The high price of waiting: How delays in care escalate hospital admissions and strain the NHS

2024 Research & Development Conference
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Presented by

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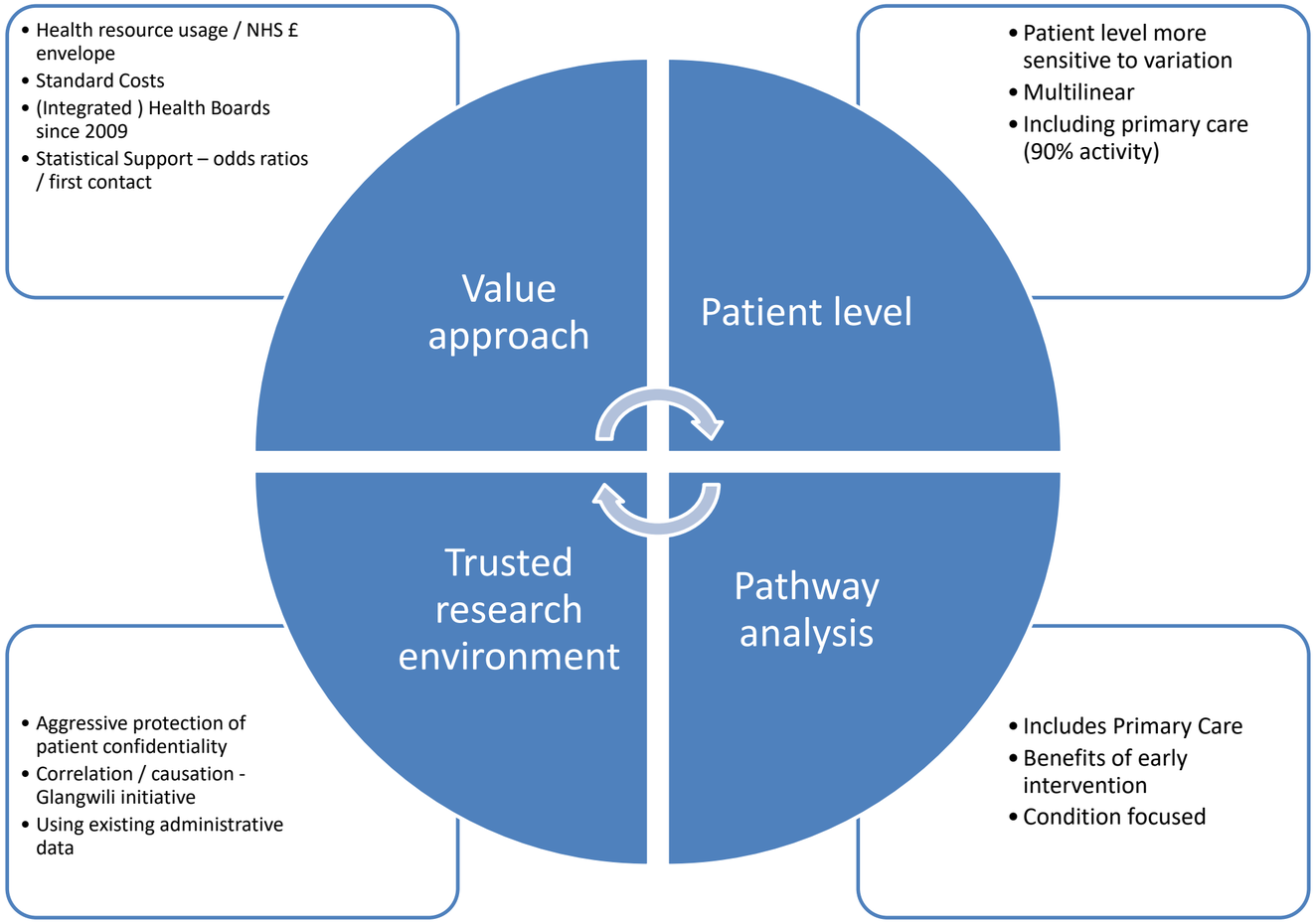
(Hosted by CTM Health Board)

UNIQUE CHARACTERISTICS OF THE JCC / SAIL PROJECT



STUDY OBJECTIVES

This work was commissioned in March 2021 by the then Welsh Health Specialised Services Committee, which became the NHS Wales Joint Commissioning Committee (NWJCC) in April 2024.

