


Investigators provide reasons why heavy vehicle drivers are blamed for crashes

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Abstract

Heavy vehicle crashes occur regularly resulting in death and serious injury, having enormous personal and economic impacts. Crash investigations have not been completed to a level that would identify why the crash has occurred with a number of investigations blaming the driver or not being completed in sufficient detail for the heavy vehicle transport industry to make informed recommendations to mitigate future crash risk.

This study consisted of conducting semi-structured interviews of 20 investigators who had a combined total of 624 years of investigative experiences attained from policing, regulatory and private industries. The investigators were asked to describe the types of investigations they had conducted, the investigative methods they used, what was the intent of their investigation and the level of detail and information they captured in their investigations, just to name a few. The semi-structured interviews identified key themes, the most significant being that investigations focused on blaming the driver, no specific investigation method was used, no formal systemic investigation training was provided and investigators were trained on the job. Additionally, investigators lacked experience, knowledge and understanding of the heavy vehicle transport industry and investigation biases were evident that affected investigation outcomes.

The semi-structured interview results identified why heavy vehicle drivers were blamed for crashes and identified several failings in the investigative method and process. A number of recommendations were made to suggest improvements to the industry. This included the need to implement a national heavy vehicle crash investigation agency that used a consistent systematic investigative methodology.

Keywords: Heavy Vehicle, Blame, Investigations, Crashes, Transport

1. Introduction

Heavy vehicles are the most common mode of on-road freight transportation around the world. In Australia, by 2030 the heavy vehicle transport industry is expected to double in size with the number of heavy vehicles on Australian roads growing in line with the increasing demand for transport freight (IBIS 2017). Heavy vehicle drivers operate in demanding work environments, with increased economic challenges that create several stresses impacting on driver behaviours (Quinlan 2001). Australia's vast distances between cities and country towns, demanding delivery schedules and pressures caused by penalties for late deliveries are some of the factors affecting heavy vehicle driver behaviour and safety in the heavy vehicle transport industry (Quinlan 2001; Meuleners et al. 2004; Quinlan et al. 2006; Quinlan & Wright 2008; Jones 2013; Mooren et al. 2014; Thompson & Stevenson 2014). When a heavy vehicle fatality occurs, an investigation is commenced to determine the party responsible for the crash and the way it has occurred (Taki et al. 2019). Police are tasked with investigating crashes, collecting information, often making a determination of fault for the crash. However, the level of data and information collected through the course of an investigation sometimes lack the reliability and detail to identify the underlying causes or to provide an understanding as to why the crash occurred (Newnam & Goode 2015; Doecke et al. 2020; Cikara et al. 2020b).

Coroners in Australia have also reported that some crash investigations have not been completed to a level that would identify why the crashes occurred. Most investigation reports apportioned the blame on the driver making it problematic for the Coroner to make informed recommendations that could otherwise be used to mitigate future crash risk (Newnam & Goode 2015; Dell 2015; Newnam et al. 2017; Cikara et al. 2020a). Brodie et al. (2009) stated that 'fatal crash investigations are a valuable tool for prevention because they have the capacity to identify risk and contributory factors and offer solutions for the prevention of future incidents' (p. 136). However, research conducted by Dell (2015), Newnam & Goode (2015) and Cikara et al. (2020b) have suggested that investigations into heavy vehicle crashes are not identifying the underlying causes and contributory factors. In fact, some drivers were criminally charged as an outcome of the Police investigation only to be found not guilty at trial of the charges preferred. This would suggest the evidence was probably not of the required standard to meet the burden of proof to substantiate such charges. One case in point is the Kerang rail crash that occurred on 5 June 2007 in Australia where a truck crashed into a train killing 11 train passengers. The truck driver was charged, pleading not guilty to 11 counts of culpable driving causing death and eight counts of negligently causing serious injury. At trial the driver was subsequently acquitted of all charges (Salmon et al. 2013). Additional evidence submitted at trial by the driver's defence team, overlooked by the Police, raised sufficient doubt regarding culpability of the driver's behaviour. Subsequent research conducted by Scott-Parker et al. (2015) identified there were key contributing factors that Police

did not take into consideration during their investigation (Cikara et al. 2020b).

