an 18-month ethnographic study in two large acute NHS hospitals in the UK and documented the process of incident investigation, reporting, and translation of the results into practice. We found that the approach has both strengths and problems. The latter stem, in part, from contradictions between potentially incompatible organizational agendas and social logics that drive the use of this approach. While Root Cause Analysis was originally conceived as an organisational learning technique, it is also used as a governance tool and a way to re-establish organisational legitimacy in the aftermath of incidents. The presence of such diverse and partially contradictory aims creates tensions with the result that efforts are at times diverted from the aim of producing sustainable change and improvement. We suggest that a failure to understand these inner contradictions, together with unreflective policy interventions, may produce counterintuitive negative effects which hamper, instead of further, the cause of patient safety.

© 2011 Elsevier Ltd. All rights reserved.

### Introduction

In line with the global patient safety agenda, an increasing number of healthcare institutions have adopted structured investigation processes as a way of learning from clinical incidents. This approach to organisational learning is based on the assumption that through determining the underlying causes of adverse events and drawing the necessary lessons, it is possible to prevent their reoccurrence (Donaldson, 2000). A common way to investigate clinical incidents is through Root Cause Analysis (RCA), a methodology combining elements from engineering, psychology, and the 'human factors' tradition (Reason, 1990; Vincent, Taylor-Adams, & Stanhope, 1998). As indicated by its name, RCA directs analytical attention to the root or latent factors that condition, enable or exacerbate clinical risk with the aim of producing recommendations on how these underlying causes should be managed or eradicated (Carroll, Rudolph, & Hatakenaka, 2002).

While RCA is formally endorsed by policy makers in USA, UK, Australia, and Denmark (Øvretveit, 2005) and is in the process of

being adopted by other countries, we have only a partial understanding of the challenges of using this approach, despite research suggesting it is not without problems (Braithwaite, Westbrook, Mallock, Travaglia, & Iedema, 2006; Iedema, Jorm, Braithwaite et al. 2006; Iedema, Jorm, Long et al., 2006; Wallace, 2006; Wu, Lipshutz, & Pronovost, 2008). Building on an extensive 12-month ethnographic study within two large acute hospitals in the UK National Health Service (NHS), we examine how the investigation of clinical incidents is conducted in practice. Our main aim is to determine the challenges of using the RCA approach and to understand where such challenges originate. Our main finding is that the problems observed stem from an inherent tension that derives from RCA being conceived not only as an improvement technique but also as a governance tool. We argue that the approach, which originally responded to a logic of learning, empowerment and decentralisation, is often translated into practice as a bureaucratic mode of legitimisation and governance. Although these principles often co-exist, at times they diverge so that the effort is averted from producing organisational learning. We argue that a better understanding of these tensions may help introduce corrective actions which may lead to a better use of this particular approach to improve patient safety.

\* Corresponding author. Tel.: +44 24 76524282.

E-mail addresses: [davide.nicolini@wbs.ac.uk](mailto:davide.nicolini@wbs.ac.uk) (D. Nicolini), [Justin.Waring@nottingham.ac.uk](mailto:Justin.Waring@nottingham.ac.uk) (J. Waring), [jeanne.mengis@usi.ch](mailto:jeanne.mengis@usi.ch) (J. Mengis).

## Root cause analysis in healthcare

RCA is the umbrella term describing methodologies and tools for the retrospective and structured investigation of adverse incidents, near misses and sentinel events (Wald and Shojania, 2001). Originally developed to analyse major industrial incidents (Andersen & Fagerhaug, 2000; Carroll, 1998), since the mid-1990s it has been taken up in healthcare systems, such as the US (Bagian et al., 2002; Wu et al., 2008), Australia, and the UK (Øvretveit, 2005; NPSA, 2004). Although each country (indeed sector and company) has developed its own variant, it is characterised by a common set of assumptions and operational activities.

In general, RCA is based on the assumption that threats and solutions to patient safety can be identified through rigorous, analytical processes. The approach aims to identify 'causal chains' and ultimately the latent or root cause factors that allow for active or individual errors (Reason, 1990). Accordingly, it emphasises the importance of unbiased investigation and the avoidance of blame (Wald and Shojania, 2001). In terms of process, RCA involves the systematic reporting of adverse events, their stratification to determine their relative priority, their investigation and the production of recommendations to promote safety. Within this investigation stage, the RCA process is usually organised in sequential steps. Amo (1998), for example, suggests these include: (1) identify the incident to be analysed; (2) organise a team to carry out the RCA; (3) study the work processes; (4) collect the facts; (5) search for causes; (6) take action; and (7) evaluate the actions taken. Although variations exist (Bagian et al., 2002; Woloshynowych, Rogers, Taylor-Adams, & Vincent, 2005) there remains an enduring commitment to this stepped, orderly, and disciplined approach. There is also broad consensus that RCA represents a toolbox of approaches rather than a single method (Andersen & Fagerhaug, 2000, p.12). Woloshynowych et al. (2005) describe more than 40 RCA techniques, such as brainstorming, cause-effect charts, "five whys" diagrams and fault trees, which provide different forms of analysis.

As with other healthcare systems, the UK National Health Service (NHS) has endorsed RCA as the main tool for incident investigation (DoH, 2001). Following the creation of the National Patient Safety Agency (NPSA) in 2002, more than 8000 NHS staff were trained in RCA (Wallace, 2006). Today, RCA is one of the cornerstones of the National Reporting and Learning System on the assumption that "when incidents do happen, it is important that lessons are learnt across the NHS to prevent the same incidents occurring elsewhere. RCA investigations are a well-recognised way of doing this" (NPSA 2004).

