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Article

Perceived Health Inequalities: Do the UK and US Public Accurately Estimate Socioeconomic Health Inequality, and Do they Wish to See It Reduced?

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Abstract: Objective. It is unknown whether the public accurately estimate socioeconomic health inequality and whether they wish to see it reduced or eliminated. **Methods.** Representative samples of the UK and US indicated the perceived and ideal lifespan of people working in "higher managerial/professional" and "routine" occupations. We present perceived and desired lifespan ratios for each sample and for key socio-demographic variables. **Results.** The UK public estimated the lifespan of professionals to be 5.9% longer than routine workers (true value of 5.8%), and 67.8% (UK) and 53.7% (US) participants correctly identified that professionals live longer than routine workers. In both populations, the median respondent expressed equal ideal lifespans for routine workers and professional workers. **Conclusion.** The UK public appear well-appraised on the average lifespan for professionals and routine workers. Across nationalities and most socio-demographic groups, the median respondent was aware of social class inequalities in lifespan and preferred that they be eliminated.

Keywords: socioeconomic health inequality; public awareness; social class; life expectancy

1. Introduction

There has been substantial research activity into describing, explaining, and mitigating the fact that health outcomes are unequal across groups defined by socioeconomic factors (Bartley 2017; Smith et al. 2016). Yet this activity has not delivered policy interventions that reduce socioeconomic inequalities in health (Mackenbach 2011; Marmot 2020). In line with the argument that successful reduction in health inequalities can only be achieved if there is public will to do so (Mackenbach 2011) there has been increased focus on trying to get "the public on board" with broader upstream policies that tackle the wider determinants of health (Farrer et al. 2015; Fuller et al. 2016; Garthwaite et al. 2016; Smith et al. 2021). Advocates of this approach appear to implicitly assume that the public already share their view that health inequalities should be reduced or even eliminated (Marmot 2020). However, one recent public report focusing on this issue claims that the scale of health inequalities is a surprise to many people in the UK, and that although many report concern, health inequality appears to be ranked as less serious compared to other forms of social inequality (Kane et al. 2022).

A well-reported finding in psychological research on economic inequality is that preferences and attitudes towards redistribution policies are driven by people's perception of the magnitude of inequality rather than actual or objective levels of inequality (Dawtry et al. 2015; Gimpelson and Treisman 2017; Jackson and Payne 2020; Norton and Ariely 2011). For example, across a variety of multi-national survey samples, Gimpelson and Treisman (2017) demonstrate there to be little correspondence between levels of

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actual and perceived economic inequality, and that the latter is more strongly associated with desires to redistribute wealth than actual levels of inequality. When it comes to public attitudes therefore, subjective perceptions of inequality matter more than objective inequality.

Although the argument has been made that in some instances the public do not link unequal health outcomes with socioeconomic status/factors (Douglas 2016), others have reported that the public is aware of unequal health across socioeconomic groups (Booske et al. 2011; Shankardass et al. 2012). In one such report, Macintyre et al. (2005) present results from a survey that asked respondents in the West of Scotland who they believed was more likely to exhibit one of a series of health states (e.g. being fit, mental illness, living longer): a richer person, a poorer person or if both are equally likely. They found that the rich were generally perceived to be fitter and to live longer than the poor, and that socially advantaged respondents were more likely to agree with this than less advantaged counterparts. However, a later Portuguese study employing this same approach found markedly lower perceived health differences between rich and poor. Whereas in Macintyre's Scottish sample 67.6% indicated they thought the rich lived longer, this dropped to 14.9% in the Portuguese sample (Lima and Morais 2015). It isn't possible to ascertain whether the differences across the Scottish and Portuguese studies are accurate estimations of health inequalities in the two countries, or if they reflect underestimates of health inequalities in Portugal or overestimates of health inequalities in Scotland. It is one thing to indicate whether people generally recognise differences in health for different social groups and another to establish how accurate their conceptualisation of these differences are.

