The distinctive nature and effects of deep poverty: a hybrid case for Minimum Income Schemes

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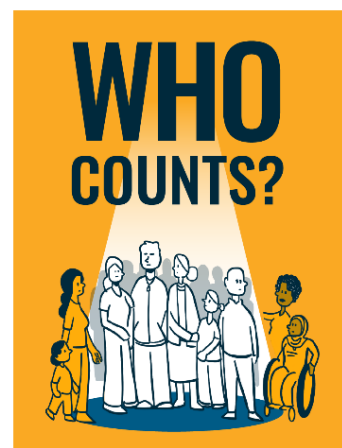**Contact:** Daniel.Edmiston@uab.cat

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Abstract

Where should finite resources be targeted when tackling poverty? To answer this question, this article draws on new analysis of the largest nationally representative household panel study in the UK to explore what bearing shallower and deeper forms of poverty have on financial trajectories, as well as health and well-being. We find that deep poverty as a "social kind" is considerably and consistently harder to escape, as well as more damaging to mental health and well-being over time. Transient experiences of deep poverty also prove more damaging than chronic, shallower forms of poverty. As such, we present evidence of distinct and profound effects of deep poverty that offer new grounds upon which to justify, time and target policy interventions across the low-income distribution. We employ income-based, material deprivation, and multidimensional measures of poverty, with the latter providing the most robust results for identifying the distinctive nature of deep poverty. The evidence presented helps establish an empirically informed case for Minimum Income Schemes (MIS) and the relatively superior returns on public social spending these could offer on both prioritiarian and consequentialist grounds.

Keywords: poverty; public expenditure; social policy; methodology; income.

Introduction

Despite an extraordinary commitment of public funds, poverty prevalence and depth have increased across the OECD and G7 over the last 40 years with government interventions failing to reduce post-market inequalities to the extent they once did (Desmond, 2023). What are the

consequences of failing to guarantee a sufficient income to people through social safety nets? How does falling below a basic minimum income affect the trajectories and outcomes of people over time? Such questions have been central to poverty research and routinely emerge from normative concerns about the social and ethical duties owed to and between members of a given political or economic community. However, these are also instrumental questions concerning the appropriate allocation, efficiency and impact of public social spending to optimise redistributive systems and behaviours (Brady & Bostic, 2015; Steinbacher, 2024).

A common assumption implicit across the social sciences is that the welfare of people is positively related to resources for people on low incomes, but this is less frequently evidenced or systematically investigated. Whilst 'ceiling effects' of money and declining marginal utility are widely documented towards the upper end of the income distribution (e.g. Jebb, Tay, Diener, & Oishi, 2018), much less attention has been given to the nature and magnitude of the relationship between resources and outcomes for those towards the very bottom (Duncan, Yeung, Brooks-Gunn, & Smith, 1998). Given the considerable evidence linking poverty to negative outcomes, it is not unreasonable to presume that a redistribution of resources towards the lower end of the income distribution would have a positive impact on those living in poverty. But targeting resources towards different parts of the low-income distribution may well produce different results with additional incomes making 'more difference at some parts of the income distribution than others' (Cooper & Stewart, 2013: 22). In response, this paper explores what bearing shallower and deeper forms of poverty have on financial trajectories, as well as health and well-being outcomes to establish where and how public social transfers could be targeted to maximise their effectiveness and efficiency. Whilst the term is widely, and often inconsistently used, we understand deep poverty here to refer to a relative condition that is experienced in reference to a higher material standard of privation, in order to explore how it differs from the more general challenges of living on a low income.

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We do so by focusing on the United Kingdom, which has the worst net replacement rate in the G7 and one of the lowest in the OECD. Net replacement rates measure welfare entitlements as a ratio of prior earnings for non-workers, typically factoring in household composition, age, and work history. The poor performance of the UK in this respect makes it an apposite context, given shrinking welfare coverage and adequacy (Alston, 2018; OECD, 2024). Drawing on new analysis of the largest nationally representative household panel study in the UK, we present new evidence on the distinctive nature and effects of deep poverty that offer new grounds upon which to justify, time and target interventions across the low-income distribution (Notten & Guio, 2023). Compared to income-based and material deprivation indicators, we find that multidimensional measures of poverty more accurately and comprehensively capture material hardship and, in turn, the distinctive nature of deep poverty. The evidence presented helps establish an empirically informed case for Minimum Income Schemes (MIS) and the relatively superior returns on public social spending these could offer on both prioritiarian and consequentialist grounds.

Policy context and research background

As a proportion of gross domestic product, public social expenditure has increased by 59.7% across the OECD and by 73.4% across the G7 since 1980 (See Table 1). There has been similar, albeit less pronounced, growth in public spending on direct cash benefits (such as old age pensions, unemployment benefits, health-related benefits and income maintenance). Since 1980, public social expenditure on direct cash benefits has grown by 22.5% across the OECD and by 30.3% across the G7 (OECD, 2024). However, we have not witnessed a corresponding reduction in poverty risk or prevalence. On average, the poverty rate and mean poverty gap after taxes and transfers has increased across the OECD and G7 over the last two decades with the relative efficiency and effectiveness of redistributive systems stalling over time (See Table 1). In response, there have been increasing concerns about the adequacy of welfare payments

and their capacity to mitigate against the incidence and severity of poverty across late capitalist contexts. Across the OECD, the value of social transfers is highly variable and often free-floating from what people actually need to cover the basics (ILO, 2011; World Bank, 2019). As a result, government interventions appear increasingly ineffective at protecting against the causes and consequences of poverty.

Table 1. Trends in public social protection expenditure, poverty rates and net replacement rates

	1980	1990	2000	2010	2020	% Change 2000-20
OECD Public social expenditure (% of GDP)	14.4	16.4	17.3	20.4	23.0	+32.9%
G7 Public social expenditure (% of GDP)	15.8	17.5	19.6	23.5	27.4	+39.8%
UK Public social expenditure (% of GDP)	15.6	14.9	16.8	23.1	22.5	+33.9%
OECD Poverty rate before taxes and transfers[1]			31.2%	33.9%	33.1%	+6.1%
G7 Poverty rate before taxes and transfers			32.1%	34.7%	36.2%	+12.7%
UK Poverty rate before taxes and transfers			35%	35.4%	32.9%	-6%
OECD Poverty rate after taxes and transfers			17.2%	17.7%	18.3%	+6.4%
G7 Poverty rate after taxes and transfers			18.1%	18.9%	18.0%	-0.6%
UK Poverty rate after taxes and transfers			19%	18.2%	17.6%	-7.4%
OECD Mean poverty gap after taxes and transfer			0.267	0.290	0.292	+9.4%
G7 Mean poverty gap after taxes and transfer			0.298	0.300	0.302	+1.3%
UK Mean poverty gap after taxes and transfer			0.260	0.291	0.327	+25.8%
OECD Net replacement rate in unemployment[2]			57	57	59	+3.5%
G7 Net replacement rate in unemployment			58	55	55	-5.2%
UK Net replacement rate in unemployment			41	38	41[3]	0%

Notes: [1] Reference to poverty rates are based on a 60% of median income threshold, [2] Net replacement rates are based on a single person without children previously on an average

In great part, the failure of social protection systems to reduce poverty across the OECD stems from a lack of shared understanding about what exactly constitutes the problem or appropriate target for policy interventions (Ascher, 2021, 2023). As with the value of social transfers, government reporting on low incomes is oftentimes arbitrary and 'non-scientific' with little substantive rationale about what forms and degrees of poverty matter, to whom and why (Beeghley, 1984; European Commission, 2022a). Domestic and supranational government often treat the relative poverty threshold (usually 50% or 60% of equivalised median incomes) as *the* relevant measure of low incomes, against which to assess the performance of government interventions. Whilst these headcount ratios provide some indication of inequality in the bottom half of income distributions, such attempts at aggregation through a unitary measure of privation tell us nothing about the changing living standards of 'the poorest' (Brady & Parolin, 2020; Parolin et al., 2023; Sen, 1981). In spite of their limitations, these measures are routinely deployed as a proxy to explore what bearing poverty has on life outcomes.

