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Northern Health Science Alliance
A Health Partnership for Northern England

NHSA Analysis of the UK Clinical Research Landscape in 2022

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Why is Clinical Research Important?

Public Investment in health research and innovation activities have an important return on investment for the nation through two high level mechanisms:

1. **Improving health: R&D active places have better health outcomes locally,**
2. **Improving wealth: Government R&D spending stimulates economic growth,**

Both of these mechanisms increase productivity in a region, and self reinforce – greater health leads to greater wealth which leads to greater health and so on.

Research by the University of York and the Kings Fund has previously estimated that for biomedical research the combined internal rate of return (health and economic) on investment is 58% and that the return is most acutely seen locally.[1]

Improving Health

More research active hospitals have better patient outcomes, for all patients not just clinical trial participants. More research active hospitals accumulate clinical skills, develop infrastructure and bring in resources that can improve clinical care.

There is evidence that these hospitals implement research findings quicker, adopt new technologies faster and staff are more likely to be up to date in clinical guidelines.[2]

This is on top of the benefits of clinical research that result in new treatments, better cost effectiveness and reduced burden of disease. It therefore makes sense to concentrate clinical research in regions with the greatest burden of disease.

Improving Wealth

Research shows that public sector research investment attracts private sector research investment in a region, for medical research this sits around £1 of public R&D investment in attracts £1 of private R&D investment, via both short term attraction and by contributions to the economy accumulating over decades.[3]

R&D investment in a region also increases the quality of supporting infrastructure: both hard infrastructure like buildings, equipment, and data repositories, and, soft infrastructure such as research and innovation networks, dedicated research support staff, contracting, regulatory and ethical approval managers.

It also results in a more concentrated skilled workforce through training and staff experience.

All of these factors help to attract private R&D spending and encourage businesses to invest in a place. We see this clearly with pharmaceutical companies, which strongly correlate to being based within 10km of centres with high public funding expenditure.[4]

Data analysis

In 2023 the UK Clinical Research Collaboration published its analysis of the 2022 Health Research funding allocations, which gives us an opportunity to see if there are any early indicators of levelling up since the last data release from 2018.

Levelling Up assessment

One of the UK's flagship policies 2019 to 2022, Levelling Up promised to address the inequalities between the North and South of England, including funding allocations to help boost Northern productivity. Looking at direct research funding awards made, in 2018 the North was awarded £324 million in funding while the greater South East was awarded £1.49 Billion.[5,6]

In 2022 the North received £405 million, an increase of £81 Million from 2018, while the Greater South East received an increase of £200 Million, resulting in a total award of £1.69 Billion.

Adjusting these figures for inflation:

Table 1: Funding in the North and Greater South East in 2022 value

Region	2018 adjusted for inflation to 2022 Value (£M)	2022 Award (£M)	Difference (£M)	% change in real terms
North	£372	£405	£33	8.8%
Greater South East	£1710	£1690	-£20	-1.16%

Looking at this per capita:

Table 2: Funding per person in 2018 and 2022, North and Greater South East of England, adjusted for inflation to 2022 values.

Region	Funding Per Person 2018	Funding per Person 2022	Increase from 2018 to 2022
North of England	£24.13	£25.72	£1.59
Greater South East	£71.24	£68.58	-£2.66

While these figures show that some rebalancing has started to occur in real terms, at the current rate of change, the total North South funding allocation per head would not be the same until 2082. This is despite the fact that the North has much greater health inequalities than the greater South East, and health research is increasingly shown to lead to better patient outcomes.[7]

Sub-Regional Analysis

Since the beneficial effects of Health R&D are felt most strongly in close proximity to where the spend is allocated, it's useful to make a sub-regional analysis. We chose to look at the spending within combined authority regions in the North, London and Cambridge, as they will be from May 2024.

Oxford was excluded from this analysis as it does not have a combined authority but the city does receive £301,802,726 of direct research funding, putting it on par with Cambridgeshire and Peterborough Combined Authority.

Direct Funding

This is funding allocated for specific projects with defined research objectives. These are the projects that allow scientists and clinicians to better understand diseases and conditions, understand prevention, detection and diagnosis, develop and evaluate new treatments, disease management and health service improvement. For a better understanding of the trends within the types of research taking place, and the broad impact of policy the UKCRC HRA analysis 2022 makes excellent further reading.

