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Pandemic unemployment and social disadvantage in Ireland

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ADELE WHELAN, ANNE DEVLIN, SEAMUS MCGUINNESS
AND PAUL REDMOND



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TABLE OF CONTENTS

EXECUTIVE SUMMARY	VII
CHAPTER 1 INTRODUCTION	1
CHAPTER 2 LITERATURE	3
2.1 COVID-19 and deprivation	3
2.2 The economic impact of COVID-19 in deprived areas	3
CHAPTER 3 DATA AND METHODS	7
3.1 Data	7
3.2 Methodology	18
CHAPTER 4 RESULTS	23
CHAPTER 5 CONCLUSION	35
REFERENCES	39

LIST OF TABLES

Table 3.1	Descriptive statistics of Pandemic Unemployment Payment data.....	7
Table 3.2	Classification of HP relative index scores at ED level in Ireland, 2016.....	11
Table 3.3	Classification of four phases of the pandemic.....	16
Table 4.1	Estimation results (marginal effects) from probit models examining EDs with disproportionately high PUP rates (10 per cent or more greater than the State average)	24
Table 4.2	Estimation results (marginal effects) from probit models examining EDs with disproportionately high PUP rates (10 per cent or more greater than the State average), across four pandemic phases.....	26
Table 4.3	Estimation results from differences-in-differences model examining the percentage changes in the PUP rates between phases at ED.....	30
Table 4.4	Estimation results from OLS models examining PUP durations	33

LIST OF FIGURES

Figure 3.1	Average length of durations (weeks) in receipt of PUP by gender and age	8
Figure 3.2	Spatial distribution of PUP recipients	9
Figure 3.3	Spatial distribution of PUP recipients in Dublin region.....	10
Figure 3.4	Spatial distribution of HP deprivation index at ED level in Ireland.....	12
Figure 3.5	Spatial distribution of HP deprivation index at ED level in Dublin region	13
Figure 3.6	PUP rates and relative HP deprivation at ED level, March 2020-September 2021.....	14
Figure 3.7	Length of durations (weeks) in receipt of PUP by deprivation	15
Figure 3.8	COVID-19 Stringency Index and the four phases.....	16
Figure 3.9	PUP rates across the four classified phases of the pandemic.....	17
Figure 3.10	PUP rates and HP relative deprivation at ED level, Phases 1-4.....	18
Figure 3.11	Distribution of the ratio ED PUP rate divided by the national average, Phase 1... 19	
Figure 4.1	Rate of off-flow from PUP between Phases 1 and 2.....	27
Figure 4.2	Rate of on-flow to PUP between Phases 2 and 3.....	28
Figure 4.3	Rate of off-flow from PUP between Phases 3 and 4.....	28
Figure 4.4	Weekly average PUP rate (%) by deprivation, March 2020-September 2021.....	29
Figure 4.5	PUP claim duration (in weeks) and relative HP deprivation at ED level	32

ABBREVIATIONS

DSP	Department of Social Protection
ED	Electoral Division
EU	European Union
HP index	Pobal Haase Pratschke Relative Deprivation Index
HR	High Restrictions
LR	Low Restrictions
MR	Medium Restrictions
PUP	Pandemic Unemployment Payment

EXECUTIVE SUMMARY

Previous research has shown that, on average, lower paid workers were more susceptible to job losses during the pandemic. This relates to the fact that many low paid jobs are in sectors that were particularly hard hit by the public health measures. For example, many businesses in the accommodation and food sectors were forced to close at various points during the pandemic, with little prospect for low-paid workers to continue to work remotely.

Our research investigates the economic impact of the pandemic on people living in disadvantaged areas in Ireland. This is carried out by examining whether area-level deprivation affected the number and duration of Pandemic Unemployment Payment (PUP) recipients. This is done by merging a unique dataset of PUP recipients from the Department of Social Protection (DSP) with Electoral Division (ED) level measures of deprivation based on the Pobal Haase Pratschke Relative Deprivation Index (HP Relative Deprivation Index).¹

Our results indicate that the employment situation of individuals in deprived areas (as measured by the HP deprivation index) was more heavily impacted by pandemic lockdown conditions than was the case for individuals from more affluent areas. Specifically, we find that ED-level Pandemic Unemployment Payment (PUP) rates, which we define as the percentage of working-age individuals in an ED in receipt of PUP, were higher in more deprived areas during lockdown periods. These area-level PUP rates also fell more quickly in more deprived areas once lockdown conditions were relaxed. Consistent with this pattern, average PUP durations were often lower in more deprived areas.

Our findings are consistent with the literature in that, relative to more affluent areas, employees in deprived areas are more likely to work in low-paid jobs that were susceptible to pandemic lockdown restrictions and offered little possibility of remote working. Accordingly, PUP rates in these constituencies fluctuated dramatically in line with the implementation, and subsequent easing, of lockdown restrictions. It is also possible that individuals in more deprived areas had less discretion in terms of the decision to work. For example, a single-earner household with children, in which the main earner is in a low-paid occupation, may need to return to work immediately once restrictions are eased. In more affluent multi-earner households, there may be greater discretion when it comes to the decision

¹ In this report, the term HP Index and deprivation index refer to the HP Relative Deprivation Index unless explicitly stated otherwise.

about when to return to work. This may also be a contributing factor to the shorter durations of PUP spells in deprived areas.

The HP deprivation index is constructed based on a variety of factors that are linked to deprivation including, for example, the percentage of individuals in an area with a third-level qualification, the percentage of lone parent households in an area, and the average number of persons per room within an area. As such, in addition to examining the overall relationship between PUP rates and deprivation, we examine the role of these individual components of the deprivation index. Our analysis shows that ED-level PUP rates are higher for areas with a greater share of lone parent households and for those with a higher share of non-Irish born individuals. These area-level characteristics are also related to longer PUP durations.

It is important to point out that this study focuses only on Pandemic Unemployment Payment recipients, which was a specific social welfare payment for those who lost all their employment due to the COVID-19 public health emergency. As such, we do not analyse the other conventional types of unemployment benefit (Jobseeker's Allowance (JA) and Jobseeker's Benefit (JB)). Prior to the COVID-19 pandemic, the number of Live Register recipients had decreased somewhat over 2018 and 2019. However, over the 81 weeks that we study, the number of Live Register recipients was relatively stable. In March 2020, there were approximately 205,000 people on the Live Register, decreasing to 163,000 in Sept 2021. Overall expenditure on jobseeker payments also fell somewhat from €2.1 billion in 2020 to €1.9 billion in 2021 (CSO, 2022). Apart from the variations in PUP receipt that we document in this paper, the underlying levels of JA and JB are likely to be higher in more deprived areas.²

From a policy perspective, the results highlight a number of potential inequalities in the impact of the pandemic with respect to area level deprivation. These economic inequalities are in addition to the greater health impacts of the pandemic which have also been found to be greater in more deprived areas. This is an important consideration for policymakers in situations whereby future events may necessitate lockdown policies.

² The Live Register (LR) is a monthly series providing a record of the number of people registering for Jobseeker's Allowance (JA), Jobseeker's Benefit (JB), Jobseeker's Benefit for the Self-Employed (JBSE), and various other statutory entitlements with the Department of Social Protection (DSP).

CHAPTER 1

Introduction

It has been well documented internationally that the impacts of the COVID-19 pandemic have been disproportionately felt by low-income households, both from a health and an economic perspective. Many low paid workers are employed in occupations which were more likely to be affected by the restrictions imposed by governments in response to the pandemic (e.g. hospitality and tourism) and simultaneously lower paid workers are less likely to be able to work from home compared to their higher paid counterparts (Whitehead et al., 2021). This report examines whether area-level deprivation affected the number and duration of recipients of the Pandemic Unemployment Payment (PUP).

The Pandemic Unemployment Payment was a social welfare payment to employees and the self-employed who lost their employment as a result of the COVID-19 pandemic. It was introduced in Ireland by the Department of Social Protection in March 2020 for those aged 18-66 years. Initially it was introduced at a flat rate of €350. Over time, it was subsequently altered to reflect an individual's pre-pandemic earnings as it may have been acting as a disincentive to return to work when restrictions eased. From March 2022 individuals still in receipt of PUP were being moved to standard Jobseeker's Benefit.

Highly deprived areas are more likely to be affected by higher unemployment rates due to various potential factors including limited job opportunities, limited resources and infrastructure, lower educational attainment, skills mismatches, differential social networks, transportation and/or mobility challenges, discrimination and bias, and cyclical effects of intergenerational disadvantage. Furthermore, these factors can interact and reinforce each other contributing to persistence in higher unemployment rates. The COVID-19 pandemic may have further exacerbated the economic challenges in more deprived areas due to the associated economic disruption and economic downturn for many reasons including higher population densities, inadequate healthcare infrastructure, lack of adequate healthcare coverage, greater prevalence of underlying health conditions, education and childcare disruptions, limited access to technology and/or internet, acceleration of remote work and the adoption of automation, disruption to social networks and support systems, in addition to other differential local contexts and government responses.

In this study, we explore how COVID-19 unemployment rates vary in more deprived areas. We specifically explore the relationship between the COVID-19 Pandemic Unemployment Payment (PUP) and spatial variations in social

deprivation at an ED level (equating to 3,409 areas in Ireland). The Pandemic Unemployment Payments replaced the income for those who lost their income due to the COVID-19 health emergency and the resulting economic impact of lockdowns and restrictions. The payment was designed as income replacement to mitigate the short-term impact on financial wellbeing that COVID-19 related job interruption would cause.

This paper uses a unique dataset of PUP recipients based on administrative data collected by the Department of Social Protection (DSP) to examine to what extent pandemic unemployment relates to social deprivation at the Electoral Division (ED) level. We examine the relationship between pandemic unemployment with overall deprivation using the relative HP deprivation index and the individual components of deprivation, including but not limited to, the proportion of lone parents, the area's educational profile, and the proportion residing in local authority housing.

The COVID-19 pandemic period examined is from March 2020 to September 2021. We consider the relationship between PUP rates and deprivation over the entire period as well as at different points of the pandemic given the heterogeneous nature of the responses taken by the government over time. We identify and examine periods of high PUP rates and high restrictions, low PUP rates and low restrictions, and low PUP rates and medium restrictions. The relationship between social deprivation and duration on PUP as well as movements on and off the payment are also examined in more detail, using data from the DSP, which contain information for all 768,188 individual PUP beneficiaries (age and gender) along with their associated ED.

Our research supports the view that individuals in deprived areas were more heavily impacted by changes in lockdown conditions compared to individuals from affluent areas. PUP rates were found to be higher in more deprived areas during lockdown periods but also fell more quickly when lockdown conditions were relaxed; consistent with this pattern, average PUP durations were also lower in more deprived areas. The evidence is consistent with individuals from more deprived areas being more likely to work in low-paid jobs that made them more exposed to the labour market disruption as a result of the COVID-19 pandemic.

CHAPTER 2

Literature

2.1 COVID-19 AND DEPRIVATION

There is a growing literature on the relationship between area-level deprivation and the impacts of COVID-19, the majority of which examine the health impacts of the pandemic rather than the economic impacts. Infection rates have been found to be higher amongst residents of more deprived areas, and severe illness in the form of hospitalisations and ICU admissions are also more likely in more deprived areas (Meurisse et al., 2022; Mena et al., 2021; Green et al., 2021; Hsiao et al., 2021; Clouston et al., 2021; Quan et al., 2021; Patel et al., 2020; Hawkins et al., 2020). McGowan and Bambra (2022) refer to how COVID-19 has played out differently in deprived communities as a syndemic resulting in higher mortality and morbidity amongst those who are more socially disadvantaged. A syndemic occurs when health-related problems cluster by person, place, or time exacerbating the spread and burden of disease.

Baena-Díez et al. (2020) looked specifically at incidence rates in Barcelona across districts based on their income levels and found a very strong negative relationship between the two, i.e. the districts with the lowest incomes had the highest rates of infection and vice versa. Gullón et al. (2022) examine neighbourhoods in Madrid; in fact the majority of such work focuses on particular areas within a country rather than a country as a whole. They find that inequalities are dynamic in that there were wide deprivation inequities in some periods whereby incidence rates were highest in the most deprived areas. Conversely, in other periods they found evidence of inverse inequities whereby rates were lower in the more deprived areas. They suggest that this may be due to differing regional policy, mobility or immunity between the neighbourhoods.