However, just as aggregation glosses over descriptive texture in our understanding of diversity below the poverty line, aggregation also undermines criterion validity, the explanatory purchase of poverty analysis and effective evaluation of social safety nets. Whilst attempts to explore inequality below the poverty line may appeal over broader categories of material disadvantage, it is equally important to not assume scalar income gradations are of equal significance. Particularly, when some degrees of poverty may have more profound consequences than others. If varying degrees of poverty do have a distinctive bearing on life trajectories and outcomes, this stands to complicate received wisdom on the appropriate

methods and measures we use in social scientific and policy analysis. Likewise, it raises questions about the public governance of (extreme) marginality and the role income targeting should play in the design of welfare systems seeking to mitigate the public and private costs associated with deepening poverty (Bramley et al., 2016).

In recent years, advanced economies with relatively high levels of social protection expenditure have pursued income targeting with a view to 'maximizing the poverty impact of spending' (Coady et al., 2021: 5). Despite this, the redistributive effects and concentration of social transfers have become successively more 'pro-rich' during welfare state expansion, benefiting those further up the income distribution across contexts such as the US, France, Canada, Australia and the UK (Garcia-Fuente, 2021). Against the backdrop of the COVID-19 pandemic and inflationary shocks, there has also been increasing domestic and supranational interest in MIS (European Commission, 2022a). MIS are non-contributory, means-tested social transfer programmes that 'ensure a minimum to any family that falls below a given income threshold - and just enough to bring them to that minimum' (Gentilini et al., 2019: 77). They are typically an income support mechanism of 'last resort' when other sources of income and welfare are either insufficient or unavailable to people in need of assistance (European Commission, 2022b: 2). Administratively demanding with a steep taper rate, MIS are often characterised as having the capacity to protect against social risks and recalibrate the balance of power between state, market and civil society across late capitalist contexts. Whilst MIS are already operational in many advanced economies, the extent and nature of coverage varies with some groups within the low-income distribution benefiting more than others across countries (Nardo et al., 2024).

Like many other high-income countries, interest in the value and potential of MIS in the UK has been prompted by growing concerns about the effectiveness of social protection spending and rising economic insecurity (Tims & Stirling, 2022). Whilst there are overlapping functions

of social transfer programmes (pertaining to the reconciliation of paid and unpaid work, retirement, labour market (re-) entry and/or employment support), the central purpose is to provide a basic minimum that prevents or alleviates poverty. And in this respect, the UK social protection system has under-performed with the adequacy and targeting of social transfers increasingly brought into question (Hirsch, 2020). Public expenditure on UK social protection is higher now than it was 40 years ago, with non-pensioner welfare spending rising from 3.6% to 5.6% of GDP between 1980 and 2022 (OBR, 2022); a similar, less pronounced trend, is also observed for pensioner benefits . However, the value of social transfer payments has fallen considerably and the UK now has the worst net replacement rate in the G7 (OECD, 2024: see also Table 1). As result, poverty rates after taxes and transfers have flat-lined, with the depth and intensity of poverty increasing, particularly over the last 25 years (Edmiston, 2024). MIS has been proposed as one policy mechanism to address this. Despite bipartisan interest in their potential though, diverse normative imperatives can motivate MIS proposals and the different levels at which it might be set.

The most common justification for MIS centres on a prioritarian approach to social protection, which places emphasis on the needs of the *most* disadvantaged (Parfit, 1997). When it comes to the question of whose poverty matters most then, prioritarianism stipulates that finite resources should, first and foremost, be targeted towards those with the least. It is of course important to note that resources are only finite to the extent that progressive redistribution is politically mediated by public institutions and civil society. That aside, such a prioritarian imperative – that pivots on a social justice principle of need – generally enjoys strong political support (Adriaans & Fourré, 2022). Depending on the impact of resources allocated through social protection systems and the extent to which they alleviate the effects of poverty, a MIS may also be motivated by a utilitarian calculation of distributive justice. Here, it may be possible to identify the level at which a MIS would need to be set to maximise aggregate utility,

whilst also prioritising resources towards the worst off. This is an empirical as much as it is a normative question, and one that that this paper engages with to develop a hybrid case for MIS. However, it is not the intention of this paper to establish at what level MIS could or should be set – an invaluable body of work has already sought to do this through sufficiency and consensus-based principles (Deeming, 2020). There are other normative grounds that can serve to justify MIS, such as egalitarian or sufficiency principles. However, this paper explores the distinctive nature and effects of deep poverty as a necessary first step to understanding what benefits a MIS might engender on prioritarian and consequentialist grounds. To do so, we offer a brief, schematic overview of the existing evidence on the life outcomes associated with (varying degrees of) poverty that has informed our approach to measurement and analysis of what exactly MIS stands to mitigate.

Poverty and life outcomes: the existing evidence

In seminal work on deprivation measurement and poverty analysis, Peter Townsend argued that 'as resources for any individual or family are diminished, there is a point at which there occurs a sudden withdrawal from participation in the customs and activities sanctioned by the culture.' (Townsend, 1979: 57). To better understand the 'point at which withdrawal *escalates* disproportionately to falling resources' at the bottom end of the income distribution, Townsend (1979: 57) drew on income and lifestyle surveys of the general public to establish what level social transfers would need to be set to mitigate the risks and effects of poverty. By virtue of data limitations and the variable elasticity of living costs, Townsend was unable to identify a definitive 'turning point'. However, subsequent analysis has sought to establish what bearing incomes have on life outcomes over time, with variable attention given to whether and how the degree of privation means 'human suffering becomes qualitatively different' (Kundu & Smith, 1983: 430). Given the breadth of literature on the relationship between poverty and life

outcomes, we principally draw on systematic reviews or meta-analyses of existing evidence to summarise evidence in relation to this question.

Cooper and Stewart (2021) undertook a systematic review of evidence available on the relationship between household incomes and children's outcomes across Europe and OECD countries. Drawing on Randomised Control Trials (RCTs), quasi-experiments and fixed-effects analysis of longitudinal data, the authors find there is significant evidence 'that money itself makes a difference' to the health, cognitive and social outcomes of children (Cooper & Stewart, 2021: 1000). Analysing different income groups through a spline function allowing for variable income effects across different knots and by testing a non-linear specification of income, several studies find 'the effect of income to be greater in lower income households, at least for some outcomes' (Cooper & Stewart, 2021: 998).

There is also strong evidence that socioeconomic position is related to and mediates individual health outcomes (Ayorinde et al., 2023). Ridley et al. (2020: 6) undertook a meta-analysis of RCTs across low and middle-income countries and found that negative economic shocks precipitate mental illness, with social transfer interventions reducing depression and anxiety over time and 'larger cash transfers causing substantially larger effects'. Observational studies of welfare policy changes in high-income countries also demonstrate higher benefit eligibility and generosity are positively related to improved mental health (Simpson, Albani, Bell, Bambra, & Brown, 2021). More-fine-grained consideration of relative effects across the low-income distribution suggest that income 'effects are potentially larger for wellbeing outcomes, for income losses and in the *most* socioeconomically disadvantaged' (Parra-Mujica et al., 2023; Thomson et al., 2021: 1). Income-support interventions across high-income countries are able to mitigate some poor health outcomes, but RCTs and quasi-experiments have looked at low-income beneficiaries overall rather than disaggregated effects (Boccia et al., 2023). In great part, this is due to a 'lack of agreement about the appropriate reference group for social

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comparison' when testing low income hypotheses (Kawachi, Subramanian, & Almeida-Filho, 2002: 649).

Studies on the relationship between incomes and sociality are less definitive – perhaps in part by virtue of the measures that tend to be adopted across different domains of social life. Whilst there is evidence that 'money does have a significant effect on the quality and stability of relationships', income effects are related to both relationship formation and dissolution with little evidence available on relationship satisfaction (Cooper & Stewart, 2015: 54). There is stronger evidence to suggest poverty increases the likelihood of social isolation, alienation from local community and shrinking social networks and participation (Mood & Jonsson, 2016). Looking at a hierarchy of poverty predictors on social connections, Mood and Jonsson (2016: 648) find economic deprivation is 'the most stable one, followed by absolute poverty and the combined deprivation/absolute poverty variable. The relative poverty measure is less able to predict social outcomes...'. By contrast, Brady et al. (2023) find that income poverty, rather than, absolute income poverty has greater predictive validity. Other studies have found the most robust poverty predictors are based on multidimensional measures of economic well-being (e.g. Gibbons et al., 2023). Despite these differences, what all these studies share is a tendency to compare outcomes against the wider income distribution rather than comparing outcomes associated shallower and deeper forms of poverty *within* 'lower-income populations' (Brady et al., 2023: 787).