Knowing that research improves health outcomes for the population local to the research activity, the analysis below tests the extent to which funding on health research is being directed to places with the largest burden of ill-health.

Table 3: Direct award funding in 2022 in selected combined authorities

Combined Authority	Total Direct Funding Awarded	Per Person 2022
Greater London Authority	£900,808,268	£102.37
Cambridgeshire and Peterborough Combined Authority	£302,210,841	£337.85
Greater Manchester Combined Authority	£120,730,180	£42.10
Liverpool City Region	£73,945,628	£47.65
West Yorkshire Combined Authority	£68,451,371	£29.11
North East Combined Authority	£52,349,635	£26.58
South Yorkshire Mayoral Combined Authority	£42,513,777	£30.92
York and North Yorkshire Combined Authority	£21,692,479	£26.51
Tees Valley Combined Authority	£7,680,980	£11.34

All combined authorities in the North receive less than half per person than what is spent in London and less than a sixth of Cambridgeshire and Peterborough. This is despite the fact that the North has some of the worst health outcomes in the UK.

Infrastructure

Infrastructure spending is an important part of the development of regions as innovation clusters. It acts as a platform to attract further investment and to develop further research, and these advantages accumulate, allowing an institute to win further funding and compounding an advantage over time.

In addition, nationally significant pieces of infrastructure, such as the Francis Crick Institute in London (£71,200,000 in 2022) and the Sanger Institute in Cambridge (£116,559,671 in 2022) help to attract top global talent, act as a signifier of further investment and help to anchor companies to the region.

Excluded from this analysis is £414,627,655 of infrastructure funding allocated at National UK Level – the majority of this is used to fund the NIHR Clinical Research Networks across the country.

Table 4: Infrastructure funding awarded in 2022 in selected combined authorities

Combined Authority	Infrastructure Funding Awarded 2022	Per Person 2022
Greater London Authority	£302,925,217	£34.42
Cambridgeshire and Peterborough Combined Authority	£143,872,764	£160.84
Greater Manchester Combined Authority	£13,671,301	£4.77
North East Combined Authority	£11,256,945	£5.71
Liverpool City Region	£8,404,005	£5.42
West Yorkshire Combined Authority	£6,299,185	£2.68
South Yorkshire Mayoral Combined Authority	£6,196,174	£4.51
York and North Yorkshire Combined Authority	£3,106,605	£3.80
Tees Valley Combined Authority[8]	£0	£0

No combined authority in the North comes close to receiving infrastructure investment on the level of London or Cambridge. Taken together, the Northern Combined Authorities were awarded £48,934,215. There are individual buildings in London and Cambridge that receive more infrastructure investment than the entire North.

This is a level of funding that places, and sustains, a firm centre of gravity in the greater South East. It signals to businesses and talent that this is where the money is.

Studentships

Skills are vital to an innovation economy and access to skills is often cited as one of the top priorities for businesses choosing where to locate. It should be remembered that skills are mobile and need to be supported with other investments to attract and retain talent.

Table 5: Studentship funding awarded in 2022 in selected combined authorities

Combined Authority	Studentship Funding Awarded 2022	Per Person
Greater London Authority	£26,050,188	£2.96
Greater Manchester Combined Authority	£5,183,903	£1.81
Cambridgeshire and Peterborough Combined Authority	£3,719,068	£4.16
North East Combined Authority	£2,495,345	£1.27
South Yorkshire Mayoral Combined Authority	£2,474,797	£1.80
West Yorkshire Combined Authority	£2,058,314	£0.88
Liverpool City Region	£1,808,456	£1.17
York and North Yorkshire Combined Authority	£1,352,208	£1.65
Tees Valley Combined Authority[9]	£0	£0

While Greater Manchester appears to buck the trend and attracted more studentship funding than Cambridgeshire and Peterborough combined authority, looking at the per person spending we see that Manchester actually receives less than half per person.

This is important as building a critical mass of talent is vital for growing an innovation economy.