Although the NPSA does not mandate a particular process or toolkit, its training and website point to the "London Protocol" (Vincent et al., 1998). According to this, RCA investigations should be undertaken by a small nominated team convened by the quality coordinator or patient safety officer and guided by a facilitator. The team members should agree the terms of reference, select the methods, and engage in information gathering, process mapping, and the identification of contributory factors/root causes. The process should conclude with a report and recommendations for change. The NPSA promotes a variety of tools to be used across these investigatory stages, primarily for collecting, analysing and interpreting results. This includes "barrier analysis, brainstorming, brain writing, change analysis, five whys, narrative chronology, nominal group technique, tabular timeline, time person grid, and simple timeline" (NPSA, 2004).

Both practitioners and academics report that RCA is capable of enabling new discursive and practical opportunities with regards to patient safety (cf. Iedema, Jorm, Braithwaite et al. 2006; Iedema, Jorm, Long et al., 2006). In our study, for example, we found that RCA constituted a visible historical improvement as "in the old time

every department did it its own way and what happened depended very much on the whims of the clinical lead". The approach thus introduced discipline and predictability into a process that had varied according to local preferences and procedures. This in turn gave voice to staff who were traditionally excluded from this type of clinical discussion (a good proportion of patient safety leaders came from a nursing background) and help to mainstream the patient safety agenda amongst the wider clinical workforce.

These comments resonate with findings by Carroll et al. (2002) who suggest that RCA constitutes a tool for promoting a shift in culture towards more trust and openness as clinicians from a variety of backgrounds participate in the processes of learning. Similarly, Iedema, Jorm, Braithwaite et al. (2006) and Iedema, Jorm, Long et al. (2006) note that RCA affords healthcare practitioners a space for new (and challenging) conversation and reflection.

It must be added, however, that RCA is not without problems. For instance, Braithwaite et al. (2006) report that their Australian informants often viewed RCA processes as limited by time constraints, lack of expertise, and difficulties of working with colleagues. Wu et al. (2008), examining the use of RCA in North America, show that there are inherent difficulties in translating RCA recommendations into tangible service change. Similarly, Tamuz, Franchois, and Thomas (2011) found that RCA, both in terms of timing and use of results, was heavily affected by professional, disciplinary and departmental politics.

Such research suggests that, despite its potential, the translation and use of RCA in healthcare remains problematic. RCA, it might be argued, is a highly context-specific model for learning that largely reflects the experiences and safety improvements witnessed in industries such as aviation and petrochemicals. In these non-healthcare settings, the 'human factors' approach has been instrumental in bringing about a radical shift in operational safety, whilst the RCA toolbox has been integral to producing recommendations for change. A growing body of research suggests, however, that the translation and replication of these successes in healthcare appears increasingly difficult. The notion of "translation" suggests that ideas, methods, and policies are not mechanically transferred or implemented from one setting to another. Instead, they travel in the guise of textualised intermediaries thanks to potential users who perceive some benefits from their adoption. Such travel in time and space thus depends on transformation, editing, and appropriation. Because there are always several possible competing interpretations of any idea, the way in which this is translated in practice is necessarily determined by specific interests and logic. The result is partial acceptance and adaptation, but also addition, substantial modification and even radical reinterpretation (Latour, 1986, talks about "betrayal"). The translation of RCA from industry to healthcare thus involves the influence of multiple and competing interests and logics that reinterpret and reframe the investigation process to align with established ways of working and enduring lines of power. Underlying tension may exist between the espoused aspiration of learning and the organisational context within which this learning is to take place.

Accordingly, our aim in this paper is to understand further how RCA is used in practice and to bring to the fore the 'gap' between theory and practice as found in the translation of RCA into healthcare. It is worth noting that our study intentionally eschews arguing whether RCA is right or wrong, or commenting on specific features of the approach. For example, we are aware that RCA is performed as a specific way of talking about, thinking of, and doing safety – what Zuiderent-Jerak, Strating, Nieboer, and Bal (2009) call a specific "safety ontology". This is characterised by a clinical/scientific approach (Iedema, Jorm, Long et al., 2006) and an orientation towards a "lack view" of safety (Mesman, 2009), that is, an approach that sees safety improvements stemming from the correction of

organisational problems instead of, for instance, developing existing sources of resilience. We are also aware that RCA has been interpreted as an emerging form of self-surveillance (Waring, 2007) and potentially extending the principle of concertive control among healthcare practitioners (Iedema, Jorm, Long et al., 2006). However, reflecting Vincent's (2009) exhortation that social science research should try to contribute positively to the cause of patient safety (see also Iedema, 2009), our underlying focus is to explore whether within these limits the particular way in which RCA has been translated in practice in the UK risks stifling its potential to generate organisational learning and thus safer healthcare.

## The study

Our paper draws on an 18-month ethnographic study within two acute hospitals (Trusts) in the UK NHS, conducted between 2008 and 2009. These Trusts were selected to reflect variability and difference in terms of size, research and teaching commitments and regional location. Site A was a medium-sized secondary care provider based primarily on one site, with 6000 staff and treating 500,000 patients a year. Site B was a large teaching Trust located over three sites providing a wide range of specialist services, with 12,000 staff and over 1 million patients a year. Both Trusts had a corporate Patient Safety Department consisting, respectively, of 8 and 9 patient safety officers/managers. The study received favourable ethical and research governance approval by the Essex 1 REC and the standard NHS framework.

Our fieldwork was carried out over three phases. First, we identified the patient safety procedures within each Trust through observations and interviews within the respective Patient Safety department over one month. Second, we investigated the similarities and differences between the two organisations through conducting a series of interviews and observations with frontline clinical departments. Third, we observed, tracked and documented 10 incident investigations from start to finish (including the RCA meetings) within these departments, split equally between Trusts. After the conclusion of each RCA, we conducted follow-up semi-structured interviews with members of the team to explore their experiences of the process and learn more about subsequent change. Overall, we conducted 120 days of observations across the two sites, carried out 102 ethnographic interviews (Spradley, 1979) and 34 semi-structured interviews. A summary of the fieldwork is provided in Table 1.