Stage 1 - INTERVENTIONS

- measure and evaluate the effectiveness of specific cardiac interventions

Stage 2 – ACCESS RATES

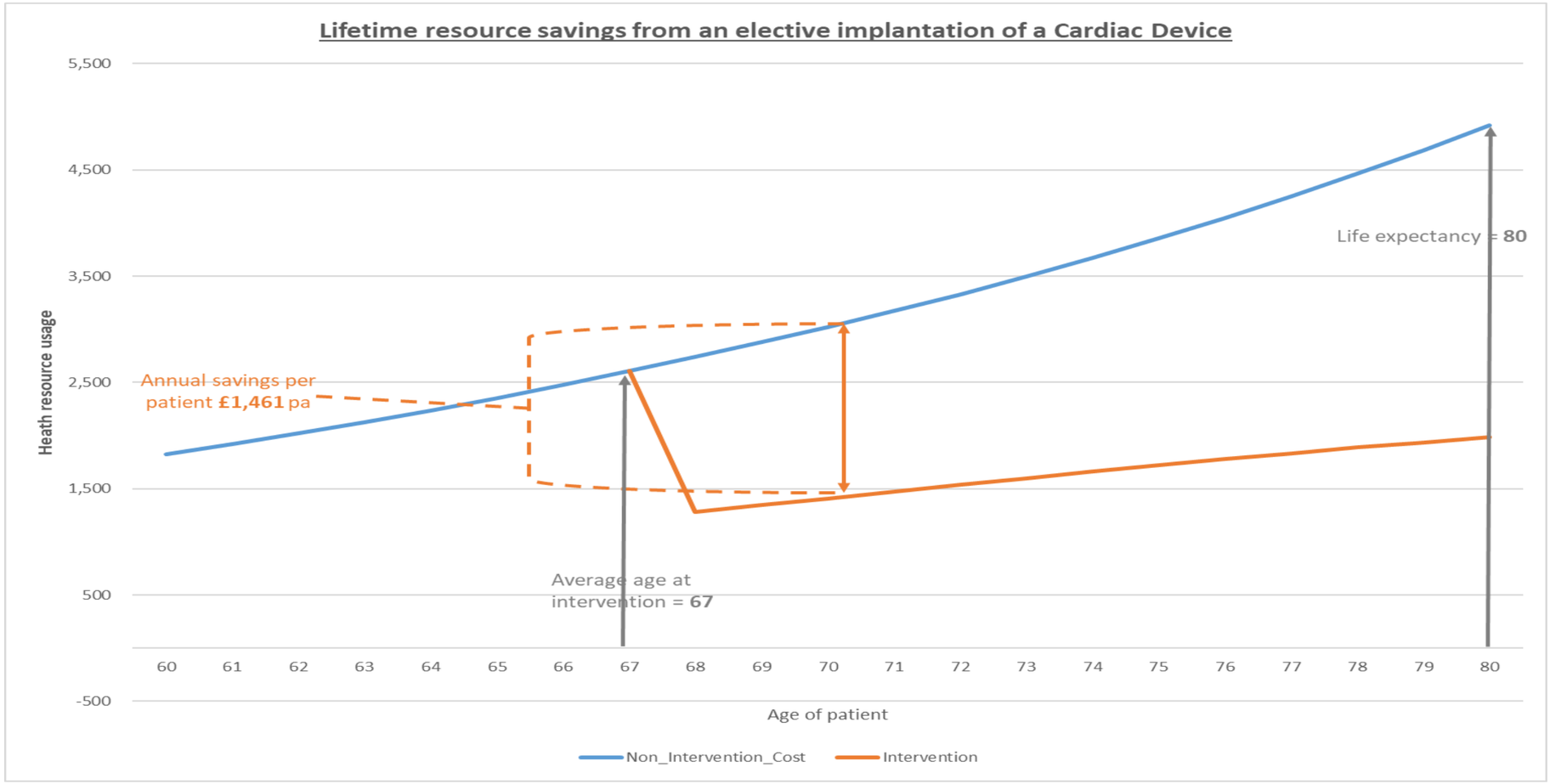
- measure variation in access rates between areas for treatment of conditions

The study applies to patients in Wales.

