Developing *the* Resilience Potentials

A Guide to the Management of Safety-II

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Safety-I: "without" adverse outcomes

Safetysynthesis

Negative outcomes are caused by failures and malfunctions.

ANSI American National Standards Institute

Safety: Freedom from unacceptable risk.

Safety-I = Reduced number of adverse events.

AHRQ Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

'Freedom from accidental injury'
'Avoiding injuries or harm to patients from care that is intended to help them.'

Eliminate failures and malfunctions as far as possible.

The first interpretation of safety

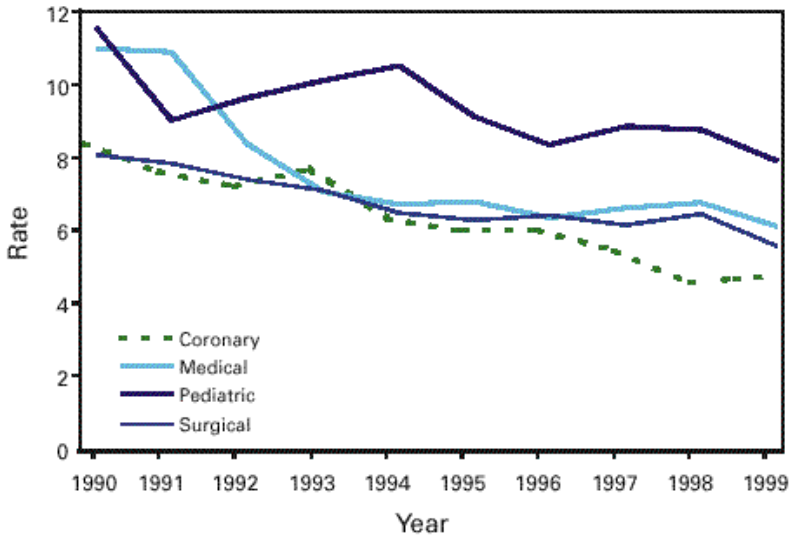
Safety is the prevention of harm to patients

$$\text{Safety} = \sum_{1}^{n} \text{Accident}_i$$

There is an presence of failures (things that go wrong) due to risks and hazards.
The number of harmful events can be counted.

It is "easy" to count how much goes wrong, but does that measure safety?

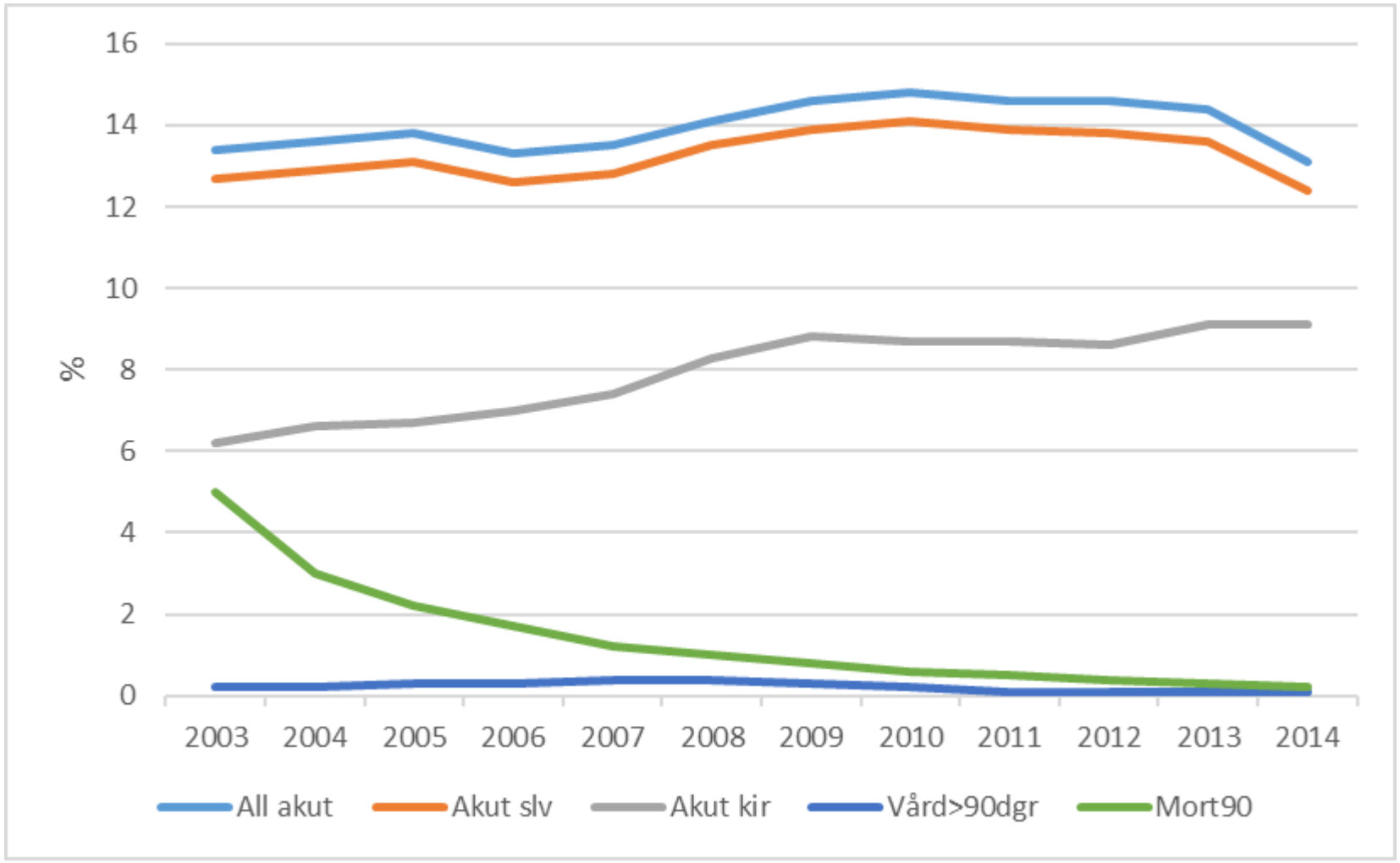
FIGURE 1. Trends in bloodstream infection rates*, by intensive care unit type and year — National Nosocomial Infection Surveillance System, United States, 1990–1999