In summary, there is a strong body of evidence that poverty negatively affects health, well-being and social outcomes. As Cooper and Stewart (2021: 998) note however, appropriate methodological approaches have not yet been applied to different reference groups within the wider category of 'the poor' to establish the relative effects of varying degrees of poverty. From the limited work that has been undertaken in this area, relative poverty measures that aggregate low-income living standards tend to have smaller effects than measures capturing

deeper forms of poverty. Less attention has also been given to a wider variety of income-based and material deprivation poverty indicators, with observational and cross-sectional studies yielding weaker effects compared to RCTs and quasi-experimental designs. There is therefore a need to ensure measures are accounting for diversity within the low-income distribution and to isolate poverty effects from time-invariable confounders in longitudinal analysis. Questions surrounding the relative size and duration of poverty effects are also rarely considered in tandem, particularly for the adult working population. We therefore deploy income-based, material deprivation and multidimensional measures of poverty in a double movement – to examine their construct and criterion validity and, in turn, better capture differences between those experiencing deep poverty, shallow poverty and no poverty to address gaps in the existing literature. We now turn to outline the methodological approach taken in this paper.

Methods: data and approach to analysis

This paper presents new analysis of Understanding Society (US): the UK Household Longitudinal Study (UKHLS) builds on the British Household Panel Survey (BHPS) by drawing on a nationally representative sample of over 40,000 households with information collected over 13 waves since 2009 (University of Essex, 2023). To adjust for sampling error, differential nonresponse, attrition and unequal selection probabilities, analyses are based on weighted data unless otherwise stated. Estimates of poverty transitions, persistence and outcomes were undertaken on all responding adults (16+) within a surveyed household. At Wave 1, 82% of eligible adults responded to the survey and by Wave 13, the overall response rate for adults that had been interviewed in the previous wave was 87%. Table 2 details time variant and time invariant characteristics of responding adults across waves, that broadly reflect the demographic and socioeconomic profile of the inferential population. As shown in Figure 1, attrition rates are higher among people in deeper forms of poverty (compared to those in shallower poverty, both calculated based on income). This is partially corrected using

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longitudinal weights, but it may have more significant implications, which we discuss later in the paper.

Table 2. Characteristics of respondents in Understanding Society covering waves 1-12 (2009-10 to 2020-21).

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9	Wave 10	Wave 11	Wave 12
Time-invariant												
Male (%)	48.8%	48.7%	48.8%	49.0%	48.9%	48.9%	48.9%	48.8%	48.8%	48.3%	48.0%	48.0%
Ethnicity												
White (%)	90.6%	90.6%	90.5%	90.3%	90.1%	90.0%	89.9%	89.7%	89.4%	89.5%	89.3%	89.2%
Mixed (%)	1.0%	1.1%	1.3%	1.3%	1.5%	1.6%	1.7%	1.8%	1.9%	2.0%	2.0%	2.1%
Asian (%)	4.7%	4.7%	4.7%	4.8%	4.7%	4.8%	4.9%	4.9%	5.0%	5.1%	5.1%	5.3%
Black (%)	2.2%	2.3%	2.3%	2.4%	2.4%	2.5%	2.5%	2.6%	2.6%	2.5%	2.6%	2.6%
Chinese (%)	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%
Arab (%)	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.2%
Other (%)	0.7%	0.8%	0.8%	0.7%	0.7%	0.6%	0.5%	0.5%	0.5%	0.4%	0.4%	0.3%
Time-variant												
Age M	46.53	46.56	46.6	46.83	47.25	47.49	47.73	47.97	48.21	48.64	49.13	49.49
SD	18.994	18.848	18.669	18.692	18.966	19.019	19.077	19.084	19.133	19.132	19.061	19.059
Respondent is employed (%)	56.4%	56.9%	57.4%	57.6%	58.2%	59.0%	59.6%	59.7%	59.4%	58.9%	57.8%	56.6%
Number of children in HH												
M	0.55	0.56	0.56	0.56	0.56	0.55	0.54	0.53	0.53	0.51	0.50	0.48
SD	0.94	0.94	0.95	0.95	0.95	0.95	0.93	0.93	0.92	0.91	0.89	0.88
HH size M	2.82	2.81	2.81	2.81	2.82	2.8	2.8	2.79	2.8	2.79	2.79	2.78
SD	1.386	1.367	1.394	1.418	1.433	1.428	1.403	1.41	1.431	1.428	1.42	1.432

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Below 60% of median incomes (%)	21.3%	19.9%	18.4%	18.5%	18.8%	17.9%	17.5%	17.3%	17.1%	17.0%	17.9%	17.6%
Below 40% of median incomes (%)	10.5%	8.9%	7.8%	8.3%	7.6%	6.6%	6.8%	7.0%	7.2%	7.6%	8.4%	7.5%
Equivalised disposable income												
AHC, monthly, original prices												
M	£1,301	£1,360	£1,405	£1,426	£1,473	£1,616	£1,634	£1,660	£1,677	£1,704	£1,713	£1,807
SD	£1,330	£1,356	£1,305	£1,400	£1,519	£2,141	£1,300	£1,489	£1,811	£1,458	£1,204	£1,418

We derive measures of equivalised net disposable income after taxes, deductions and housing costs (hereafter referred to as 'income') to best approximate attainable living standards (See Appendix 1 for our income definitions and calculations). Measures of median equivalised income and poverty lines were calculated drawing on household enumerated weights to establish what proportion of the sample were living below different poverty thresholds at each wave. Where income is used as a predictor in models, figures have been adjusted to June 2024 prices. As indirect measures of poverty, income-based indicators are often vulnerable to measurement error, particularly towards the lower end of the distribution (Brewer et al., 2017). For deeper forms of poverty, we therefore use a composite measure that combines income indicators (i.e. < 40% median incomes) with subjective measures, with those identifying as 'living comfortably' excluded to improve construct and criterion validity. Throughout this paper, we construct and draw upon a range of income-based, material deprivation and multidimensional poverty indicators to explore varying degrees of hardship in our analyses.

Figure 1. Attrition rates by income status (respondent in wave *N* but no response in any future waves, unweighted).
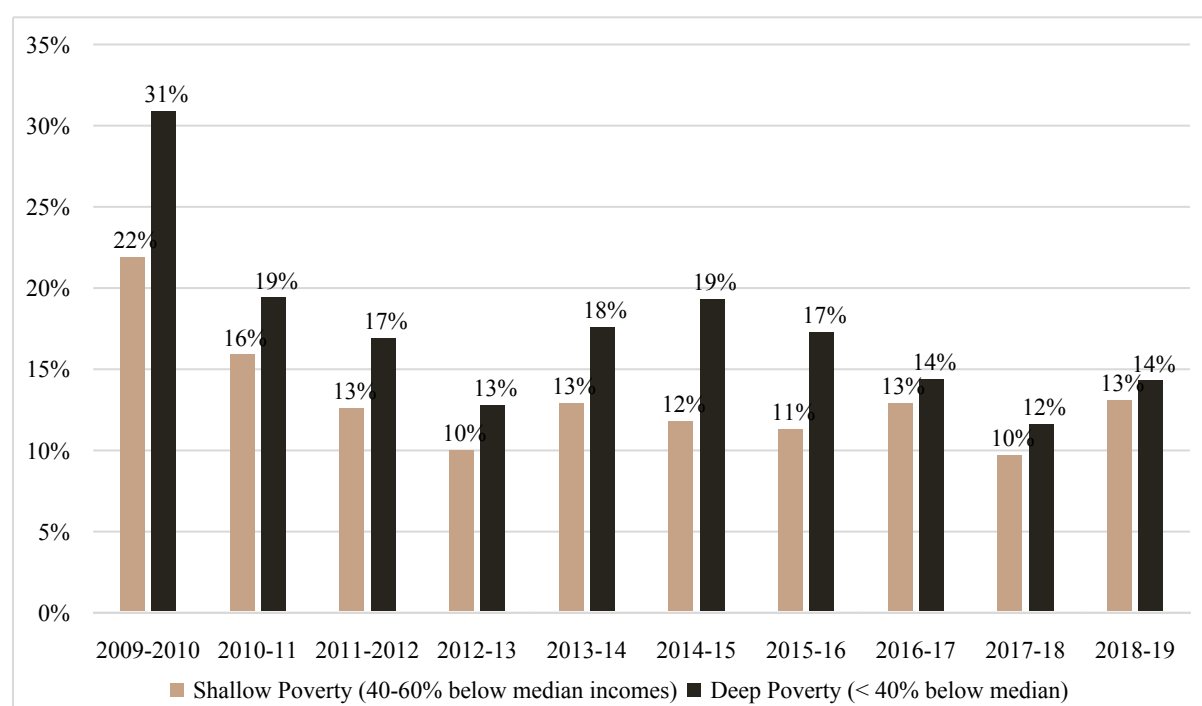

Shallow Poverty (40-60% below median incomes) ■ Deep Poverty (< 40% below median)

Table 3. Poverty measures, thresholds and indicators.

