NIHR | Manchester Biomedical Research Centre

Ian N Bruce
Director, Manchester BRC

Biomedical Research Centres

- NIHR has awarded nearly £790 million to 20 NIHR BRCs across England (2022-27)
  - MBRC more than doubled the size of the current BRC (£28.5m > **£60.4m**), **largest BRC outside of South-East**
  - **Wider geography and higher number of Themes funded**

London

1. Barts
2. Great Ormond Street
3. Imperial
4. Maudsley
5. Moorfields
6. The Royal Marsden
7. University College London Hospitals

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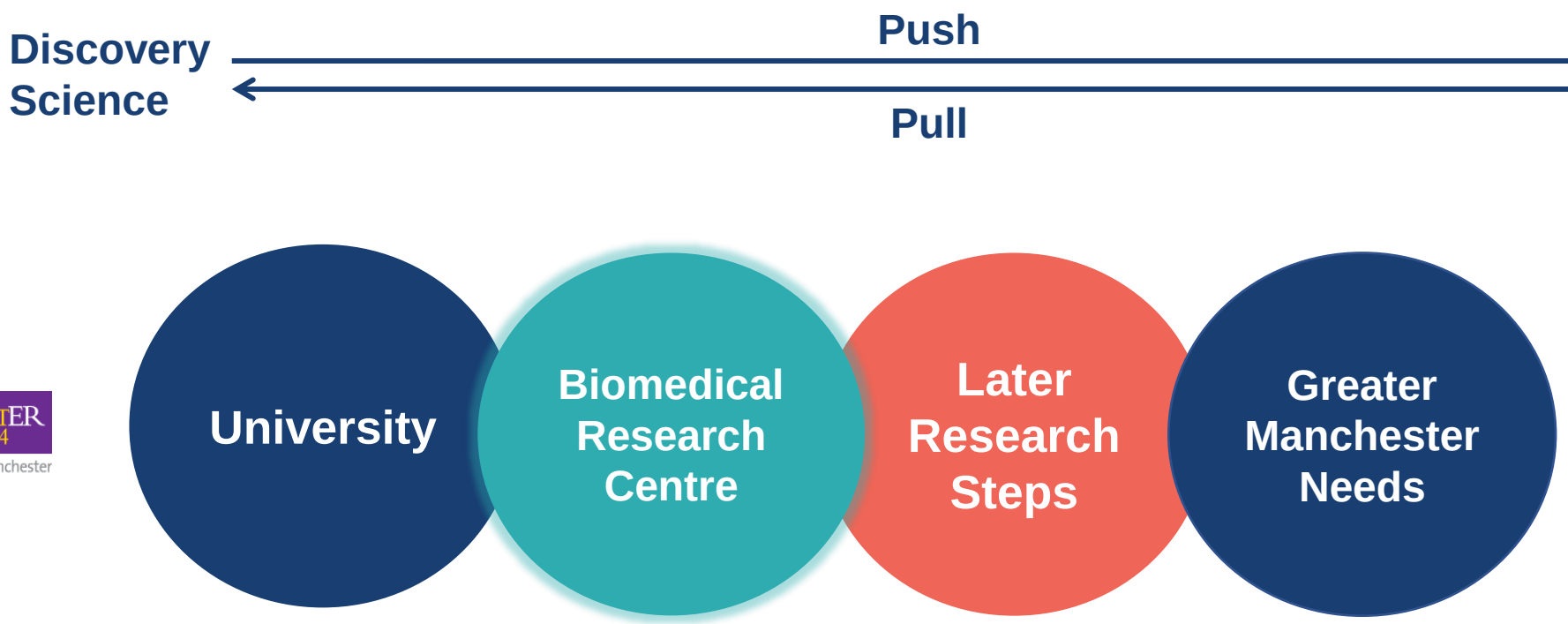
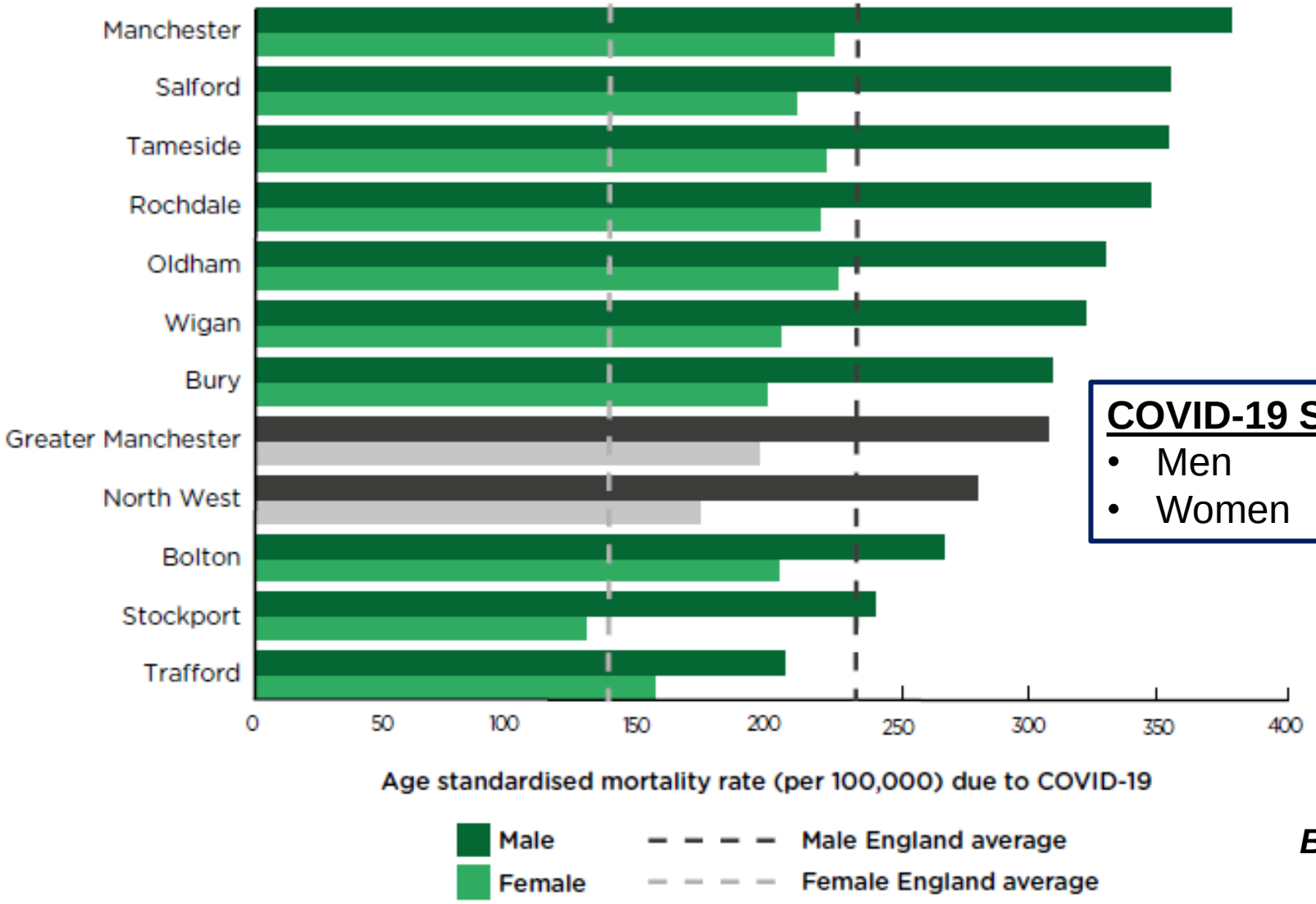
Personalised Health & Care for *all*



