Examining the mental health impacts of Universal Credit, treating phased rollout as a natural experiment

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# Abstract

#### Background

Universal Credit was rolled out across the UK as a benefit system to replace six existing benefits. It aimed to consolidate and simplify benefit claim systems and encourage more claimants into work. Key changes from legacy benefit systems may be harmful to the mental health of claimants, or conversely, the push towards work may have beneficial effects. We aimed to test the causal effects of Universal Credit compared to legacy benefit systems, treating the phased rollout as a natural experiment.

#### Methods

We used difference-in-differences methods to test for changes in mental health and well-being using the measures of life satisfaction, happiness, anxiety and whether respondents felt their lives were worthwhile reported in the Annual Population Survey. We compared as-yet-untreated areas with UC-rollout areas by month across the natural migration phase. We conducted subgroup analyses to test for differential harms by claimant types and other vulnerabilities.

#### Findings

#### Interpretation

#### Funding

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# Introduction

Universal Credit (UC) was introduced as a new, replacement benefit system, combining multiple prior benefits into a single application and award scheme. Rollout began in 2013 and aimed to gradually migrate all claimants of a ‘legacy benefit’ – Job Seekers Allowance, Working Tax Credit, Child Tax Credit, Housing Benefit, Income Support Allowance, or Income-based Employment Support Allowance – to the new claims system (National Audit Office, 2018; Department for Work & Pensions, 2022a). The UC system, in comparison with the legacy systems, is designed as a fully online application and claim-handling system. It aims to encourage more claimants into work by setting eligibility criteria, introducing a single ‘taper’ on awards as income increases, and making payments in lieu of each claim month, mimicking salary payments (Wickham *et al.*, 2020; Department for Work & Pensions, 2022a, 2022b).

The change to Universal Credit may have negatively affected the health and wellbeing of some benefit recipients (Wickham *et al.*, 2020; Brewer, Dang and Tominey, 2022). Waits for first payments – with the minimum 5-week assessment period plus administrative delays resulting in up to a 12-week wait (National Audit Office, 2018; Cheetham *et al.*, 2019) – may be a potential cause of distress in low-income households. Incurred debt and ongoing struggles to keep up with payments may prolong this effect beyond the initial months (Department for Work & Pensions, 2018a). Increased work-search requirements might similarly impact mental health across the term of benefit receipt, potentially requiring action beyond claimants’ capabilities or being perceived as ‘hostile’ and ‘uncaring’ in demanding justification for inaction (Cheetham *et al.*, 2019; Department for Work & Pensions, 2023). The switch to fully-online claims system, perceived as “complicated, disorientating, impersonal, hostile and demeaning” (Cheetham *et al.*, 2019), may additionally have contributed to worsening mental health. Conversely, the aim to increased employment of benefit claimants may lead to improved mental health outcomes, both through support in applying for jobs and in less punitive reductions in benefits with increases in earned income (Department for Work & Pensions, 2022a).

Treating the phased rollout as a stepped-wedge natural experiment, the causal effects of UC on mental health may be estimable using as-yet-unexposed areas as controls. Natural experimental methods divide populations into exposed and unexposed comparison groups using events outside of the control of the researcher (Craig *et al.*, 2017). Using the planned UC ‘natural migration’ rollout timetable, potential benefit claimants can be classified as ‘exposed’ and ‘unexposed’ by determining whether UC had, at date of data collection, been implemented in the local authority area or not. Quantifying these effects would give a clearer picture of how much observed differences in mental health are attributable to the switch to a new benefit system and give an estimate of whether UC causes overall benefits or harms to claimants. Subgroup analyses of claimant types and other vulnerabilities can also identify at-risk groups and areas for preventative action. These findings could inform future changes to benefit systems to improve mental health outcomes.

This study is part of Work Package 1 of an NIHR-funded study on evaluating the mental health impacts of Universal Credit grant number NIHR131709; Craig *et al.* (2022)].

