# Health and place

## How levelling up health can keep older workers working

Health and care
Community
Prevention
International
Inequalities
Life expectancy
Economy
Finance and wealth

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[a]You can find out more about the project here: https://www.ucl.ac.uk/epidemiology-health-care/research/epidemiology-and-public-health/research/ucl-work-and-health-research-group/health-older-people-places

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# Content

# Executive summary

The Government's 'Levelling Up' agenda comes after decades of health inequalities. The effects of the COVID-19 pandemic and the long-term impacts of the UK's ongoing cost of living crisis have both increased these inequities.

While disability-free life expectancy (DFLE)[b] improved overall in the UK from 1991 to 2011, there was still a significant gap between the local authority areas considered the 'healthiest' and the 'unhealthiest'. In 2011, DFLE at age 50 varied from 13.8 to 25.0 years - that's a gap of 11.3 years between the healthiest and unhealthiest areas.[1]

Unfortunately, over a decade later, the conversation hasn't moved on much further. *Health Equity in England: The Marmot Review 10 Years On*[2], the 2020 follow-up to Sir Michael Marmot's landmark study, found that the health gap between wealthy and deprived areas has continued to grow.

The Health of Older People in Places (HOPE) project is a multidisciplinary research project funded by the Health Foundation under the Social and Economic Value of Health in a Place (SEVHP) programme.[c] The research team includes scientists from the Department of Epidemiology and Public Health at University College London (UCL) and the School of Geography at the University of Leeds.

The HOPE project has built on this research by showing the link between levels of employment and health in a place.[d] It finds that:

- **The higher the proportion of older people with poor health in a place, the less likely it is that any adults in that place will be in paid work**. For example:
    - Older workers from the unhealthiest areas are 60% more likely to be out of work than those who live in the healthiest areas:
    - Women aged 50-74 living in the 'healthiest' areas of England

[b]Disability Free Life Expectancy is the average number of years someone of a specific age would live without limiting long-term illness, if they experience the average age-specific mortality and health rates of the area in which they live, throughout their life.

[c]https://www.health.org.uk/funding-and-partnerships/programmes/the-social-and-economic-value-of-health

[d]Health in a place is the overall level and distribution of health among the population in a particular geographical area.

and Wales were 5.6% more likely to be in paid work than those living in the 'unhealthiest' areas.

- Men aged 50-74 living in the 'healthiest' areas of England and Wales were 7.1% more likely to be in paid work than those living in the 'unhealthiest'.

- **How we measure health in a place matters:** links between health in a place and employment are stronger for self-rated health measures, compared with life expectancy figures or mortality indicators.
- **Historically disadvantaged areas continue to struggle:** areas where people left paid work at a younger age due to poor health in 1991 were much more likely to experience this trend in 2011 as well.
- **This disproportionately affects people in manual occupations:** they're much more likely to experience ill health, and they can expect four fewer years of healthy life beyond age 50, compared with workers in administrative or professional roles.
- **There's a correlation between health in a place and younger people being in paid employment:** for example, the probability of a woman aged 16 to 49 not being in paid work was 33.7% in the 'unhealthiest' areas compared with 26.3% in the 'healthiest' areas.
- **Those working in professional occupations were more likely to be in work 10 years later than those working in elementary occupations[e] or doing repetitive manual labour:** this gap in employment outcomes was most marked for people living in 'unhealthy' areas.

The levelling up agenda is more important now than ever, and it's vital it is not sidelined by the Government. It's not just about helping people live longer, healthier lives but supporting local economies and economic growth.

Although the prevalent narrative is often that individual health is an individual problem rather than a societal one, the whole community is affected by poor health.

[e]Elementary occupations consist of simple and routine tasks which mainly require the use of hand- held tools and often some physical effort.

As part of its levelling up agenda, the UK Government set itself an ambitious target to add five additional healthy years to the average UK lifespan by 2035. It has also set a target of narrowing the gap in Healthy Life Expectancy (HLE)[f] between the 'healthiest' and 'unhealthiest' local authority areas by 2030. It's unclear how the Government intends to achieve these two goals, especially given the recent decision to abandon the promised white paper on health disparities. In addition, the fallout from the COVID-19 pandemic and the current cost of living crisis are likely to widen existing inequalities.