All observations were recorded in field journals compiled by each author. All semi-structured interviews were transcribed verbatim. The research team met weekly and we held structured data sessions every 6 weeks to discuss emerging themes and plan subsequent research activities. After the completion of the fieldwork we coded all semi-structured interviews using Nvivo and analysed emerging themes in relation to the rest of our data, going back and forth between transcripts, original recordings and field notes. In this paper we focus on the overriding themes that emerged from the data relating to how RCA processes were undertaken in each organisation. The findings of our research are summarised in the proceeding section, where we focus on the challenges of conducting RCA. These findings are then discussed more widely in terms of the translation and use of RCA in the healthcare sector.

## The findings

### Collecting information

The first major challenge of undertaking RCA investigations related to the collection of information and evidence. After a reported incident had been graded and designated for investigation, the

RCA lead – whether corporate manager or local Patient Safety Lead – was responsible for gathering more detailed information to first, substantiate the contents of the report and second, to gather evidence about the actions and events leading up to the event. This usually involved: requesting patient records, staff and departmental files relating to the event, routine departmental information and eye-witness testimonies from staff.

One of the most challenging aspects involved collecting statements from clinicians. For many healthcare practitioners, being approached after an incident was unpleasant and anxiety-provoking. As one informant commented “...an investigation is still an investigation”. Many practitioners perceived the approach as an instrument of governance and part of an increasing inspectorial approach to the management of clinical work – something that both symbolically and materially originated from (and were mandated by) the perceived “centre” of the organisation. As a consequence, RCA investigators were often construed as potential agents of “Big Brother” and fear of disciplinary consequences were frequently mentioned in relation to RCA investigations.

*“People may be a little bit guarded and try to defend their corner a bit”* (Consultant)

The fear of being under investigation compounded a sense of guilt and professional insecurity that usually followed a serious untoward event. Clinicians were not only reticent about being involved in the procedures, they also wanted to ‘put the incident behind them’.

A further problem related to the quality of information provided in case notes and statements. Patient and departmental records typically contained little specific information relating to incidents or complications. As such, RCA leads were required to ‘trawl’ additional information sources, such as computer systems, staff rotas, equipment identification, and other routinely-collected hospital episode data. In this way, they attempted to create a ‘patchwork’ of information sources that could be woven together to provide different snapshots of the clinical area preceding the event.

### Convening the RCA meeting

While collecting evidence, RCA leads would usually start arrangements for convening the RCA meeting, where evidence would be analysed and latent factors discussed. Although the composition of these groups varied according to the incident in question, they typically involved the local service manager, senior nursing and medical representatives, line managers, corporate representatives for Patient Safety (who might also lead the process) and, in some occasions, the healthcare providers directly involved in the incident. There were common difficulties in forming this group. These were normally associated with diary conflicts (Vincent, Stanhope, & Crowley Murphy, 1999), but underlying this was a general sense that staff, especially clinicians, did not want to participate in the process. In most cases, resistance to participation was not open and staff resorted to what was described as “e-mail politicking” whereby staff simply ignored phone calls or automatically discarded emails related to the RCA.

In both sites, RCA leads used training and management support to overcome such problems. Training amongst clinicians was used as an awareness-raising tool that familiarised potential participants (or their colleagues) with the RCA purpose in order to enhance engagement and minimise resistance. Managerial support for RCA was mobilised primarily through formal patient safety escalation procedures. Besides clarifying which incidents should be investigated, escalating an incident also constituted a formal sign of endorsement that signalled the importance of the event.

Table 1

Directorates/institutions involved	Composition of investigation team	Facilitators of RCA process	Duration of RCA investigation	Data collected
Anaesthetics (pain management); paediatrics; orthopaedics	2 clinical risk managers (central office); lead nurse; ward manager; 2 consultants; clinical director	Clinical risk manager (central office)	April–June 2009	Observed escalation process; observed RCA meeting; accessed RCA recommendations; conducted post RCA interviews
Maternity; obstetrics & neonatal; child protection; social services	Clinical risk officer (central office); consultant; 3 midwives and supervisors; 1 midwife and her supervisor (different trust); ward coordinator; ward manager; clinical risk manager (director)	Consultant	August 2009 – NA (project ended)	Observed escalation process; observed RCA meeting; accessed RCA recommendations; conducted post RCA interviews
Medical assessment unit; medicine;	Clinical risk manager; support worker; 2 staff nurses; consultant; senior house officer; modern matron	Clinical risk manager (central office) Modern matron	February–March 2009	Observed escalation process; observed RCA meeting; accessed RCA recommendations; conducted post RCA interviews
Emergency department; surgery; intensive therapy unit; clinical decisions unit	2 clinical risk managers (central office); 2 lead nurses; senior house officer; clinical director; clinical lead	Clinical risk manager (central office)	August 2008–January 2009	Observed escalation process; observed RCA meeting; accessed RCA recommendations; conducted post RCA interviews
Pathology; histology; surgery; radiography	3 clinical risk managers (central office); directorate; quality manager; head of operations; directorate head; 2 subunit managers; radiographer; histology expert; 5 consultants various directorates	1st phase: Chief bio-medical scientist and Consultant; 2nd phase: Clinical risk manager (central office)	October–December 2008	Observed escalation process; observed RCA meeting; accessed RCA recommendations; conducted post RCA interviews
Emergency department radiology; surgery; neurology (different trust)	Clinical risk manager (central office); 2 radiologists; consultant surgeon; consultant; 2 scrub nurses; 1 lead nurse;	Clinical risk manager (central office)	January 2009–June 2009	Observed escalation process; observed RCA meeting; accessed RCA recommendations;
Emergency department; neurology; clinical decisions unit; mental health trust; regional police	2 clinical risk managers (central office); 2 ward managers; clinical sister; senior nurse; modern matron; consultant; police officer.	Clinical risk manager (central office)	February–April 2009	Observed escalation process; observed RCA meeting; accessed RCA recommendations; conducted post RCA interviews
Emergency department, haematology; gastroenterology; surgery; anaesthetics; theatres	Consultant emergency corporate safety manager (central office); clinical risk and complaints manager; input from: clinical director; 3 consultants; consultant surgeon	Clinical risk and complaints manager (lead directorate)	January–June 2009	Observed escalation process; observed RCA meeting; accessed RCA recommendations; conducted post RCA interviews
Medicine, general hospital 1; neonatal unit, teaching hospital 2; transport team 3	Risk lead, head of nursing, and consultants 3 trusts hospital. Staff on the ambulance.	Corporate safety manager (central office)	February–July 2009	Observed escalation process; observed RCA meeting; accessed RCA recommendations; conducted post RCA interviews
Anaesthetics (pain management); theatres; critical care;	Clinical governance managers (2 involved directorates); local safety coordinators (2 directorates); head of nursing; service manager; matron; team leader and deputy team leader the two directorates	Clinical governance manager (lead directorate)	December 2008–May 2009	Observed escalation process; observed RCA meeting; accessed RCA recommendations; conducted post RCA interviews