	Income Poverty	Material Deprivation	Multidimensional Poverty
A) 'No…'	> 60% of median incomes	< 25 material deprivation score	≥ 2 of the following conditions are satisfied: > 60% of median incomes; < 25 material deprivation score; holds more than GCSE level
B) 'Shallow…'	40-60% below median incomes	25-40 material deprivation score	≥ 2 of the following conditions are satisfied: 40-60% below median incomes; 25-40 material deprivation score; GCSE/other qualifications
C) 'Deep…'	< 40% median incomes	> 40 material deprivation score	≥ 2 of the following conditions are satisfied: < 40% median incomes; > 40 material deprivation score; no qualifications

Table 3 summarises how we distinguish between those a) not in poverty, b) in shallow poverty and c) in deep poverty in our analyses. For income-based indicators, we follow the conventions adopted in recent literature exploring the changing prevalence and dynamics of deep poverty in the UK context (Taylor & Schmuecker, 2023). For material deprivation, we follow the prevalence weighting strategy widely used by the Department of Work and Pensions (DWP, 2023) (See Appendix 2 for survey item details and our prevalence weighting method). For multidimensional poverty, we derive the three categories drawing on a version of the Alkire and Foster (2011) multidimensional poverty index covering income, material deprivation and education. Two cut-off points were set: the first to identify individuals who are poor in each of the dimensions considered for measuring poverty, and the second to determine, depending on the deprivations in the previous dimensions, whether a person is multidimensionally poor or not. In our case, we repeat this process with cut-off points for deep poverty and shallow poverty. An explanation of how these measures are constructed is detailed in Appendix 2. Existing evidence demonstrates how each of these measures of poverty could be capturing different features, stages and people experiencing material hardship (Hick, 2015). However,

there are also reasonable grounds to believe that multidimensional measures help mitigate measurement error; offer a more comprehensive representation of (varying degrees of) poverty experience; and are better suited to accounting for diversity within the low-income population (Alkire & Santos, 2013).

When exploring the effects of poverty on life outcomes, we focus on mental health, physical health, subjective well-being, loneliness, and life satisfaction which are each measured based on a battery of questions (except for life satisfaction). These measures are considered sensitive and robust; drawn from widely validated scales such as the GHQ-12 General Health Questionnaire which covers key dimensions of self-reported physical and mental health such as concentration, physical mobility and depression (Gnambs & Staufenbiel, 2018) (See Appendix 3 for further details).

Both in the short and long term, between-subject comparisons suggest that poverty is negatively associated with physical and mental health, as well as social well-being and life satisfaction. Namely, that those with less are more likely to experience negative outcomes, when compared against those who have more (Ridley et al., 2020). However, within-subject comparisons offer more granular insight into the extent to which levels of hardship and variations are associated with variations in negative outcomes over time (Dearing et al., 2006). We therefore also examine within-person effects of poverty on financial trajectories and outcomes. Doing so offers insight into the relative difference economic circumstance and change can make and, perhaps more importantly, what can be done about it. Compared to between-subject comparisons, within-subject analysis also reduces potential omitted variable bias because each individual serves as their own control. This, in turn, can better inform the design and delivery of income protection on either prioritarian or consequentialist grounds. Our approach also comes some way to account for the potential bi-directional relationship between poverty, health and well-being. By controlling for time variant and invariant

characteristics such as employment status – a known factor linking health declines to income reduction – we reduce the potential for reverse causality where health might directly impact income through job loss or reduced work capacity. We detail the multilevel models employed to establish within-person associations in greater detail below.

Findings

A common, reasonable conclusion across a great deal of poverty research is that 'less money' is 'bad' for individuals, but the nature and magnitude of the relationship between resources and outcomes is often under-specified (Cooper & Stewart, 2021: 998). Existing research on the nature and effects of deeper forms of poverty identifies a series of risk factors and outcomes associated with its prevalence (Taylor & Schmuecker, 2023). However, less attention has been given to how outcomes might differ across different parts of the low-income distribution. The reference category for much work doesn't always afford insight into the *relative* effects of deep poverty compared to shallower forms of poverty. For example, Taylor and Schmuecker (2023: 7) explore the dynamics of deep poverty and conclude from observed levels of churn that 'short-term periods of very deep poverty are much more common than persistent very deep poverty.' Such conclusions risk misunderstanding the distinctive nature of deep poverty. We therefore focus our attention on comparing the low-income trajectories and outcomes of those in deep poverty and comparing these to those in shallower forms of poverty over time.

A deep poverty trap

First, the evidence suggests that extended periods of poverty are considerably and consistently more likely amongst those in deeper forms of poverty. In Figure 2, we compare rates of persistent poverty – when somebody is in relative poverty (below 60% of median incomes) for at least three out of four years – and find that the difference between those in shallower and deeper forms of poverty has grown since 2009. Between 2009 and 2013, 37% of people in

shallow poverty experienced persistent poverty, compared to 44% of those in deep poverty. Between 2017 and 2021, the same proportion of those in shallow poverty experienced persistent poverty, but this rose to 52% for those in deep poverty.

Figure 2. Rates of persistent poverty (falling below 60% of median incomes in wave N, and for at least 2 of following 3 waves).
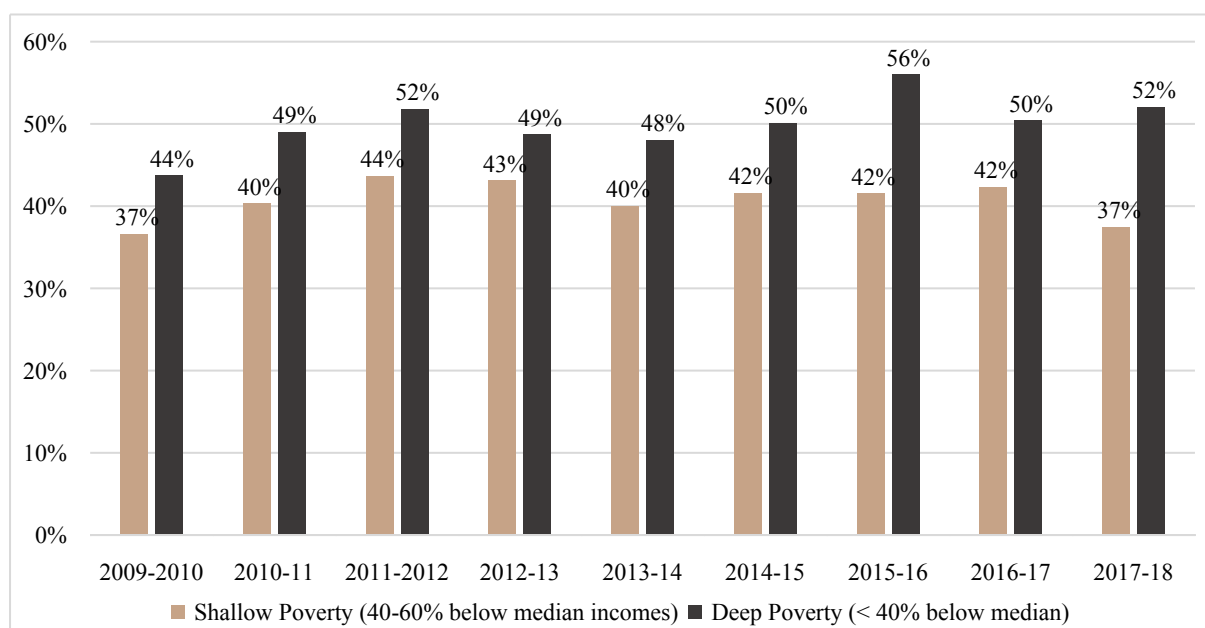
Whilst extended periods of poverty are more likely amongst those in deep poverty, it is less clear whether it is the depth of poverty itself, or whether there are other confounding factors that makes it harder to escape poverty. To better understand the risk factors associated with lower exit rates from poverty, we ran a Generalised Estimating Equations (GEE) model to explore the main effects of various predictors. A GEE model was chosen for its robustness to handling correlated data between repeated measures on the same subjects over time, and for its ability to provide reliable parameter estimates. Our predictors included sex, ethnicity, age, household type, number of children, household size, employment status and poverty depth (shallow vs. deep) (see Appendix 4 for full model). The results are summarised in Table 3 below where Ex(B) coefficients summarise the odds ratios for experiencing persistent poverty

