Data to Innovate

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Digital Health & Care Wales (DHCW)

Who **we are**

Collaboration	Innovation	Inclusive	Excellence	Compassionate
Teamwork	Creative Thinking	Diversity	Empowerment	Dignity
Supporting & Challenging	Courageous	Equality	Quality	Kindness
Listening & Valuing each other	Transformational	Respect	Continuous Improvement	Empathy
Reflecting	Embracing Change	Fairness	Drive for Results	Personal Responsibility
Continuous learning	Ambitious	Equity	Pride in what we do	Trust
		Celebrate success and achievements	Accountability	

Set up in April 2021 as a new Special Health Authority, we are part of the NHS Wales family and play an vital role in changing the way health and care services are delivered

Thousands of NHS Wales staff use our technology services every day to manage the care of patients, while our networks support millions of clinical messages connecting and joining-up care

Growing organisation – we have been expanding our workforce, skill-mix and service delivery over last two years to effectively support our partners in transforming care

Our values are central to all we do - **collaboration, innovation, inclusion, excellence, compassion**

What **we do**

- **Support frontline staff** with modern systems and secure access to information about their patients, available wherever they want to work

- **Deliver new digital solutions to support care** for cancer patients, to help nurses, to modernise critical care units, to update hospital pharmacy, prescribing and community care

- **Use data to provide insight and improve** how health and care services are delivered and accessed by patients

- **Help people manage their own health and recovery** from illness by putting health services in their pocket. Giving people access to their own digital health record and apps from any device making it easier to connect with health and care services

- **Combat cyber crime** through a dedicated cyber resilience unit

- **Use digital standards** to allow for faster development and delivery of digital services

- **Protect valuable data assets** by modernising data storage and adopting a 'cloud-first' policy

Our **Strategic Missions**

PROVIDE A PLATFORM for enabling digital transformation

- Data Platform and Reference Services
- Open Architecture and Interoperability
- Protecting Patient Data
- Sustainable and Secure Infrastructure

DELIVER high quality digital products and services

- Public Health
- Primary, Community and Mental Health
- Planned Care
- Urgent and Emergency Care
- Diagnostics
- Medicines

EXPAND the digital health and care record and the use of digital to improve health and care

- Engaging with Users: Health and Care Professions
- Engaging with Users: Patients and the Public

DRIVE better value and outcomes through innovation

- Research and Innovation
- Value from data

BE the trusted strategic partner and a high quality, inclusive, and ambitious organisation

- People and Culture
- Finance
- Sustainability
- Stakeholder Engagement
- Quality and Safety
- Governance, Performance and Assurance

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Mission 4: DRIVE better value and outcomes through innovation

As a learning organisation, lead and enable, high quality health and care, through world-leading data and digital research and innovation

DHCW's data warehouse

Dr Gareth John

Head of Information Delivery

Digital Health & Care Wales (DHCW)

Some key datasets within DHCW data warehouse (with number of records)

Admitted Patient Care	**29,031,645**	**111 Service**		
Emergency Department Dataset	**13,727,912**	Calls/Consultations		2,500,639
Hospital Pharmacy		**Ambulance**		
Drugs Issued	10,800,855	Patient Clinical Record		2,144,822
Drugs purchased	3,015,032	Journeys		9,089,136
ONS Births	**17,737,532**	Calls		6,492,532
ONS Deaths	**14,594,789**	**Canisc (Cancer system)**		
Outpatient Appointments	**80,207,992**	Specialist Palliative care		1,501,039
Outpatient Referrals	**17,038,754**	Diagnoses		1,488,859
Welsh Immunisation Service	**15,362,826**	**GP Out of Hours**		
Welsh Nursing Care Record		Consultations		272,384
Assessments	161,504	**National Community Child Health**		
Welsh Results Reporting Service		Vaccinations		23,663,381
Results	2,402,742,988	Children		1,482,842
Radiology Requests	15,415,764	**Welsh Demographics Service**		**25,796,721**
Microbiology Requests	37,881,782	**Welsh National Database for**		
Blood Sciences Requests	122,234,459	**Substance Misuse**		
Other Requests	70,753,331	Referrals to		321,955

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NDR and the Google Cloud Platform
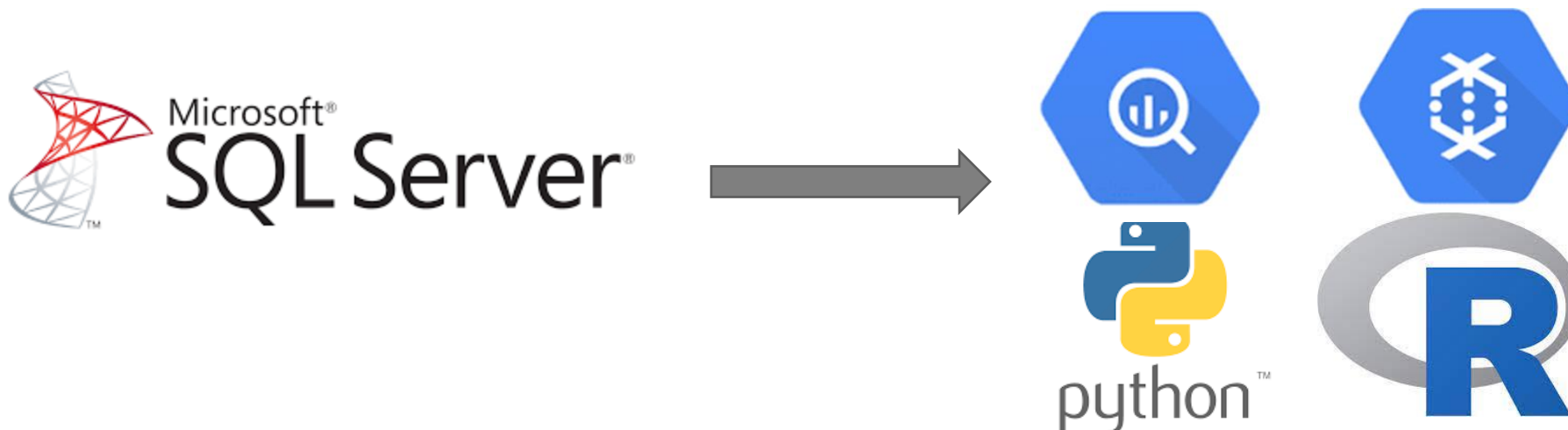
Creative collaboration