Interventions

A value approach to pathway analysis for 8 cardiac interventions

MICRO LEVEL -PATHWAY ANALYSIS - RESOURCES

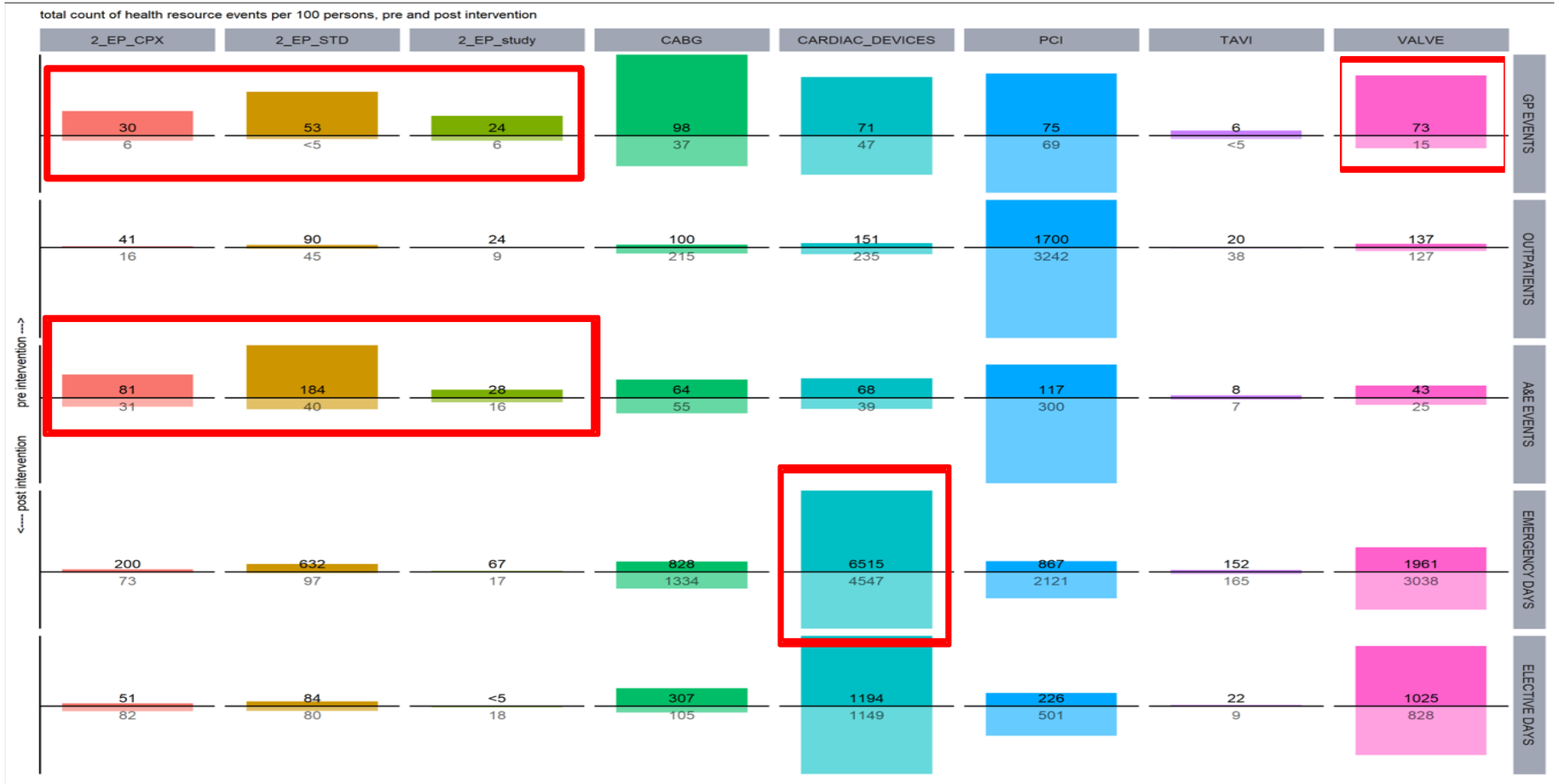


DESCRIPTION OF THE 8 INTERVENTIONS ANALYSED

Cardiac Devices Implantable Cardioverter Defibrillators (ICD): Small, battery-powered devices implanted under the skin below the collarbone. ICDs sense the heart's electrical activity and deliver impulses or shocks to restore normal rhythm when necessary.	**PCI Angioplasty-Stent** Percutaneous Coronary Intervention (PCI): A procedure to open blocked coronary arteries caused by coronary artery disease, restoring blood flow to the heart muscle without open-heart surgery.	**TAVI** Transcatheter Aortic Valve Implantation (TAVI): Involves inserting a catheter through a blood vessel in the upper leg or chest to guide and place a replacement valve over the existing, damaged aortic valve.	
Electrophysiology (EP) Study: A test to assess how electrical signals move through the heart to initiate each beat. It helps identify ineffective or chaotic signals causing abnormal rhythms and can predict the risk of sudden cardiac death.	**EP Ablation:** Combines an EP study with catheter ablation to evaluate and treat abnormal heart rhythms (arrhythmias), performed for patients of various ages with or without congenital heart disease.	**CABG** Coronary Artery Bypass Graft (CABG): A surgery that uses healthy blood vessels from elsewhere in the body, grafted to bypass blocked or narrowed heart arteries and improve oxygen-rich blood flow to the heart.	**Valve Surgery** Valve Replacement or Repair: Surgical procedures to repair or replace damaged heart valves, addressing complex issues and restoring proper valve function.

