



# Transforming outdated hospital:

*Pathways to modern,  
sustainable, and efficient  
healthcare buildings*



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## Primum non nocere

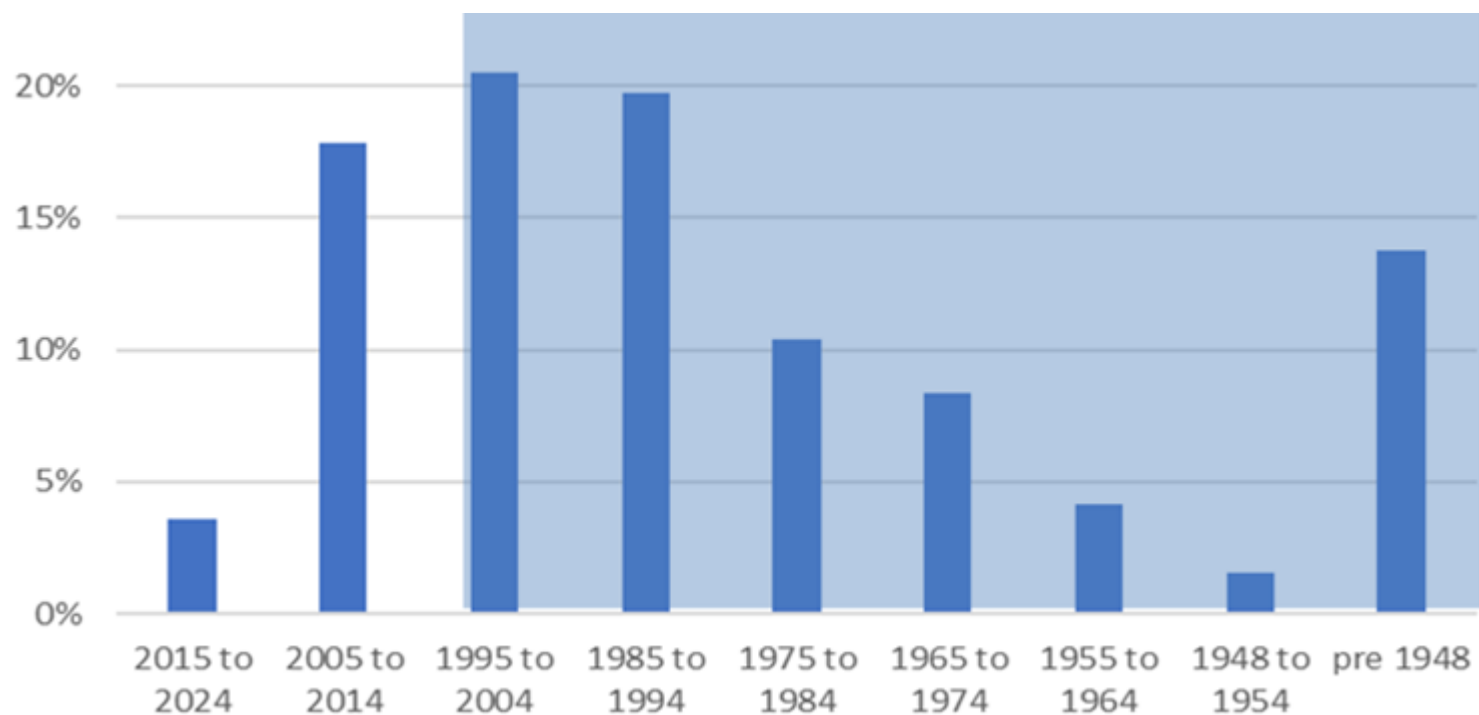
*“The very first requirement in a hospital is that it  
should do the sick no harm”*

*Florence Nightingale, 1863*

	access	Assessment	consent	disruptive	document	ioc	infection	infra	dev	medication	other	pt abuse	pt accident	self harm	treatment	
	581425	289574	199149	24966	290604	817676	134100	243862	134122	491154	212442	20978	653906	23619	563265	4680842
Full Cases	64	59	10	8	64	180	33	54	12	0	117	66	50	1	154	872
	0.011%	0.020%	0.005%	0.032%	0.022%	0.022%	0.025%	0.022%	0.009%	0.000%	0.055%	0.315%	0.008%	0.004%	0.027%	0.019%