This paper reports on the themes identified from semi-structured interviews conducted with 20 participants who have worked within policing, transport regulators, other government agencies and private companies who have been required to investigate heavy vehicle crashes. The semi-structured interviews sought responses to questions on how heavy vehicle crash investigations are conducted and the investigation methods used. Opinions were also sought on identifying the underlying causes of crashes, and a range of other issues affecting heavy vehicle transport safety, such as what was the intent of the investigation, is a nationally harmonised investigation methodology required to investigate heavy vehicle crashes, do the investigations that are conducted identify the underlying/systemic causes of a crash, would a nationally harmonised heavy vehicle crash investigation agency be of benefit to the heavy vehicle transport industry and do investigations blame the driver?

2. Participant experience

The 20 participants had a combined total of 624 years' experience in crash investigations.

Participants' policing background included international and national service. Their government experience included experience within varied national or state based regulatory or enforcement agencies involved in the transport industry other than the police. The private industry experience the participants had included employment in international and national companies, logistics and mining companies as well as oil and gas and private enterprises who use heavy vehicle transport services.

15 of the participants had 14 or more years of experience in policing. The others had corresponding experiences in government or private industry.

The number of years and the combination of experiences is outlined in Table 1.

Table 1: Total years of participant experience.

NR.	POLICE	GOVERNMENT	PRIVATE	TOTAL YEARS
1	24	6	0	30
2	6	7	5	18
3	27	0	7	34
4	20	10	0	30
5	25	5	0	30
6	27	0	7	34
7	24	10	0	34
8	18	1	7	26
9	0	28	15	43

10	26	0	7	33
11	17	7	10	34
12	42	0	0	42
13	25	5	0	30
14	35	5	0	40
15	18	7	6	31
16	22	5	0	27
17	14	10	3	27
18	0	7	12	19
19	17	9	4	30
20	15	7	10	32
Total	402	129	93	624

Table 1: Total years of participant experience

3. Method

3.1 Semi-structure interviews

20 participants took part in the semi-structured interviews.

3.2 Interview questions

Participants were asked to provide information and opinions on the following:

- Their years of experience conducting investigations.
- Their years of experience in their industry.
- The types of industry the participants worked in.
- The types of investigations conducted.
- The types of Investigation methods used.
- The intent of the investigations they conducted.
- What level of detail and information was required and captured in their investigation report?
- What level of detail was needed in their crash investigation report for the coroner to make recommendations?
- Would a national investigation method assist investigators, why?
- What levels of experience are needed to conduct heavy vehicle crash investigations?
- What levels of experience were present to their knowledge?
- What are the hurdles facing investigators that investigate heavy vehicle crashes.

What suggestions would they have to improve investigations of crashes in the heavy vehicle transport industry.

3.3 Analysis of responses

The 20 semi-structured interviews were loaded into NVivo12 and 105 codes were created to analyse the interview results. The top eight themes that were identified are included in Table 2.

NR.	THEME	N
1.	Investigations focused on blaming the driver involved in the crash.	18
2.	Need for an independent national heavy vehicle crash investigation agency.	18
3.	Lack of experience, knowledge and understanding in the heavy vehicle transport industry by investigators who conduct investigations.	18
4.	No formal systemic investigation training in the heavy vehicle transport industry - Investigators are trained on the job.	17
5.	There is no specific investigation method used in investigating heavy vehicle fatal crashes.	16
6.	National harmonisation of investigation methods is needed to improve the integrity of heavy vehicle crash investigations.	16
7.	Underlying causes of heavy vehicle crashes are not properly identified.	16
8.	Investigation biases are evident that affect investigation outcomes.	15

Table 2: Top eight themes from the semi-structure interviews

The details of the participants' responses for each theme are described in section 4 below.