Conclusions

Health research funding is highly regionally imbalanced and while the levelling up rhetoric has been welcome, the North is starting from such a disadvantage that only truly unprecedented investment will move the needle.

At the current rate of change, there will always be a North – South divide in health research funding. Given the link between health research investment to health outcomes and productivity this makes grave reading for the future Northern economy and Northern healthy life expectancy.

Who can make a difference?

The funding landscape is complex; no one organisation could change allocations through a change in strategy. The figures included here represent allocations made by 173 public and charity organisations. However, the top ten funders account for the vast majority of the funding allocation. They are:

1. Medical Research Council (UKRI)
2. Department of Health and Social Care
3. Wellcome Trust
4. Cancer Research UK
5. Innovate UK (UKRI)
6. Engineering Physical Sciences Research Council (UKRI)
7. Biotechnology and Biological Sciences Research Council (UKRI)
8. British Heart Foundation
9. Economic and Social Research Council (UKRI)
10. Francis Crick Institute (Parent funders are: MRC (55%) CRUK(35%) Wellcome (10%))

As such, it is UKRI, DHSC, the Wellcome Trust, Cancer Research UK and BHF as the largest funding bodies, who are most able to shift the dial in allocating greater funding to regions outside of the Greater South East. There is a model for how this might happen in the UKRI Strength In Places Fund (SIPF). The SIPF specifically aimed to fund areas of the UK to build on existing strengths in research and innovation to deliver benefits for their local economy, with local defined by the applicants rather than existing administrative boundaries.

This funding was concentrated in regions that typically received low funding from other UKRI sources, with North East and North West England, Scotland and Northern Ireland being the biggest beneficiaries.[10]

Is the North just worse?

Does this mean that the North conducts lower quality research and, or, puts in lower quality bids, therefore winning less funding?

Comparing the research quality across so many institutions could be a research paper in its own right, however, we present here two simple points that hopefully illustrate why the idea that the North conducts lower quality research is a poor argument:

1. Northern universities consistently rank among the best in the world
2. Northern clinical trials infrastructure consistently ranks as the best in the UK

Assuming therefore that the North conducts high quality research, does the North submit worse quality applications?

Data for only Health applications across all funders isn't available, however; UKRI data for all R&D investments in its portfolio show that the North averages a success rate of 31% of its applications to UKRI, compared to a 26% success rate for the Greater South East.[11] However, the Greater South East submits 10,358 applications, while the North submitted 4,078. The total value applied for by the Greater South East was £3.22 Billion, the total value applied for by the North was £1.48 Billion.

Why does the North submit less applications? We suggest that the North doesn't receive enough funding to support a larger research ecosystem, therefore there are less researchers to submit bids, attracting less research funding, resulting in less funding to attract further investment and researchers, so entrenching a status quo as described in this report. We also suggest that the North, having historically been underinvested in soft infrastructure, is at a disadvantage when mobilising for the largest bids that require cross regional consortia to rapidly respond to a high value call.

Summary and recommendations

We have shown that health research funding in England is highly regionally imbalanced. We have discussed the negative consequences of this for both the health and economy of the North of England and described the mechanisms by which clinical research creates health and wealth.

We have proposed some of the mechanisms by which the North receives under-investment and argue that only a significant strategic push and accompanying funding effort will have the level of impact required to support a levelling up of UK clinical research.

Policy Recommendations

Utilising Combined Authorities

1	Combined Authorities should be empowered to drive innovation, in partnership with private sector and charity funders, with funding pots to allocate into regional strengths as they see fit.
2	Combined Authorities should have dedicated funding to support pan regional projects in partnership with each other, and ensure benefits can accrue outside of city regions.
3	Northern Leaders should look to engage the largest health charities, Wellcome, Cancer Research UK and BHF to ensure research takes place in regions with maximum benefit for the health of the nation.

Innovation Cluster Development

4	Pan regional health and life science cluster organisations, like the NHSA, should be utilised, working in partnership with (mayoral) combined authorities and funders to enable the North to operate at scale and compete globally.
5	UKRI should work with the NHSA to deploy development funding for the soft infrastructure required to facilitate and develop large pan regional bids.