Another key component of public views on socioeconomic health inequality, alongside the accuracy of their conceptualisations of it, is what level of socioeconomic inequality people wish to see, if any. While recent research documents a robust preference for some inequality in income and wealth (for a review see Starmans et al. 2017), it is not well documented whether there exists a corresponding preference for some inequality in health outcomes. Moreover, if the public desires some inequality in health outcomes, then how large ought these inequalities be? There are now many studies examining aversion to health inequality in which respondents choose between pairwise health interventions and scenarios which either improve total health or reduce health inequality (e.g., Hurley et al. 2020; McNamara et al. 2021; Robson et al. 2017). However, these trade-off scenarios may over-estimate preferences for health inequality because participants are placed in dilemma where they must choose either to exacerbate inequality (whilst increasing total health) or reduce inequality.

Howarth et al. (2019) employed a different approach to answering the question of how much socioeconomic health inequality people wish to see. They asked what an 'acceptable' gap in life expectancy would be across the rich and poor. These data suggested that many of their representative UK sample want to see health inequality reduced, although the majority (54%) still viewed some level of life expectancy gap as acceptable. It is possible that this wording resulted in some of those respondents reporting a gap in health outcomes across rich and poor as acceptable even though they consider such a gap undesirable. These data therefore cannot deliver a clear answer regarding the level of health inequality the public desires.

Other research in health inequalities has shown further sensitivity to the exact question wording, as demonstrated by the variation in agreement to questions reported by Shankardass et al. (2012). Consider first the terms "rich" and "poor" which are very broad, difficult to conceptualise, and are likely to elicit a range of preconceptions and attitudes (Cozzarelli et al. 2001; Rose and Baumgartner 2013). Sociologists of health have long documented the strong moral imperative attached to health as a concept related to morality (Crawford 1984). Blaxter (1997) notes that the expectation to be healthy as a moral duty is more frequent in working class groups. It might be expected therefore that individuals from relatively less well-off backgrounds would be less likely to agree that the rich are healthier than the poor if this would equate to admitting a degree of "moral failing"

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(Crawford 1984). Therefore, self-presentational concerns might influence participants' responses depending on the extent to which they identify with either of these categories. An account of this kind might help explain the contradiction between studies which indicate that relative socioeconomic advantage is associated with agreement that the rich are healthier than the poor, whilst other findings show that socially-disadvantaged individuals are willing to articulate the material and structural factors which interact to determine health (Popay et al. 2003; Smith and Anderson 2018), and may be more likely to agree that poverty is a health determinant than those with higher income or education (von dem Knesebeck et al. 2018).

We present an alternative approach to assessing health inequality perceptions that we argue can address the highlighted limitations. A key step in understanding public views towards socioeconomic health inequality is determining how accurately people conceptualise health inequality between different socioeconomic groups. The current research addresses this by asking whether a representative sample of the UK has an accurate perception of the size of the life expectancy difference between two groups differentiated by occupational social class. We also identify for this sample, as well as a representative US sample, how perceived life expectancy estimates compare to desired life expectancy estimates.

To answer these questions, we follow a paper that inferred respondents' perceptions of and preferences for income inequality. It compared reports of ideal earnings for CEOs and "unskilled" workers and found that perceived pay inequality is less than actual pay inequality, but higher than ideal pay inequality (Kiatpongsan and Norton 2014). We ask a panel of respondents who are representative of the UK and US populations to estimate the typical lifespan of people working as "higher managers/professionals" and in "routine" occupations. We then ask what the lifespan of these two groups would ideally be. Note that while some studies have looked to answer related questions using choice experiments (e.g., Hurley et al. 2020; Robson et al. 2017), that is not appropriate to the current research questions because choice experiments measure trade-offs whereas we seek to measure unconditional desirances (i.e., instead of asking people to choose an outcome, we elicit which outcome a population would rather receive, Comerford and Lades 2021). Although care is needed not to interpret these responses as the same as preferences for policies that reduce health inequalities (Smith et al. 2021), we nonetheless see value in capturing these unconditional desires because they are directly comparable with actual and perceived levels of inequality, and therefore provide an indication of whether desires overlap with actual or perceived inequality. Moreover, we see value in capturing desires about lifespan outcomes between different socioeconomic groups without reference to trade-offs, cost-effectiveness or other mentions of scarcity.