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associated with each predictor. Ethnicity, household type, employment status and depth of poverty were all statistically significant predictors of poverty persistence.

Table 3. Summary of main effects on persistent poverty.

	Exp(B)	Standard Error
Intercept	0.84	0.17
Ethnic Background[1]		
Black	1.48***	0.098
Chinese	0.44***	0.22
Household Type[2]		
Couple Working Age, No Children	0.52***	0.13
Couple 1+ Pension Age, No Children	0.50***	0.12
Couple Working Age, Children	0.59***	0.13
Other Household	0.41***	0.13
Unemployed[3]	1.77***	0.05
Deep poverty	1.43***	0.04

Note: *** $p < .001$, [1]Reference category is "white", [2]Reference category is "Single pension age", [3]Reference category is "In paid employment",

Black individuals were almost 50% more likely to experience persistent poverty compared to white individuals (reference category) (Exp(B) = 1.48). By contrast, Chinese individuals were 55% less likely to experience persistent poverty (Exp(B) = 0.44). Compared to single pensioners (reference category), individuals living as a couple in a working-age household, both with (Exp(B) = 0.59) and without children (Exp(B) = 0.52), were less likely to experience persistent poverty. Other household types were also less likely to experience persistent poverty. Unemployed individuals were 77% (Exp(B) = 1.77) more likely to experience persistent

poverty. Finally, the depth of poverty also impacts the likelihood of poverty persistence, with those in deep poverty 43% (Exp(B) = 1.43) more likely to experience persistent poverty compared to those in shallow poverty. When holding a range of relevant factors constant, evidence suggests the capacity to 'bounce back' and transition out of poverty is compromised significantly as a result of experiencing deep poverty. The increased likelihood of poverty persistence amongst those in deep poverty underlines the need to tackle poverty depth if we are to mitigate longer-term poverty.

Cutting deep? Examining social kinds of poverty through health and well-being outcomes

Under the broad umbrella of 'poverty', it is possible that there are distinctive risks, costs and trajectories borne from varying degrees of material hardship. While related, deep poverty and shallow poverty may in fact typify distinct social kinds with unique characteristics and implications. For example, the results from the previous section evidence a chronicity to deep poverty, which in turn could influence the nature and magnitude of negative outcomes associated with it.

With that in mind, Figure 3 summarizes differences in the mental health, physical health, well-being, loneliness, and life satisfaction according to socioeconomic position. Drawing solely on an income-based indicator, it is clear these groups differ across a range of domains. The differences are less clear for physical health, where it appears that individuals in shallow income poverty exhibit worse outcomes than those in deep income poverty. However, when we move beyond an indirect (income-based) measure, to more accurately and concretely capture living standards through material deprivation and multidimensional indicators, we see differences between those experiencing shallower and deeper forms of poverty grow considerably. In addition to income poverty, we therefore also run and compare models in the rest of our analyses that draw on material deprivation and multidimensional poverty measures, which offer a more accurate, granular picture of (varying degrees) of poverty experience.

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Figure 4 illustrates the value of doing so by summarizing widening differences in mental health outcomes according to our three different measures of living standards.

Figure 3. Mental health, physical health, subjective well-being, loneliness, and overall life satisfaction by income status categories.
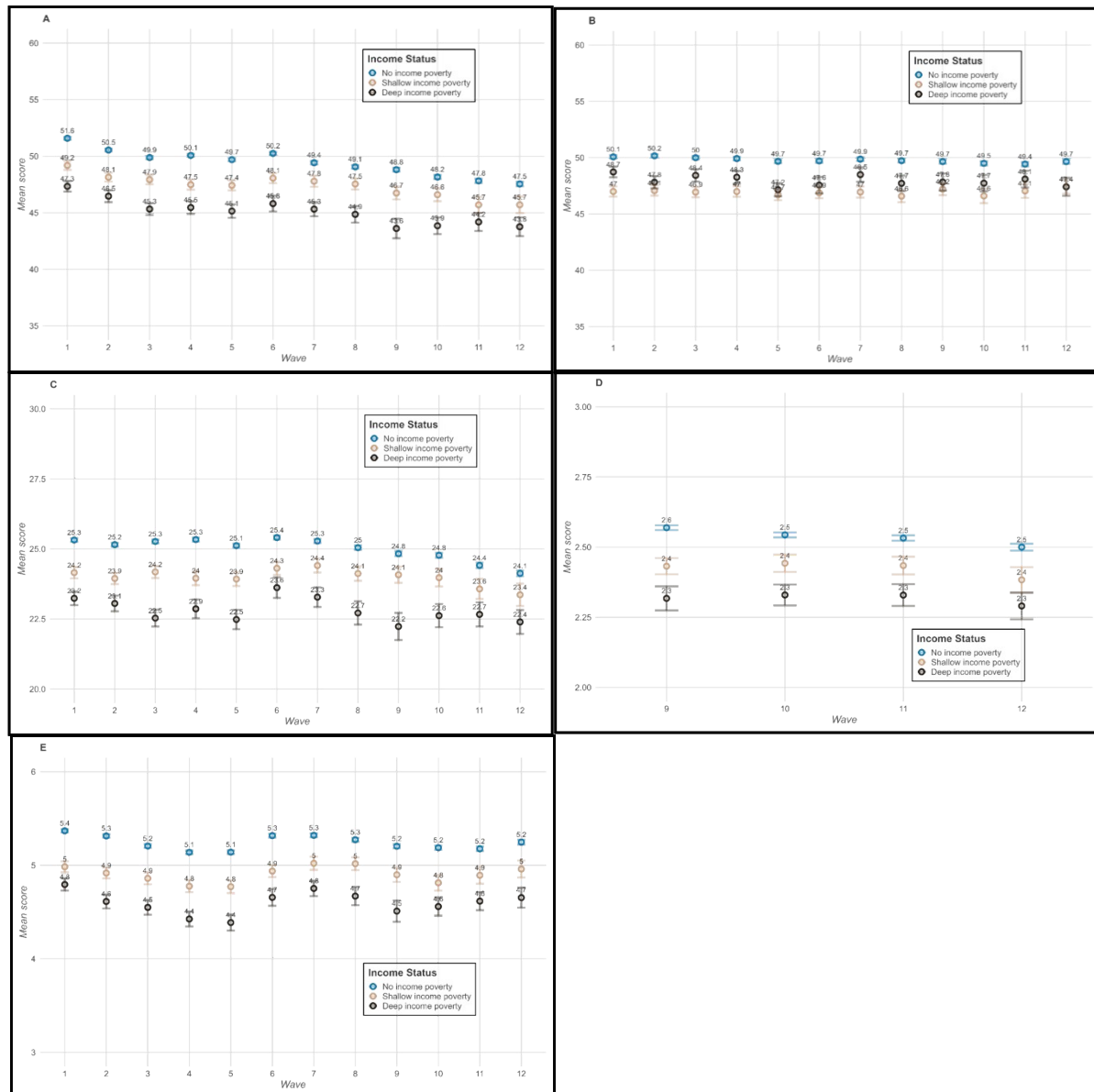
Note: Mean scores by income status for (A) Mental health, SF-12 Mental Component Summary (MCS); (B) Physical health, SF-12 Physical Component Summary (PCS); (C) Subjective well-being (GHQ); (D) Loneliness (UCLA + ELSA); (E) Overall life satisfaction.