VALUE PROJECT

CHANGE IN HEALTH RESOURCE USAGE BY POINT OF DELIVERY (Y AXES) FOR 8 CARDIAC INTERVENTIONS (X)



CHANGE IN COSTS AFTER INTERVENTION BY POINT OF DELIVERY

		Increase in annual resource usage	
Procedure	**Activity**	**Elective**	**Emergency**
EP_CPX	256	**- 104**	**- 1116**
EP_STD	609	**- 287**	**- 93**
EP_Study	150	**- 78**	41
CABG	1640	**- 213**	315
Cardiac Devices	783	**- 1461**	584
PCI	5999	23	123
TAVI	125	123	**- 153**
Valve	918	251	**- 43**

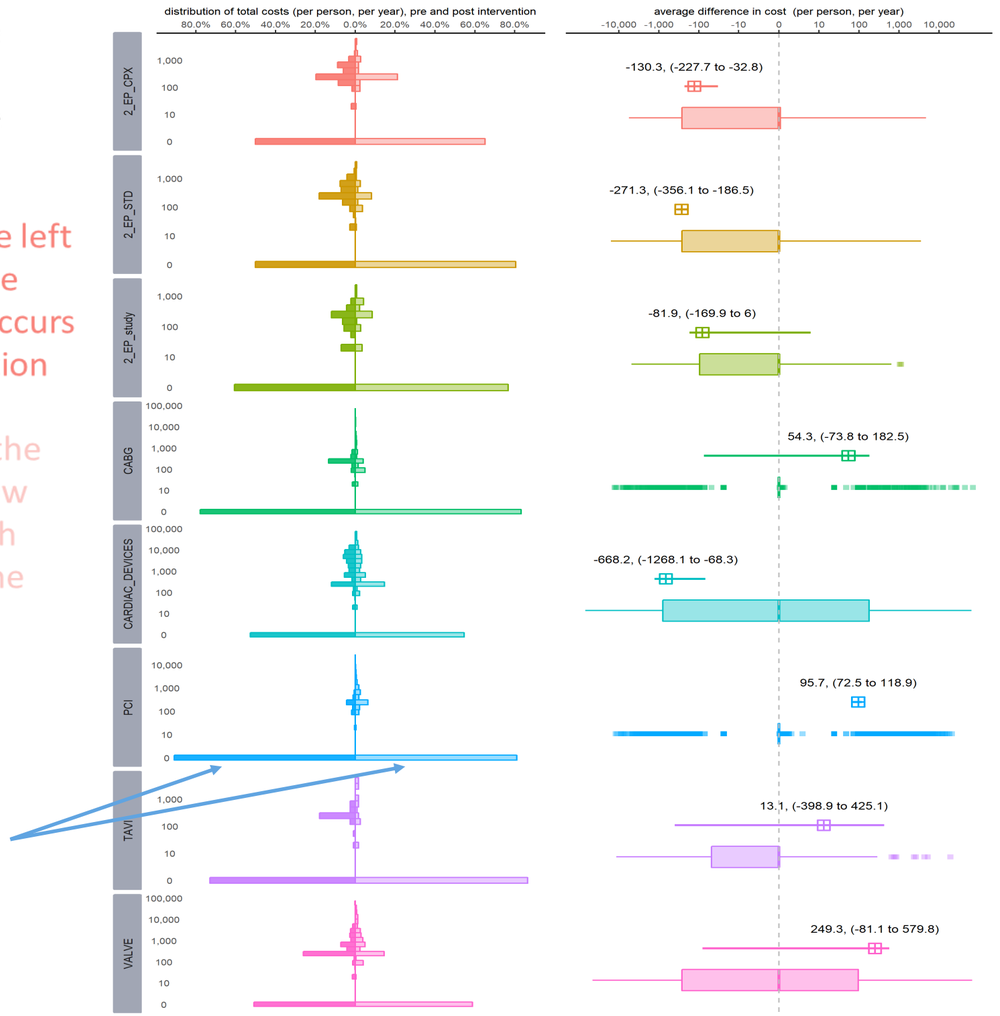
DISTRIBUTION

The left hand side shows the distribution of the costs

The darker bars on the left hand side show the frequency each cost occurs before the intervention

The lighter bars on the right hand side show the frequency each cost occurs after the intervention

All procedures have a large number of zero cost patients before and after the intervention



