Pandemic of Inequality:
An Analysis of Socioeconomic Factors Predicting
Economic Instability During the 2020-21 COVID-19
(Coronavirus) Pandemic in the United Kingdom.

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Table of Contents

ACKNOWLEDGEMENTS.....	3
ABSTRACT.....	4
INTRODUCTION.....	5
LITERATURE REVIEW	7
INTRODUCTION	7
WORKING ARRANGEMENTS	7
SELF-EMPLOYMENT.....	8
FURLOUGH.....	9
FOOD INSECURITY	10
ROLE OF STATE WELFARE SYSTEMS.....	11
MENTAL HEALTH AND WELLBEING	12
CONCLUSION.....	13
RESEARCH QUESTIONS AND HYPOTHESES	13
METHODOLOGY.....	16
DATASET AND SAMPLE.....	16
WEIGHTING	17
DEPENDENT VARIABLES.....	17
INDEPENDENT VARIABLES	20
METHODS	28
RESULTS.....	30
RESEARCH QUESTION 1	30
RESEARCH QUESTION 2	34
DISCUSSION.....	38
KEY FINDINGS	38
CONSIDERATION OF FINDINGS IN CONTEXT	39
CONCLUSION.....	41

	2
BIBLIOGRAPHY.....	42
APPENDICES.....	46
APPENDIX A: SPSS SYNTAX FOR VARIABLE CONSTRUCTION	46
APPENDIX B: RAW VARIABLE DESCRIPTORS	49

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Abstract

The coronavirus (COVID-19) pandemic has affected individuals and families across the world from March 2020 to the present. From a UK perspective, reviewed literature confirms that there is a deep divide in the factors causing a person's employment to be affected by the pandemic, with educational attainment, household income and age all having a role. Food insecurity has been increasing rapidly in recent years in the UK, and the literature confirms exacerbated levels of food insecurity coming as a result of the pandemic. The present study seeks to understand the variables influencing two research questions, firstly which factors will affect the likelihood of being 'furloughed' (under the government's Coronavirus Job Retention Scheme) or otherwise being required to reduce one's working hours, and secondly the factors that may cause someone to experience food insecurity in the pandemic. Key findings are that having young children, being self-employed and having a higher household income are all factors that may make it more likely that one will lose hours in their job or be furloughed. Conversely, being a keyworker and having higher educational qualifications are shown to reduce the likelihood of reducing job hours. Food insecurity is made more likely by being from an ethnic minority background, having young children and being a lower earner.

Introduction

The coronavirus pandemic has dominated the lives of almost every person on Earth since early 2020. Ever since the first incidences were reported in Wuhan, China in late December 2019 (DW News, 2019), the SARS-CoV-2 virus (WHO, 2020) has spread around the world causing, as of the 16 April 2021, almost 139 million cases and sadly taking the lives of over 2.9 million people (Dong, Du and Gardner, 2020). The very first case of the virus in the United Kingdom was confirmed on the 29 January 2020 in York (Wright, 2021). From that point onwards, cases in the UK steadily increased, requiring a 'lockdown' commencing on the 23 March 2020, and eventually lasting over three months, to slow the spread of the virus (Johnson, 2020). Shops besides supermarkets were required to close, people were required to work from home unless it was not possible to do so, and the people were banned from meeting their friends or families not living in their household (Walker, 2020).

The socioeconomic effects of these measures have been widespread. For many industries, such as hospitality and entertainment, doing business became illegal overnight (Johnson, 2020). This meant a sudden loss of income for millions of people unless the government responded adequately. For those who could work from home, many found themselves balancing the roles of full-time childcare provider and employee simultaneously (Zhou, 2020). British schools were closed from the 20 March 2020 (BBC, 2020), meaning that parents who needed to work from home had a considerable amount of extra pressure upon them than they usually would. The lockdown measures have had significant tolls on people across the world, affecting mental health and wellbeing, incomes, children's futures, and livelihoods.

The pandemic has continued for a period of time far longer than many expected, with second and third lockdowns being enforced in the UK from November 2020 and January 2021 (Institute for Government, 2021). At the time of writing (April 2021), many restrictions are still in place from the January 2021 lockdown, with non-essential retail shops and hairdressing salons having only just reopened. Given the scale of the impact that the pandemic has had on people's everyday lives for over a year, this study seeks to gain an understanding of who has been affected to the greatest degree, economically and socially, in order to guide the next steps that

could be taken by government and charities to help society stand up again. As discussed in the literature review, one of the overriding trends is that much of the research carried out on this fast-moving topic has concerned the first lockdown, and the immediate interventions necessary to make short-term improvements to people's lives. Whilst it is, of course, only a matter of time until a similar amount of published research will be available concerning the later stages of the pandemic, this study will use empirical UK survey data to understand the socioeconomic situation among groups of the population in September 2020. For context, in this period, cases were starting to rise again after an extended period of reduction (Dong, Du and Gardner, 2020), as such the period covered by the data is one of relative stability; people had been starting to return to some form of normality.

This paper intends to answer two key research questions. The first asking who is most likely to have been placed on "furlough", where the government paid 80% of the wages of employees under the Coronavirus Job Retention Scheme (Adams-Prassl *et al.*, 2020a), or to have otherwise lost working hours. The second research question asks which groups of people are more likely to have experienced food insecurity during the pandemic, given a considerable body of literature suggesting that the risk of falling into food insecurity was greatly increased for large sectors of the population during the course of the crisis (Weekes *et al.*, 2020; Barker and Russell, 2020). The literature review section looks at pre-existing research surrounding the effects of the pandemic, along with other periods of economic recession, such as the Great Recession of 2008-10. The purpose of this is to evaluate causes of food insecurity and loss of working hours that have been previously identified, thus informing the present study's hypotheses and the specifics of the research focus.

Following the literature review, a detailed consideration of the chosen methods of quantitative data analysis, including rationale for the choice of method, will be presented. The analysis of empirical data from *Understanding Society: the UK Household Longitudinal Survey* to answer the hypotheses of the study follows, with presentation of the descriptive statistics of the data and the regression analysis. A discussion of the results of the data analysis will then be provided, followed by concluding remarks.

Literature Review

Introduction

The coronavirus pandemic has had, and will continue to have, grave effects upon employment levels in the UK and beyond (Sensier and Devine, 2020; Bell and Blanchflower, 2020). My research considers a range of socioeconomic issues surrounding the pandemic. As previously discussed, a large section of the literature focused on the early weeks and months of the pandemic where policy responses were still being researched and put in place (Partington, 2020; Besley and Stern, 2020). In the time before the introduction of job retention schemes, government grants and furloughing, the coronavirus crisis greatly affected both personal and national economies (Fetzer *et al.*, 2020; Martin *et al.*, 2020). The present review engages with literature from the early period of the pandemic, whilst also considering the longer-term socioeconomic effects of policies upon the employed, unemployed, and self-employed. It also considers the effects of various sociodemographic variables, such as gender, ethnicity, and education level, upon the likelihood someone will be affected by the pandemic. The unemployment rate has grown to a peak of 5.1% (BBC, 2021), the highest since 2015 (ONS, 2021), incomes have fallen, and inequalities have spread throughout society (Collinson and Ambrose, 2020). Redundancies have reached a high not seen in the past 25 years (ONS, 2021). These changes draw parallels with the Great Recession of the late 2000s, where failure of the financial system caused mass unemployment (ONS, 2021). The review also considers the prevalence of new mental health issues, and their increase alongside the spread of the pandemic.

