Understanding the impact of the COVID-19 pandemic on a socially deprived UK coastal town: a preliminary exploratory analysis of health and socioeconomic data

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ABSTRACT

Introduction

In addition to the direct impact of COVID-19 infections on health and mortality, a growing body of literature indicates that there are wide-ranging indirect impacts of the COVID-19 pandemic and associated public health measures on population health and wellbeing. Exploring these impacts on a socially deprived UK coastal town will help identify priority areas to focus COVID-19 recovery efforts on.

Methods

Data on primary care diagnosis, hospital admissions, and several socioeconomic outcomes between 2016 and spring 2021 in the UK town of Fleetwood was collected and analysed in an exploratory analysis looking at pre- and post- COVID-19 patterns in health and social outcomes. Weekly and monthly trends were plotted by time and differences between periods examined using Chi-squared and t-tests.

Results

Initial falls in hospital admissions and diagnoses of conditions in primary care in March 2020 were followed by sustained changes to health service activity for specific diagnostic and demographic groups, including for chronic kidney disease and young people. Increases in the number of people receiving Universal Credit and children eligible for free school meals appear to be greater for those in the least deprived areas of the town.

Discussion

These findings provide initial evidence of the sustained impact of the pandemic across several health and social outcomes. Examining these trends in multivariate analyses will further test these associations and establish the strength of the medium-term impact of the pandemic on the population of this coastal town. Advanced modelling of this data is ongoing and will be published.

INTRODUCTION

The arrival of COVID-19 necessitated a substantial shift in focus within healthcare towards the care of people with acute COVID-19, and the protection of other patients and staff from infection. This had direct and indirect impacts on population health and wellbeing. As would be expected, there was an immediate drop in the use of hospital and primary care services as people avoided non-urgent healthcare and some healthcare services were paused during the early months of the pandemic.[1] Primary care contacts for people with acute mental health conditions in the United Kingdom (UK) dropped considerably during this time, with the pandemic having a particularly detrimental effect on the mental health of women, young people, and those financially insecure prior to the crisis.[2-4]

At the same time, the pandemic exposed, and likely exacerbated, decades of worsening health inequalities in many UK towns.[5] Some population groups experienced, and are likely to continue to experience, greater impacts on their finances.[6] Potential consequences of these economic impacts include increased food insecurity and poor health.[7-8] Better understanding of longer term indirect socioeconomic and health impacts such as these will help communities identify priority areas in the pandemic recovery period.

The aim of this analysis is to provide a preliminary assessment of the post-COVID-19 emerging trends for health and socioeconomic conditions in Fleetwood, a socially deprived coastal town in North West England. This preliminary assessment will be followed later by a robust analysis of the spatial and temporal changes in outcomes between pre- and post- COVID-19 pandemic periods.

METHODS

Study setting

Fleetwood is a predominantly socially deprived coastal town in Lancashire, home to approximately 30,000 people, many of whom were already experiencing poor health and living in disadvantaged socioeconomic circumstances prior to the pandemic.[9] It has a population older than the English average, with 22% of its population aged over 65-years-old, compared to 18% nationally.[10]

Data collection

Data including patient age band, sex, the Lower Layer Super Output Area (LSOA) for the area where the patient lived, date of activity, primary care diagnosis, hospital admission primary diagnosis, hospital admission secondary diagnosis, and admission outcome, for patients registered at a Fleetwood GP practice were provided to the research team by the NHS Midlands and Lancashire Commissioning Support Unit. Primary care data was provided for April 2016 to June 2021 and hospital data for April 2016 to April 2021.

Lancashire County Council provided data on the number of pupils eligible to receive free school meals aggregated by month and area. Street crime data was extracted from open access datasets published by the police (www.data.police.uk) for June 2018 - June 2021 (historic data is only available up to two years). Unemployment data was extracted from the open access dataset published by the Department for Work and Pensions (www.stat-xplore.dwp.gov.uk). Other area demographic data was extracted from Office for National Statistics datasets (www.nomisweb.co.uk).

Information about area income deprivation was collected from the English indices of deprivation 2019.[11] In this study, small areas aggregated into two categories: the most income deprived areas (deciles 1 and 2) and the least income deprived areas (deciles 3, 5-7). There are no areas in income decile 4 in Fleetwood. Income deprivation is subsequently used as a dichotomous variable. A full list of all variables and their descriptions can be found in the preprint of this manuscript.[12]

Statistical analysis

To examine differences between the pre- and post-pandemic periods a dummy variable for pre-March 2020 (0s) and post-March 2020 (1s) was created. Where data was provided by week, the week beginning 16th March 2020 was taken as the start of the pandemic in Fleetwood. For monthly aggregated data, the beginning of the pandemic was taken as 1st March 2020.

Weekly hospital admission rates stratified by age were created using Fleetwood population estimates for corresponding age bands. The total Fleetwood population estimate was used for rates of healthcare admissions and diagnoses. Monthly rates of Universal Credit claimants were calculated using population estimates for labour market age groups (16-24, 25-54, and 55+). Rates were plotted by time (month or week). Differences between the pre-March 2020 and post-March 2020 periods were tested using t-tests (continuous data) or Chi-squared tests (categorical data), with a p-value <0.05 threshold for statistical significance.

RESULTS

Hospital admissions

The unadjusted trend in overall hospital admissions of residents in Fleetwood indicates there was a fall post-March 2020, with sustained low levels of overall hospital admissions. Across age groups, patients aged between 0 and 24-years-old saw the most substantial falls. Admissions with a primary respiratory diagnosis dropped from 43% of all admissions pre-March 2020 to 37% afterwards (including COVID-19) and 27% (excluding COVID-19). Admissions primarily related to cardiovascular disease dropped sharply after March 2020 but increased again to normal levels by autumn 2020.