Health Innovation Manchester

Age standardised COVID-19 Mortality per 100,000 for England, the North-West and Greater Manchester and its local authorities:

(Mar 2020-Apr 21)



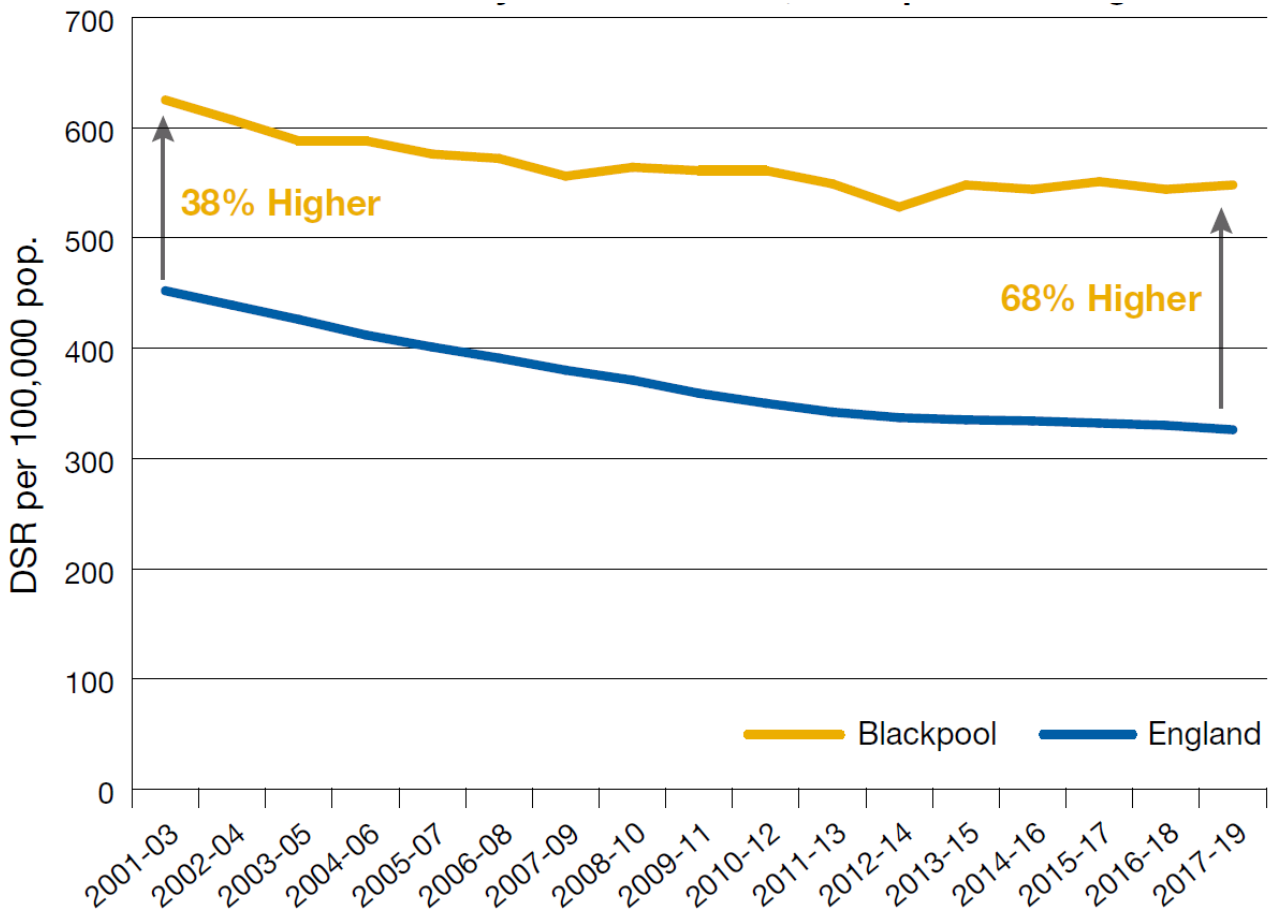
COVID-19 SMR in GM vs England

- Men = 1.3
- Women = 1.4

Building Back Fairer in GM

July 2021

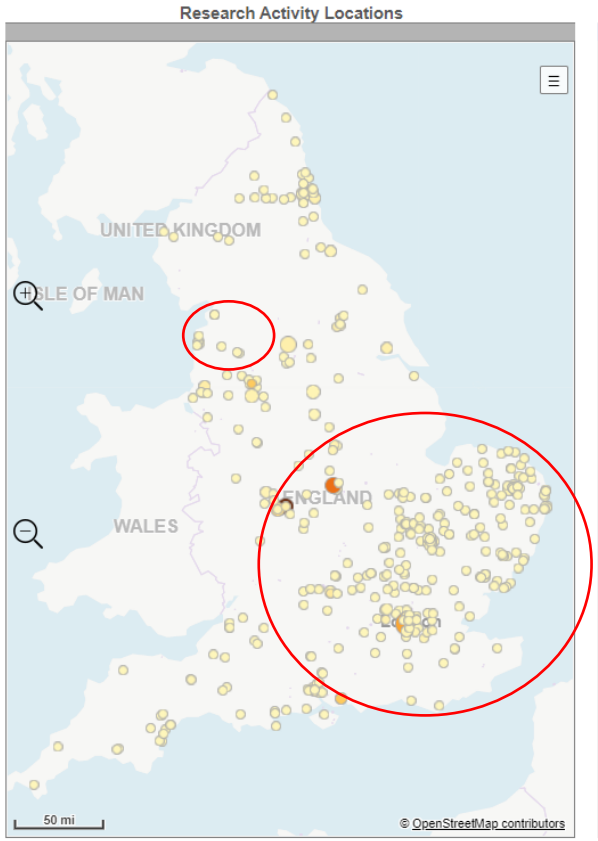
Widening Gap in Premature Mortality (<75 yrs old) from all causes in Blackpool *vs* England

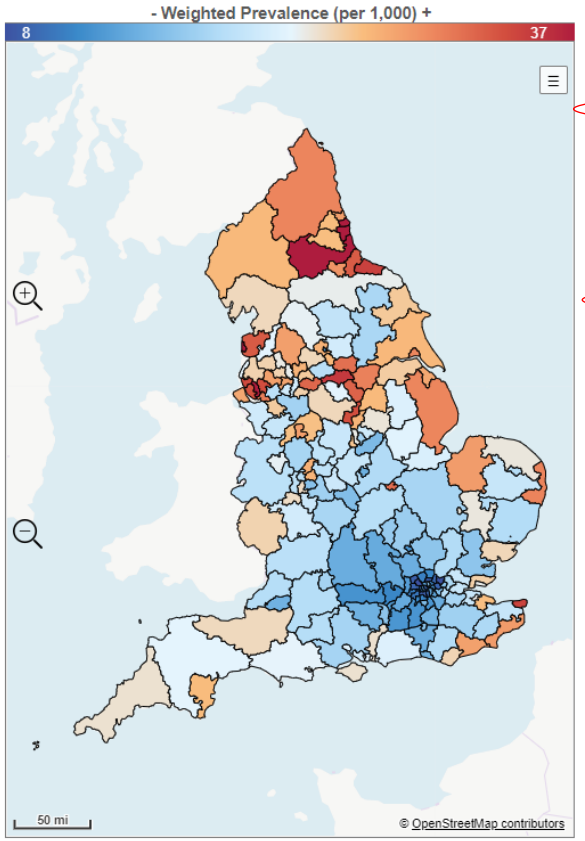


Research Activity vs Prevalence
COPD

COPD Research Activity Compared to Prevalence by CCG

NIHR | National Institute for Health Research





Which CCGs have the highest/lowest per capita prevalence?