AHRQ Patient Safety Indicators (PSIs)

PSI 04 Death among surgical inpatients with serious treatable complications.
PSI 06 Iatrogenic pneumothorax.
PSI 11 Postoperative respiratory failure.
PSI 12 Postoperative PE or DVT.
PSI 14 Postoperative wound dehiscence.
PSI 15 Accidental puncture or laceration.

"Improvements" in surgical safety

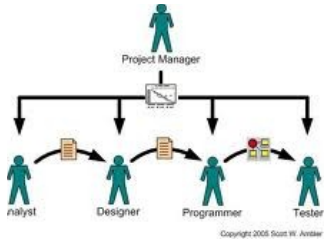


A HIGHER level of safety corresponds to a LOWER measurement

Stockholm County (2003-2014). Source: LÖF, 2016

"Beg, steal, or borrow …"

Since the 1970s health care has imported solutions such as quality assurance, root cause analysis, 'lean', standardised guidelines, teamwork, check-lists, accreditation, and above all IT in various forms.



Solutions typically presume predictability, inherent linearity, and proportionality of causes and effects – which is nowhere to be found in the real world of care delivery.

"... prevailing strategies rely largely on outmoded theories of control and standardization of work." (Berwick, 2003).

It is generally assumed that problems will be solved with a few more resources, a little more effort, another set of recommendations, better data about the amount and rate of harm, more precise measurements, tightened practices, or a new IT system.

"It is widely believed that, when designed and used appropriately, health IT can help create an ecosystem of safer care …" (IOM, 2012).

Clinical decision support systems (CDSS)

Analysis of clinical decision support system malfunctions: a case series and survey

J Am Med Inform Assoc 2016;0:1–9.
doi:10.1093/jamia/ocw005

"Health IT [information technology] creates new opportunities to improve patient safety that do not exist in paper-based systems. … However, implementation of health IT products does not automatically improve patient safety. In fact, health IT can be a contributing factor to adverse events . . . [some of which] have led to serious injuries and death." (Institute of Medicine)

PROBLEMS

(1) change in data codes or clinical terminology.
(2) inadvertent editing or disabling of rules.
(3) upgrades of the EHR software leading to spurious alerts.
(4) malfunctions in external drug classification systems.

Conclusions: CDSS malfunctions are common and often go undetected. A range of causes, commonly contribute to these malfunctions, and current approaches for preventing and detecting CDSS malfunctions are inadequate.

HIT – Healthcare Information Technology

A survey of over 17 000 EHR adopters (Feb, 2013) found that some 17 % are already considering changing their EHR vendor because their EHR systems fail to meet their basic needs.

Sloppy and Paste

High-risk copy-and-paste errors, defined as mistakes with high potential risk for patient harm, fraud, or tort claim, have been reported in 10% of patient EMRs. Medication reconciliation discrepancies are noted in almost 40% of EMR patient medication lists.

Royal Melbourne Hospital attacked by damaging computer virus

In 2nd Look, Few Savings From Digital Health Records

It is “common knowledge in the healthcare industry that a central component of the proposed health IT system—the ability to share patients’ health records among doctors, hospitals and labs—has largely failed.”

Managing Safety-I

Safety-I is a condition where the number of adverse outcomes (accidents / incidents / near misses) is as low as possible.

The belief in causality (Causality Credo)

(1) Adverse outcomes happen because something has gone wrong (cause-effect thinking + value congruence between cause and effect).

(2) Causes can be found and treated (rational deduction).

(3) All accidents are therefore preventable (zero harm principle).

PRIMUM NON NOCERE

Prevent, eliminate, constrain.
Safety, quality, etc. are different and require different measures and methods.

The second interpretation of safety

Safety is the prevention of harm to patients

$$\text{Safety} = \sum_{1}^{n} \text{Accident}_i$$

There is an presence of failures (things that go wrong) due to risks and hazards.
The number of harmful events can be counted.