Notwithstanding such activities, problems with attendance at RCA meetings remained, especially among senior clinicians.

Given prevailing time constraints, especially the mandatory 60-day deadline for formal RCA investigations, delays in collecting information and convening the group placed RCA in a difficult position. Rather than postponing the investigation until a suitable time slot, RCA leads often convened meetings with those individuals who made themselves available. They appeared, therefore, to strike a compromise between depth of data and accuracy of the investigation with ‘whatever’ and ‘whoever’ they could gather. In sum, what policies describe as a straightforward process of data collection is in fact a time-consuming, labour intensive, and negotiated process where getting things done is in tension with abstract models of scientific (or forensic) completeness and where coercion and persuasion are inextricably mixed.

#### Conducting the RCA meeting

At the core of the RCA process is the multidisciplinary meeting of the investigation team. The meetings observed lasted between one and 3 h. During these activities, the information collected by the RCA lead was presented, analysed and discussed, and a judgement made on the causes leading to the event. Participants also identified the remedial actions needed to prevent reoccurrence through drafting an action plan. We found that this process was appreciated by participants as an opportunity to better understand how different clinical practices interface – in itself a powerful tool for preventing future mishaps (see also Wakefield, Carlisle, Hall, & Attree, 2008). While an in-depth analysis of the RCA meetings goes beyond the scope of this work, three issues repeatedly emerged from our research.

First, despite efforts towards integrated and inter-professional working, professional and hierarchical differences continued to influence the direction, dynamic, and outcomes of the RCA meetings. For example, ‘turn-taking’ followed a hierarchical pattern with doctors tending to speak first and most, senior nurses having some voice, and junior staff talking only when questioned. We also observed several instances when RCA facilitators had difficulty in holding the floor and steering the meeting, especially when discussion became heated or highly technical. Significantly, facilitators encountered more difficulty when they lacked a clinical background or expertise relevant to the case, e.g. “they couldn’t see through the bullshit”, as one participant colourfully described. We found that such issues were less prominent when the meetings were moderated by senior clinicians. This casts some doubts on the robustness of the process and its capacity to grant to moderators specialised in RCA a status comparable to that of the most authoritative practitioners.

Second, we found that of the various RCA tools, the timeline was the only one systematically used during meetings. We observed the Fishbone approach in only two investigations and never saw the 5-why’s approach, despite these being considered prime instruments for RCA (Andersen & Fagerhaug, 2000). When RCA participants attempted to marshal the collected evidence and make sense of an incident, they focussed primarily on the patient’s ‘journey’, i.e. the temporal sequence of events. Most questions asked of the evidence were geared towards a more precise understanding of timings such as: “When was he transferred to that unit?” or “At what time did you say his score was assessed?” A significant finding was that RCA activities tended towards understanding ‘when’ and rarely ‘why’ events occurred. The timeline helps reconstructing the event from the perspective of “being there” and is closer to how practice is experienced by clinical staff. It might be speculated that this resonates better with healthcare work and the management of care pathways, than the tools drawn from the engineering tradition.

Third, in spite of policies describing investigations as rational and technical endeavours, emotions heavily affect the process, in general. Whilst guilt, anger, despair, and other emotions all ostensibly circulated in the meetings, not all facilitators were good at addressing these issues. Emotions were often ‘swept under the carpet’ and not properly acknowledged. This resulted in meetings where discussion failed to progress (“it all became very acrimonious”) and learning suffered (“I didn’t feel I got enough information to learn from it”). This visibly contrasted with meetings where emotional issues were properly addressed, often thanks to the influence of a senior staff member. In these cases people engaged in questioning and self-questioning practices (or at least started to) and the common perception was that this helped the cause of learning.

#### Drafting reports

Producing the report constitutes a critical step in the RCA process. Reports are both the end product of the investigation and the tool through which recommendations are circulated for implementation. In the UK, the NPSA issued a set of guidelines on how to formulate reports for large investigations (see Box 1), with shorter documents for more minor events. According to the NPSA:

*The investigation report presents the culmination of all the work undertaken by the investigation team ... The audience will use the investigation report as the basis for judging the quality of the investigation process, the findings, conclusions and recommendations. The audience will also judge the competence of the investigation team by the content, style and tone of the report (NPSA, 2008, p.4).*

Our research showed that the production of the report appeared at times to be the primary goal driving and organising other parts of the investigation process. In particular, it oriented the analysis of the information, and the formulation of corrective actions. For instance, the need to produce a final report unwittingly imposed

Box 1. Heading of a full RCA report (from NPSA guidance documents).

