Root cause analysis in the NHS: time for change?

Abstract

Root cause analyses were intended to search for system vulnerabilities rather than individual errors, using a human factors engineering approach. In practice, root cause analyses done in the NHS may generally fail to identify components where there are organisational failures, as there may be an inherent desire to protect institutional reputation. A human factors approach to root cause analysis looks at system vulnerabilities, considering the entirety of the environment in which an individual works and taking into account factors such as the physical environment and individual mental characteristics. Other human factors include group dynamics, task complexity and concurrent tasks. It is time that the growing evidence of the potential shortcomings of root cause analysis, especially as frequently applied within the NHS, is heeded. At present, rather than assisting learning it may be an impediment to patient safety. The authors propose that root cause analyses should be performed by a group of people who are not managing the service. External organisations such as the General Medical Council, Nursing and Midwifery Council, Care Quality Commission and Practitioner Performance Assessment are heavily reliant on this tool when concerns are raised. If the flaws in root cause analysis can be eliminated, drawing on the available evidence, cases such as those of Dr Hadiza Bawa-Garba and Mr David Sellu might be avoided.

Key words: Health system vulnerabilities; Human factors in healthcare; Root cause analysis

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Introduction

Recent high-profile cases such as those of Mr David Sellu and Dr Hadiza Bawa-Garba have prompted increased focus on how best to understand and prevent avoidable harm in the NHS. Root cause analysis is the tool most commonly used to learn from mistakes and drive improvement (NHS England, 2015). Root cause analysis was intended to search for system vulnerabilities rather than individual errors using a human factors engineering approach (Bagian et al, 2002).

As resources become scarce, healthcare workers inevitably stretch themselves. Rising staff shortages alongside increasing demand has been a major issue in the last decade (Rolewicz and Palmer, 2019). Healthcare workers (and patients) become more vulnerable in such situations, compounded by a tendency to blame individuals rather than address systemic shortcomings. This article considers root cause analysis and its use in a critical way, and suggests improvements.

Discussion

'A factor is considered to be a root cause if its removal from a sequence of events would prevent a final undesirable event from occurring' (Bamford, n.d).

It is accepted that adverse events have more than one root cause, because for every process there are numerous inter-related actions that produce a final outcome. According to Bamford, a properly performed root cause analysis should identify all the causes that gave rise to a particular incident as follows (Bamford, n.d):

- Physical factors where a material item has failed in some way
- Human factors where someone did something wrong, or failed to do something
- Organisational factors where a system, process or policy used by an organisation as the basis for decision making is faulty.

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In practice, a root cause analysis performed in the NHS generally fails to identify all the above components. This is especially the case when there are organisational failures, as there may be an inherent desire to protect institutional reputation. Despite being useful in the healthcare sector, it has been suggested that root cause analysis is widely applied without sufficient attention being paid to what would make it effective: its contexts of origin, and the absence of adequate customisation for the specifics of healthcare (Percarpio et al, 2008; Wu et al, 2008). Wu (and others) feel that instead of approaching an incident with the framework of a wider systems review, root cause analysis too often results in a simple linear narrative that displaces more complex, and potentially fruitful, accounts of multiple and interacting contributions to how events really unfold (Wu et al, 2008).

Who performs the root cause analysis?

A root cause analysis is supposed to convene a skilled multidisciplinary investigation team, preferably with representation from risk management personnel and clinical teams. In practice, the clinical team member almost always happens to be the clinical lead, and other members normally occupy management positions and therefore have a vested interest in the outcome of the process. This appears to be a fundamental flaw, which is against the principles of transparency and bias (intended or otherwise). Not only is this likely to be contrary to the primary interests of the patients, but also to organisational learning, and may well impede employees being listened to, heard, and dealt with in a fair way.

Nicolini et al (2011) felt that things have improved since the period when every department 'did it its own thing' and what happened depended very much on the whims of the clinical lead. In a review of the topic, these authors felt that while the human factors approach has been instrumental in bringing about a radical shift in operational safety, a growing body of research also suggests that the translation and replication of these successes in healthcare appears increasingly difficult. They also felt that investigating teams may end their analysis once they have reached a cause of mutual convenience, perhaps one that edits out causes (and thus solutions) deemed to be beyond the remit or capacities of the organization and that occludes deeper organisational and sociopolitical dynamics.