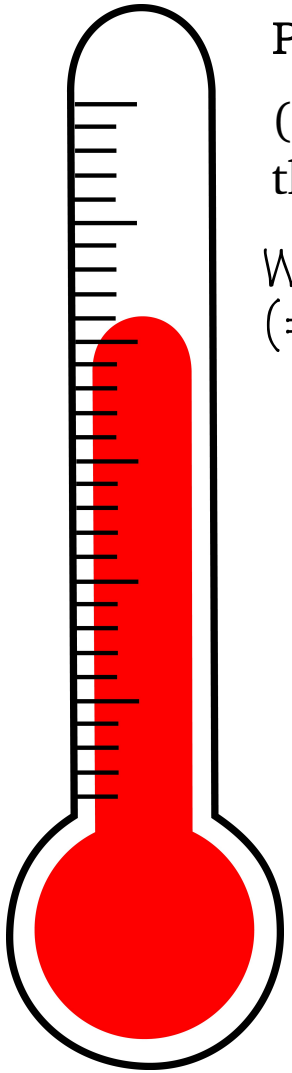
"Safety is a dynamic non-event"

$$\text{Safety} = \sum_{1}^{n} \neg\text{Accident}_i$$

There is an absence of failures (things that go wrong), but as a result of active engagement.
If safety is a non-event, it can neither be observed, nor measured

Is it possible to count the number of times something does not happen?

Safety-I is a privative concept



Privative: /ˈprɪvətɪv/

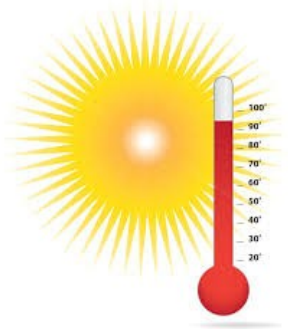
(Of an action or state) marked by the absence or loss of some quality or attribute that is normally present.

When you measure temperature, you can only measure heat but not cold (= less heat).

You can shut the door to keep the heat in, but not to keep the cold out.

Safety-I is like the "cold" - it is the lack of safety. Just as we can only understand "cold" by understanding "heat", we can only understand the lack of safety by understanding safety as a positive concept – as Safety-II.

Heat versus safety



You cannot increase the heat by reducing the cold.

You can only get rid of the cold by increasing the heat.

You cannot increase safety by reducing the number of accidents.

You can only get rid of accidents by doing things right more often.

Measuring cold = measuring accidents

Measuring heat = measuring what goes well

From Safety-I to Safety-II

Safetysynthesis

World Health Organization

Health is 'a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity'.

IMPROVED SAFETY

Safety-I:
Safety is the freedom from unacceptable risk

Safety-II:
"Safety" is the ability to sustain required operations under both expected and unexpected conditions.

Reduce unacceptable outcomes (accidents, incidents, etc)

Increase acceptable outcomes (everyday work)

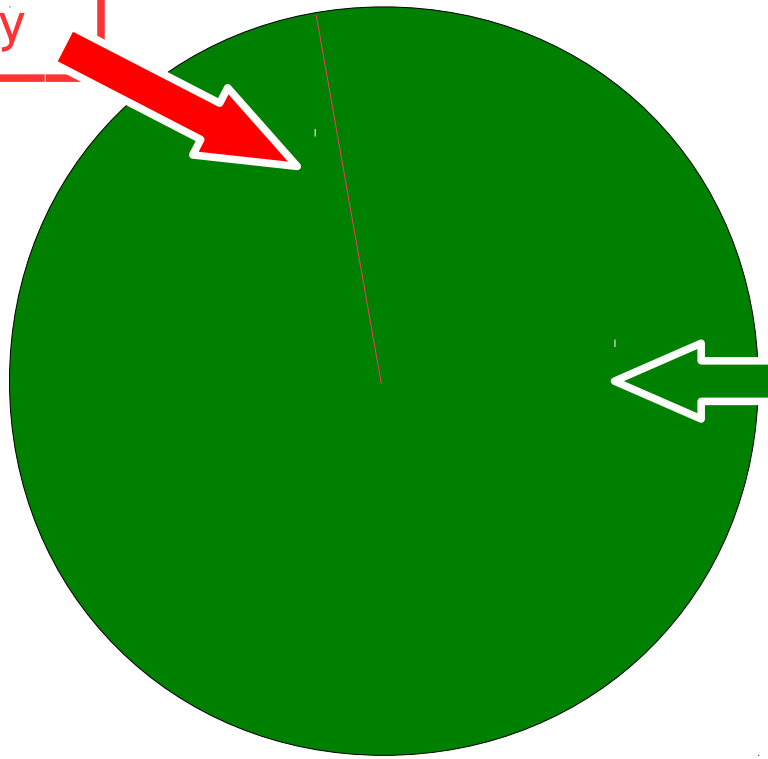
What should we be looking at?