We ask about professional and routine occupation categories for several reasons. Firstly, they overlap with the examples employed in the influential paper claiming that ideal wage inequality is universally lower than perceived wage inequality (Kiatpongson and Norton 2014). Secondly, they avoid the use of terms such as "rich" and "poor", which as we have argued above, may illicit stigma and self-presentational concerns. Most importantly, the labels we use correspond with two categories from the UK's official socioeconomic classification system (NS-SEC; Office of National Statistics [ONS] 2010), a Social Class based on Occupation classification widely used in UK official statistics and academic research. Accordingly, there exists administrative data in the UK on age at death (from 2007-2011) for these groups (ONS 2017). Thus, we can compare health inequality as perceived by our UK sample against an objective baseline.

We also capture perceived and desired health inequalities for these two occupation groups from a representative sample in the United States (US). It is documented that whilst health inequality research in the UK focuses heavily on unequal health between different social classes (Bartley 2017), a distinct research tradition prevails in the US where research into "health disparities" – often used to describe the gap in health outcomes between different racial or ethnic groups – dominates (Collyer and Smith 2020). If this difference in perspective extends to the broader public then it is reasonable to expect that

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awareness of health inequalities as a function of social class will be greater in the UK than US.

In summary, the key objectives are to report for the first time: (i) how accurate the UK-public is in its perception of occupational social class health inequalities, (ii) how estimated health inequality compares to ideal health (in)equality according to the UK and US population, (iii) which level of health (in)equality that the UK and US population desire to see and (iv) which socio-demographic factors are associated with the accurate perception of inequality as well as the desire to see lifespan equality.

2. Methods

2.1. Design, Participants and Ethical Approval

YouGov Plc GB/US collected data from the two countries using their online panel, which includes over 7,000,000 persons who have previously consented to take part in surveys. YouGov use sampling quotas whilst the survey is in field, applying targets for a range of demographic variables so that the sample collected is representative of the national population. YouGov also use these targets to derive individual weights to ensure samples remain representative. These targets are derived from official, publicly available sources such as the census and actual election results. For the UK sample, weights were based on age, gender, education level, political attention, social grade, past vote and region. For the US sample, weights were based on age, gender, race and education.

Survey responses were collected from UK panellists from 9th–10th December 2020 and from US panellists from 11th-16th December 2020. Initial sample sizes were 1,741 and 1,301 for the UK and US, respectively. Final samples were derived by limiting inclusion to only those respondents whose responses for all four of the key questions met the following criteria: were between 0 and 150 (and thus interpretable as a lifespan in years from birth) and were within two standard deviations of the mean response for that question and sample. A greater proportion of the US sample (20.1%) did not meet these criteria compared to the UK sample (7.5%). YouGov calculated post-stratification weights for the final samples, and these were applied prior to conducting all descriptive and inferential analyses. The final samples were 1,599 UK adults and 1,039 US adults. A substantial proportion of both samples were missing data on household income (UK, n = 462, 28.9%; US, n = 153, 14.7%) so this variable was included in supplementary analyses only. Occasional data on socio-demographic variables other than household income were also missing in the UK sample. Specifically, there were missing data on education (n = 64), EU vote (n = 23) and general election vote (n = 1), bringing the final sample for analyses including these predictors to n = 1,524.

2.2. Measures

After a brief description of "higher managerial/professional" and "routine" jobs (see Online Resource 1 for further detail and exact wordings), respondents were asked: "In 2007-2011, what do you think the typical lifespan (in years from birth) of people in higher managerial and professional jobs was?" and "In 2007-2011, what do you think the typical lifespan (in years from birth) of people in routine jobs was?" Next, participants were asked "What do you think the typical lifespan (in years from birth) of people in higher managerial and professional jobs should be?" and "What do you think the typical lifespan (in years from birth) of people in routine jobs should be?" Only numerical responses could be provided. Participants were always asked about higher managerial and professional jobs first and were always asked to give estimates prior to their ideal judgments.

Data on participant gender, age, household income and highest level of education were available for both samples and harmonised to aid comparison (see Online Resource 1). YouGov UK panel data also included measures of political attention, household social grade (Market Research Society 2021), and voting behaviour in 2016 EU Referendum and 2019 General Election. The US panel included data on participant race, region and voting behaviour in the 2020 Presidential election.