2.2 THE ECONOMIC IMPACT OF COVID-19 IN DEPRIVED AREAS

The economic impacts were also felt to a greater extent in more deprived areas. The social interruption of restrictions and lockdowns was found to be more acutely felt by people from socially disadvantaged backgrounds (Bonaccorsi et al., 2020), in part due to people from socially disadvantaged backgrounds being more likely to experience job disruption as a result of government restrictions (Gray et al., 2021). Similarly, people from socially disadvantaged backgrounds are less likely to be able to work from home, telecommute or accept a furlough, with these all being raised as issues of advantage or privilege (Yancy, 2020). While the literature on deprivation and COVID-19 unemployment is scarce, potentially due to a lack of data availability, there is some work on which sectors or which individuals were impacted the most. For example, early in the pandemic it was documented that

workers in accommodation, food services and retail would disproportionately be affected (Byrne et al., 2020; Berube and Bateman, 2020). However there is heterogeneity within these groups, for example, some retail workers will be affected by closures (e.g. clothing retailers) while others were classed as essential workers (e.g. grocery retailers) (Redmond and McGuinness, 2020).

Research on unemployment directly caused by the pandemic, e.g. due to lockdowns, is limited. However there is some research on unemployment due to the pandemic amongst particular groups, mostly focused on gender or racial division in the US. Building on findings that women were more likely to be unemployed due to the pandemic (Alon et al., 2020), as were minorities (Cowan, 2020), Gezici and Ozay (2020) take an intersectional approach and find that women from minority ethnic backgrounds were the worst affected. Adams-Prassl et al. (2020) also find that the economic impacts were highly unequal and exacerbated existing inequalities, again finding that women and those with less education were more likely to see their employment affected. Montenovolo et al. (2021) find employment decreases were largest in the US for Hispanics, younger workers and those with lower educational attainment. Not surprisingly, job losses were also found to be more common in roles where interpersonal contact was necessary.

The international literature examining the relationship between COVID-19 unemployment and deprivation is scarce. However, particular cohorts of society are more likely to have become unemployed; for example women, those from ethnic minority backgrounds and/or those with lower educational attainment. Therefore, it is highly likely that deprivation is also correlated with pandemic unemployment.

In Ireland it has been found that mitigation measures, such as the closure of businesses and lockdowns, had a significant impact on reducing the infection rate and likely reduced the death rate (Cazelles et al., 2021). In fact, Ireland had one of the longest closures of public space in the first wave of the pandemic in Europe and also reintroduced a reduced lockdown again in the second wave (OECD, 2020). Brioscú et al. (2021) examine the recipients of the PUP a year after it was introduced and find Hospitality, Retail, and Construction were the three most impacted sectors particularly early in the pandemic. Furthermore, younger people were more likely to be on the payment for longer periods and women's employment status was affected to a greater extent by the pandemic than their male peers. They find no strong regional differences, but otherwise area-level characteristics are outside the scope of the work. In similar work for Ireland, those who are young, low-skilled and part-time are more likely to suffer job loss as a result of pandemic mitigation measures than their counterparts (Coates et al., 2020). In Northern Ireland (NI), Lloyd (2021) finds that areas in Belfast which have long histories of deprivation had higher job losses due to restrictions in the

COVID-19 first wave than more affluent areas. This goes above the standard analysis of contemporary deprivation levels on a particular outcome by looking at deprivation through a historical lens.

Despite initial fears about the negative economic shock associated with the pandemic, we are now experiencing a very tight labour market which is in contradiction to what may have been anticipated at the outset (Quilter-Pinner et al., 2020). However, given the concerns about the economy going forward and further negative shocks, this may be a short-term phenomenon, and research on the economic impacts of the pandemic, particularly on employment, remain critical.

CHAPTER 3

Data and methods

3.1 DATA

The Pandemic Unemployment Payment data used herein were made available by the DSP. The data show individual, anonymised, administrative data for all the recipients of PUP between 18 March 2020 and 30 September 2021, a total of 768,188 observations. For each individual the dataset shows the weeks the individual was in receipt of PUP over the course of the pandemic, alongside their age, gender, and the ED in which they reside.³ Each individual in Ireland who received PUP at some point over the pandemic is therefore an observation in the data.

A summary of the descriptive information for the dataset is displayed in Table 3.1. Of all PUP recipients, 55.2 per cent were male and 60.7 per cent were aged between 18 and 40. The average age of PUP recipients was 37.5 years and is slightly lower (higher) for women (men) at 36.7 (38.1) years.

TABLE 3.1 DESCRIPTIVE STATISTICS OF PANDEMIC UNEMPLOYMENT PAYMENT DATA

Variables	Proportion (per cent)
Male	55.2
Female	44.8
Age group	
18-25 years	23.9
26-40 years	36.8
41-55 years	28.9
56-65 years	10.4
Average age	37.5
Average age (Female)	36.7
Average age (Male)	38.1
N	760,862 ⁴

Source: PUP data from Department of Social Protection.

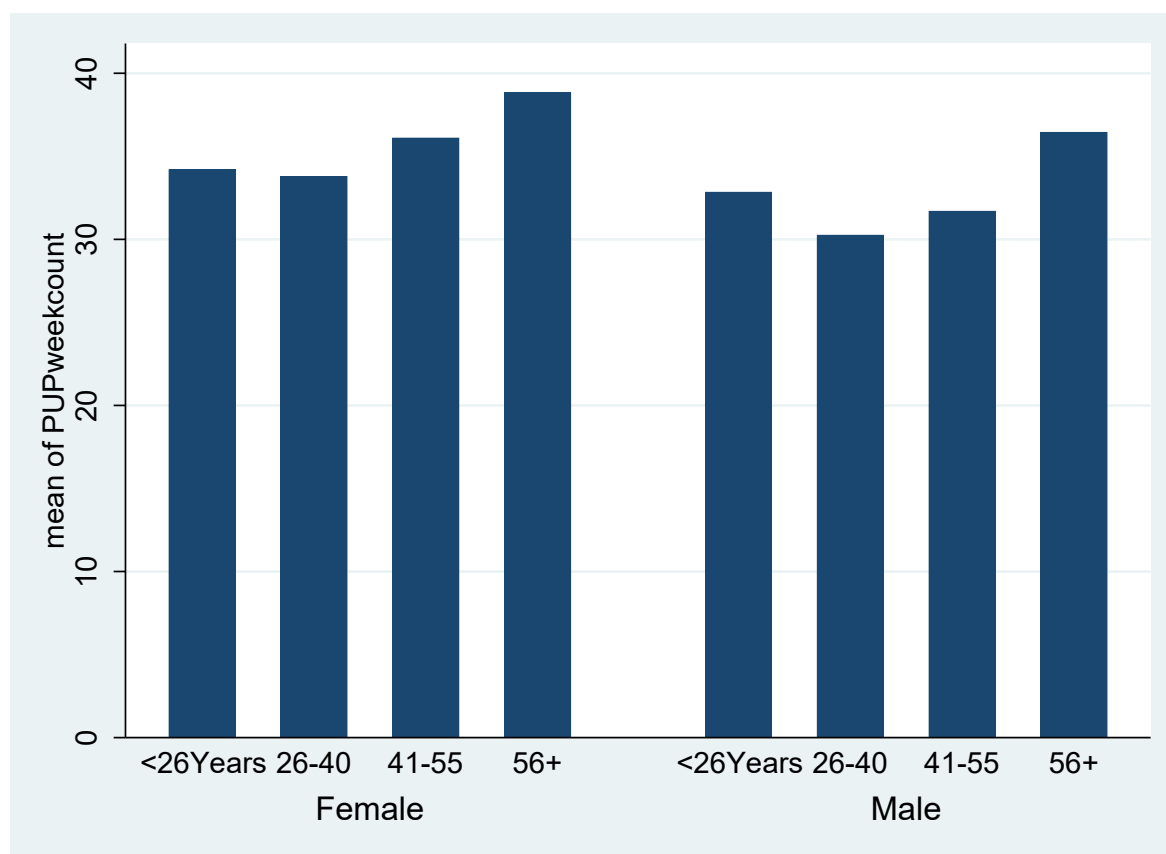
The data from March 2020 to September 2021 cover 81 weeks. Some recipients received the payment for a single week while others were on the payment for the entire 81-week period for which we have data. Figure 3.1 looks at the duration of payments in more detail, by showing the average duration of PUP receipts for both

³ There are 3,409 EDs in Ireland.

⁴ In Table 3.1, N lower than previously stated as original data included some individuals younger than 18 and older than 64 years of age.

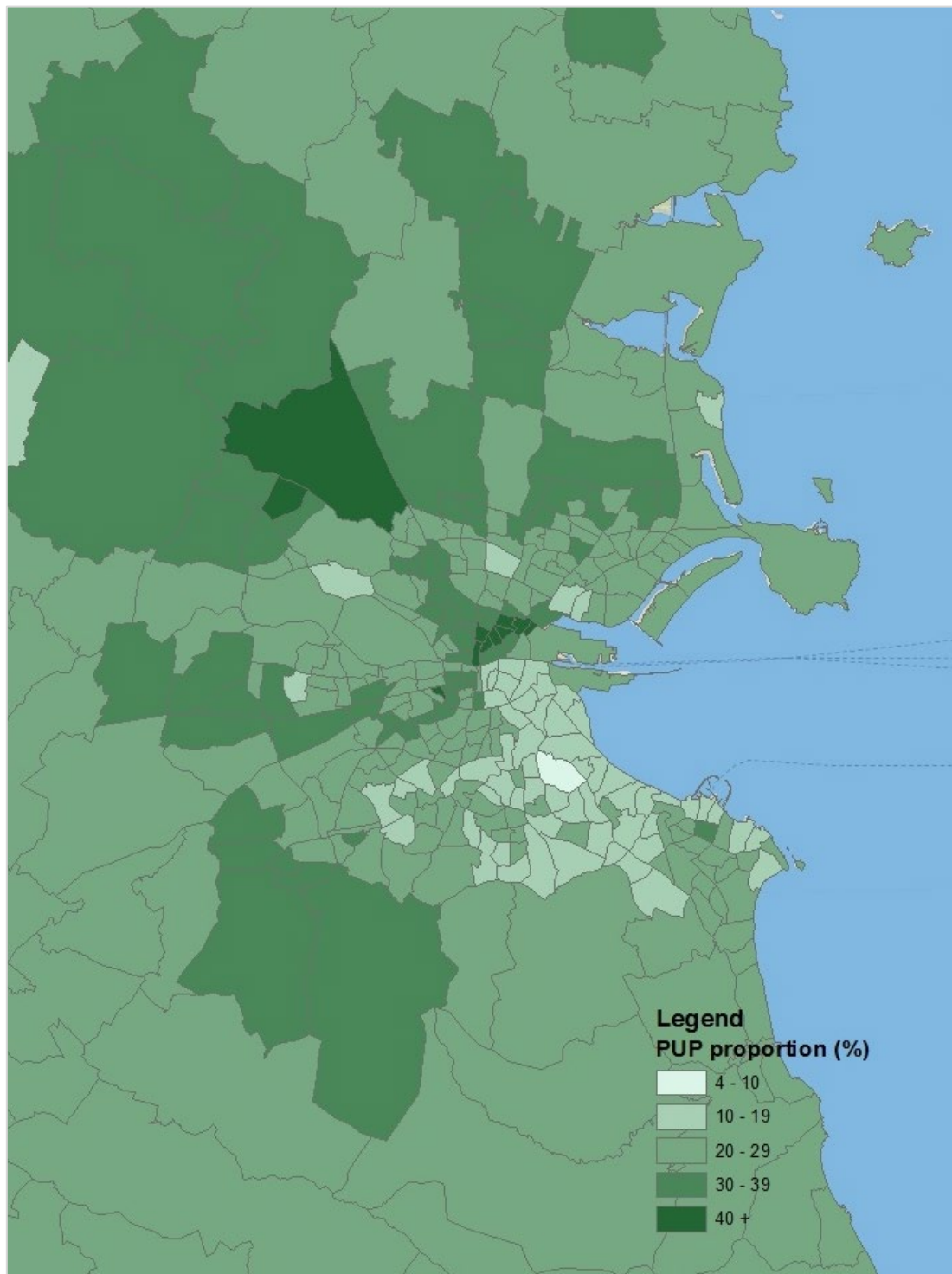
genders separately, based on age. The average PUP duration for all recipients was 33 weeks (out of the 81 weeks). On average, women were in receipt of PUP for a slightly longer duration than men (Figure 3.1). Figure 3.1 also shows that older individuals tended to spend a longer time in receipt of PUP compared to younger people.