While acknowledging that root cause analysis is a promising form of incident investigation, Peerally et al (2017) question the quality of many root cause analyses, their susceptibility to political hijack, their tendency to produce poor risk controls, poorly functioning feedback loops, failure to aggregate learning across incidents and confusion about blame and responsibility, a view anecdotally reflected among healthcare workers in the NHS. Highlighting the flaws of root cause analysis, Diller et al (2014) mention that hospitals tend to focus on 'who' did 'what' rather than on 'why' the error occurred. The importance of this focus on individual failings rather than wider system causes was arguably exemplified by the case of Dr Bawa-Garba in the UK (Mirza, 2018).

NHS staff and patients are placed at risk by staffing shortages and institutional governance deficiencies, while internal processes often confuse accountability with blame, emphasising the culpability of individuals (such as Dr Bawa-Garba) who try to compensate for system shortcomings. In the case of surgeon Mr David Sellu, it is alleged that a hospital suppressed the broader failings of an internal root cause analysis such that although Mr Sellu was later exonerated by the General Medical Council and the courts, he served more than 2 years in jail which essentially ended his career (Vaughan, 2019).

Human factors

Unless there is criminal intent, human factors are unlikely to be the root cause of adverse events, but can be contributory (Healthcare Hazard Control, 2006). A human factors approach to root cause analysis looks at system vulnerabilities (Bagian et al, 2002). This approach considers the entirety of the environment in which an individual works and takes into account factors such as the physical environment and individual mental characteristics (learning, remembering and decision making). Other human factors include group dynamics, task complexity and concurrent tasks (Greenall et al, 2004). Despite the immense pressures on NHS services (and staffing) there is some emerging recognition

Key points

- Root cause analyses were intended to search for system vulnerabilities rather than individual errors using a human factors engineering approach.
- In practice, root cause analyses done in the NHS may well fail to identify components where there are organisational failures as there may be an inherent desire to protect institutional reputation.
- A human factors approach to root cause analysis looks at system vulnerabilities, considering the entirety of the environment in which an individual works
- In the authors' experience, individuals are usually picked without any rational basis to undertake many root cause analyses for local trusts.
- The authors propose that root cause analysis should be performed by a group of people who are not managing the service.

that while root cause analysis may be useful, the importance of understanding 'why' rather than asking 'who' is crucial, and this approach is encouraged by thought leaders on safety culture such as Suzette Woodward (Woodward, 2019) and individual NHS organisations (Kaur et al, 2019).

It is high time that the growing evidence of the potential shortcomings of root cause analysis, especially as frequently applied within the NHS, is heeded. At present, rather than assisting learning, root cause analysis may be an impediment to patient safety.

Most processes external to an organisation that seek to scrutinise performance and understanding when things do not go as intended (whether local employer processes, professional regulators such as the Nursing and Midwifery Council or General Medical Council, or through a judicial process) are likely to be in some way reliant on locally undertaken root cause analysis, which may be flawed in precisely the ways research suggests, as was illustrated in the cases of Dr Bawa-Garba and Mr Sellu.

Root cause analysis, as commonly undertaken, risks hindsight bias and conformity bias, especially where establishment or managerial reputation is a factor, compounding wider potential shortcomings in the process. Challenging such bias is further inhibited by the adversarial climate that may be created and by the inequality in power between individual clinicians and senior managers. In many cases, root cause analysis is not subject to external scrutiny, and challenging conclusions not supported by evidence can be very difficult. Root cause analysis is supposed to involve a skilled multidisciplinary investigation team, preferably with representation from risk management personnel and clinical teams. In the authors' experience, individuals are usually picked without any rational basis to undertake many root cause analyses for local Trusts. Objective scrutiny suffers and the conflicts of interest may be inevitable and huge where such individuals having a primary interest in the outcome with adverse consequences for the individual staff, for organisational (or system) learning and for patient safety.