Working Arrangements

Early predictions from the infancy of the pandemic foreshadowed unemployment and loss of income for those working in leisure, retail, travel, and service sectors (Settersten *et al.*, 2020) due to state-imposed 'lockdown' orders to control the spread of the virus. This forecast was corroborated by the Institute for Fiscal Studies (Butler, 2020; Joyce and Xu, 2020), who found that the overall impact of lockdown orders upon employment is the most severe amongst the under-25s, females and the lowest earners; these groups are those most likely to be employed

in sectors which have suspended their operations during the restrictions. Furthermore, Brewer *et al* suggested that insecure workers (those on zero-hour or temporary contracts and those in the 'gig economy', for instance drivers for companies such as Uber) were 40% more likely than the rest of the workforce to have lost their jobs during the crisis (Brewer *et al.*, 2020). One estimate predicted that those on temporary contracts alone make up approximately 8% of the workforce (Mikolai, Keenan and Kulu, 2020). Even if an insecure worker had not lost their job, they were likely to have lost a significant proportion of their income, 22% reported being paid less than before the pandemic (Brewer *et al.*, 2020). However, Brewer *et al* also found that these individuals were more likely to have found a new job during the period from February to September 2020; 29% of workers in new jobs were previously working in insecure arrangements (*ibid.*).

Another group who may be affected by the pandemic are "keyworkers". These are workers who have roles which are essential to the country's operation during the COVID-19 pandemic, including sectors such as health and social care, utilities, public services, schools, security, and food provision (Department for Education, 2020). According to an analysis by Zhou (2020), 60% of keyworkers are women, and the need for childcare for younger children may cause financial insecurity. Zhou also reports that keyworkers overall are more likely to have kept their job as compared to non-keyworkers, however increased spending and a reduced income of a partner may lead to an increased risk of food insecurity.

The literature suggests a bleak picture for workers in many sectors of the economy. At the time of writing, reports of the later stages of the pandemic are far less plentiful. Therefore, the present study should respond to this gap in understanding by focusing on the period after the first lockdown ended.

Self-Employment

Self-employed people have been affected by the pandemic to a greater degree than most other workers (Blundell and Machin, 2020; Blundell, Machin and Ventura, 2020). Blundell and Machin found that over 60% of self-employed people earned less than £1,000 in April 2020, over double the figure in April 2019. In a similar vein to the Coronavirus Job Retention Scheme,

the government launched the Self-Employed Income Support Scheme (SEISS) in May 2020 in order to mitigate the economic impact on self-employed people (HM Treasury, 2020). The literature confirms a widespread feeling of despondence towards the scheme. Analysis by Gardiner and Slaughter confirmed that only 39% of self-employed people intended to apply for the programme of support; many felt uncertain about the scheme's eligibility criteria (Gardiner and Slaughter, 2020; Brewer *et al.*, 2020). The scheme had an upper earnings limit of £50,000 to be eligible, and individuals must have been running their business for more than two years at the point of application (HM Treasury, 2020). Blundell and Machin found that high earners were twice as likely to apply to the scheme as low earners (those earning less than £10,000), which could be explained by lower earning self-employed people being the secondary income earner in a household (Blundell and Machin, 2020). There are likely to be a number of reasons beyond this, however. Something the literature failed to address is the experience of the self-employed stratified by family structure (i.e., whether or not one has children) or a person's ethnicity, all limitations acknowledged by Brewer *et al.* (2020). The strict eligibility criteria for the scheme caused many self-employed people to turn to Universal Credit, which for many, would provide considerably less support than SEISS. Over a fifth of self-employed people considered seeking jobs as an employee and closing their small business as a result of the crisis (Blundell, Machin and Ventura, 2020).

Furlough

In order to mitigate the impact of the pandemic upon employment, the UK government introduced the Coronavirus Job Retention Scheme (or 'furlough scheme') in April 2020, meaning the government subsidised 80% of worker's salaries in order to reduce unemployment (Leslie and McCurdy, 2020). Adams *et al* found that workers who were less able to work from home were more likely to lose their jobs completely rather than be furloughed, whereas workers who were able to complete more than 80% of their work from home were most likely to be furloughed or stay employed (Adams *et al.*, 2020; Mayhew and Anand, 2020). Additionally, Adams-Prassl *et al* found that women were more likely to have been furloughed than men, even if the amount of work that could be done from home in a given role was the same (Adams-

Prassl *et al.*, 2020a). The study also found that, where a child in a nuclear family was unable to attend school due to lockdown, the mother was more likely to be required to provide childcare than the father, meaning women were required to plead with their employers to be furloughed (*ibid.*).

Hupkau and Petrongolo had similar findings, predicting that women would complete a further nine hours of childcare and home-schooling labour per week than men during the pandemic, controlling for other factors such as furlough or employment status (Hupkau and Petrongolo, 2020). The study also found that women, regardless of their working status or whether or not they have children, would spend a further 6 hours per week on housework than men (*ibid.*).

Food Insecurity

The coronavirus crisis has caused financial difficulties for many families and individuals throughout the UK. Food insecurity is “a condition in which households lack access to adequate food because of limited money or other resources” (Gundersen and Ziliak, 2015), and has increased dramatically over the last decade (Barker and Russell, 2020). Pat Caplan argues that austerity measures, taken by the Conservative government to cut the national debt in the early 2010s, were contributory to the rise in food insecurity (Caplan, 2020). To give context to the situation surrounding food insecurity, it is necessary to consider it outside of the pandemic, looking at wider factors. The Trussell Trust, a food bank and anti-poverty charity, found that there was a 2,595% increase in food bank usage between 2010/11 and 2018/19, with 1,585,000 food parcels being distributed in 2018/19 (Sosenko *et al.*, 2019). Sosenko and colleagues also found that households with children are more likely to experience food insecurity, and that low-income households, younger households and single parents are most likely to have insecure access to food (*ibid.*, p. 104). Food insecurity, as well as other forms of destitution, can also be caused by harsh social policy initiatives such as benefit sanctions (Fitzpatrick *et al.*, 2018), where people who receive welfare payments have their money reduced or delayed if they haven’t followed strict government requirements (Beatty *et al.*, 2015, p. iv).

The problems causing people to turn to food banks have been exacerbated by the pandemic. Almost 100,000 households received assistance from a food bank for the first time ever during

the pandemic, making up over 52% of all food bank users in April 2020 (Weekes *et al.*, 2020, p. 5). Many insecure workers were unable to earn money immediately after the onset of the lockdown restrictions, since many of these workers are found in the hospitality, accommodation, and entertainment sectors (*ibid.*, p. 11). Only 4% of the people accessing food banks in June 2020 were furloughed, meaning that the remaining 96% were either unemployed or had suffered extreme financial hardship whilst remaining employed (*ibid.*, p. 26). Barker and Russell report that people from Black, Asian and other minority ethnic groups are more likely to be vulnerable to food insecurity during the pandemic (Barker and Russell, 2020) due to an interaction between factors such as reduced educational success and lower income. The overall picture of food insecurity is one of inequality. Both generally in society, and within the pandemic, the literature suggests divides along the lines of household circumstance, income, and employment acting together to exacerbate the problem of food insecurity. The present study shall address these issues and uncover what factors may lead to someone having insecure access to food during the pandemic.

Role of State Welfare Systems

With large proportions of the workforce either losing their jobs completely or only receiving 80% of their income due to being furloughed, the government saw a reported 20,000 additional claims per day for Universal Credit, the UK's newly reformed welfare payment system, as compared to the 2019 daily average (Leslie and McCurdy, 2020). Prior to the introduction of the furlough scheme, the peak of new Universal Credit applications reached 100,000 on one day in the final week of March 2020 (Leslie and McCurdy, 2020). This is in stark contrast to the unemployment benefits sought in response to the 2008-10 financial crisis (Great Recession), with around 7,000 excess claims per day on average (*ibid.*). The Great Recession was a period of significant and sustained economic downturn in the UK and across the world, and so it is a close analogue of the coronavirus pandemic in terms of the socioeconomic effects (Banks, Karjalainen and Propper, 2020; Barr *et al.*, 2012; Banks and Xu, 2020). The Great Recession saw an increase in UK unemployment from 5.2% in April 2008 to a sustained peak of 8.0% in the winter of 2009-10 (Bell and Blanchflower, 2020; Leaker, 2021), whilst the unemployment

rate during the pandemic had not exceeded 5.1% as of December 2020 (Leaker, 2021). It should be noted, however, that a scheme akin to the Coronavirus Job Retention Scheme did not exist during the Great Recession. Therefore, it is likely that the difficulties experienced during the pandemic are different to those seen during the Great Recession, as many people were living on lower incomes, rather than having lost their jobs completely.

