Is counting accidents a measure of safety?

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How do we think about safety?

When we think about safety, we usually think about accidents - about (low probability) events with adverse outcomes.

The central aim of patient safety is to prevent or at least reduce harm to patients.

A system is safe if as little as possible goes wrong.

Safety is:

‘freedom from accidental injury’
‘avoiding injuries or harm to patients from care that is intended to help them.’
How do we measure safety?

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.


Hospital Standardised Mortality Ratio: Scotland January 2008 - March 2012
Three interpretations of what safety is

Safety is the prevention of harm to patients

\[
\text{Safety} = \sum_{i=1}^{n} \text{Accident}_i
\]

There is an \textit{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”

\[
\text{Safety} = \sum_{i=1}^{n} \neg \text{Accident}_i
\]

There is an \textit{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

\[
\text{Safety} = \sum_{i=1}^{n} \text{(acceptable outcome)}_i
\]

Safety is the \textit{presence} of acceptable outcomes. The more there are, the safer the system is.
Safety-I – when nothing goes wrong

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

Safety-I is defined by its opposite - by the lack of safety (accidents, incidents, risks).

The premise for Safety-I is the need to understand why accidents happen.

Accidents and incidents are situations that, by definition, lack safety.

How can we improve safety by studying situations where there is NO safety?

If we want to see an increase, why use a proxy measure that decreases?
Managing safety by snapshots

Safety management is based on analysing snapshots of situations where something went wrong. Accidents are analysed individually and recommendations are developed for each problem found.

Acceptable outcomes are **continuous**

Unacceptable outcomes are **discrete**
Management of Safety-I

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).

Safety-I: No “lack of safety”

We are safe if there is as little as possible of this

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

We should think about safety in terms of how many things go well and how frequently we succeed.

A system is safe if as much as possible goes right.
Safety II – when everything goes right

Safety-II: Safety is a condition where the number of successful outcomes (meaning everyday work) is as high as possible. It is the ability to succeed under varying conditions.

Safety is defined by its presence.

If the level of safety increases, the proxy measure should also increase.

The premise for Safety-II is the need to understand everyday performance.

Safety can only be improved by studying situations where it is present!

Safety-II is achieved by trying to make sure that things go right, rather than by preventing them from going wrong.
What should we be looking for?

Adverse outcomes = Absence of safety

10⁻⁴ := 1 failure in 10,000 events

Unable to see
Complicated aetiology
Difficult to change
Difficult to manage

Intended outcomes = Presence of safety

Easy to see
Uncomplicated aetiology
Easy to change
Easy to manage

1 - 10⁻⁴ := 9.999 “successes” in 10,000 events
What should we care about?

Care about what happens all the time rather than what happens rarely.

The numerator is how many there are of a type of event - accidents, incidents, etc. This number is known (with some uncertainty)

We always count the number of times something goes wrong. We analyse the rare events.

The denominator is how many cases something went well. This number is usually unknown.

We rarely count the number of times something goes well. We need to understand the common events.
Management of Safety-II

Safety-II: Resilient safety management

We are safe if there is as much as possible of this

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.
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.
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.

Counting what goes safety, but the wrong does not measure safety, lack of safety.