# Changing the Narrative of Injury Measurement

How Paired Analysis creates conversations rather than scores for injuries

with **Kevin Geddert**

Prepared by Genuine Insight Data Analytics

# About The Author

# Kevin Geddert

## Personal History

- **Originally from Fort McMurray Alberta, Canada**
- **Worked in Oil and Gas for decades**
- **2014 – Moved to Australia to help manage a medium-sized oil and gas service company.**
- **2023 - Started researching Safety Measurement with Griffith University**
- **2024 - Established Genuine Insight Pty Ltd, an independent data-consultancy, supporting companies with data and business intelligence.**

## Publishing History


- Geddert, K., Dekker, S., & Rae, A. (2021). **How Does Selective Reporting Distort Understanding of Workplace Injuries?** Safety, 7(3), 58. https://www.mdpi.com/2313-576X/7/3/58
- Geddert, K. (2025a). **Analysing safety data for an entire industry group – A case study from Queensland Coal-Seam Gas.** Australian Energy Producers Journal, 65. https://doi.org/10.1071/EP24485
- Geddert, K. (2025b). **Meeting the target, missing the point.** In S. Dekker (Ed.), Safety Theater: How the desire for perfection drives compliance clutter, inauthenticity and accidents - and what to do about it. Routledge.
- Geddert, K., Dekker, S., & Rae, A. (2026). **Injury Rates tell an incomplete story, but a more complete measurement narrative may be possible** Safety Research

# The Problems in Injury Measurement

# Things we know about the Injury Rate

- The Injury Rate was released in 1916, and was not designed to function as a stand-alone measure. (Anonymous, 1916; Geddert, 2025)
- The original designers suggested that under-reporting was to be expected, especially if an injury rate were to be used alone (Anonymous, 1916))
- The paired measure set was used during the American Industrial Revolution to drive engineering changes by safety leaders. (National Safety et al., 1919)
- Contributed to a 96.4% decline in cumulative rate and severity of injuries between 1907 and 1936 (Chaney, 1919; Geddert, 2025; Kossoris & Kjaer, 1938)
- Attempts to correct for the significant drop in severity failed to understand the initial design intent of Severity measurement.(Geddert, 2025; Kossoris, 1944)
- The original severity measure failed and vanished into obscurity by the 1970s. (Schauer & Ryder, 1972)
- Under-Reporting has plagued safety measurement for a long time. (Petitta et al., 2017; Pransky et al., 1999; Probst et al., 2008; Probst & Estrada, 2010)
- The random nature of variation in Injury Rates makes them statistically invalid as a predictive metric. (Hallowell et al., 2021)
- Measurement systems can create behaviours that are counter to their intended objective.(O'Neil, 2016; Scott, 1998)
- People have been hurt as a direct result of safety practices (Dekker, 2013) (Dekker & Breakey, 2016)
- Systematic reporting bias has been shown to exist in what gets included and excluded from Injury Rates (Geddert et al., 2021)

# The Research – Changing the Injury Narrative

Researching an alternative to what was lost

# Major Research Study

**Injury Rates tell an incomplete story, but a more complete measurement narrative may be possible.**

Journal of Safety Research (2026) - Geddert, K., Dekker, S., & Rae, A.

**Research:** How does the narrative of injury performance change when rate and severity are assessed together?

- **Three Case Studies**
- **13 Years worth of data**
- **947 million exposure hours**
- **5,919 recordable events**

**Methodology:** Severity Adjusted Injury Frequency

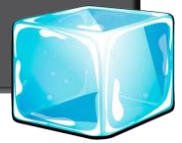
- A set of three balanced measures incorporating Injury Rate, injury Severity and a weighted average
- Designed specifically around an understanding of historic failings in severity and Injury Rate measurement

# Understanding the SAIF Methodology

## The Severity Adjusted Injury Frequency (SAIF Rate)

SAIF is the Severity Adjusted Injury Frequency. It is a simple way to express an overall severity pattern of injuries as a modifier to TRIF. (Similar to presenting wind-chill in terms of temperature)

Example: My TRIF is 4, but adjusted for severity it's 2.3



## How does it work?

One injury is set as a benchmark; all other injuries are evaluated based on how they compare to the benchmark. The benchmark for the SAIF is a lost time incident with two weeks' time lost.

- TRIF = The number of people that are hurt per 200,000 hours.
- SAIF = A relative number of people with a two-week LTI per 200,000 hours.