Mental Health and Wellbeing

Barr *et al* and others found that throughout the Great Recession, there was a positive correlation between poor mental health, suicide rates and unemployment (Barr *et al.*, 2012; Drydakis, 2015). Banks and Xu (2020) used data from the COVID dataset of Understanding Society, alongside the main annual data collected prior to the onset of the pandemic. The study found that mental wellbeing deteriorated in the pandemic, with the mean GHQ score of respondents (higher scores on this 36-point scale indicate poorer mental health) increasing by 8.1 between 2019 and the start of the pandemic (Banks and Xu, 2020). Others predicted increased levels of mental ill health and suicidal thoughts as a result of the stresses of the pandemic (Settersten *et al.*, 2020; O'Connor *et al.*, 2020). O'Connor *et al* found that, during the initial six weeks of the first coronavirus lockdown, females, people living on a low income, and those aged under 30 were more likely than any other group to experience symptoms of both anxiety and depression (O'Connor *et al.*, 2020, p. 5). A large proportion of participants in the study who experienced these symptoms had pre-existing mental health conditions, and their symptoms worsened, however 15.3% of those without a pre-existing diagnosis reported new symptoms of depression during the pandemic (*ibid.*, pp. 5-6). Similarly, Pierce *et al*, using Wave 1 of the Understanding Society COVID-19 dataset (the dataset which shall be used by the present study), found that females, those in the lowest income quintile (lowest 20% of incomes), parents of young children and keyworkers were those most likely to have suffered significant levels of mental distress in the first lockdown (Pierce *et al.*, 2020).

Given the unanimous finding that females, those living on low incomes, young people and keyworkers are most vulnerable to deteriorating mental health in the early months of the

pandemic, the present study intends to consider whether this effect continued into the later months, or if the trend was mitigated by the releasing of lockdown restrictions.

Conclusion

The present review of literature has provided an important opportunity to gain a greater understanding of the research surrounding the coronavirus and its socioeconomic effects. The early stages of the pandemic were characterised by fear, uncertainty, and economic insecurity with few economic safeguards in place (Chapman, 2020). The literature suggests that the self-employed found the early months more challenging as financial safety nets were not put in place for a longer period of time than for the employed (Blundell and Machin, 2020; HM Treasury, 2020). Furthermore, Universal Credit claims had increased significantly at the beginning of the crisis, however these began to fall again as protections were brought into effect and work restarted for many people (Leslie and McCurdy, 2020). The start of the pandemic saw a striking gender gap in childcare responsibilities, employment, housework, and health markers (Hupkau and Petrongolo, 2020; Zhou *et al.*, 2020). Due to the relentlessly fast-moving nature of the, at the time of writing, ongoing pandemic, academics must constantly reassess and re-evaluate the work they are doing to understand the situation. One of the key findings from this literature review is that work has been done to understand the impact of the pandemic upon all aspects of society, but our knowledge must be continually updated in order to best devise agile policy responses. Therefore, the gap in the body of literature that this study will address concerns a lack of contemporary research on topics that have been of interest throughout the pandemic, rather than altogether novel topics.

Research Questions and Hypotheses

Having considered the literature surrounding the pandemic and its socioeconomic effects, the present paper will seek to resolve the following hypotheses, concerning two research questions. The first of these questions asks what factors affect the likelihood someone would be furloughed from their job, or otherwise reduce their working hours, the second of which considers factors predicting the likelihood someone may experience food insecurity.

Research Question 1: *Which factors may predict a person may have reduced their working hours in the COVID-19 pandemic?*

H1: People from a minority ethnic group are likely to have reduced working hours.

H2: Females are more likely to have reduced their working hours than males.

H3: People who have children living in their household are more likely to have reduced their working hours.

- The effect of gender is likely to interact with the effect of having younger children – women with young children are more likely to have reduced their hours

H4: Higher earners are less likely to have reduced their working hours than lower earners.

H5: People with lower levels of education are more likely to have reduced their working hours.

H6: Self-employed people are more likely to have reduced their hours than people who are employed.

H7: Younger people are more likely to have reduced their hours than older people.

H8: People with lower levels of mental wellbeing are more likely to reduce their working hours.

H9: Keyworkers are less likely to reduce their working hours.

Research Question 2: *What factors make it more likely that a household has experienced food insecurity in the COVID-19 pandemic?*

H1: Households containing people from an ethnic minority background are more likely to experience food insecurity in the pandemic.

H2: Lower income households are more likely to experience food insecurity in the pandemic.

H3: Households with keyworker(s) present are more likely to experience food insecurity.

H4: Households with children are more likely to experience food insecurity in the pandemic than households without children.

- The effect of having a 'keyworker' in the household is likely to interact with the effect of having children – households with children and keyworkers are more likely to experience food insecurity.

H5: People with lower levels of mental wellbeing are more likely to experience food insecurity in the pandemic.

Methodology

Dataset and Sample

This paper used the monthly COVID-19 panel study, part of Understanding Society. The main study, also known as the UK Household Longitudinal Study, has been fielded every year since 2009, and its predecessor, the British Household Panel Study, was carried out every year from 1991 to 2009. The panel features over 40,000 households and it is the largest longitudinal study of its kind (Understanding Society, 2020a). The COVID-19 study has seven published waves as of the time of writing (April 2021), carried out on approximately a monthly basis from April 2020 to January 2021 (Understanding Society, 2020a). The study asks a range of questions about people's experiences during the pandemic, from susceptibility to illness from COVID-19, pre-existing medical conditions, mental and physical wellbeing, education, childcare, and a range of socioeconomic factors such as salary, employment and furlough status, financial security and more.

The present study used Wave 5 of the dataset, fielded in September 2020. This was chosen as it was the only wave to carry questions on the topic of food security (Institute for Social and Economic Research, 2021), which is one of the primary focuses of this analysis, as outlined in the literature review. For the purpose of longitudinal comparison, certain variables were added from Wave A (outlined in the variables sections below). Furthermore, information was not available regarding educational attainment in the COVID dataset, therefore it was necessary to import a variable (`jk_higual_dv`) from Wave 10 of the main Understanding Society study. The Understanding Society COVID-19 study is unique in its scope, being made up of a large number of participants who are already part of the main Understanding Society annual survey. The clustered, stratified probability sample of the study is drawn from the Postcode Address File, and areas of the UK with higher populations of immigrants and people from an ethnic minority background are oversampled, in order to create a more representative sample of the UK population (Understanding Society, 2020b). The sample contains individuals aged 16 or over, from all countries in the United Kingdom. The September 2020 wave of the data has 12,876 responses (Institute for Social and Economic Research, 2021). The dataset cannot be used to

identify individuals, and as such ethical approval was not required to use the dataset for the present study. However, full ethical approval has been sought by Understanding Society whilst carrying out the study.

There were telephone and web versions of the survey, with the telephone response option offered to those with no regular internet access (Institute for Social and Economic Research, 2021). The telephone survey data was not chosen to contribute to the present study, as the telephone surveys were only carried out in particular waves of the study, and none of these coincided with the waves under analysis in this study. To include the telephone survey data would have, therefore, created inconsistencies in the data.

Weighting

Owing to the clustered, stratified sample design of the study, it is necessary to weight the dataset to correct for the assumption made by the data analysis package that simple random sampling is used (Institute for Social and Economic Research, 2021).

The dataset was not weighted initially. Therefore, it was necessary to identify and use a weighting variable provided by Understanding Society. As the present study is using data from multiple waves (Wave 1 for filling in missing values caused by survey routing in Wave 5 data), the study uses longitudinal weighting, using the weight variable *ce_betaindin_lw* (Institute for Social and Economic Research, 2021). The longitudinal weighting is based on the same statistical modelling as Understanding Society's cross-sectional weight, which is used for analysis within one particular wave of data, rather than using multiple waves together.

