

The Parallel Pandemic COVID-19 and Mental Health



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Foreword



Brent Kilmurray, Chief Executive of Tees, Esk and Wear Valleys NHS Foundation Trust

Mental health organisations are firmly rooted in communities.

Our communities and our staff have first-hand experience of what COVID-19 has meant in those communities in the initial waves, and the legacy it has left since.

The impact has been acutely felt in areas where levels of deprivation were high before the pandemic, and COVID-19 has exacerbated all the trends that were already in place.

It was clear early in the pandemic, that the North was excessively affected, and the issues that have been known and felt on the ground within our communities, are now entirely borne out by this report.

The economic hit has a corresponding mental health impact – we knew and understood the issues pre- COVID-19, but we now know for sure that mental health in the North has worsened because of COVID-19.



Kathryn Singh, Chief Executive of Rotherham Doncaster and South Humber NHS Foundation Trust

The cost-of-living crisis will put more pressure on those communities, whose mental health is already under pressure, over the coming months and years.

Poor mental health is strongly associated with social deprivation, and as a health issue mental illness has the second largest impact of all illnesses in England.

The Government has committed to tackling poor health in England and to improving healthy life expectancy in its Levelling Up White Paper. If it is to achieve this goal, as this report states, improving mental health in the North of England will be central to achieving it.

Mental health is an increasingly broad term, encompassing the experience of many people.

It is now defined by the World Health Organisation as “a state of well-being in which an individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community”.

The recommendations within this report provide a comprehensive list of actions to address the breadth and depth of the impact of this parallel pandemic.

More support in areas such as public health and prevention, working with industry and employers, investing support in our children and young people, and building resilience within the most vulnerable communities are among the priority areas for targeted effort.

This may seem to be a major undertaking, but we believe we are in a strong position to support the recommendations of this report in our communities, and across the North.

We can play our part in the response needed if we have vital investment into prevention, delivery, and mental health research and innovation in our communities - those that will benefit most from them.

Mental health in the North is at the forefront of innovation and collaboration – working with partners from all sectors, across our region, nationally and internationally, to find new ways to support people with mental health issues, and to find people-centred solutions through research and evaluation.

This parallel pandemic calls for an urgent and proportionate response to the disproportionate impact on mental health of all those in the North.



Executive summary

60 Second Summary

Mental health decreased across England during the pandemic. It was worse in the North of England ahead of the COVID-19 pandemic, dropped further over the course of the pandemic and has stayed below pre-pandemic levels. Our previous research¹ found that COVID-19 deaths were 17% higher in the North of England, hospital pressure due to COVID-19 was 10% higher in the North and the three northern regions spent an additional six weeks in the harshest lockdown restrictions. Unemployment has been 20% higher in the North since 2020, wages in the North fell during the pandemic and we estimated that the increased mortality in the North of England during the pandemic cost the national economy up to £7.3bn in lost productivity.

The effect of the pandemic on other important issues – most notably mental health - has been less explored². The pandemic

potentially impacted on mental health in various ways – including the fear generated by a novel infectious disease, social isolation from lockdowns and school closures, fear over future employment and income (especially for those on furlough or unemployed), co-morbidity with COVID-19 illness, lack of access to support services (especially for those with a pre-existing condition), lack of control and fears for the future.

To understand the impact of the past few years on mental health and productivity in the North and to explore the opportunities for levelling up mental health and improving productivity across the country, the Northern Health Science Alliance commissioned this report with the four Northern NIHR Applied Research Collaborations (ARC North East and North Cumbria, ARC Greater Manchester, ARC North West Coast, ARC Yorkshire and Humber).

Key findings

The economic cost to the UK economy of mental health issues developed by people in the North during the pandemic, in the period **April 2020 to September 2021**, is conservatively estimated to be

£2bn

Between **April 2020 to September 2021** people in the North of England experienced a **2% decrease in mental health** compared with a **1.3% decrease in the rest of England**

The pandemic negatively affected mental health across England, but those in the North experienced the largest and most prolonged hit to mental health

The North experienced a **12%** increase in the numbers of anti-depressants prescribed during the pandemic

Mental health fell equally in the North and the rest of the country during the pandemic but it recovered more quickly in the rest of the country than in the North.

People in the North were prescribed more anti-depressants in the three years before the pandemic and they were prescribed more anti-depressants proportionately over the course of the pandemic than those in the rest of England

Ethnic minority women in the North had the worst mental health scores throughout the pandemic. Their mental health scores fell by

10%

at the start of the pandemic and their scores were on average

4%

lower throughout the pandemic

Across England, the gap in mental health between people in the lowest and highest income households increased fourfold (from a 0.47 point gap in 2019 to a 2.16 point gap in September 2021)



People in the North under 35 were more likely than any other age group to have developed a psychiatric disorder over the course of the pandemic with **an increase of 2.5 percentage points**

Summary of detailed findings

Mental health

Both the North and the rest of England experienced an average fall in mental health during the COVID-19 pandemic, with scores at their lowest in January 2021 (approximately a 5% decrease in average GHQ-12 scores for both regions compared with data from 2019).

By September 2021 mental health had not returned to pre-pandemic levels and the situation was worse in the North. Compared to before the pandemic in 2019, mental health was 0.5, or half a point, lower on the GHQ-12 scale, (a 2.0% decrease) in the North and 0.31 (a 1.3% decrease) in the rest of England.

Inequalities in mental health

Before the pandemic, people from ethnic minority backgrounds had similar mental health scores to those from a white British background. However, at the start of the pandemic there was a larger fall in the average mental health score for the ethnic minority group (a fall of 1.63 points on the GHQ-12 scale, compared to 0.87). This fall was greater for those from ethnic minority backgrounds in the North (a fall of 2.34, compared to 1.45 for the rest of England), and these scores remained lower throughout the pandemic.

Ethnic minority women living in the North had the lowest mental health scores (indicating worse mental health) throughout the pandemic. These scores were on average approximately 4% lower than those of ethnic minority women living in the rest of England.

The gap in mental health between the lowest and highest earners increased during the pandemic and remains large. In 2019, for England as a whole, the difference in mental health scores between the top and bottom quintiles of income was 0.47. This more than quadrupled and stood at 2.16 points in September 2021.

The proportion of people with a probable psychiatric disorder increased between 2019 and September 2021 especially amongst younger people (aged under 35) living in the North where it increased by 2.5 percentage points.

Anti-depressant prescriptions

Anti-depressant prescriptions increased across the country during the pandemic, particularly in the North.

The North experienced higher numbers of anti-depressants prescribed per person over the three years prior to the pandemic, and this gap continued during the pandemic.

Before the pandemic, the average monthly number of anti-depressant prescriptions in the North was 4.73 per person compared to 3.86 per person in the rest of England; 22.5% higher.

During the pandemic this increased to 5.32 per person in the North compared to 4.37 per person in the rest of England; 22% higher.

During the pandemic the North East and Yorkshire and the North West experienced the greatest volume of anti-depressant prescriptions at 5.39 and 5.27 per person, respectively.

Impact on productivity:

We conservatively estimate that these reductions in mental health in the North during the two years of the pandemic could cost the UK economy around £2bn in lost economic productivity.

Policy Recommendations

1

Increase NHS and local authority resources and service provision for mental health in the North. Increase the existing NHS health inequalities weighting within the NHS funding formula.

2

Build resilience in mental and physical health in the most vulnerable communities and support them through the cost-of-living crisis by increasing benefit payments and by getting rid of the two child cap.

3

Invest in research into mental health interventions in the North, specifically in communities which will benefit most strongly from them.

4

NHS England and NHS Improvement and the Office for Health Improvement and Disparities should adopt a public mental health approach that focuses on early mental ill health prevention.

5

Government should invest in and develop a monitoring system for understanding the longer-term mental health impacts of the COVID-19 pandemic on children and parents. Targeted support should then flow to families where needed.

6

Area-level measures of physical and mental health should be developed to better understand place-based inequalities.

7

Embed Equality Impact Assessments in all COVID-19 recovery and other policy processes relating to socioeconomic deprivation at national, regional, and local levels.

8

Integrated Care Systems should commission more health promotion, condition management and prevention services that promote the health and wellbeing of the workforce in the North.

9

Community public health budgets should be safeguarded so that action to relieve acute NHS backlogs does not undermine efforts to tackle the root causes of ill-health and boost health resilience.

10

Government and the NHS should deliver health and mental health promotion interventions together with industry and employers, targeted at employee mental and physical health.



1 Introduction

There is a well-known productivity gap between the three Northern regions (North East, North West, Yorkshire and Humber) and the rest of England of £4 per person per hour.³ There is also a large gap in health between the North and the rest of England, with life expectancy 2 years lower in the North. In our 2018 'Health for Wealth' report, the NHTA found that: improving health in the North would reduce the regional gap in productivity by 30% or £1.20 per-person per-hour, generating an additional £13.2 billion in UK GDP.⁴

However, since 2020, the COVID-19 pandemic has vastly changed the regional context. In autumn 2021, the NHTA published a report which examined the impact of the first year of the COVID-19 pandemic on health and productivity in the North⁵. We found large regional inequalities in the health and economic impacts of COVID-19 on the North including:

- COVID-19 deaths were 17% higher in the North of England.
- Hospital pressure due to COVID-19 was 10% higher in the North.
- The three northern regions spent an additional 6 weeks in the harshest lockdown restrictions.
- Unemployment in the north has been 20% higher since 2020,
- Wages in the North fell during the pandemic – whilst increasing elsewhere.
- The increased mortality in the North of England during the pandemic cost the national economy up to £7.3bn in lost productivity.

Despite the wide ranging health, social and economic impacts of the pandemic, there has been little exploration of the regional impacts on mental health. This introductory chapter provides background on productivity, mental health and COVID-19 in the North of England.

