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Data driven recovery

How intelligent use of information can support healthcare system recovery and transformation

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Introductions

Intelligent use of information

Feedback everywhere we go: even without the pandemic the current model of health service delivery is unsustainable

Our work says there are actions we can take

- Risk stratification to precision prevention
- New and integrated care models
- Demand and capacity planning
- Costs and productivity
- Getting the data right

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But you can't do this by models and methods alone: co-production – how – is essential

This needs real expertise – knowledge , experience and wisdom – to lead the co-development

Supporting leadership to get the baggage out and select the right services for transformation

Engagement process with clinical leaders future models based on technology, policy and context

System look at pathways and population segments with real time demand, capacity and options modelling

Co-production of realistic but very challenging – structured framework, regular communication, clear outcomes

Knowledge transfer – technical, application of knowledge, shared-understanding

This is hard and messy but sustainable change is unlikely without it

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Precision prevention

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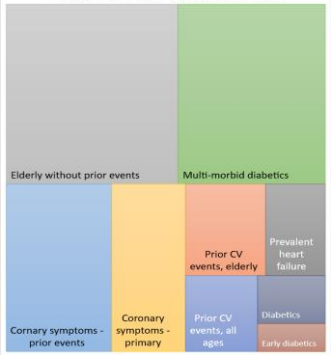
Precision diagnosis and treatment – an example of where the science is taking us now

Leveraging Proteomics for Population Health & Precision Cardiometabolic Medicine

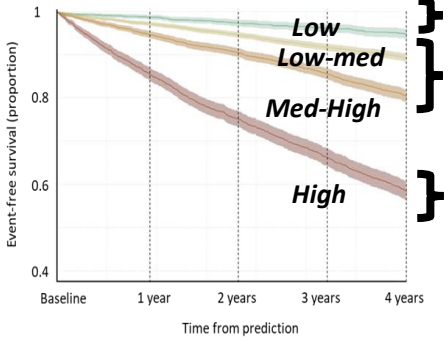
Select difficult-to-segment populations

People with higher than average risks



Assess event likelihood in next four years

Death, heart failure, myocardial infarct, stroke



Allocate resources

- Status Quo
- Modulate preventative care
- Avoid next event: maximize treatment intervention

Whole Patient Assessment

SomaSignal™ tests to aid choice of action:

- Liver fat
- Visceral fat
- VO2 max
- Virtual OGTT

- Kidney (current)
- Kidney (prognosis)
- Heart failure

Rational Choice of Treatment

Exercise
Statins
Vitamin E
Caloric restriction
Glitazone/metformin

Max statin +PCSK9
SGLT-2
GLP-1
DPP-4
EPA
Angioplasty
Bariatric surgery

Repeat Testing to Measure Change

Modulate course of treatment and assess cost-effectiveness of practices

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What can you do with all this?

- Risk stratification
- Life course planning
- Clinical model change
- Real demand management
- Front foot planning

In other words plenty of opportunity – leading 1 of our clients to plan for a 22% emergency care reduction

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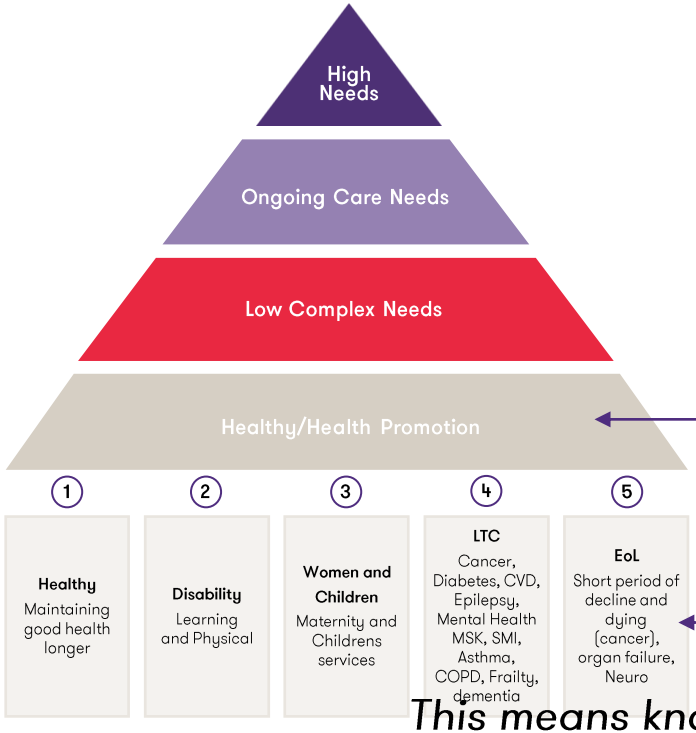
Integrated care models

Looking at Stratification...