**If the UK had achieved the current levelling up agenda goal of reducing the HLE gap by five years between 2001 and 2011, older people's participation in the labour market would have increased by 3.7% between 2001 and 2011. This is equivalent to 250,000 additional older people in paid employment. The HOPE project used Disability-Free Life Expectancy (DFLE)[g] as a proxy for HLE, as HLE data for local authorities is not available in 2001.**

## Recommendations

The Government should:

- **Increase spending on preventative health programmes** (which are delivered by local authorities) to at least 6% of the national health budget. This is in line with Canada, who currently invest the most in prevention across the G20 and continue to raise this proportion in accordance with the rise in preventable diseases.
- **Earmark part of the £4.8 billion levelling up infrastructure fund** for projects that will create jobs suitable for older workers in the 'unhealthiest' local authority areas, especially in those where a high proportion of employment is in manual work.
- **Collect, monitor and publish data every year on health in a place, in particular self-rated health measures and labour market participation for people over the age of 50**. This should be in addition to the decennial census, to ensure policy makers have more up-to-date and accurate information from areas where people have historically left employment early due to poor health.

[f]Average number of years after age 50 spent in "Very Good" or "Good" health.
[g]Disability free life expectancy is the average number of years a person aged 'x' would live disability-free (no limiting long-term illness) if they experienced the particular area's age-specific mortality and health rates throughout their life.

- **Confirm that there will be another census in 2031 and add detailed questions about health and labour market participation for people aged over 50.**
- **Improve access to medical services to allow older people in poor health to remain in work.** This includes reducing wait times to see a GP and for referrals, treatments and A&E.
- **Provide support, including career training and advice, to help older workers transition to less physically demanding roles, especially those in manual roles.**

Local authorities should:

- **Develop a five-year strategy to increase employment rates for people aged over 50** in the 'unhealthiest' communities, in partnership with business. This strategy should recognise that older women often face additional barriers to employment apart from health barriers.
- **Include local targets to improve population health in line with the national average for people aged 50 to 74** as part of their annual planning exercise.
- **Increase support for older workers in manual occupations to stay in employment.** For example:
    - Training and financial support, either through the benefits system or apprenticeship schemes, that help older workers transition to less physically demanding jobs as they age.
- **Strengthen local tailoring of prevention programmes, using the recommended increases in prevention funding**, to ensure that services fully cater to local population health requirements.
- **Address ageism at a local level**, by educating and informing people on how to receive the best care to prevent or manage health conditions, regardless of age. The aim is to challenge the perception that long-term conditions are an inevitable consequence of old age when many are preventable.
    - Local authorities should also work with businesses to challenge employer perceptions that older people's health is a barrier to their participation in the labour market.

# Introduction

It has long been understood that we will need to address health inequalities if we are to achieve the 'longevity dividend'.[3] This is the benefit we could see across our whole society if we can maximise the benefits of people living longer as our population ages. ILC-UK research finds that:

- People aged 50 and over earned 30% of the UK's total earnings (£237 billion) in 2018; this will rise to 40% (£311 billion) by 2040
- Spending by older consumers will rise from 54% (£319 billion) of the UK's total consumer spending in 2018 to 63% (£550 billion) by 2040

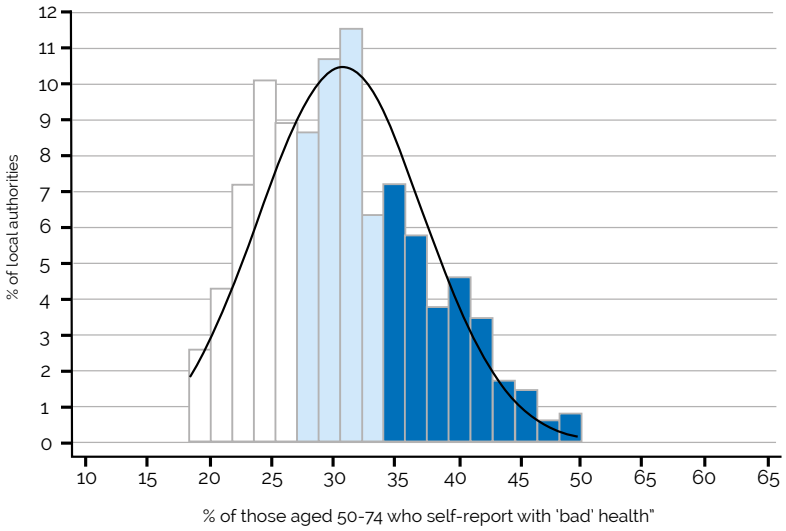
All people who live in the areas of England and Wales with the highest proportion of older people in poor health are 1.6 times more likely to not be in employment, no matter their own age.[4] For older people, geographical health inequalities in these poorer areas are resulting in higher levels of early labour market exit and greater economic inactivity.[5]

While older people's contribution to our economy is already significant, we know that health inequality is a significant barrier to unlocking their full potential.

## There are large inequalities in older people's health, depending on where they live

The HOPE project uses nine measures of health in a place.[h] When we apply these measures across places in England and Wales, we can see large geographic inequalities. For example, Figure 1 shows that the proportion of people aged 50 to 74 who report their health as "bad" (those that selected "fair" or "poor") ranges from a low of 18% in the 'healthiest' local authorities to a high of 50% in the 'unhealthiest' local authorities.