1.1 Productivity in the North

The UK's productivity crisis is well-documented and entrenched. While labour productivity grew at its fastest rate for a decade in the second half of last year, Britain's annual productivity rate remains well below its pre-crisis peak. Nowhere is this decline more pronounced than in the North – where job growth since 2004 has been less than 1% compared to over 12% in London, the South East and the South West.⁶ The North has not been benefiting from economic growth:

- The North of England generated over £327 billion Gross Value Added (GVA)⁷ to the UK economy in 2015 – around 20% of total UK GVA⁸.
- However, the North accounts for 25% of the UK population (16 million people - of which 63% are of working age)⁹ so GVA per worker is well below that of the rest of the UK.
- The average GVA output per worker in the North is £44,850 - 13% less than the national average.¹⁰
- GVA per hour worked was £28 in the North compared to £32 nationally.¹¹
- There are some places in the North that do better, such as Cheshire, but generally, productivity is lower in the North.¹²

- Average annual earnings in the North are more than 10% lower than the rest of England.¹³
- Economic inactivity rates were 25.8% in the North East compared to 18.8% in the South East.¹⁴
- Poverty rates are also over 5 percentage points higher in the North than the rest of England. For example, child poverty rates are 29% in the North East, 31% in the North West and 30% in Yorkshire and Humber, compared to 21% in the South East.¹⁵
- The North East (21%) and North West (19%) also have some of the highest levels of fuel poverty in England, whilst the South East (11%) has the lowest.¹⁶
- The northern economy has around 23% of the UK's jobs, but the job density rate¹⁷ for the Northern regions is 0.79 compared to 1.02 in London.^{18,19}

These productivity gaps are reflected in the North South health divide.

1.2 Health in the North

There are deep-rooted and persistent regional inequalities in health across England, with people in the North consistently found to be less healthy than those in the South - across all social groups and amongst both men and women.²⁰

There is a two year life expectancy gap between the North and the rest of England and premature death rates are 20% higher for those living in the North across all age groups.²¹ Over the last 50 years, this is equivalent to over 1.5 million Northerners dying earlier than if they had experienced the same lifetime health chances as those in the rest of England.²²

This health divide has been widening in recent years. Between 1965 and 1995, there was no health gap between younger Northerners aged 20-34 years and their counterparts in the rest of England. However, mortality is now 20% higher amongst young people living in the North. Similarly since 1995, for those aged 35-44 years, excess mortality in the North increased even more sharply to 49%.²³ England's regional health inequalities are now some of the largest in Europe.²⁴

Regional inequalities in mental health are also observed in England, with evidence suggesting a history of inequalities in mental health in the North.²⁵ The term 'mental health' has traditionally been used to refer to the absence of 'mental illness' or 'mental disorder'.²⁶

Mental disorders are conceptualised as a variety of presentations causing significant distress or impairment of functioning, characterised by "a combination of abnormal thoughts, perceptions, emotions, behaviour and relationships with others".

In recent decades, mental health has increasingly come to be understood as encompassing positive functioning and wellbeing rather than simply the absence of mental illness.²⁶ Mental health is now defined by the World Health Organisation as "a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community".²⁷ Despite this, measures of mental distress remain important indicators of population health.



In England, approximately 17% of adults surveyed by the most recent Adult Psychiatric Morbidity Survey in 2014 met the criteria for having a common mental disorder.²⁸ As defined by NICE, common mental disorders (CMDs) include depression, generalised anxiety disorder, panic disorder, obsessive-compulsive disorder (OCD), post-traumatic stress disorder (PTSD) and social anxiety disorder.^{29,30}

In 2017, each of the three Northern regions, the North East, the North West and Yorkshire and the Humber had a higher prevalence of common mental disorders (18.2%, 18.0%, 17.6% respectively) than the prevalence for England as a whole (16.9%).³¹ More recent evidence from a study using Public Health England data also suggested that there was a greater proportion of people in contact with secondary mental health services in North West regions, compared to the England as a whole.³²

Analyses from the NHTSA 2021 report also highlighted the unequal effects of the first year of the pandemic on mental health in the North.³³ The report showed that those living in the North, especially those in the North East and Yorkshire and the Humber, experienced a larger drop in mental health than those living in the rest of England.

There were also higher numbers of antidepressant prescriptions in the North, compared to the rest of England. These inequalities in mental health are also further stratified by other axes of inequality such as ethnicity, gender, income, age and education.

1.3 Health for Wealth

In our 2018 'Health for Wealth' report, the NHTSA explored the links between this regional health divide and the regional productivity divide.³⁴

We found that regional inequalities in health are the key reason for the productivity difference between the North and the rest of England. Long-term health conditions lead to economic inactivity, increased risk of job loss and lower wages. Improving health in the North would lead to substantial economic gains: it would reduce the £4 gap in productivity per-person per-hour between the Northern regions and the rest of England by 30% or £1.20 per-person per-hour, generating an additional £13.2 billion in UK GDP.

- Health is important for productivity: improving health could reduce the £4 gap in productivity between the North and the

rest of England by £1.20 per-person per-hour, generating an additional £13.2 billion in UK GDP.

- Reducing the number of working aged people with limiting long term health conditions by 10% would decrease rates of economic inactivity by 3 percentage points in the North.
- Increasing the NHS budget by 10% in the North will decrease economic inactivity rates by 3 percentage points.
- If they experience a spell of ill health, working people in the North are 39% more likely to lose their job compared to their counterparts in the Rest of England. If they subsequently get back into work, then their wages are 66% lower than a similar person in the Rest of England.
- Decreasing rates of ill health by 1.2% and decreasing mortality rates by 0.7% would reduce the gap in gross value added (GVA) per-head between the North and the Rest of England by 10%.
- Increasing proportion of people in good health in the North by 3.5% would reduce the employment gap between the North and the Rest of England by 10%.

So, given the relationship between health, health care and productivity in the North, in order to improve UK productivity, we need to improve health in the North. The COVID-19 pandemic has highlighted this issue even more.

1.4 COVID-19 and the North

The COVID-19 pandemic has hit the country unevenly with a disproportionate effect on the North of England. Our previous research found that COVID-19 deaths were 17% higher in the North of England, hospital pressure due to COVID-19 was 10% higher in the North and the three northern regions spent an additional 6 weeks in the harshest lockdown restrictions.³⁵

Unemployment in the North has been 20% higher since 2020, wages in the North fell during the pandemic and we estimated that the increased mortality in the North of England during the pandemic cost the national economy up to £7.3bn in lost productivity.

However, despite the well-established existence of regional inequalities in terms of health outcomes, access to resources and indeed the differential region-specific lockdown periods, little focus has yet been placed on investigating and describing potential region-specific inequalities in mental health during the COVID-19 pandemic. The pandemic impacted on mental health in various ways – the fear generated by a novel infectious disease, social isolation of lockdown, fear over future employment and income (especially for those on furlough or unemployed), co-morbidity with COVID-19 illness, lack of access to support services (especially for those with a pre-existing condition), lack of control and fears for the future.

The Northern Health Science Alliance therefore commissioned this report with the four Northern NIHR Applied Research Collaborations (ARC North East and North Cumbria, ARC Greater Manchester, ARC North West Coast, ARC Yorkshire and Humber) to understand the impact of the COVID-19 pandemic on mental health and productivity in the North and to explore the opportunities for 'levelling up' mental health and improve productivity, across the country.

1.5 COVID-19 and Mental Health

The rest of the report examines regional trends in mental health during the COVID-19 pandemic. It examines:

Chapter 2: Regional Trends in Mental Health during the COVID-19 Pandemic: overall

This chapter describes the trends and regional inequalities in mental health throughout the pandemic. Specifically, this chapter outlines changes in mental health measured using the General Health Questionnaire 12, as well as the proportion meeting the cut-off for likely diagnosable minor mental health disorder for the North compared to the rest of England. We show that mental health deteriorated over the peak period of the pandemic and that, though improving, this had not returned to pre-pandemic levels by the end of the survey data available.

Chapter 3: Inequalities in Mental Health during the COVID-19 Pandemic: by ethnicity, sex, income and age

This chapter examines inequalities in mental health for the North compared to the rest of England by sex, ethnicity, income and age. We show that women, people from ethnic minority backgrounds, those in the lowest quintile of income, and younger people (age 15-35) in the North had worse mental health throughout the pandemic. In particular, people from ethnic minority backgrounds in the North (especially women) had worse mental health.

Chapter 4: Regional Trends in Anti-Depressant Usage during the COVID-19 Pandemic

This chapter explores the trends in anti-depressant prescribing in the North and Rest of England. Anti-depressant prescribing data (expressed as the number of prescriptions per person), is an indicator of clinical depressive disorders. We show the North experienced greater volumes of anti-depressant prescriptions per-person before the pandemic and that this has been further exacerbated during the pandemic.

Chapter 5: Impact of the Parallel Pandemic on Productivity

This chapter combines estimates from earlier chapters of this report as well as previous evidence of the effect of mental health on economic productivity. We estimate that unless urgent action is taken, the reductions in mental health experienced in the North of England could cost the UK economy up to £2bn a year in lost productivity. This is in addition to the reductions in productivity caused by unemployment and furlough, which also hit the North hard during the pandemic.

Chapter 6: Policy Context and Recommendations

This chapter reflects on what is needed to improve mental health – particularly in the North and increase productivity. It suggests ways forward for local, regional and national policy makers in local authorities, national government and the NHS.



2 Regional trends in mental health during the COVID-19 Pandemic

Summary of key points

- Both the North and the rest of England experienced a fall in mental health during the COVID-19 pandemic, with scores at their lowest in January 2021 (approximately a 5% decrease in average GHQ-12 scores for both regions compared to 2019).
- By September 2021, average mental health scores had not returned to pre-pandemic levels. Average mental health scores were lower by 0.5, or half a point on the GHQ-12 scale, (a 2.0% decrease) in the North and 0.3 (a 1.3% decrease) in the rest of England in September 2021 compared to 2019.