Risk stratification - using the data to identify within each segment where an impactable intervention can be focussed

Main "dimensions":

- Demographics and Risk Factors
- Clinical Information
- Socio-economic Characteristics

Diabetes, Frailty and Mental Health…..

This means knowing more about our populations than if in "repair shop" mode

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Diabetes – a worked example

- Diagnosed with T2 Diabetes
- BMI > 30
- No energy/strength to perform activities; Shopping, cleaning, driving, walking..
- Not achieving optimal glucose control/remission
- Undertakes fasting for cultural or religious beliefs
- 1 or more health or care condition
- Mental health,
- Renal Disease , CKD, frail etc

- Not achieving 2 or more optimal Blood pressure > Cholesterol, HBa1c
- Smoker /social substance misuse
- Drinks >14 units of alcohol in a week daily
- Pregnant/History of gestational diabetes
- Not up to date/partially up to date with imms and vacs/screenings

- Diagnosed with T2 Diabetes
- BMI 25 – 29.9+
- HbA1c>48
- Limited energy/strength to perform activities;
- Shopping, cleaning, driving, walking..
- Not achieving optimal glucose control/remission and or using insulin or other technologies
- Undertakes fasting for cultural or religious beliefs
- 1 or more health or care condition (Mental health,
- Renal Disease , CKD etc)

- Not achieving 1 optimal
- Blood pressure, Cholesterol, HBa1c,% Patients with GFR >30
- Eye Care/Optical screenings
- Smoker /social substance misuse
- Drinks >14 units of alcohol within short period of time/Daily
- Pregnant/History of gestational diabetes
- Not up to date/partially up to date with imms and vacs and screenings

- BMI 25 – 29.9+
- Limited energy/strength to perform activities;
- Shopping, cleaning, driving, walking..
- Family history of T1 or T2 diabetes
- Ethnicity South Asian, African and African Caribbean.
- 1 or more health or care condition (Mental health, Renal Disease , CKD etc), High Blood pressure, Cholesterol)

- Smoker /social substance misuse
- Drinks >14 units of alcohol in a week regularly
- Pregnant/History of gestational diabetes

- BMI of 18.5 – 25.9
- Active (good energy and strength to perform general physical activities. Shopping, cleaning, driving, walking..
- Drinks <14 units of alcohol on a weekly basis.
- No known health conditions
- Non smoker, does not use harmful substances (drugs)

Diabetes – a worked example

	GP Patients not diagnosed with Diabetes – At a glance!	GP diagnosed with Type 2 Diabetes – At a glance!
Summary	• High degree of obesity, smoking, high blood pressures and lipid abnormalities • Disease waiting to happen	• Variation in treatment target achievement across localities (32 – 40%) • Variation in structured education programme between localities (36-61%) • Variation in income, employment and adult skills deprivation across localities (under 50% vs over 50%)
Area A	1. 51% of population without diabetes are overweight or obese 2. 19% smoke 3. 13% on hypertension register 4. 10% high cholesterol	1. 7.1% of population aged 15+ diagnosed with T2 diabetes; 31% family history of diabetes 2. 36% offered Structured Education Programme 3. 33% achieving all 3 treatment targets (HbA1c, Hypertension, Cholesterol) 4. 15% smoke; 86% overweight or obese; 19% on CKD register 5. 24% live in areas of high 'income deprivation'; 39% in areas of high 'employment deprivation'; 45% in areas of high 'adult skills deprivation'
Area B	1. 39% of population without diabetes are overweight or obese (??) 2. 20% smoke 3. 9% on hypertension register 4. 7% high cholesterol	1. 5.4% of population aged 15+ diagnosed with T2 diabetes; 34% family history of diabetes 2. 61% offered Structured Education Programme 3. 32% achieving all 3 treatment targets (HbA1c, Hypertension, Cholesterol) 4. 17% smoke; 84% overweight or obese; 10% on CKD register 5. 56% live in areas of high 'income deprivation'; 54% in areas of high 'employment deprivation'; 53% in areas of high 'adult skills deprivation
Area C	1. 48% of population without diabetes are overweight or obese 2. 14% smoke 3. 13% on hypertension register 4. 12% high cholesterol	1. 5.9% of population aged 15+ diagnosed with T2 diabetes; 31% family history of diabetes 2. 56% offered Structured Education Programme 3. 40% achieving all 3 treatment targets (HbA1c, Hypertension, Cholesterol) 4. 11% smoke; 84% overweight or obese; 17% on CKD register 5. 9% live in areas of high 'income deprivation'; 13% in areas of high 'employment deprivation'; 12% in areas of high 'adult skills deprivation'

So how might we go at this?