	Male & Female
Ischaemic heart diseases (I20-I25)	64,435
Dementia and Alzheimer's disease (F01, F03, G30)	37,762
Cerebrovascular diseases (I60-I69)	35,977
Malignant neoplasm of trachea, bronchus and lung (C33, C34)	30,148
Chronic lower respiratory diseases (J40-J47)	26,748
Influenza and Pneumonia (J09-J18)	26,151
Malignant neoplasm of colon, sigmoid, rectum and anus (C18-C21)	14,006
Malignant neoplasms of lymphoid, haematopoietic (C81-C96)	11,059
Malignant neoplasm of prostate (C61)	9,671

Iatrogenic Harm  
 82,204



**79%**

## Reason

£13.8b

## Inspiration

Better infrastructure

=

better outcomes

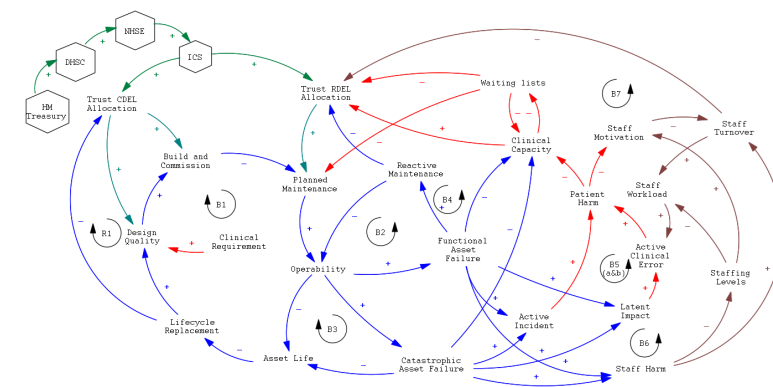
+

sustainability