From hackathon to a
"Last Year of Life" population dashboard

Gareth John
Head of Information Delivery
Digital Health & Care Wales (DHCW)

Anthony Byrne
Palliative Care Consultant
Cardiff & Vale University Health Board

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Reuse - Recycle
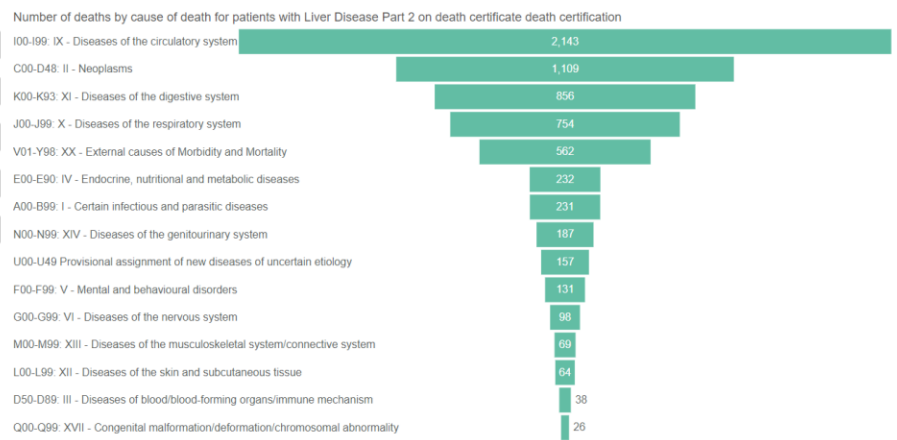
The Challenge

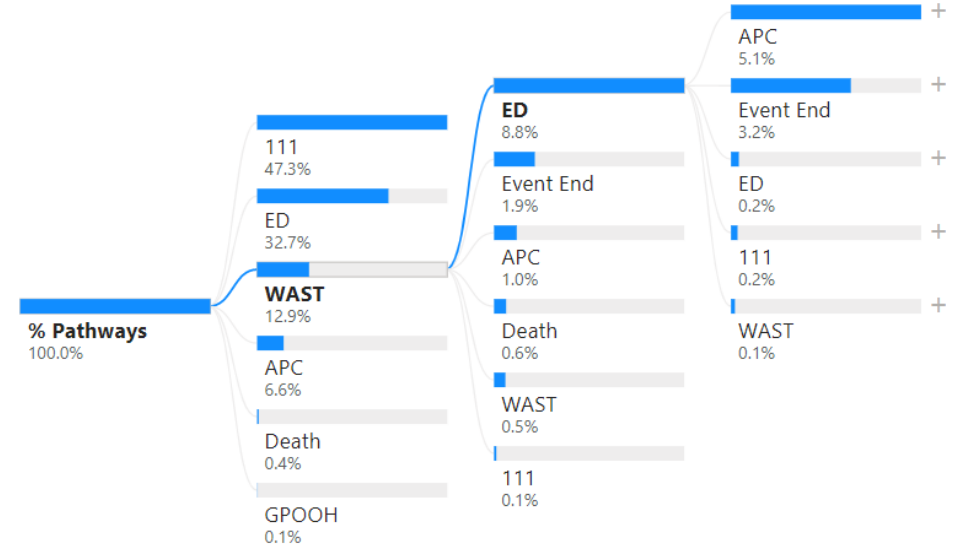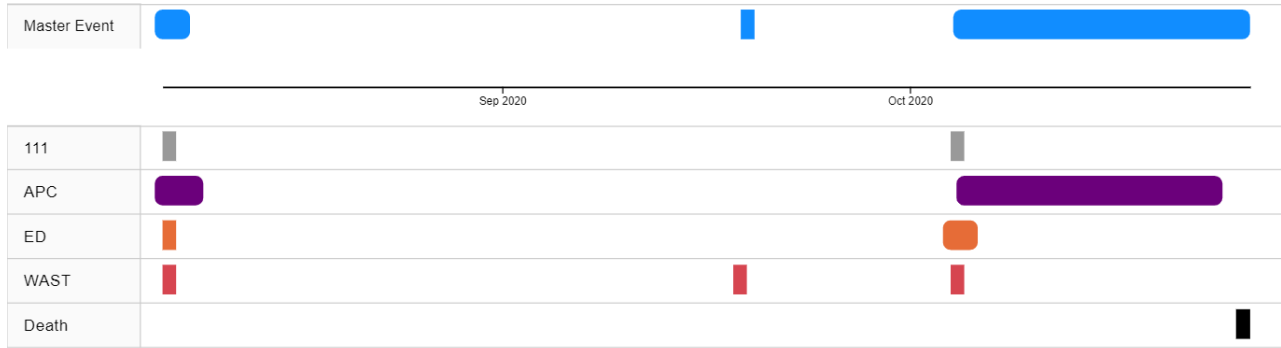- Create cohort: "Individuals who died in the calendar year of 2021"
- Bring together all available data relating to these individuals for their last year of life (focused on unscheduled care interactions)
- Analyse and visualise data in an understandable and engaging way

Hackathon analysis – creating the cohort

Cohort derived from death registrations data (source: Office for National Statistics), with deaths due to external causes (e.g. accidents, suicides) excluded

