Learning the lessons from WMSDs: A framework for reporting and investigation

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with
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Dr Natassia Goode

- Senior Research Fellow within the Centre for Human Factors and Sociotechnical Systems

- Theme leader for Organisational Safety

- PhD in cognitive psychology, full time research in HF for the past 6 years

- Key areas: Organisational behaviour, accident analysis, workplace safety

- Theoretical approach to accident causation: systems thinking

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Background

- WMSDs still a major burden on individuals, organisations and the healthcare system in Australia.

- Considerable evidence that WMSDs are caused by a complex system of factors (e.g. individual, work design, sociocultural factors + physical risks)

- Significant literature on accident causation and learning from incidents

- Have these advances been translated into practice? Are current reporting and investigation systems optimized for learning from WMSDs?

Aim: Develop a practical framework for optimising learning from reports and investigations into WMSDs, which provides guidance on:

- The organisational resources required
- The processes that need to be implemented
- The types of contributing factors and countermeasures to consider

Learning: the capability to extract experiences from incidents and convert them into measures and activities which will help to avoid future similar incidents and improve safety overall.

Stage 1: Literature review on contemporary theory regarding accident causation and learning from incidents, identifying:

- A best practice model of accident causation
- A model of learning from incidents
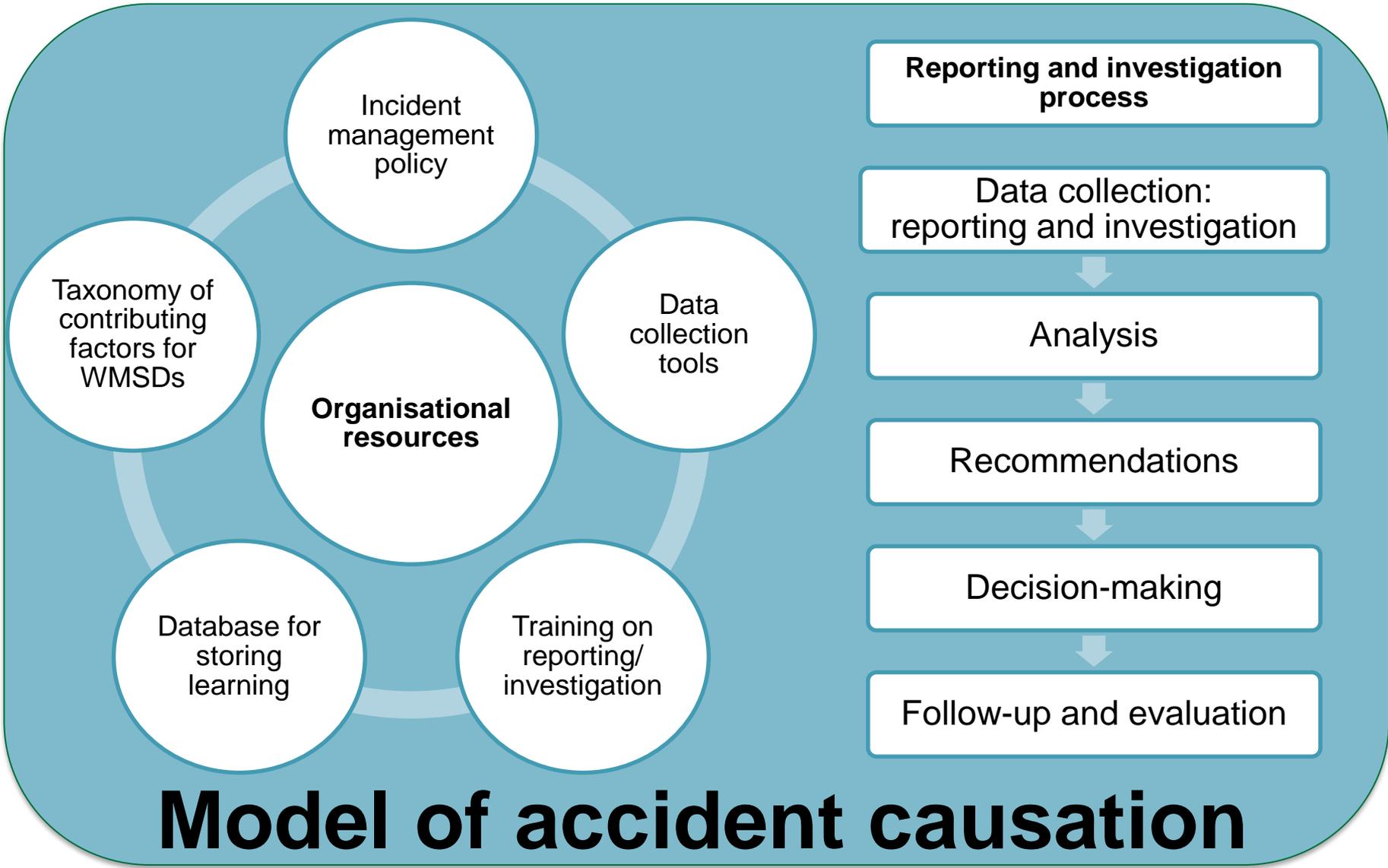- The conditions required to optimise learning from incidents