# Methods

## Aim and research questions

We aimed to estimate the Average Treatment Effects across Local Authority areas of Universal Credit on the mental health of people eligible to claim benefits. Additionally, we aimed to test differences in effect sizes across markers of vulnerability.

### Research questions

1. What is the impact of UC rollout on the mental health and wellbeing of working age adults?
2. Do effects vary across sex, age of claimant, pre-UC employment status, household structure, disability and health status, and country?
3. How does this effect vary in the time periods immediately before and immediately following a switch to Universal Credit? Are there anticipatory effects in the immediate pre-rollout period? Do post-exposure effects change as time from rollout increases?

## Protocol

The analysis plan, along with code used in analysis, is archived at [osf.io/knajb](https://osf.io/knajb) (Baxter *et al.*, 2022).

## Data

We used data from the Annual Population Survey (APS) secure-access version collected between 2013-2019 (Office for National Statistics - Social Survey Division, 2022). These data are released as annual cross-sectional datasets, produced from the Labour Force Survey data collection (Office for National Statistics, 2012). APS responses record demographics, household and employment conditions, benefit receipt and the ‘ONS4’ well-being outcomes [‘Life Satisfaction’, ‘Worthwhile’, ‘Happiness’ and ‘Anxiety’; Office for National Statistics (2018)]. Data are collected using area-based quotas and record each observation’s area of residence; this allows grouping of observations by Local Authority District, which match the area-wise Universal Credit rollouts announced for the 2015–2018 period (Department for Work & Pensions, 2018b).

## Study design

We used natural experimental methods to estimate the effects of the rollout of Universal Credit on mental health across all claimants and potential claimants. We treated the differences in treatment timing as a ‘target trial’, evaluating how closely the phased rollout emulates a stepped wedge randomised controlled trial to assess the potential for bias in these comparisons (Hernán and Robins, 2016; Craig et al., 2019; Matthews et al., 2022). We determined the eligible population using two methods – observation of any benefit receipt at any time point, and a logistic regression prediction of UC uptake under a simulated full-UC-rollout scenario using UKMOD (Centre for Microsimulation and Policy Analysis, 2022). We conducted a staggered difference-in-differences analysis, treating the UC ‘natural migration’ phased rollout period as a marker defining exposed and unexposed comparators (Callaway and Sant’Anna, 2021; Goodman-Bacon, 2021; Sun and Abraham, 2021). We compared changes in mental health in local authority areas in which Universal Credit had been introduced with changes in mental health in local authority areas in which Universal Credit had not yet been introduced. We explored differences in effects across subgroup characteristics marking potential differences in vulnerability to benefit changes and differences in reasons for claiming universal credit.

## Determining the affected population

To determine comparable populations of potential UC claimants across the observed years for inclusion, we used two definitions of population of interest, one using empirical methods of determining exposure and one using prediction methods.

Under the empirical definition, the population of interest included all respondents who report claiming either a legacy benefit (Job Seeker’s Allowance, Tax Credits, Housing Benefit, Income support, Income-based Employment and Support Allowance) or Universal Credit at any time point. A limitation of this method is that a potential claimant under one system may be ineligible (or have been disincentivised from applying) under the other. Under the intended outputs of UC in encouraging claimants into work, a person whose circumstances have been thus affected by the UC rollout might not be an observed claimant in the exposed period. Matching cross-sectional populations by observed benefit receipt may not create exchangeable populations. Additionally, benefit receipt may be differentially underreported under one or both systems. The alternative approach of using observed characteristics as straightforward markers of eligibility (for example, including all unemployed respondents) is hampered by missing data on housing costs, savings and partner’s income which determine eligibility and payment amount.

To overcome these potential biases, we used a machine-learning model trained on simulated data to predict the probability of a person receiving UC under a full-UC-rollout scenario. We used the UKMOD static tax-benefit microsimulation model to simulate benefit receipt for a donor population (from the Family Resources Survey) under a full-UC-rollout scenario from 2014 to 2019. We trained a model to predict probability of receipt of Universal Credit from a set of individual and household characteristics which were recorded in both the Family Resources Survey dataset and the APS dataset. We used this model to calculate a probability score for each observation in the APS dataset for receiving UC in the hypothetical scenario of exclusive and full UC availability across all years. We assigned this probability as a weight to each respondent to have a comparably weighted population across all years, giving greatest weight to those who were most likely to be affected by the changes in benefit systems.