Introduction

A large body of research has shown that mental health in the UK declined for many during the most intense period of the pandemic and associated periods of lockdown. Further to this, many of these studies have demonstrated mental health inequalities across age, sex, ethnicity and income. However, despite the well-established existence of regional inequalities in terms of health outcomes, access to resources and indeed the differential region-specific lockdown periods, little focus has yet been placed on investigating and describing potential region-specific inequalities in mental health during the COVID-19 pandemic.^{36,37,38,39,40}

Methods

Data and sample

This analysis used data from the nationally representative UK Household Longitudinal Survey (UKHLS; also known as Understanding Society) which aims to provide a sample of around 100,000 individuals living in around 40,000 households and collects information on a range of topics, including mental and physical health, socioeconomic position, and demographic characteristics of the individual and the household. The UKHLS has a complex and multi-stage sampling frame and includes a boost sample to increase the sample size of participants from an ethnic minority background. Further detail on the sample design of the survey is available online.^{41,42}

Mainstage survey data covering the period from January 2019 to December 2019 was used as a pre-COVID-19 baseline.⁴³ In addition, all nine waves of the COVID-19 survey (specifically covering the months April to July 2020, September 2020, November 2020, January 2021, March 2021 and September 2021) were included.⁴⁴ The COVID-19 survey is comprised of eligible participants from the mainstage data (those who participated in waves 8 or 9 of the mainstage survey) who responded to the COVID-19 surveys. Participants of the COVID-19 survey can therefore be linked to their responses in previous waves of the mainstage survey. Across each of the nine COVID-19 survey waves, sample size fluctuated at around 13,000, with a maximum of 16,662 at Wave 1 (April 2020) and a minimum of 11,797 in Wave 7 (November 2020).⁴⁵ Surveys were distributed and completed online. The two small telephone-based supplementary samples (fewer than 800 respondents) were not included in this analysis.⁴⁶ After refining the sample to participants with residential addresses based in England only, in 2019, the total sample size was

24,372 participants. Sample sizes of each of the COVID-19 study survey waves (April 2020-September 2021) after having been refined to England ranged from between 14,425 to 9,686.

Measures

Demographics

For all of the included survey waves, age was recoded into a categorical variable with the following seven brackets (in years): 15-25, 26-35, 36-45, 46-55, 56-65, 66-75, 76+. A second coding of the age variable with three categories was also created to aid the visualisation of age group specific trends: 15-35, 36-65, 66+. Sex was provided as a binary categorical variable in the survey data with available responses being 'male' or 'female'. Net household income was adjusted for the household size and composition by following as closely as possible the practice used in the OECD equivalence scale provided in the mainstage data.⁴⁷ A weight of 1 was assigned to the first adult in every household, 0.5 to all subsequent adults and 0.3 to each person aged 15 or under. Net household income was then divided by the household sum of this weight. This equivalised household income measure was calculated for both the mainstage and COVID-19 data. Educational qualification data was not available in the COVID-19 survey waves and was instead imputed from the 2019 mainstage data. Educational qualifications were recoded into three categories: GCSE or lower (including no qualifications), A-level, and higher education qualification or above. Due to limitations in sample size for analyses by region, ethnicity was recoded into a binary variable with respondents allocated to white British or ethnic minority categories.⁴⁸ Further detail on the sample size of people from ethnic minority backgrounds is available in the Appendix tables A.1 and A.2.

Self-reported mental health

The 12-item version of the General Health Questionnaire (GHQ-12) was operationalised to assess non-psychotic mental ill health (such as anxiety and depression). Likert responses (coded 0-3) to each of the 12 questions were summed and reverse coded, such that higher values indicated better mental health. The scale is commonly operationalised in a 0-36 unidimensional format but can also be used in a 'caseness' approach. The 'caseness' measure recodes 1 and 2 values to zero and 3 and 4 values to 1, so that when summed the scale runs from 1 to 12.⁴⁹ A score greater than or equal to 4 on this scale is then taken as a cut-off to indicate the probable presence of a diagnosable mental health disorder.⁵⁰

Analysis

The survey waves were largely used as repeated cross-sections in this analysis (with the exception of the results presented in Figure 2.2 where respondents' data from 2019 and September 2021 were linked so that within-person change in mental health could be quantified).

Results

Baseline characteristics in 2019

Table 2.1 presents descriptive statistics for the sample. The sample was comprised of a greater proportion of women than men across all regions (55.3% for the overall sample). The largest age category across all regions

was 46-55 (range: 16.8%-20.6%), except in the North East where it was the 56-65 category (20.4%) and North West where it was the 36-46 group (17.7%). The sample was predominantly White British (74.4% for the overall sample), with the lowest proportion in London (33.0%) and the highest in the North East (95.0%). The average household income (equivalised using a modified approach to the OECD scale described above) for the sample was £14812.35, with the highest average found in London (£17952.91) and the lowest in Yorkshire and The Humber (£12628.08). Finally, a large proportion of the sample had GCSE or lower level education (47.9%). The proportion of people in the lowest category of education was highest in the North East (56.0%) and lowest in London (36.8%).

Mental health

Using the 2019 wave (taken as a pre-pandemic baseline in this study), the average GHQ-12 score (coded so that higher values mean better mental

health) for the whole of England was 24.55 (SD 5.63). Table 2.2 shows the average GHQ-12 score and proportion meeting the threshold for a minor mental health disorder for each of the three Northern regions (the North East, North West and Yorkshire and the Humber), for these Northern regions pooled and for the rest of England (the East Midlands, West Midlands, the East of England, London, the South East and the South West pooled). These average scores and proportions are presented for 2019 and the last wave of the COVID-19 survey (September 2021), alongside the difference between the averages or percentages at both waves. At baseline, all regions had similar GHQ-12 scores (around 24.5). The North West had the largest reduction in average GHQ-12 scores (indicating worse mental health) from 2019 to September 2021 (-0.67), followed by the North overall (-0.50). Similarly, the North West also had the largest increase in the proportion of participants meeting the threshold for a diagnosable minor psychiatric disorder (1.07).

Table 2.1 – Descriptive statistics for the sample at baseline (2019) – figures are n(%) unless otherwise stated

	North East & The Humber	North West	Yorkshire	East Midlands	West Midlands	East England	London	South East	South West	Total
Sex										
Male	479 (44.39)	1469 (45.73)	1252 (45.20)	1000 (45.05)	1140 (43.12)	1207 (45.16)	1640 (44.28)	1612 (44.09)	1095 (45.36)	10894 (44.70)
Female	600 (55.61)	1743 (54.27)	1518 (54.80)	1220 (54.95)	1504 (56.88)	1466 (54.84)	2064 (55.72)	2044 (55.91)	1319 (54.64)	13478 (55.30)
Age										
18-25	130 (12.05)	440 (13.70)	382 (13.79)	276 (12.43)	393 (14.86)	325 (12.17)	632 (17.06)	441 (12.07)	261 (10.81)	3280 (13.46)
26-35	119 (11.03)	418 (13.01)	395 (14.26)	280 (12.61)	347 (13.12)	292 (10.93)	519 (14.01)	416 (11.38)	253 (10.48)	3039 (12.47)
36-45	163 (15.11)	569 (17.71)	430 (15.52)	296 (13.33)	428 (16.19)	445 (16.66)	657 (17.74)	546 (14.94)	316 (13.09)	3850 (15.80)
46-55	200 (18.54)	538 (16.75)	522 (18.84)	422 (19.01)	456 (17.25)	452 (16.92)	762 (20.57)	670 (18.34)	447 (18.52)	4469 (18.34)
56-65	220 (20.39)	508 (15.82)	416 (15.02)	391 (17.61)	437 (16.53)	448 (16.77)	526 (14.20)	642 (17.57)	453 (18.77)	4041 (16.58)
66-75	153 (14.18)	477 (14.85)	396 (14.30)	352 (15.86)	360 (13.62)	426 (15.95)	368 (9.94)	596 (16.31)	427 (17.69)	3555 (14.59)
76+	94 (8.71)	262 (8.16)	229 (8.27)	203 (9.14)	223 (8.43)	283 (10.60)	240 (6.48)	343 (9.39)	257 (10.65)	2134 (8.76)
Ethnicity										
White British	1014 (95.03)	2497 (78.25)	694 (21.75)	1,887 (85.46)	1761 (67.24)	2214 (83.71)	1214 (33.01)	3045 (83.93)	2218 (92.53)	17976 (74.36)
Ethnic minority ⁵¹	53 (4.97)	694 (21.75)	616 (22.47)	321 (14.54)	858 (32.76)	431 (16.29)	2464 (66.99)	583 (16.07)	179 (7.47)	6199 (25.64)
Household income⁵²										
Mean (SD)	13194.94 (17832.19)	13782.96 (14921.8)	12628.08 (12010.11)	13460.78 (13463.42)	13610.84 (13666.46)	15172.77 (15592.81)	17952.91 (23089.78)	16166.2 (15537.36)	14747.46 (19948.49)	14812.35 (16806.76)
Education										
None/GCSE	561 (55.99)	1453 (50.64)	1321 (52.84)	1112 (54.89)	1221 (50.68)	1216 (49.96)	1226 (36.84)	1421 (42.81)	1051 (47.54)	10,582 (47.89)
A-level	100 (9.98)	324 (11.29)	298 (11.92)	208 (10.27)	297 (12.33)	237 (9.74)	474 (14.24)	391 (11.78)	224 (10.13)	2,553 (11.55)
Higher	341 (34.03)	1092 (38.06)	881 (35.24)	706 (34.85)	891 (36.99)	981 (40.30)	1628 (48.92)	1507 (45.41)	936 (42.33)	8,963 (40.56)

Table 2.2 – Mental health in 2019 compared to September 2021 by region

	2019					September 2021					Difference				
	NE	NW	YH	North	Rest E	NE	NW	YH	North	Rest E	NE	NW	YH	North	Rest E
GHQ-12 (SD)	24.56 (5.53)	24.57 (5.59)	24.44 (5.75)	24.52 (5.64)	24.56 (5.62)	24.37 (5.48)	23.90 (6.02)	24.01 (6.03)	24.02 (5.94)	24.25 (5.76)	-0.19	-0.67	-0.43	-0.50	-0.31
Probable disorder															
No (%)	839 (79.90)	2,457 (80.69)	2,005 (79.31)	5,301 (80.04)	12,945 (80.21)	343 (81.67)	973 (79.62)	846 (79.51)	2,162 (79.90)	5,901 (80.46)					
Yes (%)	211 (20.10)	588 (19.31)	523 (20.69)	1,322 (19.96)	3,193 (19.79)	77 (18.33)	249 (20.38)	218 (20.49)	544 (20.10)	1,433 (19.54)	-1.77	1.07	-0.2	-0.14	-0.25

Figure 2.1 shows the trend in average GHQ-12 scores from 2019 throughout the pandemic for the North compared to the rest of England. This figure demonstrates that there was a substantial fall in average GHQ-12 scores (whereby lower scores indicate worse mental health) during the peak period of the pandemic for both the North and the rest of England. In this figure, average scores for the North and the rest of England appear very similar. Though average GHQ-12 scores appear to have been increasing since January 2021, data from the final wave of the COVID-19 survey (September 2021) indicated that they had not returned to the pre-pandemic average. This is further demonstrated in Figure 2.2, which shows that on average, there was a decline in individual level mental health status (measured using the within-person change in GHQ-12 scores) across all of the Northern regions, as well as in the rest of England. The average within-person change in mental health status was largest for individuals in the North West (-0.75) followed by the North overall (-0.59).⁵³

GHQ-12 can also be operationalised in a 'caseness' format to indicate a probable non-psychotic diagnosable minor mental health disorder. Figure 2.3 illustrates regional differences in GHQ-12, operationalised as a binary 'caseness' indicator.