Stage 2: Systematic review on the evidence regarding the risk factors associated with WMSDs

- Developed a prototype taxonomy of the contributing factors involved in WMSDs

Stage 3: Study of reporting and investigation practices in 19 large Australian organisations (Interviews with 38 safety managers, documentation review, analysis of incident and investigation reports)

- Factors that facilitate or act as barriers to implementing the conditions identified as best practice in the framework
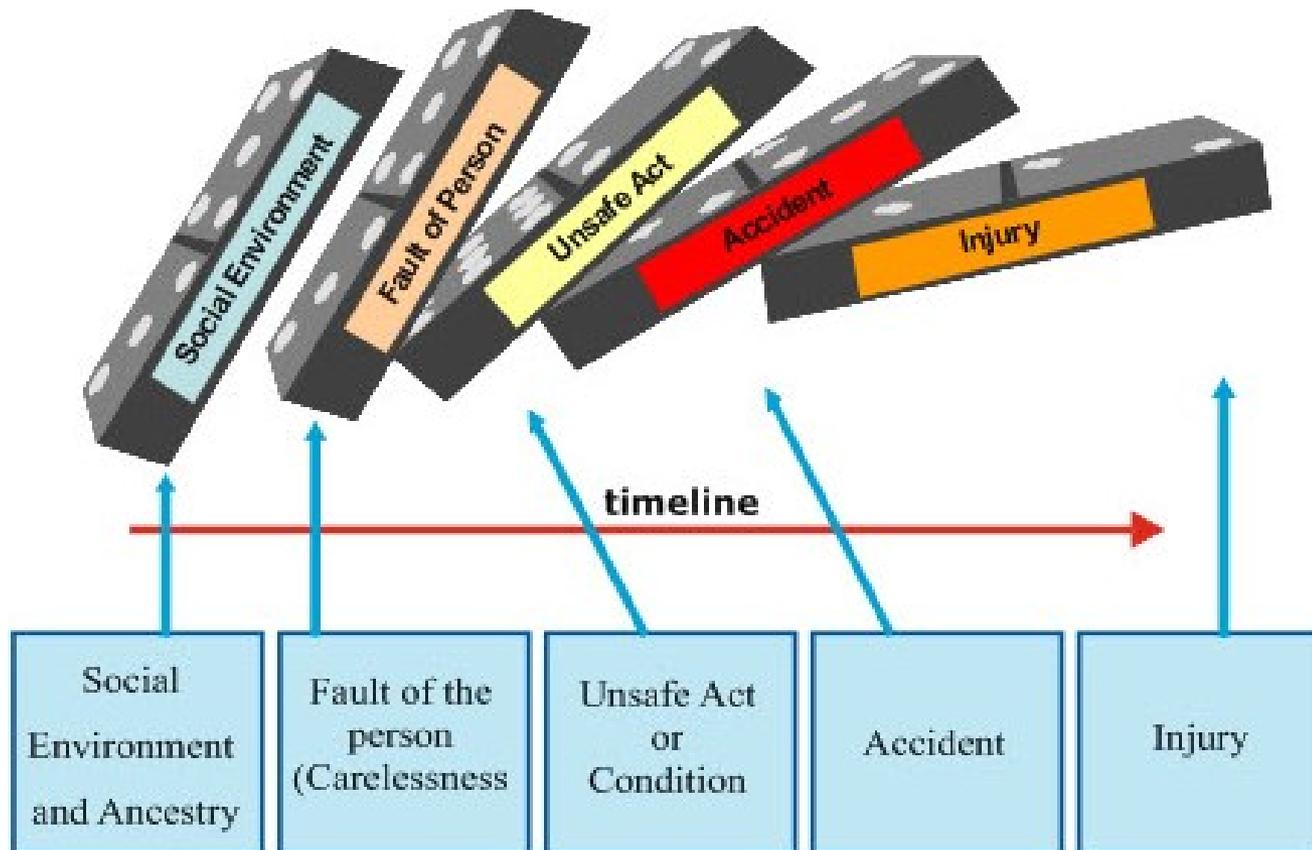
Framework for reporting and investigation