Local Network	CCG	Prevalence	General Population	Weighted Prevalence (per 1,000)
England Total		**1,119,576**	**58,906,242**	**19.0**
North East a...	South Tyneside	5,840	157,145	37.2
North East a...	Durham Dales, Easingt...	10,635	292,023	36.4
North West ...	Blackpool	6,415	177,797	36.1
North West ...	Knowsley	5,873	165,042	35.6
North East a...	Sunderland	9,653	283,669	34.0
Yorkshire an...	Barnsley	8,475	265,436	31.9
North East a...	South Tees	9,333	296,733	31.5
Kent, Surrey...	Thanet	4,549	145,497	31.3
North West ...	South Sefton	4,781	155,072	30.8
North West ...	St Helens	5,902	192,527	30.7
East Midlands	Hardwick	3,171	103,631	30.6
North West ...	Liverpool	16,208	532,841	30.4
North West ...	Fylde and Wyre	4,529	151,630	29.9
North East a...	Hartlepool and Stockto...	8,862	297,143	29.8
Yorkshire an...	Rotherham	7,741	263,020	29.4
Greater Man...	Tameside and Glossop	7,233	247,784	29.2
East Midlands	Corby	2,260	78,532	28.8
Yorkshire an...	Wakefield	10,703	373,242	28.7
North West ...	Halton	3,658	131,206	27.9
Yorkshire an...	Doncaster	8,939	322,418	27.7
Eastern	Great Yarmouth and W...	6,254	226,999	27.6
North East a...	Northumberland	8,939	325,159	27.5
East Midlands	Lincolnshire East	6,864	250,214	27.4
Yorkshire an...	Hull	8,196	299,148	27.4
North East a...	Darlington	2,878	108,273	26.6
Kent, Surrey...	South Kent Coast	5,380	205,585	26.2
Eastern	West Norfolk	4,587	175,733	26.1
North West ...	East Lancashire	9,910	381,783	26.0
North East a...	North Tyneside	5,680	218,862	26.0
West Midlands	Stoke On Trent	7,547	290,815	26.0
Greater Man...	Wigan Borough	8,491	327,689	25.9
Kent, Surrey...	Hastings and Rother	4,858	188,251	25.8
Greater Man...	Salford	6,978	272,631	25.6
Yorkshire an...	North East Lincolnshire	4,312	169,523	25.4
North West ...	Wirral	8,533	336,210	25.4
West Midlands	Cannock Chase	3,321	133,160	24.9
Yorkshire an...	Bradford Districts	8,257	332,487	24.8
East Midlands	Mansfield and Ashfield	4,782	193,778	24.7
Greater Man...	Heywood, Middleton a...	5,756	233,290	24.7
West Midlands	Walsall	7,119	288,553	24.7
Yorkshire an...	East Riding of Yorkshire	7,430	304,028	24.4

Blackpool 3rd and Fylde and Wyre 13th out of 196 CCGs

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NHS Manchester University NHS Foundation Trust