Safe tysyn thesis

10^{-4} := 1 failure in 10.000 events

Adverse outcomes =
Absence of safety

Easy to see
Complicated aetiology
Difficult to change
Difficult to manage



'Difficult' to see
Uncomplicated aetiology
Easy to change
Easy to manage

Intended outcomes =
Presence of safety

1 - 10^{-4} := 9.999 "successes"
in 10.000 events

SAFETY =
"WITHOUT"

SAFETY =
"WITH"

From the negative to the positive

Safetysynthesis

Negative outcomes are caused by failures and malfunctions.

All outcomes (positive and negative) are due to performance variability.

Safety-I = As little as possible goes wrong.

HRO = Ability to respond when something fails.

Safety-II = As much as possible goes well.

Eliminate failures and malfunctions as far as possible.

Improve ability to respond to adverse events.

Facilitate everyday work.
Improve resilience.

The third interpretation of safety

Safety is the prevention of harm to patients

$$\text{Safety} = \sum_{1}^{n} \text{Accident}_i$$

There is an presence of failures (things that go wrong) due to risks and hazards.
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"Safety is a dynamic non-event"

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There is an absence of failures (things that go wrong), but as a result of active engagement.
If safety is a non-event, it can neither be observed, nor measured

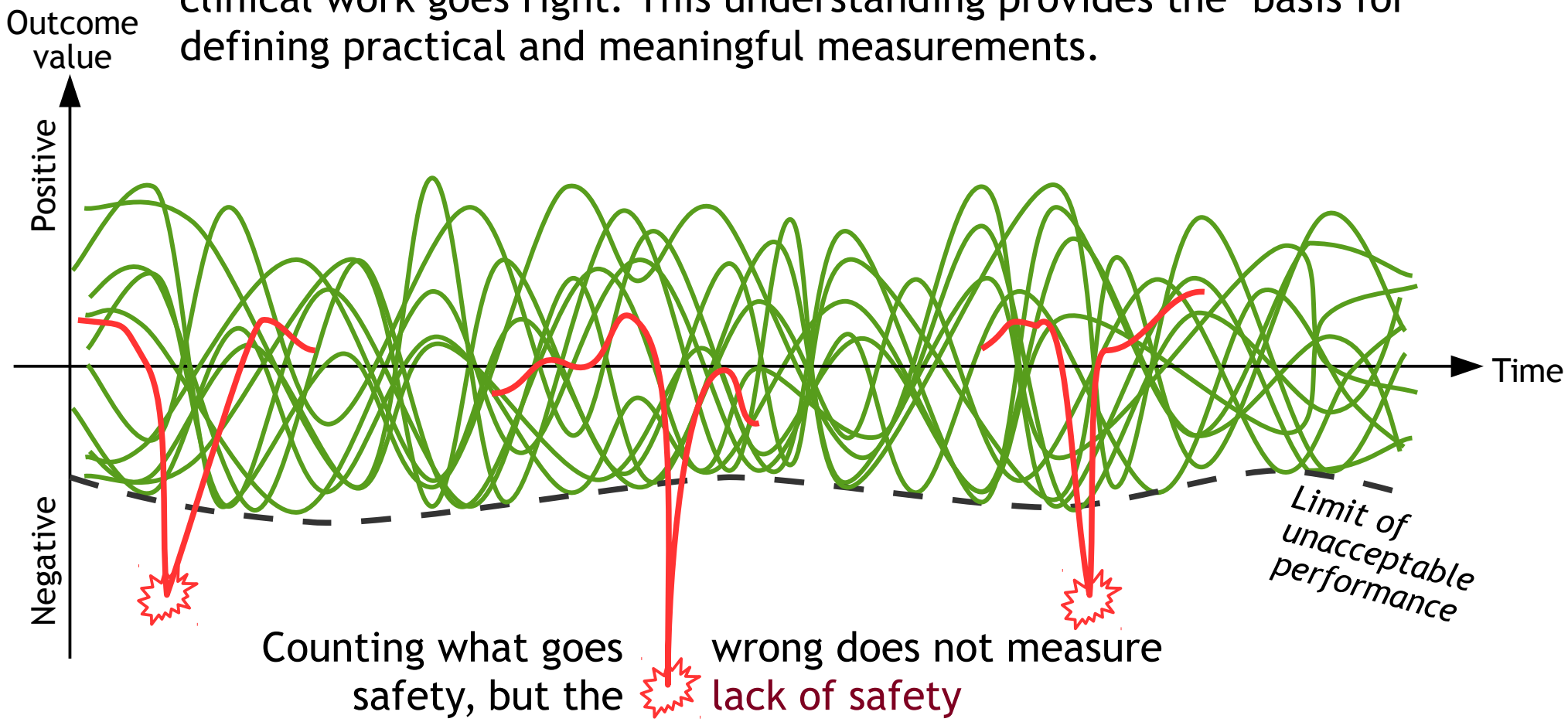
Safety is a dynamic event

$$\text{Safety} = \sum_{1}^{n} (\text{acceptable outcome})_i$$

Safety is the presence of acceptable outcomes.
The more there are, the safer the system is.