FIGURE 3.1 AVERAGE LENGTH OF DURATIONS (WEEKS) IN RECEIPT OF PUP BY GENDER AND AGE



Source: PUP data from Department of Social Protection.

In order to examine how social deprivation relates to PUP rates, we aggregate the PUP recipients at an ED level to calculate the proportion of working age individuals in an ED who received PUP over the pandemic. There are 3,409 ED areas. At a State level, between March 2020 and September 2021, 26 per cent of those aged 18-64 received the payment. Across EDs, the proportion of the those aged 18-64 who received PUP varied from 4 per cent to 59 per cent. Figures 3.2 and 3.3 display the spatial variation of PUP at the ED level nationally and for the Dublin region respectively. There is considerable variation across Ireland with higher rates in particular seen around counties Dublin, Kerry and Donegal. Considerable variation is also seen between the Dublin EDs (Figure 3.3).

FIGURE 3.3 SPATIAL DISTRIBUTION OF PUP RECIPIENTS IN DUBLIN REGION

Source: PUP data from Department of Social Protection.

Aggregating the PUP data allows us to then merge the ED level PUP data with the 2016 Pobal Haase Pratschke (HP) Relative Deprivation Index (also at ED level). The HP relative deprivation index is created using data from the 2016 Census for Ireland at a low geographical level on a range of indicators for demographic profile, social class composition and labour market situation (including age dependency, population change, educational attainment, housing, occupation, lone

parenthood, and unemployment).⁵ Table 3.2 shows the deprivation index score, which ranges from approximately -40 (most deprived) to +30 (least deprived). Table 3.2 also shows the labels that correspond to the deprivation index scores, which are used to describe EDs. At one end of the scale, an ED may be described as ‘very affluent’, while at the other end, ‘extremely disadvantaged’. The spatial variation of the HP relative deprivation index is shown nationally and for Dublin in Figures 3.4 and 3.5. Again, substantial variation is seen across Ireland with higher levels of deprivation in particular in Donegal, Roscommon and Mayo. There is also considerable variation within Dublin with some very affluent areas beside some very deprived EDs.

TABLE 3.2 CLASSIFICATION OF HP RELATIVE INDEX SCORES AT ED LEVEL IN IRELAND, 2016

Relative Index Score	Label	Number of EDs in 2016	Percentage of EDs in 2016	Our Classification (1-4)
20 to 30	Very Affluent	1	0.03%	4
10 to 20	Affluent	146	4.28%	4
0 to 10	Marginally Above Average	1,274	37.37%	3
0 to -10	Marginally Below Average	1,733	50.84%	2
-10 to -20	Disadvantaged	239	7.01%	1
-20 to -30	Very Disadvantaged	15	0.44%	1
Below -30	Extremely Disadvantaged	1	0.03%	1
Total		3,409	100%	

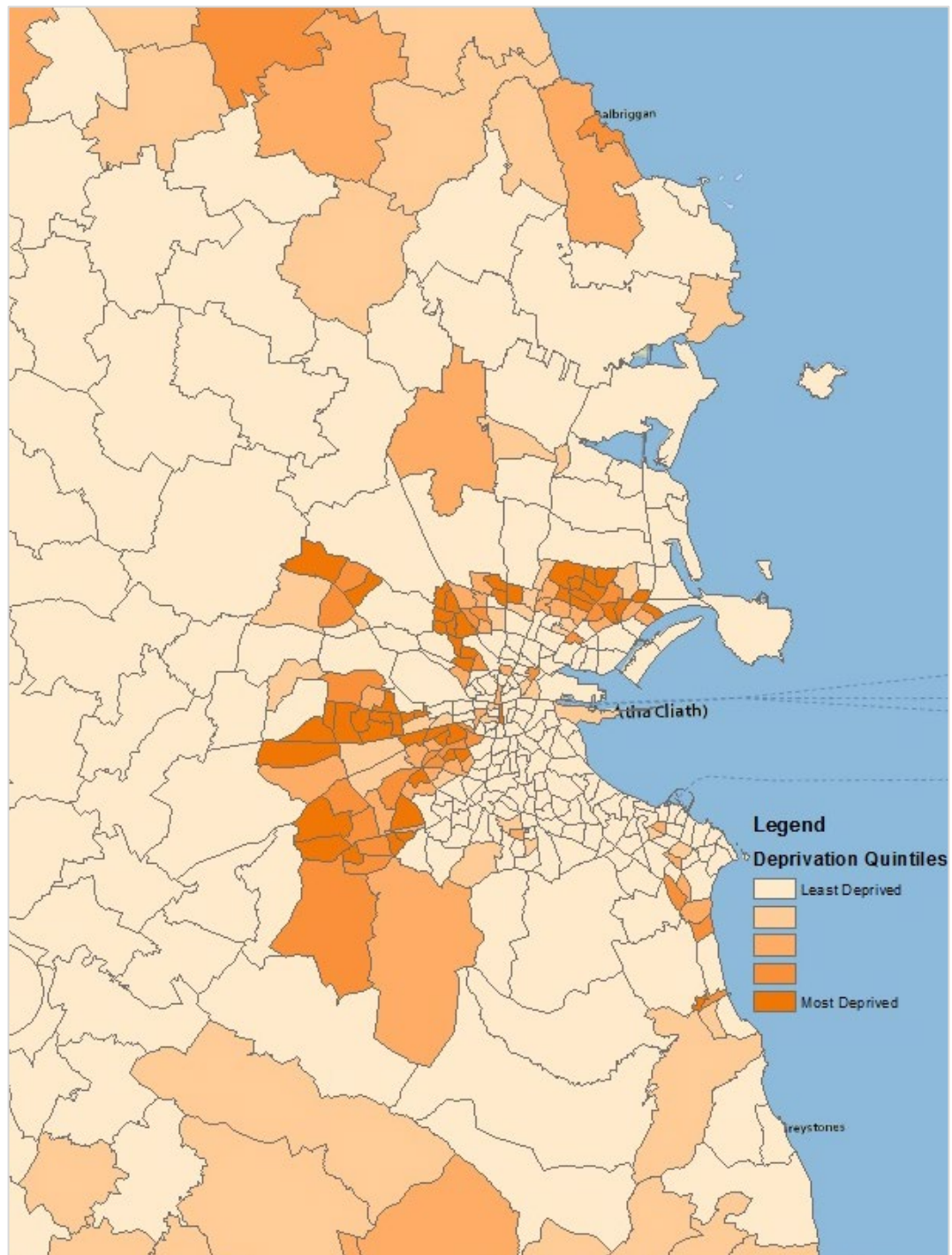
Source: Pobal (<https://www.pobal.ie/app/uploads/2018/06/The-2016-Pobal-HP-Deprivation-Index-Introduction-07.pdf>).

⁵ For more on the HP deprivation index see: <https://www.pobal.ie/app/uploads/2018/06/The-2016-Pobal-HP-Deprivation-Index-Introduction-07.pdf>.

FIGURE 3.4 SPATIAL DISTRIBUTION OF HP DEPRIVATION INDEX AT ED LEVEL IN IRELAND



Source: Pobal HP Index.

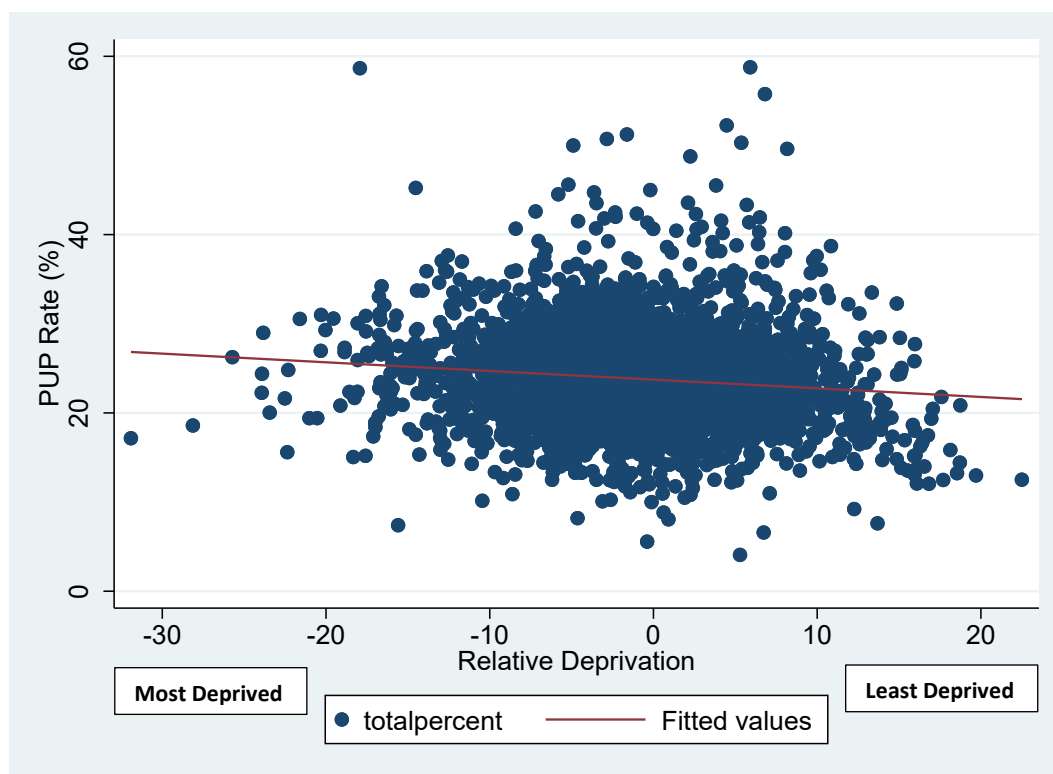
FIGURE 3.5 SPATIAL DISTRIBUTION OF HP DEPRIVATION INDEX AT ED LEVEL IN DUBLIN REGION

Source: Pobal HP Index.

Descriptive evidence on the relationship between the HP deprivation index and the proportion of PUP claimants at the ED level highlights differences in COVID-19 unemployment rates based on social deprivation. Figure 3.6 shows the PUP rates plotted against relative deprivation at the ED level. There is a clear relationship between relative deprivation and the proportion of those in an ED who were in receipt of PUP. The most deprived areas have higher rates of PUP than more

affluent areas (a score in the region of -30 for relative deprivation represents the most deprived EDs in Ireland).