**Figure 1: Histogram of English and Welsh local authority residents aged 50–74 who reported their own health as 'bad'**




Note: White bars 'healthiest' third of areas, lght blue bars 'middle' healthiest and dark blue bars 'unhealthiest' third of areas. The black line shows that the data follows a normal distribution curve.

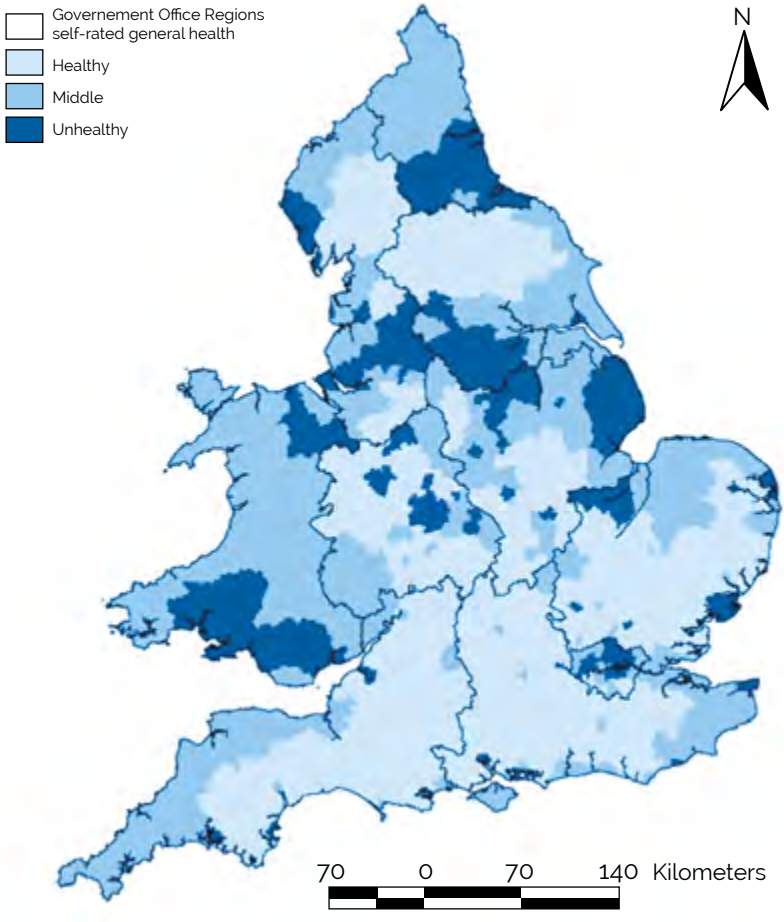
Source:2011 Census England and Wales (n=348 local authorities)

Older people's health in a place isn't equally distributed across the country either. Figure 2 maps the distribution of self-rated general health in each English and Welsh local authority area. The areas with better levels of health are in the south-east of England. "Middle" levels of health are found in many coastal areas. The areas with the lowest levels of health are the former industrial and coal mining areas

[h]We list the HOPE project's nine health in a place measures in Appendix A.

of south Wales, the Midlands, northern England and the north-east, as well as some London boroughs and coastal locations.

**Figure 2: Self-rated health of those aged 50–74 across local authorities in England and Wales, 2011**




Note: Dark blue lines indicate boundaries of Government Office Regions.

Source: 2011 Census, England and Wales (n=348 local authorities)

## Poor health in a place is linked to low employment for all

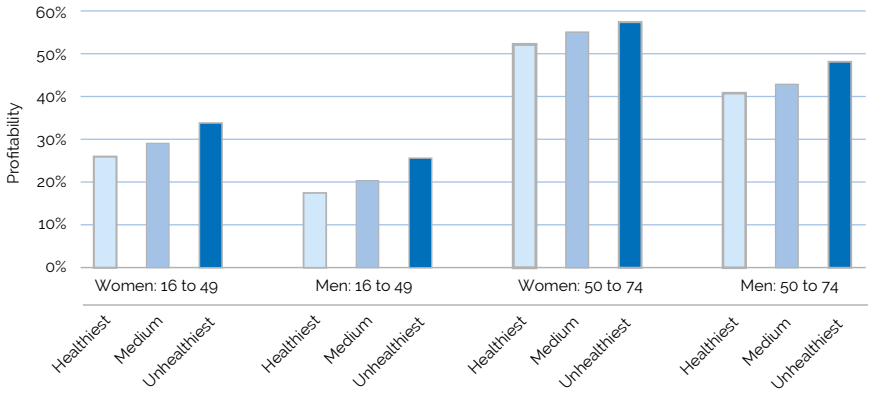
Poor health in a place has a high correlation with labour market participation. When a local authority area has more older people in poor health, the odds of being in paid work are lower for adults of all ages.