MANCHESTER 1824 The University of Manchester

Manchester University NHS Foundation Trust Board

BRC Governance Board

BRC Strategic Executive Group

Industry & Scientific Advisory Boards

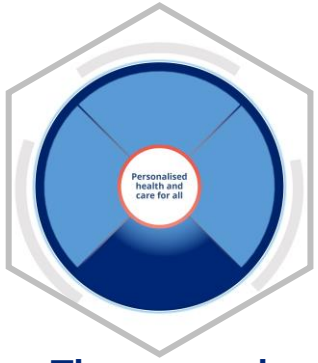
NHS The Christie NHS Foundation Trust

NHS Northern Care Alliance NHS Foundation Trust

NHS Greater Manchester Mental Health NHS Foundation Trust

NHS Lancashire Teaching Hospitals NHS Foundation Trust

NHS Blackpool Teaching Hospitals NHS Foundation Trust



Themes and Cluster

Inclusive Research infrastructure

Strategic Core Delivery

Discover

Develop

Deploy

NIHR one manchester

Manchester Clinical Research Facility

Lancashire Clinical Research Facility

Applied Research Collaboration Greater Manchester

Patient Recruitment Centre Blackpool

Greater Manchester Patient Safety Translational Research Centre

Clinical Research Network Greater Manchester

School for Social Care Research

School for Primary Care Research

Policy Research Unit in Health and Social Care Systems and Commissioning

Manchester Academic Health Science Centre

Health Innovation Manchester

NHS North West

Greater Manchester Health and Social Care Partnership

Lancashire and South Cumbria Health and Care Partnership

Personalised health and care ***for all***

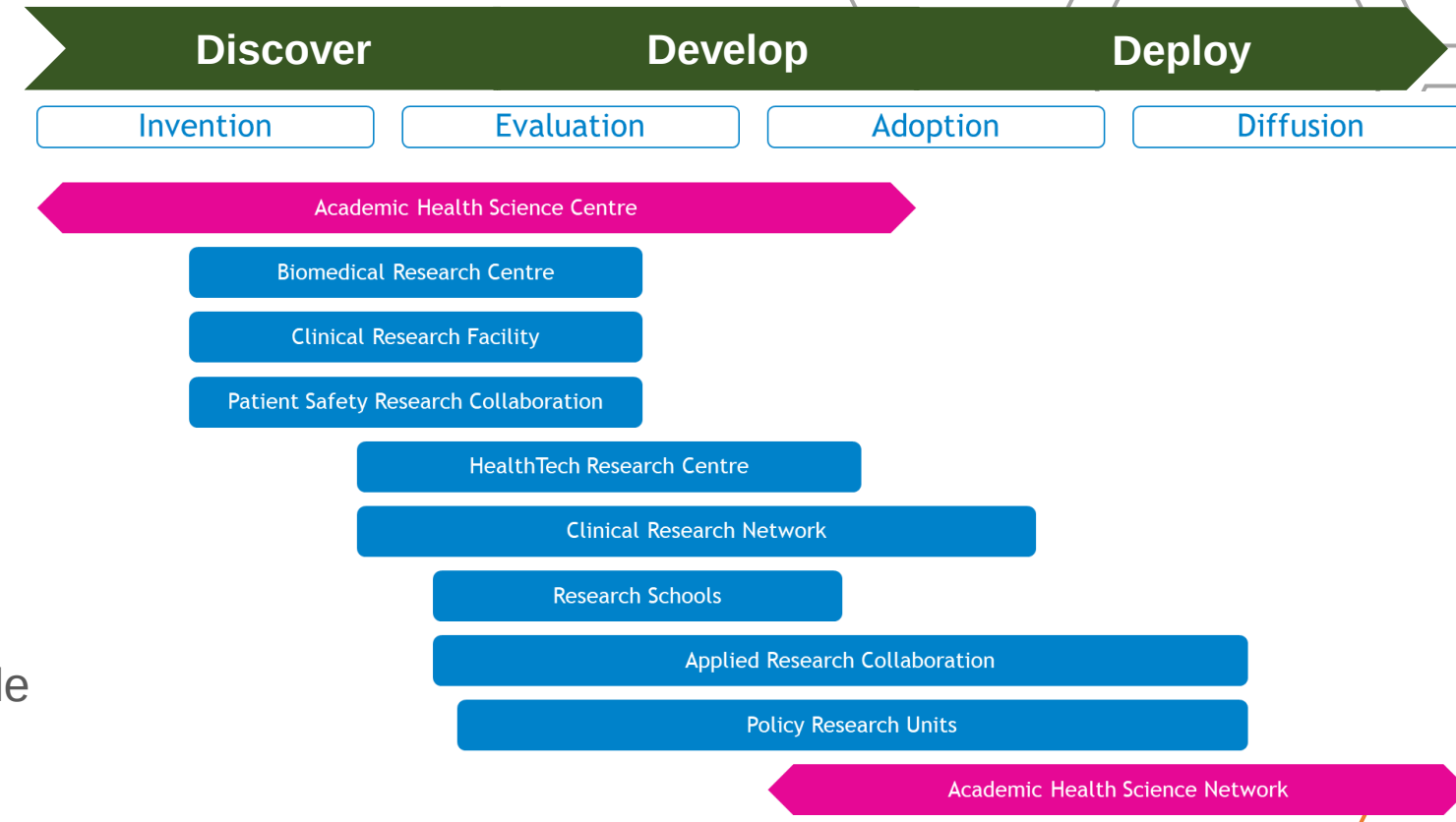
"...big enough to matter

small enough to know each other

driven enough to make things happen"

NIHR Infrastructure Oversight Board

- <u>All GM NIHR Infrastructure</u>
- Aligned to the Discover, Develop, Deploy mission of Health Innovation Manchester
- Shared strategy and goals
- Integrated ‘One Manchester’ approach
- EDI
- PPIEP
- Industry Partnerships
- Capacity Building
- Each infrastructure component has a key role within the overall system



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Manchester BRC's vision is to drive personalised health & care for *all*

Embed early translational research further into our communities and localities in GM, Lancashire and South Cumbria by deepening the meaningful involvement of patients, public and civic partners.

Build a unique national powerhouse for innovation by combining the world-leading discovery and translational science capabilities of our partnership with a strong research culture centred on a committed, diverse and inclusive workforce.

Accelerate at scale, the impact of our research through our mature and integrated innovation pipeline in order to achieve measurable improvements in health and wellbeing across all sections of society in our region and beyond.

Grand Challenges

Addressing our region's burden of ill-health and aligning with MAHSC, Manchester BRC's core infrastructure will support scientific programmes designed to tackle three grand challenges:

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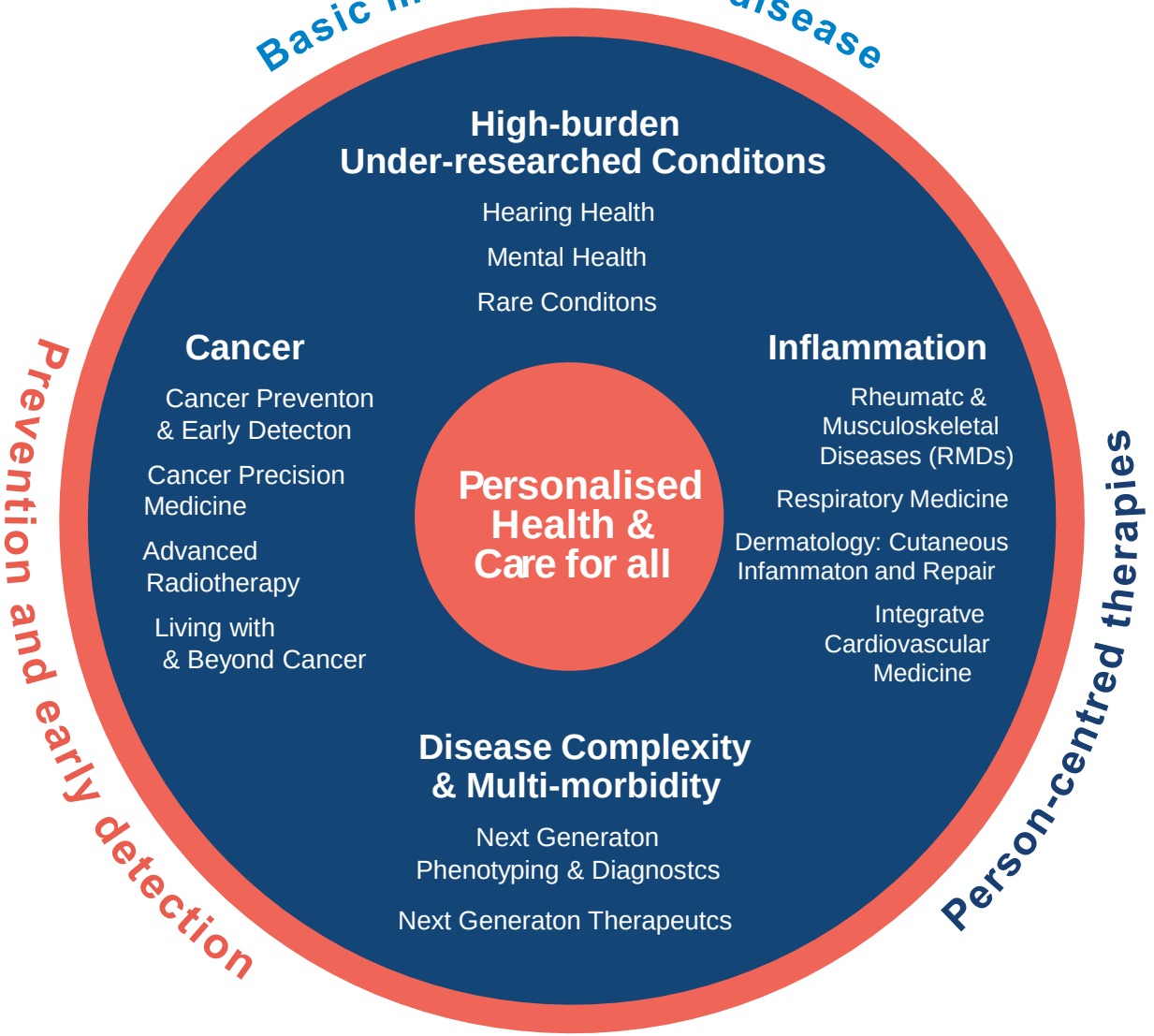
Manchester BRC Structure



