Making ‘safety’ the focus of investigations into adverse events in health care

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Abstract

This paper seeks to provide an overview for applying lessons learned in aviation safety investigation to safety investigation in the healthcare industry. There are well established regulations and procedures in aviation that make safety the end product of any accident investigation. Furthermore, standards of practice in aviation are well documented and are part of the legal code. This is currently not the case in healthcare. While healthcare has made admirable strides in improving patient safety, we maintain that concepts such as regulation, independence of investigation, standards of practice, and investigator competency to name a few, are important to move healthcare safety to the next level.

“Air safety through accident investigation” is the official motto of the International Society of Air Safety Investigators (ISASI).1

Similarly, declaring a goal of “enhancing healthcare safety through independent and systematic investigation of adverse events”, would seem to be eminently appropriate and strike a chord with many of us who are required from time to time to undertake investigations into adverse events. As the Transport Accident Investigation Commission (TAIC) notes “The concept of independent investigations for safety was pioneered in the aviation industry, which has led all other modes in the effective use of 'not for blame' safety investigations”.2

Health care often acknowledges the need to learn from the aviation experience. Thus, we present an overview of the investigative processes used in analyzing adverse events in aviation. We then compare these well-established and validated processes with current healthcare practices. Finally, we propose how an independent, centralised investigative system could be established in health care, hence offering the prospect of providing the safety advantages to health that have long been valued in aviation.

Air safety investigation

Underlying philosophy—Annex 13 of the Convention on International Civil Aviation describes the aim of air accident investigation as follows:

“the sole objective of the investigation of an accident or incident shall be the prevention of accidents and incidents. It is not the purpose of this activity to apportion blame or liability” 3.

This objective is echoed in the Transport Accident Investigation Commission (TAIC) Act, 1990, Section 44 which is New Zealand’s ICAO Annex 13 investigation agency. TAIC carries out safety investigation only. The information obtained by TAIC can only be disclosed for the purpose of the investigations, a provision that is intended to foster full and frank evidence gathering.
The role of TAIC is differentiated from the role of the Civil Aviation Authority of New Zealand (NZCAA) as the NZCAA is charged with the regulation and over-sight of the civil aviation system. The NZCAA can carry out both safety investigations and law enforcement investigations – which can occur in parallel. All information received by the NZCAA can be used to inform either type of investigation. However, a safety investigation works to an evidential standard focussed on the “balance of probability”.

An enforcement investigation works to a higher evidential standard, as required by the judicial system. Consequently, information used in prosecutions is either factual, or that obtained by interview, where the interviewee is cautioned. Mindful of its multifaceted role, the NZCAA provides a public document which clearly outlines its policy on the collection and use of safety information.

The Dash 8 Case: an illustration—To illustrate these distinctions, it is useful to consider one of the most widely argued cases concerning the use of aircraft accident investigation evidence for purposes other than for safety and the prevention of accidents. This was the investigation into the Ansett Dash-8-100 aircraft which crashed on its approach into to Palmerston North airport on 9 June 1995.

Contemporaneous with the TAIC safety investigation, the New Zealand Police mounted its own investigation to examine whether or not criminal charges should be laid against the pilots for the accident. In the course of their investigation, the Police sought and obtained access to the cockpit voice recorder (CVR) and its transcript—although this was strongly opposed by the aviation community including TAIC.

Because the CVR records cockpit voice communications on a continuous loop basis it can be a very important tool in accident investigation, and particularly in understanding what was happening just prior to the accident. Pilots accept the intrusion of their conversations “being taped” because they want to work in a safe operating environment and recognise that when things go wrong their recorded conversation may be invaluable in preventing similar future events. Successful application requires a high degree of trust between operational personnel and investigators.

Trust depends on ensuring that the recorded material will only be used for the safety purposes that both parties have agreed to. Any additional use of the information beyond the promotion of safety would likely destroy the free and open communication between pilots on the flight deck. Pilots could become more concerned about what they should or should not talk about, than maintaining a positive and safe working environment.

In the case of the Ansett Dash 8 aircraft accident, after multiple legal arguments, New Zealand legislation was passed to reinforce the well established international aviation protection limiting the use of such recorded information to safety investigative evidence.