FIGURE 3.6 PUP RATES AND RELATIVE HP DEPRIVATION AT ED LEVEL, MARCH 2020-SEPTEMBER 2021

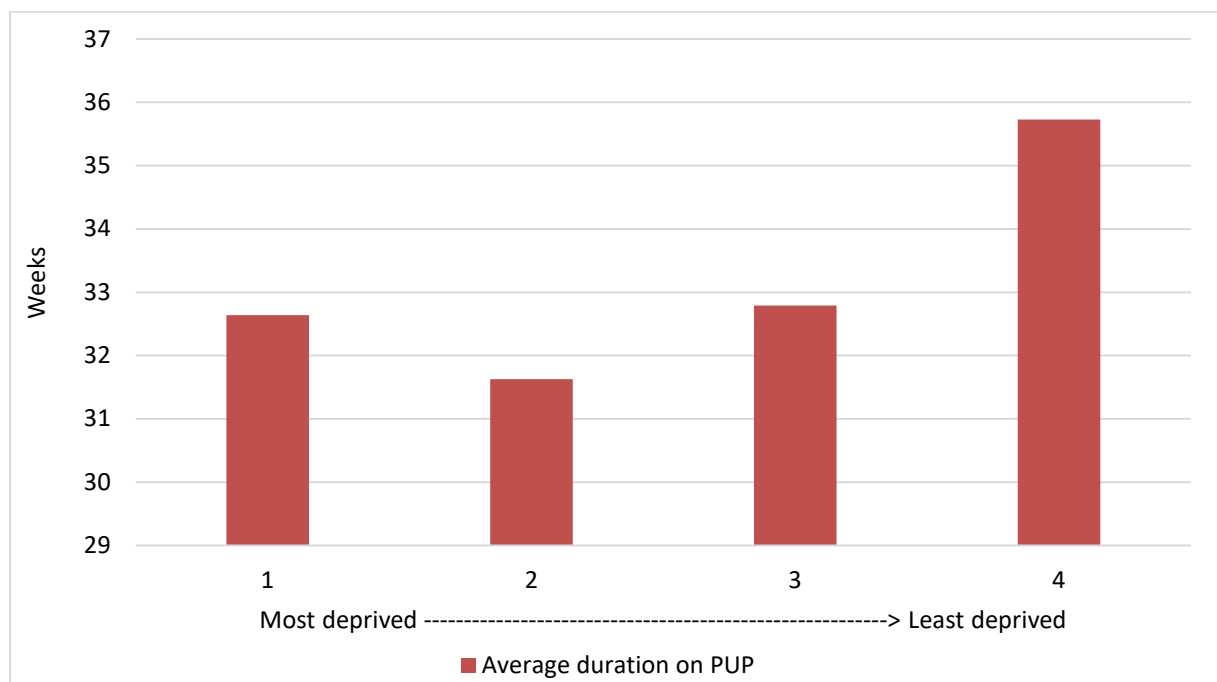


Source: PUP rate from DSP and deprivation from HP Index.

Note: In relation to the relative deprivation index, lower values indicate more deprived areas. For the complete classification of HP relative index at ED level in Ireland, see Table 3.2.

We also examine the average duration by deprivation. Using a four-point scale of those most deprived, those marginally above average deprivation, those marginally below average deprivation and least deprived,⁶ we find differences in PUP durations. Figure 3.7 displays the average duration on PUP at an ED level. Individuals in the least deprived areas on average spent longer on PUP than their counterparts in more deprived areas.

⁶ The creators of the HP index use eight categories to describe areas by their deprivation but for the purposes of this research the most and least deprived categories are made up of only a few EDs and we therefore amalgamate into four categories. For more on these categories see <https://www.pobal.ie/app/uploads/2018/06/The-2016-Pobal-HP-Deprivation-Index-Introduction-07.pdf>.

FIGURE 3.7 LENGTH OF DURATIONS (WEEKS) IN RECEIPT OF PUP BY DEPRIVATION

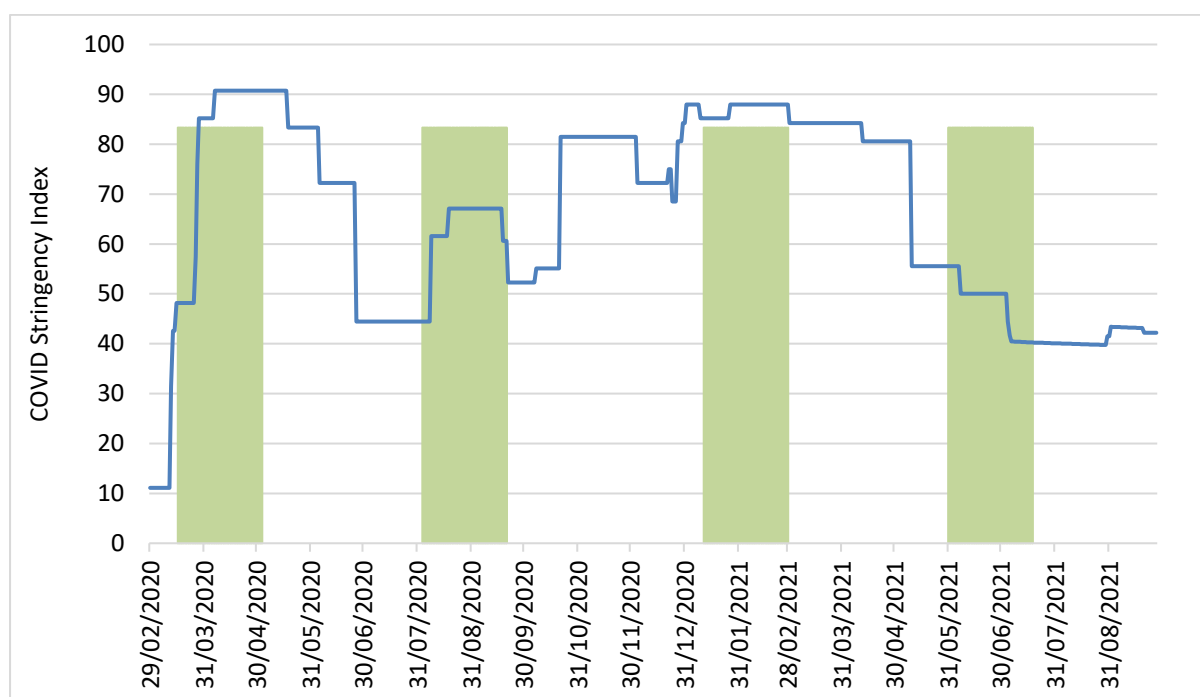
Source: PUP duration from DSP data and deprivation from HP Index.

Given how the pandemic evolved over time with infections rising and falling, and restrictions easing and constricting, PUP rates also ebbed and flowed over time. As such, we also examine how PUP reciprocity and its relationship with deprivation changes over time. We classify four distinct time periods (each covering seven weeks) based on the number of PUP recipients and restrictions at the time (Table 3.3). The number of PUP recipients is based on CSO data, and the level of restrictions is measured using the COVID-19 Stringency Index. The COVID-19 Stringency Index is a composite measure based on nine forms of government response to the pandemic (school closures, workplace closures, cancellation of public events, restrictions on public gatherings, closures of public transport, stay-at-home requirements, public information campaigns, restrictions on internal movements and international travel controls). The index is the mean score of each of the nine forms of response with each taking a value between 0 and 100, with 100 being the strictest response measures. Specifically, we wanted to identify phases where PUP rates were high and restrictions were high, and compare those with i) time periods where PUP rates were low and restrictions were low and ii) PUP rates were low and restrictions were medium. Firstly, Figure 3.8 shows how restrictions changed over the period of interest using data from the Our World in Data COVID-19 Stringency Index (Our World in Data, 2022).

TABLE 3.3 CLASSIFICATION OF FOUR PHASES OF THE PANDEMIC⁷

	Start date ⁸	End date	No. of People Nationally in Receipt of PUP (N)	Restrictions (COVID-19 Stringency Index)
Phase 1	16 March 2020	3 May 2020	High (496,803)	High (80)
Phase 2	3 August 2020	20 September 2020	Low (238,595)	Medium (63)
Phase 3	11 January 2021	28 February 2021	High (473,730)	High (87)
Phase 4	31 May 2021	18 July 2021	Low (253,736)	Low (48)

Source: Authors' analysis.

FIGURE 3.8 COVID-19 STRINGENCY INDEX AND THE FOUR PHASES

Source: Authors' analysis using Our World in Data (2023) – COVID Stringency Index.

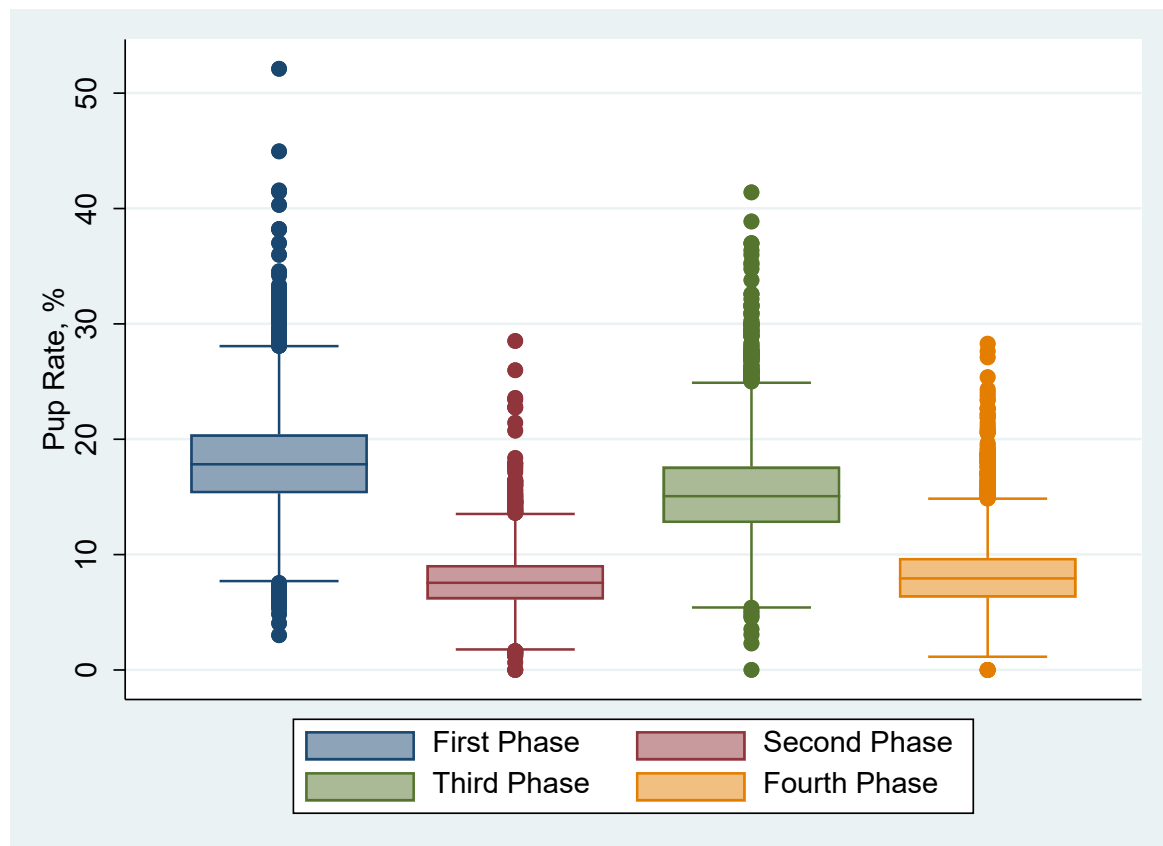
PUP rates at the ED level differed considerably over these time periods as shown in Figure 3.9. Overall, between 4 per cent and 59 per cent of individuals across the 3,409 EDs were in receipt of PUP at some point during the 81 weeks for which we have data. Looking at distinct time phases, the rate of PUP was highest in the early period of the pandemic. In the first phase, when restrictions were high, the average rate was 18 per cent, with variations between 3 per cent and 52 per cent. In Phase 2, when restrictions were medium, the numbers in receipt of PUP were

⁷ The COVID Stringency Index was used to determine phases where restrictions were high and phases in which restrictions were lower. For more on the index see: <https://ourworldindata.org/explorers/coronavirus-data-explorer>.

⁸ Week beginning 16 March, data begin on 18 March.

much lower, averaging 8 per cent, with the rate across EDs varying from 0 per cent to 29 per cent. In Phase 3 restrictions were high, and the average PUP rate was 15 per cent with a range from 0 per cent to 41 per cent. In Phase 4, restrictions were low. The average rate of PUP at the ED level in the final phase was 8 per cent with a range from 0 per cent to 28 per cent.