4. Discussion

4.1 Investigations focused on blaming the driver involved in the crash

Blaming the driver for a crash was a strong and consistent theme in this study. Many participants stated they had conducted investigations that blamed the driver without taking into consideration other underlying causes. As one participant put it, *'the focus was very much on the driver and what the driver did wrong'*. Another participant bluntly stated that *'blame is easy, drivers are an easy target just blame them and the investigation is done'*. This is consistent with Dell's observation (2015) that:

There has also been a continuous effort to address the problem with emphasis on apportioning the blame for accidents to individuals and then taking legal action against them. Too often, those directly involved in accidents, such as the driver of the vehicle, the pilot of the aircraft or the operator of the machine, are the ones that are blamed.

This approach is symptomatic of the current investigative regime for heavy vehicle crashes. Larsen (2004) identified that *'The purpose of the police is to assess who is the guilty party, and when this is established, which may be on the basis of rather little information, they stop their investigation'* (p. 120). It is suggested the process is similar to that used in other countries around the world. Police are tasked with and responsible for collecting crash information for the purposes of determining fault and liability. As yet another participant stated, *'So with Police you're looking at finding blame with the driver, if the evidence is there then the driver gets charged, it's about as direct as that.'* However, the data collected often lacks the detail to fully identify and understand the contributing factors (Doecke et al. 2020).

There are a myriad of factors leading up to the cause of a crash; however, much of the past academic research has focused on driver centric causation factors such as speeding, fatigue, drugs/alcohol and vehicle maintenance (Driscoll 2003; Newnam & Goode 2015; Newnam et al. 2017; Cikara et al. 2020b). Other research conducted by Quinlan (2001), Quinlan & Wright (2008), Jones (2013), Newnam & Goode (2015), Newnam et al. (2017), Cikara et al. (2020a) suggests there are several other factors that influence driver behaviours that subsequently lead to a crash.

This study identified, from the responses provided by the participants, the heavy vehicle crash investigation focused blame on the driver, diverting opportunity away from identifying other underlying causes (Quinlan 2001; Jones 2013; Mooren et al. 2015). Salmon et al. (2012) and Salmon and Lenne (2015) found that investigations that focus on the driver were a key barrier in preventing a reduction in crashes. This is consistent with the findings of other authors (see, for example, Quinlan 2001; Driscoll 2003; Newnam & Goode 2015; Newnam et al. 2017; Cikara et al. 2020a).

Research conducted by Brodie et al. (2009) argued that attributing a single cause to a crash is problematic as these crashes often occur following a chain of events failing within a system. Brodie et al's. (2009) research suggested that underlying or associated factors should be considered with a broad systems and analytical approach to heavy vehicle crashes, not just be narrowly focused on blaming the driver. The information captured from the semi-structured interviews strongly suggests that a broad systems and analytical approach does not occur with the lens being clearly focused on blaming the driver.

4.2 Need for an independent national heavy vehicle crash investigation agency

Most participants in this study agreed that an independent national heavy vehicle crash investigation agency, one that uses a standardised investigative methodology, is needed to assure the identification of the underlying causes of heavy vehicle crashes. The participants also agreed that an independent heavy vehicle crash investigation agency, made up of skilled, competent, and trained investigators with relevant industry experience would positively benefit and support the heavy vehicle transport industry. As one participant stated, *'This definitely needs to happen, one agency, one method, a national approach'* and another stated that *'It's well overdue, some agencies protect their own patches, don't share the information, this will eliminate all that'* and another stated that *'it would make every State doing it the same way across Australia, all the investigations into heavy vehicle crashes would be investigated the same way.....will end up with better results, better outcomes.'*

The Australian Trucking Association (2019) made submissions to the Senate Rural and Regional Affairs and Transport Reference Committee recommending that the role of the Australian Transport Safety Bureau, presently the independent investigator of aviation, rail and maritime incidents, be extended to carry out investigations of heavy vehicle crashes.