Incident management policy

Taxonomy of contributing factors for WMSDs

Data collection tools

Organisational resources

Database for storing learning

Training on reporting/ investigation

Reporting and investigation process

Data collection: reporting and investigation

Analysis

Recommendations

Decision-making

Follow-up and evaluation

Model of accident causation

What-you-look-for-is-what-you-find

What-you-find-is-what-you-fix

Sequential models
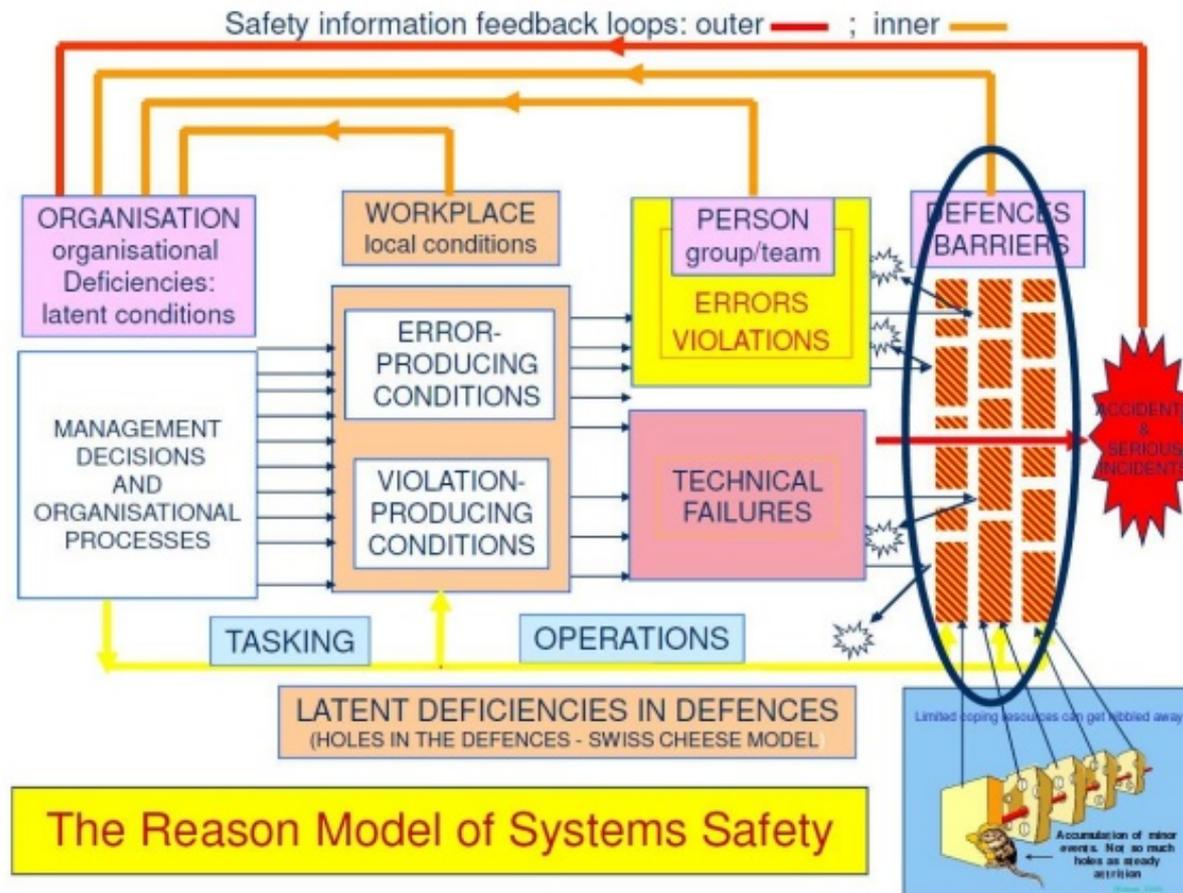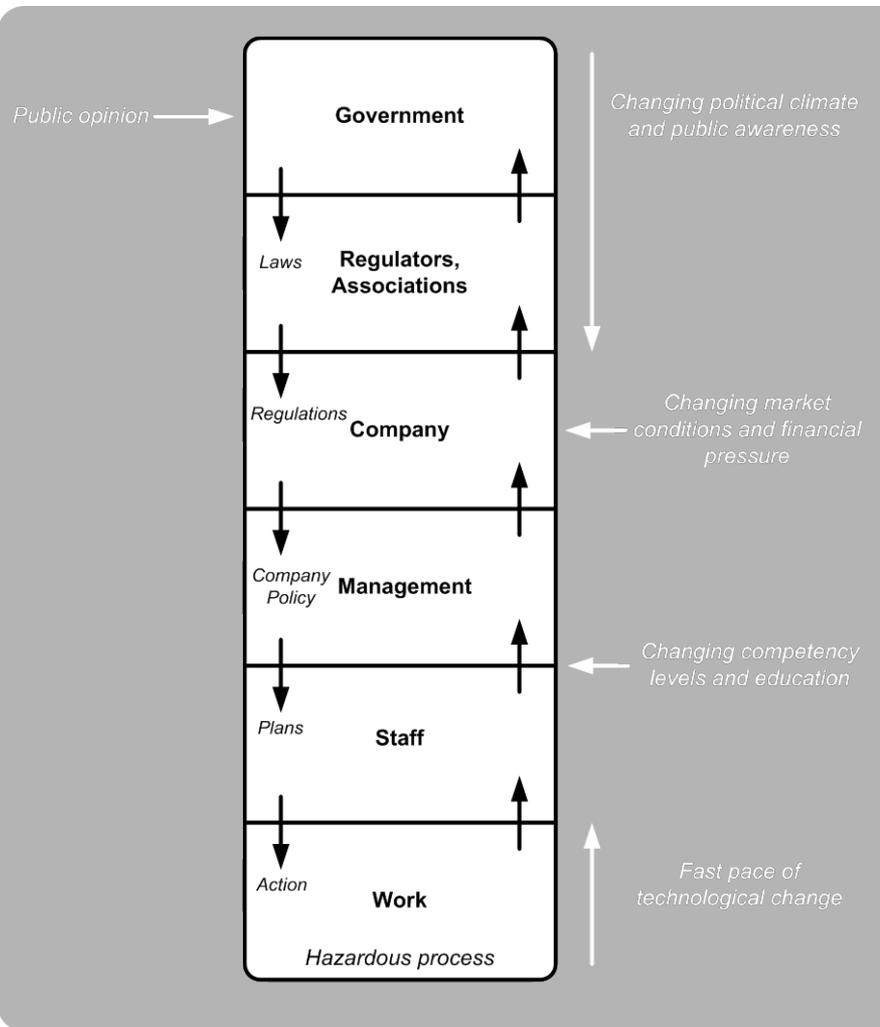
Epidemiological models

Figure 7: The Reason Model of System Safety (Reason, 1997)