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2.3. Analysis

To quantify estimated and ideal levels of inequality, we calculated ratios such that each respondent's estimate for professionals was divided by their estimate for those in routine occupations (as in Kiatpongsan and Norton 2014). Ratios >1 therefore indicate greater life expectancy for professionals than routine workers, ratios of 1 indicate the same for both groups, and ratios <1 indicate greater life expectancy for routine workers than professionals. Ratios failed to meet normal distribution assumptions, and therefore related samples Wilcoxon Signed-Rank Tests were used to compare estimated and ideal life expectancy ratios.

We examined which socio-demographic variables predict being within +/- 2 years of the correct socioeconomic gradient in life expectancy within the UK sample, as well as a preference for absolute equality in lifespans (ideal ratio = 1) for both the UK and US sample. Specifically, multivariate logistic regressions were conducted to determine which socio-demographic variables are associated with accurate perception of the objective life expectancy difference or desiring lifespan equality. Socio-demographic predictors were entered simultaneously and were weighted using YouGov post-stratification weights. All predictors except for political attention were modelled as categorical, and contrasts are reported relative to a single reference category. Adjusted odds ratios and 95% confidence intervals (95% *CI*) for all variables are reported. Weighted general linear models were tested using R in RStudio and corresponding forest plots were created using the forestmodel package (see data availability statement for access to data and syntax).

3. Results

Table 1 presents mean age in years reported by respondents and, for UK respondents, the actual average age of death for professional and routine workers between 2007 and 2011. UK respondents underestimated age of death for professionals (by about 8 years) and routine workers (by about 6 years). The table in the Online Resource 2 presents socio-demographic data as well as median life expectancy ratios for the whole sample as well as separated by socio-demographic characteristics. 67.8% of the UK sample and 53.8% of the US sample correctly estimated that professionals have longer life expectancy than routine workers.

Table 1. Mean age in years (standard deviations in parentheses) reported by respondents from the UK (N = 1,599) and US (N = 1,039) for the two NS-SEC categories.

	Actual	Estimated	Ideal
UK Professional	86.1	78.25 (7.06)	81.64 (7.83)
UK Routine	81.4	75.11 (6.74)	80.78 (7.97)
US Professional	n/a	71.93 (14.69)	75.99 (16.88)
US Routine	n/a	70.32 (14.70)	75.36 (17.44)

The median estimated life expectancy ratio for the UK sample was 1.0588 (*IQR* = .0856) which is very close to the true value as reported in ONS age of death data from the 2007-2011 period (86.1/81.4 = 1.058; ONS 2017). The median estimated life expectancy ratio for the US sample was 1.0291 (*IQR* = .1460). The median ideal lifespan ratio for the two countries was 1.0000 (UK *IQR* = .0256; US *IQR* = .0526), indicating a desire for full equality by the median respondent in the two samples. Estimated lifespan ratios were significantly higher than ideal life expectancy ratios in both the UK (T = 242,396, z = -16.072, p < .001) and the US (T = 124,211, z = -5.758, p < .001), revealing a consistent desire for reduced inequality in lifespan relative to the status quo as perceived by respondents themselves. Whilst there is variation in the median estimated lifespan ratios across demographic subgroups, ideal life expectancy ratios remained at 1.0000 for all sub-groups and across both countries (for further information see Online Resource 2).

The difference in UK respondents' estimates for Professionals and Routine workers was used as a measure of perceived magnitude of socioeconomic inequality in life

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expectancy. Differences ranged from -29 to 30 and the modal difference in estimates (5 years; 21.7% of the sample gave this response) approximated the true value of 4.7 years. 38.8% of the sample gave responses within +/-2 years of the actual difference. The distribution of these responses around the actual difference is shown in Figure 1.