Engaging across the system in population health management planning

(Notts, Cwm Taf Morgannwg, more on that in a minute)

Working with secondary care teams on the future role of the clinician

(PAHT, Northern Devon, Cardiff & Vale)

Strengthening data & analytics functions within providers and systems

(North Wales, West Midlands)

Building this into demand and capacity modelling for strategic change

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Demand and capacity

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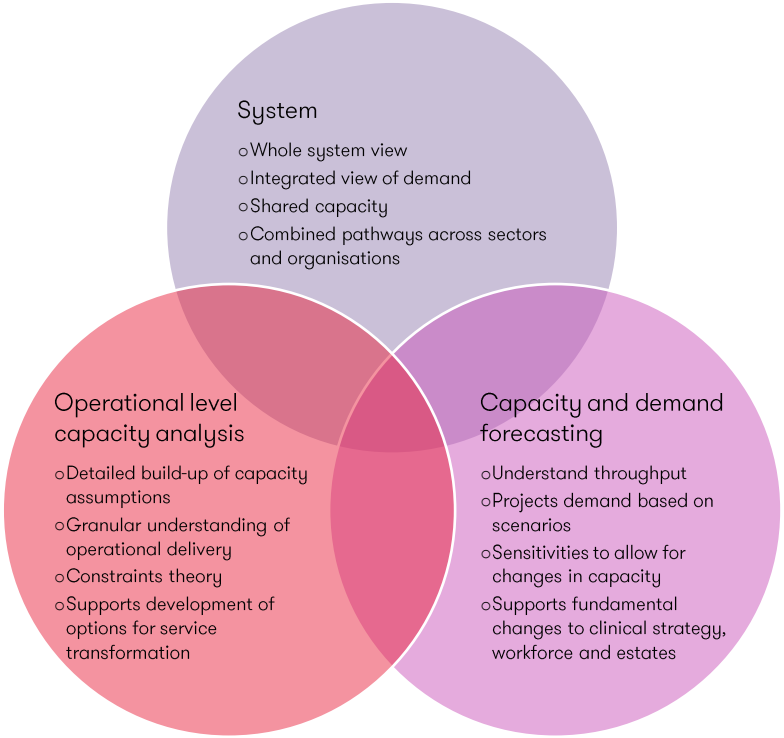
The need to understand demand and capacity

Demand and capacity modelling underpins all our work at the moment

There is a real and pressing need to understand not just expected patient need, but the operational capacity available to address this, and the gap that is left

Creates an agreed evidence base and shared understanding between executive, operational and clinical leads



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Modelling approach

Understand socio-economic and other determinants of demand to inform forecasting

Establish baseline

Data

Baseline (2019/2020)
Patient level data:
- Referrals
- Waiting times
- Activity across sites, services and teams
- Admissions and ward stays
- Community caseload and contacts
- Patient acuity/needs:
  - MHA status
  - Outcome measures
  - Primary diagnosis
  - Comorbidities
  - Medical history
- Current bed, clinical room and workforce capacity across services and sites

Demand

Adjustments
- Covid impact
- Unmet demand

Demographic change
- ONS patient level age, gender and location adjusted projections
- Mental illness prevalence
- Socio-economic factors
  - Unemployment
  - Deprivation
  - Inequalities
  - Education
  - Homelessness

Non demographic change
- Referral trends
- Waiting list growth
- MH condition prevalence and trends
- Impact of Covid on MH demand

Review and validate operational assumptions, scenarios and best practice to meet model objectives

Assumptions & scenarios

Assumptions

Operational
- Bed occupancy levels
- Length of stay
- Leave
- Contacts per staff member
- Time per contact

Scenarios

Trust initiatives
- New models of care
- Alternatives to hospital-based care
- Investments
- Estate plans
- Workforce plans

External initiatives
- National policies and plans
- ICS plans

Opportunities
- Efficiencies
- Best practice examples

Complement modelling outputs with report to understand implications and inform transformation journey

Deliver outputs

Model outputs

Activity projections
- Admissions
- Outpatients
- Community caseload and activity

Capacity projections
- Beds (in and out of area)
- Community staffing (WTEs)
- Full picture across sites, services, cohorts
- Estate options/implications
- Workforce options/implications

