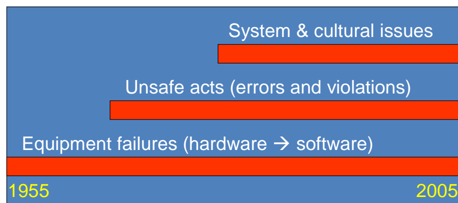
The Canadian Healthcare Safety Symposium
Halifax, Nova Scotia 21-23 October 2010

The noughties revisited and a hesitant peek into the teens

James Reason
Professor Emeritus
University of Manchester, UK

Expanding focus of safety concerns across industries



1960s	1970s	1980s	1990s	2000s
Metal fatigue	Flixborough	Chernobyl	Paddington	Linate
Aberfan	Seveso	Zeebrugge	Long Island	Überlingen
Ibrox	Tenerife	Bhopal	Alabama	*Columbia*
	TMI	*Piper Alpha*	*Estonia*	
	Mt Erebus	Dryden	Eschede	

Ever-widening search for the 'upstream' factors

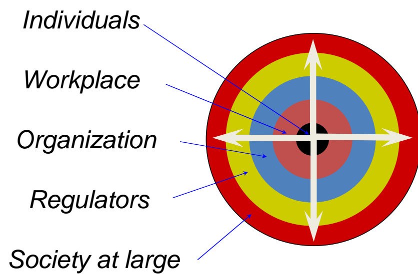
Individuals

Workplace

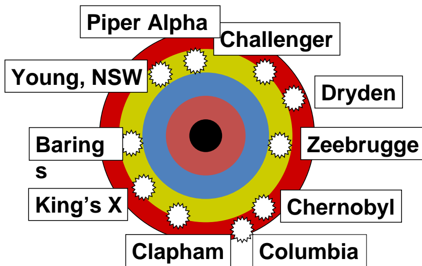
Organization

Regulators

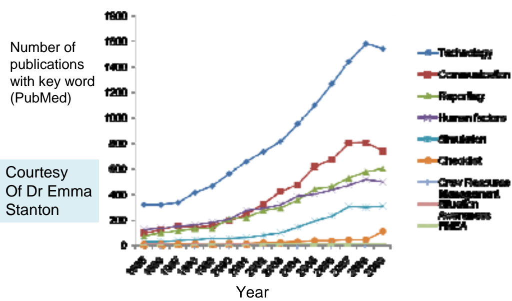
Society at large



Echoed in many domains



Interventions to improve patient safety 1995-2009



Quality & Safety in Health Care 2006;15:229-230

'. . . junior doctors say they rarely see their seniors report or act on errors—their own or those of others.'

M Walton
Professor of Medicine
University of Sydney

Errors dominate the risks: Two models of error

- Person model
- System model

Each has its own 'theory' of error. Each directs a particular type of remedy.

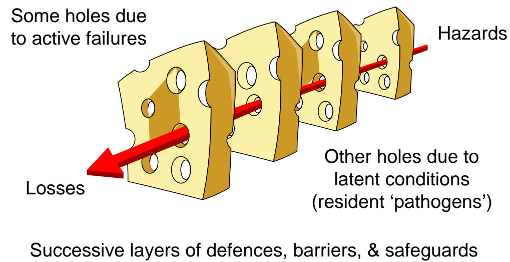
The person model

- Sees errors as the product of wayward mental processes: forgetfulness, inattention, distraction, carelessness, etc.
- Remedial measures directed primarily at the 'sharp end' error-maker: naming, blaming, shaming, retraining, fear appeals, writing another procedure, etc.

The system model

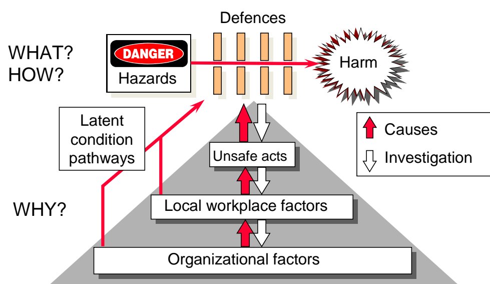
- Health carers are human. They will make errors. This is not a moral issue.
- Adverse events are the product of latent conditions (pathogens) within the system.
- 'Sharp-enders' are more likely to be the inheritors than the instigators.
- Remedial efforts directed at improving defences and removing error traps.
- Endorsed by many high-level reports.

The 'Swiss cheese' model of accident causation



Successive layers of defences, barriers, & safeguards

A system perspective on adverse events



Recurrent error traps

- Same situation or procedure produces the same errors in different people.
- In health care:
  - Wrong route drug administration (Vincristine, Bupivacaine)
  - Wrong duct (lapchole)
  - Wrong site (frequency up by half in UK)
  - Wrong dose (order of magnitude errors)

First law of error management

- Fallibility can’t be eliminated, it’s part of the human condition.
- We can’t fundamentally change the human condition, but we can change the conditions under which people work to make them less error provoking and more tolerant of errors that do occur.