Figure 2.1 - Trends in GHQ-12 (higher scores indicating better mental health) between 2019 and September 2021 by region



Figure 2.3 Proportion with scores indicating potential presence of minor psychiatric disorder: 2019, March 2020 and September 2021

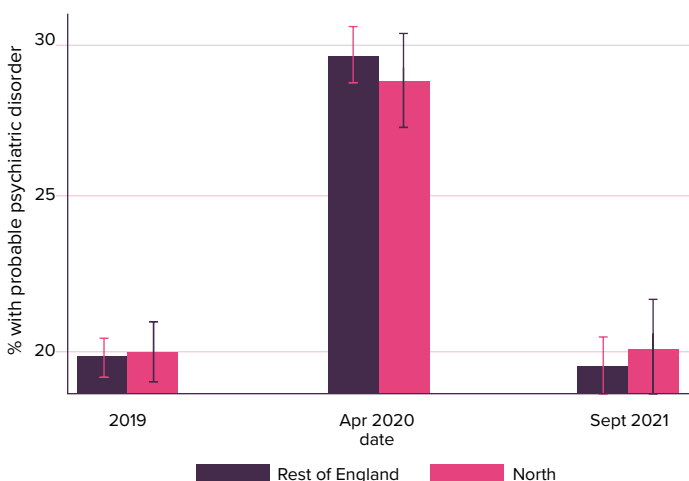
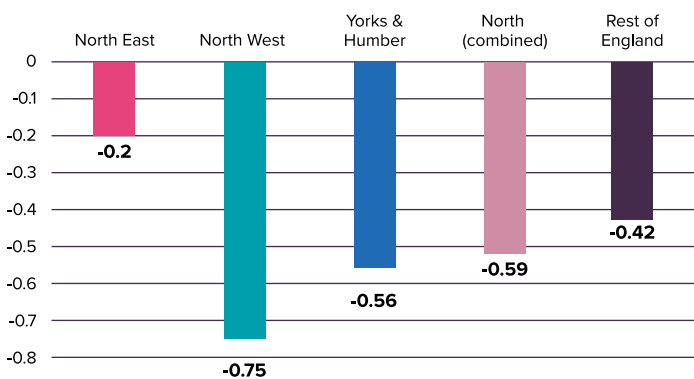


Figure 2.3 shows that compared with the baseline (2019), the proportion of people with scores indicating the potential presence of a minor psychiatric disorder increased substantially in April 2020 (the first month of the COVID-19 survey), and then decreased in September 2021 back to levels similar to those in 2019.⁵⁵ There did not appear to be much difference between the North and the rest of England in this pattern.

Conclusions

This chapter has examined regional trends in mental health during the COVID-19 pandemic. We found that, on average, both the North and the rest of England experienced a deterioration in mental health during the pandemic (with the largest decrease observed in average GHQ-12 scores of approximately 5% for both regions in January 2021 compared to 2019). By September 2021 mental health had not returned to pre-pandemic levels and the situation was worse in the North. Compared to before the pandemic in 2019, mental health was 0.5, or half a point, lower on the GHQ-12 scale, (a 2.04% decrease) in the North and 0.31 (a 1.26% decrease) in the rest of England at the final wave of the COVID-19 survey (September 2021).

Figure 2.2 - Average within-person change in mental health: 2019 to September 2021⁵⁴



3 Inequalities in mental health during the COVID-19 Pandemic: by ethnicity, sex, income and age

Summary of key points

- Before the pandemic, people from ethnic minority⁵⁶ backgrounds had similar mental health scores to those from a white British background. However, at the start of the pandemic a fall in average mental health scores was observed to a greater extent in ethnic minority groups (a fall of 1.6 points on the GHQ-12 scale, compared to 0.9). This fall was greater for those from ethnic minority backgrounds in the North (a fall of 2.3, compared to 1.5 for the rest of England), and these scores remained lower throughout the pandemic.
- In analyses by sex and ethnicity, ethnic minority women living in the North had the lowest average mental health scores throughout the pandemic. These scores were lower than ethnic minority women living in the rest of England. In the last wave of the COVID-19 survey the average GHQ-12 score for ethnic minority women in the North was 1.6 points lower than the average score of ethnic minority women in the rest of England.
- The gap in average mental health between the lowest and highest earners increased during the pandemic and remains large. In 2019 the difference in average GHQ-12 score between the top and bottom quintiles of income was 0.47 points. This more than quadrupled and stood at 2.16 points at the end of the survey in September 2021.
- By age group, the proportion of people with a probable psychiatric disorder increased between 2019 and September 2021 the most for those under 35 living in the North (by 2.5 percentage points).

Introduction

In this chapter, inequalities in mental health by sex, ethnicity, income, and age for the North compared to the rest of England are examined.

Methods

The methods for this chapter are outlined in Chapter 2.

Results

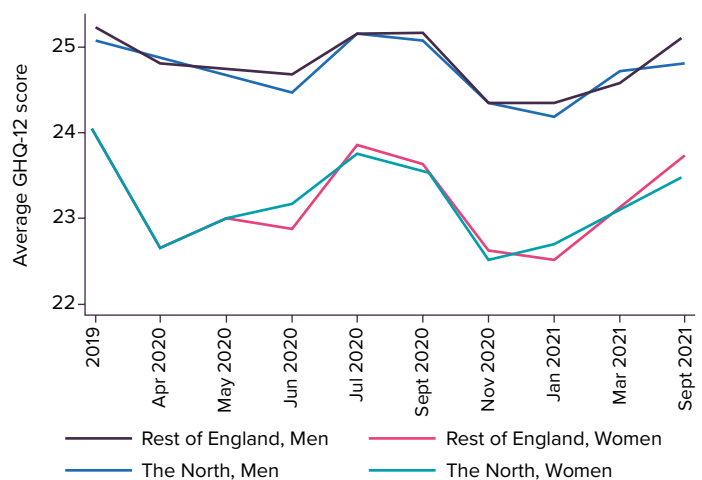
Sex

Figure 3.1 shows the trend in average GHQ-12 score over time by sex. On average, women had lower GHQ-12 scores compared to men throughout the COVID-19 pandemic. These trends appear largely similar in the North and the rest of England.

Ethnicity

Descriptive analyses by ethnicity (white British compared to ethnic minority), presented in Figure 3.2, show that on average, people from ethnic minority backgrounds had similar mental health scores to those from White British backgrounds in 2019. However, average GHQ-12 scores dropped by a greater extent in the ethnic minority group than in the White British group. Though average GHQ-12 scores by region

Figure 3.1 - Trends in GHQ-12 (higher scores indicating better mental health) between 2019 and September 2021 by region and sex



appeared similar for those from a white British background, people from an ethnic minority background had worse average GHQ-12 scores over time in the North compared to the rest of England.

Sex and Ethnicity

Analyses of GHQ-12 trends in the North compared to the rest of England by both sex and ethnic group were then performed and results presented in Figure 3.3. Ethnic minority women in both regions had the lowest average GHQ-12 scores, with those from the North having the lowest.

While in the rest of England white British women and ethnic minority women had similarly low average GHQ-12 scores, in the North, the gap was much wider. Mental health for white British men in both areas appeared similar across time. However, a gap between men from ethnic minority groups between the regions was observed, with those from the North again having the lowest average GHQ-12 scores of the two groups.

Income

Figure 3.4 shows the trend in average GHQ-12 scores by the bottom (quintile 1) and top (quintile 5) quintiles of income for the North and the rest of England.⁵⁷ The trend for each quintile was broadly similar between the North and the rest of England where average scores in the highest income quintile in both areas appeared largely unaffected by the COVID-19 pandemic period. In addition, average scores at the final COVID-19 survey wave were similar to the 2019 average for the fifth quintile group. However, though average mental health appeared to be trending upwards after November 2020 for the lowest income group,

this had not returned to the 2019 average by the final wave and the gap between the first and fifth quintiles remains much larger in September 2021 than it was in 2019 (a difference of 0.47 points on the GHQ-12 scale in 2019, compared to 2.16 points in September 2021 for England overall).

Age

Finally, Figure 3.5 shows the difference in percentage points from 2019 to September 2021 in the proportion of people meeting the cut-off for the potential presence of a minor psychiatric disorder by age group. In both regions, the 36-65 age group had the smallest change between the baseline wave and the final wave of the COVID-19 survey, with an increase of between 0.61 and 0.88 percentage points.

The largest increase in the North was for the 15-35 age group (of 2.5 percentage points), whereas this group saw a reduction in the rest of England. The largest increase for the rest of England was the 66-75+ age group (with an increase of 1.89 percentage points), whereas this group saw a reduction in those meeting the threshold in the North.

Conclusions

In this chapter, we show that across England, women had worse average mental health scores than men and that people from ethnic minority background had worse mental health than people from white British backgrounds.⁵⁸ We additionally show that average mental health scores were lower (worse) for people from ethnic minority backgrounds in the North compared to the rest of England, and especially so for women from ethnic minority backgrounds in the North. We go on to demonstrate a gap in average mental health scores between the lowest and highest household income groups which grew over the pandemic and remains large. Finally, we show that the young adults age group (15-35) in the North suffered the largest increase in people meeting the threshold for probable non-psychotic mental illness in terms of percentage points from 2019 to September 2021.

In summary, these results suggest that inequalities exist in mental health by sex, ethnicity, income and age across England and between the North and the rest of England. In particular, they highlight the existence and widening of inequalities in mental health by income and demonstrate the inequalities in mental health impacting women from ethnic minority groups in the North in particular.

