Optimising incident reporting systems for learning: a systems thinking approach

Dr Natassia Goode
Research Fellow, USCAR
Still a significant problem in Australia.
Never again!

We must learn from this event!

There is little evidence that organisations are learning from incidents and near misses in the workplace.
A long series of steps towards learning...

1. Identifying events worth reporting
2. Reporting
3. Analysing
4. Decision-making
5. Implementation
6. Follow-up
The problem...models of accident causation

- Starting machinery without warning
- Lack of supervision
- Lack of training
- Lack of guard rails
The problem...models of accident causation

The answer:
- strict supervision
- remedial training
- discipline
An alternative: the systems approach

1. Safety is impacted by the decisions and actions of everyone in the system not just front line workers.

2. Near misses and adverse events are caused by multiple, interacting, contributing factors.

3. Effective countermeasures focus on systemic changes rather than individuals.

The goal is not to assign blame to any individual, but to identify how factors across the system combine to create accidents and incidents.

Why haven’t we applied this understanding to the analysis of workplace injuries and near misses?
The UPLOADS Project

Goal: develop a standardised, national approach to incident reporting and learning for the outdoor activity sector in Australia underpinned by a systems model of accident causation.

Support:
Organisation in analysing their own data; and
The collection of industry-wide data.
What is the outdoor activity sector?

Horse riding; trail biking; caving; bushwalking; trail running; canoeing; sailing; mountain biking; slacklining; rockclimbing; orienteering; surfing; 4WDing; rogaining; camping; challenge ropes courses; expeditions; fishing; kayaking; snorkelling; off road triathlons; pioneering ...

• Recreation
• Education
• Adventure
• Therapeutic
• Developmental
• Tourism
• Skill development
• Community engagement
• Spiritual development
Just like any workplace

WHS Legislation:

They hold a duty of care towards their clients and employees.

They must eliminate or manage the risks within the workplace as far as reasonably possible.
High risks

2007 - 2009 there were five fatalities in commercial rafting operations in Cairns.

Three different companies.

Why?
Prior to UPLOADS what was known?

• A little about the ‘broken component’ (e.g. activity leader failures)
• Limited evidence on system wide failures
• Poor data systems
• Incident reporting limited
Project Phases

1. **Methodological development.** Prototype incident reporting, storage and analysis methods was developed, forming a prototype accident & injury surveillance system;

2. **Methodological validation and refinement.** Prototype system was trialled and evaluated by led outdoor activity providers;

3. **In-depth incident study.** Injury surveillance system will be implemented in order to conduct an in-depth study of injury causing incidents in the led outdoor activity domain in Australia; and

4. **Accident causation model development.** Based on the findings, a systems-based model of injury incident causation for the led outdoor activity domain will be developed.
The system consists of:

1) A software tool for recording injury and near miss data, tailored to the outdoor activity context;

2) A coding framework for classifying the causal factors involved in outdoor injuries and near misses. The framework is underpinned by a systems theory model, Rasmussen’s Risk Management Framework.

3) Tools for analysing the causal factor data;

4) Paper-based and video training; and

5) A method for secure and confidential contribution to the industry database.
Coding framework development

1. Comparison of systems-orientated accident analysis methods for the purposes of analysing fatal outdoor accidents (e.g. HFACS; STAMP; and Rasmussen’s Framework- Salmon, Cornelissen & Trotter, 2012).

2. Rasmussen’s framework was then adapted to describe the ‘led outdoor activity system’.

3. Analysis of over 1000 led outdoor incidents was then undertaken to identify a set of specific causal factors involved in outdoor incidents.

4. We then populated the framework with these factors.

5. Reliability testing – 14 safety managers from outdoor activity providers coded 10 detailed incidents, revised the framework.
Coding framework

State and Federal Government (8)

Regulatory bodies and professional associations (8)

Local Area Government (6) Parents/Carers (6) Schools (8) Higher-level Management (11)

Supervisor/Field Managers (10)

Activity Leader (9) Activity Participants (8) Other People in Activity Group (9)

Group Factors (8)

Other People in Activity Environment (8)

Activity Environment (6) Activity Equipment and Resources (5)
Automatic tools for analysis
Secure and confidential reporting

Data collection

- Led Outdoor Activity Providers
  - Instructor/Safety manager
    - Report incident
      - Organisation’s data system
      - Auto de-identification

UPLOADS system

- Activity Incident
  - Contributory factors
  - *Note data is non-identifiable regarding organisations, instructors, participants etc

Data analysis

- UPLOADS annual report
- Periodic reporting to industry
- Ad hoc data requests
- *Note reporting shows aggregate data only and is non-identifiable

Reporting of aggregate data

Products

- Standardised incident/near miss reporting form
- Organisation level database
- UPLOADS aggregate database
- UPLOADS analysis framework

*Note: organisations can run their own in-house analyses using own organisation level database
UPLOADS: summary of features

• Based on a systems theory framework.
• Specifically designed for outdoor activity providers.
• Systematically track incident, staff and participant data.
• Tools to analyse your own data.
• Video and paper-based training material.
• Allows you to contribute deidentified data to an industry database.
• Analysis of industry-level data will provide evidence to support systemic changes.
But will it improve safety??

1. Identifying events worth reporting
2. Reporting
3. Analysing
4. Decision-making
5. Implementation
6. Follow-up
Thank you!

Dr Natassia Goode
University of the Sunshine Accident Research Team
ngoode@usc.edu.au
Key future Human Factors Issues in Safety Science

1. We need a method for developing systems-orientated accident analyses into systems-orientated recommendations.

2. We need to better integrate systems-thinking into work planning and design.

3. We need models that can predict when the normal conditions of work are migrating towards the boundaries of safety.