## The Math

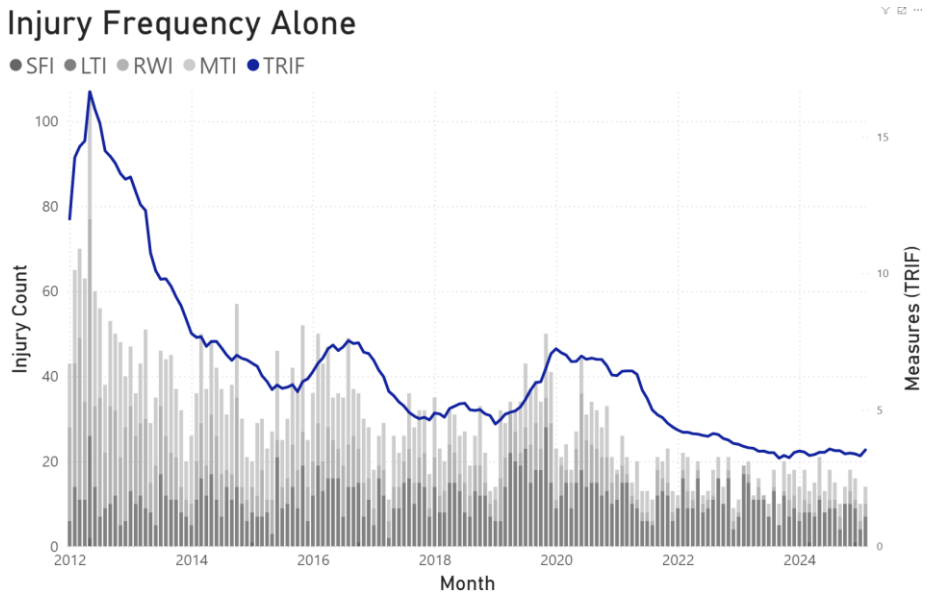
- A 14-day LTI is the benchmark injury. As such, it counts as a 1 for both TRIF and SAIF.
- Injuries are given a relative base score according to classification (medical treatment, restricted work, lost time, SIF) with a potential modifier in each classification.
- Base ratings for each category are set via a Base-3 logarithm; each category is exponentially more or less significant than the surrounding category.
- The modifiers in each category adjust the resulting SAIF value for outcomes relative to the benchmark, and specific to that category.