The proper measurement of safety

To measure safety properly, we must understand how and why everyday clinical work goes right. This understanding provides the basis for defining practical and meaningful measurements.

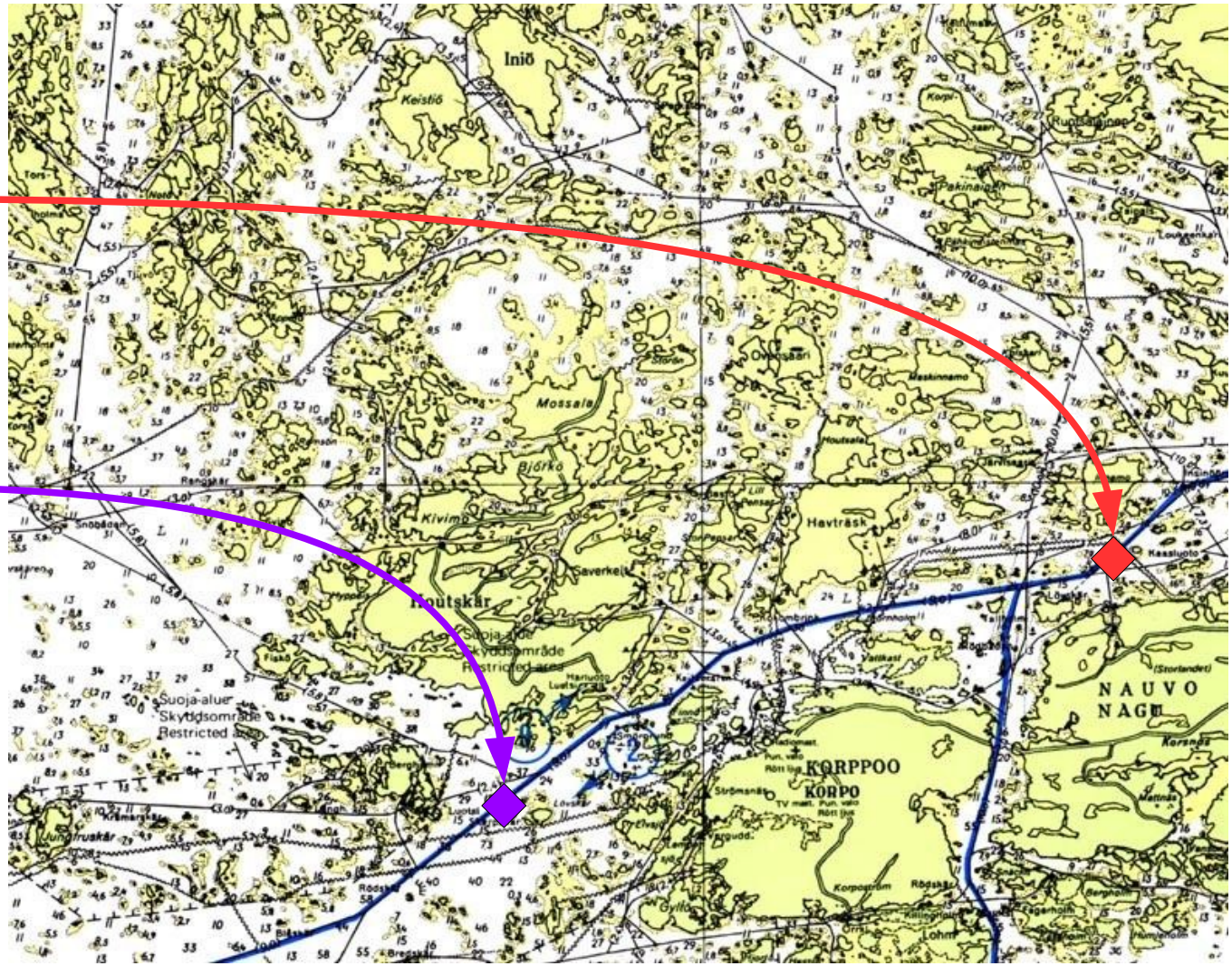


Safety management is like travelling

POSITION:
Where are we now?
How well do we do?

GOALS or TARGETS:
What is the target?
Where and when?

MEANS:
How can we get there
(improving 'position')?



Two types of safety management

	SAFETY-I	SAFETY-II
GOALS or TARGETS: What is or target?	Zero accidents – elimination of preventable harm	As much as possible goes well (AHARP)
POSITION: Where are we now?	Counting adverse outcomes – things that go wrong.	Measuring processes and functions – things that go well.
MEANS: How can we improve?	Linear thinking: eliminate, prevent, protect	Non-linear thinking: Improve, support, facilitate
FOCUS: Where should we look?	Work-as-imagined: WAI-WAD compliance	Work-as-done: WAI-WAD reconciliation

Measures of products vs. processes

Safe tysyn thesis

Input → Product?

Input → Process?

Process → Product?