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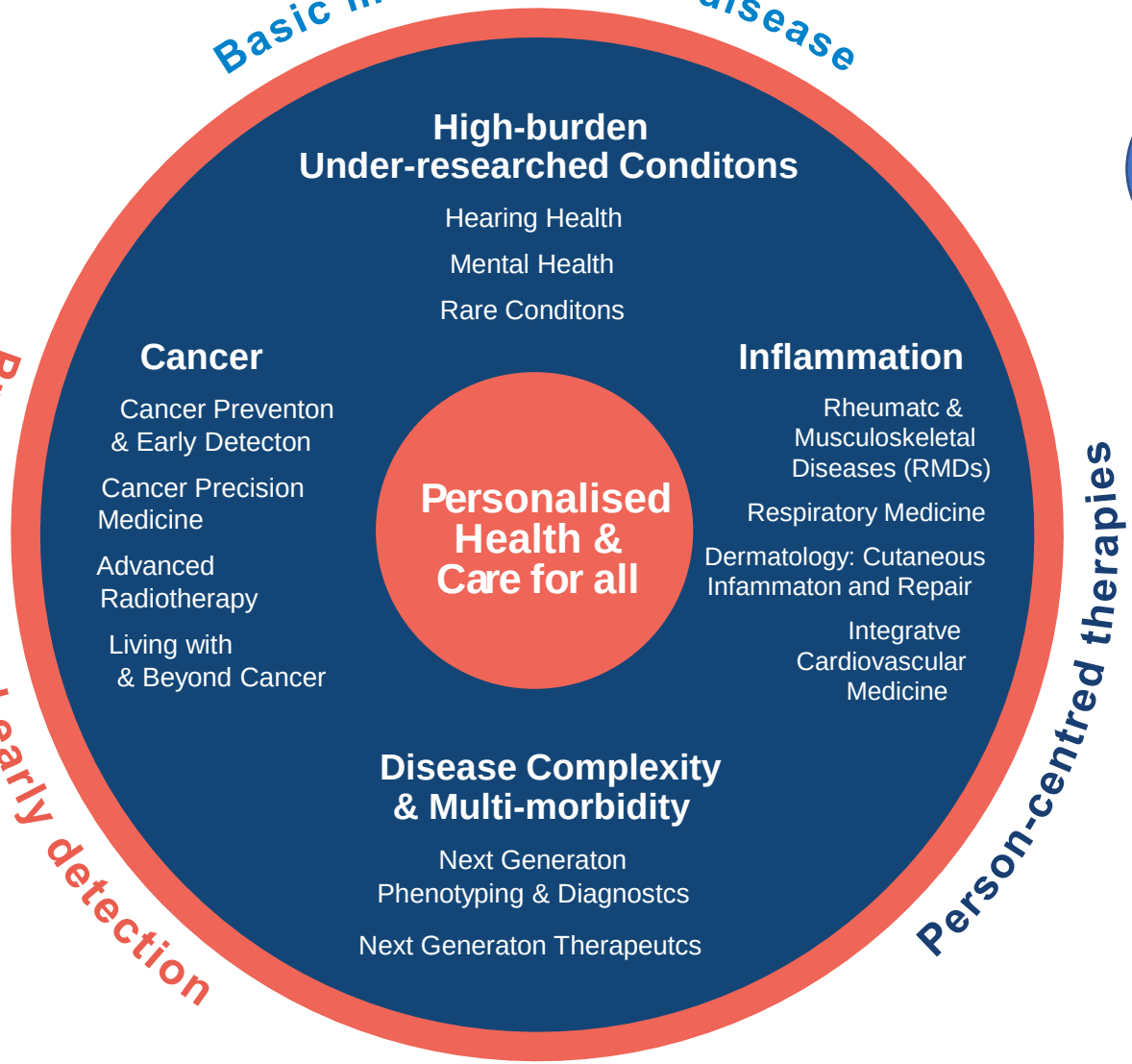
Manchester BRC Structure

4 clusters
13 Themes

Drive integration across themes



Peer support for project/programme monitoring

Maximise leverage of internal/external grant funding

Cluster Lead:
Professor Maya Buch - Maya.Buch@manchester.ac.uk

Disease Complexity and Multimorbidity Cluster

Disease complexity:

- presence of distinct subsets *within* a condition
- A common pathways *across* conditions
- presumes multiple long-term conditions occur within chronic diseases in a non-random way.

Aim:

- To deepen understanding of disease mechanisms, including how inequalities and social factors impact biological processes
- To support novel diagnostics
- To provide a platform to provide early proof of concept for our novel therapeutics pipeline.

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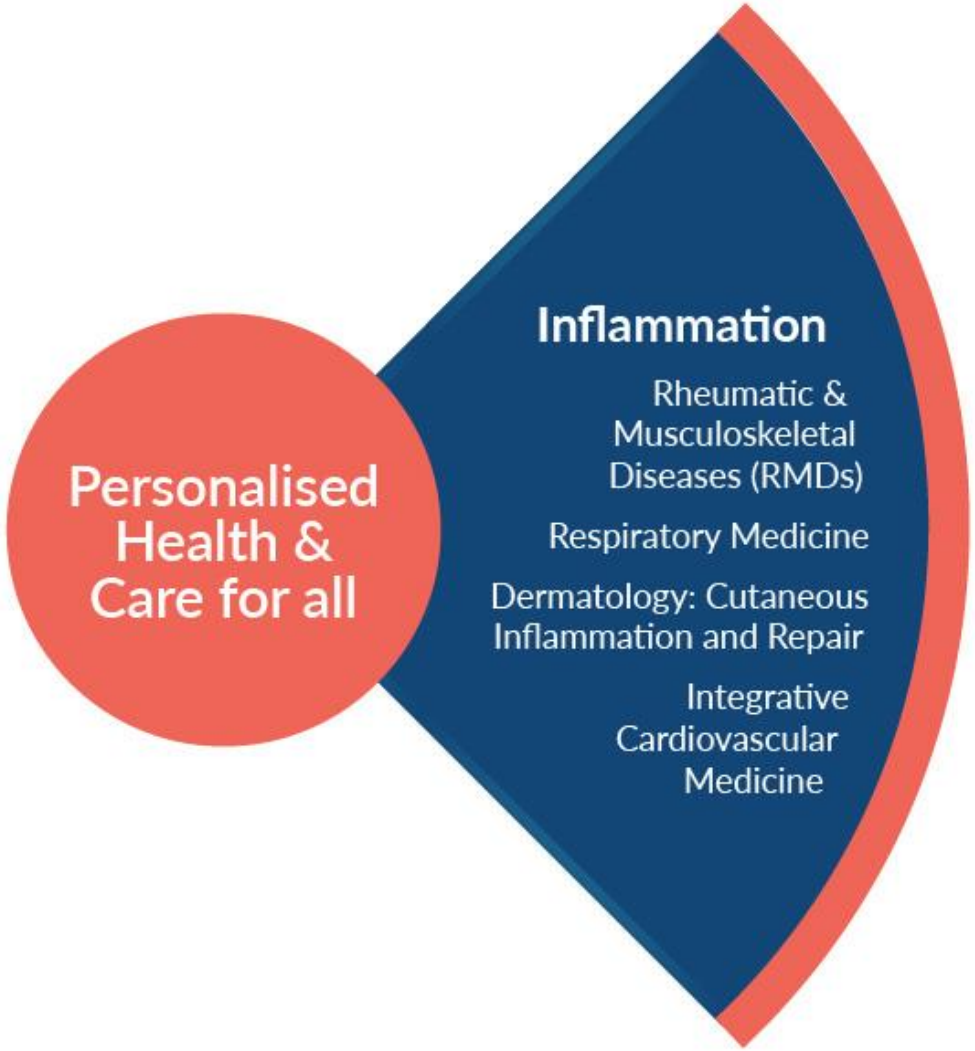
Cluster Lead:
Professor Anne Barton -
Anne.Barton@manchester.ac.uk