In a submission to the Productivity Commission on National Transport Regulatory Reform (2020), the Australian Transport Association stated, *'it is critical that ATSB (Australian Transport Safety Bureau) style investigations are conducted by independent agencies and not included in the role of existing agencies involved in heavy vehicle regulation such as the NHVR'* (p.287). The Australian Transport Association further stated should the ATSB be permitted to investigate heavy vehicle crashes, these investigations should not replace existing police and coronial

investigations but provide valuable insights and recommendations for improving safety. In support The Brisbane City Council also called for a consistent cross industry and nation-wide approach to heavy vehicle crash investigations as did the South Australian Freight Council suggesting the ATSB could have an expanded role and that these investigations were complementary to those investigations conducted by the Coroner. Additionally, it is the NatRoad policy that a dedicated authority, such as the ATSB, be given the authority to promptly and fully investigate heavy vehicle crashes and share the learnings and recommendations publicly (Productivity Commission 2020).

4.3 Lack of experience, knowledge and understanding in the heavy vehicle transport industry by investigators who conduct investigations

Participants in this study consistently suggested that one of the reasons why drivers were being blamed for heavy vehicle crashes was because many investigators had limited knowledge, experience and lacked understanding in investigating heavy vehicle crashes which negatively influenced the investigative outcomes. Participants in this study felt that it was important to ensure those who investigated heavy vehicle crashes had specific knowledge of the heavy vehicle transport industry and particularly understanding the problems associated with driving heavy vehicles in all road conditions. As one participant asserted, *'Most investigators in the police and I'm speaking from experience wouldn't have a clue, wouldn't know where to look and what questions to ask, in case they had some form of industry knowledge. Even experienced investigators wouldn't know about heavy vehicles which is a problem'*.

To gain a thorough understanding of the real issues leading to heavy vehicle crashes, investigators must have a thorough knowledge of all aspects of the heavy vehicle transport system that can contribute to crash causation, an understanding of the interrelationships between the parties within the system and an understanding of the problems and issues from the driver's perspective. As one participant expressed, *'look at what I've experienced, I know that it is common, Police just don't have the specific training and other Government agencies are not that more better off. You need to definitely have specialists, much like aviation, you would not get a novice investigating a plane crash like you do with heavy vehicles, it is not an ideal situation'*.

The Productivity Commission on National Transport Regulatory Reform (2020) acknowledged that for an independent agency such as the ATSB to transition into investigating heavy vehicle crashes would take require time to develop and train investigators. The Productivity Commission estimated that a time period of between 18 months to 2 years, would be needed for investigators to gain the right skills and knowledge to undertaken heavy vehicle crash investigations.

4.4 No formal investigation training in the heavy transport industry - Investigators are trained on the job

Participants in this study stated they had not received formal training in heavy vehicle crash investigation. Most of the knowledge, skills and experiences they acquired had been gained from being trained on the job and obtaining advice from other co-workers during their career. It was not until later in their careers did some participants attend to investigation training courses, albeit not specific to the heavy vehicle transport industry.

Many participants agreed that often investigators did not have the skills, training, experience, knowledge and competence to investigate heavy vehicle crashes. Investigators were not trained in investigative methods and only gained a rudimentary understanding from ad hoc training courses, none of which were specific to the heavy vehicle transport industry. Most participants stated that their investigation training consisted of 'on the job' training where there was a tacit transfer of knowledge from one to another, with most acquiring their knowledge through day-to-day experiences and the passage of time.

As one participant stated, *'Policing is like a full time university for the entire duration of your career'* and another participant affirmed that *'I didn't get any formal training for investigating crashes, it was all on the job, you learnt as you attended a crash, you learnt more with each crash, you got better at it with every one you attended'* and another stated that *'because in my early policing career the focus was very much on the driver and what the driver did wrong, there was not much awareness of actually looking further than that, looking at the employer, or at the circumstances surrounding that'*. The participant concluded that the focus of the investigation was to identify if there was evidence to

apportion blame.