Dependent Variables

The present study seeks to answer two research questions, each having their own dependent variable.

Research Question 1

In answering the research question 'Which factors may predict a person may have reduced their working hours in the COVID-19 pandemic?', the dependent variable was named *furl_losthours*. To create a binary variable which comprises multiple factors, the IF tool within

SPSS syntax was used to select groups of cases from multiple variables, combining them into one. The variable was created based on the following parameters, where respondents meeting any of these parameters were coded with a value of 1, and those who do not meet the criteria coded as 0.

- Respondent was self-employed, employed, or both, in Wave 5 and:
 - Worked more hours per week in Jan/Feb 2020 than in Wave 5 OR
 - Had been furloughed in any survey wave from 1 to 5 OR
- Respondent was unemployed in Wave 5 and:
 - Had worked more than 0 hours per week in Jan/Feb 2020.

This variable gives a broad overview of any respondents who have reduced the amount of work done over the pandemic (as of September 2020), as compared to their situation in January/February 2020. This means that any person who has either become unemployed as a result of the pandemic, or who lost working hours in any way, including through furlough, will be counted in this variable.

Figure 1

A bar graph showing the distribution of cases in the variable 'furl_losthours' in respondents aged 66 or younger.

This research question, when analysed, will only include cases where the respondent is under 66 years of age. This is the state's age of retirement as of 2020 (HM Government, 2019, p. 2), and as such it would be inappropriate to include pensioners in an analysis concerning

working hours. Whilst, of course, pensioners and those above the age of 66 may well do work, the overall picture is that this is the standard age of retirement. This presents a potential limitation of this study; however, Understanding Society does not provide any information pertaining to retirement status, therefore respondent age is the nearest estimator. Bearing this in mind, Figure 1 (above) presents the distribution of the variable.

Research Question 2

To answer the second research question 'What factors make it more likely that a household has experienced food insecurity in the COVID-19 pandemic?', a dependent variable named *foodinsecurity* was created. The variable, like *furl_losthours* is binary, with a value of 1 meeting the criteria, and a value of 0 not meeting the criteria. The variable was created based on the following parameters:

- Respondent has been to a food bank at any time in the four weeks leading up to September 2020 OR:
- Respondent has been forced to have smaller meals than usual or skip meals in the last week due to lack of access to food or lack of funds.

The distribution of this variable is set out in Figure 2.

Figure 2

Bar chart showing the distribution of the dependent variable 'foodinsecurity'.

The variable *ce_foodbank_cv* in the original dataset was one of the constituent parts of this dependent variable. For simplicity and for the purposes of this analysis, the original variable was recoded, so that both levels of food bank usage (visiting a food bank ‘less than four times’ and ‘four times or more’ in a four-week period) are coded as 1, and no food bank usage is coded as 0. Whilst this will enable the analysis to capture a broader range of experiences, it should be considered that keeping the levels of food bank usage would contribute to a greater level of granularity. The purpose of this analysis is to succinctly portray the overall situation, so this is why I have chosen to simplify this variable.

Independent Variables

To allow exploration of the present study’s various hypotheses, a number of independent variables were created. Whilst some of these variables are present in both research questions, others are specific to the analysis of one of the two questions. An explanation of those variables pertinent to both questions is presented below, followed by an overview of those only relevant to one of the two questions.

Universal Variables

Ethnicity

The ethnicity of respondents is recorded in the variable ‘*racel_dv*’. The variable allows respondents to select their ethnicity from a list of 18 options. For this analysis, however, these were collapsed into two categories: white, and ethnic minority background. The overall picture of this is shown in Table 1. This is in order to show whether there is a disparity between ethnic minorities and white people in terms of food insecurity and working hours overall, rather than identifying specific ethnic groups. Therefore, a dummy variable for ‘white’ was created in the analysis to serve as a binary variable. Dummy variables make the output of logistic regression simpler to analyse, as it makes the interpretation of odds ratios more intuitive (Garavaglia and Sharma, 2016).

Table 1

A table providing the values of the 'ethnicity' variable, and frequency distribution of values.

Label	n	%
White (British, Irish, and other white)	8036	91.77%
Other (mixed, Black, Asian, and other ethnicities)	721	8.23%

Income

Household income provides a key component of the analysis of both questions as it provides an important marker of socioeconomic status. The household income as of January/February 2020 were used rather than the income in September 2020. This decision is rooted in the theory that pre-pandemic income is more likely to reflect the socioeconomic status of a household in the longer-term, rather than reflecting the short/ medium-term impact of the pandemic.

The raw household income variable 'ca_bllhearn_amount' was coded in such a way that respondents could give their value for household take-home pay and the unit (i.e. monthly, weekly etc) separately. The variable was standardised, so all values were on an annual scale, so weekly figures were multiplied by 52.14, fortnightly figures were multiplied by 26, monthly figures by 12 and annual figures by 1. The new variable, 'base_earnings_deciles', is represented by Table 2. This was created by splitting the standardised values into income deciles using the Visual Binning tool in SPSS.

Table 2

Table showing the range of values in the base_earnings_deciles variable.

Code	Range of values (£)	N	%
1	0.00-5,520.00	595	9.2%
2	5,520.01-13,556.40	774	12.0%
3	13,556.41-19,200.00	799	12.4%
4	19,200.01-24,000.00	654	10.2%
5	24,000.01-30,000.00	652	10.1%
6	30,000.01-36,000.00	742	11.5%
7	36,000.01-42,000.00	513	8.0%
8	42,000.01-50,400.00	594	9.2%
9	50,400.01-63,600.00	519	8.0%
10	> 63,600.01	605	9.4%
Total		6447	100.0%

Mental Wellbeing Score

As discussed in the literature review, mental wellbeing and socioeconomic status are linked; people with a lower income are more likely to experience poor mental wellbeing.

In the dataset, mental wellbeing is measured by asking respondents to answer questions from the GHQ questionnaire, which is a mental illness diagnosis tool used by medical professionals (Goldberg, 1978). Twelve questions were asked on a variety of topics including concentration, depression, happiness and more. Respondents were asked to give a score of 0-3, where 0 represents no association with the statement/positive wellbeing, and 3 represents high association with the statement/negative wellbeing. Responses were summarised in the continuous aggregate score variable 'ce_scghq2_dv', where scores of 2 and 3 (the strongest association with poor mental wellbeing) are coded as 1, meaning the worst wellbeing is represented by a score of 12, and the best is represented by 0. The range of values is represented in the histogram found in Figure 3.

Figure 3

Histogram showing the distribution of GHQ scores in the dataset.

Table 3

Table of the descriptive statistics of the 'ce_scghq2_dv' variable.

Statistic	Value
<i>N</i>	8675
Minimum	0
Maximum	12
μ	2.10
Median	0
σ	3.370
Skewness	1.709

Table 3 depicts the distribution of the GHQ variable. The median value is 0, meaning that at least 50% of respondents give no evidence of poor mental wellbeing. The mean value is 2.10, with a standard deviation of 3.370. The skewness value of 1.709 indicates a high positive skew, where the majority of the data is found in the left-hand-side of the histogram, as can be seen in Figure 4.

Presence of Children in the Household

Figure 4

Pie chart presenting the distribution of 'kids' variable.

For both research questions, whether or not a household has children is an important consideration. The variable 'kids' contains all respondents who have at least one under-18 in their household, with having no children coded as 0, and having children coded as 1.

The distribution of the variable is shown in Figure 4, with 70% of cases having no children, and 30% having at least one child. The variable 'under5s' was created, representing whether someone has a pre-school child (aged under 5 years). In Figure 4, the distribution of both 'kids' and 'under5s' are given. Of the 2689 respondents with children, 26.6% (717) have pre-schoolers. Those with pre-school children are those under consideration in the analysis as these parents are likely to have faced issues working at home – many pre-school children attend nurseries and playgroups which wasn't possible in the pandemic for many non-keyworkers.