There was no immediate impact on admissions of patients with a primary diagnosis of mental health following March 2020. However, there was a sustained fall in admissions of patients with a secondary diagnosis of mental health in the post-March 2020 period. The proportion of all hospital admissions in this diagnosis category actually increased in the post-March 2020 period (31% to 38%, $p<0.01$), suggesting these admissions did not fall as much as overall hospital admissions post-March 2020, or as much as other health conditions common to hospital admissions pre-March 2020.

Primary care

There were considerable and sustained falls in recorded new diagnoses of chronic obstructive pulmonary disease (COPD) and chronic kidney disease (CKD). Diagnosis of hypertension also saw a sudden fall in spring 2020, although the rates of new diagnoses have been increasing since summer 2020. There were significant differences in the proportion of diagnoses for depression among young people (aged up to 24 years), which has grown in the post-March 2020 period. Additionally, a lower proportion of new diagnoses of chronic kidney disease (0.30 vs. 0.56, $p<0.01$) and peripheral arterial disease (0.48 vs. 0.20, $p=0.02$) were among women in the post-March 2020, the reverse of the relationship with sex and diagnosis in the years previous. The proportion of new diagnoses for asthma among patients living in the most income deprived areas appears to have fallen in the post-March 2020 period (0.66 vs. 0.52, $p=0.04$).

Crime

The proportion of 'anti-social behaviour' and 'violence and sexual offences' crimes occurring in the most deprived areas fell post-March 2020, with a corresponding proportion increase in the least deprived areas; Chi-squared tests indicated that this difference was only statistically significant for anti-social behaviour crimes (Table 1).

Unemployment

The Alternative Claimant Count (ACC) is an indication of the number of people receiving Universal Credit who are required to look for work. There was a statistically significant increase in the rate of claimants per 1000 population post-March 2020 (27.4 vs 50.6, $p<0.01$). Post-March 2020, the proportion of male claimants, younger claimants and those living in the least deprived areas of Fleetwood grew (Table 1).

Free School Meals

The mean rate of pupils entitled to receive free school meals per 1000 pupils grew in the post-COVID-19 period in both the most and least income deprived areas in Fleetwood (Table 1). While the numbers of pupils eligible for free school meals is much higher in the most deprived areas both pre- and post-COVID-19, the rate of pupils eligible for free school meals per 1000 pupils increased by 40% in the least deprived areas (120 pre vs 167 post, $p=0.04$), compared to 24% in the most deprived areas (344 pre vs 428 post, $p<0.01$).

DISCUSSION

These initial exploratory findings indicate how the health and social wellbeing of residents of Fleetwood has been impacted in the first 18 months following the COVID-19 pandemic. The results point towards some key areas that call for comprehensive multivariate analysis using survival, multivariate time series and spatial analyses.

Areas of interest include the large and sustained falls in hospital admissions for respiratory-related conditions, the changes in the age and sex demographics of incidence of diagnosis in primary care, and indications of changes to some social outcomes in some of the least deprived areas of the towns. The varied nature of the pandemic's impact on different patient populations corresponds to other study findings, although this study was able to investigate longer term trends (18 months).[1] However, while the sustained fall in diagnoses of COPD may seem alarming, this likely reflects barriers to using spirometry as a diagnostic tool because of COVID-19 infection concerns.[13]

An increase in depression diagnoses among young people aligns to a growing research literature pointing

			pre-March 2020	post-March 2020	p value[1]
All crime	Income (%)	Most	89.48	89.27	0.4146
		Least	10.52	10.73	
Antisocial behaviour	Income (%)	Most	90.19	88.75	< 0.01
		Least	9.81	11.25	
- Violence and sexual offences	Income (%)	Most	90.78	89.93	0.0654
		Least	9.22	10.07	
Unemployment (ACC)	Monthly rate[2]	-	27.4	50.6	< 0.01
	Age (%)	16-24	0.17	0.21	< 0.01
		25-49	0.56	0.56	
		50+	0.27	0.23	
	Sex (%)	Female	0.44	0.39	< 0.01
		Male	0.56	0.61	
	Income area (%)	Most Dep	0.81	0.73	< 0.01
		Least Dep	0.19	0.27	
Free school meals	Income area rate[2]	Most Dep	344	428	< 0.01
		Least Dep	120	167	0.04

[1] X^2 tests for group differences. T-test for differences in rates.
[2] Mean rate per 1000 population

Table 1: Group differences for selected social and economic indicators pre and post-March 2020.

towards the impact the pandemic has had on that population group's mental wellbeing, who have experienced substantial disruptions to school, social, and working life.[14] There is a need for longitudinal research to assess the longevity of these health impacts.

Several socioeconomic outcomes appear to have increased in areas classified as the 'least deprived' in Fleetwood. This does not necessarily contradict evidence that the COVID-19 pandemic has exacerbated social inequalities.[5] The 'least deprived' areas in Fleetwood sit in the middle of national deprivation rankings. Other studies have suggested that those in middle-income housing, particularly those who were in work but on low pay, may have experienced the greatest financial disruption to their lives.[6] The apparent changes in the 'least deprived' areas could indicate the pre-pandemic vulnerability of population groups experiencing moderate but not severe financial insecurity.

This preliminary study reports early indications that the COVID-19 pandemic has had an impact on several health and social outcomes in Fleetwood. However, there is a need to examine these trends in multivariate analyses to establish the strength of the impact on this coastal community.

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