Patients by Age and Sex

● Female ● Male

Age	Female	Male
<40	177	218
41–45	119	150
46–50	179	291
51–55	365	477
56–60	554	761
61–65	719	1,036
66–70	1,096	1,515
71–75	1,735	2,262
76–80	2,190	2,710
81–85	2,825	3,066
86–90	3,169	2,557
>90	3,736	1,894
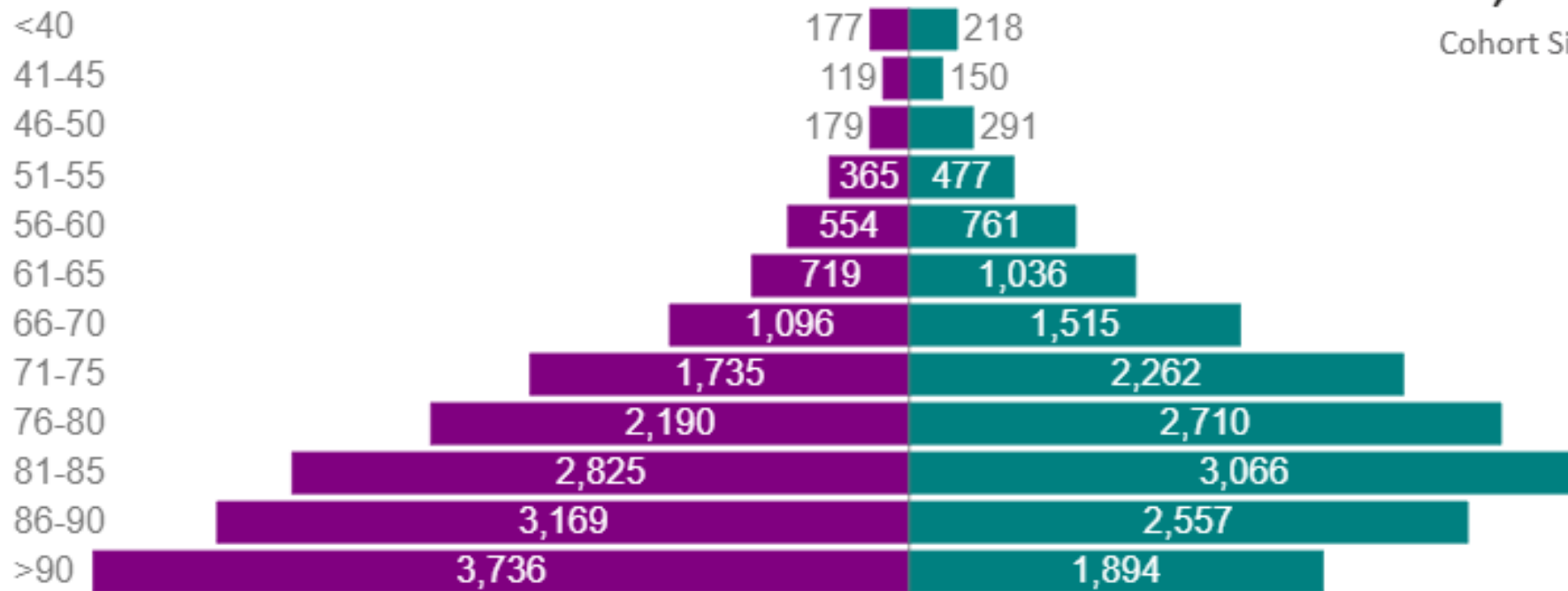
33,801

Cohort Size

Hackathon analysis – healthcare interaction data sources

Welsh Ambulance Service Trust (WAST) – Emergency (999) calls

Emergency Department attendances (ED)

Admitted Patient Care (APC)

GP Out of Hours (GPOOH)

111 Service (Non emergency calls)

Specialist Palliative Care (SPC) contacts

Welsh Demographic Service (National patient register)

Power BI

- Existing skills ✔
- Existing templates ✔
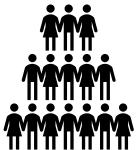- Interactivity for users ✔
- Already licensed to publish dashboards ✔

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Palliative Care Cohort | Patient on a Page

View by Contact Type | View by Contact Group

Year of Death
2021

Age
All

Sex
All

Diagnoses
Include all records regardless of Diagnoses

Residence HB
All

Days to Death
0   365

Contact Types
All

Palliative Care Patient Contacts

Service Type Group ● 111 ● GPOOH ● WAST ● ED ● APC ● SPC ● Death

	365	180	0
9			
327			
444			
575			
689			
823			
1022			
1193			
1429			
1483			
1548			
1561			
1621			
1625			
1628			
1685			
1747			
1804			
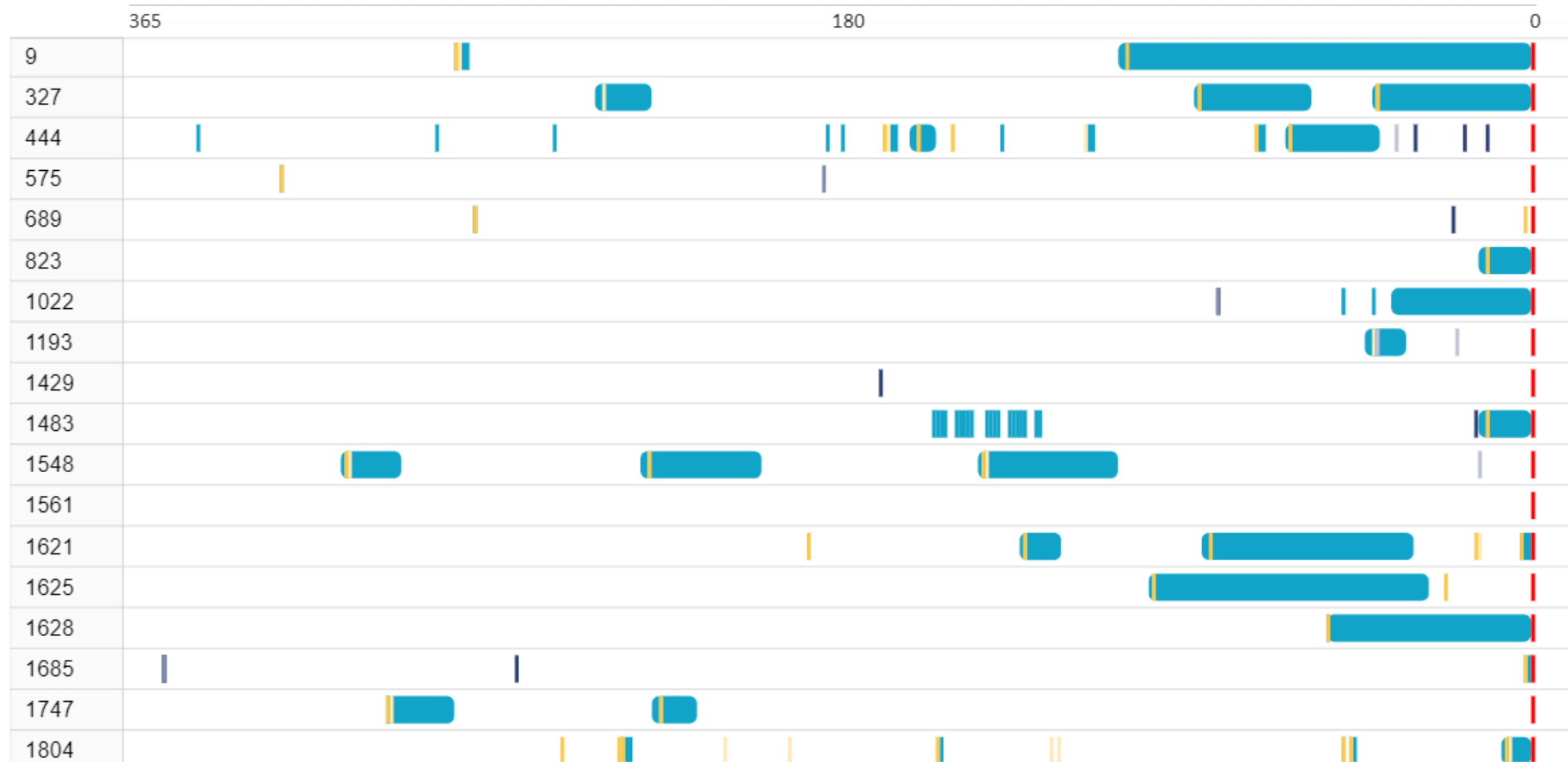
Totals days that our cohort spent in a hospital or an ambulance