Report

Scenarios
- Baseline
- Business as Usual (growth only)
- Clinical model opportunities
- Improved patient flows/transfers
- Admission alternatives
- Efficiency opportunities
- Digital opportunities

Financial

Reshaped workforce

Estate sizing

Connecting the system

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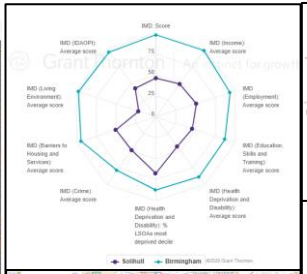
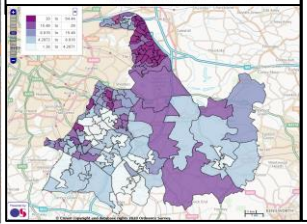
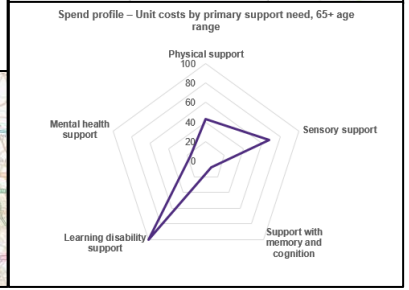
Visualisation of outputs

Group	Metric	Population	Abergele	Conwyn Bay	Llandudno	Coastal	Rural	Denbigh	Prestatyn	Rhyl	Ruthin
Historic / recent demand indicators	MH Adult Inpatient admissions	per 10k 18-64 pop.	28.8	51.9	59.3	27.2	18.6	39.1	26.5	54.6	43.7
	MH adult Outpatient appointments	per 10k 18-64 pop.	253.2	392.3	402.3	234.1	248.5	286.0	395.5	767.8	169.7
	Adult CMHT referrals	per 10k 18-64 pop.	566.7	545.2	603.4	396.0	407.0	386.8	338.8	546.6	252.8
	MH Adults Social Care Service Users	per 10k 18-64 pop.	2.8	13.1	10.8	0.6	1.6	4.5	1.5	7.6	2.6
	Average number of hour's domiciliary care commissioned per MH Service User per week		10.5	21.7	2.5	28.0	7.0				
	Average number of weekly appointments with District Nurse		2.2	2.7	1.8	2.1	2.7	3.0	3.4	2.5	2.8
	Section 2,3,4 assessments	per 10k 18-64 pop.	9.3	12.0	17.1	7.9	26.4	3.0	10.3	8.3	7.7
	S136 assessments	per 10k 18-64 pop.	8.3	14.8	16.2	11.5	3.1	7.5	6.6	19.3	5.1
	Prevalence of Mental Health (QAIF)		1.0	1.3	1.1	0.8	0.5	1.3	1.0	1.3	0.9
Indicators of potential future demand	Rate of change in adult inpatient admissions (pre-Covid) (%)		-42.6%	7.4%	58.5%	6.3%	7.7%	-29.0%	-4.8%	-18.2%	5.4%
	Rate of change in adult Outpatient Appointments (pre-Covid) (%)		-9.3%	-7.6%	302.9%	165.6%	104.8%	-12.6%	-18.2%	-10.8%	-23.3%
	Rate of change in Adult CMHT referrals (%)*		-16.0%	-6.5%	-15.7%	-20.7%	0.3%	-30.1%	-15.0%	-25.6%	-27.5%
	Rate of change in MH Adult Social Care Users (pre-Covid) (%)		0.0%	20.0%	33.3%	0.0%	0.0%	20.0%	0.0%	57.1%	0.0%
	Rate of change in average weekly Domiciliary Care hours per MH Service User		0.0%	0.0%	0.0%	0.0%	0.0%				
	Rate of change of DN appointments		0.4%	1.7%	0.4%	-0.5%	-5.3%	-9.5%	29.3%	1.7%	15.9%
	Rate of change S2,3,4 assessments		66.7%	-18.5%	137.5%	85.7%	54.5%	-33.3%	16.7%	-33.3%	0.0%
	Rate of change S136 asssessments		-25.0%	-32.5%	-30.8%	-13.6%	0.0%	0.0%	-47.1%	-15.2%	0.0%
	Deprivation (WIMD Score)		24.1	20.4	19.6	13.2	15.5	16.5	18.8	40.0	13.8
	Prevalence of diabetes (QAIF)		11.1	8.0	7.7	7.4	7.3	8.2	9.4	8.4	6.9
	Prevalence of obesity (QAIF)		12.3	8.5	8.7	8.4	10.9	8.2	8.6	8.4	7.0
	Lone parent households with dependent children (%)		5.9%	6.7%	6.5%	5.9%	5.1%	6.2%	7.3%	9.0%	4.9%
	Claimant count (%)		7.9%	8.4%	8.7%	5.4%	4.9%	4.5%	6.8%	11.0%	4.5%
	Suicide rate	per 10k 18-64 pop.	1.1	1.1	1.1	1.1	1.1	2.1	2.1	2.1	2.1
	Homelessness	per 10k 18-64 pop.	2.2	2.2	2.2	2.2	2.2	0.5	0.5	0.5	0.5
	Care leaver rates	per 10k 18-64 pop.	55.4	50.5	79.5	33.5	37.4	27.3	61.5	114.7	28.1
	Number of GPs	per 10k 18-64 pop.	13.9	8.2	15.3	10.9	14.0	12.8	11.0	9.0	12.0
Supply / capacity indicators	Investment in capacity in prevention/ early help programmes										
	Domiciliary workforce (external market)*	per 10k 18-64 pop.	94.8	120.4	93.0	44.7	52.2	109.8	48.5	95.1	58.8
	Substance Misuse Support workforce										
	MH LA workforce (WTE) – outside CMHTs	per 10k 18-64 pop.	1.9						0.6		
	Average Salary of MH LA workforce (WTE) – outside CMHTs		£27,846						£35,393		
	MH BCU workforce (WTE) – outside CMHTs	per 10k 18-64 pop.	16.7								
	Average Salary of MH BCU workforce (WTE) – outside CMHTs		£29,034								
	Adult CMHT & Wellness team capacity (WTE)	per 10k 18-64 pop.	7.2						7.3		
	WIMD Score – Access to services		23.8	14.0	19.2	18.9	59.2	26.7	9.9	17.8	43.1
	Waiting times outpatient appointments		16								
	Waiting times inpatient admission		4								