INTERVENTIONS - CONCLUSIONS

- By examining the whole pathway, we can understand where to target resources
- Following the data can help reduce preconceived biases
- There are high value interventions that reduce subsequent pressures on health services
- **Deprivation** is a key driver in follow up cost variation

The interventions work has been **published**:
Davies G, Akbari A, Bailey R, Evans L, Smith K, Goodfellow J, et al. (2024)
Cardiac interventions in Wales: A comparison of benefits between NHS Wales specialties.
PLoS ONE 19(2): e0297049. **https://doi.org/10.1371/journal.pone.0297049**

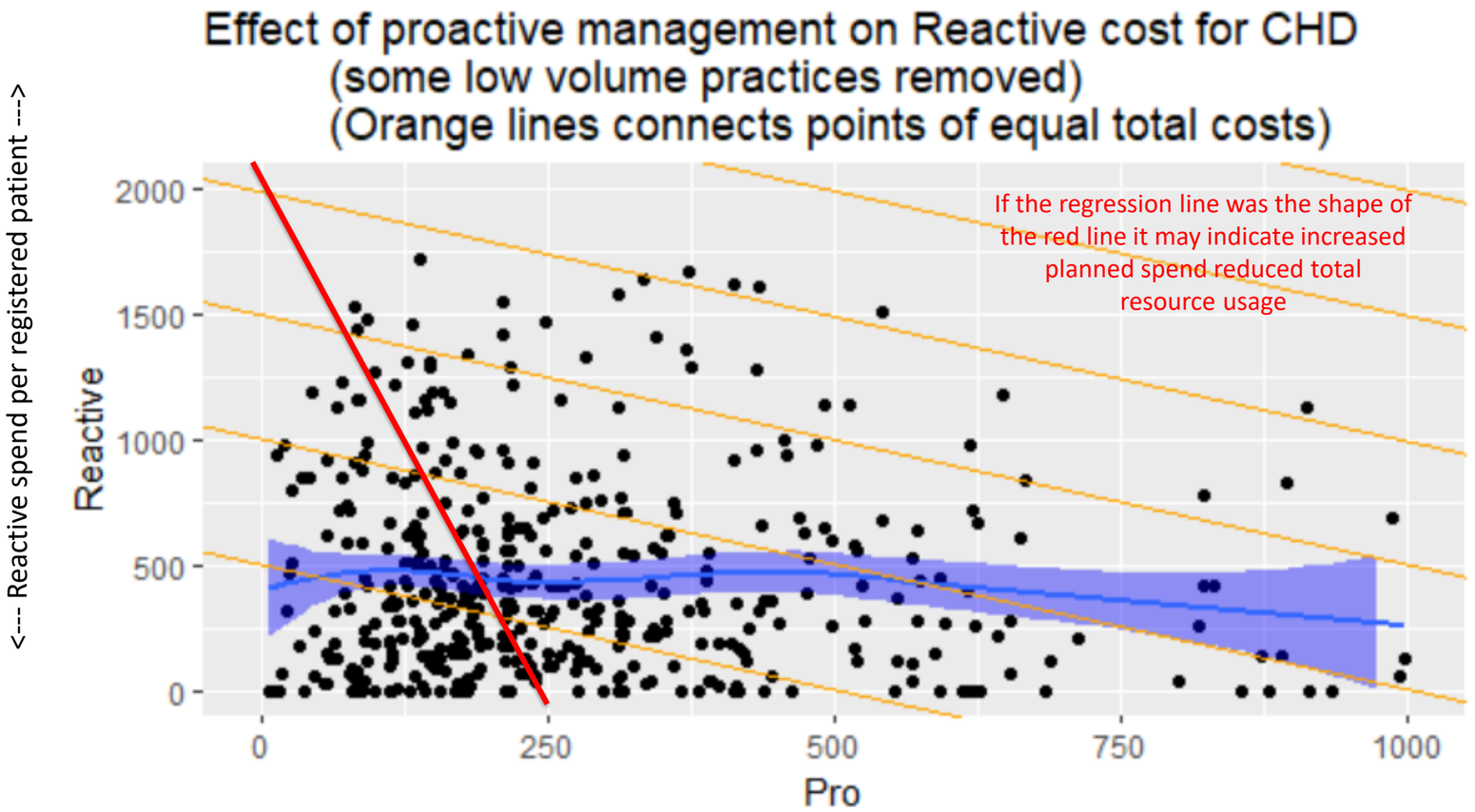
Access

A value approach to pathway analysis for Coronary Heart Disease

PRACTICE LEVEL - PATHWAYS ANALYSIS 1

- Using the SAIL databank **41,384** Coronary Heart Disease (CHD) patients were followed for a minimum of 1 year, and a maximum of 5 years after their first CHD event in the period. The results are adjusted to express them as an annual figure. The study period was **2015-19**
- GP contacts, outpatients and planned admissions are categorised as **proactive events**.
- A & E attendances and emergency admissions are categorised as **reactive events**.
- Standard costs were applied: bed day - £398, outpatient - £143, A&E attendance - £188 and visit to GP - £36.
- Summarised showing co-ordinate for each GP practice