Patients with Stays by Months to Death and Service Type

Service Type ● WAST ● ED ● APC

Our cohort spent on average **12 times as many days in a hospital or an ambulance** as that of an age/sex-comparable control group during their last year of life.

For the last 3 months of life, they spent **25 times as many days in a hospital or an ambulance**
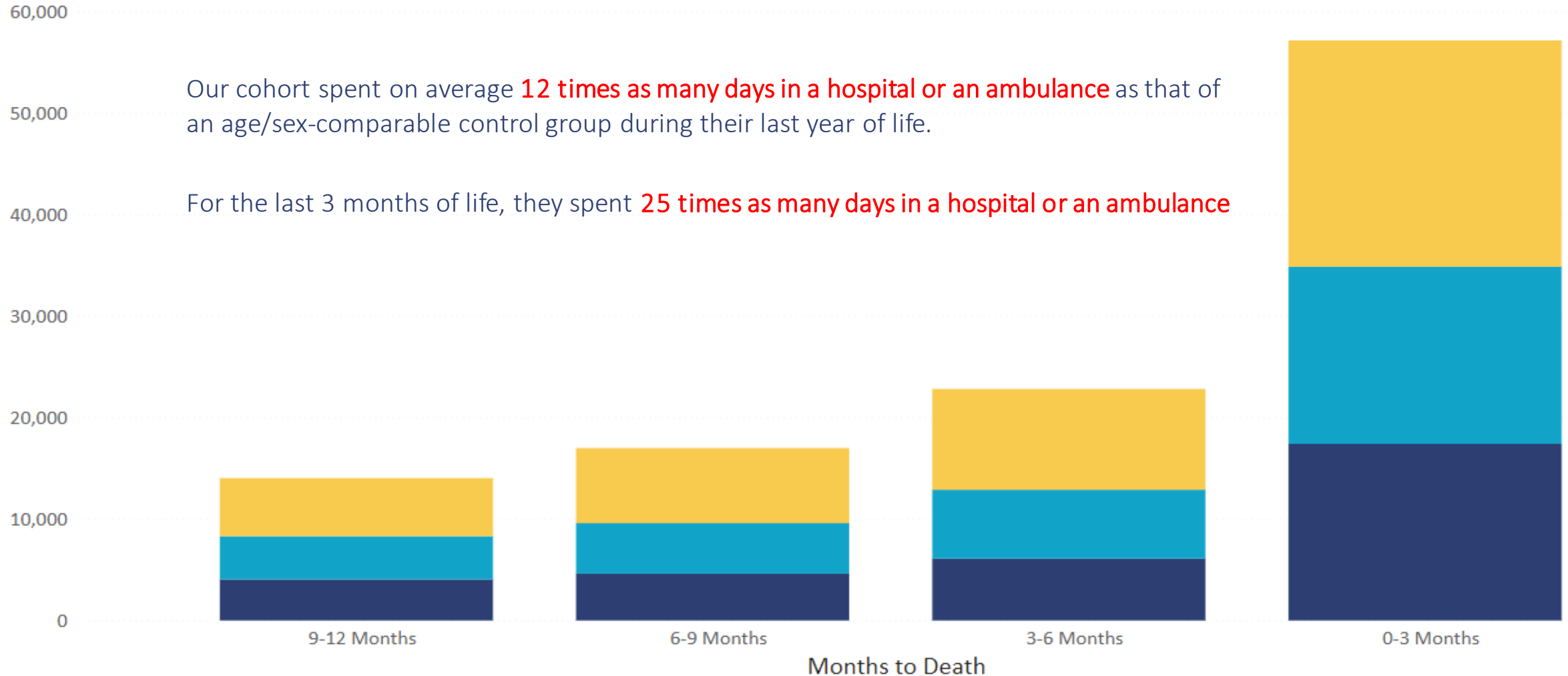
Months to Death

*Total number of patients that have had stays in Hospital/Ambulance split by the Services they've used by the Months they have left until death.

Hackathon reflections: the information specialists

- Pleased with what we were able to achieve in just 2 days
- Lots of enthusiasm and engagement from both the information and clinical side
- Felt as though we were equal partners in the creative process
- A nice template for how to successfully collaborate with healthcare professionals

Welsh Value in Health Centre

- **Responsible for developing approaches to Value-Based healthcare in NHS Wales**

- **Seek to improve health outcomes that matter most to the people of Wales**

- **Establish a data driven system to support delivery of healthcare**

NHS Wales Data Dashboards

- Utilise existing routine data held in DHCW Data Warehouse

- Enriched with new data, such as Patient Reported Outcome Measures and National Audit Data

- Visualisations created in Power BI and made available to NHS Wales

- Currently 13 live dashboards covering a wide range of health areas

Innovation

Driving best practice and change

Helping deliver better outcomes for patients

Breaking down barriers

Driving Best Practice and Change

- Historical "working in silos" has led to large amounts of unwarranted variation in NHS Wales

- This has led to differences in patient outcomes for similar conditions across Wales

- The data dashboards have been key in identifying these areas of unwarranted variation

Hip Procedures Dashboard

- Showed significant variation across Wales in the fixation types used for hip replacements in over 65's