Figure 3.2 - Trends in GHQ-12 (higher scores indicating better mental health) between 2019 and September 2021 by region and ethnic group

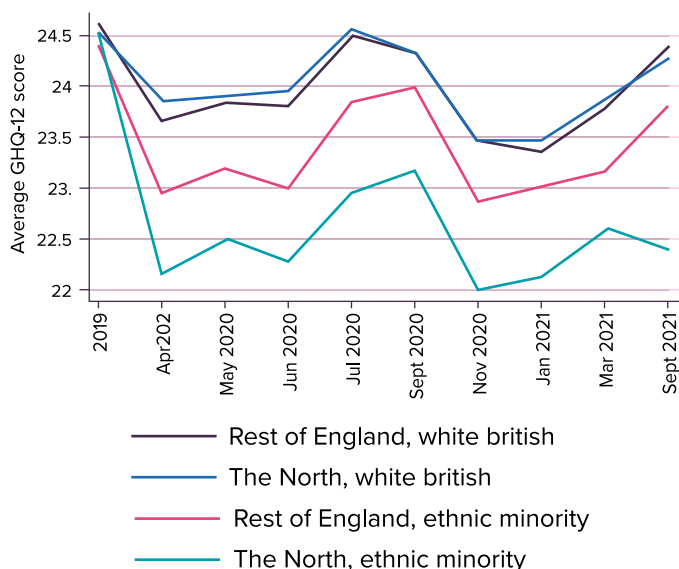


Figure 3.3 - Trends in GHQ-12 (higher scores indicating better mental health) between 2019 and September 2021 by region, sex, and ethnic group

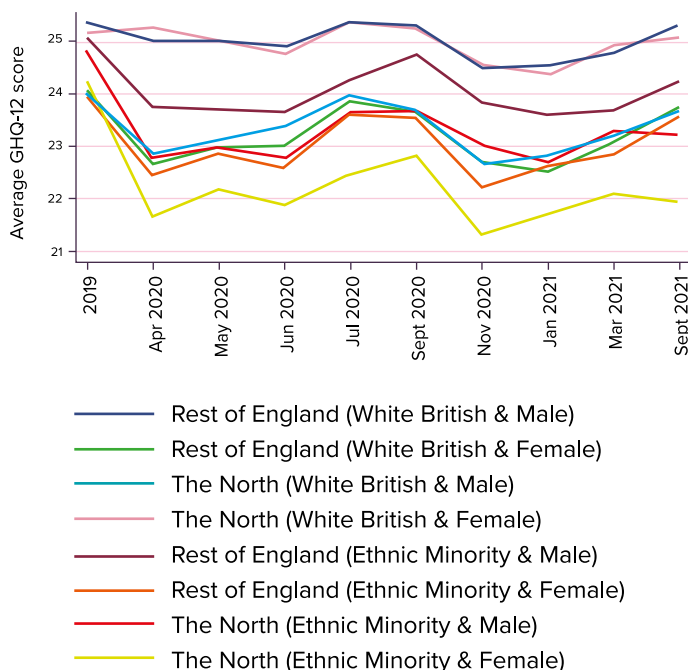


Figure 3.4 - Trends in GHQ-12 (higher scores indicating better mental health) between 2019 and September 2021 by the top and bottom quintiles of income

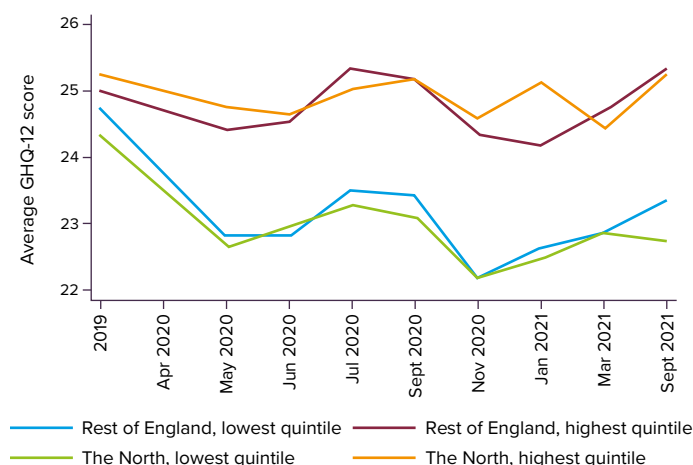
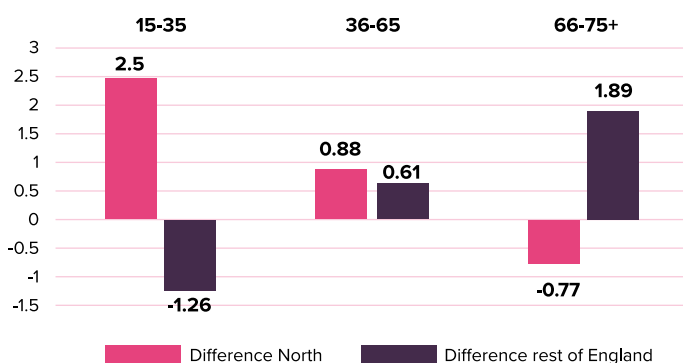


Figure 3.5 - Difference in percentage points of those meeting the cut-off for a minor psychiatric disorder: 2019 to September 2021



4 Regional trends in anti-depressant prescribing before and during the COVID-19 Pandemic

Summary

We found that individuals living in the North:

- Experienced greater numbers of anti-depressants prescribed per person over the three years prior to the pandemic, and this remained the case during the pandemic.
- The average number of anti-depressant prescriptions before the pandemic in the North was 4.73 per person (95% CI: 4.64 to 4.82) compared to 3.86 per person in the Rest of England (95% CI: 3.79 to 3.94.)
- During the pandemic the average number of anti-depressant prescriptions in the North was 5.32 per person (95% CI: 5.22 to 5.42) compared to 4.37 per person in the Rest of England (95% CI: 4.28 to 4.45).
- During the pandemic the North East & Yorkshire and the North West experienced the greatest volume of anti-depressant prescriptions at 5.39 (95% CI: 5.29 to 5.49) and 5.27 (95% CI: 5.17 to 5.37) per person, respectively.
- The pandemic affected both the North and the rest of England, but the North experienced the largest hit to mental health as suggested by medication trends. The North experienced an increase in the numbers of anti-depressants prescribed over and above that experienced in the rest of the country.

Introduction

In this chapter we explore the use of mental health services before and during the pandemic. We use anti-depressant prescribing data as an indicator for the presence of depressive disorders. Here we assume that greater rates of prescribed anti-depressants indicate higher prevalence of depressive disorders.⁵⁹ Other data on interactions with mental health services during the pandemic are not yet available at a granular level to allow us to explore regional differences. We outline some potential limitations of this approach in the discussion.

Methods

Data and Sample

We use data coded in the British National Formulary (BNF) directory as an antidepressant which include: tricyclic and related antidepressant drugs, monoamineoxidase inhibitors, selective serotonin re-uptake inhibitors and other antidepressant drugs.⁶⁰ The dataset is a complete record of detailed information relating to prescriptions issued in England (but may have been dispensed in England, Wales, Scotland, Guernsey, Alderney, Jersey, and the Isle of Man). Data are coded at the GP practice level, but are aggregated and released at the Clinical Commissioning Group (CCG) level.

CCGs are clinically-led statutory National Health Service (NHS) bodies that

have a responsibility for the planning and commissioning of health care services in their local area. They were created following the Health and Social Care Act in 2012, and replaced Primary Care Trusts (PCTs) on 1 April 2013. The number of CCGs has fluctuated overtime following mergers. In the dataset we use, there are 106 CCGs in England. Each CCG is located entirely within an NHS region. There are seven NHS regions, which differ slightly from the nine government office regions.⁶¹ The North (consisting of the North West and North East and Yorkshire) contains 51 CCGs whereas the rest of England (consisting of London, Midlands, East of England, South East and South West) contains 55 CCGs.

To calculate the rate of anti-depressants prescribed per person we used the total quantity of prescriptions and population sizes in CCGs. Using per-person measures accounts for the unequal sizes of CCGs. However, it does not account for the fact that the prevalence of mental health conditions may differ by CCG.

Analysis

We present the trends in anti-depressant prescribing over a five-year period prior (January 2017 to November 2021), consisting of a pre-pandemic period (January 2017 to February 2020) and a 20-month period during the pandemic (defined as March 2020 to November 2021) by NHS region and North vs Rest of England.

Given the increase trends in prescription in both the North of England and the rest of England before the pandemic, we use a statistical model to allow us to investigate if there was bigger increases during the pandemic in the North of England. To investigate if the pandemic had a differential impact on the prescription of anti-depressants in the North of England compared to the rest of England, we implemented a 'difference-in-difference' specification. A difference-in-difference model is a form of a 'controlled before-and-after' design.

The difference-in-difference design allowed us to examine the differential impact of the parallel pandemic by comparing the change in the prescription of anti-depressants from before the pandemic to during the pandemic observed in the North of England to the change in the prescription of anti-depressants from before the pandemic to during the pandemic observed in the rest of England. Simply focussing on the North alone may lead to biased results, due to, for example, regression to the mean. By comparing changes in trends in the North to changes in trends in the rest of the country, we can abstract away from these concerns.

Difference-in-difference involves estimating models of the form:

Equation 4 1

$$y_{it} = \alpha + \beta \text{North}_i + \gamma \text{After}_t + \delta (\text{North}_i * \text{After}_t) + \tau_i + \epsilon_{it}$$

where y_{it} is the per-person prescription of anti-depressant medication in CCG i in month t , North_i is a binary variable equal to one if CCG i is in

the North of England and zero for the rest of England, After is a binary variable equal to one if the month of observation is during the pandemic (March 2020 or later) and zero for pre-pandemic months. The interaction term is equal to one if and only if the observation relates to a Northern CCG in a pandemic month. The key parameter of interest is δ and it tells us if there was differential effects of the pandemic experienced between the North and the rest of England. We additionally included year and month fixed effects to account for seasonal variation.

Results

In all of the trends presented, we observe that the number of anti-depressants prescribed per-person fluctuate seasonally throughout the year. This fluctuation is pretty uniform across the different NHS regions. In the three years prior to the pandemic, we observe that Northern regions consistently experienced higher levels of anti-depressant prescribing than regions in the rest of England. The North East and Yorkshire and the North West had the highest and second highest average number of anti-depressant prescribing per person during this period (Table 4.1).