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Costs and productivity

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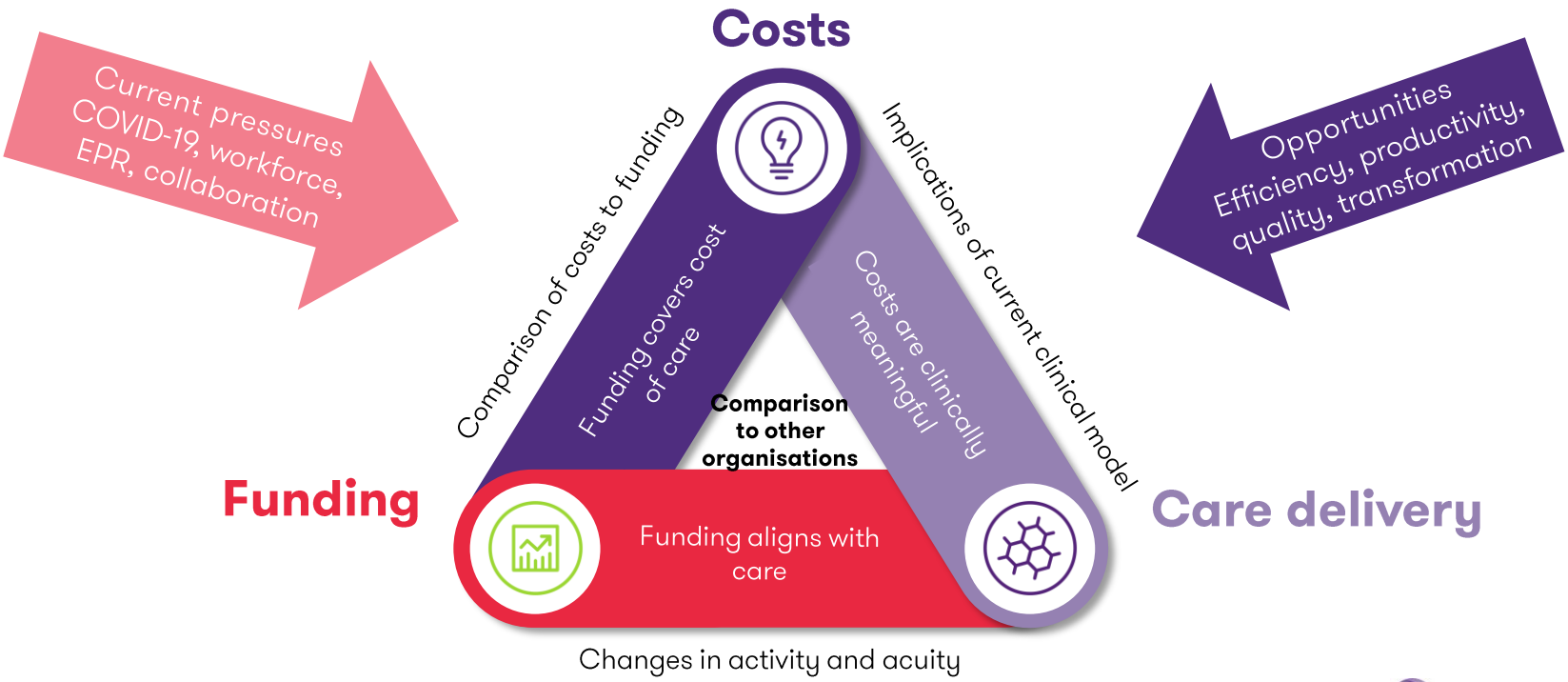
Understand current cost base and cost drivers