+

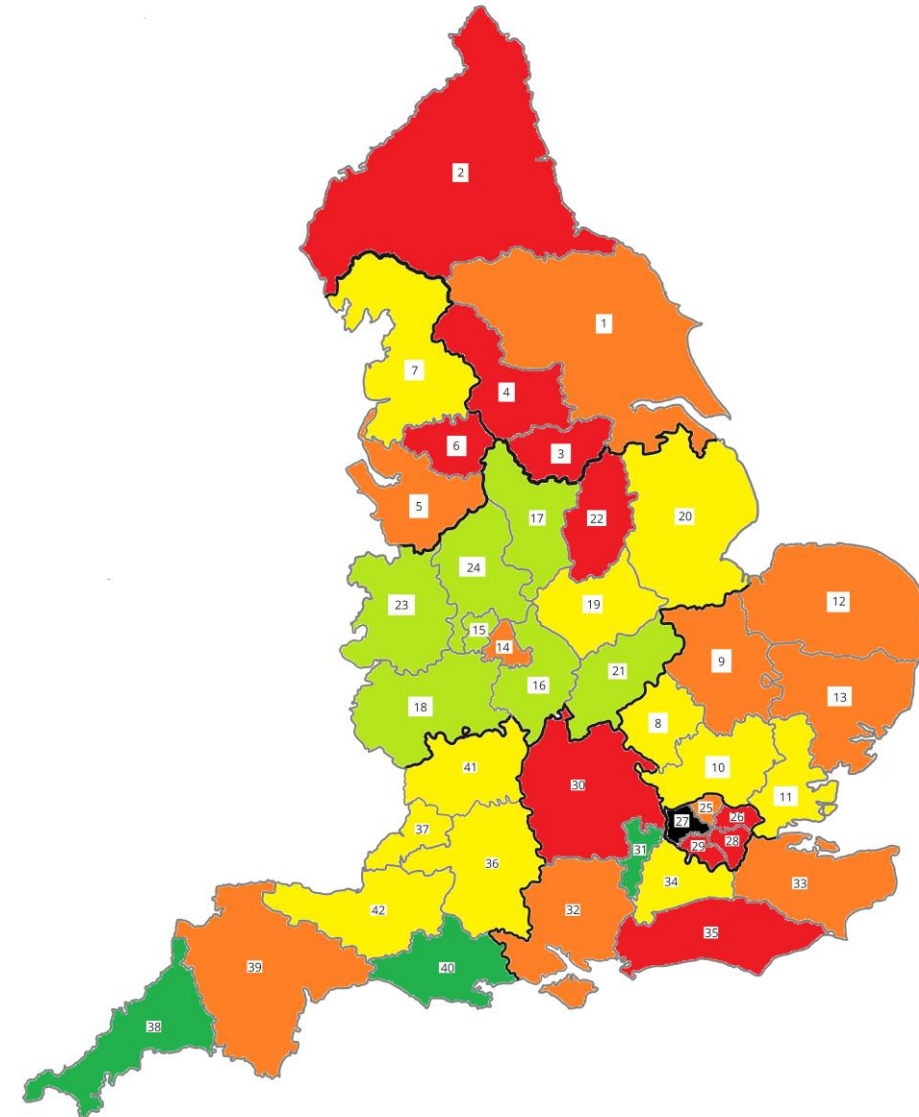
efficiency

## Aspiration



Infrastructure failure refers to the collapse or malfunction of critical systems, such as clinical facilities, service networks and systems that support healthcare delivery. These failures can arise from age-related degradation, inadequate maintenance, design flaws, or not replacing aged assets, posing significant risks to patient outcomes and operational efficiency.

**£13,753,275,035**  
**+£25,000,000,000**



## ACTIVE

56,561

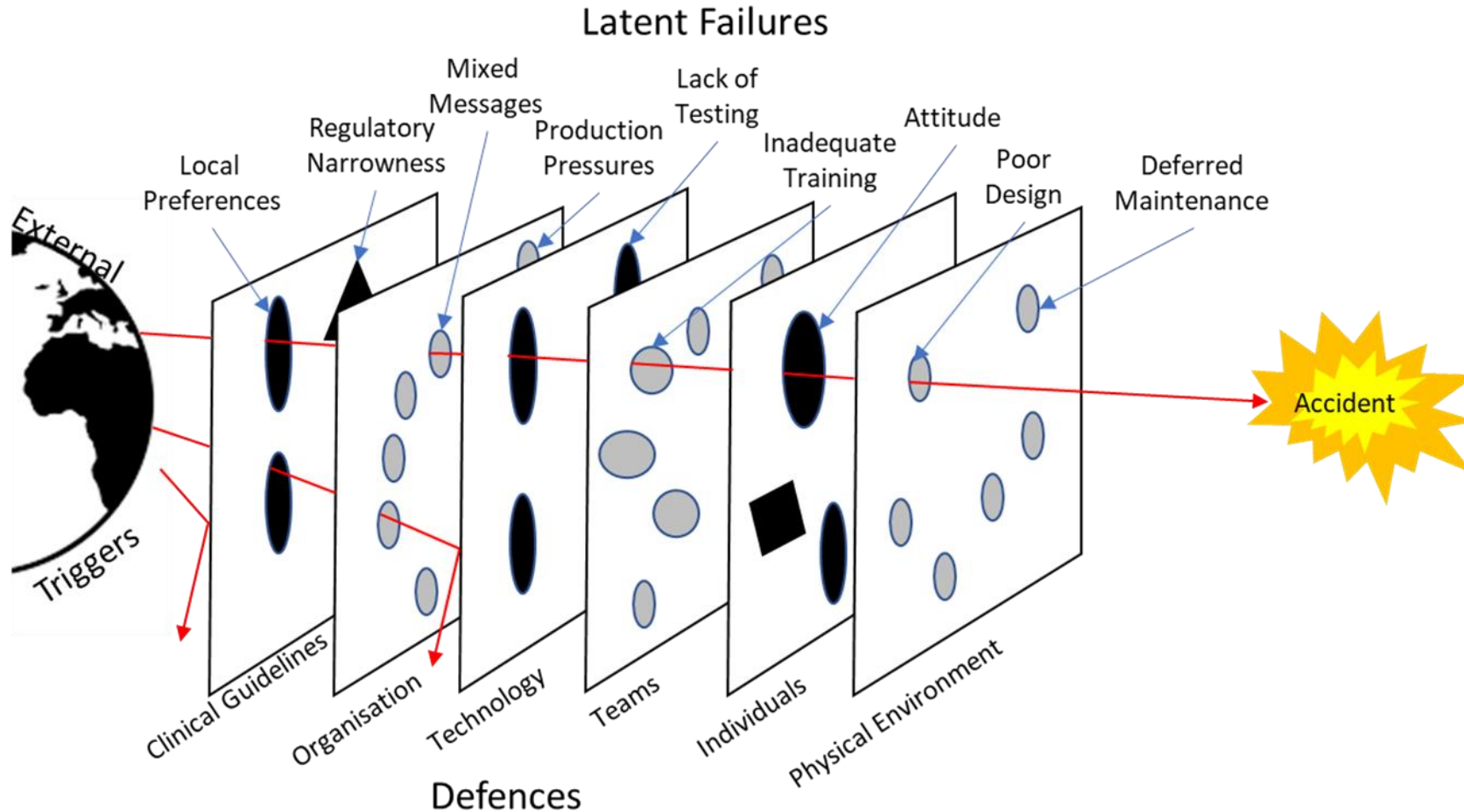
	Active	Total
No Harm	89.52%	75.87%
Low	9.77%	21.87%
Moderate	0.62%	1.86%
Severe	0.05%	0.25%
Death	0.04%	0.15%