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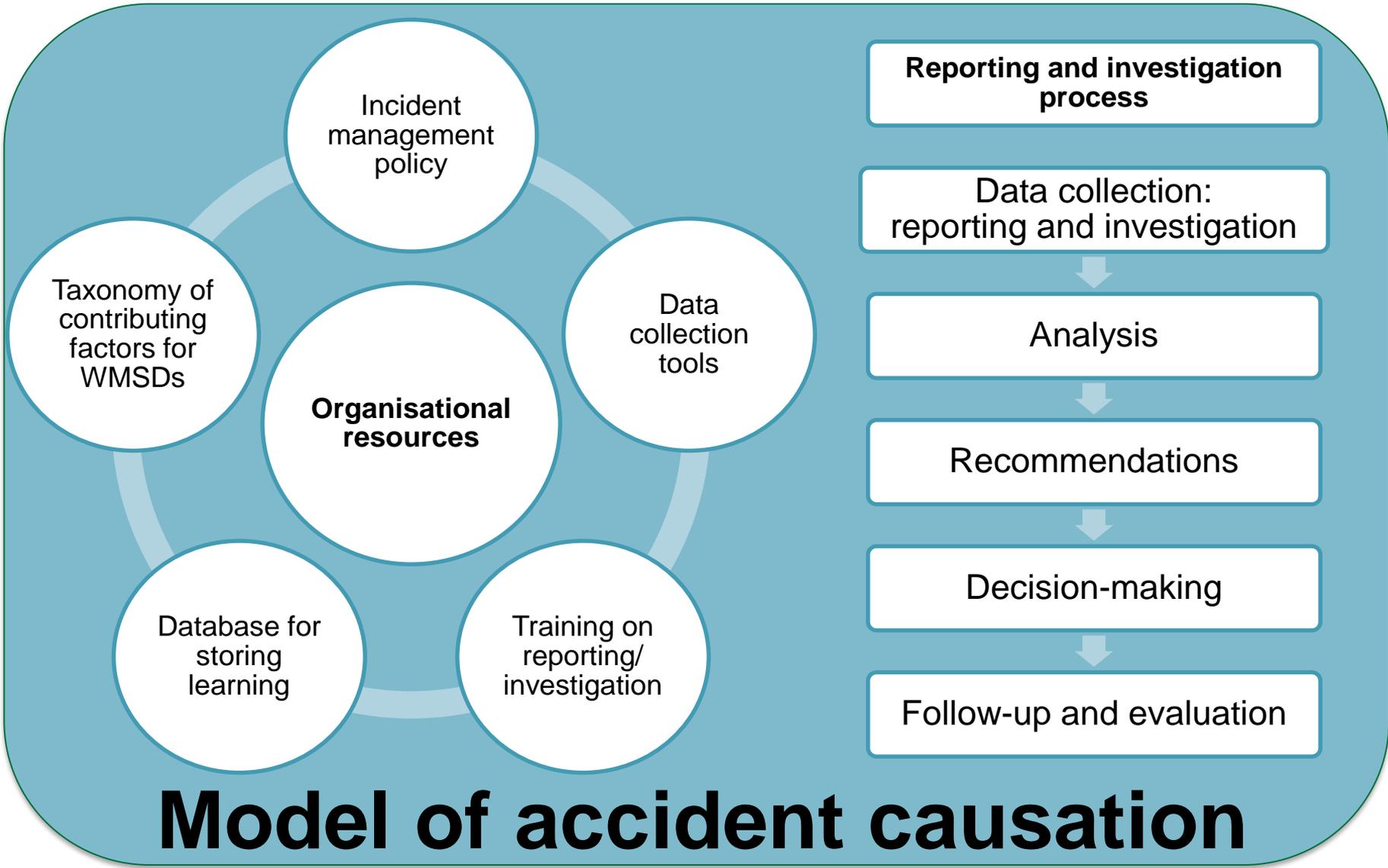# Best practice: Systems models

Current practice

Barriers
- The majority of safety managers did know about accident causation models (22/38).
- Reasons' Swiss cheese (12/38)
- Use of inconsistent methods/models.

Facilitators
- Integrated into all organisation documents (1 organisation).

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Best Practice	Facilitator(s)	Barrier(s)
Clear definitions of what should be reported/investigated	Include examples in documentation	Lack of clarity around definitions e.g. "all incidents" or "all near misses"
Define who is responsible and involved in each stage of the learning cycle.	Senior management have specific responsibilities	Lack of skill sets Lack of power to implement changes

Taxonomy of contributing factors

Best Practice	Facilitator(s)	Barrier(s)
Domain specific taxonomy	Integrated into all aspects of reporting and investigation	Unclear/overlapping categories

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Taxonomy – the literature

Government								
Regulatory bodies and associations								
Company								
Management	Job Design	Supervisor support	Supervisory methods	Co-worker support	Efforts & rewards	Organisational change	Work scheduling	Breaks
Staff	Demographics	General health characteristics	General health, prior pain and co-morbidities	Health behaviours	Individual psychological factors	Worker perceptions job security	Worker strain and opportunities for recovery	
Work	Ambient conditions	Equipment	Postures	Task factors				