Figure 4. Mental health by income status, material deprivation, and multidimensional poverty categories.
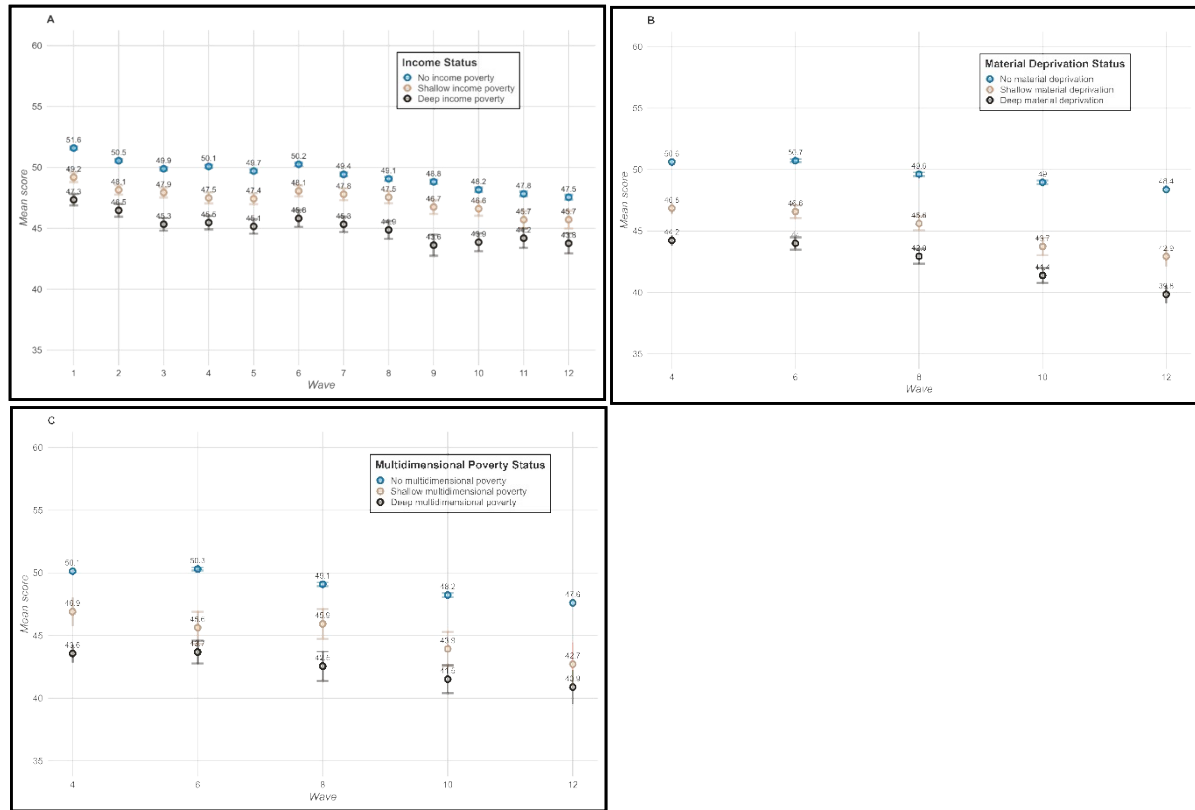
Note: (A) Mean scores by income status categories for mental health, SF-12 Mental Component Summary (MCS); (B) Mean scores by material deprivation categories for mental health, SF-12 Mental Component Summary (MCS); (C) Mean scores by multidimensional poverty categories for mental health, SF-12 Mental Component Summary (MCS).

To further explore the effects of deep poverty, we conducted longitudinal multilevel analyses using the *nlme* package in R (Pinheiro, Bates, DebRoy, Sarkar, & Team., 2021; R Core Team, 2024). We did so to account for the hierarchical structure of the data, with observations across different waves (level 1) nested within subjects (level 2). Initially, we constructed a null model for each dependent variable (an intercept-only model) to establish the intraclass correlation coefficient (ICC). The ICC for these models ranged from 0.24 to 0.52, indicating that a substantial portion of the variance (between 24% and 52%) is explained by differences between

subjects, with the remainder explained by within-subject variability over time. We then built unconditional growth models for each dependent variable (only including the wave variable). In these models, the effects of wave – linear, quadratic, and cubic – were significant, and therefore included as covariates in subsequent analyses. This is true except for loneliness, where the data to calculate material deprivation is only available in two non-consecutive waves. We centered the time-variant continuous variables within individuals (age, number of children, and household size) and included them as covariates in the main models, along with others such as gender and ethnicity. In the main models, we included a random slope for time (wave), allowing not only the intercept to vary between individuals but also the rates of change at different time points.

First, we built models solely for income. Income was divided by 5,000 and then centered within subjects to observe the effect of a £5,000 change on the dependent variables. As expected, income positively predicted mental health ($B = 0.12$, $SE = 0.04$, $p = 0.028$), subjective well-being ($B = 0.09$, $SE = 0.02$, $p < 0.001$), and loneliness ($B = -0.01$, $SE = 0.01$, $p = 0.019$). However, we did not find a significant effect on physical health ($B = -0.05$, $SE = 0.04$, $p = 0.427$) or life satisfaction ($B = 0.01$, $SE = 0.01$, $p = 0.075$). Figure 5 shows the main results for each dependent variable, with all the previously mentioned covariates included in these models. In Figure 5, markers to the left of 0 indicate that, compared to shallow poverty (the reference in our models), belonging to that category is associated with a decrease in the outcome; markers to the right indicate the opposite. The results indicate that, irrespective of the measure chosen, individuals in deep poverty have poorer mental health, well-being and life satisfaction, compared to those in shallow poverty. Focusing solely on income-based indicators, being in deep poverty (as opposed to shallow poverty) is associated with an average decrease of 0.82 in the mental health scores and 0.46 in well-being scores. Conversely, individuals who are not in income poverty show better mental health and higher subjective well-being as is to be expected.

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Contrary to our expectations, individuals in shallow income poverty in this model exhibit the poorest physical health and exhibit greater feelings of loneliness.

As discussed above, while income is an important indirect proxy for living standards, material deprivation and multidimensional poverty capture more accurately, and comprehensively, experiences of material hardship, with differences becoming more salient and profound across domains of life. Particularly, when adopting a multidimensional measure of poverty, we come closer to capturing the complexity and breadth of deep poverty, and in turn the more distinctive it appears as a social kind compared to shallow poverty. Focusing on measures of material deprivation and multidimensional poverty, people in deep poverty appear to fare considerably worse in terms of mental health, well-being, loneliness and life satisfaction. With increasingly fine-grained measures of living standards then, we find that those in shallow poverty exhibit increasingly similar outcomes to those not in poverty, whilst those in deep poverty exhibit increasingly distinctive outcomes. Except for the case of physical health, this suggests there may be something about deep poverty as a social kind that warrants further academic and policy attention. When measurement error is reduced and hidden disability-related factors are better accounted via our material deprivation and multidimensional measures, we can see a stronger relationship between physical health and deep poverty emerging in our models that is just shy of significance. The complete models, including covariates, can be found in the Appendix 5 (Tables S2-S5). While our analyses include a significant number of controls, there are still variables that may bias the effects of our measures of living standards (e.g., hidden costs associated with disability). Bearing this in mind, we conducted several sensitivity analyses that confirms a consistent pattern across domains (see Table S6 in Appendix 5 and Appendix 6).