Keyworker Status

Table 4

A table showing the coding and counts of cases who are and are not keyworkers.

Code	Status	<i>n</i>	%
0	Not Keyworker	6239	73.7
1	Keyworker	2228	26.3
Total		8467	100

Being a keyworker may contribute to experiencing food insecurity, as many keyworkers, such as cleaners, supermarket workers, and transport workers are often in low-paid positions. Many of these roles, particularly supermarket workers, are worked on a part-time basis, which may also contribute to having a lower income and to struggling more with affording basic necessities. Whilst other keyworkers, such as doctors, are highly paid, there may be a correlation between keyworker status and food insecurity. Table 4 depicts the distribution of values in the variable.

Regarding furlough and loss of working hours, being a keyworker will almost certainly be associated with a reduction in probability of reducing one's working hours.

Research Question 1

Sex

It is worth noting that Understanding Society does not ask respondents their gender identity, or whether or not someone identifies with the same gender as their biological sex. They only ask the respondent's biological sex. Henceforth, any reference to either sex or gender can be considered to represent the same concept.

Figure 5

Bar chart showing the distribution of the 'sex' variable.

Sex is coded as Male (1) and Female (2). A series of dummy variables were created, with the root name 'sex', such that 'sex_1' codes males as 1 and females as 0, and 'sex_2' the opposite. Nine cases answered in a third category: 'Prefer not to say'. These cases have been omitted from the analysis since they make up 0.01% of the dataset. With that in mind, when employing dummy variables, these cases will remain in consideration, within the '0' code of each dummy variable. The proportion of sexes in the dataset are represented by Figure 5.

Respondent sex is absent from Research Question 2 as this question is analysed on a household level, rather than an individual level. Therefore, it is not useful to include sex (or indeed age) in the analysis of that question.

Education Level

Education level was included as a proxy for socioeconomic status, as one's education level is likely to correlate with job level, social class, and salary. There was no variable present in the COVID-19 data to analyse job level or job description, however the main Understanding Society annual survey asks respondents the highest level of education they have attained in the variable 'hiqual_dv'. This variable was imported into the dataset, matched with each case, then recoded in such a way that each level of education is in order of difficulty/ status, as noted in Table 5, into the new variable 'highqual'.

Table 5

A table showing the coding and counts of cases in each education category in variable 'highqual'.

Code	Level	<i>n</i>	%
0	Other qualification	643	7.5
1	No qualification	492	5.6
2	GCSE or equivalent	1838	21.4
3	A-Level or equivalent	1980	23.0
4	Undergraduate degree	2613	30.4
5	Other higher qualification	1032	12.0
Total		8598	100

The table shows that the most common level of education achieved was a degree, with 30.4% of respondents having achieved this. As previously explained, the variable was coded to make it ordinal in structure, so that each successive level of education was worth one additional 'point' in the regression equation. This is with the exception of 'Other higher qualification' which encompasses postgraduate vocational qualifications for professionals such as nursing or teaching. Highest qualifications reported as 'other' were coded as '0', as this will cause it to act as the reference category in a regression analysis. This is useful because 'other' does not have a specific position in the ordinal scale.

The hypothesis relating to education level and changing working hours is that having attained a higher level of education makes it less likely that the pandemic will cause someone to reduce their working hours. Therefore, it was necessary to recode the variable so that each level of education had a sensible position on an ordinal scale.

Self-Employment

Due to a lack of government support as denoted by the literature, there is likely to be a correlation between self-employment and having reduced one's working hours. Figure 6 presents the distribution of the self-employment variable, which contains those who are either 'self-employed' or 'both employed and self-employed'. Therefore, the 'not self-employed' group contains those who are on a payroll only, or who were unemployed in Wave 5.

Figure 6

Bar chart presenting the distribution of 'selfemployed' variable.

Age

Age of respondents was included in the analysis of those who have reduced their working hours or been furloughed, as the literature suggests that younger people are more likely to experience loss of working hours than older people. Table 6 and Figure 7 shows the distribution of ages in the dataset, which have been restricted to ages under 66 as set out in the literature review.

The mean age is 43.70, and the data is moderately skewed at -.175. Therefore, this subset has a skew towards the older ages, with a median age of 45 years. The standard deviation of 13.855 means that two-thirds of the cases sit between 29.85 and 57.56 years ($\mu \pm \sigma$).

Table 6

Table showing the descriptive statistics of the age (in years) of respondents in the dataset.

Statistic	Value
<i>N</i>	6935
Minimum	17
Maximum	66
μ	43.70
Median	45.00
σ	13.855
Skewness	-.175

Figure 7

Histogram depicting the distribution of the age variable.

Methods

Given the binary structure of the outcome variables, binary logistic regression is the most relevant method of analysis for this study (Pampel, 2000). Binary logistic regression allows the probability of a particular outcome, be it 1 or 0, to be predicted based on other factors (Agresti, 2018). IBM SPSS Statistics for Macintosh 27.0.0 was used to analyse the data (IBM Corporation, 2020).

Using a block model for logistic regression allowed for a gradual increasing of model complexity, as different variables were added to the models to see changing effects. In research

question 1, Block 1 features the demographic variables pertaining to sex and ethnicity, as this was the first trend I wished to investigate. It seemed to have strong parallels in the literature. Block 2 adds the variable of having children, and an interaction variable between this and sex. Block 3 adds information about income and employment status, as this element is important to consider against the backdrop of other demographic characteristics. Block 4 adds educational qualifications as this gives an idea of a respondent's job level. Block 5 adds the binary variable of keyworker status; keyworker status and education level are important to consider alongside one another as they give an idea of the type of job someone does as a keyworker. Finally, Block 6 adds age and wellbeing, which are two variables I wished to refrain from adding until last in order to be able to consider them along with others.

A block model was also employed to answer research question 2 (food insecurity). Block 1 only includes household income, as this appears to be one of the largest predictors of food insecurity from the literature. Block 2 adds ethnicity, as those in a household with members from an ethnic minority background are more likely to face food insecurity, and it is interesting to consider this alongside income. Block 3 adds the effect of being a keyworker, as this alongside the earnings variable is essential to gauging which keyworkers are affected by food insecurity to a greater degree. Block 4 adds the 'under5s' variable, which adds the impact of having pre-school children to the analysis. Block 5 adds the interaction effect between being a parent of pre-school children and being a keyworker. Finally, Block 6 adds the variable pertaining to mental wellbeing, as this is useful to consider alongside all other factors as a holistic picture.

Results

This chapter presents the results of the data analysis carried out in order to answer research questions 1 and 2. The results of the binary logistic regression are presented below, along with statistical tests relevant to the analysis.

Research Question 1

Research question 1 was “Which factors may predict a person may have reduced their working hours in the COVID-19 pandemic?”. In order to assess this question, a binary logistic regression was fitted to the data. The results of this are presented in Table 7.

Block 1 of the analysis considered whether ethnicity and sex alone were predictors of furlough or job loss. The Nagelkerke pseudo- R^2 test gives a value of 0.000, which means that none of the variance (0%) in the dependent variable is explained by this model. Furthermore, neither predictor (sex or ethnicity) in this model has a statistically significant coefficient (B) or odds ratio (ExpB), and the chi-square (χ^2) value for this model is non-significant, meaning that there is little utility in analysing this model.

Block 2 of the analysis adds the ‘under5s’ variable to the model, denoting whether or not someone has pre-school children, along with an interaction model between sex and ‘under5s’. In this model, the Nagelkerke pseudo- R^2 value is 0.003, meaning that 0.3% of variance the dependent variable is explained by the model. This is not a large figure, however there are few variables in the model and as such this should be expected. The χ^2 value of 0.036 for the model was significant at the 0.05 significance level, meaning this model is a good fit for the data. The sex variable was non-significant ($p>0.05$), as was the ethnicity variable once again. The under5s variable was significant at the 99% significance level ($p<0.01$) and had a positive coefficient. ‘under5s’ has an odds ratio of 1.480, with a 95% confidence interval of between 1.146 and 1.911. This means that those with pre-school children are 48.0%, with a 95% confidence interval between 14.6% and 91.1%, more likely to lose hours at work or be furloughed during the pandemic than those without pre-school children. The interaction variable introduced in this model (sex*under5s) is not statistically significant.