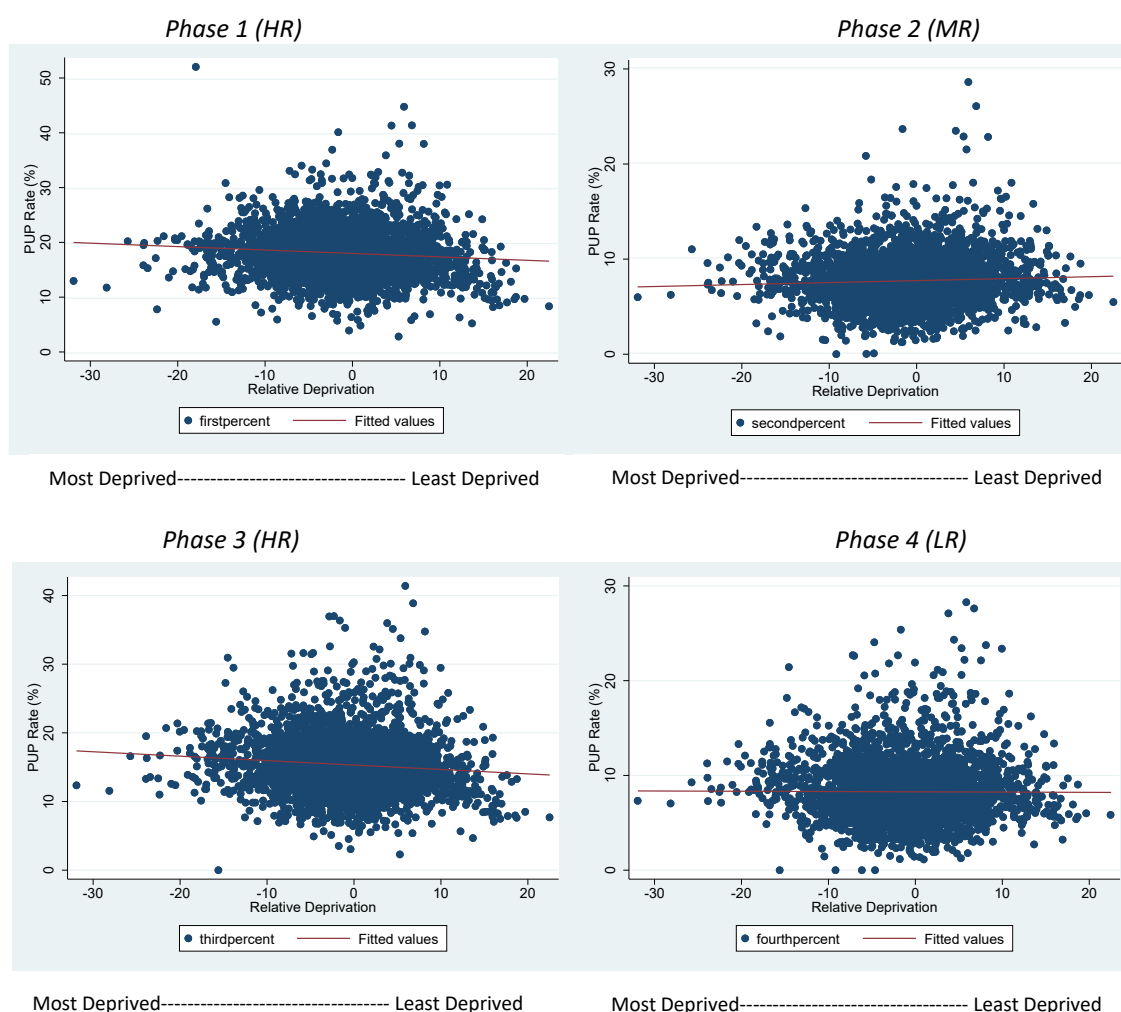
FIGURE 3.9 PUP RATES ACROSS THE FOUR CLASSIFIED PHASES OF THE PANDEMIC



Source: PUP rate from Department of Social Protection data.

Note: See Table 3.3 for complete classification of the four stages identified.

Figure 3.10 shows the relationship between PUP rates and the HP relative deprivation index across the four phases. The second and fourth phases appear distinctly different. In Phase 1 and Phase 3, the relationship is consistent with what was seen in Figure 3.6; PUP rates are higher in more deprived areas. However, in Phases 2 and 4 (Figures 3.10 and 3.12), conversely, higher rates are observed in the more affluent areas, although the correlation appears weaker than was seen in the other phases. This provides an initial indication that flows off PUP were rapid in the more deprived areas when restrictions were lifted.

FIGURE 3.10 PUP RATES AND HP RELATIVE DEPRIVATION AT ED LEVEL, PHASES 1-4

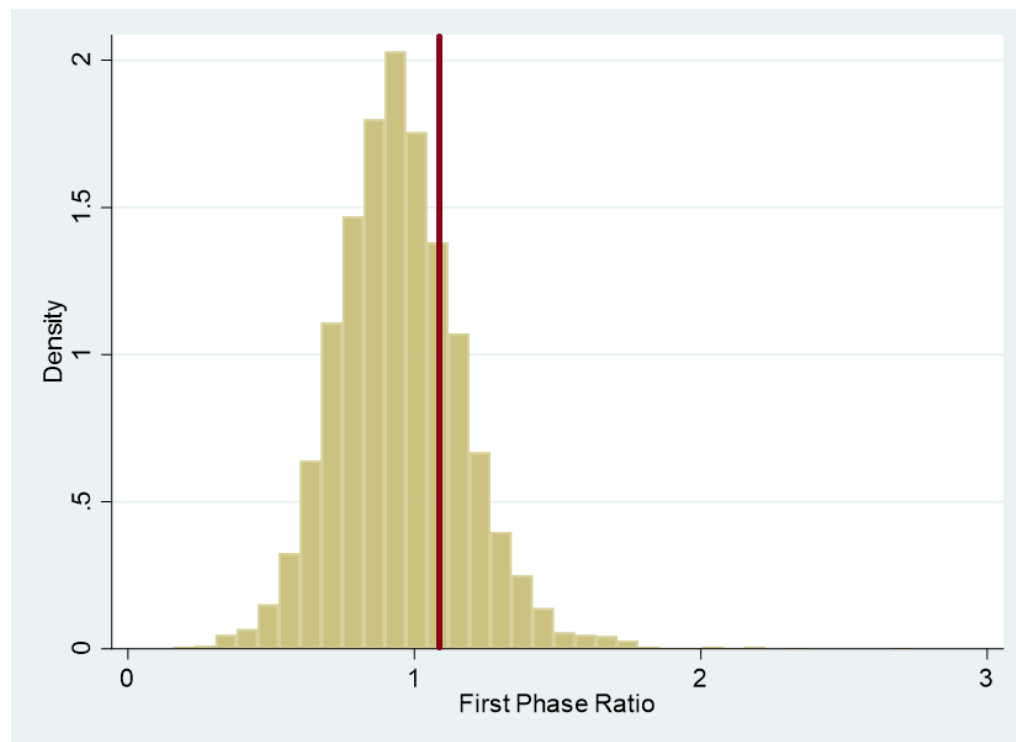
Source: PUP rate from DSP and deprivation from HP Index.

3.2 METHODOLOGY

The objective of our empirical strategy is to measure the extent to which pandemic related unemployment was higher, or lower, in more deprived areas after controlling for other factors. For the PUP rate we have individual level data of those in receipt of the payment but not for those without PUP receipt. Therefore, individual level analysis is not possible. PUP rates as a proportion of the working age population at the ED level were calculated. A dependant variable was then generated indicating whether an ED had a higher rate of PUP receipt than average. The ED PUP rate was divided by the average PUP rate nationally so that a ratio of 1 meant that the PUP rate in the particular ED was in line with the average PUP rate. A ratio of greater (less) than 1 means that the PUP rate within the ED was higher (lower) than average. A binary was then created whereby it was 1 for those with a ratio of more than 1.1, identifying those EDs which had disproportionately higher rates of PUP. All other EDs were coded as zero. Figure 3.11 shows the distribution of this constructed variable and the associated cut-off point for the construction of the dependent variable. We constructed a binary variable for ease of interpretation of the results. A threshold of 1.1 was chosen in order to focus on

EDs which had disproportionately higher rates of PUP than the State average. As shown in Figure 3.11 a large proportion of EDs have a rate close to the average with 36 per cent of EDs having a rate 10 per cent either side of the average, looking then at only those more than 10 per cent above the average allows us to specifically examine those areas which had relatively high levels of PUP reciprocity. When using this cut-off we are examining 768 EDs, about 23 per cent of all EDs.⁹

FIGURE 3.11 DISTRIBUTION OF THE RATIO ED PUP RATE DIVIDED BY THE NATIONAL AVERAGE, PHASE 1



Source: PUP rate from Department of Social Protection data.

We estimate a probit model to examine EDs with disproportionately higher PUP rates, and measure the impact of deprivation, while simultaneously controlling for other demographic and area-level characteristics that may also influence PUP rates (Table 4.1). Several specifications were utilised, beginning with a model looking at the overall PUP rate and then subsequently for the four phases described above.

The probit model took the standard form to examine the effect of Deprivation on PUP rates at an ED level:

$$HIGHER_PUP_j^* = \beta_1 X_j + \beta_2 DEP_j + \varepsilon_j \quad (1)$$

⁹ The results are not sensitive to the cut-off point of 1.1. Robustness checks using cut-off between of 1.05 and 1.09 were modelled and the results remain unchanged. The change in the number of EDs either side of the cut-off was relatively small. We have also run the model using the continuous variable and findings are consistent.

where $HIGHER_PUP_j^*$ equals 1 when the ED PUP ratio is greater than 1.1 (where the PUP ratio is the ED PUP Rate divided by the average PUP State rate i.e. Higher PUP rate signifies an ED with a PUP rate 10 per cent or more in excess of the State average), X_j represents a vector of area-specific independent variables, individual and employment share characteristics, DEP_j is main independent variable of interest measuring the area-level deprivation of each ED, and ε_j is an iid error term.

We begin by including the overall measure of deprivation from the HP deprivation index coded on a four-point scale (as outlined in Table 3.2 above) where 1 denotes the most deprived areas and 4 the most affluent areas.¹⁰ In a subsequent model, we include measures of the sub-components which make up the HP deprivation index as controls to examine the key drivers rather than the overall composite indicator. Specifically, these are the ED's age dependency rate, educational attainment, lone parent rate, average persons per room, unemployment by gender and the tenure status of households. The proportion of migrants in an ED, while not included within the HP deprivation index, is also added as a control to the specification.

In addition to the deprivation level measures, we also control for a range of other area level characteristics that we derive using the 2016 Census data, as individuals' occupation before the pandemic is not included in the data available to us. Occupational composition within each ED is also controlled for, given the relationship they will have with the likelihood to receive PUP; i.e. some occupations will be affected by restrictions much more than others while some are more suitable for remote working than others. As occupation is included as a control, the HP deprivation components which measure skills levels are dropped out due to collinearity between occupation and skill level.

We also measure variations in the PUP rate within EDs over time. This is done using a difference-in-difference approach. Such an approach allows time invariant unobserved heterogeneity to be accounted for, resulting in more robust estimates. The difference-in-difference approach takes the following form:

$$\frac{Y_{it} - Y_{i(t-1)}}{Y_{i(t-1)}} = \alpha_t + \beta_t Deprivation + \gamma_t X_{it} + \varepsilon_{it} \quad (2)$$

where the outcome variable on the left-hand side is the percentage change in the PUP rate between two sequential phases. We focus mainly on the overall magnitude of the coefficients as the movements between phases are either predominantly on-flows or off-flows depending on how restrictions change. On-flows are when PUP rates increase from the previous period while off-flows are

¹⁰ While a 6-point scale is normally used the proportion of EDs in either tail is very small and leads to imprecise estimates.

when PUP rates fell between two sequential periods. To assist the interpretability of our results, all percentage changes are transformed to be positive. Deprivation is again on a four-point scale.

Finally, we estimate an OLS model to examine the average PUP claim durations across EDs and measure the impact of deprivation while simultaneously controlling for other personal and area-level characteristics that may also influence PUP claim durations (Table 4.4). The OLS model took the standard form to examine the effect of deprivation on average PUP claim duration at ED level:

$$PUP_DUR_j^* = \beta_1 X_j + \beta_2 DEP_j + \varepsilon_j \quad (3)$$

where $PUP_DUR_j^*$ is the variable which denotes the average length of PUP claims in weeks at an ED level, X_j represents a vector of area-specific independent variables, individual and employment share characteristics, DEP_j is again the main independent variable of interest measuring the area-level deprivation of each ED, and ε_j is an iid error term.