- Best practice is for older patients to receive cemented fixations

Type of Fixation

View Over Time

● Cemented ● Hybrid ● Uncemented ● Unspecified

Health Board	Cemented	Hybrid	Uncemented
ABUHB	22.3%	36.0%	39.0%
BCUHB	23.5%	40.9%	34.1%
CTMHB	16.1%	20.3%	60.3%
CVUHB		94.0%	
HDUHB	70.3%	14.7%	14.5%
SBUHB	21.3%	38.1%	36.9%
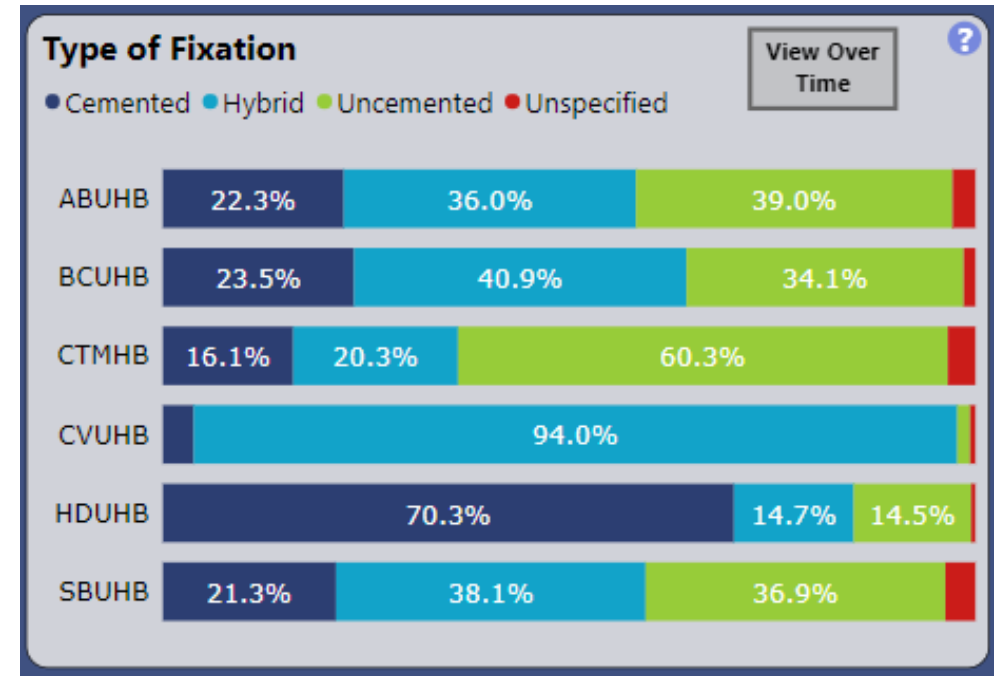
"The dashboard showed us that there's a massive amount of uncemented procedures that are being carried out across all age groups which are very costly and they have a significantly higher chance of returning to theatre."

Mr. Phill Thomas, Consultant Orthopaedic Surgeon

Hip Procedures Dashboard

Median LoS Based on HBA1C Pre-op Results

<48 - Normal	48-69 - High	>69 - Uncontrolled
4.0	4.0	6.0

Median LoS Based on HB Pre-op Results

<109 - Low	110-129 - Normal	>130 - High
8.0	5.0	4.0
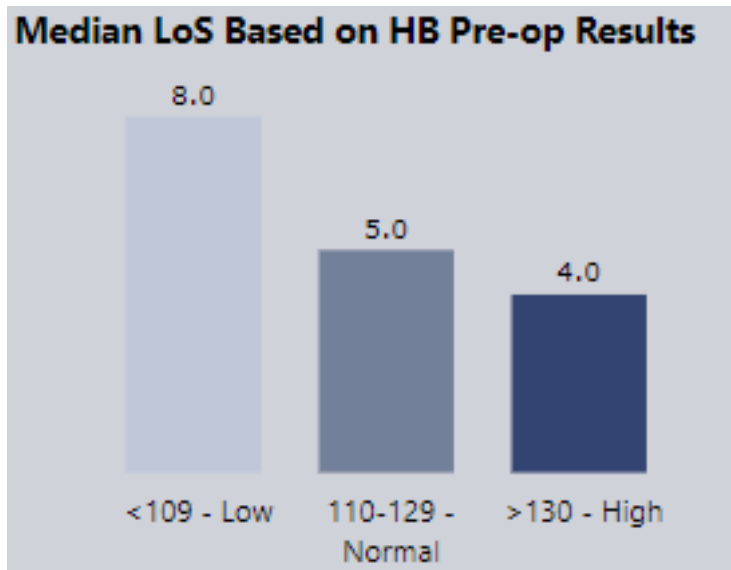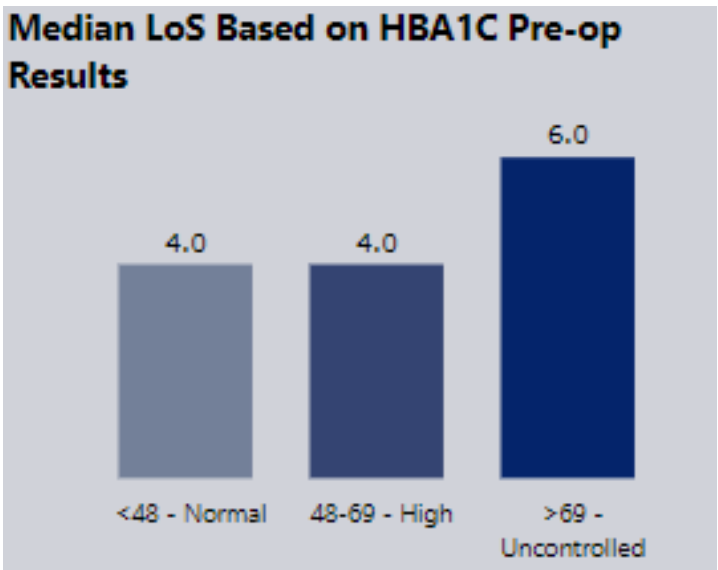
This dashboard showed the importance of getting patients to a safe level with HBA1C and HB before surgery. This can be done fairly simply by changing medication over a relatively short period of time. This has been a great stick for us to get some resource to optimize preoperative care."