#### RCA investigation report template – guidance

- Executive summary
- Incident description and consequences
- Pre-investigation risk assessment
- Background and context
- Terms of reference
- The investigation team
- Scope and level of investigation
- Investigation type, process and methods used
- Involvement and support of patient and relatives
- Involvement and support provided for staff involved
- Information and evidence gathered
- Chronology of events
- Detection of incident
- Notable practice
- Care and service delivery problems
- Contributory factors
- Root causes
- Lessons learnt
- Recommendations
- Arrangements for shared learning
- Distribution



the idea that the analysis of evidence should be concluded and corrective action identified during the RCA meeting. In other words, need for a closure discouraged further investigations. And thus indirectly affected the quality of the recommendations.

The need to produce an action plan of recommendations also meant that safety problems were routinely discussed in terms of available solutions (see also Iedema, Jorm, Long et al., 2006). “Root causes” were phrased as: “what would have helped here...”, or “what we do in obstetrics in such occasions is ...”. Reflecting this, facilitators often summarised RCA meetings in terms of “learning points”, reframing latent factors in terms of the available solutions. This meant less tangible problems (i.e. where a specific department is not supported by the Trust) could only be addressed if translated into a concrete problem (i.e. “we are not a drop-in centre for neck pain”) and for which there existed a clear-cut solution (i.e. “we have to define clear admission and release criteria”). In this way, problems that did not have feasible, short-term solutions were rarely addressed in action plans. This was particularly acute for factors related to long-term resource constraints.

The need for a well-crafted, presentable, and correctly formulated document that could be used “for judging the quality of the investigation process” (NPSA 2008), dominated the RCA process (see also Iedema, Jorm, & Braithwaite, 2008). Reports were often circulated to the participants for repeated comment and feedback, with some undergoing up to nine reiterations, with the espoused aim of “getting everybody on board”. The effort of maintaining consensus amongst participants, however, had a visible effect on the content of the documents. From the 25 reports reviewed few contained any contentious or highly consequential findings or recommendations, for example, calling for senior management changes or disciplinary action for doctors.

The need for a document that ‘looked good’ required significant effort by the authors to use the appropriate RCA language or jargon. While this seldom surfaced in the multidisciplinary meetings, it was strategically reintroduced during the drafting process, seemingly to give credibility to the process. In this way, mistakes became “care and service delivery problems” and “contributory factors” were decided post facto on the basis of group discussion. The analysis thus continued well into the writing process, but in a less open and participatory way, with the report conveying a story often quite different from the one that emerged during the RCA meetings. In short, the reports were more “politically correct”, simpler and imbued with the language of RCA. By the same token, the emotional elements that transpired through the individual statements and in the meetings were gradually filtered out when the narrative elements were substituted by a more causal type of account in the final report (see also Waring, 2009).

Our observations suggest that producing a “nice” report at times became the main goal of the investigation and displaced the original objective of producing learning and change. The risk managers worked to produce a document that reflected policy recommendations, but in itself did not necessarily make a huge impact on the life of the organisation.

#### *Making change happen after the investigation*

A final set of challenges relates to the difficulties of enacting change in a complex context such as a modern hospital where diverse work practices, views, professional allegiances, and interests co-exist at departmental and unit levels. The result is that investigations themselves often become part of ‘the game’ they are supposed to portray. For example, RCA investigations are perceived (and conducted) as a form of imposed scrutiny of the work practices (Iedema, Jorm, Braithwaite et al. 2006), where staff engage in various protective manoeuvres to maintain control over their

organisational and disciplinary jurisdictions, and to defend their reputation. These manoeuvres range from not providing requested information, to not participating in meetings. A more sophisticated manoeuvre involved conducting an internal pre-emptive departmental investigation in advance of the official RCA, so that when the meeting took place they had already implemented ‘corrective actions’ and the inquiry could be safely controlled (Tamuz et al., 2011). Similarly, investigations became a resource for action instead of their trigger. In at least two cases we observed that the RCA process was used to support changes that departments had tried to promote previously without success. Instead of a process of evidence-based change, we observed instances of change-based evidence, whereby “evidence” about “root causes” was used to support existing agendas (see also Tamuz et al., 2011). It is not the political use or perception of RCA that is surprising, but that this is rarely mentioned in policy. Politics is an inherent aspect of organisational life and as such is neither positive nor negative. They become problematic where they are disregarded or when they are not taken into consideration.

The difficulties of operating in a complex and internally-differentiated context are also manifest during the translation in practice of the corrective actions. Problems that have systemic roots often necessitate radical solutions that are likely to have (potential) systemic impact. For instance, some root causes may call for radical organisational restructuring or management change that go beyond the scope of the people involved in the RCA process: “A lot of processes involve a lot of different departments, various individuals and sometimes fall outside the remit of control of me or other people”.

These difficulties had two significant implications. They steered the discussion of remedial changes towards what was possible rather than necessary. Action plans tended to focus on relatively minor local changes whilst broader ‘systemic’ issues were excluded from consideration. Although this undoubtedly delivers short-term benefits – something was done about the incident – it does not address the more deep-seated problems affecting the NHS as complex organisation. Second, remedial actions that required the collaboration of more than one department were often only partially enacted, usually within rather than across clinical areas. This was partly due to the fact that the process seemed to be scarcely oriented towards producing change (the mechanisms were simply not there) and partly to the bureaucratic model of change inscribed in the approach. Change in organisations requires work, effort and management. “Implementation” is thus a misnomer for the process. Mandating complex change through action plans and new rules alone (as in the traditional bureaucratic model), is often a poor strategy for ensuring that long-term changes are introduced.

