Journal calls for use of objective data in root cause analyses of adverse medical events

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Dr. Farrokh Alemi calls for moving past Root Cause and Failure Mode analysis in hospital risk management as they are unsupported by data. Credit: George Mason University

Wrong-site surgery, medication errors, and fires in operating rooms can be devastating for patients, providers, hospitals, and insurance companies alike. In risk management, these are referred to as sentinel adverse events. Determining the true causes of these events can help

hospitals improve their processes, leading to large impacts on costs and outcomes of care. Typically, hospital risk managers and improvement teams do this through either Root Cause or Failure Mode analysis—both methods that can only point to possible causes and that do not look at patterns over time or across sites.

In an editorial in the *Quality Management in Healthcare* journal, Dr. Farrokh Alemi calls for moving past these methods, as they are unsupported by data. Dr. Alemi is a professor of health informatics in the George Mason University's College of Health and Human Services. He is a national thought leader on statistical methods relevant for quality improvement.

"Relying on clinicians' insights for understanding root causes has not worked well. It has perpetuated the system that produces these events. What is needed is objective data that can provide fresh insights into causes of these events," adds Alemi. "Risk managers need to rethink their case-by-case reasoning about adverse events and examine patterns across these events. Only then they can understand true underlying causes of adverse events."

While individual events should still continue to be reviewed, it's important that risk managers look at patterns of data across cases. The editorial has called for use of modern causal analysis to produce new insights into why sentinel adverse events keep reoccurring.

To help risk managers orient themselves to modern causal analysis, several articles in the special issue demonstrate different methods of relying on objective data. In the special issue, Alemi also authored a causal network tutorial. The tutorial shows how improvement teams and risk managers can create data-based causal networks through repeated use of regression analysis. This method can more reliably identify the root cause of adverse events rather than just possible causes.

"Unlike in some other industries, we continue to see adverse events happening at a high rate in health care," explains Alemi. "We actually have an opportunity to prevent them, and that is promising. This tutorial shows how risk managers can use tried-and-true statistical methods to see which factors are actually causing these adverse events so they can prioritize addressing the factors that will reduce these events."

In his tutorial, Alemi gives step-by-step instructions for conducting a type of multivariate regression analysis—a least absolute shrinkage and selection operator (LASSO) regression to create a causal network. Once the LASSO regression is completed, the findings must be tested and then the parameters of the network are determined through analysis of objective data. The method objectively identifies causes of adverse events.

The journal's special section also includes articles by a number of authors analyzing adverse events in operating rooms, blood administration, and treatments that diminish the risk of blot clots. A review article shows the history of development of causal networks and how these methods may be relevant to risk managers.

More information: It Is Time for a Paradigm Shift in Sentinel Event Investigations, *Quality Management in Healthcare*, DOI: 10.1097/QMH.0000000000000274 , journals.lww.com/qmhcjournal/F… entinel_Event.8.aspx

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