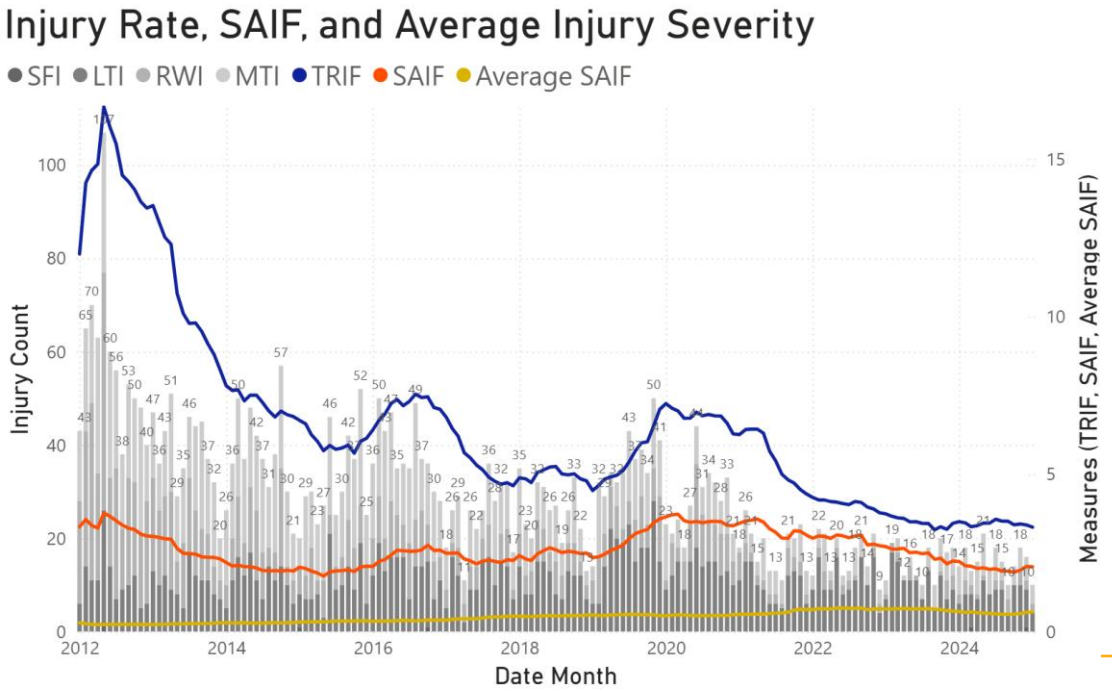
# Case Study: Samples

## Stand-Alone Injury Rate Narratives:

The narrative from TRIF alone was that the organisation had seen a downward trend over the past 13 years.

Performance has hit a plateau through 2024-25



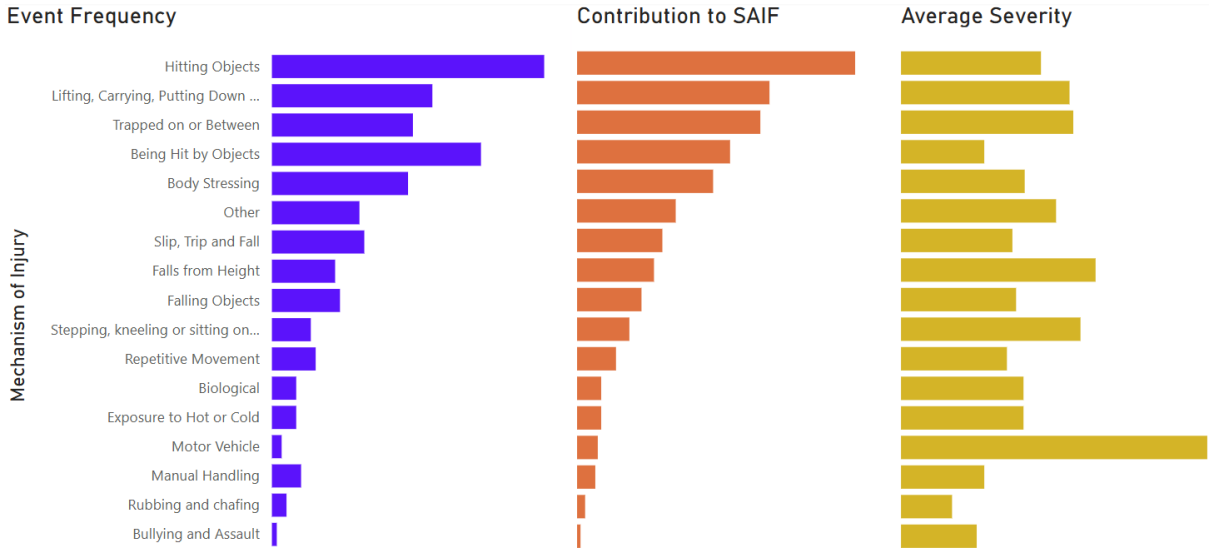




## Narratives from Balanced Measures:

In the same period where the long-term trend was an 80% reduction in Injury Rates the average severity of events would more than triple.

This period in 2024-25 would see the first drop in the average severity of events in 12 years, suggesting that a material change in injury performance was taking place while Injury Rates held flat.