While the prevalent narrative is often that individual health is an individual problem rather than a societal one, the poor health of some affects their whole community. In the unhealthiest areas of England and Wales, all **residents aged 16 to 74 were 1.6 times more likely to be out of work** than those living in the healthiest areas.[6]

The association between health in a place and employment was slightly stronger for men of this age than for women.[7] In research that compared data from the 'healthiest' tertile of local authorities in England and Wales to the 'unhealthiest' third:

- Women aged 50-74 living in the 'healthiest' areas were found to be 5.6% more likely to be in paid work than those living in the 'unhealthiest'.[8]
- Men aged 50-74 living in the 'healthiest' areas were found to be 7.1% more likely to be in paid work than those living in the 'unhealthiest'.[9]
- There was a correlation between health in a place and younger people's participation in paid employment. For example, the probability of a womanaged 16 to 49 not being in paid work was 33.7% in the 'unhealthiest' areas compared with 26.3% in the 'healthiest'.[10]

**Figure 3: Predicted probability of not being in paid work, by tertile of local authority residents aged 50–74 who reported their own health as 'bad' and age group/gender**



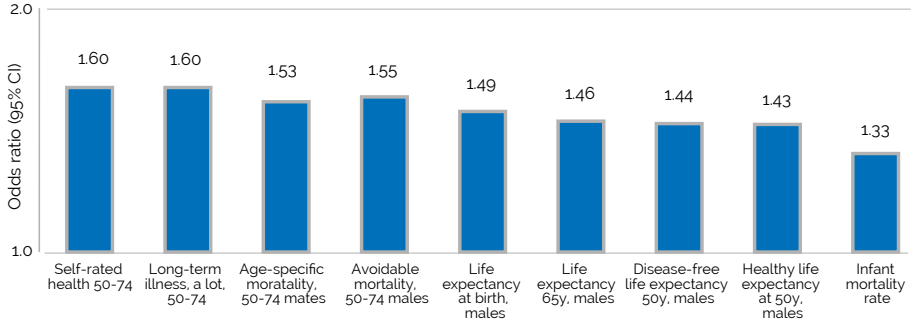

Tertiles = Light blue bars 'healthiest' third of local authorities (18.3%-27.0%), medium blue bars 'middle' healthiest of local authorities (27.1%-33.1%) and dark blue bars 'unhealthiest' third of local authorities (33.2%-49.8%). Age 16-49 (n=268,215) and age 50-74 (n=162,162).

Source: ONS Longitudinal Study (n=430,377)

## Measurement matters

Another factor to consider is how health in a place is measured. Using self-rated health measures showed the strongest link between health in a place and employment; this is as opposed to using traditional measures such as life expectancy figures or mortality indicators. For example, Figure 4 shows that if residents of local authorities aged 50-74 years are asked to self-rate their health or report whether they have a long-term illness, all residents living in the 'Unhealthiest' third of areas had 1.6 times higher odds of not being in employment. If health in a place was measured using the infant mortality rate, their odds reduced to 1.3 only. Collecting the correct type of data at a local level would help give policy makers a more accurate picture of why people are leaving employment due to poor health.

**Figure 4: Age-adjusted odds of not being in paid work, for the 'Unhealthiest' vs 'Healthiest' third of local authorities, 16-74yrs**




Reference group: in paid work

Source: ONS Longitudinal Study (n=430,377)

## Inequity by area

For people aged 55, we found a DFLE gap of two years between the north and the south of England.[11] This builds on earlier studies, which have found that while life expectancy has increased in the least deprived areas of England, there have been no significant increases in the most deprived areas.[12] The Marmot review of 2020[13] found that increases in life expectancy across the UK have slowed since 2010, with the slowdown being greatest in the more deprived areas of the country.[14]

Another area being left behind is coastal communities. The Chief Medical Officer's report in 2021 identified these places as needing population interventions and greater research on reducing health inequalities.[15] While urban deprivation is often highlighted, the coastal communities in England and Wales are often forgotten.

This research has added to the growing evidence base of significant health inequalities in England and Wales, which are resulting in fewer older people in these 'unhealthier' communities participating in the labour market.

