

The logo for PYB Consulting, featuring the letters 'PYB' in a bold, blue, sans-serif font, followed by the word 'Consulting' in a blue, cursive script font. The logo is set against a white rectangular background.

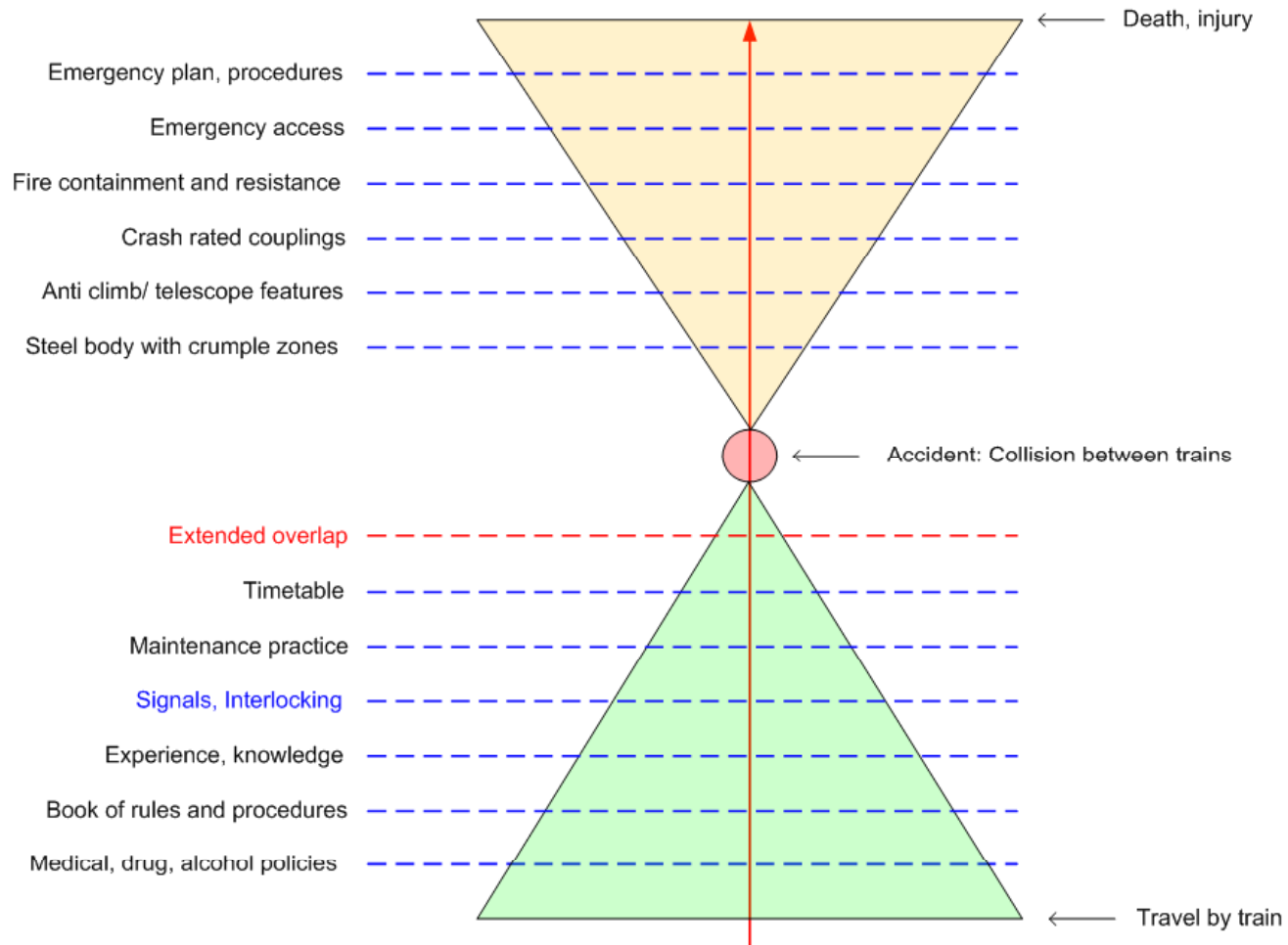
PYB Consulting

Passing loop collision risk