National Funders

6	New health and life science technology institutions should be created outside of London, the South East and East of England, based on regional expertise and with attracting additional private sector investment as a core goal.
7	UKRI and NIHR should be held accountable to ensure research is conducted in areas with the highest health burden.
8	The charity funders should consider geographic burden of disease in their funding criteria and aim to allocate funds in regions with higher burden. They should also consider how their allocations can stimulate local economies, further increasing the impact and return of their investments
9	DHSC and UKRI should create new funding and roles to support clinical research, innovation and entrepreneurial activities and prioritise the north for this funding.
10	Government should re-affirm its commitment to increasing investment in R&D as a percentage of GDP and commit any additional uplift to regions outside the South East.

Methodology

Data Sources

UK Health Research Analysis 2022 (UK Clinical Research Collaboration, 2023) https://hrcsonline.net/reports/analysis-reports/uk-health-research-analysis-2022/". This data set is released every 4 years by the UKCRC and reports UK Health research funding from voluntary returnsby funders. It takes data from 173 organisations and covers the vast majority of health research spending in the UK by charity and public sector organisations.

It does not account for:

- Industry funded research
- local authority funded research
- research funded by devolved NHS Trust budgets not administered by DHSC
- research funded by non-UK organisations

Please see the UK HRA Analysis 2022 report for further information on the inclusion and exclusion criteria of the dataset and other limitations.
Monetary values

2018 Figures have not been adjusted for inflation and are at 2018 values. 2022 Figures have not been adjusted for inflation and are at 2022 values.

The UK Health Research Analysis series uses annualised values for each award, taking the total award value over its lifetime and calculating the predicted commitment within 2022.

Therefore this is a snapshot of health research in 2022.

Population

Population Estimates 2018 : North (15,429,617) Greater South East (24,242,920) Source: ONS Population estimates and components of population change. Detailed time series 2001 to 2018.

Population Estimates 2022: Population Estimates: North (15,740,415) Greater South East (24,644,510) Source: Office for National Statistics (ONS), released 23 November 2023, ONS website, statistical bulletin, Population estimates for England and Wales: mid-2022.

Population data for sub regional analysis: Population data wasn't available at county level for 2022; so UK census 2021 data was used. Source: UK census 2021 licensed under the Open Government Licence v3.0

Combined Authority	Population 2021
Greater London Authority	8799700
Cambridgeshire and Peterborough Combined Authority	894500
Greater Manchester Combined Authority	2867800
Liverpool City Region	1551800
West Yorkshire Combined Authority	2351600
North East Combined Authority	1969800
South Yorkshire Mayoral Combined Authority	1375000
York and North Yorkshire Combined Authority	818300
Tees Valley Combined Authority	677200

Combined Authority Calculations

The UKHRA 2022 provides geographical location data at City/Town level and at ITL1 region level.

Combined Authority data was calculated assigning City / Towns to their respective City Council / Local District Council / County Council/ Unitary Authority, and then to the parent Combined authority as appropriate. The List joining City / Town to Combined authority is below. N.B. Only Cities and Towns featuring on the HRA database are included below, cities and towns not in receipt of funding will not appear.

City / Town	Combined Authority
March	Cambridgeshire and Peterborough Combined Authority
Ely	Cambridgeshire and Peterborough Combined Authority
Cambridge	Cambridgeshire and Peterborough Combined Authority
Fulbourn	Cambridgeshire and Peterborough Combined Authority
Huntingdon	Cambridgeshire and Peterborough Combined Authority
London	Greater London Authority
Chislehurst	Greater London Authority
Richmond	Greater London Authority
Dagenham	Greater London Authority
Edgware	Greater London Authority
Hampton	Greater London Authority
Harrow	Greater London Authority
Hayes	Greater London Authority
Kingston Upon Thames	Greater London Authority
New Malden	Greater London Authority
Northwood	Greater London Authority
Ruislip	Greater London Authority
Stanmore	Greater London Authority
Sutton	Greater London Authority
Uxbridge	Greater London Authority
Teddington	Greater London Authority
Manchester	Greater Manchester Combined Authority
Stockport	Greater Manchester Combined Authority
Salford	Greater Manchester Combined Authority
Wigan	Greater Manchester Combined Authority
Ashton-under-Lyne	Greater Manchester Combined Authority
Bolton	Greater Manchester Combined Authority
Crumpsall	Greater Manchester Combined Authority
Cheadle	Greater Manchester Combined Authority