There was consensus from the participants that the lack of formal systematic crash investigation training resulted in investigations not being properly conducted simply because they did not know what to look for in a systematic context, what questions to ask or what to explore. Participants felt it was easier to find the evidence that focused on blaming the driver, which over time developed into a subconscious investigative pattern of behaviour with unintentional biases.

As far back as 1994, the National Road Transport Commission identified the issue regarding Police lack of knowledge in enforcing road laws for heavy vehicle vehicles may be limited due to a lack of training (Jones 2013). The National Heavy Vehicle Enforcement Strategy (2008) identified the same theme and was explicit about the need for specific and appropriate training for enforcement officers.

This research suggests focus should be given to training investigators in understanding principles of undertaking systemic investigations that capture causal factors from other parts of the heavy vehicle transport system and other parties in the heavy vehicle transport chain of responsibility. Larsen (2004) suggested that in depth investigation methods requires training and experience. Manuele (2014) posited that for personnel to develop knowledge they should be given the required training to acquire the necessary skills and competencies. Driver accountability is only one element of the heavy vehicle transport system (Cikara et al. 2020a; Cikara et al. 2020b). The comment by one participant sums up why investigators need to be properly trained and the practice of 'on the job training' discontinued when he stated that *'I wasn't investigating a fatality to look for blame but because of the way I was taught it usually ended up blaming the driver'*.

4.5 There is no specific investigative methods used in investigating heavy vehicle fatal crashes

Many participants in this study reported that they did not use a standardised investigative methodology. However, some used an investigation plan or form that assisted when they conducted heavy vehicle crash investigations. One participant explained that *'At a minimum you would work on a file and my modus operandi was on every file there would be a coversheet and the coversheet would be requirements for that investigation and there would be a proforma with plenty of gaps'*, whereas another participant stated *'Look, mate, to be honest I don't know. All I was doing was when you talk about methodology was simply just covering the elements of the offence to see if there was anything in it or not. And whether we'd charge someone or not'*. Only two participants mentioned using a standard investigation method. Both were working in private industry. One stated: *'Basically we used the (name redacted) methodology. It's a very good methodology if used correctly'* and the other referred to the use of a standardised investigative template.

Previous studies into the causation factors of heavy vehicle fatal crashes concluded there is the need to develop a domain specific investigative methodology to identify the underlying causes contributing to a heavy vehicle crash (Salmon et al, 2010; Salmon et al, 2012; Newnam & Goode 2015; Newnam et al, 2017; Cikara et al. 2020a; Cikara et al. 2020b). In support, Hollnagel (2004) suggested that a prescribed causal factor investigative model should be used during an investigation. Moreover, the studies identified a pressing need to develop an industry wide reporting and analysis system so that the causation factors of a heavy vehicle crash can be identified, removing the focus away from blaming the driver. This is supported in previous research by Bohensky et al. (2005) who recognised that if the process for investigating deaths is standardised these deaths would be more easily and efficiently investigated. It has been shown that the application of structured investigation methodology can improve safety outcomes as evidenced in other safety critical domains such as aviation, rail and maritime that already use structured methods (Sheridan 2008; Cassano-Piche et al. 2009). A comprehensive investigative process is likely to identify factors that have contributed to a crash all the way up to the level of regulatory bodies and Government agencies (Newnam et al. 2017).