GP PRACTICE LEVEL - DIFFERENCES IN PROACTIVE / REACTIVE SPEND



PATIENT LEVEL - PATHWAYS ANALYSIS 2

- Patient pathways were then split based on the setting of first event in period
- 2 analysis were carried out:
  - a **regression model** looking at how each factor affects cost
  - An **odds ratio analysis** finding out how each factor affects **the risk of** the first event being in an **emergency setting**
- 26 factors over 6 domains were analysed
- Ethnicity data and lifestyle factors were not sufficiently populated at the beginning of project

PATIENT LEVEL - PATHWAYS ANALYSIS 2

Background variable		Regression analysis 95% CI Increase in costs	Lower	Upper		Likelihood of having first contact in an emergency setting rather than as an elective 95% CI Odds ratio	Lower	Upper	
Setting	Proactive								
	Reactive	3,944	3,524	4,364	***				
Sex	Male								
	Female	-84	-479	312		1.318	1.236	1.407	***
Age	<65								
	65-74	1,177	634	1,719	***	0.470	0.431	0.513	***
	75-84	1,986	1,436	2,536	***	0.597	0.546	0.652	***
	85+	5,023	4,360	5,686	***	0.977	0.876	1.089	
Deprivation	1 - Least deprived								
	2	-219	-870	432		0.974	0.876	1.083	
	3	207	-443	858		1.044	0.939	1.160	
	4	-117	-752	517		1.089	0.981	1.209	
	5 - Most deprived	26	-595	648		1.140	1.029	1.264	*
No. of comorbidities	0								
	1	693	108	1,277	*	0.970	0.880	1.069	
	2	1,396	735	2,057	***	1.077	0.967	1.200	
	3	2,437	1,711	3,163	***	1.191	1.058	1.341	**
	4	3,475	2,668	4,281	***	1.345	1.180	1.535	***
	5	5,015	4,337	5,692	***	1.519	1.359	1.699	***
Health Board	Betsi Cadwaladr								
	Powys	218	-881	1,318		1.810	1.520	2.156	***
	Hywel Dda	1,071	325	1,817	**	1.157	1.032	1.298	*
	Swansea Bay	-1,568	-2,199	-937	***	3.503	3.161	3.882	***
	Cwm Taf Morgannwg	734	-102	1,570		0.786	0.692	0.894	***
	Cardiff & Vale	883	103	1,663	*	0.783	0.695	0.883	***
	Aneurin Bevan	606	-88	1,299		0.577	0.518	0.642	***
Rurality	Urban								
	Rural	-430	-922	62		1.001	0.925	1.084	
Constant		-1,687	-2,541	-834	***				

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05

REGRESSION MODEL & ODDS RATIO ANALYSIS

Note 1: When a registered patient's first event was in an emergency setting (reactive) subsequent annualised costs were **£3,944 more** per year

Note 2: Female patients were **32%** more likely to have their first event in an emergency (reactive) setting

The **% split** of each variable in each domain / category is shown on the inside of the outer rim.