Inflammation Cluster

Addresses several of the most common causes of death and disability in our region and nationally, in which prognosis is strongly influenced by deprivation and adverse social determinants.

Aims:

- deepen understanding of the common and individual processes driving disease evolution, co-morbidities and therapeutic responses
- Translate these to precision trials in patients across the life course to reduce morbidity and mortality.



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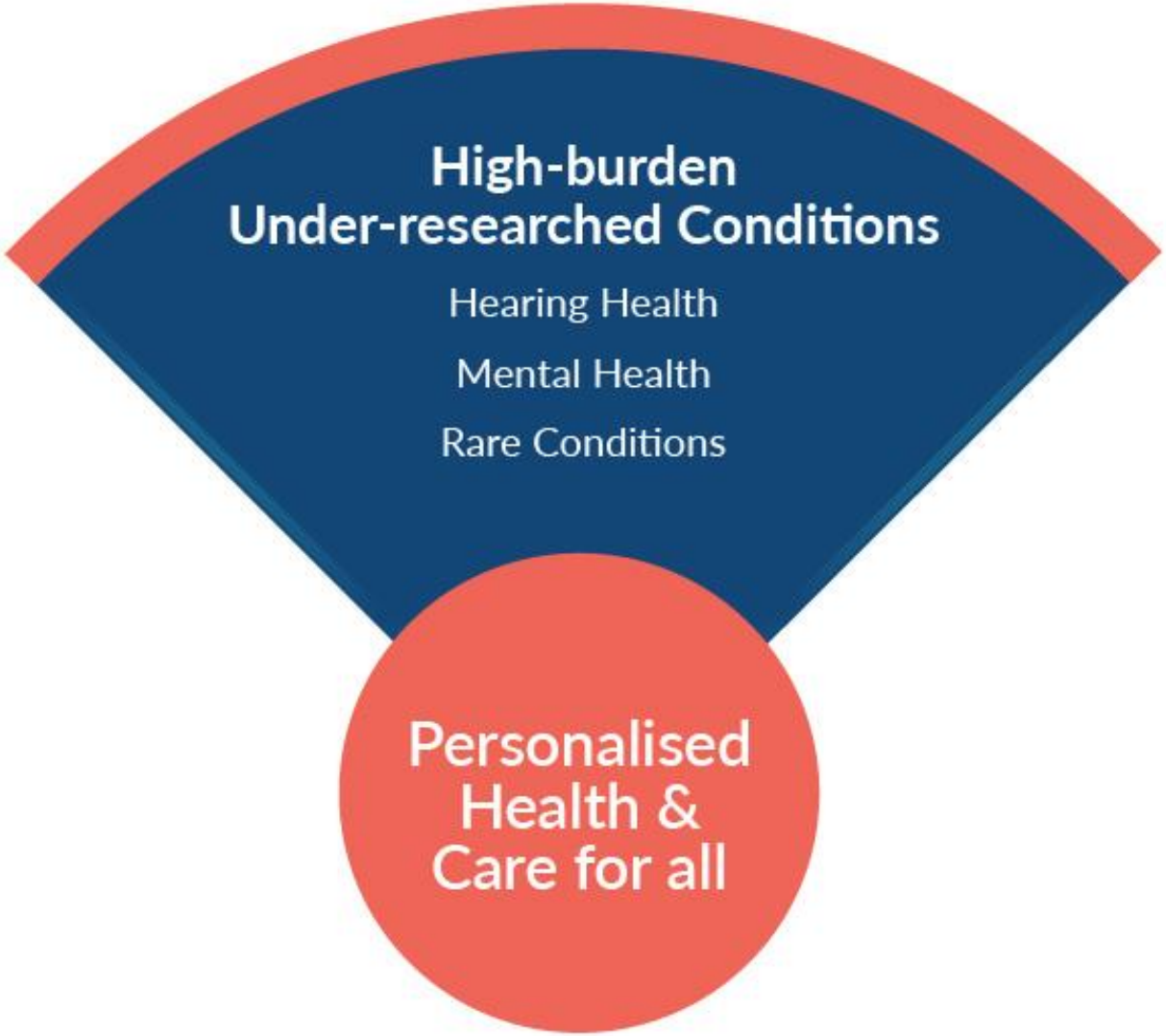
Cluster Lead:
Professor William Newman -
William.Newman@manchester.ac.uk

High Burden Under Researched Conditions Cluster

Research will be undertaken on disorders that have high impact on individuals and families but where traditionally there has been under-investment.
Plan to address areas of unmet need for people with hearing impairment, rare conditions and mental health disorders, often these are hidden disabilities.

Multi-professional approach:

- Working with affected individuals to focus on prevention and early diagnosis to reduce long-term disease burden
- Using novel approaches including gene therapies, digital interventions and devices to transform lives.