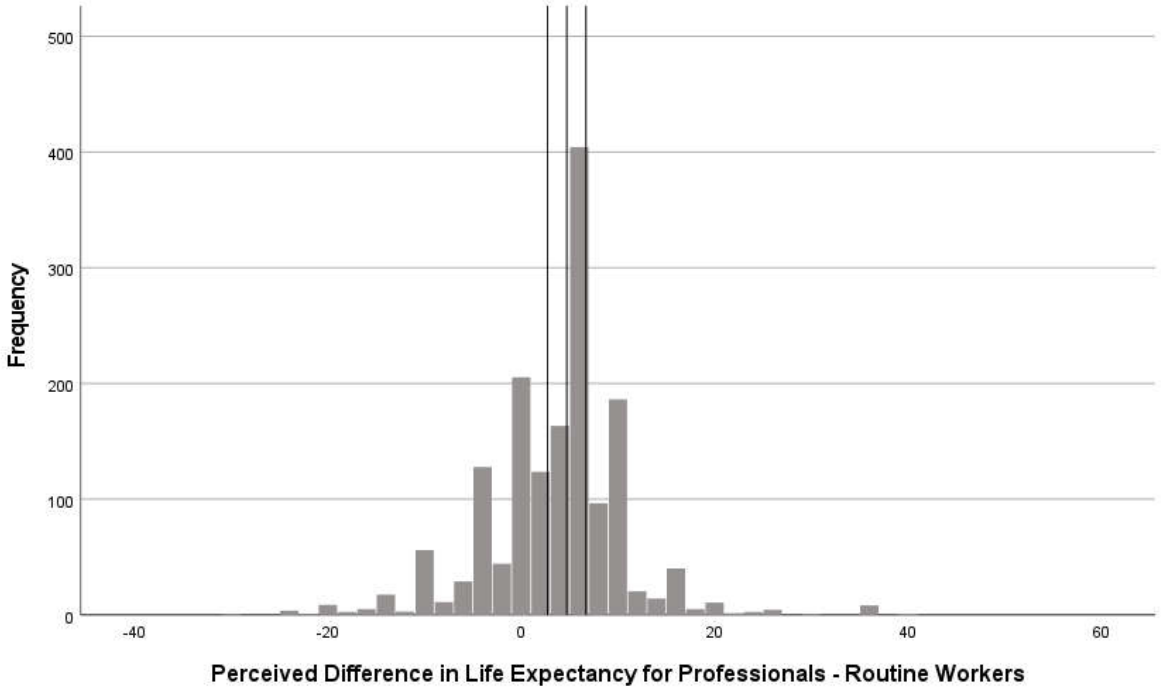

Figure 1. Distribution of perceived life expectancy difference responses around the actual difference in life expectancy between professional and routine workers (UK; N = 1,599). Lines intersecting the X axis represent (from left to right): actual difference – 2 years, actual difference (4.7 years), actual difference + 2 years.

Next, we examined which UK respondent characteristics predict perceptions that were within 2 years of the correct difference in life expectancy between professional and routine workers (86.1-81.4 = 4.7). Odds ratios and corresponding 95% confidence intervals are shown in Figure 2. Being over 60 (relative to under 40), in a medium (relative to low) social grade and having higher levels of political attention significantly increased the odds of accurately indicating the life expectancy difference between Professionals and Routine workers. This pattern was robust to the inclusion of household income (see Online Resource 3).

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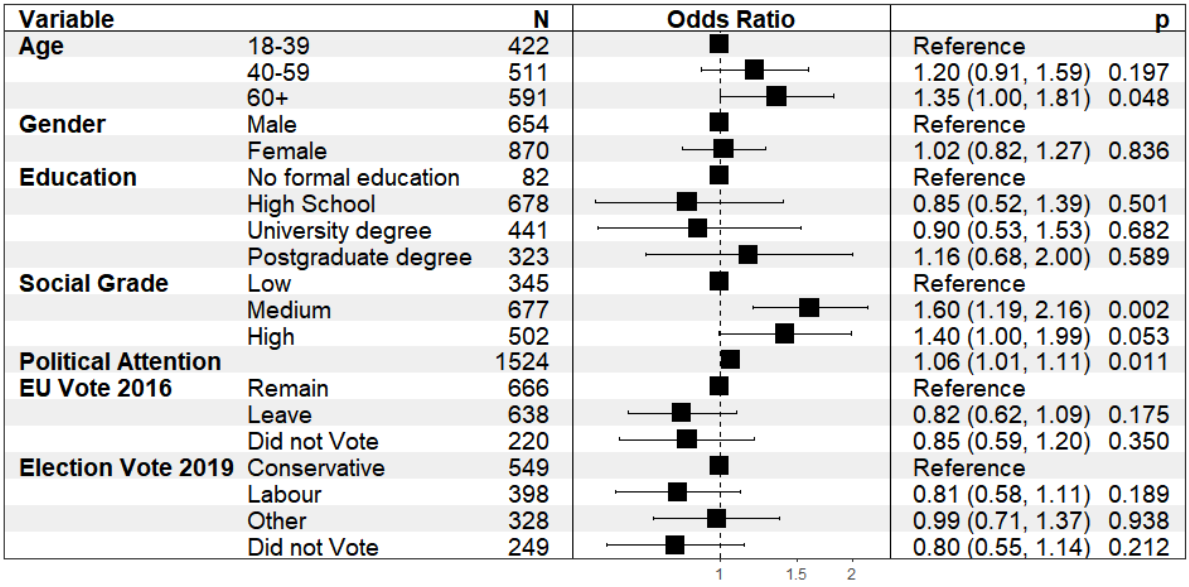