Block 3 of the analysis adds the variables concerning earnings and employment status to the analysis. The Nagelkerke pseudo- R^2 value for this analysis is 0.027, meaning 2.7% of variance is explained by the model. Whilst still low, the R^2 value was markedly increased in this model as compared to Block 2. Furthermore, the χ^2 test of model fit is significant at ($p < 0.001$), meaning that the model is a good fit for the data. The variables for sex, ethnicity, and the interaction variable for sex and having pre-school children remain non-significant. As per Block 2, having pre-school children in the home gives 47.5% increased odds that one will be required to reduce their working hours during the pandemic. The income variable is statistically significant at the 0.001 significance level with an odds ratio of 1.053. For each income decile, there are 4.4% (95% CI = 2.3% to 6.6%) increased odds that one may be furloughed or lose hours in their work. For instance, for someone whose household earns a median income, £29,900 (Webber and O'Neill, 2021), there are 22% increased odds of having reduced hours. In the self-employed, the odds of having reduced hours are 119.5% (95% CI 83.3% to 162.9%) higher than for those who are employed on payroll.

Block 4 introduces the variable concerning highest qualification earned (highqual). The Nagelkerke pseudo- R^2 value for this analysis is 3.2%, meaning the model can explain 0.5% more of the variance in the dependent variable than Block 3. The χ^2 test of model fit is statistically significant at the ($p < 0.001$) level. The pre-school children, income and self-employment variables remain statistically significant as per previous models. The qualification variable is statistically significant ($p < 0.001$) with an odds ratio of 0.906, meaning that the odds of having lost working hours or being furloughed are reduced by 9.4% (95% CI = reduced odds by 5.1% to 13.5%) for each higher level of education. For example, this means that someone who has an undergraduate degree has 19.2% lower odds of losing working hours or being furloughed than someone with only GCSE level qualifications.

Block 5 adds keyworker status as a predictor in the model. The Nagelkerke pseudo- R^2 value for this model is 5.9%, meaning that this model can explain 2.7% more variance in the dependent variable than Block 4. This is a small value; however, it represents the largest increase between two models in the analysis, with an increase of 84% model-on-model. The χ^2

test of model fit is statistically significant at the ($p < 0.001$) level, and the other statistically significant variables remain so, as per previous models. The keyworker variable is statistically significant ($p < 0.001$) with an odds ratio of .528 (95% CI = 0.466 to 0.597). This means the odds of a keyworker losing hours in the job or being furloughed are reduced by 47.2%, as compared to a non-keyworker (CI = 40.3% to 53.4%).

Block 6 adds age and mental wellbeing as predictors in the model. The Nagelkerke pseudo- R^2 value for the model is 6.3%, signifying an increase of 0.4% in the amount of variance that can be explained by the new model. The χ^2 test of model fit is statistically significant at the ($p < 0.001$) level, and other variables previously assessed remain statistically significant with the addition of the new variables. Age, measured in years, has a statistically significant ($p < 0.001$) influence on the likelihood of furlough or working hours reduction, with an odds ratio of 0.991. This means that for every additional year of age, the odds of experiencing a reduction of working hours decreases by 0.9% (95% CI = 0.5% to 1.4% reduction in odds). The wellbeing variable is not statistically significant.

Table 7

A table displaying the results of a series of binary logistic regression models relating to Research Question 1.

	Block 1			Block 2			Block 3			Block 4			Block 5			Block 6		
	B	SE	ExpB	B	SE	ExpB	B	SE	ExpB	B	SE	ExpB	B	SE	ExpB	B	SE	ExpB
Constant	-.452	.108	.636	-.515	.110	.597***	-.834	.124	.434***	-.560	.141	.571***	-.404	.143	.667**	.014	.179	1.014
female	.003	.058	1.003 [.895, 1.124]	.037	.062	1.038 [.919, 1.172]	.075	.063	1.078 [.953, 1.218]	.091	.063	1.095 [.968, 1.239]	.134	.064	1.144* [1.010, 1.296]	.134	.064	1.143* [1.009, 1.296]
ethnicity = white	.093	.109	1.097 [.886, 1.358]	.112	.109	1.118 [.903, 1.386]	.075	.111	1.078 [.868, 1.339]	.053	.111	1.055 [.849, 1.311]	.049	.112	1.050 [.843, 1.307]	.107	.113	1.113 [.892, 1.389]
under5s				.392	.130	1.480** [1.146, 1.911]	.388	.132	1.475** [1.139, 1.909]	.402	.132	1.496*** [1.155, 1.937]	.471	.134	1.602*** [1.232, 2.084]	.410	.135	1.506** [1.156, 1.963]
female* under5s				-.296	.180	.744 [.523, 1.059]	-.307	.182	.735 [.515, 1.050]	-.301	.182	.740 [.518, 1.057]	-.328	.184	.720 [.502, 1.033]	-.363	.185	.695* [.484, .998]
base_earnin gs_deciles							.043	.011	1.044*** [1.023, 1.066]	.052	.011	1.053*** [1.031, 1.076]	.063	.011	1.065*** [1.043, 1.088]	.060	.011	1.062*** [1.039, 1.086]
selfemploye d							.786	.092	2.195*** [1.833, 2.629]	.803	.092	2.233*** [1.864, 2.675]	.727	.093	2.069*** [1.723, 2.484]	.767	.094	2.154*** [1.791, 2.591]
highqual										-.099	.024	.906*** [.865, .949]	-.101	.024	.904*** [.862, .947]	-.112	.024	.894*** [.853, .937]
keyworker													-.639	.063	.528*** [.466, .597]	-.640	.063	.527*** [.466, .597]
age																-.009	.002	.991*** [.986, .995]
wellbeing																-.001	.009	.999 [.982, 1.017]
	Nagelkerke R ² : .000 Block χ^2 : p = .692 Model χ^2 : p = .692			Nagelkerke R ² : .003 Block χ^2 : p = .008 Model χ^2 : p = .036			Nagelkerke R ² : .027 Block χ^2 : p = .000 Model χ^2 : p = .000			Nagelkerke R ² : .032 Block χ^2 : p = .000 Model χ^2 : p = .000			Nagelkerke R ² : .059 Block χ^2 : p = .000 Model χ^2 : p = .000			Nagelkerke R ² : .063 Block χ^2 : p = .000 Model χ^2 : p = .000		

ExpB is followed by 95% CI [LL, UL] | * $p < .05$. ** $p < .01$. *** $p < .001$.

Research Question 2

In order to assess Research Question 2 (*'What factors make it more likely that a household has experienced food insecurity in the COVID-19 pandemic?'*), a binary logistic regression was fitted to the data. The results of this are presented in Table 8.

Block 1 analyses the effect of household earnings on the dependent variable (likelihood of experiencing food insecurity). The Nagelkerke pseudo- R^2 value of this model is 0.038, meaning that 3.8% of the variance in the dependent variable is explained by this model alone. The χ^2 test of model fit is statistically significant at the ($p < 0.001$) level. The household earnings variable is statistically significant ($p < 0.001$), with an odds ratio of .807 (95% CI 0.758 to 0.859). This means that for each increase in income decile, a household has 19.3% lower odds of experiencing food insecurity.