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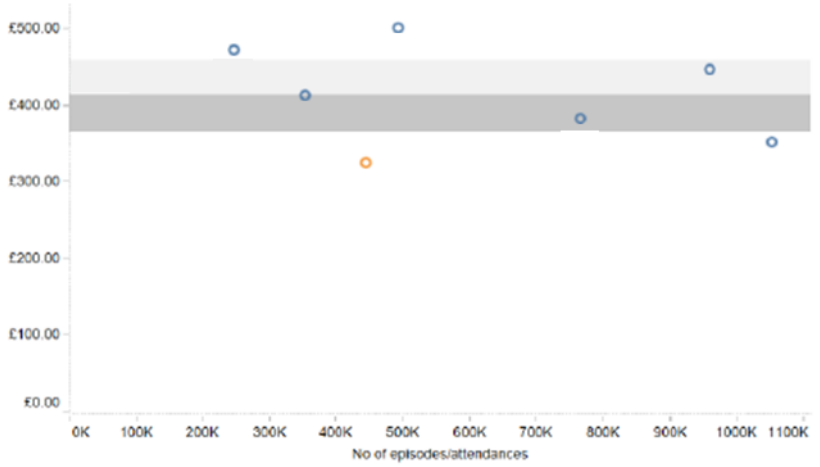
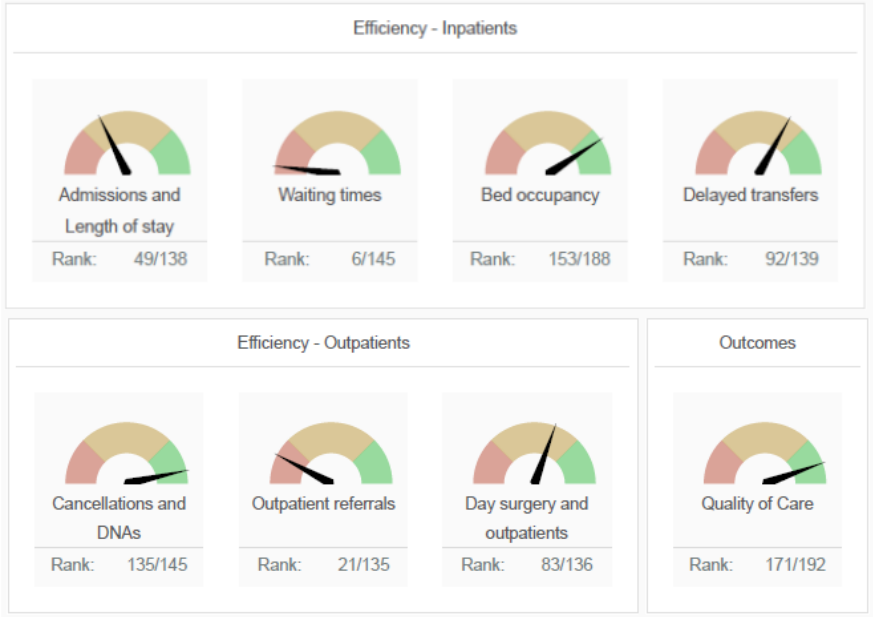
Expectation vs reality

Expectation: rurality leads to inefficient services & workforce issues

Chart 5: average unit cost compared to remote Trusts 2019/20



Metric	2017/2018		2018/2019		20
	National average	Remote peers	National average	Remote peers	National average
Vacancy rate					
Proportion of temporary staff					
Staff turnover					
Staff sickness					
Agency spend as % of staff costs					