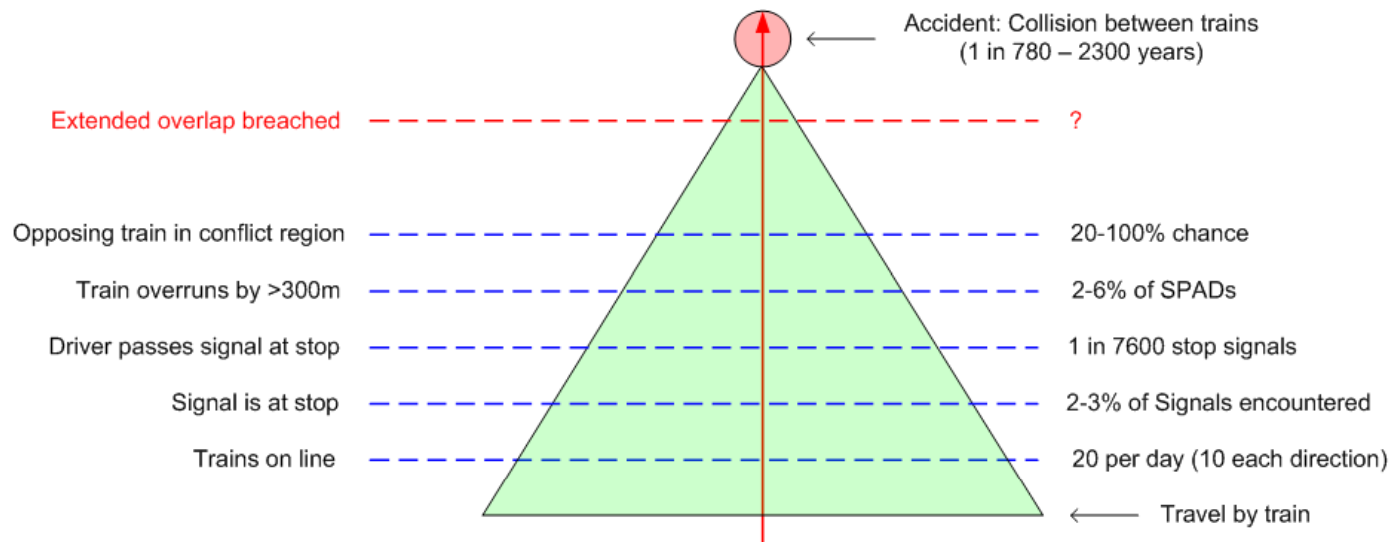
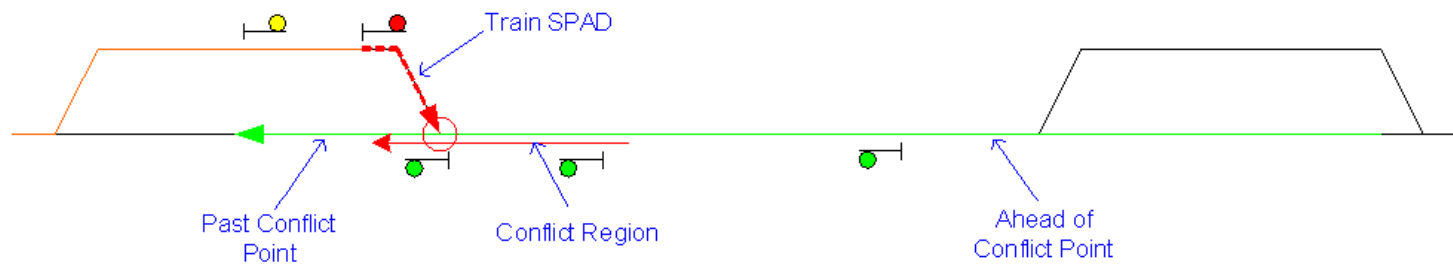
Extended overlaps as control

- Risk model for passing loops
- Cases (size of problem):
 - head on collision (2 scenarios)
 - head to tail (2 scenarios)
- Context of tolerable risk
- Longer overlap as control?
 - Effectiveness
 - Added risk