CHAPTER 4

Results

Table 4.1 estimates Equation 1 pooled across all the weeks of data available (81 weeks). Column 1 shows a model with only the four levels of area deprivation to observe the aggregate effect before adding our control variables in Columns 2 and 3. The results show that disproportionately high PUP rates (10 per cent or more above the State average) are more likely in more deprived areas. The most deprived areas are 13 percentage points more likely to have disproportionately high PUP rates when compared to the least deprived areas (Table 4.1, Column 2). Interestingly, the second and third most deprived group of EDs, which make up a large proportion of all EDs, also are more likely to have disproportionately high PUP rates, when compared to the most affluent group. These two groups are 13 percentage points and 9 percentage points respectively more likely to have disproportionately high PUP rates (i.e. PUP rate 10 per cent or higher in excess of the PUP state average). In terms of the other covariates, areas with large proportions of non-EU born individuals, relative to the Irish/UK population, are more likely to have disproportionately high levels of PUP reciprocity. Certain occupations (such as managerial, administrative, skilled trades and sales) are also correlated with the PUP rate. Given we are controlling for occupation at the area-level, it is unlikely to have the same effect that would be seen if we were able to control for individual level occupation. Area-level occupation make-up is also likely to be highly correlated with area-level deprivation, which potentially explains the low marginal effects we see.

In Column 3 (Table 4.1), a similar specification is used but rather than include deprivation as per the HP deprivation index, the components of the index are used as derived from Census 2016 in order to gain an understanding of what elements of deprivation are driving higher PUP rates. Areas with a high proportion of lone parents and an above average persons per room rate were more inclined to have disproportionately higher than average PUP rates. In this specification, the impact of the occupational composition controls is consistent with the earlier specification, and areas with larger proportions of EU28-born individuals are found to have disproportionately higher than average rates of PUP.

TABLE 4.1 ESTIMATION RESULTS (MARGINAL EFFECTS) FROM PROBIT MODELS EXAMINING EDS WITH DISPROPORTIONATELY HIGH PUP RATES (10 PER CENT OR MORE GREATER THAN THE STATE AVERAGE)

	1		2		3	
Deprivation						
1 Most Deprived	0.16	***	0.13	***		
2	0.12	***	0.13	***		
3	0.08	**	0.09	**		
4 Least Deprived	Ref		Ref			
Deprivation Components						
Age dependency Rate					0.00	**
Education (Ref: Third-level)						
Primary education					0.00	
Medium education					-0.00	
Lone parent rate					0.01	***
Above average persons per room					0.06	***
Male Unemployment Rate					-0.00	
Female Unemployment Rate					0.00	
Local Authority rented					0.00	
Place of birth (Ref: Ire/UK)						
EU born			0.00	*	0.01	**
Non-EU born			0.01	**	0.00	
Occupations (Ref: Professional Occupations)						
Managers, directors, and senior officials			0.01	**	0.01	***
Associate professional and technical			0.00		-0.00	
Administrative and secretarial			0.01	***	0.01	***
Skilled trades			0.01	***	0.01	***
Caring, leisure and other service			0.00		0.00	
Sales and customer service			0.01	**	0.00	
Process, plant and machine operatives			-0.00		-0.00	
Elementary occupations			0.01	***	0.01	***
Not stated/Other			0.01	***	0.00	*
PUP Characteristics						
Proportion male			-0.00		-0.00	
Average Age			-0.00		0.00	*
N	3,409		3,409		3,409	
R2	0.01		0.05		0.08	
Wald chi2	19.30	***	139.23	***	241.19	***

Source: PUP data from DSP; HP deprivation index from Pobal and occupation data from 2016 Census.

Notes: *** p<0.01 **p<0.05 *p<0.1; outcome variable is equal to 1 if the ED has a higher-than-average rate of PUP.

Table 4.2 utilises the same specification as is seen in the second column of Table 4.1, with the outcome variable for each model equating to a binary variable indicating disproportionately high PUP rates for each classified phase of the pandemic. There is evidence of significant heterogeneity across the phases, in terms of the proportion receiving PUP, and the relationship with deprivation.

Deprivation plays a substantially different role across the four phases which appears to be related to the nature of restrictions at the time. In fact, the overall analysis in Column 1 is disguising some of the differences. In Phases 1 and 3, both periods with high levels of restrictions, all areas with the exception of the most affluent are more likely to have disproportionately higher PUP rates (10 per cent or more above the State average). In Phase 3, the most deprived areas are the most likely to have disproportionately high PUP rates while in Phase 1 this is not the case. Interestingly, in Phase 1 early in the COVID-19 pandemic, disproportionately higher than average rates were more likely to be seen in the second category, that is the group that is relatively deprived. In Phase 2, PUP rates do not differ by deprivation. In Phase 4, when restrictions were low, only the most deprived areas see disproportionately higher than average rates. However, there is no statistically significant difference for the other deprivation categories. This indicates that the most deprived areas were more likely to have disproportionately high rates of PUP in the latter stages of the pandemic. As in the earlier models, higher proportions of non-EU born individuals is correlated with higher PUP rates.

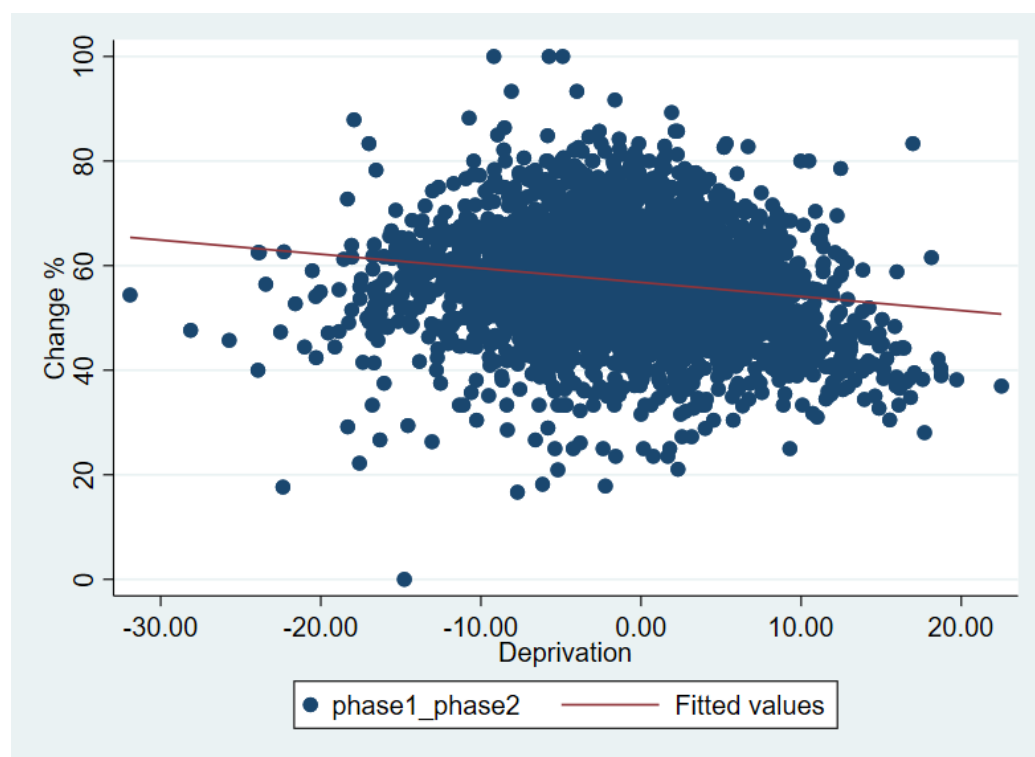
TABLE 4.2 ESTIMATION RESULTS (MARGINAL EFFECTS) FROM PROBIT MODELS EXAMINING EDS WITH DISPROPORTIONATELY HIGH PUP RATES (10 PER CENT OR MORE GREATER THAN THE STATE AVERAGE), ACROSS FOUR PANDEMIC PHASES

			HR		MR		HR		LR	
	Overall		1		2		3		4	
Deprivation										
1 Most Deprived	0.13	***	0.15	***	-0.02		0.22	***	0.11	**
2	0.13	***	0.21	***	-0.02		0.17	***	0.04	
3	0.09	***	0.17	***	0.00		0.13	***	0.04	
4 Least Deprived	Ref		Ref		Ref		Ref		Ref	
Place of birth (Ref: Ire/UK)										
EU born	0.00	*	0.00		0.00		0.00		0.00	
Non-EU born	0.01	**	0.01	***	0.01	***	0.01	*	0.01	***
Occupations (Ref: Professional Occupations)										
Managers, directors, and senior officials	0.01	**	0.01	***	0.00		0.01	**	0.01	*
Associate professional and technical	0.00		0.00		0.01	*	0.00		0.00	
Administrative and secretarial	0.01	***	0.01	**	0.01	***	0.01	***	0.01	***
Skilled trades	0.01	***	0.00	**	0.00	**	0.01	***	0.01	***
Caring, leisure and other service	0.00		0.01		0.01	***	0.01	**	0.01	***
Sales and customer service	0.01	**	0.01	**	0.00		0.01	**	0.01	**
Process, plant, and machine operatives	-0.00		0.00		-0.01	**	0.00	*	-0.01	*
Elementary occupations	0.01	***	0.02	***	0.01	***	0.02	***	0.01	***
Not stated/Other	0.01	***	0.00	**	0.00	**	0.01	**	0.00	**
PUP Characteristics										
Proportion male	-0.00		0.00		0.00		0.00	**	0.00	***
Average Age	-0.00		0.00		0.00		-0.01	*	-0.01	***
R2	0.05		0.04		0.06		0.03		0.05	
Wald chi2	139.23	***	133.10	***	158.58	***	133.04	***	169.16	***

Source: PUP data from DSP; HP deprivation index from Pobal and occupation data from 2016 Census.

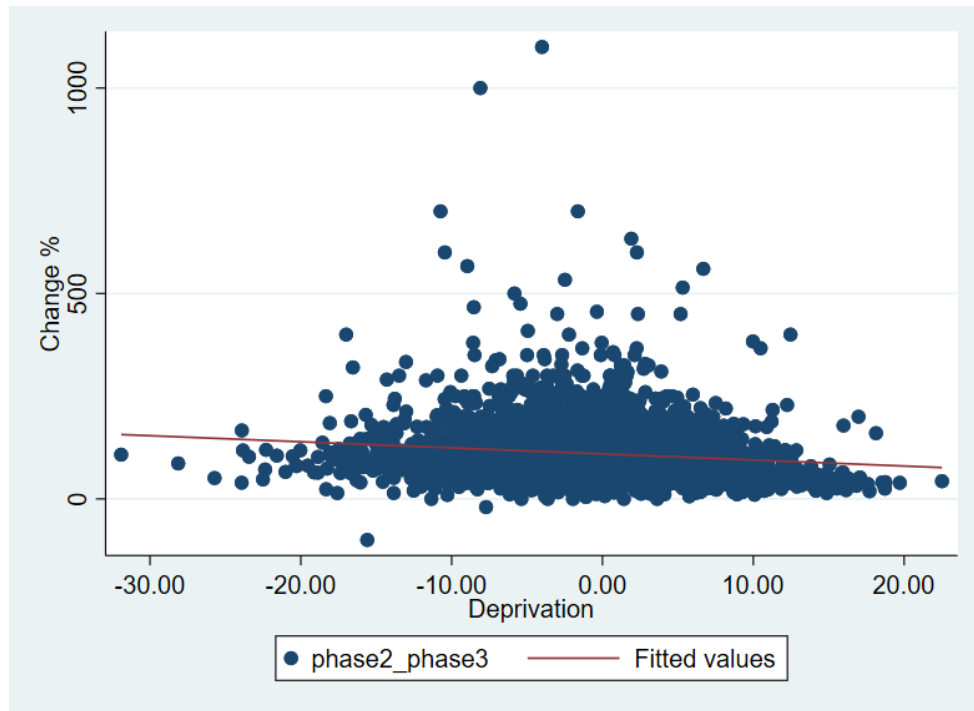
Given the changing restrictions and resulting fluctuations in the PUP rate over time, we also examine changes between the four phases and again considerable heterogeneity is evident. Figures 4.1 to 4.3 show the rate of change between subsequent phases plotted against deprivation (with negative extremes indicating the most deprived areas). Between phases the large majority of EDs see an average increase or decrease in the rate depending on how government restrictions have changed (i.e. when restrictions tighten the PUP rate increases and vice versa), therefore we are mainly interested in the magnitude of the change. In periods of off-flow where the PUP rate fell, the change in PUP has been multiplied by -1 to make all numbers positive and allow for easier interpretation.