Human performance: Two aspects

Human as hazard

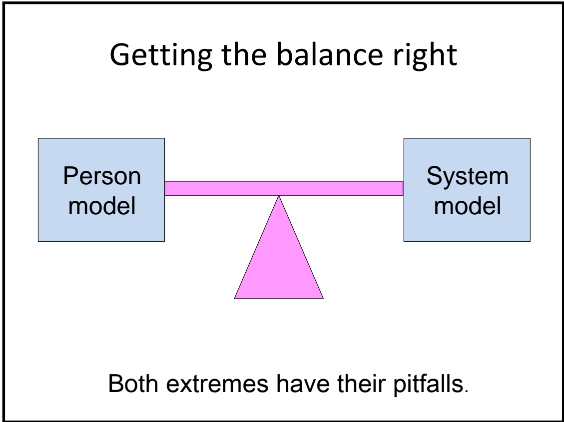
- Slips
- Lapses
- Mistakes
- Violations

Human as hero

- Adjustments
- Compensations
- Recoveries
- Improvisations

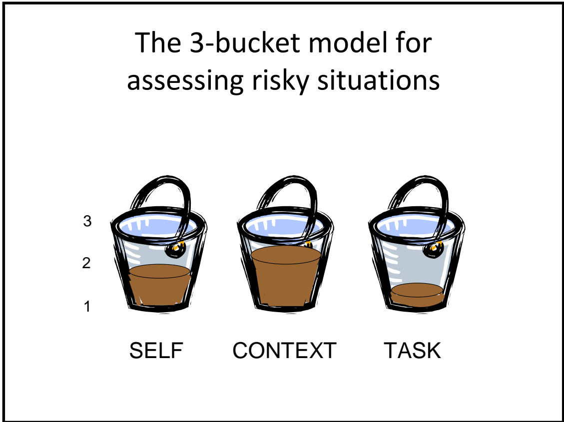
Health care: Distinctive features

- Diverse activities and equipment
- ‘Hands on’ work—high error opportunity, small margins of safety
- Uncertainty and incomplete knowledge
- Patients are vulnerable and needy
- Local event investigation
- One-to-one or few-to-one delivery



On the front line . . .

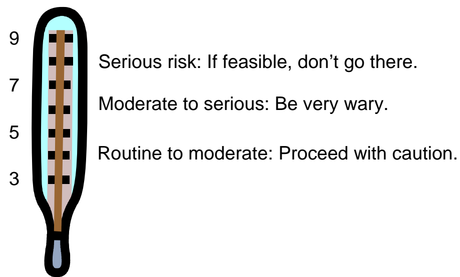
- Professionals at the sharp end (nurses, junior doctors) have little opportunity to improve the system overall.
- We need to make them more risk-aware and 'error-wise' – mental skills that will:
  - Allow them to recognise situations with high error/risk potential.
  - Improve their ability to detect and recover errors that are made.

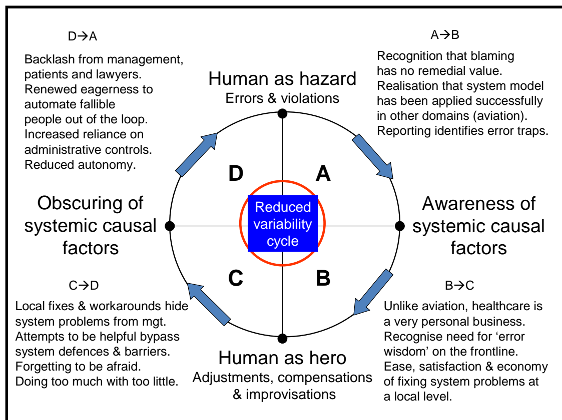


How the model works

- In any given situation, the probability of unsafe act(s) being committed is a function of the amount of brown stuff in all three buckets.
- Full buckets do not guarantee an unsafe act, nor do empty ones ensure safety. We are talking probabilities not certainties.
- But with foreknowledge we can gauge these levels for any situation and act accordingly.
- Don’t go there—challenge assumptions, seek help.

How the buckets might be ‘read’ by junior staff working alone

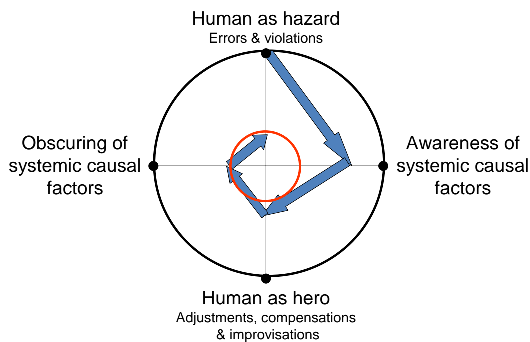




Further comments

- At first sight, it looks as though the cycle has a 'good' sector (right side) and a 'bad' sector (left side).
- But each is a complex mixture: there is good in the 'bad' and bad in the 'good'.
- Nothing is wholly black or white. All have a potential downside, all have some benefits.
- A better understanding of these issues permits anticipation and manipulation of their effects→ maximising the positives and minimising the negatives.

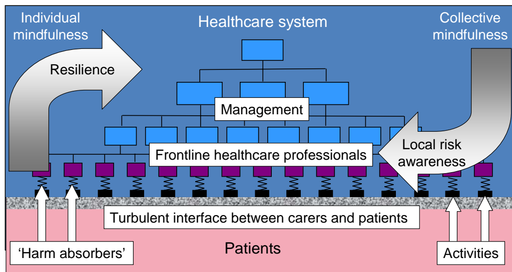
With each cycle there could be a reduction in variability



Reduced variability

- It is hoped that as the organisation learns and matures, variability will diminish.
- The tensions and transitions implicit in the cycle remain, but the perturbations are less disruptive.
- Eventually (one hopes), the person and system models will operate cooperatively rather than competitively.
- Enhanced robustness (one hopes) is an emergent property of this harmony.

Balancing Person & System



Summary

- In all hazardous industries, there has been an increasing involvement of systemic factors in the understanding of safety.
- This has produced many benefits, but we must also recognise the distinctive and very personal features of health care.
- A balance needs to be struck between system & person models in health care.
- The person model usually means 'human as hazard'. But there is also 'human as hero'.
- Speculative cycles around two-sided person & system axes are outlined.