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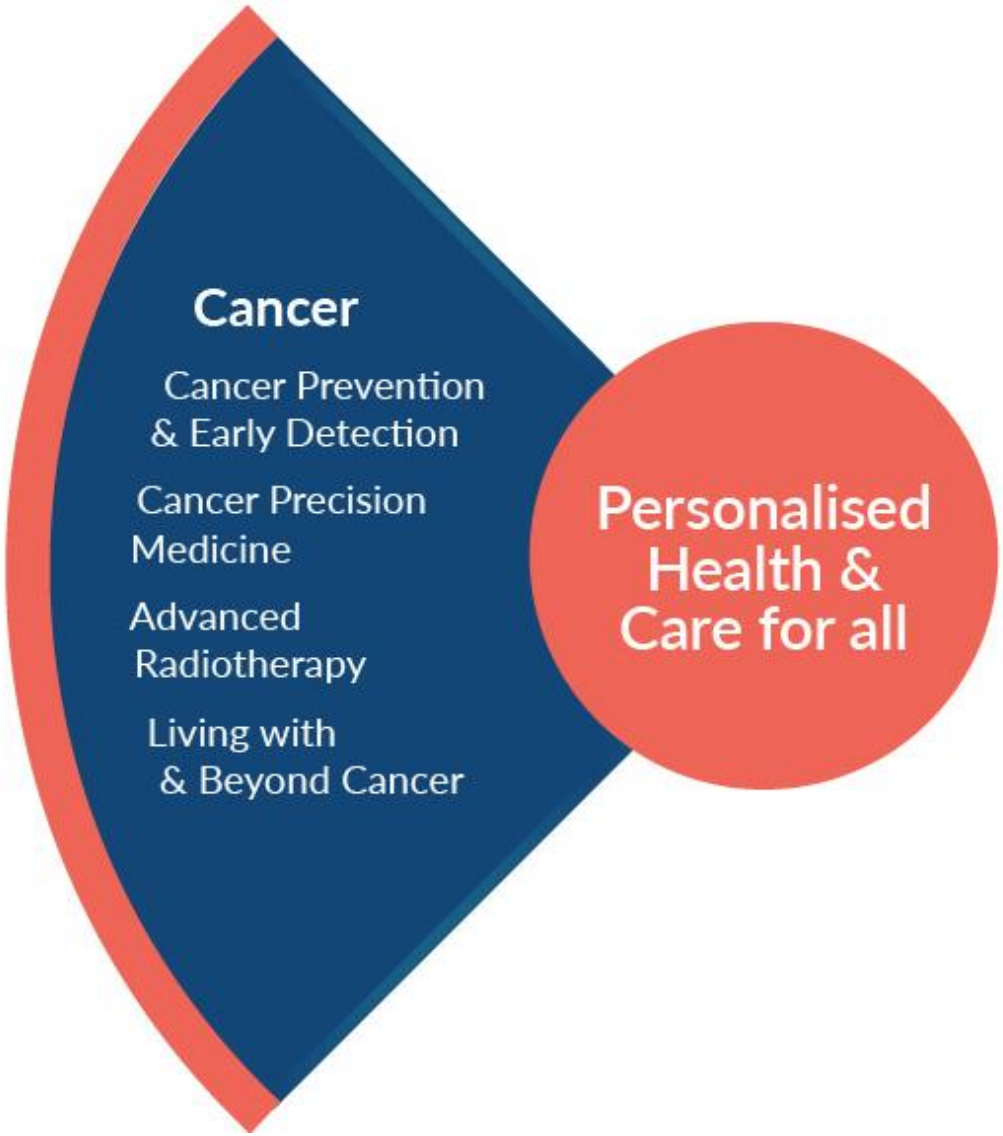
Cluster Lead:
Professor Emma Crosbie - Emma.Crosbie@manchester.ac.uk

Cancer Cluster

Addresses emerging challenges and opportunities to improve the lives of all patients with cancer, including people at risk of cancer.

It provides a patient centred approach to research in earlier diagnosis, better treatment and personalised, follow up care.



Disease Complexity Cluster:
Next Generation Phenotyping and Diagnostics

Aims:

1. Identify actionable insights into disease phenotypes and trajectories in diverse populations through accelerated methodological development alongside integration of complex biological and clinical datasets
2. Deliver advanced diagnostic capability across the translational cycle

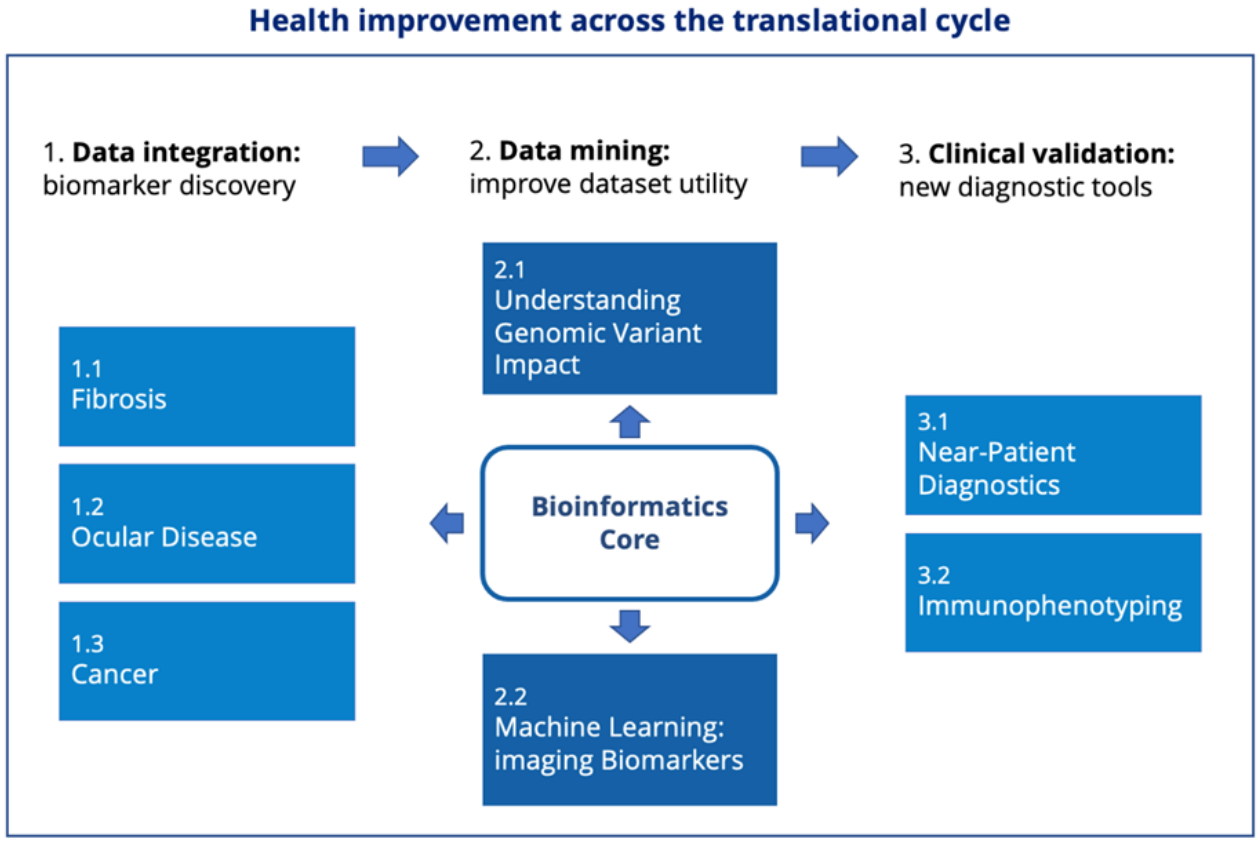
Disease Complexity Cluster:
Next Generation Phenotyping and Diagnostics

These aims will be delivered by three work programmes (each containing specific projects):

Programme 1: Multidimensional data integration to improve biomarker discovery

Programme 2: Data mining to advance the utility of existing diagnostic datasets

Programme 3: Clinical validation of translatable diagnostic methodologies



Inflammation Cluster:
Respiratory

Aims:

To develop novel biomarker-led diagnostic and prognostic strategies, facilitating precision therapeutic approaches to improve outcomes for patients.