INPUT PARAMETERS

Management policies
Roles & responsibilities
Safety culture
Certification
QA / QM - Lean

PRODUCT

Proxy measurements

Resilience potentials
Few and stable

Direct measurements

Functions (WAD)
Many and variable

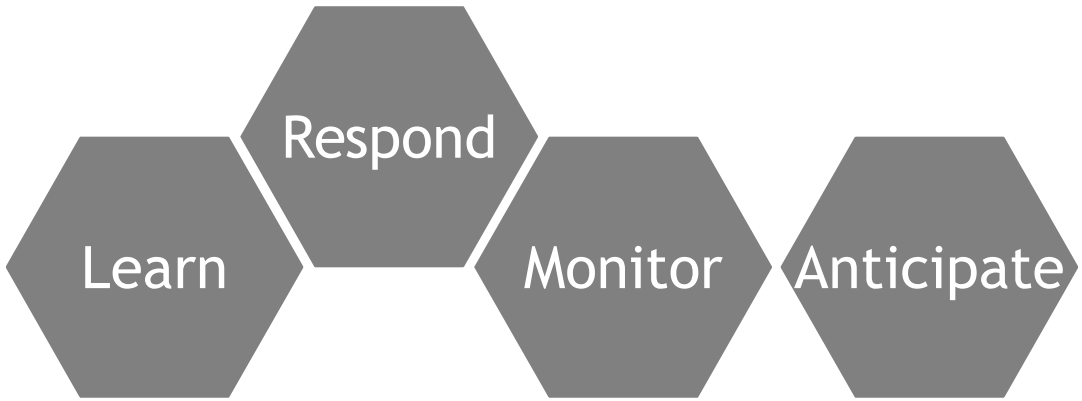
What goes well

What goes wrong

Resilient health care

Resilience is an expression of how people, alone or together, cope with everyday situations - large and small – by adjusting their performance to the conditions.

Resilient performance means that an organisation can function as required under expected and unexpected conditions alike (changes / disturbances / opportunities).

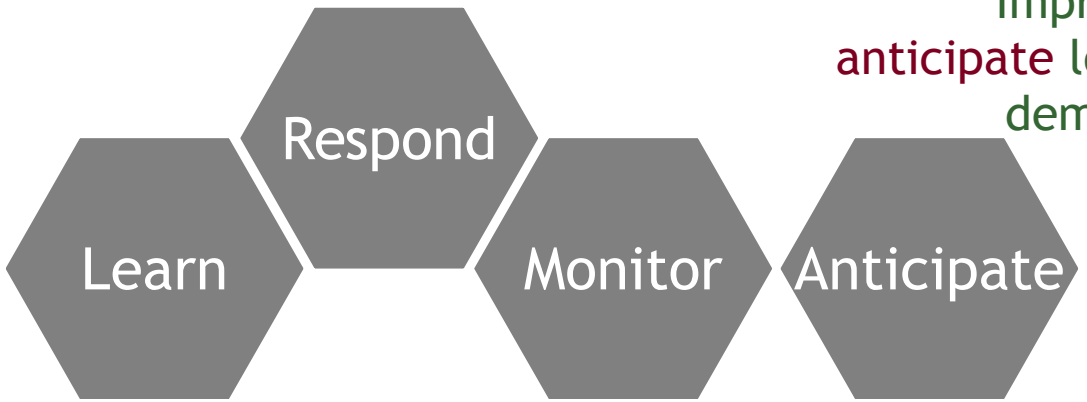


Resilint performance requires that an organisation has the potentials to **respond**, **monitor**, **learn**, and **anticipate**.

Four resilience potentials

Improve the potential to respond to threats and opportunities alike

Improve the potential to anticipate long-term changes to demands and resources.



Improve the potential to learn both from what goes right and what goes wrong.

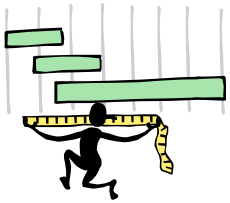
Improve the potential to monitor what happens externally and internally.

As high as reasonably practicable

Safe tysyn thesis

Respond

For which events is there a response ready?
What is the threshold of response?
How many resources are allocated to response readiness?
…



Monitor

How have the indicators been defined?
How many indicators are leading and how many are lagging?
What is the delay between measurement and interpretation?
….