#### **Discussion**

Our study adds to a growing body of research on the challenges of using RCA (Braithwaite et al., 2006; Tamuz et al., 2011; Wu et al., 2008). We find that in practice difficulties arise at several stages of the RCA process. The question therefore is where do these challenges originate? Interrogating the nature and origins of these challenges has relevant practical and theoretical implications for patient safety. Our observations indicate that some of the challenges derive not so much from a wrong application of the approach but rather from some contradictions stemming from how this approach is translated into practice. Failure to understand these contradictions may lead to ineffective or wrong remedial actions.

#### *The translation in practice of RCA*

As noted above, RCA was conceived to investigate incidents in environments often dissimilar from healthcare, such as process

engineering, aerospace, and aviation (Carroll et al., 2002). It was developed from the Total Quality Management movement where it was conceived primarily as an “organizational learning device” (Heget et al., 2002). RCA was then translated into the healthcare context according to an improvement logic and as a critical tool to direct learning in the aftermath of clinical incidents. In line with this genealogy, RCA should deliver learning and service improvement through promoting workforce involvement, fostering horizontal workplace relationships, liberalising the scrutiny of clinical expertise, and creating a democratised view of service transformation (Iedema et al., 2008). Our study suggests, however, that in the UK the approach was translated in practice, and appropriated, by two further policy agendas: the need to re-establish public legitimacy, and to demonstrate appropriate forms of governance and accountability in the wake of safety events.

According to the first of these two linked ‘agendas’, RCA can be interpreted, albeit loosely, as following the model of the “Public Inquiry”. In the UK, a public inquiry is an official review of events ordered by a government body to shed light on delicate or sensitive public matters with public transparency and political neutrality (House of Commons Library, 2004). Although they often trigger important policy changes, public inquiries serve numerous other purposes. These include providing a cathartic outlet for the wider public after a tragedy or scandal (Walshe, 2003); and constituting “ceremonial occasions that play an important role in the cultural adjustment stage of critical events” (Brown, 2004: 95), especially in mitigating anxiety and maintaining institutional legitimacy. To be successful, they must be comprehensive and promulgate the belief that an exhaustive investigation of the facts will reveal the truth (Brown, 2004, p. 100). Conceiving RCAs as mini-public inquiries increases their general acceptability and perceived value. RCAs help healthcare organisations to restore some sense of legitimacy in the aftermath of a patient safety incident, reducing the sense of uncertainty and irrationality that incidents often produce. However, this places emphasis on the content, appearance, language and recommendations of the final report. In our two Trusts we observed that it was paramount to produce a comprehensive, clear and polished story and that concluded with tangible, easy-to-communicate recommendations. From this perspective, reports communicate that normality has been restored; which might explain why incompatible events, dissenting voices or incurable elements are usually edited out. The quality of the report is not based on its capacity to make change happen, but on its rigour, elegance, and adherence to the canon of “good” scientific research. What might be goal displacement from the logic of restoring legitimacy is, in fact, a very rational and functional endeavour from a public inquiry perspective. In addition, “sanitising” investigations from disagreements in the interest of restoring legitimacy undermines learning as this requires accepting that contradictions can be highly generative (Engeström, 2001). However, these two logics conflict because treating all investigations as mini-public inquiries makes the process laborious so that results often arrive when the organisation has already moved on.

Some of these features are amplified by the way RCA responds to another powerful policy agenda. This relates to modes of governance, transparency and accountability associated with the “Audit Society” (Power, 2007). In line with this, our observations suggest that RCA has been translated in practice as a mechanism of surveillance, control and audit. As noted by Kewell and Beck (2008), the increasing number of NHS investigations can be explained in the context of “a return to big government” (p.380). When interpreted in this way, RCA investigations are conceived, utilised and, above all, perceived on the ground as emanations of central authority and as means to expand the grip of managers on the daily healthcare practices (Waring, 2007). This can be seen, for example,

through the creation of a corporate unit of investigators (the Risk Management Department) which escalates and conducts investigations, and assumes that once rational recommendations are formulated, change will inevitably follow (Iedema et al., 2008). Such an approach to safety and learning reflects a bureaucratic and centralistic view of organisational governance. Translating RCA according to this logic therefore involves a steer towards a model of change-based on command (recommendations) and control (auditing of their implementation) rather than reflexivity and local search. In this way, RCA gives undue emphasis to the existing linear and rational elements of the approach (RCA was, after all, developed in an engineering environment) that are insufficiently attentive to the complex environment in which patient safety problems arise.

While to some extent the logic of control might be interpreted as differing from that of public inquiry, these two agendas can sustain and amplify each other. For example, the need for management to look proactive and efficient requires that only “actionable” problems are considered so that possible root causes may well remain unaddressed. Similarly, the idea that organisations are mainly rational projects run by rational individuals means that RCA investigations aim at achieving closure, in so much as a sense of order or control is quickly re-established. By the same token, the emotional dimension implicit in the investigation process becomes increasingly invisible through analytical stages. From this perspective, RCA investigations are focussed on producing a set of auditable recommendations. Finally, utilising a demonstrably efficient set of procedures for maintaining accountability (i.e. producing a high level of reporting, or achieving investigation targets) becomes an objective in its own right. It becomes a ‘ritual of verification’ (Power, 2007) that serves to demonstrate managerial efficiency especially vis-à-vis other “governing bodies”.