Investigator competency—The aviation sector recognises that safety investigation is a discipline in its own right and there are fulltime safety investigator positions available. Only professionally qualified and experienced individuals in investigative practice, who can demonstrate the necessary in-depth knowledge and skills required
to properly and rigorously address accident and incident issues, are permitted to be responsible for investigations.

Many air safety investigators are members of the professional investigative body International Society of Air Safety Investigators (ISASI). Air Safety Investigators have both knowledge and skills in safety investigation in addition to specialist knowledge and skills in a pertinent area (for example, engineering, flight operations (pilot), or human factors psychology). Many undertake University courses in accident investigation and safety management. These may include specialised knowledge concerning human perception and cognition as a precursor to training in interviewing technique.

Investigators usually work in multidisciplinary teams where a high level of mentoring is expected and provided. ISASI members are expected to act in compliance with a strict, explicit Code of Ethics. There are annual national and international Society of Air Safety Investigators seminars and a quarterly technical publication to promote the scientific development of knowledge and skills.

Commonality of approach and regular analysis of information—A visit to the CAANZ website (www.caa.govt.nz) will enable a perusal of multiple Aviation Safety Summary Reports which are published quarterly. Included in the data is the identification of accident causal factors, classified in a way useful for analysis—e.g. active failures, organisational failures, and task/environment factors involved in adverse events.

Analysis and reporting of these factors enables the CAANZ to direct the size, shape and activity of its safety resource. This means that data can be validly pooled because of the commonality of mission and agreed methodology of data collection. Also significant safety issues are rarely accepted as a driver of safety improvement on the basis of a single event. Rather, many issues come to light during trend analysis.

Investigations in health care

Investigation pathways—In health care, an investigation into an adverse event can be opened in multiple ways. Investigations which can lie outside the healthcare area entirely include:

- Coroner’s investigation of a death with a view to “prevent[ing] deaths and promot[ing] Justice”.
- Police investigation of patient harm with the view to assessing criminality.
- ACC investigation of harm with a view to determining cover and entitlement, although also has a legislative responsibility to carry out ‘harm reporting’.

There are also internal investigations undertaken by various healthcare organisations such as the district health boards (DHBs). In discussions with a number of DHBs, our impression is that there are two systems in operation; one designed to investigate adverse events relating to staff (a “health and safety” event), and one designed to investigate adverse events relating to patients (a “quality” event). Organisationally, these two systems are delivered through separate structures, with often little collaboration or integration in systems, methodologies, data or practice (between and within healthcare organisations).
Finally, there are investigations that have a regulatory function or perceived regulatory function. For example, the Health Practitioners Disciplinary Tribunal hears and determines disciplinary proceedings brought against health practitioners. At the heart of the Health and Disability Commissioner’s function is the legislative requirement to protect the rights of the health and disability services consumer provided for in the Code and to investigate potential breaches of the Code.

**Underlying philosophy**—The issue of protection of information is raised in The Health Practitioners Competence Assurance Act, 2003 which semi-protects information obtained via a “protected quality assurance activity”. Importantly, the Minister of Health can authorise the disclosure of this ‘protected’ information for the purposes of the investigation and prosecution of offences if satisfied that the information relates to conduct that constitutes or may constitute a serious offence. Information from investigations conducted by the Health and Disability Commissioner can be passed to the Medical Council of New Zealand for consideration of disciplinary action.

**Investigator competency**—We have not been able to find a knowledge and discipline basis in healthcare investigation similar to that used in the aviation sector. It is also not clear to us how investigators and ‘experts’ are chosen for each investigation. Rosemary Godbold and Antoinette McCallin in a paper discussing the New Zealand Health and Disability Commissioner not only asked “who are the experts” but also “what if experts differ and set different standards?”

‘**Standard**’ practice—This question of standards raises some particular differences between aviation and health care. Standard practice is unequivocal in aviation. For example, in terms of leadership authority and responsibility for decision making, it is vested by law.

We, and others, suggest that “standard practice” in health care is ambiguous. A recent pilot study undertaken by us in the perioperative area of a NZ tertiary healthcare provider indicated that team members appear unclear as to who is overall clinically responsible for a patient, who is medico-legally responsible when there is an adverse event, whether they are working in a delegated or share care situation, and who to contact if they have concerns over a patient’s care.