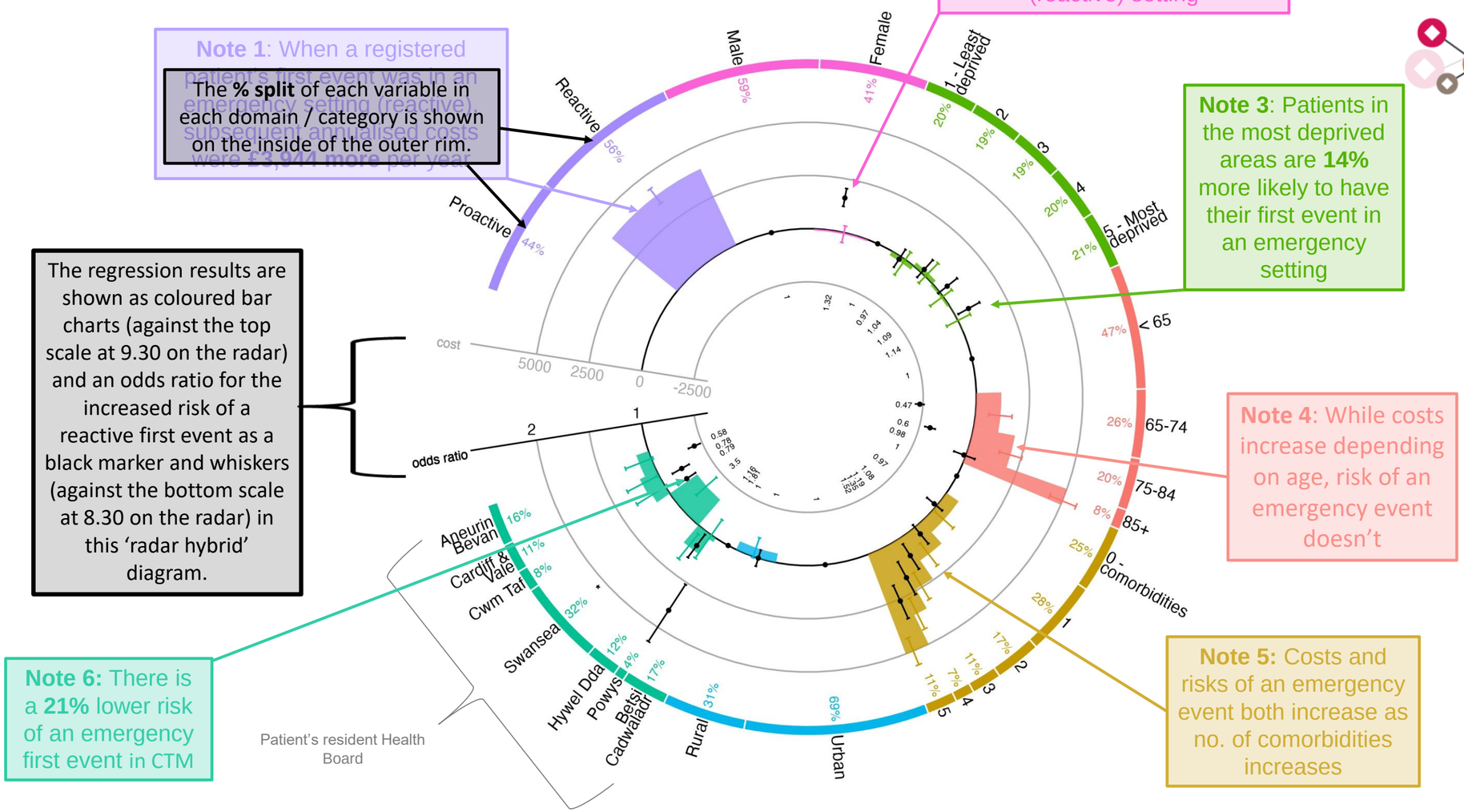
Note 3: Patients in the most deprived areas are **14%** more likely to have their first event in an emergency setting

The regression results are shown as coloured bar charts (against the top scale at 9.30 on the radar) and an odds ratio for the increased risk of a reactive first event as a black marker and whiskers (against the bottom scale at 8.30 on the radar) in this 'radar hybrid' diagram.

Note 4: While costs increase depending on age, risk of an emergency event doesn't

Note 5: Costs and risks of an emergency event both increase as no. of comorbidities increases

Note 6: There is a **21%** lower risk of an emergency first event in CTM



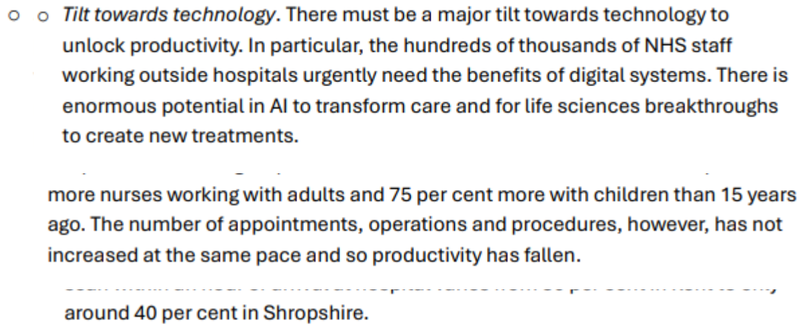
The regressions model's constant is - £1,687

* Swansea Bay omitted as outside plot range

NEXT STEPS

- Test correlation against Glangwili Hospital Cardiology triage service in West Wales
  - HD OP waiting times 6-8 weeks, Welsh av. 52 weeks
  - Median referral to assessment from 168 days to 6 days
  - Post COVID referrals dropped by 17% in HD, increased by 27% across Wales
- Test versus other conditions and produce second paper

Relevant main points from summary letter from Lord Darzi to the Secretary of State for Health & Social Care 2024 concerning the Independent Investigation in the NHS in England.