In summary, translating RCA simultaneously as a means of re-establishing institutional legitimacy and as a system of governance has the effect of focussing attention towards the achievement of ‘consensus’, ‘closure’, and ‘control’. These three aspects emerge clearly from our research. This risks transforming RCA from a process of learning and service improvement into a bureaucratised and routine management chore. What was conceived as a ‘means to an end’ (producing organisational learning and change) becomes an ‘end in itself’ regulated by a number of well-known bureaucratic principles. This stands in conflict with the espoused learning agenda. For example, Weick and Westley (1996) warn that closure and consensus are often enemies of the capacity of organisations to learn from incidents that require them “to confront the possibility that the story being told is simultaneously a tale of disorder in which the reality of danger masquerades as safety and a tale of order in which the reality masquerades as danger” (p. 456). Other authors emphasise that in the pursuit of organisational transformation, the process of inquiry is often more important than its results. Learning emerges through “an interactive inquiry process that balances problem solving actions implemented in a collaborative context with data-driven collaborative analysis or research” (Reason & Bradbury, 2007, p.12). Pursuing comprehensiveness and excessive rigour may thus hamper the reflexivity upon which the approach relies. At the same time, pursuing centralised control contradicts the bottom up, decentralised and democratic orientation that authors such as Iedema et al. (2008) consider most promising characteristics of RCA.

## Concluding remarks

Our paper argues that the gap between theory and practice in RCA investigations can be explained through recognising the distinct policy agendas through which RCA has been translated.

These serve to partially displace the espoused goal of preventing the reoccurrence of patient safety incidents through organizational learning. While the current model of RCA is clearly a significant improvement on previous approaches to learning, it might still be argued that it does not fulfil its potential and is not always conducive to learning. In particular, the way RCA has been translated into practice ignores the idea that learning often stems from the inquiry process itself, not the report; that the inquiry process should not be divorced from the practice of clinical work; that emotions are part and parcel of the organisational learning process (Vince, 2001); and that focussing on feasible solutions (a closure orientation) and emphasising consensus reduces the capacity to learn through creativity and divergent thinking (cf. Engeström, 2001).

Our analysis suggests that the time is ripe for a critical assessment on what RCA has been able to achieve since its introduction almost a decade ago. Some of the challenges cannot be attributed to teething problems or defects in its implementation, but in fact, have much deeper roots. As such, tackling the shortcomings of RCA with more training (Wallace, 2006) or by arguing for increased independence and professionalization of RCA investigators (Downham & Lingham, 2009) may in fact exacerbate, instead of resolve these challenges. Whilst such a solution could improve the quality of the reports and the public confidence in the process, it would merely strengthen RCA's affordance of governance and legitimization, instead of learning. A different approach needs to be pursued, therefore, if the aim is to foster organizational learning. This would imply, among others, four main things.

First, "tales of disorder" (Weick & Westley, 1996: 456) need to be actively encouraged through voicing differences and disagreements within process. One way to achieve this would be to shift the locus of RCA initiatives from the centre to the periphery. Bringing investigations closer to the frontline would also have advantages in terms of leading investigations where relevant changes can be effectively implemented.

Second, the RCA toolkit should be better aligned with the multiple agendas attached to, and involved in, incident investigation. Structured techniques to support reflection and analysis should be retained (for RCA's governance and legitimating affordances), but they need to be simplified and adapted to the different perspectives of those involved in facilitating learning and change. In particular, there is an urgent need to develop tools that reflect the narrative nature of thinking amongst healthcare practitioners and that are oriented towards producing change, not analysis. Story-telling, video-reflection, and other existing approaches should be considered and used alongside the traditional engineering-based RCA tools which, according to our evidence, are not used in the field.

Third, the role of the central safety office should shift from controlling and mandating single investigations to systematically analysing trends and drawing out common issues and recurrent causal factors from across incidents. One way to achieve this is to form cross-departmental standing groups around patterns of (causes of) incidents (i.e. communication problems between shifts, falls, infection control), which would support local learning activities and system-level interventions. Finally, and related to the above, RCA investigators should be encouraged to perceive themselves, and be trained as, agents and facilitators of organisational development instead of professional investigators or inspectors. Progress would stem not from conducting bigger and better RCAs, but rather from repositioning RCA investigations as opportunities to trigger local and organisational learning.

## Acknowledgements

The paper builds on the results of the project Improving the Capacity of Healthcare Organisations to Act on Evidence in Patient

Safety (PTOC21) funded by the Warwick International Manufacturing Research Centre. The WIMRC is supported by the UK EPSRC with supplementary contributions from collaborating partners. The research team also included Prof. Jacky Swan and Prof. Peter Spurgeon. Their invaluable contribution is gratefully acknowledged.