Mr. Phill Thomas, Consultant Orthopaedic Surgeon

Driving best practice and change

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Helping Deliver Better Outcomes for Patients

- Patient Reported Outcome Measures are key to helping deliver better outcomes for patients

- They are digital questionnaires that can be filled in by patients during their care

- The results are visualised in data dashboards to help identify important areas that matter to the patients

LYMPROM®

Lymffoedema Cymru
Lymphoedema Wales

Pain scale relating to Lymphoedema

Please indicate your pain / discomfort / ache relating to Lymphoedema with 0 being no pain and 10 extreme pain

none — Level of pain — extreme
0 1 2 3 4 5 6 7 8 9 10

Heaviness scale relating to Lymphoedema

Please indicate the heaviness relating to Lymphoedema with 0 being not heavy and 10 extremely heavy

none — Level of heaviness — extreme
0 1 2 3 4 5 6 7 8 9 10

Using the scale (0 to 10) please indicate the **impact*** Lymphoedema has had on you in the past four weeks (*please tick one box only for each row*):

*Impact is a term used to describe the extent to which Lymphoedema inhibits any aspects of your life

none — Level of impact — extreme
0 1 2 3 4 5 6 7 8 9 10

Home life	
Personal care	
Work	N/A
Finances	N/A
Body image	
Intimacy / desirability	N/A
Walking	
Anxiety levels	
Hobbies	
Holidays	N/A
Shopping for clothes and/or shoes	

Please state any other parts of your life affected by Lymphoedema:

Lymphoedema Dashboard

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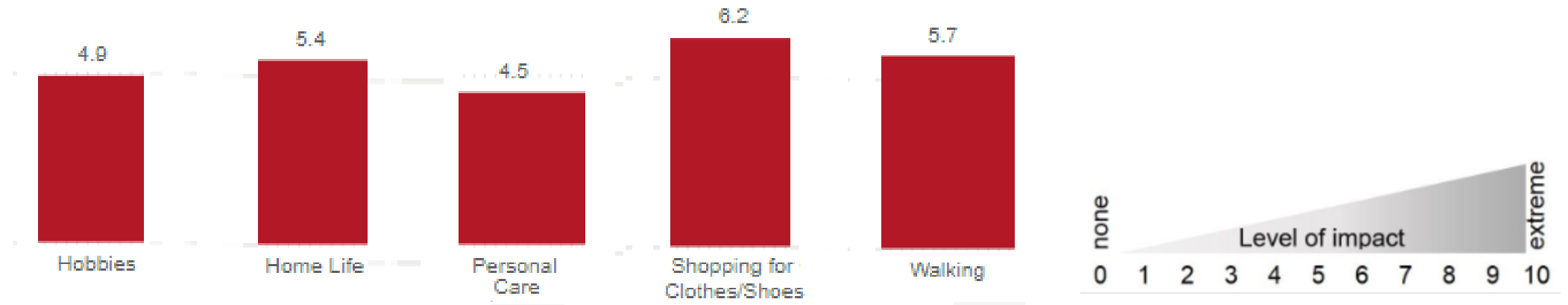
- Lymphoedema dashboard showed that the areas of life most impacted for Lymphoedema patients

Average LYMPROM© item impact (zero is no impact & 10 is extreme impact)

Please note averages are only shown where there are at least 3 responses per item

Hobbies	Home Life	Personal Care	Shopping for Clothes/Shoes	Walking
4.9	5.4	4.5	6.2	5.7

none — Level of impact — extreme
0 1 2 3 4 5 6 7 8 9 10

"The dashboard showed us that the biggest challenge for patients is shopping for clothes, walking and home life. This has enabled therapists to prioritise care and ensure appointments are focused on what matters most to patients"

Marie Gabe-Walters, Lymphoedema Specialist

Breaking Down Barriers

- Engaging with clinical networks to understand the key questions affecting the NHS that need answering and the data required to do so

- Collaborative, iterative approach

- Enabling stakeholders to navigate and utilise dashboards for effective decision making

Liver Disease Dashboard

- Worked with consultant hepatologists Dr. Tom Pembroke and Dr. Andrew Yeoman investigating liver disease in Wales

- They could see from local data in Cardiff and Swansea that diagnoses of liver disease in their areas was increasing

- Using the data in the DHCW Data Warehouse, we were able to look at the picture nationally

Liver Disease Dashboard

All Wales - new liver disease diagnoses by year
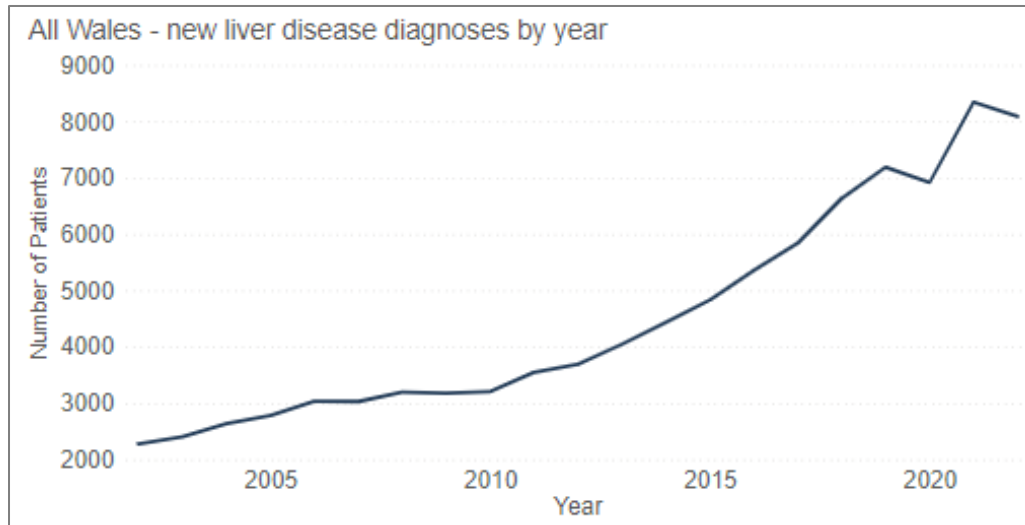
Data showed drastic increase in liver disease diagnosis in Wales over the last 20 years