In the two years during of the pandemic, the North East and Yorkshire and the North West had the highest and second highest average number of anti-depressants prescribed per person at 5.39 and 5.27, respectively (Table 4.2). London and the South East remained the lowest and second lowest with average numbers per person at 2.44 and 4.27, respectively (Table 4.2).

In Figure 4.1 and Figure 4.2, we see a gap between the North and the rest of England in the numbers of anti-depressants prescribed per-person. Prior to the pandemic, the North had consistently greater numbers of anti-depressant prescriptions per person (4.73) compared to the rest of England (3.86). In line with previous years, during the pandemic the North had a greater numbers of anti-depressant prescriptions per person (5.32) compared to the rest of England (4.37).

Figure 4.3 presents a graphical depiction of the difference-in-difference specification. The grey squares are the average number of anti-depressants prescribed per-person in the North and the grey dots are the corresponding averages in the rest of the country. The (top) dashed red line is a linear trend based on pre-pandemic values for the North and the (bottom) dashed red line is a linear trends based on pre-pandemic values for the rest of England. The solid lines are locally smoothed polynomial lines that best fit the data. During the pandemic, the lines in the North are above their expected values whereas in the rest of England they are very similar. We can quantify these changes in trends using linear regressions (Equation 4-1).

Table 4.3 presents the results from the difference-in-difference specification. Throughout the full five year period, the North experienced 1.1 unit ($p < 0.01$, the coefficient on North) higher prescriptions of anti-depressants per-person compared with the rest of the England. During the pandemic, prescriptions per-person increased in both regions by 0.1 ($p < 0.10$, the coefficient on After).

This increase is not significant at $p < 0.05$, but we hypothesise this is likely due to the lag-effect and this difference will remain and become statistically significant in the absence of intervention. However, the North experienced an additional increase of 0.1 units of antidepressant prescription ($p < 0.05$, the coefficient on North*After) compared to the rest of the country. This confirms the graphical analysis presented in Figure 4.3.

This additional increment experienced in the North is around 2% of the pre-pandemic level, or around 37% of a standard deviation. This is over and above the increases experienced in the rest of England.

Table 4.1 Mean number of anti-depressants prescribed per-person between January 2017 and February 2020 (pre-pandemic)

	Mean	Std. dev.	[95% conf. interval]
North	4.728	0.273	4.639 to 4.816
Rest of England	3.863	0.222	3.791 to 3.935
East of England	4.040	0.230	3.965 to 4.114
London	2.163	0.119	2.124 to 2.202
Midlands	4.016	0.245	3.937 to 4.096
North East & Yorkshire	4.756	0.285	4.664 to 4.849
North West	4.702	0.263	4.617 to 4.787
South East	3.805	0.209	3.737 to 3.873
South West	4.418	0.248	4.337 to 4.498

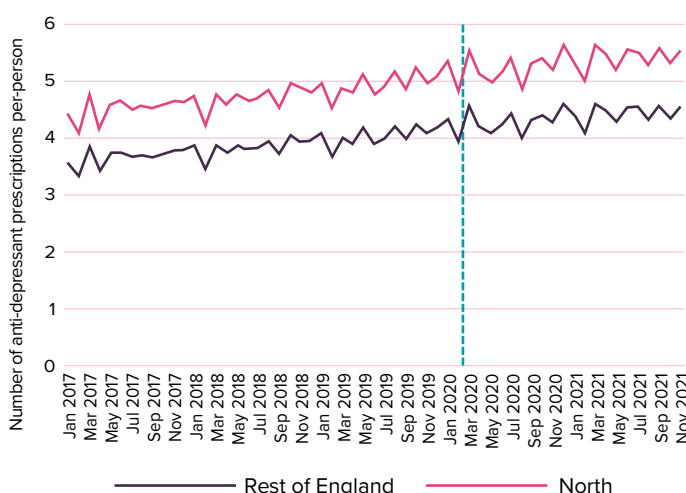
Table 4.2 Mean number of anti-depressants prescribed per-person between March 2020 and November 2021 (during the pandemic)

	Mean	Std. dev.	[95% conf. interval]
North	5.323	0.221	5.223 to 5.424
Rest of England	4.369	0.178	4.288 to 4.450
East of England	4.559	0.171	4.481 to 4.636
London	2.444	0.113	2.393 to 2.496
Midlands	4.570	0.196	4.481 to 4.659
North East & Yorks	5.387	0.225	5.285 to 5.489
North West	5.267	0.219	5.167 to 5.366
South East	4.270	0.177	4.190 to 4.351
South West	5.002	0.204	4.909 to 5.095

Table 4.3 Difference in difference estimation of the effect of the pandemic on the prescription of antidepressants

	Coefficient	95% Confidence Interval
North	1.05***	[0.99 to 1.10]
After	0.13	[-0.18 to 0.29]
North * After	0.12*	[0.03 to 0.21]
N	120	

Figure 4.1 Trends in rate of anti-depressant prescriptions per-person during the COVID-19 Pandemic (January 2017 –November 2021) by region. Dashed red line represents start of the COVID-19 pandemic (March 2020)



Discussion

We acknowledge that antidepressant prescribing rates are not necessarily the ideal indicator of depression prevalence due to a number of factors which we outline below. However other data on interactions with mental health services during the pandemic are not yet available at a granular level to allow us to explore regional differences, therefore antidepressant prescribing is used an indicator for the purposes of this report.

First, we are aware that that tricyclics, MAO-is and SSRIs have a diverse range of indications. They are often used not just for depression but for other common mental disorders, including generalised anxiety disorder, panic disorder, OCD, and PTSD. They are also used for other physical health conditions e.g. duloxetine for stress incontinence, fluoxetine for menopausal symptoms, amitriptyline for neuropathic pain.

Therefore, we acknowledge that relying on the prescription of these medications may overestimate the likely prevalence of depression. However, we have no reason to assume that this would affect the North and the rest of England in a differential way, and hence don't think it should in anyway bias our results or interpretation.

Secondly, there is evidence that suggests that social deprivation, ethnicity and physical illness have associations with antidepressant prescribing.⁶² A similar, albeit later, analysis by the Health Foundation found similar patterns. They additionally find that anti-depressant prescribing was associated with the prevalence of depression, although the increase in



depression was not fully explained by the increased prescribing of anti-depressives.⁶³

Conclusions

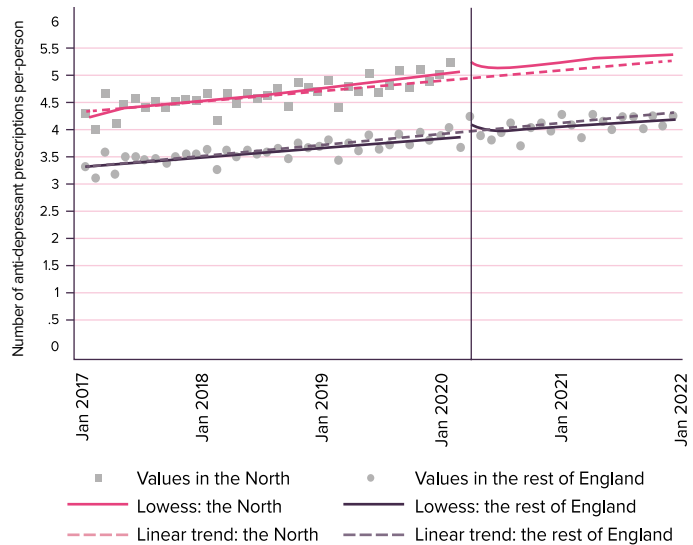
In this chapter, we use anti-depressant prescribing as a proxy for depressive disorders and demonstrate the North experienced greater rates both before and during the pandemic. Considering the gradual rise in anti-depressant prescribing over time, we used a model that allowed us to test whether there was an additional increase in the number of prescriptions in the North compared to the rest of the country as a result of the pandemic.

We observed that both the North and the rest of England saw prescriptions increase, but that the North experienced significantly higher numbers of anti-depressant prescribing than the rest of England. This implies that the rates of prescriptions were already higher pre-pandemic, and the pandemic has exacerbated this inequality – highlighting the parallel pandemic.

Figure 4.2 Trends in rate of anti-depressant prescriptions per-person during the COVID-19 Pandemic (March 2020-November 2021) in the North and the Rest of England (RoE)



Figure 4.3 A graphical depiction of the difference in differences



Notes: The model is estimated using OLS with robust standard errors, clustered at the level of aggregation (North/rest of England). The same size indicates there are 120 monthly observations observed in two groups (North and rest of England). The model also includes fixed effects for years and months, but these are omitted here for brevity. * p<0.1, ** p<0.01, *** p<0.001

5 Impact of the Parallel Pandemic on Productivity

Introduction

Productivity has fallen throughout the country for a number of reasons, including unemployment and furlough. However, we have previously demonstrated that health is important for productivity too.⁶⁴ Given the huge mental health implications of the pandemic – and particularly the geographical inequalities that exist – we expect the parallel pandemic to further effect productivity in the North. In Chapter 2, we observed that the pandemic had caused a reduction in mental health in the North and the rest of the country, where mental health was measured using the General Health Questionnaire (GHQ). In the North, this reduction (from 2019 to September 2021) was around 0.5 points (on a 0-36 scale), equivalent to 8.87% of a standard deviation (Table 2.2). The corresponding reduction in the rest of England was 0.31 points, equivalent to 5.51% of a standard deviation. In this chapter, we used past estimates of the relationship between reductions in mental health and economic productivity to estimate the potential cost to the economy of this reduction in mental health in the North.

Methods

Using data from 2011 to 2018 (latest available data), we ran a fixed-effects linear model to estimate the relationship between mental well-being (measured using the Small Area Mental Health index (SAMHI), a composite measure of mental health⁶⁵) and Gross Value Added (GVA) at a local authority level within the North. GVA was deflated to 2018 prices to remove any possible inflationary changes.

The use of fixed-effects models allowed us to isolate the within area changes in mental well-being and how they correlated with the within area changes in GVA. This allowed us to abstract away from factors that were largely time invariant (i.e. deprivation and need). We also account for population characteristics known to be associated with GVA.