## References

- Amo, M. (1998). Root cause analysis. A tool for understanding why accidents occur. *Balance*, 2(5), 12–15.
- Andersen, B., & Fagerhaug, T. (2000). *Root cause analysis: Simplified tools and techniques*. Milwaukee: ASQ Quality Press.
- Bagian, J. P., Gosbee, J., Lee, C. Z., Williams, L., McKnight, S. D., & Mannos, D. M. (2002). The veterans affairs root cause analysis system in action. *JACO Journal of Quality Improvement*, 28, 531–545.
- Braithwaite, J., Westbrook, M., Mallock, N., Travaglia, J., & Iedema, R. (2006). Experiences of health professionals who conducted root cause analyses after undergoing a safety improvement programme. *Quality & Safety in Health Care*, 15(6), 393.
- Brown, A. (2004). Authoritative sensemaking in a public inquiry report. *Organization Studies*, 25(1), 95–112.
- Carroll, J. S. (1998). Organizational learning activities in high-hazard industries: the logics underlying self-analysis. *Journal of Management Studies*, 35, 699–717.
- Carroll, J. S., Rudolph, J. W., & Hatakenaka, S. (2002). Lessons learned from non-medical industries: root cause analysis as culture change at a chemical plant. *Quality & Safety in Health Care*, 11, 266–269.
- Department of Health. (2001). *Doing less harm. Improving the safety and quality of care through reporting, analysing and learning from adverse incidents involving NHS patients*. London: DoH.
- Donaldson, L. (2000). An organisation with a memory. *Clinical Medicine*, 2(5), 452–457.
- Downham, G., & Lingham, R. (2009). Learning lessons: using inquiries for change. *Journal of Mental Health Law*, 18, 57–69.
- Engeström, Y. (2001). Expansive learning at work: toward an activity theoretical reconceptualization. *Journal of Education and Work*, 14(1), 133–156.
- Heget, J. R., et al. (2002). Eisenberg patient safety awards. System innovation: veterans health administration national center for patient safety. *Joint Commission Journal of Quality Improvement*, 28, 660–665.
- House of Commons Library. (2004). *Investigatory inquiries*. Standard Note. SN/PC/2599, 30 November.
- Iedema, R. A. (2009). New Approaches to researching patient safety. *Social Science & Medicine*, 69(12), 1701–1704.
- Iedema, R. A., Jorm, C., Braithwaite, J., et al. (2006). A root cause analysis of clinical error: confronting the disjunction between formal rules and situated clinical activity. *Social Science & Medicine*, 63, 1201–1212.
- Iedema, R. A., Jorm, C., Long, D., Braithwaite, J., Travaglia, J., & Westbrook, M. (2006). Turning the medical gaze in upon itself: root cause analysis and the investigation of clinical error. *Social Science & Medicine*, 62, 1605–1615.
- Iedema, R., Jorm, C., & Braithwaite, J. (2008). Managing the scope and impact of root cause analysis recommendations. *Journal of Health Organisation and Management*, 22(6), 569–585.
- Kewell, B., & Beck, M. (2008). NHS inquiries: a time series analysis. *Public Money & Management*, 28(6), 375–382.
- Latour, B. (1986). *Science in action*. Cambridge, Mass: Harvard University Press.
- Mesman, J. (2009). The geography of patient safety: a topical analysis of sterility. *Social Science & Medicine*, 69(12), 1705–1712.
- NPSA. (2004). *Root cause analysis toolkit*. Available online at <http://www.nrls.npsa.nhs.uk/> Accessed 27.10.10.
- NPSA. (2008). *RCA investigation tools: Guide to investigation report writing*. Document 0769B V1.
- Øvretveit, J. (2005). *Effectiveness of interventions to improve patient safety. A review of research and guidance*. Stockholm: Karolinska Institute.
- Power, M. (2007). *Organized Uncertainty: Designing a world of risk management*. Oxford: University Press.
- Reason, J. (1990). *Human error*. New York: Cambridge University Press.
- Reason, P., & Bradbury, H. (2007). *Handbook of action research*. London: Sage.
- Spradley, J. P. (1979). *The ethnographic interview*. New York: Thomson Learning.
- Tamuz, M., Franchois, K. E., & Thomas, E. J. (2011). What's past is prologue: organizational learning from a serious patient injury. *Safety Science*, 49(1), 75–82.
- Vince, R. (2001). Power and emotion in organizational learning. *Human Relations*, 54(10), 1325–1351.
- Vincent, C. A. (2009). Social scientists and patient safety: critics or contributors? *Social Science & Medicine*, 69(12), 1777–1779.
- Vincent, C. A., Taylor-Adams, S., & Stanhope, N. (1998). A framework for the analysis of risk and safety in medicine. *British Medical Journal*, 316, 1154–1157.
- Vincent, C., Stanhope, N., & Crowley Murphy, M. (1999). Reasons for not reporting adverse incidents: an empirical study. *Journal of Evaluation in Clinical Practice*, 5(1), 13–21.
- Wakefield, A., Carlisle, C., Hall, A., & Attree, M. (2008). Patient safety investigations: the need for interprofessional learning. *Learning in Health and Social Care*, 8(1), 22–32.
- Wald, H., & Shojania, K. G. (2001). Root cause analysis. Evidence Report/Technology Assessment No. 43. In K. G. Shojania, et al. (Eds.), *Making health care safer: A critical analysis of patient safety practices*. AHRQ Publications.



- Wallace, L. M. (2006). From root cause analysis to safer systems: international comparisons of nationally sponsored healthcare staff training programmes. *Quality & Safety in Health Care*, 15(6), 400–402.
- Walshe, K. (2003). *Inquiries: Learning from failures in the NHS?* London: The Nuffield Trust.
- Waring, J. (2007). Adaptive regulation or governmentality: patient safety and the changing regulation of medicine. *Sociology of Health and Illness*, 29, 163–179.
- Waring, J. (2009). Constructing and re-constructing narratives of patient safety. *Social Science & Medicine*, 69(12), 1722–1731.
- Weick, K. E., & Westley, F. (1996). Organizational learning: affirming an oxymoron. In S. R. Clegg, C. Hardy, & W. Nord (Eds.), *Handbook of organization studies* (pp. 440–458). London: Sage.
- Woloshynowych, M., Rogers, S., Taylor-Adams, S., & Vincent, C. (2005). The investigation and analysis of critical incidents and adverse events in healthcare. *Health Technology Assessment*, 9(19).
- Wu, A. W., Lipshutz, A. K., & Pronovost, P. M. (2008). Effectiveness and efficiency of root cause analysis in medicine. *JAMA*, 299, 685–687.
- Zuiderent-Jerak, T., Strating, M., Nieboer, A., & Bal, R. (2009). Sociological refigurations of patient safety. *Social Science & Medicine*, 69, 1713–1721.