4.6 National harmonisation of investigation methods is needed to improve the integrity of heavy vehicle crash investigations

Many participants stated that to effectively and efficiently address the ongoing risk of heavy vehicle crashes, it is necessary to implement a nationally harmonised investigation methodology to improve investigative outcomes. Research suggests that for investigations to look beyond the driver and focus on the systems, decisions and actions of others, it is essential for there to be an investigation method that captures these elements (Toft et al. 2012; Dell 2019; Cikara et al. 2020a). In relation to the need for a nationally harmonised investigation methodology, one participant expressed that it would: *'enable you to more accurately gather your data or whatever you want to use as data, because then you're playing with a consistent level playing field as opposed to - and again, one would help that with a national system there would be the correct checks and balances put in place. Whereas if you go off in different states, they may not all have the correct or the appropriate checks and balances in place'*. Another participant stated that *'It would be advantageous because if you ever use the same methodology, as long as it's proven to be a good methodology, it gets all the causes and required outcomes'*.

The Productivity Commission National Transport Regulatory Reform (2020) has reported the existing investigation system is not suitable with several industry and government stakeholders supporting the calls for a national approach to investigating heavy vehicle crashes. It was stated this would add valuable transport expertise to the investigation process.

4.7 Underlying causes of a heavy vehicle crashes are not properly identified

This study identified there were multiple factors that adversely influenced the quality of heavy vehicle crash investigations, the most prominent of which were the investigators' skills sets, availability of and access to resources and competing priorities such workloads.

A review of coronial investigation findings into heavy vehicle fatal crashes identified several instances where the Coroners expressed concern about the limitations and quality of police investigations into heavy vehicle fatal crashes. For example, in 2001 the Victorian State Coroner highlighted a number of serious deficiencies in a heavy vehicle fatal crash investigation and formally recommended that *'Police give consideration to the development of a basic investigation standard for fatal and serious collisions'* (Victorian Coroners Court, case number 1114/2001). In another example, a Coroner in Queensland expressed concern at the *'sub-optimal practices'* and quality of a heavy vehicle fatality investigation stating that *'The outcome was less than perfect, but probably no worse than many investigations regularly undertaken throughout the state'* (Queensland Coroners Court, 2010/4091).

Bugeja et al. (2007) found that police expert crash investigators were usually not involved in the investigation of all fatal heavy vehicle crashes, especially those that are single heavy vehicle crashes. It is acknowledged that most single vehicle fatal crashes are not investigated by experienced crash investigators. Bugeja et al. (2007) concluded that there were recognised limitations associated with the coronial investigations of heavy vehicle crashes because of the substandard level of detail captured in investigations and the lack of an existing systematic approach because Police investigators were inexperienced. It was found that should a single contributing factor be identified in a heavy vehicle fatal crash such as speeding or fatigue for example, as being obvious all other potential factors may be ignored or become irrelevant. The Coroner recommended all information relevant to a heavy vehicle fatal crash must be collected regardless of early assumptions, biases or conclusion so that every possible avenue of inquiry could be explored and all contributory factors considered, rather than having a limited investigation devoid of detail.

Bugeja et al. (2007) have noted that:

- currently there is no systematic approach to the coroner's investigation of heavy vehicle related fatalities, which ultimately impacts upon research on fatal heavy vehicle collisions and the development of future countermeasures by industry and authorities.

This may explain why Coroners' recommendations following fatal heavy vehicle crash investigations were infrequent. Brodie et al. (2010) identified a number of instances where there were no recommendations made from heavy vehicle fatal crashes and of the heavy vehicle fatal crashes where recommendations had been made if was found there was a lack of effective evaluation of the impact of the recommendations that were made.

Regardless of the early assumptions or conclusions, all information relating to the heavy vehicle crash, no matter how trivial, must be collected so that every possible avenue of inquiry could be explored. Indeed, research conducted by Kjellen (2000) also suggested that the procedures and methodologies of the investigative process must be such that it extracts constructive information in such detail that it can be used to inform strategy and provide recommendations to prevent future crashes from occurring.