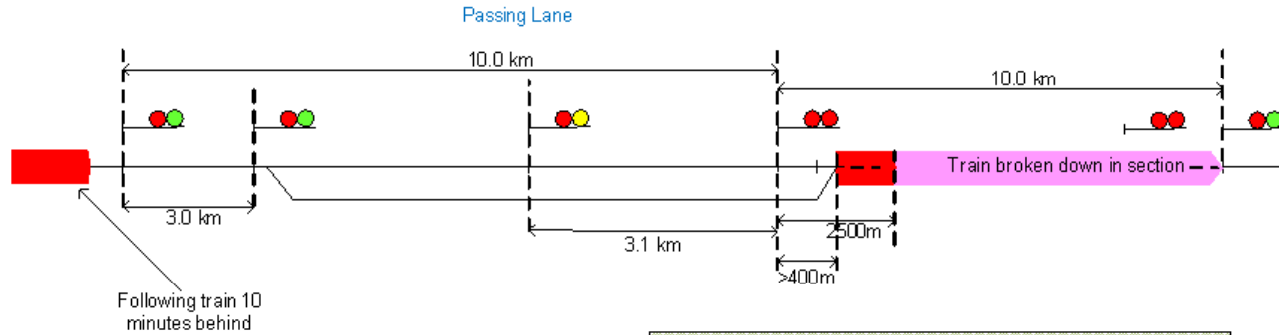
Bow tie swiss cheese model (after Reason)