## Historical health inequalities are entrenched

Between 1991 and 2011 DFLE in England and Wales increased by 3.03 years for men and 1.73 for women.[16] But the same data sets showed the DFLE gap between north and south[i] remained entrenched.

| Year | DFLE: men aged 55 | DFLE: women aged 55 | DFLE: men in the south | DFLE: men in the north | DFLE: women in the south | DFLE: women in the north |
|---|---|---|---|---|---|---|
| **1991** | 8.52 | 10.97 | 9.47 | 7.61 | 11.95 | 10.04 |
| **2011** | 11.55 | 12.70 | 12.55 | 10.59 | 13.78 | 11.65 |

This gap is even more profound when we compare DFLE at age 55 in the 'healthiest' and 'unhealthiest' local authority areas.

**DFLE in the 'unhealthiest' area was 13.8 years, compared with 25.0 in the 'healthiest' area: a health gap of 11.3 years.**

These figures predate the period in the 2020 Marmot report, which found that life expectancy has fallen in our most deprived area, demonstrating that geographical health inequalities have been an issue for some time. It's likely that DFLE in these areas has since fallen further as a result of austerity policies, the COVID-19 pandemic and the current cost of living crisis.

Areas where people have historically left paid work at a younger age due to poor health are also much more likely to do so in the present day if living in the same area.

The evidence from the HOPE project and existing literature shows that geographical health inequalities endure. Nothing short of a focused and sustained policy programme to address this will close this gap.

[i] 'South' comprises the Government Office Regions: East of England, London, South-East and South-West; 'north' comprises the Government Office Regions: North-East, North-West, Yorkshire & Humberside, East Midlands, West Midlands and Wales.

## Health in a place and employment are more closely linked for some occupations than others

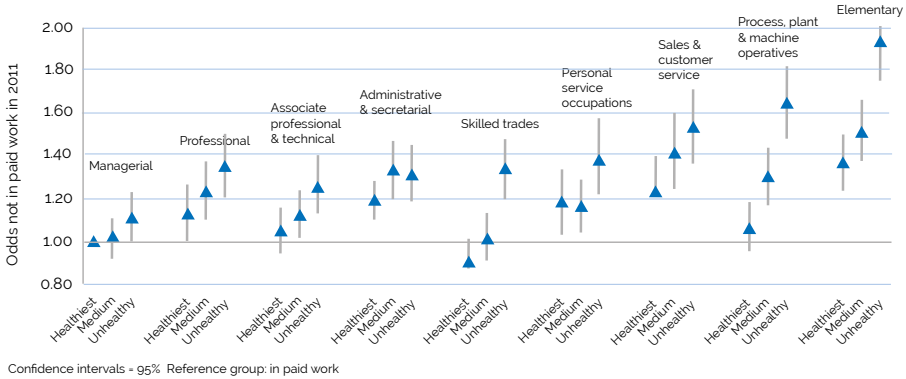
Previous research has found that those working in elementary occupations are much more likely to experience ill health than those who don't.[17] Both men and women in elementary occupations can expect four fewer years of HLE beyond age 50 compared to those in administrative or professional roles.[18]

The HOPE project created models for how health in a place influences employment outcomes for people working in different occupations. Those models show that health in a place and occupation are both significant factors for leaving paid employment early. Those working in professional occupations were more likely to be in work 10 years later than those working in elementary occupations. This is consistent with an earlier study in 2016 which also found that those in manual jobs were at heightened risk of health-related exit from employment.[19]

### Health affects how likely some occupation types are to stay in work

The gap is widest for older people who worked in the following three major groups: skilled trades; process, plant and machine operatives; and elementary occupations (for example, cleaners and unskilled construction workers). For example, in Figure 5, people aged 40-64 in 2001 and working in elementary occupations had a 1.9 (1.8-2.1) times higher risk of not being in work 10 years later if they lived in the 'Unhealthiest' third of local authorities. This is compared to only a 1.4 (1.2-1.5) higher risk of work exit if they worked in the same occupational group but lived in the 'Healthiest' third of local authorities. These findings were not explained by individual level of health, suggesting that people with poor health fare worse if they live in an unhealthy area.

**Figure 5: Adjusted* Relative Risk Ratio of not being in paid work in 2011, as linked to interaction between self-rated health and major occupation in 2001**




Confidence intervals = 95% Reference group: in paid work

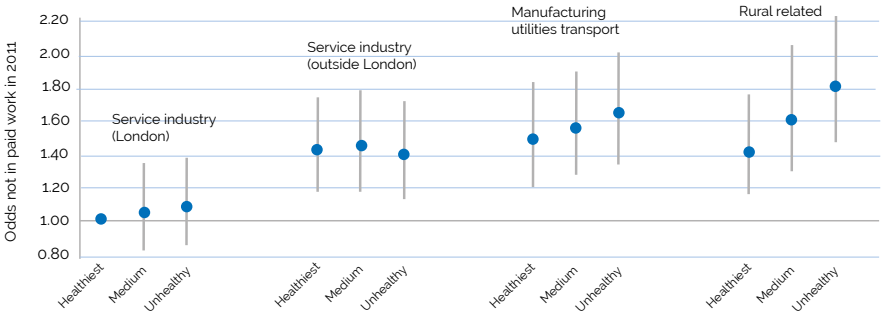
Note: Interaction between health in a place and occupation group. The baseline is for people aged 50 to 74 in 2011, who were self-rated as 'healthy' (as captured at local authority level, with tertiles 'healthy', 'middle' and 'unhealthy') and in a managerial occupation in 2001.* Adjusted for age, sex, individual self-rated health, hours of caring, highest qualification level and area unemployment rate.