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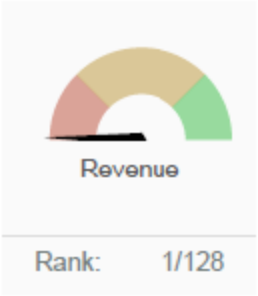
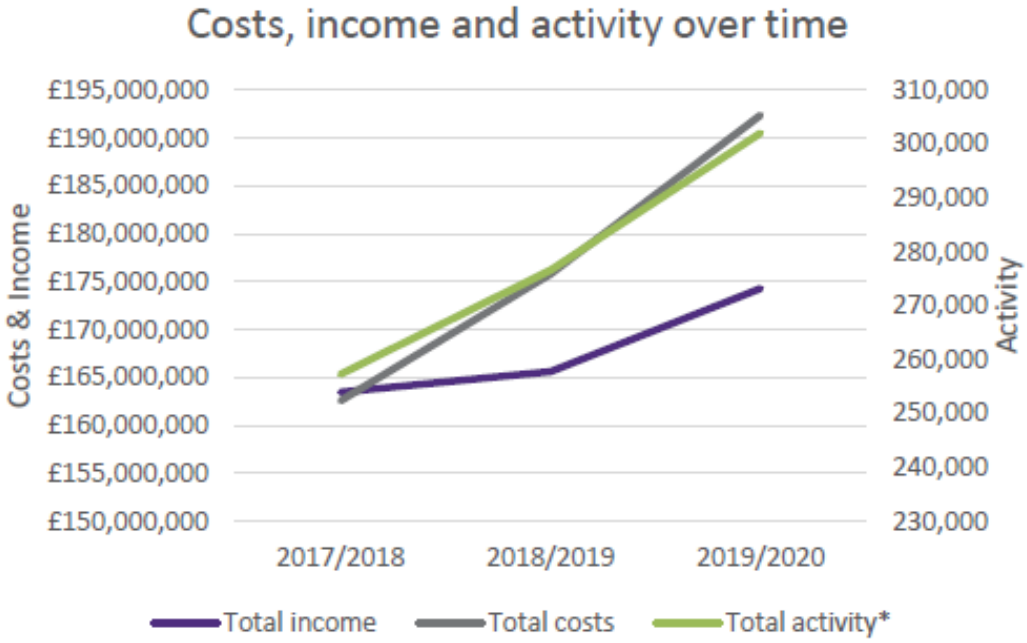
Expectation vs reality

Reality: funding had not kept pace with clinical delivery





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Getting the data right

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The data pathway

Inputs

Consistency of data capture
Documentation and SOPs
Levels of training and support
Process of data entry by clinical and service staff
National and local data definitions and requirements
Assurance and validation of inputs

Systems

Clinical systems and connectivity
System templates and configuration
Information captured outside of clinical systems
Consistency of naming conventions and hierarchies
Documentation of processes and business rules

Data management

System outputs definition
Database definition and management
Hardware and infrastructure
Data flows across organisations
Consistency of datasets between organisations
Completion and validation of national submissions

Reporting and insight

Understanding requirements: provider, commissioner/system, national
Reporting tools and platforms: dashboards, scorecards, bespoke
Access and relevance of benchmarking
Information sent outside of organisation (national/ local)

Service engagement

Clinical ownership of data
Use of information & reports by services
Process for identifying and prioritising business need and user requirements
Data quality improvement
Digital skills: training and education in the use of information

Governance, assurance, change control

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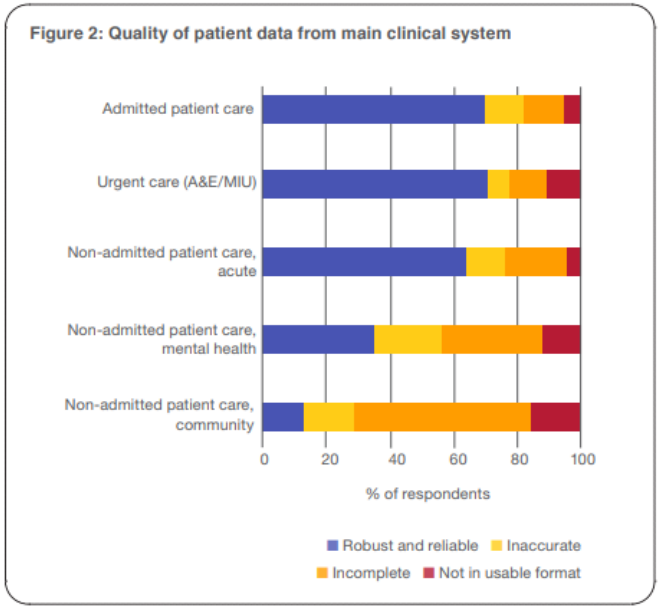
Working with the HFMA to improve data