Incidence of Liver disease patients by Deprivation
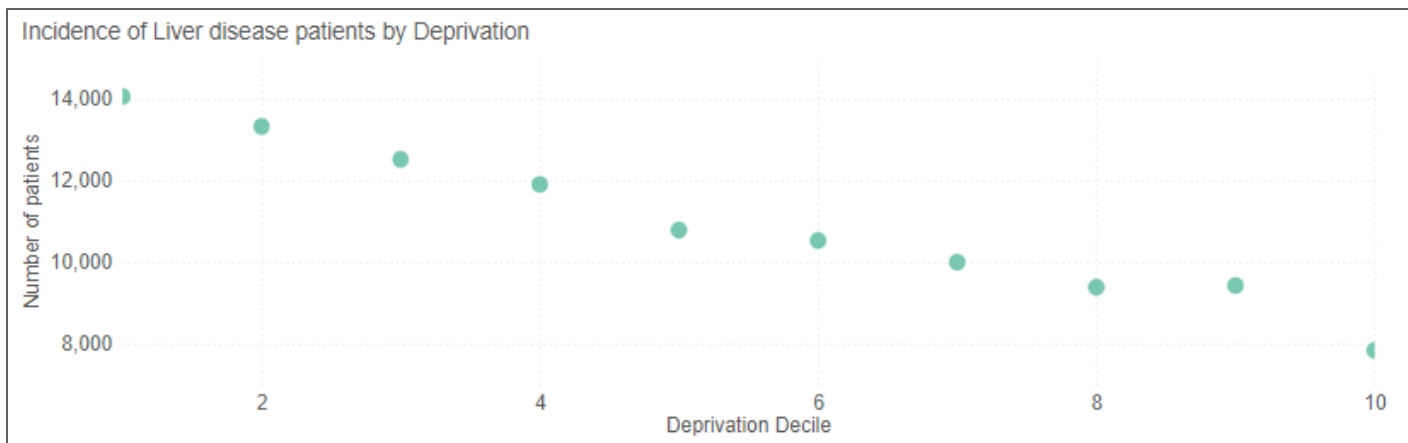
Strong correlation with deprivation

Liver Disease Dashboard
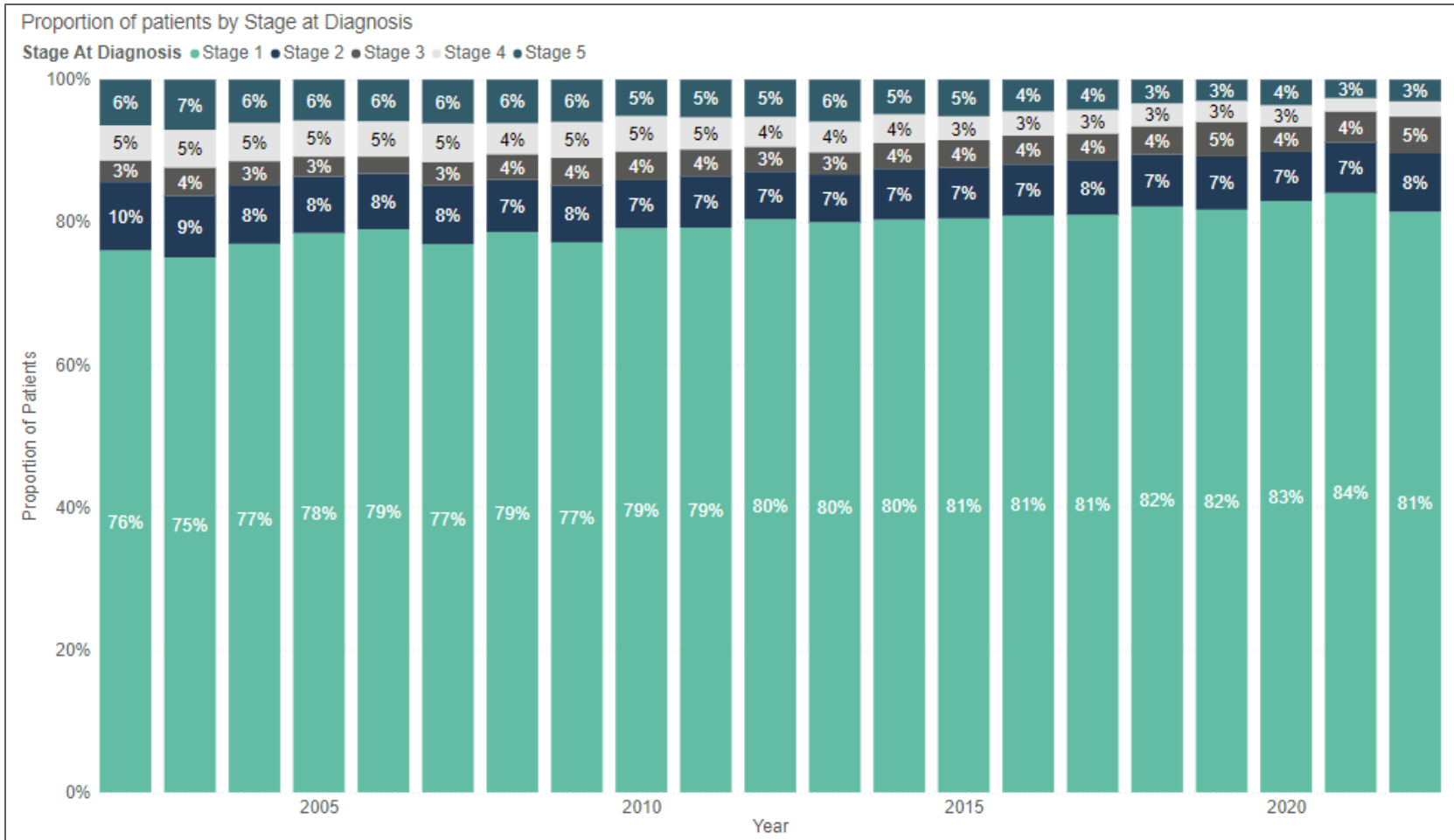
Improvements in the diagnosis of liver disease at earlier stages – but more work to be done

Liver Disease Dashboard

- Dashboard presented at National Liver Disease Implementation Group

- Public Health Wales secured funding for an analyst to work on liver disease

- Project looking at adding fibroscan results into Welsh Clinical Portal to aid clinicians with early diagnosis

Digital Health and Care Wales

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THE FOUR STRATEGIC AIMS

R&I Strategic Aim 1

Deliver the assets and resource to facilitate the Research and Innovation environment across Wales