Source: ONS Longitudinal Study (n=128,710)

## Health in a place in service sector industry locations in London is not associated with chances of staying in work

We also found that people working in London areas with a dominant service sector weren't significantly more or less likely to leave the workforce, regardless of the area's 'healthiness'. Outside of London, there was a gradient in service sector work exit, with the highest odds of work exit being in unhealthy districts with rural related industries. This can be seen in Figure 6, where people aged 40-64 in 2001 and living in an area with predominant rural related industries, had a 1.8 (95 % CI: 1.5-2.2) times higher chance of not being in work 10 years later if they lived in the 'Unhealthiest' third of local authorities, in areas in London dominated by the service sector. This is compared to only a 1.4 (95% CI: 1.1-1.7) higher risk of work exit if they lived in an area with the same industry cluster but lived in the 'Healthiest' third of local authorities.

**Figure 6: Adjusted* Relative Risk Ratio of not being in paid work in 2011, as linked to interaction between self-rated health and industry cluster area in 2011**




Confidence intervals = 95% Reference group: in paid work

Note: Interaction between health in a place and industry cluster. The baseline is for people aged 50 to 74 in 2011, who were self-rated as 'healthy' (as captured at local authority level, with tertiles 'healthy', 'middle' and 'unhealthy') and working in the service industry in London in 2001.* Adjusted for age, sex, individual self-rated health, hours of caring, highest qualification level, area unemployment rate and occupational social class.

Source: ONS Longitudinal Study (n=102,169)

## The legacy of former coal mining communities

Areas where the main source of employment used to be coal mining are still affected by the former hazards of working with coal, many years after the coalfields closed. Historically, people from these communities had poor health at a younger age. Many ex-miners and those directly affected by coal mining have now died, but these communities show the legacy effect of long-term deprivation.[20] The employment opportunities in former coal mining areas are often in manual roles, leading to fewer years of DFLE for those that live there.

As the next section outlines, policy makers must invest in local authority areas with significant socio-economic gaps. This should include consideration of how occupation type by area is contributing to these gaps. The likelihood of leaving the labour market early are far greater for older workers in areas where most of the jobs are physically demanding.

## What if current Government targets were achieved?

If the UK Government had achieved its current levelling up agenda target to add five years to HLE by 2011, 3.7% of older people who had left would have stayed in the labour market[21] – this is equivalent to 250,000 people.

Addressing the current entrenched geographical health inequalities in this country would help more older people stay in the labour market and help our society reap the economic benefits that we refer to as the 'longevity dividend'.

The 2019 Conservative Party Manifesto made a commitment to use *"investment prudently and strategically to level up every part of the United Kingdom, while strengthening the ties that bind it together."*[22] It was unclear how the Conservative Party intended to deliver on this commitment at the time - but the issue of geographical inequality is now at the front and centre of British politics.

The 2022 White Paper *Levelling Up the United Kingdom* failed to address our ageing population in any meaningful way. It offers no policy initiatives to help older workers remain in employment in poorer parts of the country, or any policies to help reduce health inequalities for older people anywhere.[23]

*Levelling Up the United Kingdom* sets the following health goals:

- By 2030, the gap in HLE between areas where it's highest and lowest will have narrowed
- And by 2035, HLE will increase by five years

The modelling done by the HOPE project provides some useful insight into how narrowing geographical inequalities may affect older workers' participation in the workforce. But we must also consider the impacts of recent events and policy decisions, which may significantly change this picture for less well-off communities in the future.

The first factor is the austerity measures introduced after the 2008 financial crisis. While they affected the whole public sector, they hit local authorities particularly hard. Research from the Joseph Rowntree Foundation found that, in real terms, local authorities in England lost 27% of their spending power between 2010/11 and 2015/16.[24]

Local authorities in poorer areas were hit hardest, both by the cuts from central government and by reduced local revenue – as poorer communities were hit hardest by the recession.

The second factor is the COVID-19 pandemic – this will lead to increased inequalities in DFLE for poorer areas, where DFLE levels were already low.[25] There has been a significant increase in older workers leaving paid employment since March 2020 across the country. We've also seen a significant increase in economic inactivity, reversing trends from recent years.