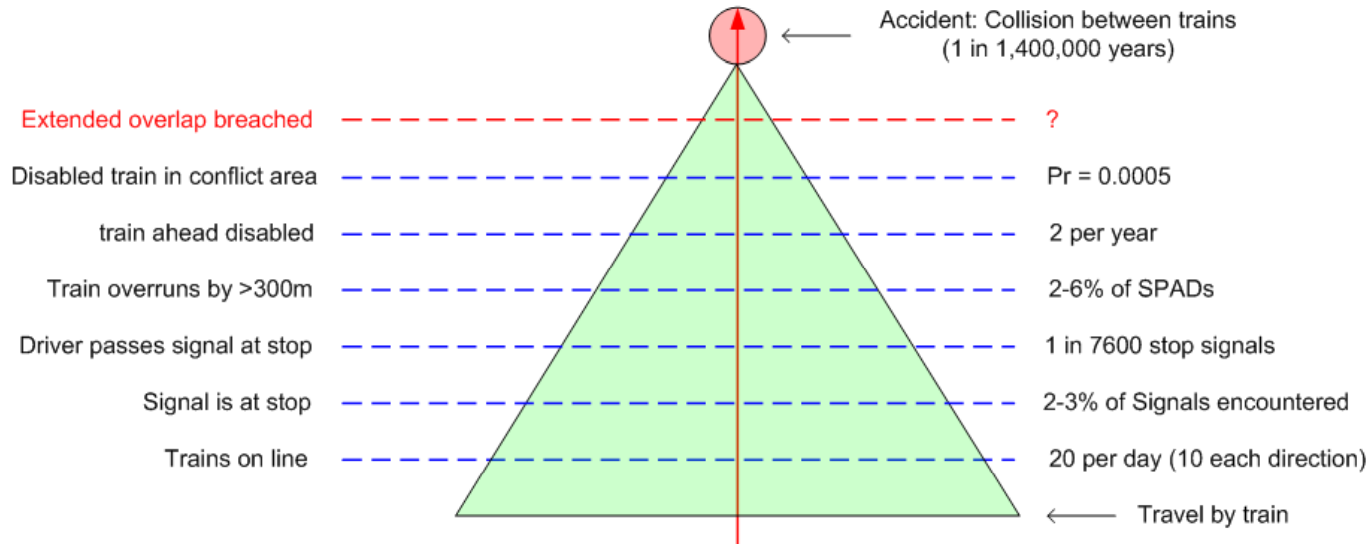
Head on collision at passing loop



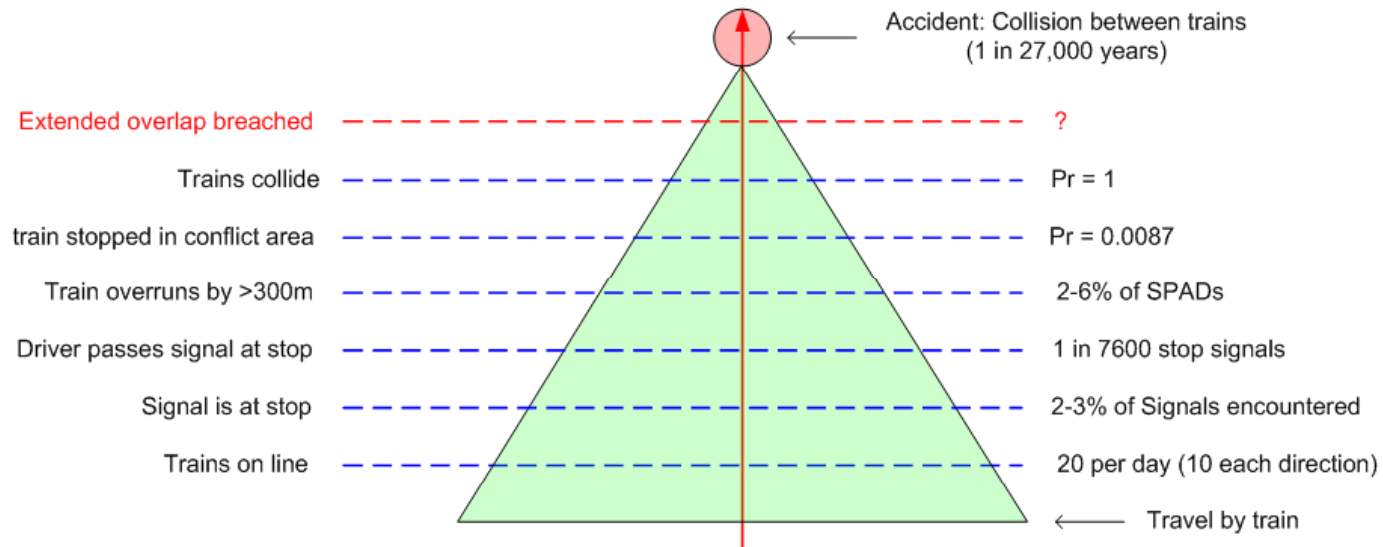
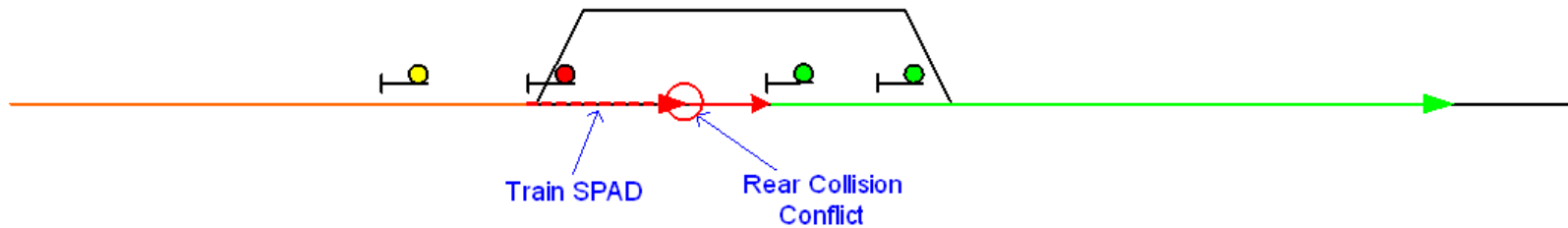
Follow on collision at passing loop