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Taxonomy + current practice

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Government	Government funding and priorities							
Regulatory bodies and associations	WHS regulations	Equipment standards	Expense of equipment	Expense of changes to work environment				
Company	Approval process for recommendations	Company funding and resources	OHS funding and resources	Safety monitoring systems	Senior management attitudes safety	Policies / procedures	Long term OHS strategies	Co-operation between different work groups in the organisation
	Safety culture	Senior management accountability and responsibility for OHS outcomes	Silos within the organisation					
Management	Staff workloads	Communication of risk controls measures	Management and direct supervisor attitudes to safety	OHS Team power and responsibiltiy				
	Job Design	Supervisor support	Supervisory methods	Co-worker support	Efforts & rewards	Organisational change	Work scheduling	Breaks
Staff	Demographics	General health characteristics	General health, prior pain and co-morbidities	Health behaviours	Individual psychological factors	Worker perceptions job security	Worker strain and opportunities for recovery	
Work	Ambient conditions	Equipment	Postures	Task factors	Maintenance of equipment and work environment	Dynamic work environment	Nature of the work	

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Best practice: Database used to store all reports and investigation findings

Facilitators

- Software accessible online
- Simplicity of questions
- Automatic email reminders
- OHS Team can modify questions
- Multiple people can add information about an incident