The two most frequent reasons respondents gave to the ONS Lifestyle Survey for leaving the workforce earlier than planned were 1) the pandemic and 2) illness and disability.[26] ONS figures published in September 2022 show that around one in five (18%) respondents said they were currently on an NHS waiting list for medical treatment; this rose to 35% for those who had left their previous job due to a health condition.

These factors could see health inequalities widen by area, especially if older workers return to paid employment much earlier in wealthier parts of the country.

It's too soon to say how the current cost of living crisis will affect health inequalities or older workers' participation in paid work. UK labour shortages, combined with the rising cost of living, may result in many older workers returning to paid employment.

But as these labour shortages are in the 'Unhealthiest' areas being studied by the HOPE project it's doubtful that older people living in those places will have the good health or ability to take on these roles.

## Recommendations

These recommendations are directed at policy makers, at both the local and national level. The Government's levelling up agenda offers the best opportunity to address geographical health inequalities in decades. But to do this, it must include significant investment in preventative healthcare, to improve population health in the 'unhealthiest' local authority areas.

The Government should:

- **Increase spending on preventative health programmes** (which are delivered by local authorities) to at least 6% of the national health budget. This is in line with Canada, who currently invest the most in prevention across the G20 and continue to raise this proportion in accordance with the rise in preventable diseases.
- **Earmark part of the £4.8 billion levelling up infrastructure fund** for projects that will create jobs suitable for older workers in the 'unhealthiest' local authority areas, especially in those where a high proportion of employment is in manual work.
- **Collect, monitor and publish data every year on health in a place, in particular self-rated health measures and labour market participation for people over the age of 50**. This should be in addition to the decennial census, to ensure policy makers have more up-to-date and accurate information from areas where people have historically left employment early due to poor health.
- **Confirm that there will be another census in 2031 and add detailed questions about health and labour market participation for people aged over 50.**
- **Improve access to medical services to allow older people in poor health to remain in work.** This includes reducing wait times to see a GP and for referrals, treatments and A&E.
- **Provide support, including career training and advice, to help older workers transition to less physically demanding roles, especially those in manual roles.**

Local authorities should:

- **Develop a five-year strategy to increase employment rates for people aged over 50** in the 'unhealthiest' communities, in partnership with business. This strategy should recognise that older women often face additional barriers to employment apart from health barriers.
- **Include local targets to improve population health in line with the national average for people aged 50 to 74** as part of their annual planning exercise.
- **Increase support for older workers in manual occupations to stay in employment.** For example:
    - Training and financial support, either through the benefits system or apprenticeship schemes, that help older workers transition to less physically demanding jobs as they age.
- **Strengthen local tailoring of prevention programmes, using the recommended increases in prevention funding**, to ensure that services fully cater to local population health requirements.
- **Address ageism at a local level**, by educating and informing people on how to receive the best care to prevent or manage health conditions, regardless of age. The aim is to challenge the perception that long-term conditions are an inevitable consequence of old age when many are preventable.
    - Local authorities should also work with businesses to challenge employer perceptions that older people's health is a barrier to their participation in the labour market.

## Conclusion

The HOPE research builds on the work of the 2020 Marmot review and others in highlighting geographical health inequalities. The HOPE project also links health in a place to labour market participation for those aged 50 to 74 and highlights the issue that in the 'unhealthiest' parts of the UK, older workers are significantly more likely to leave paid employment earlier than in the 'healthiest' parts.

The HOPE research projections show that achieving the Government's goal of reducing the HLE gap will mean that older workers will participate more in the labour market. This demonstrates that policy makers must prioritise investment in this area.

Reducing these longstanding geographical health inequalities should be a top priority for policy makers, not just because it's the right thing to do, but because we need to achieve the potential economic benefits of an ageing population.

We've been inactive for too long. Now that the Government has set itself targets, we must act to reduce inequalities, rather than letting them stay the same or get worse.

The consequences of doing nothing would be drastic. With all business sectors currently being hit by skills shortages, if the Government doesn't level up on health, things can only get worse. It's vital that we act now.

# Appendix A: the HOPE project methodology

The HOPE project, led by UCL in partnership with the University of Leeds, is a research project that focuses on examining links between older people's health in a place and the labour market participation of everyone living in that place, no matter their age. The project involved research with adults in England and Wales, including specific research questions asking:

- How large are the geographic inequalities in older people's health in a place across England and Wales in 2011?
- Did these geographic inequalities widen or narrow during the 20 years from 1991 to 2011?
- Does how we measure health matter when determining the strength of correlations between health in a place and employment?
- Is the link between health in a place and labour market participation stronger or weaker for certain occupations?
- How many more older workers would have been in the labour market in 2011 if the current levelling up health targets had been achieved by 2011?