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Figure 5. Coefficient plot for income/material deprivation/MPI categories.
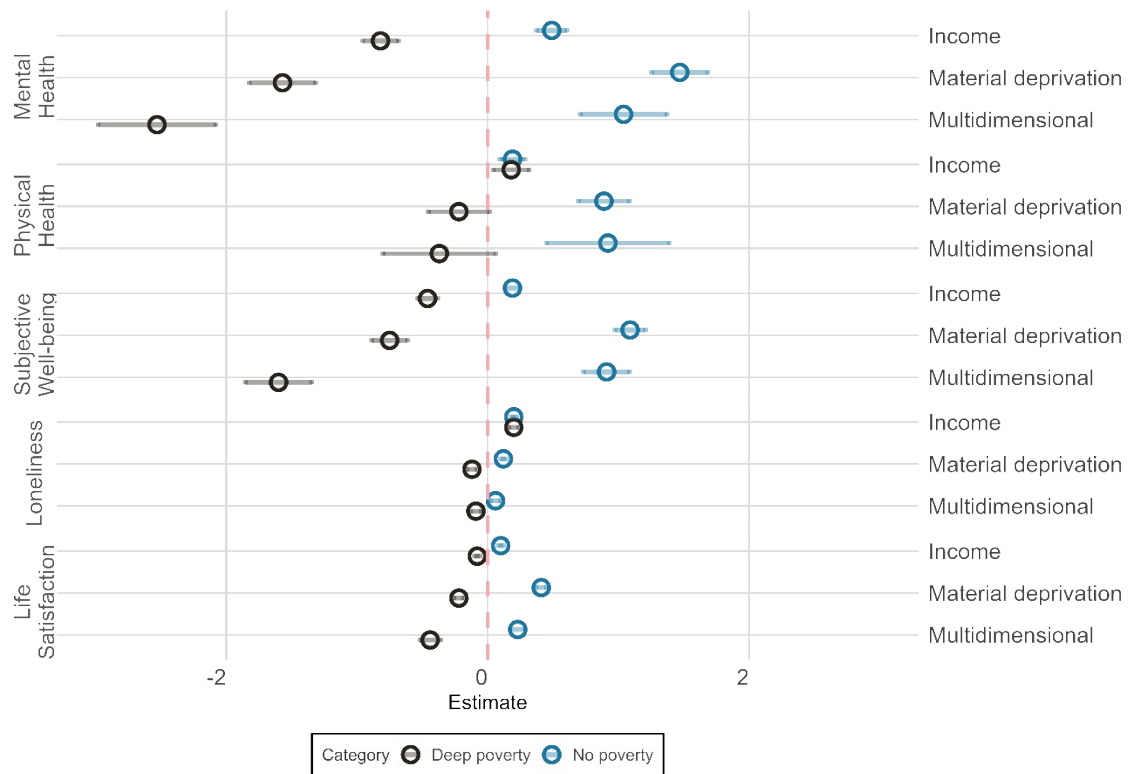
Note: Reference category is "Shallow". Covariates: employment status, sex, ethnicity, age, household type, household size, number of kids, wave, quadratic wave, cubic wave.

Having established that deep poverty has a distinctive effect on several core domains of life, we proceeded to analyze if it has distinctive cumulative effects over time. To do so, we followed a similar approach in terms of statistical modelling as before. To calculate the cumulative effects of being deep poverty, shallow poverty and no poverty over time, we constructed a new variable for each. In these, we calculated the cumulative number of waves in which the individual had been in each category.

As shown in Figure 6, longer periods in deep poverty are, regardless of the measure adopted, associated with worse mental and physical health, higher loneliness and lower well-being and life satisfaction. However, as in the previous case, the coefficients are higher when measures are based on more direct indicators of living standards such material deprivation or

multidimensional poverty. A similar pattern occurs with shallow poverty, which generally predicts mental health and well-being negatively and significantly, although to a lesser extent, except in the case of the income-based categorization. The results are similar for physical health: the longer the duration of poverty, the greater magnitude of the negative effect. However, in this case, the duration of deep poverty has a greater effect than that of shallow poverty. As in the previous analysis and considering the questions on material deprivation are only asked in some waves, we repeated the analyses of the duration of the income-based poverty categories using only waves 4, 6, 8, 10, and 12 (see Table S12 in Appendix 5). As before, the results were similar, and our conclusions remain the same.

To delve deeper into the differences between the effects of shallower and deeper forms of poverty, we performed a Wald test to check if the effects of the duration of varying degrees of poverty are statistically similar. The results showed that these coefficients are statistically different, except in the case of multidimensional poverty predicting loneliness. This reinforces the idea that we are dealing with substantive and differentiated categories that have distinct effects on physical health, mental health, subjective well-being, loneliness, and life satisfaction. In this case, the complete models, including covariates, for these analyses can be found in appendix 5 (Tables S9-S11).

Figure 6. Coefficient plot for income/material deprivation/MPI categories duration.
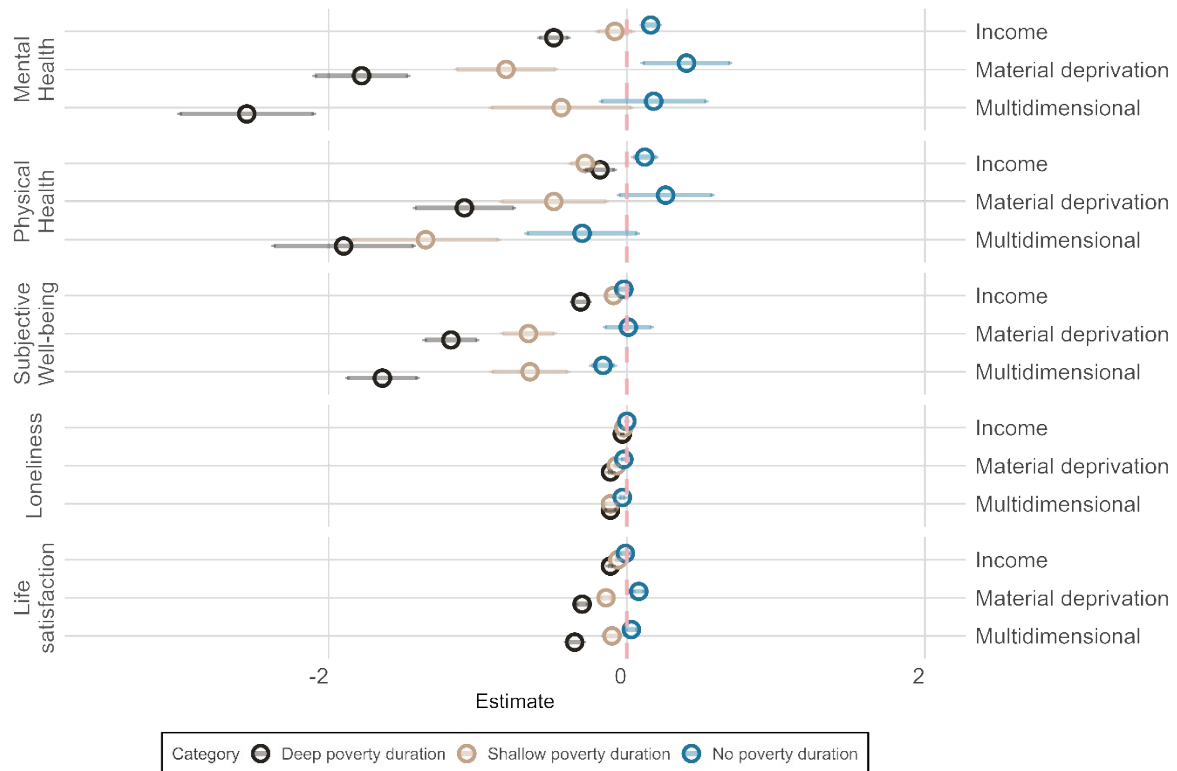
Note: Covariates: employment status, sex, ethnicity, age, household type, household size, number of kids, wave, quadratic wave, cubic wave.

Poverty depth and persistence: the case for timely interventions

Finally, we sought to establish whether simply having briefly been in deep poverty is more damaging than being in shallow poverty for an extended period. To answer this question, we again used longitudinal multilevel models to compare experiences of persistent and fleeting poverty over a four-wave period (from Wave 1 to Wave 4). First, we created a dummy variable in which people who had been in deep poverty either once or twice during the four-wave period were coded as 0 (transient deep poverty), and those who had been in persistent poverty for at least three waves during the four-wave period (but never in deep poverty were coded as 1 (persistent shallow poverty). The results of this comparison appear in Model 1 of Table 4. Using a more conservative measure, we then coded those individuals who had only been in

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deep poverty once and never in shallow poverty during the four-wave period as 0, and those who had been in shallow poverty at least three times during the aforementioned period as 1 (Model 2 in Table 4). The complete models can be found in Appendix 5 (Table S13).