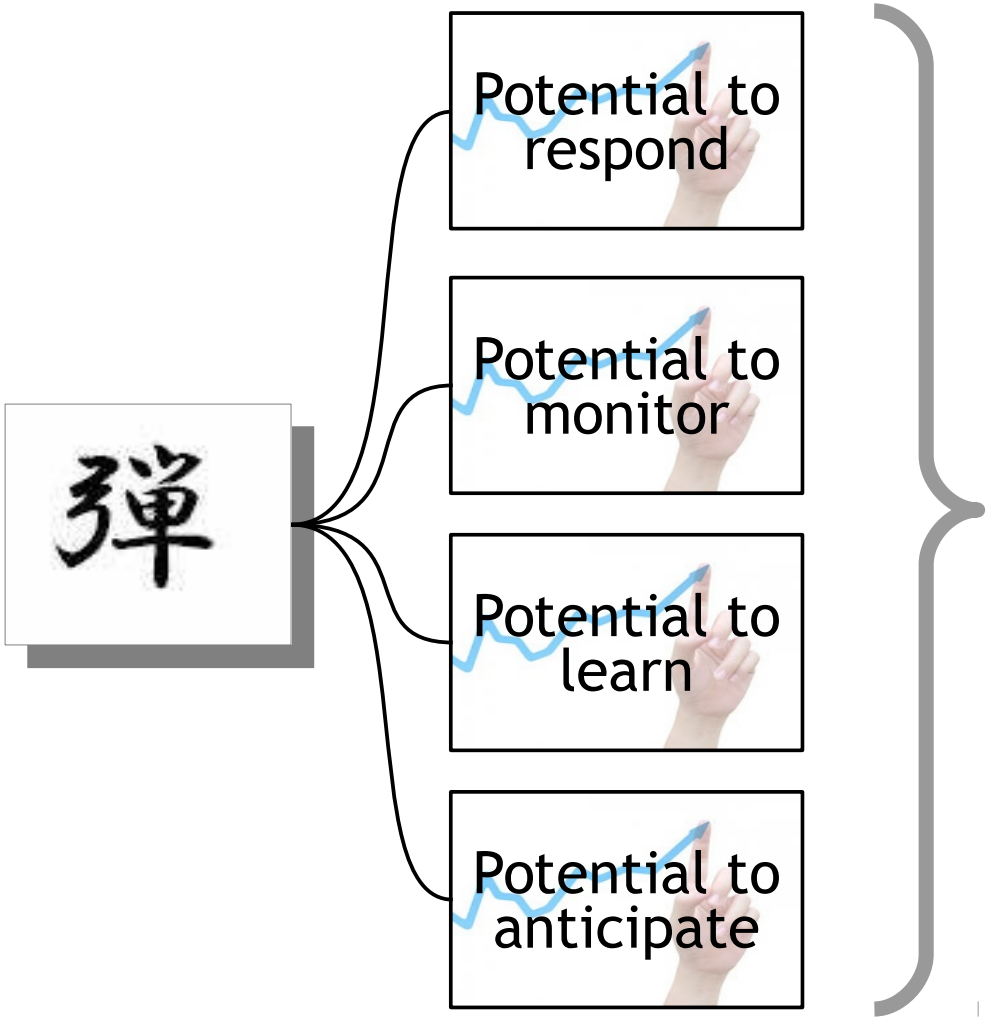
Learn

What is the learning based on (successes – failures)?
Is learning continuous or event-driven?
How are the effects of learning verified and maintained?
…

Anticipate

What is the implicit/explicit "model" of the future?
How far does the organisation look ahead ("horizon")?
What risks are the organisation willing to take?
…

The Resilience Assessment Grid (RAG)



Comprises four sets of questions, one for each potential.
The questions are:
DIAGNOSTIC – point to details of a potential that are meaningful to assess.
FORMATIVE – answers can be used to make decisions about how to improve potentials
SPECIFIC – address issues that are important for a concrete organisation.

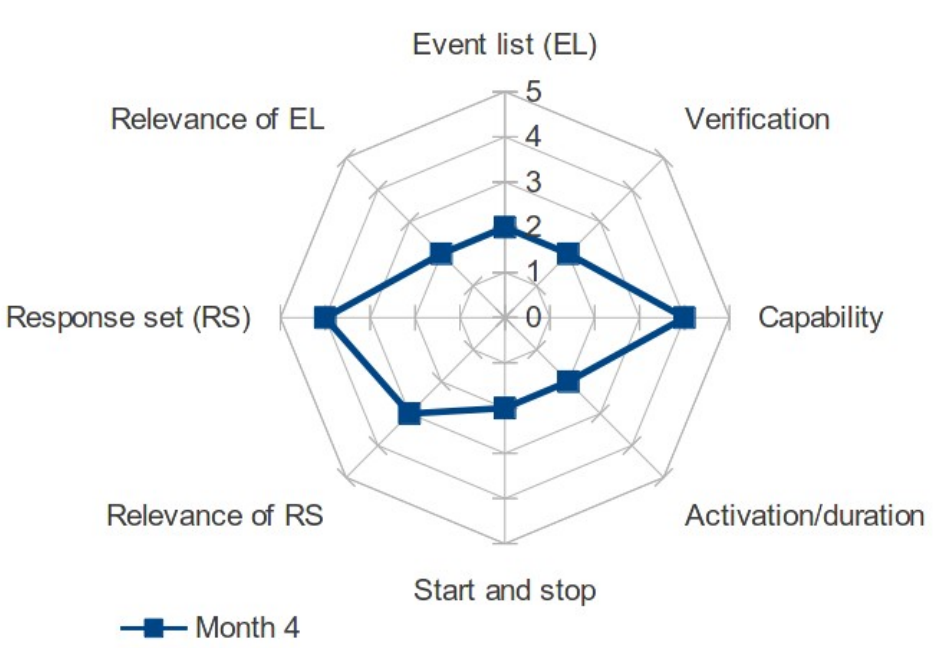
Example of RAG (St. Paul)

