NIHR | Manchester Biomedical Research Centre

The National Institute for Health and Care Research (NIHR) Manchester Biomedical Research Centre (BRC) and NIHR Manchester Clinical Research Facility (CRF): Inclusive Research examples

Case Title	Differences in prevalence of health conditions being identified in Primary Care across areas of Greater Manchester, Blackpool, and Preston: hot and cold spot analysis
BRC Cluster(s)	Advanced Diagnostics and Therapeutics Catalyst, Cancer, Under-Researched Conditions and Inflammation Clusters
BRC Theme(s)	Next Generation Therapeutics, Next Generation Phenotyping and Diagnostics, Cancer Prevention and Early Detection, Advanced Radiotherapy, Cancer Precision Medicine and Living With and Beyond Cancer, Hearing Health, Mental Health, Rare Conditions, Rheumatic and Musculoskeletal Diseases, Respiratory Medicine, Dermatology, Integrative Cardiovascular Medicine
Inclusive Research Element	Health Inequalities
Rationale for case study	To look at the prevalence of health conditions in deprived areas of Greater Manchester, Blackpool and Preston and to look at the geographical distribution of four of these conditions (cancer, rheumatoid arthritis, osteoporosis and mental health) as examplars.
Background	Greater Manchester, Blackpool and Preston have high levels of deprivation and health inequality and have been disproportionately affected by the Covid-19 pandemic. Health inequalities are more evident in minoritised groups. It is expected that certain conditions are of higher prevalence in areas which are more deprived, but a previous pilot investigation found that this is not always the case. There was therefore the need to find out which conditions registered by GPs had prevalence lower than the England prevalence.
What we did	We collaborated with colleagues from Tackling the Root causes Upstream of Unhealthy Urban Development (TRUUD) to analyse data published in the Quality and Outcomes Framework (QOF) 2022-2023 from 451 GP surgeries in 12 North West Local Authorities: Manchester, Bury, Bolton, Salford, Wigan, Trafford, Stockport, Tameside, Rochdale, Oldham, Blackpool, and Preston. We generated data on the prevalence of patients diagnosed with atrial fibrillation, cancer, dementia, osteoporosis, hypertension, rheumatoid arthritis, heart failure, coronary heart disease, chronic kidney disease, stroke and transient ischaemic attack (TIA), mental health, diabetes mellitus, obesity, COPD, peripheral arterial disease, non-diabetic (ND) hyperglycaemia, depression, epilepsy, asthma, patients diagnosed with a learning disability and patients receiving palliative care. Prevalence was determined by the number of patients recorded by GP practices and reported to QOF in 2022-23. We analysed the data from the practices in the 25% most deprived areas, based on their 2019 Index of Multiple Deprivation (IMD) score. We used a technique known as 'hot and cold spot analyses' to identify hot spots (conditions with prevalence higher than the England prevalence) and cold spots (conditions with prevalence lower than the England prevalence). We also developed 'heat maps' of Greater Manchester, Blackpool and Preston to look at the geographical spread of the prevalence of diagnosed cases of cancer, osteoporosis, rheumatoid arthritis, and mental health conditions as our exemplars. The maps are divided up into small regions known as Lower Layer Super Output Areas (LSOA), that allow for detailed and useful statistical analysis. We used the QoF data to calculate the prevalence of cancer and mental health conditions in each LSOA. Hot spots were shaded red and cold spots were shaded blue. We then compared these hot and cold spot maps to maps of regional deprivation (based on the IMD score).

What the outcome(s) is/are	Cold spots - atrial fibrillation, cancer, dementia, osteoporosis, hypertension, rheumatoid arthritis, heart failure, coronary heart disease, chronic kidney disease, stroke and transient ischaemic attack (TIA), had prevalence lower than England prevalence in the most deprived areas of Greater Manchester, Blackpool, and Preston. Patients receiving palliative care were also below England prevalence. Hot spots - mental health, diabetes mellitus, obesity, COPD, peripheral arterial disease, non-diabetic (ND) hyperglycaemia, depression, epilepsy, asthma, and patients diagnosed with a learning disability had prevalence above England prevalence.
Conclusions	It is too early to draw any definite conclusions, as our biostatistics team is still validating the data and conducting further analyses. Further studies are needed to understand the various underlying factors that might explain the differences in the prevalences of hot and cold conditions. The findings however suggests that there may be potentially missed diagnosis among patients living and registered to GP practices in deprived areas and a high number of conditions with prevalence falling below the national prevalence (cold spots). The hot and cold spot analysis can guide research undertaken within the BRC to go beyond the normal recruitment routes (sampling from the same pool of people) and take into consideration the findings of the hot and cold spot analysis to better understand regional differences in condition specific inequalities. In so doing, researchers can adapt their methodologies to tackle unmet need by recruiting both the visible and invisible from diverse backgrounds. As such research findings will be more applicable to the population.
Recommendations	A further investigation is required to ascertain why people in certain communities are not making it onto GPs registers.
Future work	We plan to: • Extract data from publicly available databases such as the Quality Outcomes Framework (QOF) data from the past 5 years, Office of National Statistics (ONS) data and the Health Survey for England for the prevalence of non-communicable diseases. The data from each of the databases will provide an understanding of change in disease prevalence whilst accounting for changes in geographical boundaries, deprivation and demographics over time. • A further investigation is required to ascertain why people in these communities are not making it onto the GPs' registers. In the next stage, we will investigate other indicators such as ethnicity, gender, economic status, and age.