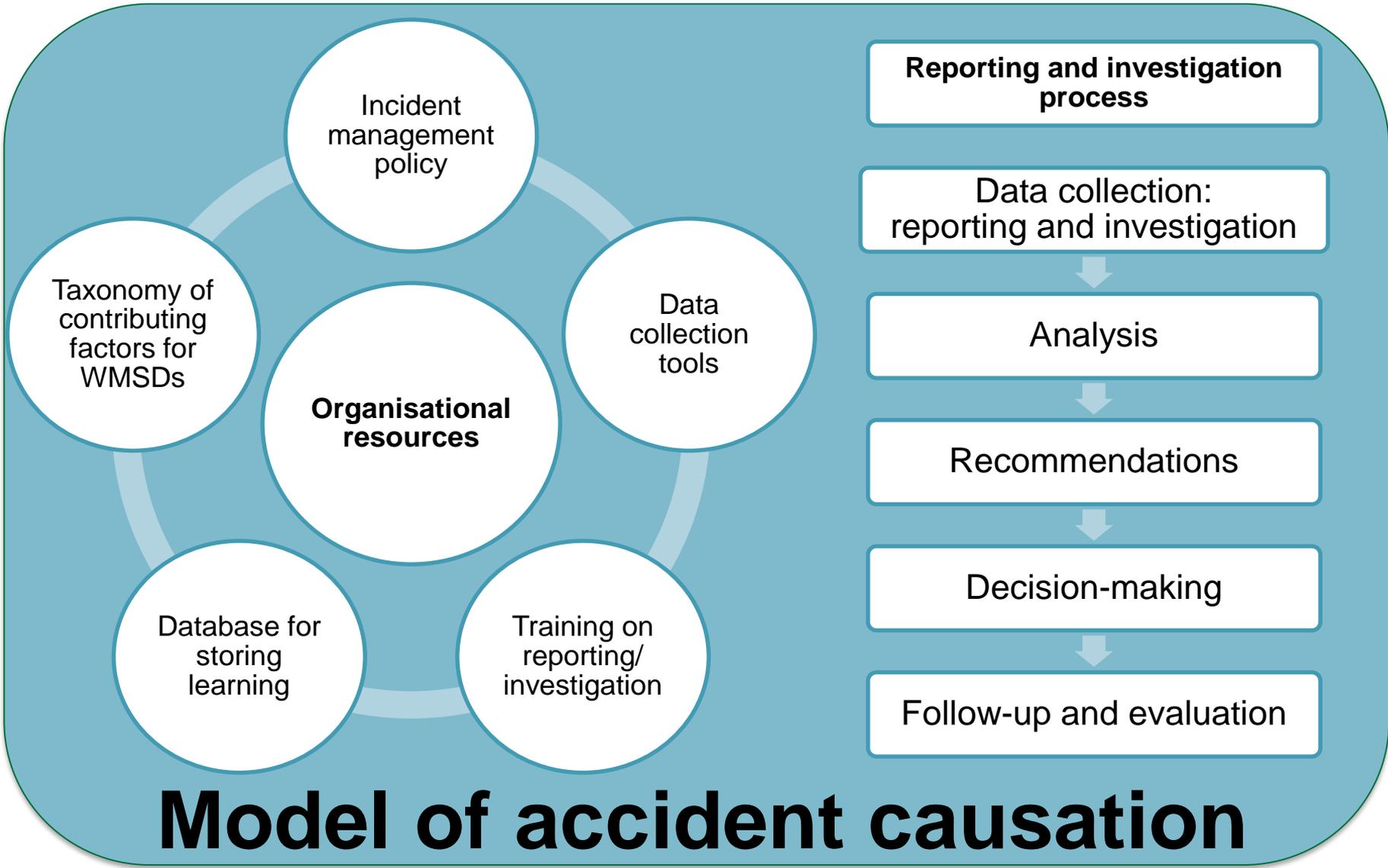Barriers

- Difficult to enter reports e.g. fields do not match paper form, system is slow, interface confusing
- Multiple systems for different types of incidents, hazards and near misses
- Investigation findings not recorded
- Difficult to extract data for analysis
- Search function does not allow you to identify clusters of incidents
- Managers can delete reports they don't perceive as important

Data collection tools

Best Practice	Facilitator(s)	Barrier(s)
Incident forms collect information required to support decision making around investigation	Forms collect info from multiple people Free text boxes for detailed description of events/conditions, cont factors, recommendations	Forms encourage selection of single contributory factor Forms time consuming Lack of space for incident description and contributory factors Confusing categories
Range of standardised investigation tools available that target data around levels of Rasmussen's framework	Interview questions Previous risk assessments Same tools used in all WMSD investigations	Informal chats Reliance on single tool Tool use based on personal preferences

Training

Best Practice	Facilitator(s)	Barrier(s)
All staff receive appropriate training on incident reports	Considers different skill sets, education levels, and access to computers Annual	One off training Training embedded in other OHS compliance training
All lead investigation staff receive appropriate formal training	Opportunity to reflect on investigation practice Evaluation of investigation reports	Online training Training not specific to org context Training focuses on compliance Lack of opportunity for feedback False sense of authority

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Model of accident causation

The process – the learning cycle

Reporting and investigation process

Data collection:
reporting and investigation

Analysis

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Follow-up and evaluation

Data collection – investigations

Process	Best Practice	Facilitator(s)	Barrier(s)
Selection of incidents for investigation	Incidents should be those from which as much information as possible can be extracted (for prevention)	Incident and investigation reports stored in an accessible format	Software tool does not support identification of clusters/trends
Investigation goals Review and revision of Risk Control Measures	Goal is learning with a focus on reviewing risk controls and identification of targets for prevention	Rebadging of investigations e.g. 'Review of risk controls', 'Review of practice'	Competing goals e.g. compliance, punishment, litigation Lack of clarity on difference between internal and external investigations
Investigation scope	Investigations focus on factors influencing behaviour rather than immediate context of injury	Investigation goes 'up and out' rather than 'down and in' Focus also on why risk controls didn't work	Focus is on injured person, 'root cause', what 'should have been done'