Block 2 adds the effect of ethnicity to the analysis. The Nagelkerke pseudo- R^2 value of this model is 0.073, meaning that 7.3% of the variance in the dependent variable is explained by this model. The χ^2 test of model fit is statistically significant at the ($p < 0.001$) level, and the earnings variable remains statistically significant. The variable is statistically significant ($p < 0.001$) with an odds ratio of .228 (95% CI = 0.157 to 0.331). The odds ratio shows that households made up of exclusively white people (1) have 77.2% lower odds of experiencing food insecurity as compared to households made up with at least one person from an ethnic minority background (0), holding constant other factors.

Block 3 adds keyworker status to the model. The Nagelkerke pseudo- R^2 value of this model is 0.077, meaning that 7.7% of the variance in the dependent variable is explained by this model. The χ^2 test of model fit is statistically significant at the ($p < 0.05$) level, and previous variables remain statistically significant. The odds ratio of the keyworker variable is 1.522 (95% CI = 1.099 to 2.108), and is statistically significant, however only at the ($p < 0.05$) level. This means that households containing a keyworker have 52.2% higher odds of experiencing food insecurity as compared to those not containing keyworkers. It must be considered that, due to the significance level of this statistic, that there is a very weak association between the keyworker variable and the dependent variable.

Block 4 adds the variable containing information about pre-school children in the household to the model. The Nagelkerke pseudo- R^2 value of this model is 0.115, meaning that 11.5% of the variance in the dependent variable is explained by this model. The χ^2 test of model fit is statistically significant at the ($p < 0.001$) level. The earnings and ethnicity variables remained statistically significant at the ($p < 0.001$) level in this model, however the keyworker variable became non-significant upon the inclusion of the under5s variable. The under5s variable has an odds ratio of 4.461 (95% CI = 3.082 to 6.457), meaning that households with a pre-school child present have 346.1% higher odds of experiencing food insecurity as compared to those who do not have pre-school children. However, as shall be discussed later in the present paper, the small sample size of people with children under the age of 5 fitting within the foodinsecurity variable's parameters is very small. As such, this is a key limitation of this paper, which is also partially explained by the large confidence interval around the odds ratio.

Block 5 adds an interaction between the keyworker and under5s variables. The Nagelkerke pseudo- R^2 value of this model is 0.119, which means that only 0.4% more of the variance in the dependent variable is explained by this model than Block 4. The χ^2 test of model fit is statistically significant at the ($p < 0.05$) level. The other variables from previous models that were statistically significant are still so, however it is worth noting that the odds ratio of the under5s variable has changed considerably, and the standard error has increased from 0.189 to 0.280. This could be explained by the issues of sample size presenting uncertainties as considered prior. The interaction variable has an odds ratio of 2.505 and is statistically significant at the ($p < 0.05$) level, suggesting a low level of association. The interaction variable odds ratio suggests that in households with both keyworkers *and* pre-school children, the odds of experiencing food insecurity are 150.5% higher than in those who experience only one of these factors.

Block 6, finally, adds the mental wellbeing variable. The Nagelkerke pseudo- R^2 value of this model is 0.173, meaning that 5.4% more of the variance in the dependent variable is explained by this model than Block 5. The χ^2 test of model fit is statistically significant at the ($p < 0.001$) level, and previous variables remain statistically significant. The odds ratio of the wellbeing

variable is 1.182 (95% CI = 1.140 to 1.225), meaning that for each additional score of the GHQ-12, or poorer mental wellbeing, the odds of experiencing food insecurity increase by 18.2%. This means that, for those with the poorest mental wellbeing, the odds of experiencing food insecurity could increase by 218.4%.

Table 8

A table displaying the results of a series of binary logistic regression models relating to Research Question 2.

	Block 1			Block 2			Block 3			Block 4			Block 5			Block 6		
	B	SE	ExpB	B	SE	ExpB	B	SE	ExpB	B	SE	ExpB	B	SE	ExpB	B	SE	ExpB
Constant	-2.575	.145	.076***	-1.316	.207	.268***	-1.428	.213	.240***	-1.606	.221	.201***	-1.528	.222	.217***	-2.083	.240	.125***
base_earnin gs_deciles	-.215	.032	.807*** [.758, .859]	-.212	.032	.809*** [.760, .862]	-.224	.033	.799*** [.750, .852]	-.257	.034	.773*** [.723, .827]	-.256	.034	.774*** [.724, .828]	-.251	.035	.778*** [.726, .834]
ethnicity = white				-1.478	.190	.228*** [.157, .331]	-1.451	.190	.234*** [.161, .340]	-1.323	.195	.266*** [.182, .390]	-1.327	.196	.265*** [.181, .389]	-1.376	.201	.253*** [.170, .375]
keyworker							.420	.166	1.522* [1.099, 2.108]	.292	.170	1.339 [.960, 1.868]	.022	.211	1.022 [.676, 1.546]	.123	.214	1.131 [.743, 1.721]
under5s										1.495	.189	4.461*** [3.082, 6.457]	1.051	.280	2.860*** [1.651, 4.955]	1.082	.289	2.950*** [1.674, 5.199]
keyworker*u nder5s													.918	.386	2.505* [1.176, 5.338]	.937	.394	2.553* [1.179, 5.531]
wellbeing																.167	.018	1.182*** [1.140, 1.225]
	Nagelkerke R ² : .038 Block χ^2 : p = .000 Model χ^2 : p = .000			Nagelkerke R ² : .073 Block χ^2 : p = .000 Model χ^2 : p = .000			Nagelkerke R ² : .077 Block χ^2 : p = .013 Model χ^2 : p = .000			Nagelkerke R ² : .115 Block χ^2 : p = .000 Model χ^2 : p = .000			Nagelkerke R ² : .119 Block χ^2 : p = .015 Model χ^2 : p = .000			Nagelkerke R ² : .173 Block χ^2 : p = .000 Model χ^2 : p = .000		

ExpB is followed by 95% CI [LL, UL] | * $p < .05$. ** $p < .01$. *** $p < .001$.

Discussion

This section considers the application of the research findings to the literature, and associated recommendations for further research, along with a consideration of limitations of the research.

Key Findings

The first research question considered the relationship between a range of factors and the likelihood of losing working hours or being furloughed during the COVID-19 pandemic. The findings of the study suggest that having young children, having a higher household income and being self-employed all have the effect of increasing the odds of being furloughed or losing working hours during the pandemic. Conversely, factors which have the effect of attenuating the risk of being furloughed or losing working hours include having higher educational qualifications, being a keyworker, and being older. Ethnicity, gender, and level of mental wellbeing did not have a significant effect upon the likelihood of losing working hours.

It is necessary to consider the hypotheses set out in the literature review, and whether or not they may be accepted. Firstly, the data give us cause to fail to reject the null hypothesis concerning ethnicity, gender and mental wellbeing and working hours (H1, H2, & H8), as the data concerning these hypotheses were not statistically significant. Furthermore, the hypothesis suggesting that higher earners were less likely to have reduced their working hours (H4) is incorrect, according to the findings of this study, as the opposite is true. Therefore, in this case the null hypothesis must also be retained. In all other hypotheses, the null hypothesis must be rejected, as there is evidence to suggest these hypotheses are correct.

The second research question explored factors which may affect the likelihood of experiencing food insecurity at the hands of the pandemic. The key findings from the research conclude that being from an ethnic minority background, having pre-school (aged under 5) children, and having poor mental wellbeing are all likely to put a household at a higher risk of experiencing food insecurity. On the contrary, having a higher household income acts as a protective factor from food insecurity. No statistically significant evidence was found to suggest

that being a keyworker has an impact upon experiencing food insecurity. Therefore, the null hypotheses must be rejected for all of the research hypotheses, with the exception of the hypothesis suggesting a link between being a keyworker and experiencing food insecurity (H3).

Consideration of Findings in Context

The findings of the present study in many ways corroborate the prior literature on the subject of the coronavirus pandemic's socioeconomic implications. Research from Blundell and Machin (2020) found that self-employed people are often the secondary income earners in a household, especially when they earn less than their partners. As such, the finding that self-employed people are more likely to reduce their working hours would make sense in context. This question could be answered with a variable concerning the number of earners in the household; however, this was not included in this analysis. If one is a lower earner anyway, it would make sense from a practical perspective for the person earning more to continue working if the other adult in a household was needed, for instance, for childcare purposes.