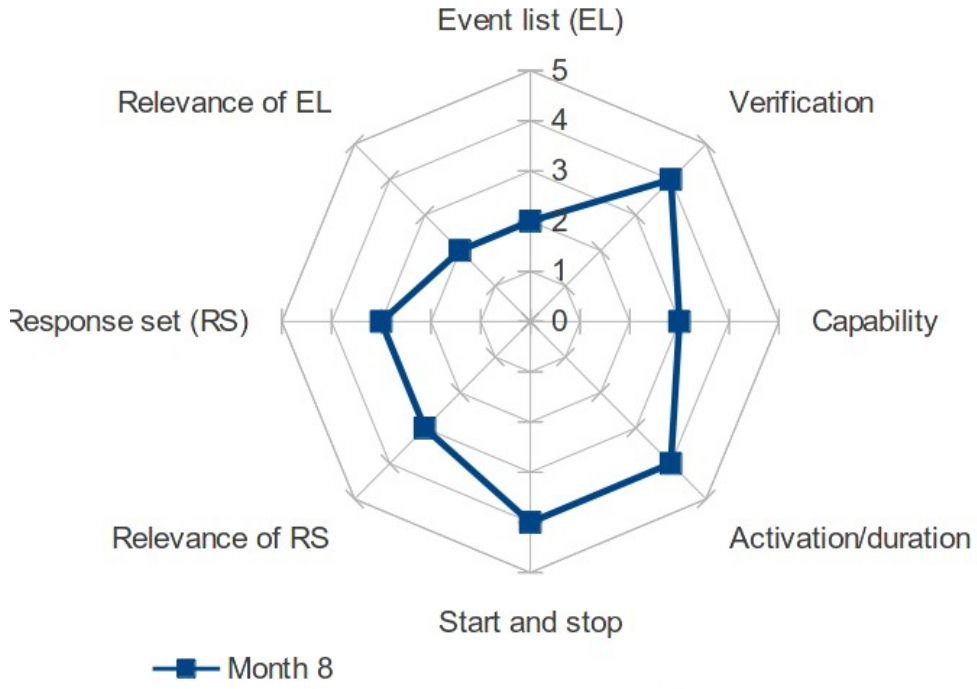
Question	Contents
1	We have a list of everyday and unexpected clinical, system, and environmental events for which we prepare and routinely practice action plans.
2	We revisit and revise our list of events and action plans on a systematic basis.
3	We follow defined thresholds, actions, and stopping rules to adapt/transform operations and proactively mobilize resources in order to maintain our capacity for response under conditions of increased volume and acuity.
4	We effectively team, communicate and work together within the department, and with other departments and services.
5	We have organizational support and resources to maintain our capability to meet acuity and volume demands.
6	We link our local department adaptations to organizational and health system changes.

Example of RAG (CARe)

ITEM (Anticipating)	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly agree
Senior staff anticipate the challenges that will face the unit in the medium to long term					
Anticipated medium to long term challenges are shared with staff					
Senior staff anticipate opportunities for the unit in the medium to long term					
Anticipated long term opportunities are shared with staff					
Long term risks are addressed in plans and policies					

Example RAG (potential to respond)





Australian Government
Australian Radiation Protection and Nuclear Safety Agency

Safe tysyn thesis

… the key principles of holistic safety are arranged in seven categories called 'characteristics' … A Safe Organisation exhibits the key characteristics as described in these guidelines. The presence of these characteristics has been found to both increase organisations' resistance to incidents and accidents while improving overall safety management and productivity.

1. Human aspects
2. Non-technical skills
3. Defence in depth
4. Management system
5. Resilience
6. Safety culture
7. Protective security and nuclear safety culture

HUMAN CHARACTERISTICS	
TECHNOLOGICAL CHARACTERISTICS	
ORGANISATIONAL CHARACTERISTICS	
4—*Management System*	A safe organisation will integrate safety and environmental protection seamlessly into an integrated safety management system
5—*Resilience*	A safe organisation will build or engineer resilience into the system
5.1 The ability to respond	
5.2 The ability to monitor	
5.3 The ability to anticipate	
5.4 The ability to learn	
6—*Safety Culture*	A safe organisation will at all levels possess shared values and beliefs for safety that produce behavioural norms that provide an appropriate and demonstrable attention to safety

Holistic Safety Guidelines
OPERATIONS SERVICES
OS-LA-SUP-240U
November 2012

Managing Safety-II

Safety-II is a condition where as much as possible goes well.

Support, augment, facilitate. Safety, quality, etc. are inseparable and need matching measures and methods.

1. Care about what happens all the time rather than what happens rarely. We always count the number of times something fails, but rarely the number of times it just works.
2. Look for 'work-as-done' - the habitual adjustments and why they are made. When something is done, as a part of work, it has usually been done before and gone well before.
3. Learning should be based on the frequency of events rather than their severity. Small improvements of everyday performance may be more important than large improvements of rare performance.

PRIMUM BENE FACERE


Thank you for your attention