FIGURE 4.1 RATE OF OFF-FLOW FROM PUP BETWEEN PHASES 1 AND 2



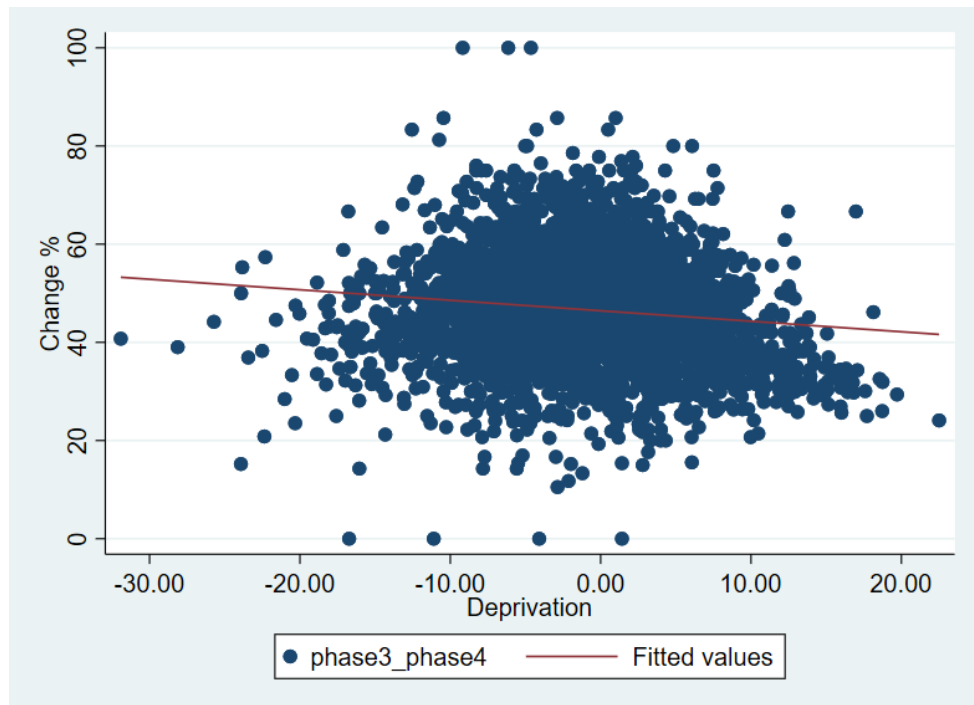
Source: PUP data from DSP and HP deprivation index.

FIGURE 4.2 RATE OF ON-FLOW TO PUP BETWEEN PHASES 2 AND 3



Source: PUP data from DSP and HP deprivation index.

FIGURE 4.3 RATE OF OFF-FLOW FROM PUP BETWEEN PHASES 3 AND 4

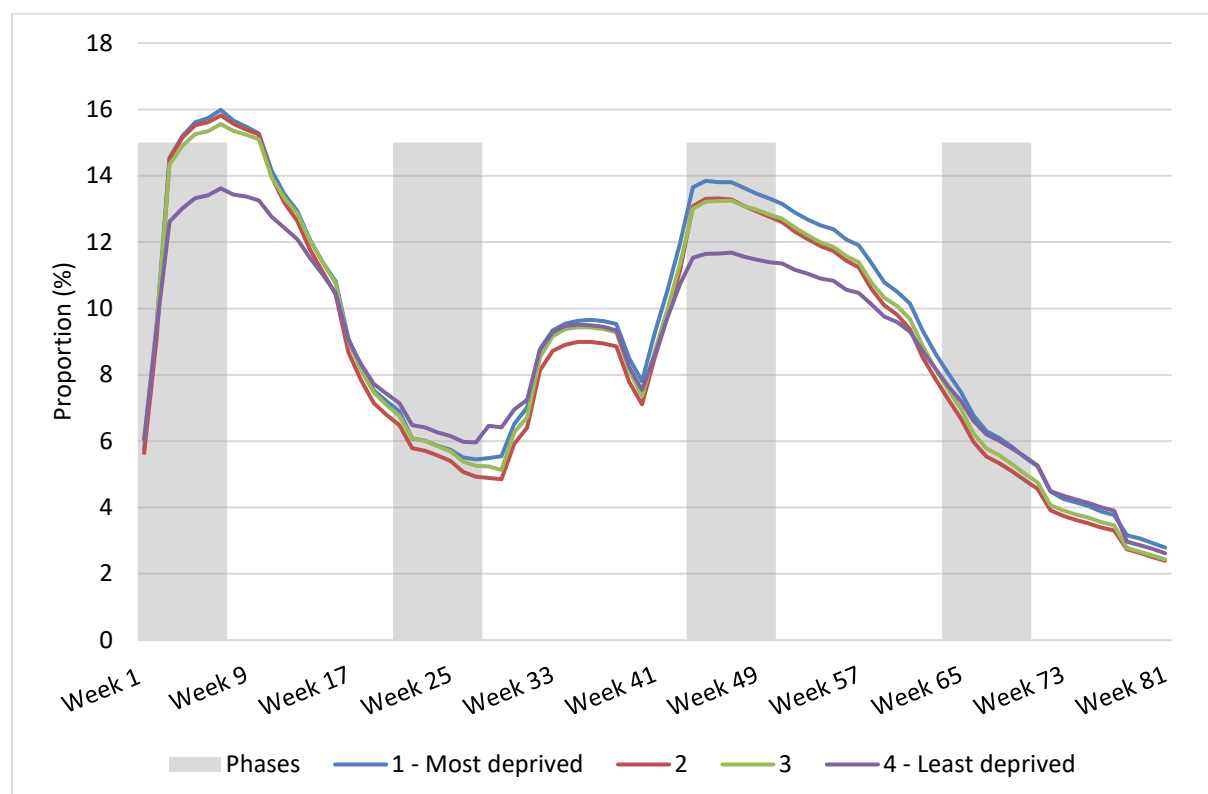


Source: PUP data from DSP and HP deprivation index.

Alternatively, we can look at the weekly rate of PUP averaged across the EDs within each deprivation category used in the models. As shown in Figure 4.4, over the

duration of this study from March 2020 to Sept 2021, the average PUP rate within the most deprived EDs fluctuates to a greater extent than the least deprived EDs. The four phases that we examined are also highlighted in Figure 4.4 using grey shaded areas.

FIGURE 4.4 WEEKLY AVERAGE PUP RATE (%) BY DEPRIVATION, MARCH 2020-SEPTEMBER 2021



Source: PUP data from DSP and HP deprivation index.

When formally modelled (Table 4.3) the percentage change is always greater in more deprived areas. When in a period of off-flow, that is between Phases 1 and 2, and Phases 3 and 4 (Figure 4.1 and 4.3), the change (in this case a fall) in PUP is greater in the more deprived areas. When in a period of on-flow, that is between Phases 2 and 3, when restrictions tighten and PUP claims increase, the increase again is largest in the most deprived areas. Table 4.3 displays the results of a difference-in-differences model where the outcome variable is the percentage change in the rate of PUP at an ED level. Both a basic specification with only deprivation is shown as well as a specification based on those previously used which controls for migration, occupation composition within the area and the characteristics of the PUP claimants.

TABLE 4.3 ESTIMATION RESULTS FROM DIFFERENCES-IN-DIFFERENCES MODEL EXAMINING THE PERCENTAGE CHANGES IN THE PUP RATES BETWEEN PHASES AT ED

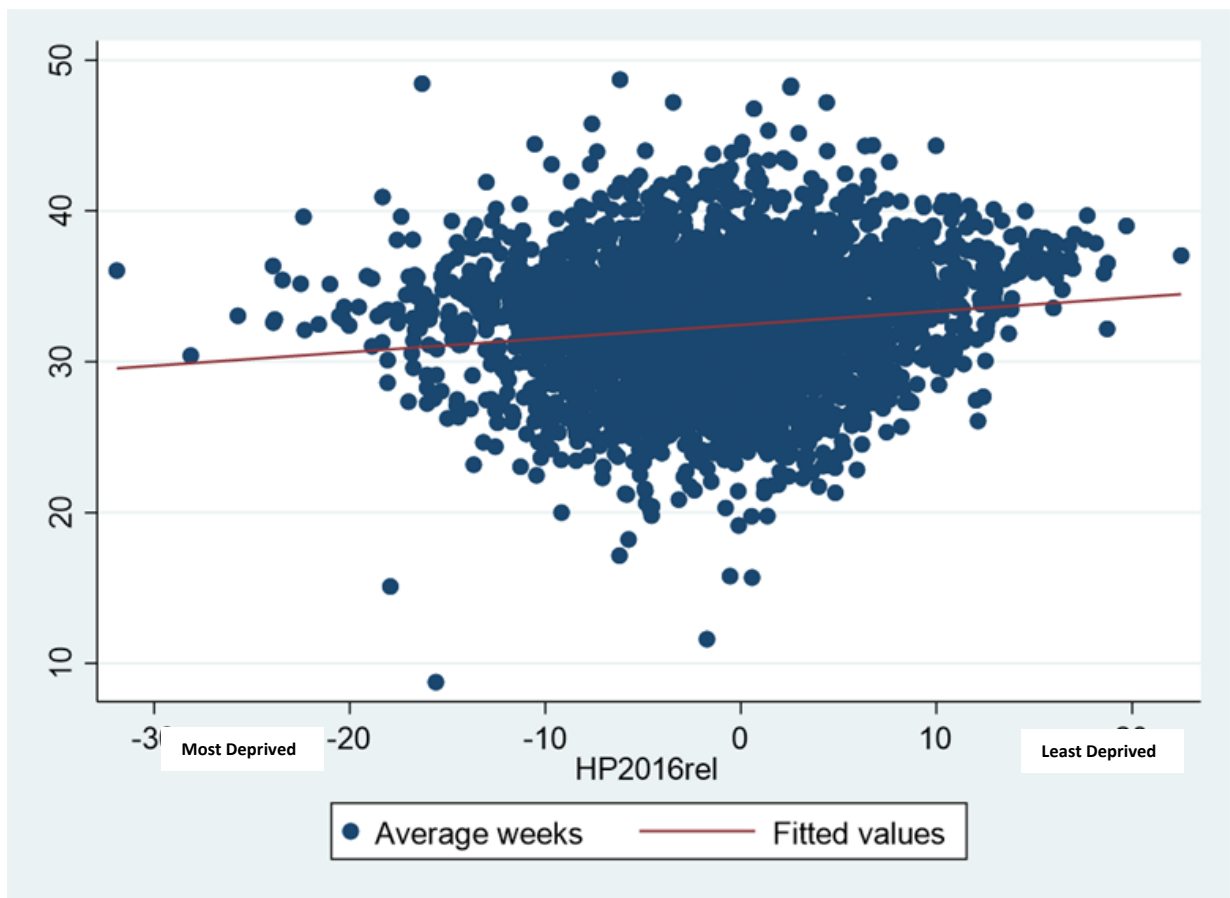
	Phase 1 -2 (off-flow)				Phase 2-3 (on-flow)				Phase 3-4 (off-flow)			
	Decrease in PUP Rate				Increase in PUP Rate				Decrease in PUP Rate			
<i>Deprivation</i>												
1 Most Deprived	9.38	***	5.17	***	45.95	***	27.25	***	7.96	***	4.74	***
2	12.02	***	6.81	***	50.84	***	27.57	***	11.73	***	7.30	***
3	9.44	***	5.04	***	38.12	***	18.14	***	9.28	***	5.67	***
4 Least Deprived	Ref		Ref		Ref		Ref		Ref		Ref	
<i>Place of birth (Ref: Ire/UK)</i>												
EU born			0.18	***			0.72	*			0.09	
Non-EU born			-0.47	***			-2.11	***			-0.50	***
<i>Occupations (Ref: Professional Occupations)</i>												
Managers, directors and senior officials			0.03				-0.11				0.07	
Associate professional and technical			-0.20	**			-1.59	***			0.04	
Administrative and secretarial			-0.14	*			-0.61				-0.18	**
Skilled trades			0.11	**			0.80	***			0.04	
Caring, leisure and other service			-0.07				-0.10				-0.09	
Sales and customer service			0.14				-0.17				-0.11	
Process, plant and machine operatives			0.18	***			-0.29				0.19	***
Elementary occupations			-0.05				-0.48				0.03	
Not stated/Other			-0.12	**			-0.51				-0.09	*
<i>PUP Characteristics</i>												
Proportion male			0.08	***			0.25				0.19	***
Average Age			0.04				-1.75	***			0.35	***
R2	0.06		0.12		0.03		0.06		0.05		0.11	
F-stat	74.91	***	28.95	***	30.30	***	15.06	***	63.55	***	30.30	***

Source: PUP data from DSP; HP deprivation index from Pobal and occupation data from 2016 Census.