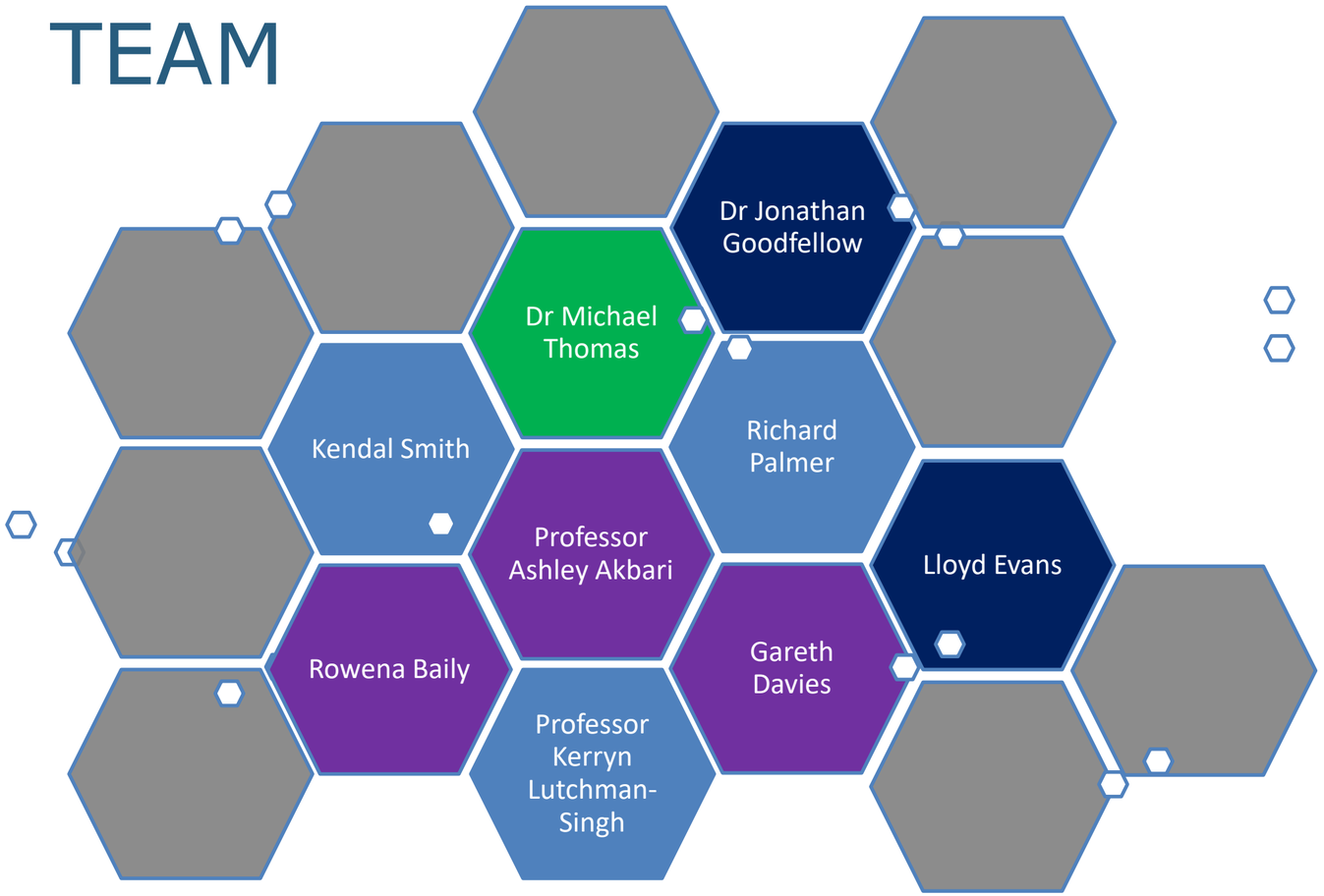


- *Tilt towards technology*. There must be a major tilt towards technology to unlock productivity. In particular, the hundreds of thousands of NHS staff working outside hospitals urgently need the benefits of digital systems. There is enormous potential in AI to transform care and for life sciences breakthroughs to create new treatments.

more nurses working with adults and 75 per cent more with children than 15 years ago. The number of appointments, operations and procedures, however, has not increased at the same pace and so productivity has fallen.

around 40 per cent in Shropshire.

TEAM



NHS Wales Joint Commissioning Committee

NHS Wales Executive

Hywel Dda University Health Board

Swansea University

THANK YOU – DIOLCH YN FAWR

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