This ambiguity regarding role and responsibility is also shown where there are different findings of the Health and Disability Commissioner and the Medical Practitioners disciplinary Tribunal on the same case.

Furthermore, issues identified as remedial or restorative may only be artefacts of ambiguity of role and responsibility. If these are not clearly differentiated at the outset this can cause further confusion. This raises the concern that if the causal analysis is potentially flawed then so might be the consequential recommendations for improvement.

**Improving safety in health care**—Regulation is crucial to safety. It is heartening that the concept of therapeutic jurisprudence has been well received in relation to regulation of health care practitioners.

However, as we have illustrated in the foregoing examples, there is room for some reform of the many investigative pathways to provide a safety investigative function.
We wish to make it clear that our view should not be taken as personally critical of individuals and/or organisations involved in the investigation of adverse events in health care. In fact we consider that, in spite of the current nature of healthcare investigations, the organisations discussed have enhanced safety and improved the understanding of the systemic nature of many adverse events in health care.

We also wish to make it clear that we are not questioning the need to protect the public from a specific individual, and so the need for disciplinary and enforcement mechanisms. In fact, the need for the latter is well established in the safety literature as part of a “just culture”\(^\text{14}\).

As in aviation safety practice, we consider there are two dimensions to these improvements:

- The development of legislation for medical investigations for safety purposes as a priority.
- The development and recognition of health system-specific safety investigative knowledge and skills.

**A proposal for the way forward**—We propose the establishment of an independent central safety investigation agency to investigate adverse events in health care. “Regulatory” (and other) investigations would continue to be provided for under the legislation, and we iterate that robust regulation is a critical aspect of a comprehensive safety management system.

Ideally we believe that this agency should be co-located with TAIC for these reasons:

- To avoid “reinventing the wheel” and the duplication of facilities. TAIC’s structure is consistent with international practice for independent safety investigation agencies. It would seem sensible to maximize the appropriate use and/or adaption of current and proposed legislation, procedures and administration which apply to transport investigations. There is no theoretical reason to suggest that the safety investigative principles used in transport and other safety critical industries would not apply to health care.
- TAIC is already accepted as a non-punitive safety organisation. We believe that building on this foundation will lead to the more rapid development of trust between a central agency and stakeholders within health care.
- Both transport and health care will benefit from shared knowledge, skills and abilities. Investigation of transport accidents and incidents often require ‘medical’ input. Healthcare accident and incident investigation will similarly benefit from the experience and specialist knowledge (for example, in interviewing witnesses) of transport accident safety investigators.

We would however extend the services currently offered by TAIC.

Safety data showing trends across events would be readily accessible (similar to that provided by CAANZ), and short courses in safety design and practice would be offered. This would facilitate face-to-face transfer of the experience of trained safety investigators. Furthermore, education completes the safety cycle—providing direct feedback to the ‘coalface’.
Our proposal emphasises the need for quality research. Research can be prioritised by, and directly flow from comprehensive, independent accident/incident data. Prioritised topics would help guide researchers and organisations in planning research in this area and provide information of use to funding agencies in allocation of research monies.

We believe these proposed changes would bring the following benefits;

- Rationalisation and clarification of the multiple paths currently available for investigation of medical incidents
- The development over time of consistent and clearer standards of practice and responsibility
- Improved efficiency and consistency in the collection and management (including availability) of standard data on adverse events in health care
- The development of a culture of ‘first and foremost learn and improve practice from incidents’ in the health sector.

There are many relevant issues that are beyond the scope of this article. There were 258 serious and sentinel events in hospitals alone (year 2008–2009) that may require investigation. The occurrences reported to NZCAA (period 2005–2009) on average number 4468 per year of which TAIC investigates, on average, fewer than 10. As there is the lack of the NZCAA equivalent in NZ health care, the proposed central agency would need to incorporate safety elements of the NZCAA procedures to be of value. Funding will always be an issue—however, costs can be limited if we build on what already works well.

We acknowledge that our ideas are not complete, and welcome the opportunity to discuss this with others. Our concern is that if these issues are not discussed in open forum, changes can, and do, take place via a commercial ‘Request for Tender’ process. Is that the best we can do for New Zealand?

Competing interests: None known.

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2. Transport Accident Investigation Commission [homepage on the Internet].