The results summarised in Table 4 suggest, at least as we have conceptualized our independent variable, that briefly experiencing deep income poverty, compared to being in shallow income poverty for an extended period, has a greater negative impact on mental health, well-being, and life satisfaction. Once again, we also find that being in shallow income poverty seems to be more detrimental to physical health. However, given the potential for measurement error and hidden disability-related costs discussed earlier, this is perhaps to be expected.

Qualitative evidence suggests that when people fall into more severe forms of material hardship, they are left with little choice but to draw down on dwindling resources in ways that push them further into a poverty debt trap (Fitzpatrick et al., 2023). The depletion of affective and material resources is so profound, intimate and damaging that even brief spells in deep poverty then can cast a longer, darker shadow in the lives of those affected than shallower forms of poverty.

Table 4. Summary of main effects for transient deep poverty vs shallow persistent poverty.

Predictor	SF-12 Mental Component Summary (MCS)	SF-12 Physical Component Summary (PCS)	Subjective wellbeing (GHQ)	Loneliness (UCLA + ELSA)	Overall life satisfaction
			Model 1		
Intercept	54.35***	43.98***	26.63***	2.60***	3.86***
	(2.06)	(1.83)	(1.19)	(0.09)	(0.33)
Shallow persistent poverty[1]	1.29***	-0.42*	0.42**	0.03	0.18***
	(0.20)	(0.26)	(0.12)	(0.02)	(0.03)
N_{obs}	26,070	26,070	26,205	9,283	24,487
N_{subj}	9,882	9,882	9,897	4,561	9,523
			Model 2		
Intercept	54.07***	42.58***	26.67***	2.56***	3.74***
	(2.67)	(2.43)	(1.50)	(0.11)	(0.41)
Shallow persistent poverty[2]	0.77**	-0.70**	0.47**	0.05*	0.10*

	(0.26)	(0.26)	(0.14)	(0.02)	(0.04)
N_{obs}	16,170	16,170	16,222	5,829	15,368
N_{subj}	7,999	7,999	8,008	3,505	7,690

Note: * p < .05, ** p < .01, *** p < .001 [1]Reference category is "Being in deep poverty once or twice", [2]Reference category is "Being in deep poverty once and never or only once in shallow poverty in the four-wave period" Covariates: employment status, sex, ethnicity, age, household type, household size, number of kids, wave, quadratic wave, cubic wave.

Discussion and Conclusion

While a distinction between 'the poor' and 'the non-poor' remains analytically useful to establish the determinants and effects of poverty as a broader category of experience, our results demonstrate how this tendency risks glossing over important differences and effects associated with varying degrees of hardship. Across a range of domains and ways of operationalising living standards, we demonstrate that deep poverty is a distinct social kind from shallow poverty, with differentiated trajectories and effects. Conversely, we find that shallow poverty is a more similar social kind to non-poverty in several non-trivial respects.

First, we find that deep poverty is associated with a higher likelihood of poverty persistence. If you fall into deep poverty, it is much harder to escape poverty more generally. This has significant implications in itself, due to the negative effects of persistent poverty on, for instance, mental health outcomes (Lai et al., 2019). Secondly, our results show that, centred within-person, an increase in income is associated with better mental health and higher well-being. People in deep poverty however exhibit considerably worse mental health, lower well-being, greater loneliness, and lower life satisfaction compared to those in shallow poverty. Such differences imply that our understanding of the impact of poverty needs to take better account of how varying degrees of poverty may interact differently with the determinants of health and well-being. Our results are consistent across different measures of poverty, but we observe greater effects when using direct and multidimensional measures. When the changing severity of poverty is better captured through such measures, we find that those in shallow poverty exhibit increasingly similar outcomes to those not in poverty, whilst those in deep poverty exhibit increasingly distinctive outcomes. Regarding physical health outcomes, the results are partially contrary to what was anticipated. As expected, people who are not in poverty exhibit better physical health than those in shallow poverty. However, the latter exhibit worse physical health than those in deep poverty. This is only the case when using an indirect,

income-based measure of living standards. More broadly, it is possible that our results concerning physical health are due to measurement error. Either due to the quality of self-reports on physical health in terms of reporting biases and individual subjectivity (Sinha et al., 2021), or indeed incomplete measures of disposable incomes, particularly for those with limiting health conditions or disabilities (Zaidi & Burchardt, 2005). Where more direct, comprehensive measures of living standards are used in our models, our results are in line with expectations. That said, it is possible that there is something else concerning the relationship between physical health and income poverty, in terms of cofounders or moderating variables, that we are not capturing and controlling for in our analyses to explain these results. Although our sensitivity analyses give us confidence in the robustness of our results (see Appendix 6).

Thirdly, our results show that the cumulative experience of persistent deep poverty has a much more detrimental impact on people's mental health, well-being, loneliness, and life satisfaction over time. Whilst not statistically significant, we also see similar trends for physical health as well. Finally, we demonstrate that even brief spells in deep poverty have a more detrimental effect on mental health and well-being than being in persistent shallow poverty for longer periods. These results underscore the critical importance of timely interventions that quickly improve the situation of people in deeper forms of poverty, both due to the harmful effects of experiencing this situation (prioritarian imperative), even during short periods, and the cumulative impact it has over time (consequentialist rationale).

Our results suggest that shallow poverty and deep poverty warrant greater academic recognition and attention as distinct social kinds, with different policy responses in terms of timing, means-testing and targeting (Ascher, 2023). In this paper, we have shown how people in deep poverty are consistently and considerably worse off across several key domains of life. From a prioritarian perspective, our results justify welfare interventions focused on those with the least by showing how the trajectories and outcomes are markedly worse for those in deeper

forms of poverty. Such evidence adds significant weight to the argument for prioritizing finite resources to those with the least. Doing so aligns with normative appeals to ensure those who are most disadvantaged receive the attention and resources they urgently need. From a consequentialist perspective, social policy interventions aimed at breaking the dynamics of deep poverty and its adverse effects could be more effective in increasing overall social well-being, producing the greatest impact, relative to money spent (Steinbacher, 2024).

A recent study estimated that poverty costs the UK National Health Service and social care system £29 billion per year due to poorer health outcomes, acute service demand and broader public health issues (Bramley et al., 2016). Our evidence suggests that a MIS may yield the greatest returns in terms of reducing the public cost of poverty. As has been argued concerning destitution (Bramley et al., 2015), the social costs of non-intervention can be far-reaching. Given the cumulative effects of deep poverty, MIS present an opportunity to maximise the efficiency of welfare spending and minimize the costs associated with (deep) poverty. In short, if policymakers or members of the public aren't convinced on prioritarian grounds, they should be convinced by a consequentialist argument for MIS. That said, there are reasons to believe that interventions of this kind, centered on a principle of need, may also have strong public support. Whilst distributive preferences are strongly driven by equity and equality concerns, principles of need generally garner substantial public support and there is a potentially complementary relationship between this and positive attitudes towards social protection more generally, especially for people living in poverty (Alcañiz-Colomer et al., 2024).

Reflecting on the limitations of our study, the nature of the data does not allow us to draw unequivocal causal conclusions. Although we draw on longitudinal and not cross-sectional data, we do not achieve the level of control or manipulation available through experimental designs or RCTs. Moreover, since this was not our goal here, we did not focus on potential reciprocal causality between poverty and the outcomes studied. For example, one might think

that worse mental health, in turn, leads to a greater likelihood of remaining in deep poverty. Whilst we do control for factors linking health declines to income reduction (e.g. changing employment status), future research could go further to consider the reciprocal causal relationship between different levels of poverty and associated health and well-being. Finally, attrition is considerably higher among those in deep poverty in US. Previous studies show that some of the factors influencing attrition in longitudinal surveys are poorer self-reported health, lower participation in social activities, or depression; some of these variables are closely related to what we studied. We may therefore underestimate the magnitude of the relationship between deep poverty, income trajectories and life outcomes.

Data and code availability

The datasets analysed during the current study are available in the UK Data Service repository, http://doi.org/10.5255/UKDA-SN-6614-19. Both the code used for the analyses and a description of how to access the data, along with some resources on the data, can be found at:

https://osf.io/jmune/?view_only=79e8b5b0c7f64857a897bb1a72ec83c3

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