The results from this model are presented in Figure 5.1, where it can be seen that a one standard deviation increase in poor mental well-being was associated with a £1,491 (95% CI: £685.37 to £2,298.31) decrease in GVA per-head in the North. Results for the rest of England are qualitatively similar.

Results

Given that COVID-19 has caused a 8.87% of a standard deviation decrease in mental health in the North, we estimate this could translate into around a £132 (=0.887*£1491) reduction in GVA per-head in the North if this reduction in the levels of mental well-being is maintained. Given a population size of 15.5 million people in the North, this loss in GVA in the study period is equivalent to around £2 billion (£2,046,000,000) in the period April 2020 to September 2021. This is shown in Figure 5.1 and Table 5.1.

Conclusions

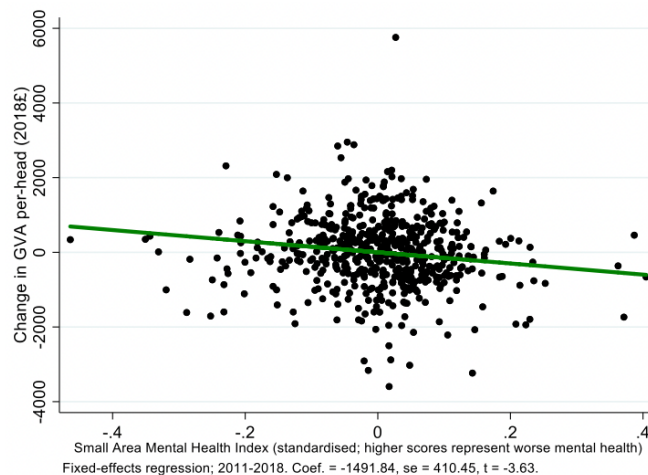
Productivity has fallen during the pandemic because of economic factors including unemployment and furlough. However, we know that health – in particular mental health – also affects productivity. We have shown here that the effects of the pandemic on mental health within the North of England could cost the UK economy an additional £2bn unless urgent action is taken.

Table 5.1 The relationship between mental health and Gross Value Added (GVA) per-head at local authority level within the Northern Powerhouse; 2011 – 2018

	GVA per-head (2018£)
SAMHI	-1491.839*** (-2298.310 to -685.368)
Population size (number of people)	-0.018 (-0.038 to 0.002)
% of population (aged 16+) with no qualifications	-12.785 (-64.648 to 39.078)
% of population (aged 16+) who are aged 16-64	-15.881 (-85.487 to 53.725)
% of population (aged 16+) who are white UK nationals	21.129 (-33.143 to 75.401)
Year effects (base=2011)	
2012	370.746* (28.230 to 713.263)
2013	637.368** (254.928 to 1019.808)
2014	1150.600*** (671.811 to 1629.389)
2015	1901.077*** (1353.403 to 2448.752)
2016	2160.251*** (1524.909 to 2795.593)
2017	2602.668*** (1893.408 to 3311.927)
2018	3069.439*** (2227.608 to 3911.270)
N	72
Observations (N*T)	569

Model is a fixed-effects linear model to account for within LAD variation. The model is additionally weighted by the population size of a LAD. SAMHI = small-area mental health index, which is standardised to have mean zero and unitary standard deviation. It is increasing in poor mental health (higher scores relate to worse mental health outcomes). GVA is deflated to 2018 prices. 95% Confidence Intervals in brackets. * p<0.05; ** p<0.01; *** p<0.001.

Figure 5.1 The relationship between mental health and Gross Value Added (GVA) at local authority level within the Northern Powerhouse; 2011 – 2018



Note: the model also includes year fixed-effects, the LAD's total population (number of people), the % of the population (aged over 16+) who have no qualifications, the % of the population (aged over 16+) who are aged 16-64, and the % of the population (aged over 16+) who are white UK nationals. GVA is deflated to 2018 prices. The regression was weighted by the size of the LAD population. Full regression results are contained in Table 5.1.

6 Policy Recommendations

Mental illness is the second largest source of burden of disease in England and is related to several co-morbidities including cardiovascular disease, respiratory and cancer. Poor mental health is strongly associated with social deprivation.

The Government has committed to tackling poor health in England and to improving healthy life expectancy by five years by 2035 in its Levelling Up White Paper.

If it is to achieve this goal improving mental health in the North of England will be central to achieving it. However, as our report shows, there are considerable challenges that need to be met.

The pandemic has made mental health for those in the North of England even worse. Coupled with a cost-of-living crisis that is hitting the poorest hardest strong policy measures need to be taken straight away to stop the parallel pandemic escalating further.

1 Increase NHS and local authority resources and service provision for mental health in the North. Increase the existing NHS health inequalities weighting within the NHS funding formula.

2 Build resilience in mental and physical health in the most vulnerable communities and support them through the cost-of-living crisis by increasing benefit payments and by getting rid of the two child cap.

3 Invest in research into mental health interventions in the North, specifically in communities which will benefit most strongly from them.

4 NHS England, NHS Improvement and the Office for Health Improvement and Disparities should adopt a public mental health approach that focuses on early mental ill health prevention.

5 Government should invest in and develop a monitoring system for understanding the longer-term mental health impacts of COVID-19 pandemic on children and parents. Targeted support should then flow to families where needed.

6 Area-level measures of physical and mental health should be developed to better understand place-based inequalities.

7 Embed Equality Impact Assessments in all COVID-19 recovery and other policy processes relating to socioeconomic deprivation at national, regional, and local levels.

8 Integrated Care Systems should commission more health promotion, condition management and prevention services that promote the health and wellbeing of the workforce in the North.

9 Community public health budgets should be safeguarded so that action to relieve acute NHS backlogs does not undermine efforts to tackle the root causes of ill-health and boost health resilience.

10 Government and the NHS should deliver health and mental health promotion interventions together with industry and employers, targeted at employee mental and physical health.

Appendix

Ethnicity descriptive statistics

Sample size by ethnicity (binary) for each region in the first wave of the COVID-19 survey (April 2020).

Table A.1 Ethnicity (binary) sample size by region – n(%)

	White British	Ethnic minority
North East	572 (96.46)	21 (3.54)
North West	1,450 (84.06)	275 (15.94)
Yorks & The Humber	1,252 (84.14)	236 (15.86)
East Midlands	1,204 (89.58)	140 (10.42)
West Midlands	1,137 (76.00)	359 (24.00)
East England	1,470 (86.57)	228 (13.43)
London	839 (44.44)	1,049 (55.56)
South East	2,110 (86.69)	324 (13.31)
South West	1,496 (93.38)	106 (6.62)
England	11,530 (80.81)	2,738 (19.19)

Table A.2 Ethnicity (broad groups) sample size by region – n(%)

	White British	Other White	Mixed
Rest of England	8,256 (78.91)	502 (4.80)	243 (2.32)
North	3,274 (86.02)	80 (2.10)	46 (1.21)
England	11,530 (80.81)	582 (4.08)	289 (2.03)

	Asian	Black	Other
Rest of England	1,005 (9.61)	378 (3.61)	78 (0.75)
North	356 (9.35)	40 (1.05)	10 (0.26)
England	1,361 (9.54)	418 (2.93)	88 (0.62)

Additional graphs

Figure A.1 Average GHQ-12 score by income quintiles for the North, the rest of England and England overall

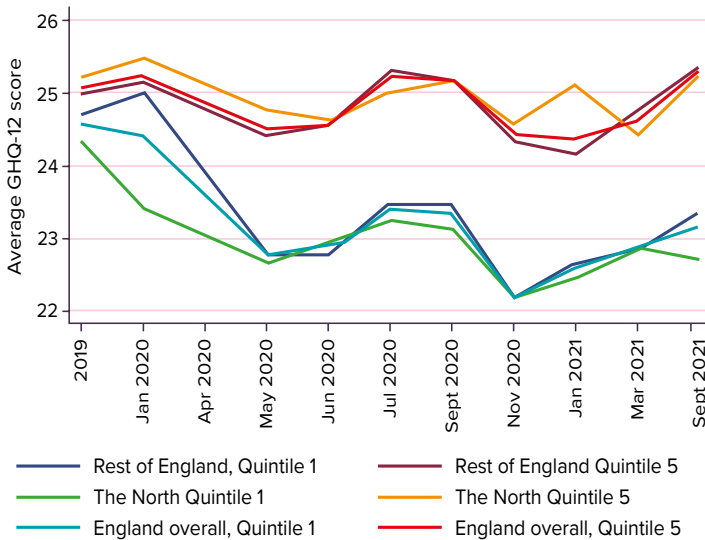
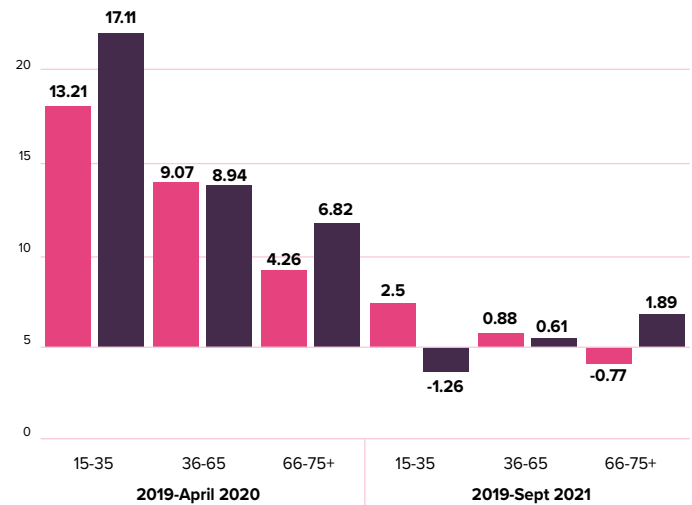
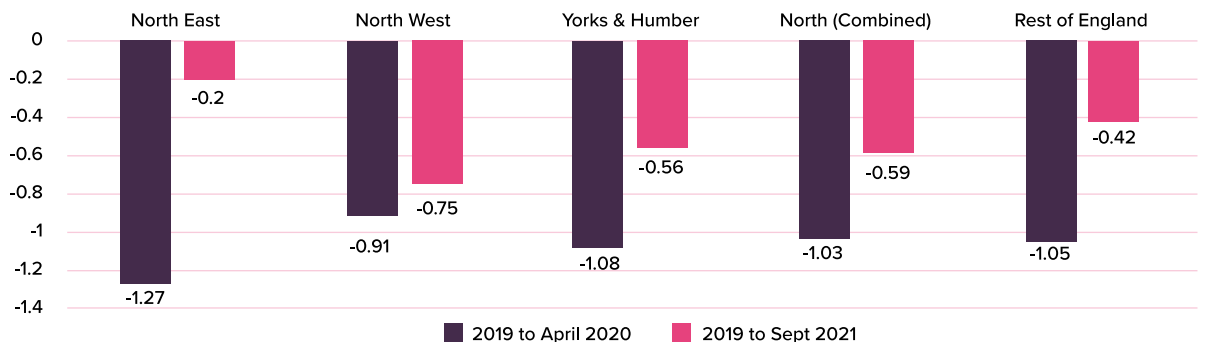