Base scenario with following train

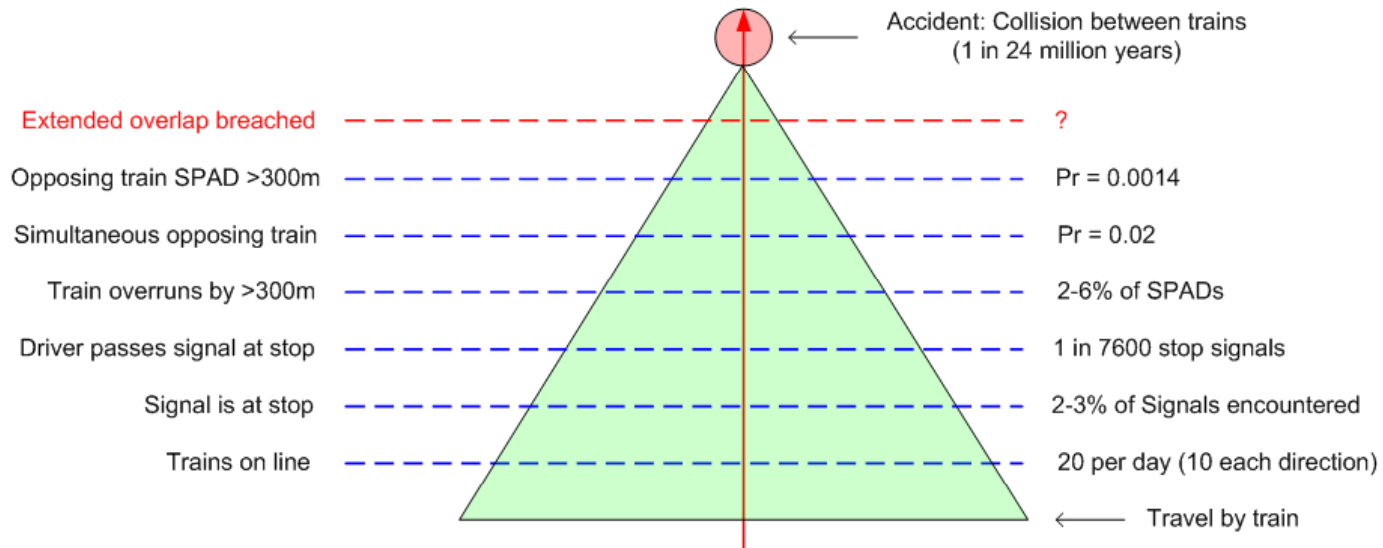
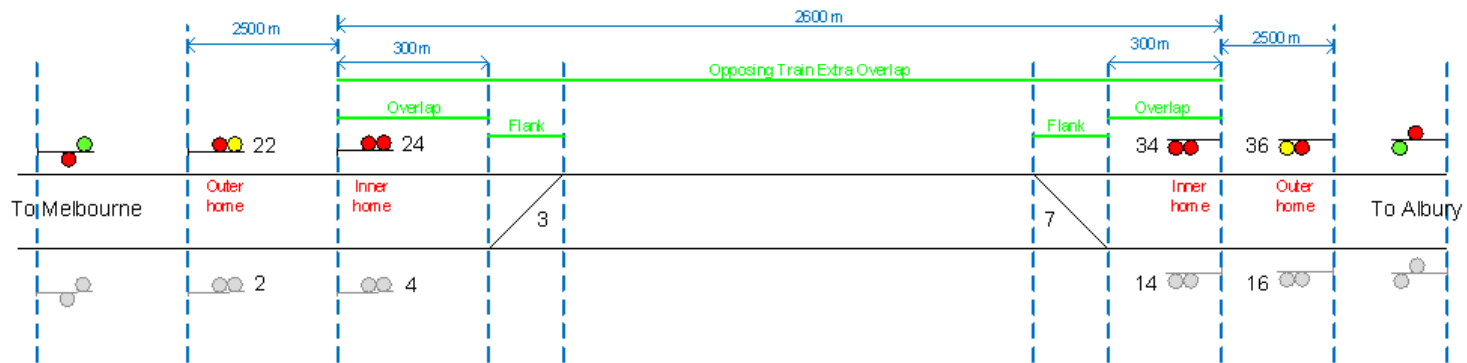