On the topic of childcare, whilst there was no significant evidence to suggest an interaction between being a mother specifically and having reduced working hours, having young children does have a significant impact upon working hours in the pandemic. Whilst Adams-Prassl *et al* found that mothers were more likely than fathers to be forced into providing childcare and reduce working hours as a result (Adams-Prassl *et al.*, 2020b), it must be considered that their study considers all parents together, rather than splitting by age of child or whether or not a mother works. Therefore, this study evaluates a slightly different set of parameters to Adams-Prassl *et al.*

Regarding food insecurity, much of the research conducted prior to the present study seems to have made similar findings. Sosenko *et al* found that households with young children and low-income households are more likely to experience food insecurity than other groups (Sosenko *et al.*, 2019). The finding that those from an ethnic minority background are more likely to experience food insecurity is one shared by Barker and Russell, along with Weekes *et al* (Weekes *et al.*, 2020; Barker and Russell, 2020). A new finding that has not seen a parallel in the literature, however, is that those who have lower levels of mental wellbeing are more likely

to experience food insecurity. This finding is particularly important considering the wider context leading to poverty that disproportionately affects those with poorer mental wellbeing (Fitzpatrick *et al.*, 2018).

The present study has considered the impact of a variety of factors relating to the pandemic in September 2020. At the time of writing, seven months have passed since this data was collected. Future research would benefit from considering the longer-term effects of policy interventions, such as the furlough scheme, and their impact upon job retention rates and food insecurity as the pandemic continues. Data from the winter of 2020/21 is only just starting to become available to researchers, and it would be useful to plan future policy interventions for the long-term socioeconomic recovery of the UK based upon this newer data. However, the present study has provided useful evidence of factors which have affected the lives of people through these trying times and adds to the literature in this regard. Particularly important, as mentioned previously, is to consider the effect of mental wellbeing upon food security and is a gap in the literature which policymakers should plan to spend some time investigating and addressing.

One major limitation of this study has been the sample size, particularly regarding the number of people in the sample who have experience of using a food bank or in any other way experiencing food insecurity. If at all possible, this could have been alleviated through the availability of an alternative and/or additional dataset which could be used to answer questions of food insecurity in the pandemic. Whilst the findings of this study have been useful, it is possible that the severity of findings has been overstated by the lack of cases: 271 in 8,843 cases have experienced some form of food insecurity according to Figure 2.

Additionally, one notices that Research Question 1 suffers from very low values of R^2 , indicating that the regression models do not explain a great deal of the variance in the dependent variable. This can be caused by a model that requires further tuning and improvement in order to better reflect the data. Whilst the findings from the model were statistically significant, it should be considered that a model with a greater variety of predictor variables may explain the full picture of the data more successfully.

Conclusion

This project has created new understandings on the topic of working in the pandemic, and in the topic of experiencing food insecurity in the pandemic. The study has confirmed previous findings from earlier stages of the pandemic, such as that the self-employed and those with young children are disproportionately affected by the pandemic in terms of their working hours. This trend continues to the point where this data was gathered: September 2020. New realisations have also been made, for example that those with poor mental health are more likely to experience food insecurity as compared to those with a better level of mental wellbeing. From the literature reviewed, this finding doesn't seem to have been made until this point.

The overarching theme of this paper has been one of inequality, an inequality which transcends the context of the pandemic. The coronavirus pandemic has acted, for many, as an opportunity to refocus policy requirements, working arrangements and the way we live our lives as a society. The present study, along with prior literature, has found evidence to suggest a widespread socioeconomic inequality, particularly with regard to food security, but also in employment and general standards of living. Future policy must address these inequalities through a range of measures, including social welfare, care and health reform, to restructure the economy of the UK to be one that helps people through times of crisis, rather than allowing people to suffer in the way that they have.

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Appendices

Appendix A: SPSS Syntax for Variable Construction

Dependent Variable 1: furl_losthours

```

COMPUTE filter_$=(ce_hours >= 0).
VARIABLE LABELS filter_$ 'ce_hours >= 0 (FILTER)'.
VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.
FORMATS filter_$ (f1.0).
FILTER BY filter_$.
EXECUTE.

IF (ce_hours < ca_blhours) furl_losthours = 1.
EXECUTE.

IF (ce_ff_furlough = 1) furl_losthours = 1.
EXECUTE.

FILTER OFF.
USE ALL.
EXECUTE.

IF (unemployed = 1 & ca_blhours > 0) furl_losthours = 1.
EXECUTE.

```

Dependent Variable 2: foodinsecurity

```

RECODE ce_cutmeals (1=0) (0=1).
EXECUTE.

IF (ce_cutmeals = 1) foodinsecurity = 1.
EXECUTE.

RECODE ce_foodbank_cv (2=1) (3=1) (1=0).
EXECUTE.

IF (ce_foodbank_cv = 1) foodinsecurity = 1.
EXECUTE.

```

Independent Variable: education level (highqual)

```

IF (jk_hiqual_dv=5) highqual = 0.
EXECUTE.

IF (jk_hiqual_dv=9) highqual = 1.

```

EXECUTE.

IF (jk_hiqual_dv=4) highqual = 2.

EXECUTE.

IF (jk_hiqual_dv=3) highqual = 3.

EXECUTE.

IF (jk_hiqual_dv=1) highqual = 4.

EXECUTE.

IF (jk_hiqual_dv=2) highqual = 5.

EXECUTE.

Independent Variable: variables relating to presence of children in the home

IF (ce_hhcompa = 0 & ce_hhcompb = 0 & ce_hhcompc = 0) kidfreehousehold = 1.

EXECUTE.

RECODE kidfreehousehold (MISSING=0).

EXECUTE.

IF (ce_hhcompa >= 1) under5s = 1.

EXECUTE.

IF (ce_hhcompa = 0) under5s = 0.

EXECUTE.

IF (kidfreehousehold = 0) kids = 1.

EXECUTE.

IF (kidfreehousehold = 1) kids = 0.

EXECUTE.

Independent Variable: ethnicity – recoding.

IF (racel_dv=1) ethnicity = 1.

EXECUTE.

IF (racel_dv=2) ethnicity = 1.

EXECUTE.

IF (racel_dv=3) ethnicity = 1.

EXECUTE.


```
IF (racel_dv=4) ethnicity = 1.  
EXECUTE.
```

```
IF (racel_dv=5) ethnicity = 2.  
EXECUTE.
```

```
IF (racel_dv=6) ethnicity = 2.  
EXECUTE.
```

```
IF (racel_dv=7) ethnicity = 2.  
EXECUTE.
```

```
IF (racel_dv=8) ethnicity = 2.  
EXECUTE.
```

```
IF (racel_dv=9) ethnicity = 3.  
EXECUTE.
```

```
IF (racel_dv=10) ethnicity = 3.  
EXECUTE.
```

```
IF (racel_dv=11) ethnicity = 3.  
EXECUTE.
```

```
IF (racel_dv=12) ethnicity = 3.  
EXECUTE.
```

```
IF (racel_dv=13) ethnicity = 3.  
EXECUTE.
```

```
IF (racel_dv=14) ethnicity = 4.  
EXECUTE.
```

```
IF (racel_dv=15) ethnicity = 4.  
EXECUTE.
```

```
IF (racel_dv=16) ethnicity = 4.  
EXECUTE.
```

```
IF (racel_dv=17) ethnicity = 5.  
EXECUTE.
```

```
IF (race1_dv=97) ethnicity = 5.
EXECUTE.
```

Appendix B: Raw Variable Descriptors

Base_earnings – which is the standardised variable of earnings from Jan/Feb 2020.

Statistic	Value
<i>N</i>	6447
Minimum	£0.00
Maximum	£286,770.00
μ	£32,652.23
Median	£29,900.00
σ	£24,693.04
Skewness	1.768