Figure 2. Forest plot showing odds ratios (and 95% confidence intervals) of accurate perceptions of life expectancy differences between professional and routine workers in the UK sample (N = 1,524).

60.1% of the UK sample indicated a desire for equal life expectancy for these groups. The proportion of US respondents indicating a desire for equal life expectancy was lower: only 46.7% of the US sample indicated the same life expectancy for the two groups. Figure 3 depicts the outcome of these multivariate logistic regression analyses to assess whether likelihood of desiring equal life expectancy varied with socio-demographic characteristics. In the UK, desire for equality was more likely for those with a university or postgraduate degree (relative to those without formal education), for those with higher levels of political attention and for Labour and other voters (relative to Conservative voters). Conversely, participants over 60 were significantly more likely to indicate a desire for inequality in life expectancy relative to participants who were under 40. Similar effects of age and education were evident in the US respondents. Participants who identified as Black (compared to White) and Trump voters (relative to Biden voters) were significantly more likely to indicate a desire for some form of inequality in life expectancy between professionals and routine workers. Desire for equal life expectancy did not vary with household income (see Online Resource 4).

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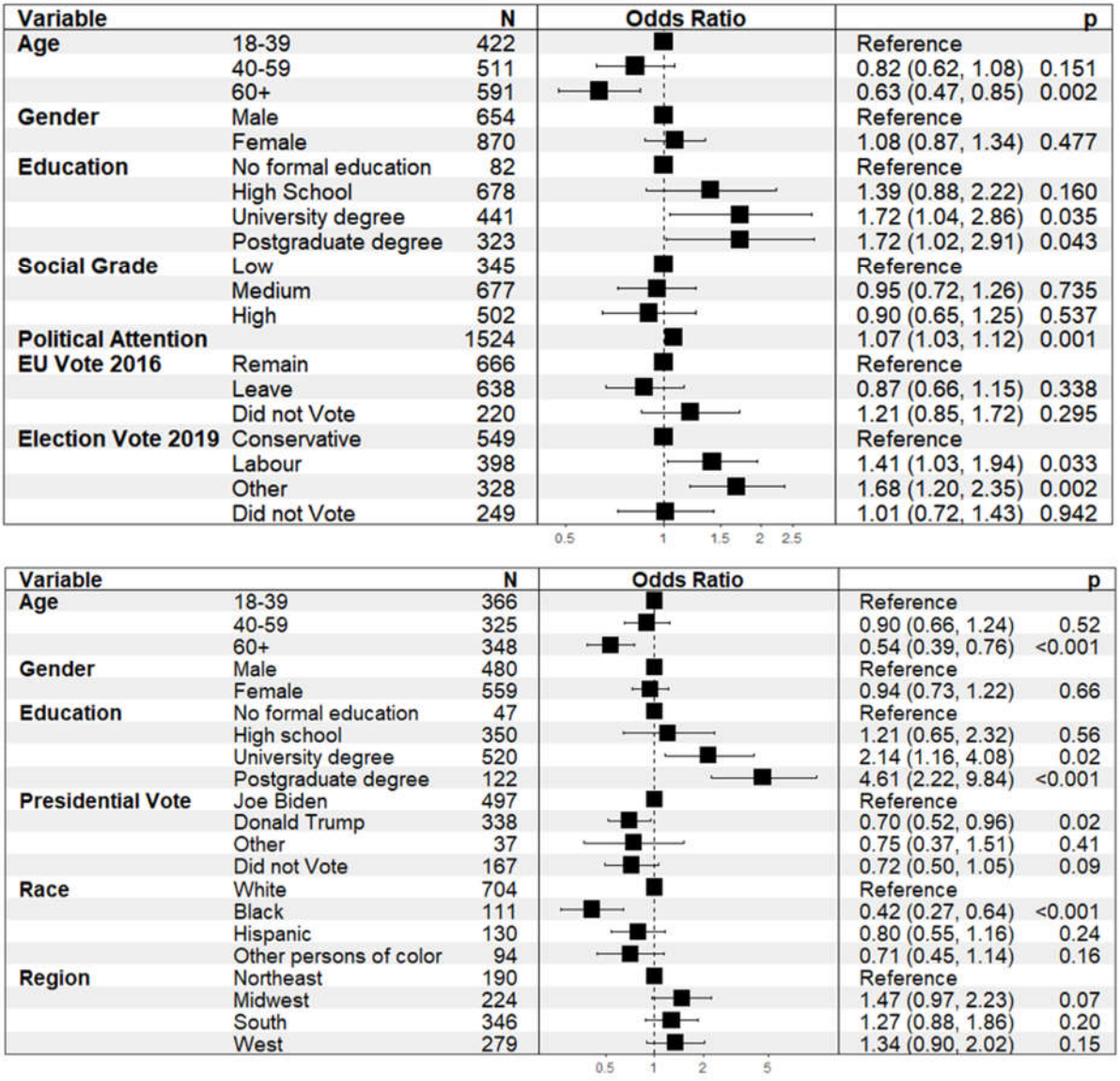