City / Town	Combined Authority
Littleborough	Greater Manchester Combined Authority
Altrincham	Greater Manchester Combined Authority
Liverpool	Liverpool City Region
Prescot	Liverpool City Region
Durham	North East Combined Authority
Sunderland	North East Combined Authority
Gateshead	North East Combined Authority
Newcastle upon Tyne	North East Combined Authority
North Shields	North East Combined Authority
Sheffield	South Yorkshire Mayoral Combined Authority
Doncaster	South Yorkshire Mayoral Combined Authority
Barnsley	South Yorkshire Mayoral Combined Authority
Rotherham	South Yorkshire Mayoral Combined Authority
Middlesbrough	Tees Valley Combined Authority
Darlington	Tees Valley Combined Authority
Stockton-On-Tees	Tees Valley Combined Authority
Redcar	Tees Valley Combined Authority
Billingham	Tees Valley Combined Authority
Leeds	West Yorkshire Combined Authority
Bradford	West Yorkshire Combined Authority
Shipley	West Yorkshire Combined Authority
Pudsey	West Yorkshire Combined Authority
Wakefield	West Yorkshire Combined Authority
Huddersfield	West Yorkshire Combined Authority
Wetherby	West Yorkshire Combined Authority
Keighley	West Yorkshire Combined Authority
York	York and North Yorkshire Combined Authority
Harrogate	York and North Yorkshire Combined Authority
Thirsk	York and North Yorkshire Combined Authority

Definitions

Direct Funding: Funding allocated to specific research projects with defined research objectives

Indirect Funding: Infrastructure, Personal funding, Studentships and unclassified

Infrastructure: Capital Infrastructure, R&D support for the NHS, i.e. the Clinical Research Networks, Administrative support, R&D Resources such as data repositories.

Studentships: training, studentships, fellowships scholarships where no research objectives are available.

Personal funding: salary support for individuals, costs to attend meetings, membership of professional bodies.

Internal Rate of Return: This is the interest rate at which the net present value of all the cash flows (both positive and negative) from a project or investment equal zero. It is used to evaluate the attractiveness of a project or investment.

References: 1. Estimating the Economic Value of NIHR Biomedical Research Centres and Units, N.Hex et al, 2020
2. Ozdemir BA, Karthikesalingam A, Sinha S, Poloniecki JD, Hinchliffe RJ, Thompson MM, Gower JD, Boaz A, Holt PJ. Research activity and the association with mortality. PLoS One. 2015 Feb 26;10(2):e0118253. doi: 10.1371/journal.pone.0118253.
3. Sussex, J., Feng, Y., Mestre-Ferrandiz, J. et al. Quantifying the economic impact of government and charity funding of medical research on private research and development funding in the United Kingdom. BMC Med 14, 32 (2016). https://doi.org/10.1186/s12916-016-0564-z
4. Laura Abramovsky and Helen Simpson, 'Geographic Proximity and Firm-University Innovation Linkages: Evidence from Great Britain,' Journal of Economic Geography 11, no. 6 (2011): 949–977, doi:10.1093/jeg/lbq052
5, ITL1 regions North East, North West, Yorkshire and the Humber
6. ITL1 regions East of England, London, South East
7. Bambra, Munford, Brown et al (2018) Health for Wealth: Building a Healthier Northern Powerhouse for UK Productivity, Northern Health Science Alliance, Newcastle
9. Not all health funding awards are captured by the data set and some health related awards that are not primarily Health will be excluded, therefore it's unlikely that this figure is truly zero, however its also unlikely this figure will be significantly out of line with other northern regions
9. Not all health funding awards are captured by the data set and some health related awards that are not primarily Health will be excluded, therefore it's unlikely that this figure is truly zero, however its also unlikely this figure will be significantly out of line with other northern regions
10.Geographical Distribution of UKRI Spend FY2019-20 and FY2020-21
11. UKRI Outputs and Investment data 2022


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