The positive coefficients for the more deprived areas in all specifications suggest that areas that are more deprived have larger changes than those which are least deprived – this is the case for both on-flows and off-flows, although the magnitude differs. More precisely, in Column 1, the most deprived group sees on-flows 9 per cent larger than the most affluent groups. When further controls are added, this coefficient falls somewhat, but remains positive and statistically significant at the highest level. In the next set of columns, the pattern is persistent, but the magnitude of the deprivation coefficient is considerably larger. Between Phases 2 and 3, the most deprived group sees increases 46 per cent (or 27 per cent when controls are included) larger than the most affluent groups. These differences are evident for all groups relative to the most affluent. The relatively higher increase in the PUP rate for those in the second deprivation category is potentially due to a relatively higher level of employment within this group pre-pandemic when compared to the first (highest) level of deprivation category. That is to say that the most deprived EDs are likely to have higher levels of unemployment prior to the pandemic and therefore will not have been affected by pandemic job interruption to the same extent.

Areas with higher proportions of individuals employed in skilled trades and as process, plant and machine operatives saw larger off-flows between Phases 1 and 2, which shows the impact the restrictions had on these occupations early in the pandemic. Areas with higher proportions of skilled trades also saw large on-flows between Phases 2 and 3. Areas with large proportions of process, plant and machine operatives saw no statistically significant relationship with the Phase 2 to Phase 3 off-flow but did experience larger on-flows again between Phases 3 and 4. Areas with more male recipients also saw larger off-flows but did not experience a larger on-flow between Phases 2 and 3. Areas with higher proportions of residents born in non-EU countries saw much smaller changes between phases, which may suggest this group are less vulnerable to the employment impacts of the public health measures which were introduced. This could take two forms; either they do not access the benefit, or these areas had high PUP rates in the first phase which were persistent throughout the pandemic.

These models suggest that important differences exist in the duration of PUP spells between areas. Therefore, the length of time spent on PUP over the 81-week period for which we have data is also examined. The average number of weeks spent on PUP at an ED level ranges between 8.8 weeks and 48.7 weeks. Descriptively, there appears to be a relationship between deprivation and the duration spent on PUP. Individuals located in the more affluent areas spend longer on PUP when compared to more deprived areas.

FIGURE 4.5 PUP CLAIM DURATION (IN WEEKS) AND RELATIVE HP DEPRIVATION AT ED LEVEL

Source: PUP data from DSP and HP deprivation index.

However when modelled formally, as shown in Table 4.4 using an ordinary least squares (OLS) regression, while individuals in the most affluent areas had the highest durations, the shortest durations were in the second group, i.e. the marginally below average group rather than the most deprived group.

TABLE 4.4 ESTIMATION RESULTS FROM OLS MODELS EXAMINING PUP DURATIONS

	1		2		3		4	
Deprivation	-3.09	***	-2.38	***	-1.89	***		
2	-4.10	***	-3.05	***	-2.74	***		
3	-2.94	***	-2.04	***	-1.95	***		
4 Least Deprived	Ref.		Ref.		Ref.			
HP Index Components								
Age dependency Rate							-0.01	
Education (Ref: Third-level)								
Primary education							-0.07	***
Medium education							-0.19	***
Lone parent rate							0.05	***
Above average persons per room							-0.11	
Male Unemployment Rate							0.10	***
Female Unemployment Rate							-0.04	**
Local Authority rented							0.00	
Place of birth (Ref: Ire/UK)								
EU born			-0.02		-0.03		-0.01	
Non-EU born			0.19	***	0.20	***	0.10	***
Occupations (Ref: Professional Occupations)								
Managers, directors, and senior officials			0.06		0.03		0.10	***
Associate professional and technical			0.02		0.02		0.03	
Administrative and secretarial			0.07	**	0.09	***	0.12	***
Skilled trades			0.03		0.02		0.07	***
Caring, leisure, and other service			0.13	***	0.13	***	0.13	***
Sales and customer service			0.01		0.00		0.03	
Process, plant and machine operatives			-0.13	***	-0.13	***	-0.07	***
Elementary occupations			0.04		0.04		0.06	**
Not stated/Other			0.06	***	0.06	***	0.06	***
PUP Characteristics								
Proportion male					-0.11	***	-0.10	***
Average Age					0.12	***	0.19	***
R2	0.05		0.09		0.12		0.21	
F-stat	55.99	***	23.66	***	29.86	***	43.42	***

Source: PUP data from DSP; HP deprivation index from Pobal and occupation data from 2016 Census.

Areas with higher proportions of residents who are non-EU born have longer PUP claims. A 10 percentage point increase in the proportion of non-EU born individuals is associated with the average PUP claim increasing by two weeks (Columns 2

and 3). With regard to occupational composition of an area, areas with large proportions of administrative and secretarial occupations, caring, leisure and other services and other/not stated roles have longer PUP claims. Areas with high proportions employed in process, plant and machine operative roles spent less time in receipt of PUP on average. These differences are likely to reflect differences in how occupations were impacted by restrictions.

When the components of the HP index are controlled for individually (Column 4), areas with high male unemployment and a larger proportion of lone parents have longer PUP durations, while areas which have lower educational attainment spend shorter intervals on the payment. Female unemployment also has a negative and statistically significant relationship with the length of PUP claims. Areas with a high proportion of male claimants spent less time on PUP, while areas with older claimants had significantly longer PUP claims.

These combined results suggest that not only were deprived areas more affected economically by the pandemic but that they also experienced the economic impact in a much more volatile manner than affluent areas. Individuals in deprived areas, even after controlling for occupational composition (and other controls) were more likely to see more extreme changes based on the ebb and flow of restrictions. This is an important policy lesson for future events where such lockdowns and restrictions play a role in any government responses.

CHAPTER 5

Conclusion

There is a growing literature on the relationship between area-level deprivation and the impacts of the COVID-19 pandemic. The vast majority of literature to date examines the health impacts of the pandemic where infections rates and severe illness in the form of hospitalisations and ICU admissions have been found to be higher amongst residents of more deprived areas (Meurisse et al., 2022; Mena et al., 2021; Green et al., 2021; Hsiao et al., 2021; Clouston et al., 2021; Quan et al., 2021; Patel et al., 2020; Hawkins et al., 2020).

This report examines the economic impacts of the pandemic by examining the relationship between pandemic unemployment and deprivation due to COVID-19. The Pandemic Unemployment Payment (PUP) was a social welfare payment for employees and self-employed people who lost all their employment due to the COVID-19 public health emergency and the resulting economic impact of lockdowns and restrictions. The payment was designed as income replacement to mitigate the short-term impact on financial wellbeing that COVID-19 related job interruption would cause.

The outbreak of the COVID-19 pandemic at the start of 2020 prompted governments to implement restrictive measures. A high proportion of businesses were temporarily closed, and the majority of employed people were confined and isolated in their homes to prevent the spread of the virus. The health crisis had a significant impact on the labour market, unemployment and economic life. Our results show that deprived areas – when compared to the most affluent areas – were also more affected economically by the pandemic, and deprived areas experienced the economic impact in a more volatile manner. Individuals in deprived areas, even after controlling for area-level occupational composition, were more likely to see more extreme changes in pandemic-related unemployment based on changes due to Government restrictions.

Our results show that disproportionately high PUP rates (10 per cent or greater in excess of the State average) are more likely in more deprived areas. The most deprived areas are 13 percentage points more likely to have disproportionately high PUP rates than the least deprived (most affluent) areas. Interestingly, the second and third most deprived group of EDs, which make up a large proportion of all EDs (marginally above and below average relative deprivation rates), are also more likely to have disproportionately high PUP rates, than the most affluent group. These two groups are 13 percentage points and 9 percentage points respectively more likely to have higher than average (10 per cent or greater) PUP

rates. The area-level components of the HP Index (derived from Census 2016) driving disproportionately higher PUP rates were found to be areas with a higher share of lone parents and an above average persons-per-room rate. Also, areas with large proportions of non-EU born individuals, relative to the Irish/UK population, are slightly more likely to have disproportionately higher levels of PUP reciprocity.

Furthermore, deprivation plays a substantially different role across different phases of the pandemic related to the nature of Government restrictions at the time. In phases with high levels of restrictions (Phases 1 and 3), all areas with the exception of the most affluent are more likely to have disproportionately higher rates of PUP. In Phase 3, the most deprived areas are the most likely to have PUP rates that are disproportionately higher than the State average (10 per cent above or greater) while in Phase 1 this is not the case. Interestingly, in Phase 1, early in the pandemic, disproportionately higher than average rates were more likely to be seen in the second category, i.e. the group which is relatively deprived, rather than the most deprived group. In Phase 2, PUP rates do not differ by deprivation. In the final Phase 4, when restrictions were low, only the most deprived areas saw disproportionately higher than average rates than the most affluent areas. However, there is no statistically significant difference for the other deprivation categories. This indicates that the most deprived areas were more likely to have disproportionately high rates of PUP in the latter stages of the pandemic.

When government restrictions are low, generally the relationship between area-level deprivation and PUP rates becomes less evident and the relationship appears to be driven by periods of high restrictions. This finding is in line with Bonaccorsi et al. (2020) who shows that social interruption of restrictions and lockdowns was found to be more acutely felt by people from socially disadvantaged backgrounds. Gray et al. (2021) also highlight that people from socially disadvantaged backgrounds were more likely to experience job disruption as a result of government restrictions. Our findings show that the percentage change, whether 'on' or 'off', is always greater in more deprived areas. When in a period of widespread off-flow, the change in PUP (in this case a fall) is greater in the more deprived areas.¹¹ When in a period of widespread on-flow, when restrictions tighten and people start to claim PUP, the increase again is largest in the most deprived areas.¹²

Therefore, PUP rates were found to be higher in more deprived areas during lockdown periods but also rates fell more quickly when lockdown conditions were

¹¹ For example, between Phases 1 and 2 and Phases 3 and 4 outlined in Figure 4.2 and 4.4.

¹² For example, between Phases 2 and 3 outlined in Figure 4.3.

relaxed; consistent with this pattern, average PUP durations were also found to be lower in more deprived areas. Furthermore, our findings show that average PUP durations tended to be lower in areas with greater proportions of individuals with fewer years of education, and in areas with historically higher levels of female unemployment. Occupational composition within each ED is also controlled for using derived variables from the 2016 Census. A number of area-level characteristics, not related to deprivation, were also found to be important for average PUP duration levels. For example, average PUP durations were longer in areas containing higher shares of non-EU nationals. An analysis of how PUP rates change between phases comes to similar conclusions.

From a policy perspective, the results highlight a number of potential inequalities in the impact of the pandemic with respect to area-level deprivation. Higher PUP rates in more deprived areas suggest that people in these areas are more exposed to the labour market disruption associated with public health restrictions. Many low-paid jobs were disproportionately impacted as a result of business closures during the pandemic, with little prospect for low-paid employees to work remotely. Our results show that once restrictions were eased, there was a sharp decline in PUP recipients in more deprived areas, again suggesting a high reliance on lower paid jobs that were susceptible to pandemic restrictions. The sharp fall in PUP rates in deprived areas following the easing of restrictions, coupled with the shorter average duration of PUP receipt in deprived areas, could also indicate that employees in these areas had less discretion when it came to returning to work. This is an important policy lesson for future events where such lockdowns and restrictions play a role in any government responses.

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