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Design of recommendations

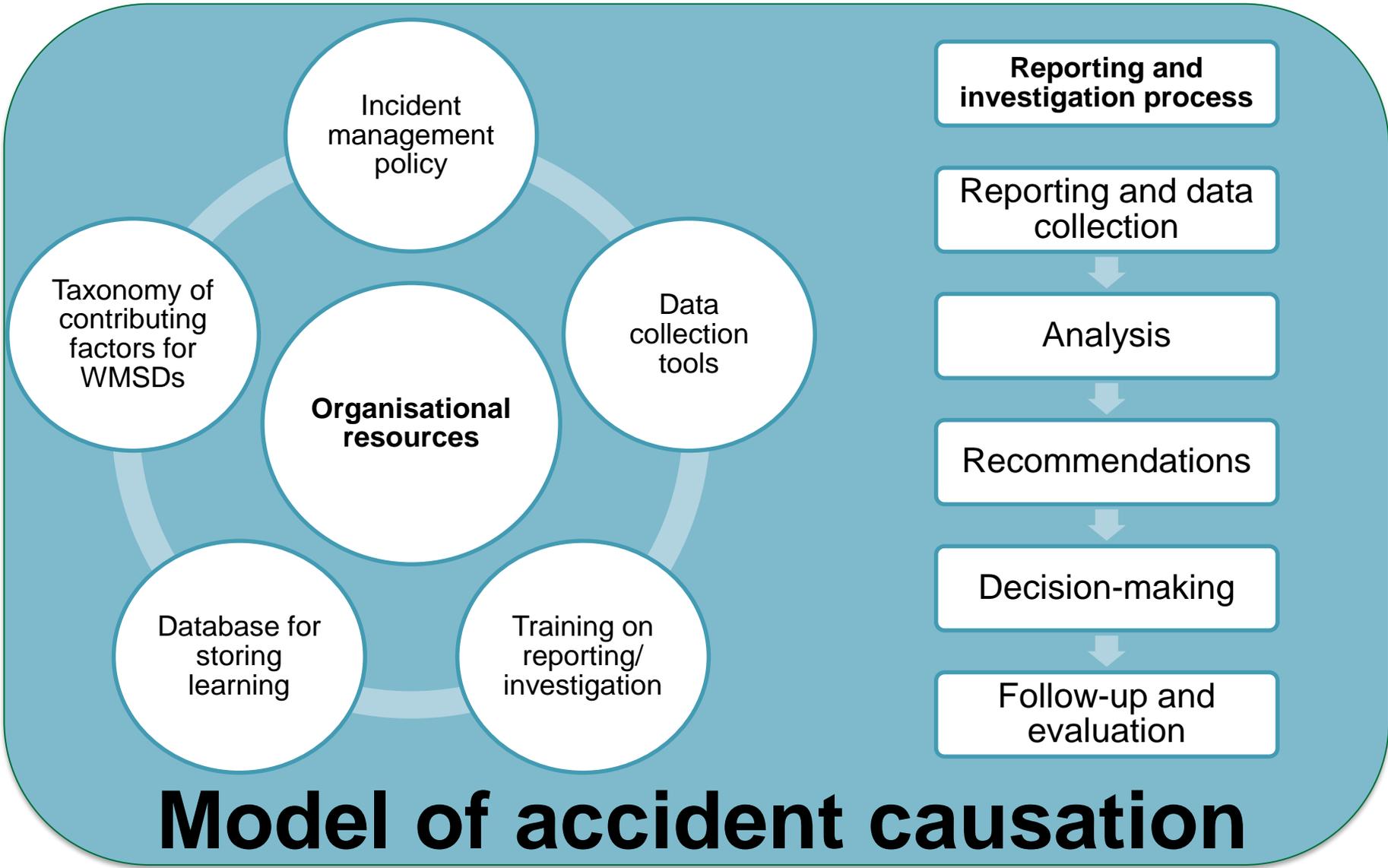| Best Practice	Facilitator(s)	Barrier(s)
Formal consultation process incorporates: - Multiple participants - Multiple recommendations - Consideration of interactions with existing control measures - Barriers to implementation	- Produce number of recommendations with risk matrix and strengths and weaknesses - OHS team have frequent verbal contact with senior manager	- Lack of workload allocation to participate - OHS team are perceived to be responsible for developing recommendations

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Selecting recommendations

Process	Best Practice	Facilitator(s)	Barrier(s)
Addressing injured worker issues	Identifying appropriate risk controls through consultation process Risk controls focus on addressing factors that influence behaviour rather than retraining or education	- Injured worker is directly involved in design of recommendations	- Lack of funding
Identifying effective recommendations	Decision made based on whether recommendations: - Target factors influencing behaviour - Target organisational redesign - Apply across the organisation - Include plans for long term maintenance	- OHS team has frequent interactions with senior management	- Recommendations address personal factors - OHS team communicate with senior management through business cases or monthly reports

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Framework for reporting and investigation

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- **Organisational resources**
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Reporting and investigation process

- Reporting and data collection
- Analysis
- Recommendations
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- Follow-up and evaluation

Directions for future work

- Further development of the taxonomy

- Application of the framework to improve processes in a particular domain (e.g. healthcare)

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Questions/Comments

Email me for the full report on the framework:

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