## LATENT

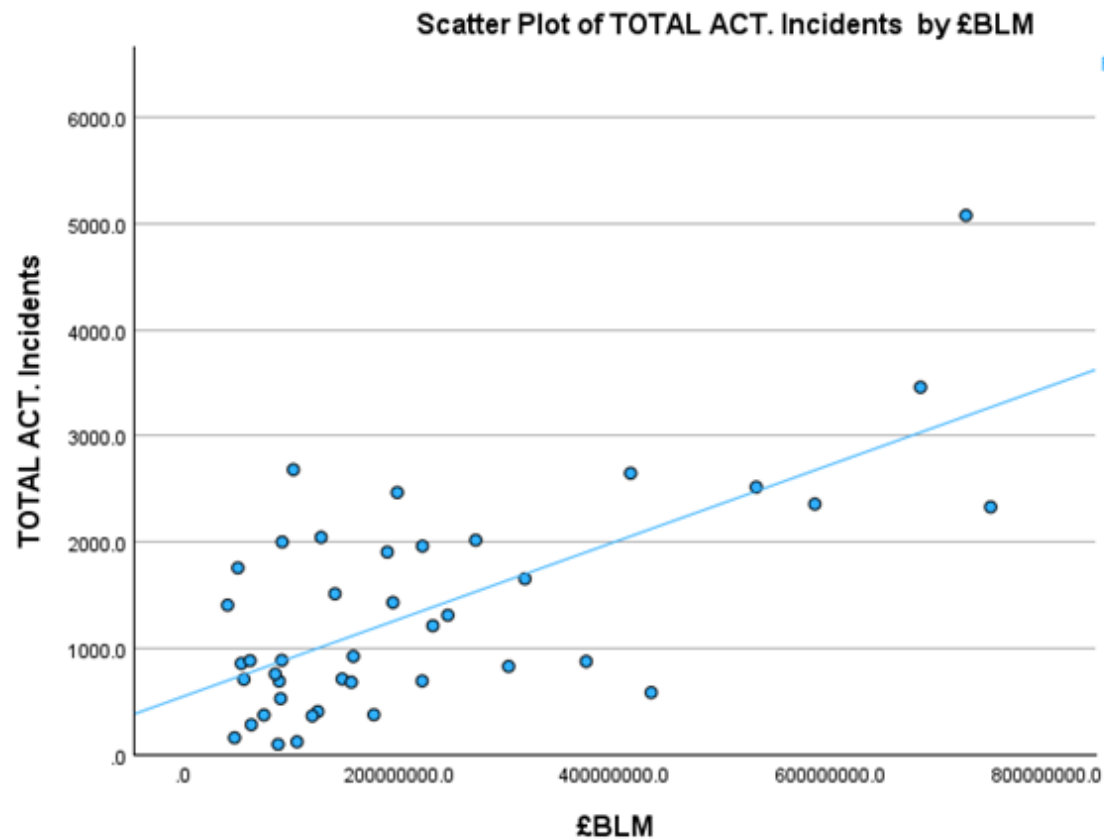


"There are known knowns. There are known unknowns. That is to say, there are things that we know we know. And there are things that we know we don't know. But there are also unknown unknowns – the ones we don't know we don't know."