Conclusions

Root cause analysis is intended to search for system vulnerabilities rather than individual errors, using a human factors engineering approach. In practice, root cause analysis done in the NHS may generally fail to identify components where there are organisational failures, as there may be an inherent desire to protect institutional reputation.

The authors propose that root cause analysis should be performed by a group of people who are not managing the service. The emergence of the Health Service Investigation Branch at a system level may help prompt such an approach. External organisations such as the General Medical Council, Nursing and Midwifery Council, Care Quality Commission and Practitioner Performance Assessment are heavily reliant on this tool when concerns are raised. If we can eliminate the flaws in root cause analysis, drawing on the available evidence, we might all avoid cases such as those of Dr Bawa Garba and David Sellu. The authors believe that we cannot afford to not do so.

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Conflicts of interest

The authors declare no conflicts of interest.

References

Bagian JP, Gosbee J, Lee CZ et al. The Veterans Affairs root cause analysis system in action. Jt Comm J Qual Improv. 2002;28(10):531–545. https://doi.org/10.1016/S1070-3241(02)28057-8

Bamford P. Root cause analysis. n.d. https://www.ics.ac.uk/ICS/Advisory-Documents.aspx (accessed 22 February 2020)

Diller T, Helmrich G, Dunning S et al. The Human Factors Analysis Classification System (HFACS) applied to health care. Am J Med Qual. 2014;29(3):181–190. https://doi.org/10.1177/1062860613491623

Greenall J, Hyland S, Colquhoun M et al. Medication safety alerts. Can J Hosp Pharm. 2004;57(4):242–244

Healthcare Hazard Control. Root-cause analysis. 2006. https://www.sfda.gov.sa/en/medicaldevices/gcc/Workshops/Documents/RootCauseAnalysisHealthcareRiskControl_Oct2006.pdf (accessed 13 March 2020)

Kaur M, de Boer R, Oates A, Rafferty J, Dekker S. Restorative just culture: a study of the practical and economic effects of implementing restorative justice in an NHS trust. 2019. MATEC Web Conf. 2019;273:01007. https://doi.org/10.1051/matecconf/201927301007

Mirza DM. The Bawa-Garba principle for medical error. BMJ. 2018;363: k4112. https://doi.org/10.1136/bmj.k4112

NHS England. Serious incident framework: supporting learning to prevent recurrence. 2015. http://www.england.nhs.uk/wp-content/uploads/2015/04/serious-incidnt-framwrk-upd.pdf (accessed 22 February 2020)

Nicolini D, Waring J, Mengis J. Policy and practice in the use of root cause analysis to investigate clinical adverse events: mind the gap. Soc Sci Med. 2011;73(2):217–225. https://doi.org/10.1016/j.socscimed.2011.05.010

Peerally M, Carr S, Waring J, Dixon-Woods M. The problem with root cause analysis. BMJ Qual Saf. 2017;26(5):417–422. https://doi.org/10.1136/bmjqs-2016-005511

Percarpio KB, Watts BV, Weeks WB. The effectiveness of root cause analysis: what does the literature tell us? Jt Comm J Qual Patient Saf. 2008;34(7):391–398. https://doi.org/10.1016/S1553-7250(08)34049-5

Rolewicz L, Palmer B. The NHS workforce in numbers. 2019. https://www.nuffieldtrust.org.uk/resource/the-nhs-workforce-in-numbers#3-what-do-the-shortages-mean-for-hospital-staffing (accessed 13 March 2020)

Vaughan J. Overturning injustice. BMJ;364:l1024. https://doi.org/10.1136/bmj.l1024

Woodward S. Implementing patient safety: addressing culture, conditions, and values to help people work safely. New York: Taylor and Francis; 2019

Wu AW, Lipshutz AK, Pronovost PJ. Effectiveness and efficiency of root cause analysis in medicine. JAMA. 2008;299(6):685–687. https://doi.org/10.1001/jama.299.6.685