4.8 Investigation biases are evident that affect investigation outcomes

It was identified from a number of participants that there were key factors that influenced the conduct of an investigation. These factors included biases, protectionism and preconceived ideas. Additionally, and more concerningly, factors such as external interference and pressures to achieve particular biased outcomes were also identified. Because of these factors, it was alleged the course of the investigation was influenced pressuring the investigator to look for blame, rather than investigate all the reasons why the crash occurred.

One participant stated they had personally experienced interference where personal agendas and biases had influenced the course of an investigation when he stated that *'I've seen personal agendas, I've experienced where they've pointed the blame and they haven't even started [or] finished the investigation... its impacted on me because its opened my eyes to the way biases can happen, and I'm more alert to them'* and another stated that personal agendas influenced the outcome of an investigation so that management were not personally seen in an unfavourable light. Another commented that *'it happens more than it should, management and the exec (sic) want to be seen as being great, not at fault, but shit on the rest, it's a concern and difficult to deal with'* and another stated that *'I think a lot of organisations try and protect themselves. If they find a fault and they're liable then, of course, it's going to create issues for them as an organisation, as far as their safety statistics are concerned, even for litigation, perhaps, and even prosecution, whatever'*.

Such was the negative experience from one participant when they explained how individuals could influence the direction of an investigation in stating that *'an individual with influence can have a detrimental impact on the investigation, amongst their peers if they are strong enough they can actually guide the investigation down the wrong path'*. It was alleged investigations were hindered or impacted due to fear and if an investigator was not strong enough, certain pathways in an investigation were not pursued.

Another participant commented that *'Organisational investigations are often quite biased where they try and make things look as good as they can for themselves so they don't shoot themselves in the foot'* and yet another stated that *'without doubt there's a lot of people that want to protect their own industry. They want to protect themselves, they want to cover their own arse (for want of a better word) they don't want to air their dirty laundry to the wider public'* and another who suggested that *'preconceived biases and self-protection have applied pressure on the investigator so that it steered the investigation in a specific direction, removing focus from organisations and avoids identifying the factors that abrogated the responsibility from the company'* and another who stated that *'they're seeking the outcome of penalising the individual', basically blaming the driver'*.

In a study conducted by Manuele (2014) it was argued that investigation reports were often biased in favour of blaming an individual. Self-preservation was dominant, with management being reluctant to report deficiencies in management systems they were responsible for. Manuele (2014) went on to state that *'If incident investigations are thorough and unbiased, the reality of the technical, organisational methods of operation and cultural causal factors will be revealed'* (p.41)

There was consensus in this study that it is easier to look for blame rather than investigate why the crash occurred. This finding was also supported by Lundberg et al. (2010) who suggested that investigations with limited scope, focusing on behaviour and breaches of the law, would also be affected by bias *'that leads investigators away from the ideal'*.

5. Conclusions

This study identified eight themes - investigations focused on blaming the driver; the need for an independent national heavy vehicle crash investigation agency; a lack of experience, knowledge and understanding in the heavy vehicle transport industry by investigators who conduct investigations; no formal systemic investigation training in the heavy vehicle transport industry-Investigators are trained on the job; no specific investigation method used in investigating heavy vehicle fatal crashes; national harmonisation of investigation methods is needed to improve the integrity of heavy vehicle crash investigations; and underlying causes of heavy vehicle crashes are not properly identified and investigation biases are evident that affect investigation outcomes

This study found heavy vehicle drivers are blamed for crashes due to several factors - investigators did not have the training, knowledge or experiences to undertake heavy vehicle crash investigations with many being trained on the job or learning from others; underlying causes of heavy vehicle crashes were not being identified; biases and self-protection, where it was identified some participants had experienced instances where organisations would rather blame the driver than be held accountable for poor management practices.

The overwhelming view of most participants in this study was that an independent national heavy vehicle crash investigation agency, made up of skilled, competent and trained investigators with relevant industry experience and that uses a standardised investigative methodology, is needed to conduct thorough investigations which go beyond blaming the driver, thereby ensuring the identification of the underlying causes of heavy vehicle crashes.

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