# Case Study: Samples



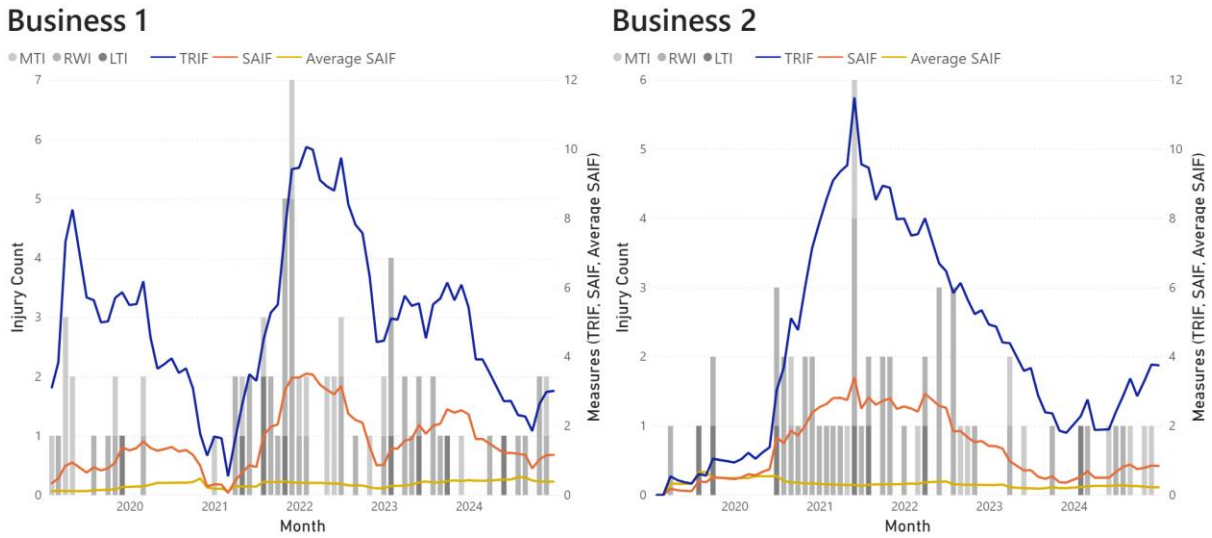

## Failure Mechanisms with Balanced Measures:

With Rate alone, high volume mechanisms get the most immediate attention from a data perspective.

The average severity of events allowed individual failure mechanisms to be identified as more likely of a severe outcome (such as motor vehicle accidents or falls from height).

This finding wasn't surprising, but rather a validation of both the measures and a practical demonstration of the low-volume events that have serious consequences.