Follow on collision at mid-lane signal

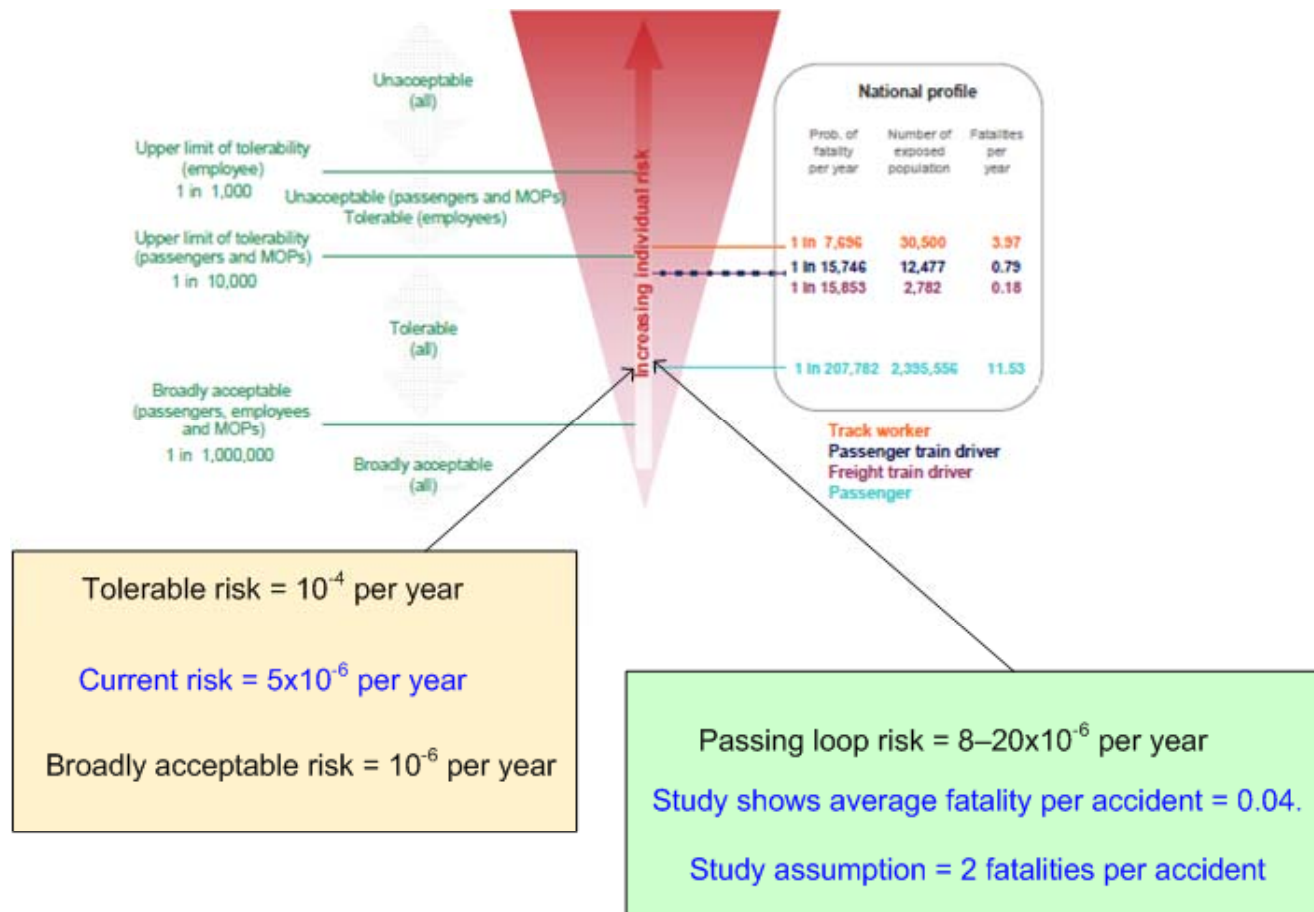


Case 4

Head on collision with simultaneous SPAD



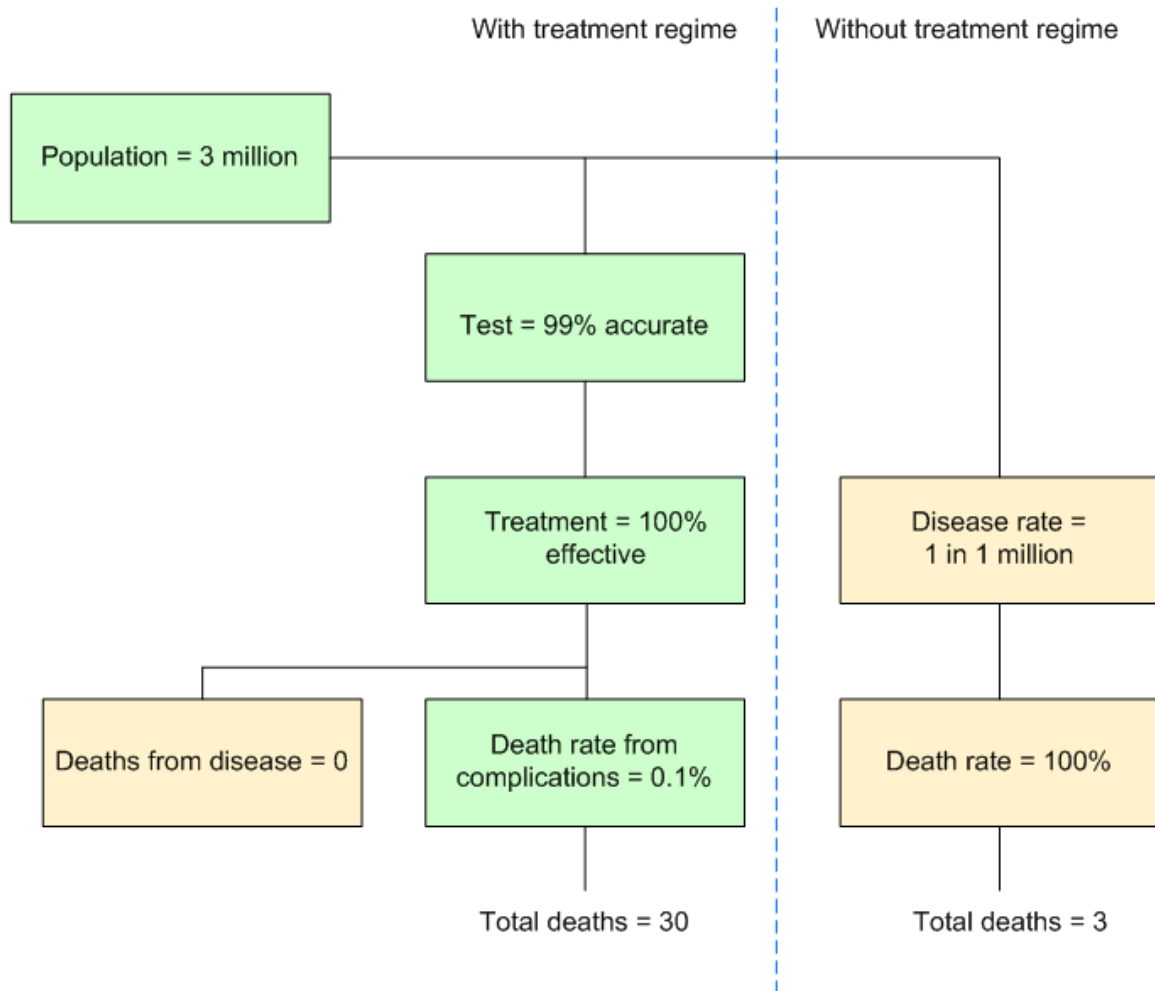
Tolerable risk (UK)



Solution? - extended overlaps

- **Does it work?:**
 - Train which sees signal at stop can apply brakes and stop safely
 - Though line capacity reduced by approx 10%
- **What proportion of residual risk is thus controlled?**
 - Do drivers subject to “disregard” stop in braking distance of signal?
 - Violet Town (?)
 - Beresford (?)
 - Few SPADs known where this mechanism has been proved effective
- **Risks associated with new control**
 - Reason: “dangerous defences” (Agincourt)
 - AWS at Ladbroke (too much of a good thing)

Morbus horibilis - prognosis



- **Accident scenario**

- Train sees signal at stop and stop
- Driver applies the rules to pass the signal and proceed forward
- Train collides with train in section
- Too much confidence?

- **Noted cases**

- Glenfield (NSW - 1999)
- Holmesglen (Vic - 2000)
- Aircraft (Vic 1999)
- Syndal (Vic 1989)
- Ringwood (Vic 1989)
- South Dynon (Vic 1986)

- **The problem of head on collision**
 - By providing 300m overlap, 94-98% SPADs are contained
 - Remaining trains do not reliably stop within extended overlap
 - Residual risk: one collision in 780-2300 years gives risk possibly a little higher than average risk on rail in Britain
- **The problem of head to tail collision**
 - By providing 300m overlap, 94-98% SPADs are contained
 - Residual risk: one collision in 1.4 million years
- **Extended overlap as control?**
 - Gives driver a last chance to apply brakes safely
 - Reduces line capacity by approx 10%
- **Risk associated with this control**
 - History of drivers confidently entering occupied sections and colliding