## Exposure

The replacement of legacy benefits with UC broadly took place in three phases (Department for Work & Pensions, 2018b, 2022a; National Audit Office, 2018):

* The restricted rollout of the ‘live service’ from 2013 to a limited subgroup, mainly single, childless claimants.
* The full-service ‘natural migration’ period from 2016 onwards – open to all claimant types but only applied to new claimants, existing claimants with changing circumstances necessitating a change in claim, and voluntary benefit switchers.
* The concluding ‘managed migration’ phase, which was piloted in 2019-2020 but paused for the pandemic and restarted in 2022, implementing a forced migration of all claimants to UC by 2024.

Observing the whole eligible population, we proposed using the natural migration dates as markers of exposure to Universal Credit if the respondent lived in an area already exposed at the time of data collection. The dates by Job Centre Plus reported in the ‘Universal Credit transition rollout schedule March 2018 to December 2018’ (Department for Work & Pensions, 2018b) were used to determine a first exposed date for each Local Authority. These were matched to APS observations by Local authority district. Each observation was assigned a ‘1’ for exposure if the reference date for that interview matched or followed the month of rollout and a ‘0’ otherwise. Months from rollout were additionally assigned to each, individual, counting upwards from negative months to ‘0’ in the month of planned natural migration in that district and a positive count of months following.

## Outcomes

The four wellbeing outcomes (Table 1) were recorded for each observation.

| Label | Question in survey | Possible answers (on a scale of 0–10) |
| --- | --- | --- |
| Life Satisfaction | “Overall, how satisfied are you with your life nowadays?” | 0 – ‘not at all satisfied’ to 10 – ‘completely satisfied’ |
| Worthwhile | “Overall, to what extent do you feel that the things you do in your life are worthwhile?” | 0 – ‘not at all worthwhile’ to 10 – ‘completely worthwhile’ |
| Happiness | “How happy did you feel yesterday?” | 0 – ‘not at all happy’ to 10 – ‘completely happy’ |
| Anxiety | “How anxious did you feel yesterday?” | 0 – ‘not at all anxious’ to 10 – ‘completely anxious’ |

Table 1 – The four questions recording subjective wellbeing, recorded in the Annual Population Survey in data collected from April 2011.

## Missing data

We used multiple imputation methods to overcome potential biases due to missing data in our primary analyses. Data of interest was missing for x% of respondents. The variable with the highest rate of missingness was earned income, with data missing for x% of eligible respondents. We generated [20] imputed datasets.

We additionally carried out a ‘complete case’ analysis of all observations with complete data. We compared effect estimates between complete and imputed samples to examine robustness of findings.

## Statistical analysis

We used difference-in-differences methods to estimate the effects of the introduction of Universal Credit on mental health and wellbeing. Two-way fixed-effects (TWFE) estimates compare exposed with non-yet-exposed units can ensure comparison of exchangeable units. However, in cases of varying treatment timing and effect size this can introduce error in estimating magnitude and direction of outcome (Goodman-Bacon, 2021; Roth et al., 2022). We ran TWFE models and examined effect estimate by treatment timing using decomposition to test for bias due to heterogeneous treatment effects. In further models, to overcome anticipated bias, we used the R package ‘did2s’ (Butts and Gardner, 2021) to implement the methods of Callaway and Sant’Anna (2021) and ‘Two-stage differences in differences’ approach by Gardner (2021) as two comparable alternatives. We used each method to estimate a static effect estimate across the four quarters following the rollout date in each Local Authority. We further used each method to produce a coefficient and standard error term for each quarterly period before and after introduction of Universal Credit to examine timings and patters of effects.

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