Figure A.3 Difference in percentage points of those meeting the cut-off for a minor psychiatric disorder: 2019 to April 2020 and 2019 to September 2021



Sample size by ethnicity (broad groups) for the North, compared to the rest of England in the first wave of the COVID-19 survey (April 2020)

Figure A.2 Average within-person change in mental health: 2019 to April 2020 and 2019 September 2021



Footnotes and references

- 1 <https://www.thenhsa.co.uk/app/uploads/2021/09/A-Year-of-COVID-in-the-North-report-2021.pdf>
- 2 We explored the impact of the pandemic on children's mental health in our recent NHS-led Child of the North report: <https://www.thenhsa.co.uk/app/uploads/2022/01/Child-of-the-North-Report-FINAL-1.pdf>
- 3 <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/articles/regionalandsubregionalproductivityintheuk/jan2017>
- 4 <http://www.thenhsa.co.uk/app/uploads/2018/11/NHSA-REPORT-FINAL.pdf>
- 5 <https://www.thenhsa.co.uk/app/uploads/2021/09/A-Year-of-COVID-in-the-North-report-2021.pdf>
- 6 Centre for Cities (2015) Cities Outlook 2015 <http://www.centreforcities.org/wp-content/uploads/2015/01/15-01-09-Cities-Outlook-2015.pdf>
- 7 Gross value added (GVA) is a measure of the increase in the value of the economy due to the production of goods and services. It is measured at current basic prices, which include the effect of inflation, excluding taxes (less subsidies) on products (for example, Value Added Tax). GVA plus taxes (less subsidies) on products is equivalent to gross domestic product (GDP). (Office for National Statistics, 2016).
- 8 Northern Health Science Alliance (2018) The Northern Powerhouse in Health Research - A Science and Innovation Audit, <http://www.thenhsa.co.uk/case-studies/uk-science-innovation-audit/>
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- 11 ONS (2015), Regional and sub-regional productivity in the UK, <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/articles/regionalandsubregionalproductivityintheuk/jan2017>
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- 13 ONS (2020), Annual Survey of Hours and Earnings, <https://www.nomisweb.co.uk/reports/lmp/gor/2013265927/report.aspx#tabearn>
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- 15 End Child Poverty (2013) Poverty Map of the UK. [http://www.endchildpoverty.org.uk/images/ecp/130212%20ECP%20local%20report%20final\(2\).pdf](http://www.endchildpoverty.org.uk/images/ecp/130212%20ECP%20local%20report%20final(2).pdf)
- 16 Department of Energy and Climate Change (2013) Fuel Poverty Report. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/226985/fuel_poverty_report_2013.pdf
- 17 Jobs density is defined as the number of jobs in an area divided by the resident population aged 16-64 in that area. For example, a job density of 1.0 would mean that there is one job for every resident aged 16-64. The total number of jobs is a workplace-based measure and comprises employee jobs, self-employed, government-supported trainees and HM Forces. Nomis (2012) Job density <https://www.nomisweb.co.uk/articles/649.aspx>
- 18 Northern Health Science Alliance (2018) The Northern Powerhouse in Health Research - A Science and Innovation Audit, <http://www.thenhsa.co.uk/case-studies/uk-science-innovation-audit/>
- 19 Nomis (2020) Labour market Profile data 2018/19 <https://www.nomisweb.co.uk/reports/lmp/gor/2013265927/report.aspx#tabwab>
- 20 Dorling (2010) 'Persistent North-South Divides', in *The Economic Geography of the UK*, Sage Publications London.
- 21 Hacking et al (2011) Trends in mortality from 1965 to 2008 across the English north-south divide: comparative observational study. *British Medical Journal*, 342, d508
- 22 Hacking et al (2011) Trends in mortality from 1965 to 2008 across the English north-south divide: comparative observational study. *British Medical Journal*, 342, d508
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- 24 Bamba et al (2014) North and South: addressing the English health divide, *Journal of Public Health*, 36: 183-186
- 25 Lewis, G. and Booth, M., 1992. Regional differences in mental health in Great Britain. *Journal of Epidemiology & Community Health*, 46(6), pp.608-611.
- 26 <https://www.who.int/news-room/fact-sheets/detail/mental-disorders>
- 27 <https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response>
- 28 McManus, S., Bebbington, P.E., Jenkins, R. and Brugha, T., 2016. Mental health and wellbeing in England: the adult psychiatric morbidity survey 2014. NHS digital.
- 29 <https://www.nice.org.uk/guidance/cg123/chapter/Introduction>
- 30 The definition and categorisation of mental disorders have long been a subject of debate among both psychiatrists and people with lived experience of these issues. One area of concern relates to the potential conflation of 'psychopathology' with everyday reactions to difficult external circumstances, at the risk of over-medicalising distress when applying diagnoses of 'mental disorders'. The authors acknowledge this complexity whilst using language of mental disorders within the mainstream paradigm. (Bracken, P., Thomas, P., Timimi, S., Asen, E., Behr, G., Beuster, C., Bhunoo, S., Browne, I., Chhina, N., Double, D. and Downer, S., 2012. Psychiatry beyond the current paradigm. *The British journal of psychiatry*, 201(6), pp.430-434)
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- 34 Bamba, C., Munford, L., Brown, H., et al (2018) Health for Wealth: Building a Healthier Northern Powerhouse for UK Productivity, Northern Health Sciences Alliance, Newcastle. <http://www.thenhsa.co.uk/app/uploads/2018/11/NHSA-REPORT-FINAL.pdf>
- 35 <https://www.thenhsa.co.uk/app/uploads/2021/09/A-Year-of-COVID-in-the-North-report-2021.pdf>
- 36 Fancourt, D., Steptoe, A. and Bu, F., 2021. Trajectories of anxiety and depressive symptoms during enforced isolation due to COVID-19 in England: a longitudinal observational study. *The Lancet Psychiatry*, 8(2), pp.141-149.
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48 The language used in this report to refer to people from ethnic minority backgrounds was chosen to most accurately reflect the analytical operationalisation of ethnicity used in the quantitative analyses performed. Descriptive analyses showed the sample sizes of any smaller aggregations of the ethnicity categories available in the dataset to be too small to provide reliable results. Tables presenting sample size statistics by region and ethnicity are included in the appendix (tables A.1 and A.2). The authors acknowledge the limitations of this approach and understand that those described by the term 'ethnic minority' in this report are not a homogenous group. A greater volume of data and further research is required to understand the nuances of the impact of Covid-19 on the mental health of more fine-grained and meaningful ethnic groupings.

49 Understanding Society. 2021b. Dataset Documentation [Online]. Available: <https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation/questionnaire-modules> [Accessed 17/04/2022].

50 'Caseness' measures are relevant to clinical mental health contexts. For example, the 'Improving Access to Psychological Therapies' service in the NHS delivers psychological therapies for people with common mental health disorders (CMDs). On accepting referrals, self-reported mental health questionnaires for CMDs such as anxiety and depression

are used. Individuals who score above the clinical cut-off are then classed as a clinical case (<https://fingertips.phe.org.uk/profile/common-mental-disorders/supporting-information/Glossary>)

51 Sample size limited the ethnic minority groups which could be studied in the Covid-19 survey data. Further detail on the sample size of more fine-grained ethnic groups by region is presented in the Appendix, tables A.1 and A.2.

52 The income variable available in the 2019 mainstage survey contained a high number of zero values (n= 2,978). The number of zero values in the subsequent Covid-19 survey waves was considerably lower (n=311 in the second wave).

53 Figure 2.2 uses a linked sample (refined to sample members who responded to both the 2019 and September 2021 surveys) n= 9,451 (NE = 406, NW = 1,169, Y&H = 1,004, North total =2,579, rest of England = 6,872)

54 See Appendix Figure A.2 for an additional graph including 2019 to April 2020 within-person change.

55 See Appendix Figure A.3 for an additional graph showing the difference in percentage points of those meeting the cut-off for a minor psychiatric disorder from 2019 to April 2020 and from 2019 to September 2021.

56 The language used in this report to refer to people from ethnic minority backgrounds was chosen to most accurately reflect the analytical operationalisation of ethnicity used in the quantitative analyses performed. Descriptive analyses showed the sample sizes of any smaller aggregations of the ethnicity categories available in the dataset to be too small to provide reliable results. Tables presenting sample size statistics by region and ethnicity are included in the appendix (tables A.1 and A.2). The authors acknowledge the limitations of this approach and understand that those described by the term 'ethnic minority' in this report are not a homogenous group. A greater volume of data and further research is required to understand the nuances of the impact of Covid-19 on the mental health of more fine-grained and meaningful ethnic groupings.

57 See Appendix Figure A.1 for a similar figure which additionally includes lines representing average GHQ-12 scores for England overall for the highest and lowest quintiles of income.

58 The association between ethnicity and worse mental health in the pandemic has been shown to vary in relation to factors such as financial insecurity and loneliness. For example, a study of mothers in Bradford found that those from a Pakistani heritage were more likely to experience an increase in depression and anxiety during the pandemic if they were lonely but less likely to experience an increase in depression if they lived in a large household compared with White British mothers. In contrast, mothers of White British ethnicity had greater odds of an increase in depression if they were financially insecure and/or physically inactive compared with Pakistani heritage mothers reporting the same exposures (<https://bmjopen.bmj.com/content/12/1/e047748>)

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Health and Care Research