Figure 3. Forest plots showing odds ratios (and 95% confidence intervals) of desiring equal life expectancy for professional than routine workers in the UK sample (upper panel; N = 1,524) and US sample (lower panel; N = 1,039).

4. General Discussion

Perceived and ideal socioeconomic health inequalities were measured using an intuitive and objective scale, years of life. In the UK, where there are objective data with which to compare, the median respondent captured actual lifespan differences between the two categories very well: they estimated the proportion of extra lifespan that professionals have relative to routine workers at 5.9% versus a true value of 5.8%. We find that the UK population is generally very aware of a socioeconomic health gradient and that a large minority have relatively accurate perceptions of this gradient: 67.8% indicated an awareness of inequality that favours professionals relative to those in routine professions and nearly 40% gave responses that were within +/- 2 years of the correct life expectancy gap.

This is the first report of the accuracy of public perceptions of existing life expectancy inequality by occupational social class. Whilst the median UK respondent gave a relatively accurate estimate, perceptions were less accurate for those who were less politically engaged, younger and in lower social grade occupations. We did not find evidence that accuracy differed with level of education or voting history. The finding that lower social grade individuals were less accurate stands in apparent contradiction to considerable

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evidence showing that individuals from relative disadvantage articulate how material and structural factors interact to determine health (Popay et al. 2003; Smith and Anderson 2018) and are more likely to agree that poverty is a health determinant than those with relatively higher income or education levels (von dem Knesebeck et al. 2018).

Our results echo those found by previous quantitative studies, which also found that awareness of socioeconomic health inequality increases with social advantage (Macintyre et al. 2005; Shankardass et al. 2012). These previous studies asked participants whether they agree that "the rich are much healthier than the poor," which as previously identified might invoke self-presentational concerns and conflate a moral imperative to health. Our approach to assessing perceptions of existing health inequality should not have suffered from this issue; at no point did we refer to "rich", "poor", or "health" or make evident our intent to directly compare responses for the two groups. From the respondent's perspective, our survey simply asked how long groups of people live and how long they should live. Under these conditions, participants from lower social grade occupations were still less likely to accurately report the existing life expectancy gap.