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Inflammation Cluster:
Respiratory

1. Precision diagnostics & therapeutics in airways disease	2. Understanding and improving airway symptoms and function	3. Exacerbation mechanisms and diagnosis	4. Precision Therapy in Respiratory Infections/Exacerbations
Lead: Clare Murray	Lead: Jacky Smith	Lead: Tim Felton	Lead: Dave Singh
Apply precision approaches, to reduce treatment burden in asthma in underserved populations.	Identify treatments for respiratory conditions lacking licensed therapies and assess pollution risks relevant to our GM population.	Reduce risk of acute respiratory events and AMR, prevalent in our underserved population	Apply precision approaches to host-pathogen interactions in complex respiratory infections to develop person-centred care and improve outcomes.

Cancer Cluster:
Living with and Beyond Cancer

Aim:

To optimise identification and personalise treatments, reducing the burden of multiple long-term conditions after cancer therapy and improve morbidity and mortality.

Cancer Cluster:
Living with and Beyond Cancer

1: CARDIOVASCULAR HEALTH	2: BONE HEALTH	3: RECURRENT & SECOND CANCERS
Lead: Chris Miller	Lead: Claire Higham	Lead: Kim Linton
Development of individual risk estimates for cardiovascular morbidity and mortality leading to personalised diagnostics and therapeutics; improving cardiova scular health in cancer patients.	Optimising bone health in cancer patients by identification of those at high risk of impaired bone health/fractures to facilitate targeted interventions for prevention and treatment.	Earlier detection of second, treatment related cancers or recurrence to improve outcomes for high risk patients

High Burden Under-Researched Cluster:
Rare Conditions

1. Improved diagnosis, understanding, and prevention of RCs	2. Understanding the Impacts and Outcomes of RCs	3. Novel treatments for RCs
Leads: Gareth Evans Sid Banka	Leads: Ramona Moldovan, Katherine Payne	Leads: Simon Jones, Rob Wynn
Our focus on early diagnosis and prevention of RCs will aid more effective clinical care and inform future treatments.	By defining outcomes relevant to RCs we will be able to design studies to establish real benefits for individuals affected by RCs.	New approaches to treatment of RCs including gene therapies will improve patients' lives.

The BRC Partnership

NHS Trust	Themes
NHS Manchester University NHS Foundation Trust	Next Generation Phenotyping and Diagnostics, Next Generation Therapeutics, Rheumatic Musculoskeletal Diseases, Respiratory, Integrative Cardiovascular, Cancer Prevention and Early Detection, Rare Conditions
NHS The Christie NHS Foundation Trust	Cancer Precision Medicine, Radiotherapy, Living with and beyond cancer
NHS Northern Care Alliance NHS Foundation Trust	Leads in Dermatology and Wound Healing, Rheumatic Musculoskeletal Diseases, Cardiovascular Medicine (Additional specialist services include neuroscience, major trauma, intestinal failure, head and neck, cancer)
NHS Greater Manchester Mental Health NHS Foundation Trust	Mental Health, Complex trauma and resilience, psychosis, youth mental health, perinatal mental health, suicide prevention, delivering psychological therapies in common mental illness
NHS Blackpool Teaching Hospitals NHS Foundation Trust	Cardiology and Haematology, Cancer
NHS Lancashire Teaching Hospitals NHS Foundation Trust	Cancer, Next Generation Phenotyping and Diagnostics, Respiratory

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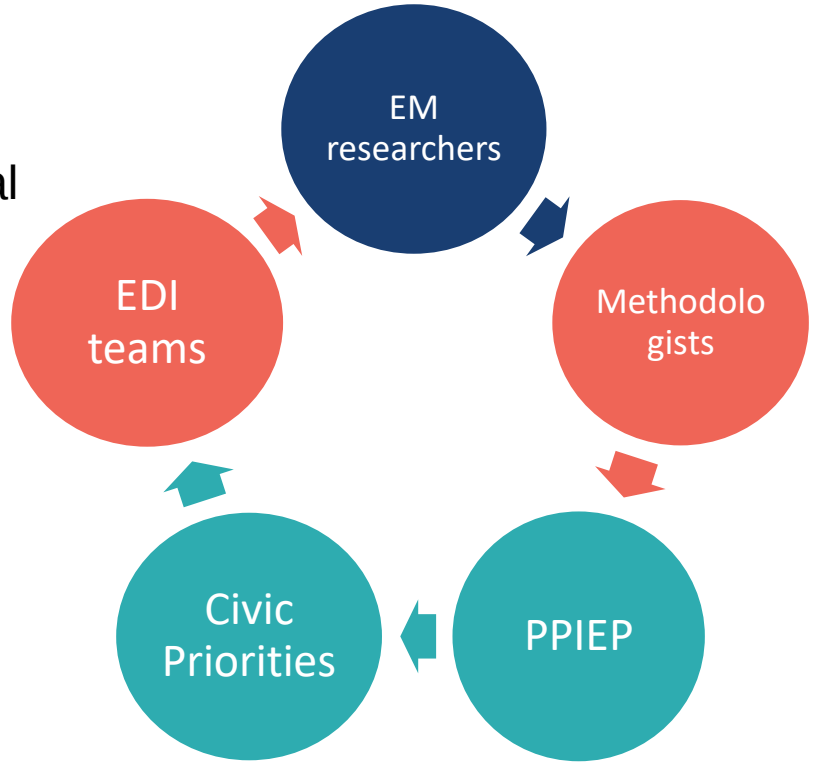
Inclusive Research Oversight Board

Mission:

Embed the principles of Inclusive Research (IR) into the experimental medicine (EM) programmes and strategies of MBRC and MCRF.

Provide internal peer review, peer support and expertise on the evaluation of EM, against IR principles to MBRC.



- Includes patients, citizens, public health, methodologists and our GMHSCP/NHS-NorthWest.
- Bring people and place into the heart of our research so that it is better delivered, more informed and serves diverse communities
- Meaningful engagement to understand the complex and diverse experience and perspectives of our communities and promote a more health research confident population

IROB Leads:

Sheela Medahunsi
Sheela.Medahunsi@nihr.ac.uk

Aparna Verma
Aparna.Verma@manchester.ac.uk

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Finance and Activity Report Summary Financial Year 1 (1 December 2022 to 31 March 2023)

- 224 projects
  - 44 majority BRC funded (>50% project cost covered by BRC)
  - 21 industry funded
  - 61 charity funded
  - 98 DHSC/NIHR, Research Council or Other non-commercially funded
- 100 BRC linked research publications (100% NIHR acknowledged)
- £22,707,057 of leveraged income
- 3937 participants recruited to projects
- 27 Strategic Industry Partnerships and 44 SME links

Recent Successes and Progress

- All Short-Term Objectives achieved
- Capital Bid £2.3M across partners
- Mental Health Mission (approx. £10m to Manchester)
- Specialist Nodes in UK Rare Disease Research Platform (3 of 11)
- BHF Centre of Excellence bid submission (awaited)

Summary

- Significant endorsement:

  - Wide research excellence
  - Focus on health inequity / inclusivity
  - Value for money and leverage
  - **Regional ambitions for national benefit**

Summary

- Major Opportunities:

  - Step change in delivering translational/early phase research
  - Synergising theme activities through
    - Cluster model
    - Cross-BRC pump-priming initiatives

  - Build translational research capacity across North-West
  - Leverage new income (academic/industry) and inward investment