- **Heat**
- **Noise**
- **Infection spread**
- **Light**
- **Disruption**



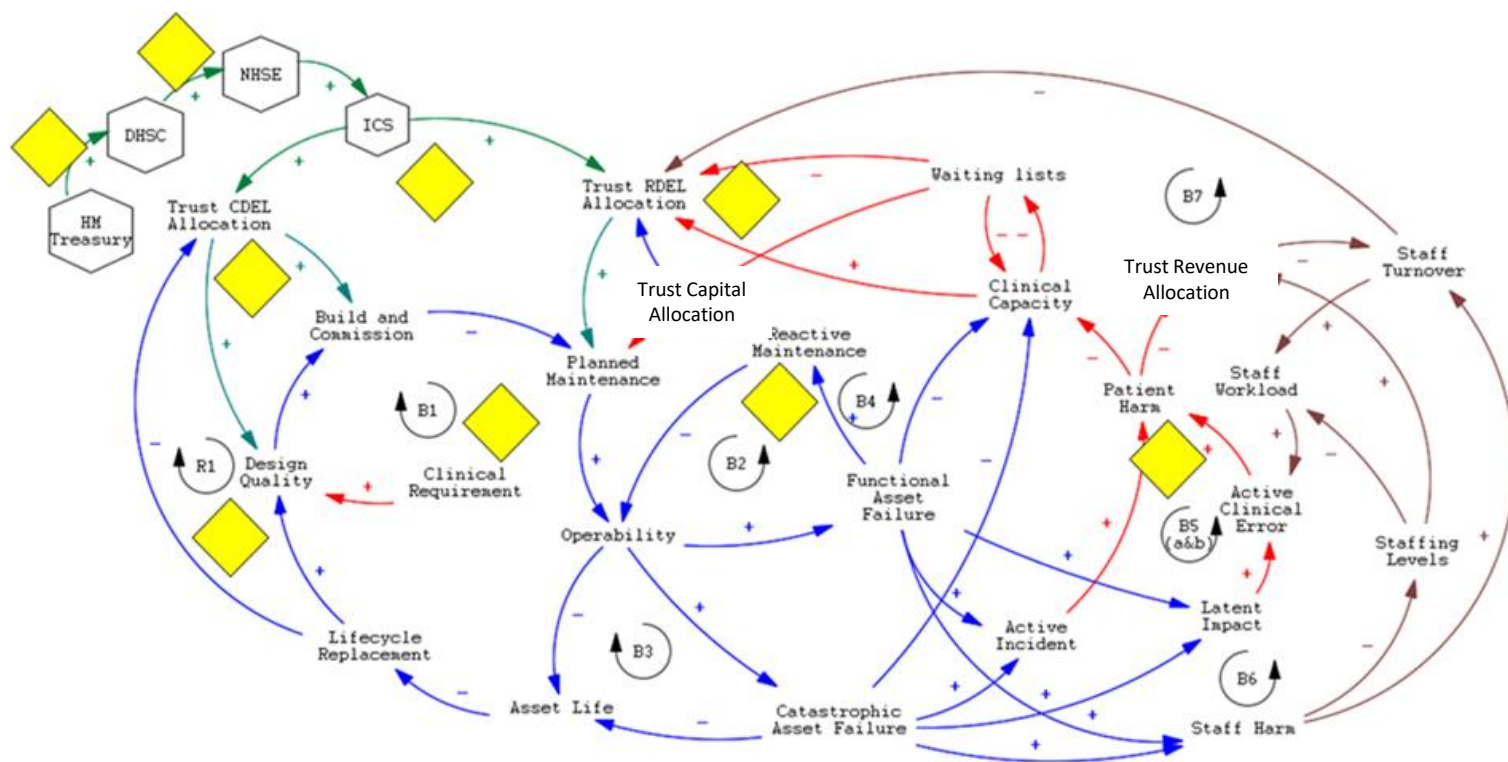
↑ £ Backlog Maintenance

=

↑ Patient Harm Incidents

	Total Backlog	
	Total Incidents	Active Incidents
No Harm	0.447	0.448
Low Harm	0.283	0.227
Moderate Harm	0.461	0.095
Severe Harm	0.207	0.176
Death	0.266	-0.024
Total Incidents	0.444	0.446

Total CIR	
Total Incidents	Active Incidents
0.128	0.503
0.137	0.22
0.243	0.045
0.035	0.088
0.134	-0.018
0.144	0.494