These data also allow comparisons across two countries, with smaller perceived lifespan differences between professionals and routine workers in the US sample than the UK sample. One possibility is that the true socioeconomic gradient in lifespan is smaller in the US than the UK. This seems unlikely. Although there are few direct comparisons between the two countries using measures of social class, income gradients in health are estimated to be comparable in the two countries (Martinson 2012) or even steeper in the US than the UK (Choi et al. 2020). An alternative explanation is that the US-public is less aware than the UK-public that health outcomes differ by social class. This is plausible because research on health inequalities in the US tends not to highlight socioeconomic differences but rather focuses on other variables, e.g., ethnicity (Collyer and Smith 2020). Moreover, the focus on occupation-derived measures of social class is a phenomenon particular to the UK (Bartley 2017).

We also find that the desire for absolute equality in lifespan for the two groups was less common in the US sample, although the median and modal response for this sample was also one. A mechanism that might partially explain this result is that the US population is generally more tolerant of inequality than other developed countries (Alesina et al. 2004). These data indicate that this tolerance may extend to health outcomes. Despite these differences between the two samples, however, we observe a consistency across countries and demographic groups: ideal lifespan inequality was significantly lower than perceived inequality and a plurality of respondents desired absolute socioeconomic equality in life expectancy.

Howarth et al. (2019) asked UK residents: "What is an acceptable difference between how long the richest 5% and poorest 5% can expect to live?" Only 46% of the representative sample answered "no gap" in life expectancy, which is markedly lower than the 60.1% in the current UK-sample. Why might desires for equality be more prevalent in the current UK sample and design? One explanation is that we asked respondents what outcome "should" obtain where Howarth et al. (2019) asked what outcome is "acceptable". Another likely explanation lies in the fact that whilst previous work in this area has typically captured perceptions of health across different income or wealth groups (Booske et al. 2011; Howarth et al. 2019; Hurley et al. 2020; Macintyre et al. 2005; McNamara et al. 2021; Shankardass et al. 2012), this is the first report of desires for health inequality relating to occupational social class. Studies of attitudes to poverty and social welfare find that rich and poor categorizations are sensitive to perceptions of deservingness, which can include blaming the poor for poverty (Dorey 2010). If studies of health inequalities that utilise terminology such as "rich" and "poor" are more likely to evoke negative stereotypes of this kind, then this might in part account for more consistent desires for equal life span between two groups that are engaged in work: professional and routine workers. We took care in designing our questions to minimise self-presentational concerns and to avoid using procedures or question wordings that would convey our own value judgments on the question of health inequality or indicate that a certain level of inequality might or might

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not be acceptable. At no point in our questions did we mention concepts of "equity", "equality", "fairness" or "an acceptable gap". We consider these results to be the cleanest manifestation yet of public desires regarding health equality across occupational social class.

5. Limitations

We were reliant on YouGov's existing socio-demographic measures, which were not equally available across the two countries. Moreover, whilst a measure of social grade was available for the UK population (Market Research Society 2021) this metric does not correspond directly with the NS-SEC so it was not possible to determine whether perceptions of and desires for life expectancy gradients for professionals and routine workers varied according to whether participants themselves fell into these groupings. Despite repeatedly piloting the questions with samples in both countries, there were differences in the proportion of each sample who provided responses that were interpretable as lifespan estimates. It remains possible that the question formulation was more difficult for US residents to interpret and that this may have influenced their estimates. Any such bias should have impacted both estimates comparably and is unlikely to have influenced the final ratios reported here. Nonetheless, we applied the same exclusion criteria to both samples and updated post-stratification weights accordingly to ensure the final samples remained nationally representative.

6. Conclusions

We presented a novel approach to measuring perceived and ideal health inequalities. We consider these results to be the cleanest manifestation yet of UK-public perceptions of existing social class inequality – which was relatively accurate – as well as both UK- and US-public desires on this topic. The results reveal a widespread understanding of the social gradient in lifespan and a desire that social class inequalities in lifespan be eliminated.

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Compliance with Ethical Standards: Ethical approval was obtained from the corresponding Academic Ethics Committee at Birmingham City University before data was collected.

Data availability statement: All data and code underlying this article are available at the OSF Repository at https://osf.io/68qwu/?view_only=517ea645702e473e8caf11e32dee3bb1.

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