Area	Practical solutions
Governance and leadership	• Ensure you have the basic governance in place • Nominate a Board member with specific responsibility for scrutiny and oversight of clinical data quality • Establish a data quality panel chaired by a clinician
Using the data	• Ensure that information is used to support decision making: improvements will happen as clinicians review their activity and identify service improvements • Make data readily available and easily understood: interactive reporting, trend analysis, or dashboard reporting
Clinical relevance and ownership	• Align data entry into clinical systems with how care is delivered so that it generates meaningful, clinically relevant information • Build in checks to improve clinical data quality: monthly activity sign-off with operational managers
Consistent understanding	• Informatics, operational service, and finance teams should spend time understanding each other's activities to ensure that data is more joined up and consistent • Establish a single-version-of-the-truth for activity data to align national and local reporting, and internal and external views of services are the same

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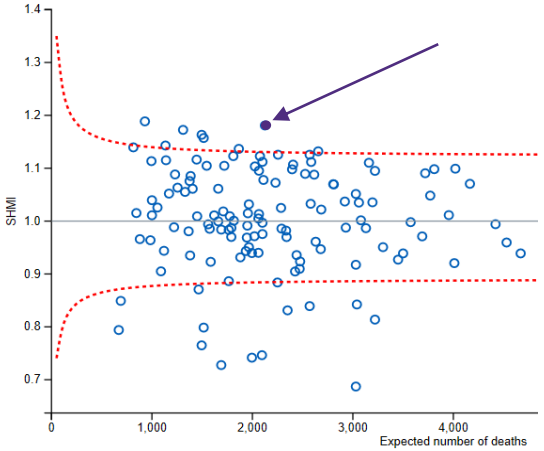
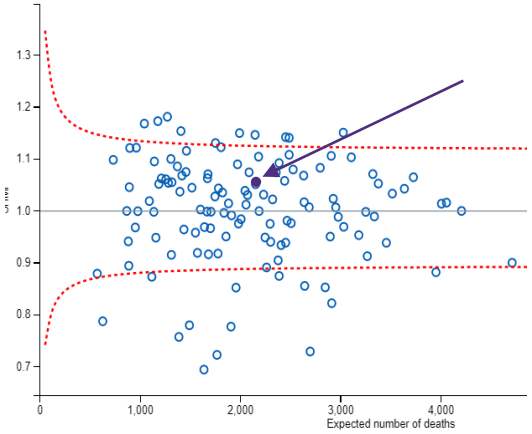
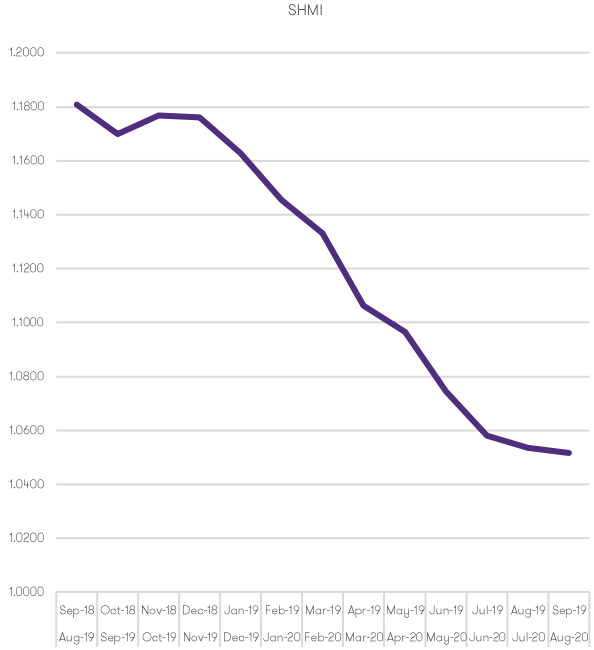
Ensuring clinical data reflects care delivered







Incorrect and misleading alerts

- Pneumonia
- UTI
- GI haemorrhage
- Fluid and electrolyte disorders

Alerts accurately reflecting care delivery

- Secondary malignancies
- Cancer of bronchus
- (Linked to out of hospital performance)

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Thanks for listening

Looking forward to questions

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