- Asset
- Finance
- Patient
- Staff

## Example

*Delayed investment worsens impact*



*Increased impact worsens availability*



*Reduced availability worsens outcomes*



*Worse outcomes decreases capacity*

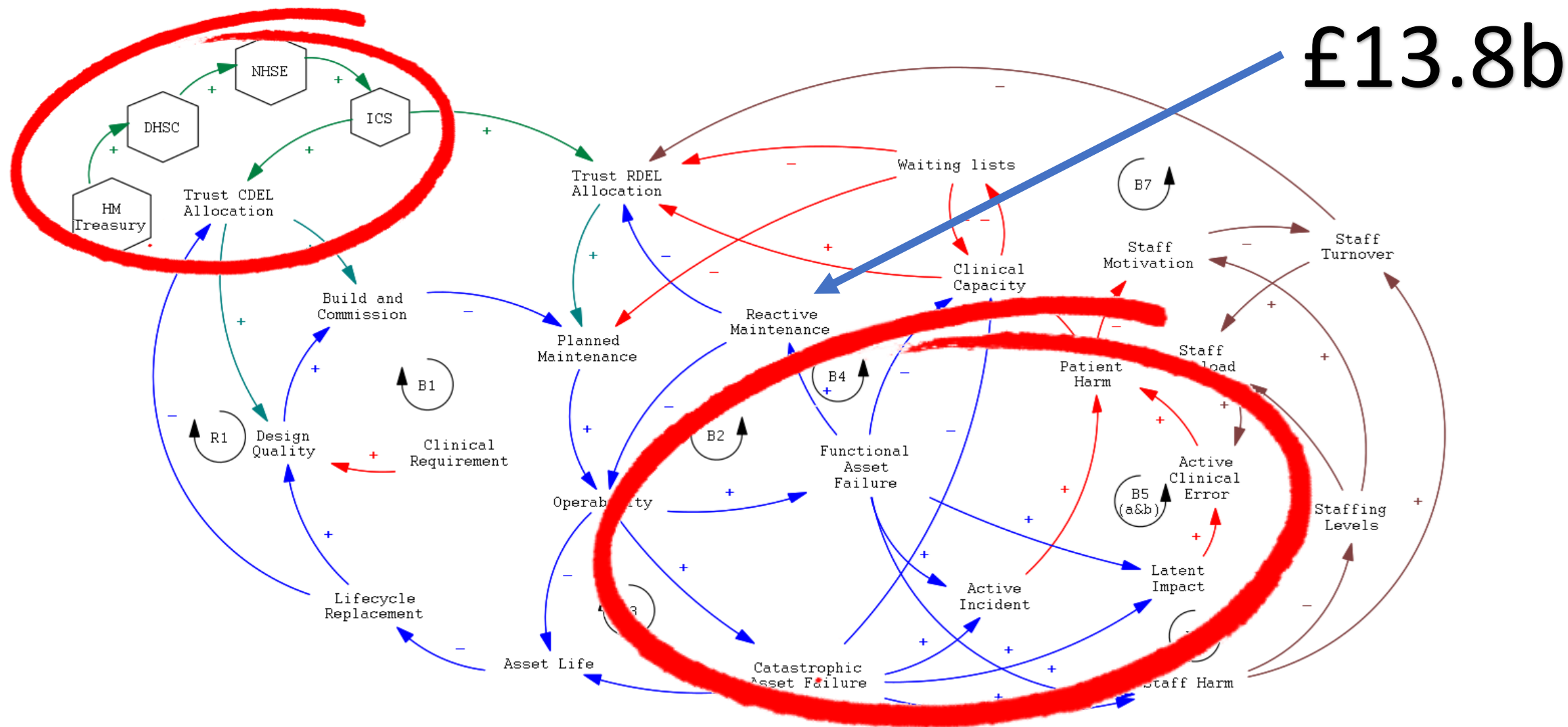


*Decreased capacity decreases revenue*



*Decreased revenue delays investment*







1859

## Three key principles of modern hospital design

- Space
- Ventilation
- Light





- **Evidence-Based Design (EBD)**

Facilities must improve safety, recovery, workflow.

- **Sustainable Design**

Use of low-carbon, low-maintenance materials.

- **Smart Systems:**

Predictive maintenance using IoT and analytics.

## INFORMATION



### Backlog

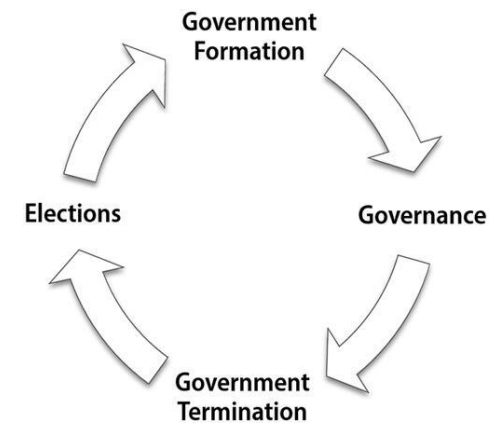
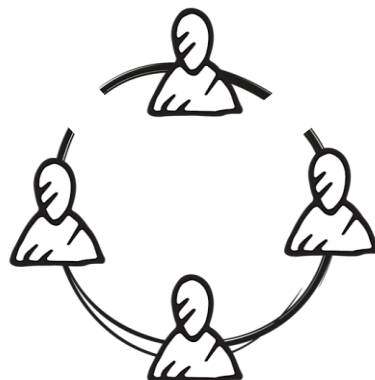
- Target highest-risk assets
- Asset condition surveys
- PSI data to prioritise.

### Policy

- Embed infrastructure in NHS quality/safety standards.
- Require Trust Boards to report estate risks alongside clinical metrics.

### Design

- Academically assess most efficient (whole life cost) approach to redesign and rebuilding the NHS





## DO THIS...

- **Mandate** estate risk audits in patient safety reviews
- **Invest** in predictive maintenance tools.
- **Design** new hospitals for adaptability, longevity, and infection prevention.
- National estate **strategy** aligned with sustainability goals.

## ...TO ACHIEVE THIS

- Safe, modern hospitals:
  - Reduce mortality/morbidity.
  - Attract staff.
  - Increase efficiency.
- **Reframe estate as core clinical infrastructure, not admin cost.**

***“We shape our buildings,  
thereafter they shape us”***



## *Reading list*

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Research Website