# Case Study: Samples

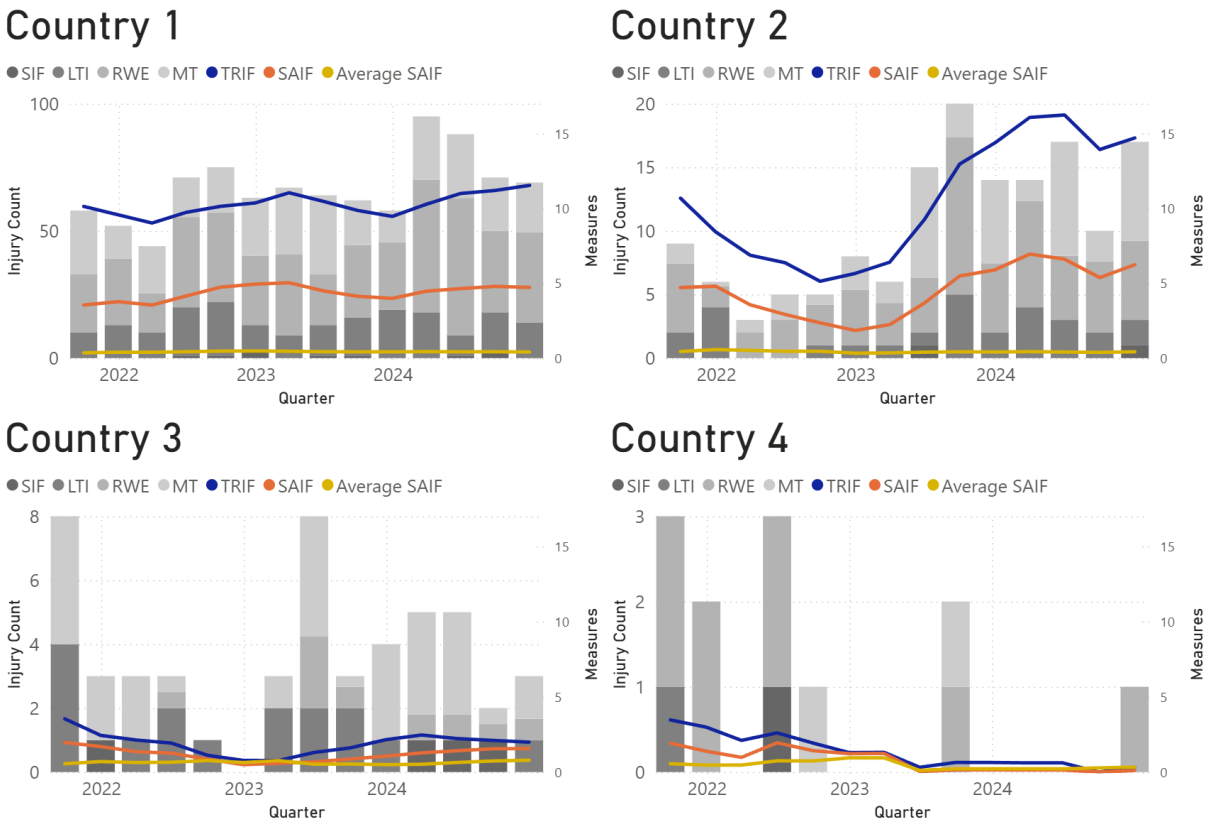



| Business | TRIF | SAIF | Average SAIF | Total Hours |
|---|---|---|---|---|
| Business 1 | 3.07 | 1.18 | 0.38 | 15,026,040 |
| Business 2 | 3.27 | 0.67 | 0.20 | 15,113,519 |
| **Total** | **3.16** | **0.95** | **0.30** | **30,139,559** |

## Comparing to Business Units with Balanced Measures:

Two businesses that had relative similar TRIF rates were markedly different when severity and rate were assessed together. The business with the higher TRIF had 47% lower average severity. So the business with the higher Injury Rate had a considerably lower overall weighted average of rate and severity.

# Case Study: Samples




| Country | TRIF | SAIF | Average SAIF | Total Hours |
|---|---|---|---|---|
| Country 1 | 11.54 | 4.72 | 0.41 | 90,395,921 |
| Country 2 | 14.71 | 6.24 | 0.42 | 13,258,274 |
| Country 3 | 1.99 | 1.57 | 0.79 | 29,454,456 |
| Country 4 | 0.31 | 0.10 | 0.33 | 11,123,121 |
| **Total** | **9.30** | **3.96** | **0.43** | **144,231,772** |

## Comparing international Business Units with Balanced Measures:

The difference in average event severity between regions suggested that reporting was absent in one international area, but also that the other three countries were not including the same profile of events despite having the same definitions. Whether this was a product of international cultural differences, medical practices, or reporting differences is not something this research can ascertain. The Average event SAIF measure did demonstrate that the other two measures(TRIF and SAIF Rate) could not reasonably be compared across international boundaries with the assumption that they were reflective of the same types of events.

# Discussion and Analysis Quotes

"The design and implementation of injury measurement tools substantially altered the narratives of injury performance in both direction and complexity."

"When metrics were examined together, the narratives centred on understanding the relative relationships among injury measures rather than treating any single measure as the sole performance metric."

"When viewing any major trend in a stand-alone Injury Rate, it is likely that a change in the reporting of low-severity events is a better explanation of Injury Rate movement than a material shift in injury performance."

"More narrative options were possible when measures were taken together and in context with one another."

"Most Injury Rate movements observed in this research were potentially driven by shifts in the inclusion or exclusion of lower-severity events."

"Narratives about a paired set of measures were seldom discussed as better or worse. Rather, discussions moved towards culture and risk-based descriptions of the findings."

# Four Key Findings

Following this research, four key guidelines were developed that contributed to the overall ability to change the injury performance narrative.

**Pairing:**

Injuries must be simultaneously assessed based on both rate and severity of outcome, with a weighted measure of the two for reference.

**Continuous variability:**

It is important to avoid categorical leaps in value when addressing lower-severity events.

**Simple Narrative:**

An injury measurement tool benefits greatly from having a simple-to-understand narrative device.

**Scale:**

The objective of measuring severity is to identify relative differences between subjects, not to accurately

quantify severity.

# Important Ideas

**A Comment on Accuracy**

"It is important to note that a base-3 logarithm cannot truly honour the reality of suffering and loss experienced by someone who has undergone a life-altering event. It is indeed doubtful that quantifying the true reality of severity in terms of actual suffering and loss experienced would be either possible or helpful. The hope of this research is that: by creating usable measures of injury rates and severity, actual suffering and loss may be immeasurably reduced."

- Kevin Geddert – 2026 - *Injury Rates tell an incomplete story, but a more complete measurement narrative may be possible*

# Where to from here…

# What Next?

Upcoming Work:

- What we lose in the processing of safety data, and how to get it back.
- The Attention Pendulum Problem
- Safety Measurement in Uncertainty

Stay Tuned

# Questions & References




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# Agenda

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|---|---|
| My Background | **10 min** |
| History of the Injury Rate | **15 min** |
| Alternative Injury Measurement | **10 min** |
| Changing the Injury Narrative | **20 min** |
| Dialog | **5 min** |