R&I Strategic Aim 2

Focus on quality and the impact of our research and innovation

R&I Strategic Aim 3

Identify, develop and nurture effective partnerships

R&I Strategic Aim 4

Develop a culture of innovation that promotes creativity, learning, encouragement and support

GOVERNANCE - PROCESS - ENGAGEMENT - DELIVERY - EVALUATION - INSIGHT - OUTCOMES

Partnerships & Networks

Strategic partnerships with academia:

- WIDI – Trinity & USW (Teaching, W&OD, R&I projects)
- Swansea University (SAIL, Foundry, School of Medicine projects)
- Cardiff University (Data Science Academy, Data Innovation Research Institute, School of Medicine, Computer Science)
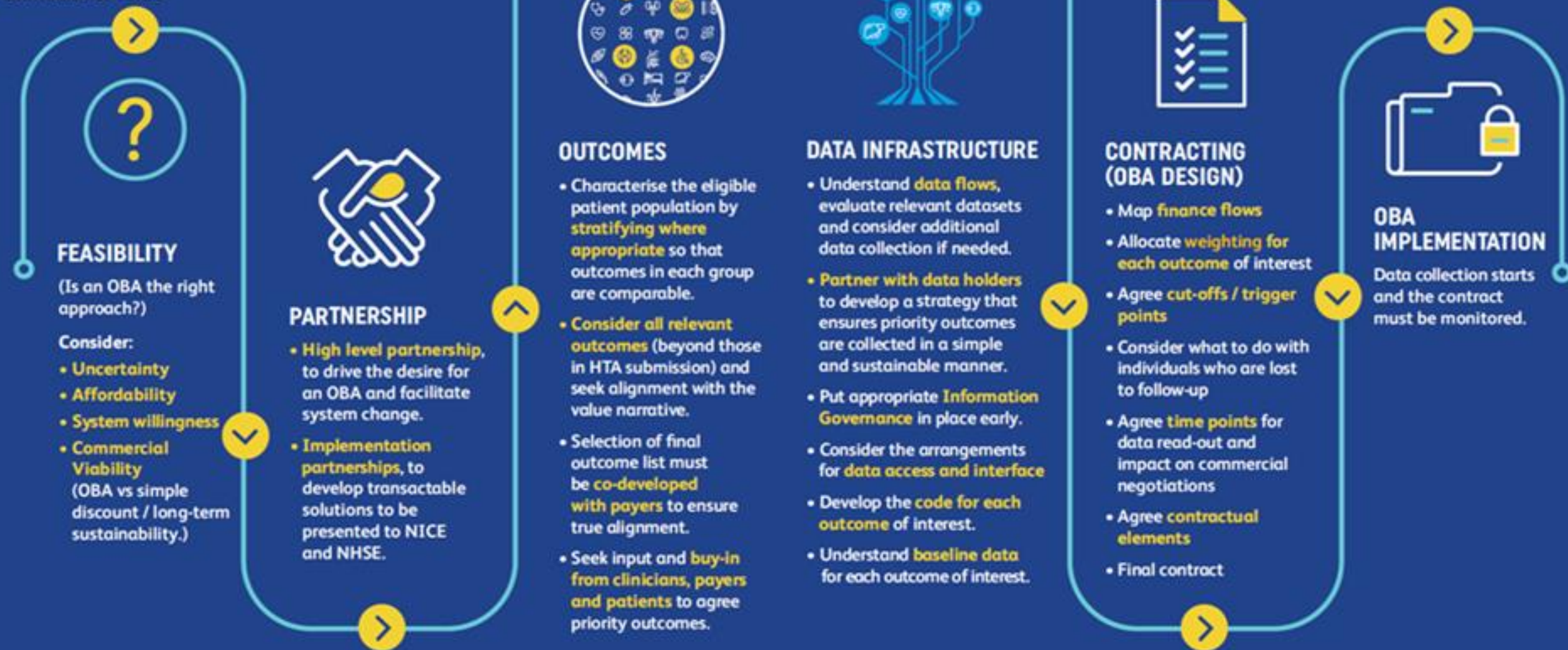- Cardiff Met, Bangor, Aberystwyth

Strategic partnerships with networks:

- Health & Care Research Wales
- Welsh Modelling Collaborative
- Network Data Labs
- Healthcare Sciences Network
- Genomics Partnership Wales
- Health Data Research UK
- Innovation Network for Health and Social Care in Wales
- European Connected Health Alliance
- Bevan Commission

IDEATE: OBA ROADMAP

Outcomes & Innovation Team
UK Health & Value

FEASIBILITY

(Is an OBA the right approach?)

Consider:
- Uncertainty
- Affordability
- System willingness
- Commercial Viability
(OBA vs simple discount / long-term sustainability.)

PARTNERSHIP

- High level partnership, to drive the desire for an OBA and facilitate system change.

- Implementation partnerships, to develop transactable solutions to be presented to NICE and NHSE.

OUTCOMES

- Characterise the eligible patient population by stratifying where appropriate so that outcomes in each group are comparable.

- Consider all relevant outcomes (beyond those in HTA submission) and seek alignment with the value narrative.

- Selection of final outcome list must be co-developed with payers to ensure true alignment.

- Seek input and buy-in from clinicians, payers and patients to agree priority outcomes.

DATA INFRASTRUCTURE

- Understand data flows, evaluate relevant datasets and consider additional data collection if needed.

- Partner with data holders to develop a strategy that ensures priority outcomes are collected in a simple and sustainable manner.

- Put appropriate Information Governance in place early.

- Consider the arrangements for data access and interface

- Develop the code for each outcome of interest.

- Understand baseline data for each outcome of interest.

CONTRACTING (OBA DESIGN)

- Map finance flows

- Allocate weighting for each outcome of interest

- Agree cut-offs / trigger points

- Consider what to do with individuals who are lost to follow-up

- Agree time points for data read-out and impact on commercial negotiations

- Agree contractual elements

- Final contract

OBA IMPLEMENTATION

Data collection starts and the contract must be monitored.

The OBA process should consider in parallel:
1. An iterative approach that needs to model cost-effectiveness, revenue and budget impact
2. Financial flow mapping

R&I Opportunities

- Supporting national R&I infrastructure
- NHS Patient App
- National Data Resource
- Secure Research Platform
- Advanced Analytics
- Data requests
- Training & support
- Data platforms & insights
- Partnerships
- Pilots, innovation and adoption

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Any Questions

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