'Health in a place' is increasingly being used in the study of health and health disparities.[27] In the UK, this was headlined by the Government commissioned Marmot review in 2010.[28]

The HOPE project used nine health indicators to measure health in a place. These were derived from census and ONS vital statistics data.

| | Age range | Data source | Description |
|---|---|---|---|
| Self-rated health | 50-74 | 2011 census | Proportion of census respondents aged 50-74 who reported "fair" or "poor" self-rated health |
| Long-term limiting illness | 50-74 | 2011 census | Proportion of census respondents aged 50-74 who reported activities limited a lot |
| Age-specific mortality rate | 50-74 | ONS 2010-12 | Age-specific rates of mortality in each local authority area |
| Avoidable mortality | < 75 years | ONS 2010-12 | Age-standardised mortality rates in each local authority area for causes considered avoidable |
| Life expectancy, at birth and age 65 years | Birth and age 65 | ONS 2010-12 | Estimate of the average number of years a person of that age would survive if they experienced that area's age-specific mortality rates for that time period throughout the rest of their life |
| DFLE | Ages 50 | ONS 2013-15 | Average number of years after age 50 spent free from limiting long-term illnesses or disability |
| HLE | Ages 50 | ONS 2011-13 | Average number of years after age 50 spent in "Very Good" or "Good" health |
| Infant mortality rate | <1 year | ONS 2010-12 | Rate of infant deaths within the first year of life per 1,000 live births |

Seven health indicators were chosen to represent the older working age population (self-rated health at ages 50-74, long-term illness at ages 50-74, age-specific mortality rate at ages 50-74, avoidable mortality, life expectancy at birth and 65 years, DFLE at 50 years, and HLE at 50 years). Two more indicators (life expectancy at birth and infant mortality rate) were included as test indicators to determine if associations were limited to older people's health in a place.

The HOPE project initially conducted a scoping review to identify which health indicators were available in OECD countries, including the UK. There was such limited data that a summary review could not be completed. Instead, the project published a scoping review to systematically identify which overall health indicators are available at sub-national geographies for all age groups in the relevant countries.

Across the 38 OECD countries, the project only identified twelve health indicators where data was available at a population level for sub-national geographies. Compared to other OECD countries, the UK was one of the countries with the highest number of health in a place mortality and morbidity measures for small area levels (e.g. Output Area or Data Zone). Of the 12 health measures identified, the UK was missing only two: amenable mortality and activity limitations.[29]

The HOPE project linked the nine health indicators selected to the ONS Longitudinal Study (LS) data from the 2001 and 2011 censuses. The ONS LS contains linked census and life events data for a 1% sample of the population of England and Wales. It contains records on over 500,000 people usually resident in England and Wales at each point in time and is largely representative of the whole population.[30]

The HOPE project longitudinal analysis included individuals aged 40-64 who were in paid work, either in 2001 or the previous five years. It identified how many of those were still in employment 10 years later in 2011, aged 50-74.[31] It did the same with ONS LS data from the 1991 census allowing progress to be tracked over a 20-year period.

For the levelling up goal projections, the project used ONS LS data from 2001 to calculate the impact of reducing the DFLE gap between local authority areas, from a gap of 9.6 years in 2001 to a hypothetical 4.6 years in 2011. The actual DFLE gap in 2011 was 11.6 years. It calculated the percentage of older people who would have stayed in the labour market by predicting the probability of work exit for LS members who lived in local authority areas where the health goal was met (DFLE at age 50 being 20.5 to 25.0), compared to those where it wasn't met (DFLE at age 50 being 13.8 to 20.4).

Additional analyses examining changes in DFLE from 1991 to 2011 used data derived from Mortality Rates (Vital Statistics) and Limiting Long-Term Illness Rates (Censuses).

We also analysed a number of publications for this report:

'(Un-) Healthy Ageing: Geographic Inequalities in Disability-Free Life Expectancy in England and Wales' by Paul Norman, Daniel J Exeter, Nicola Shelton, Jenny Head and Emily T Murray. *Health & Place 2022*; 76:10282.

'Linking the health of older people in places with labour market outcomes for all: does it matter how we measure health?' by Emily T Murray, Jenny Head, Nicola Shelton, Brian Beach and Paul Norman. Pre-print *SocArXiv* 22 April 2022 [https://osf.io/preprints/socarxiv/w9vcu/].

'Does improving the health of older people in a place result in better labour market outcomes in those places? Findings from a nationally representative survey of England and Wales from 2001-2011.' by Emily T Murray and Paul Norman. *Presentation to International Medical Geography Symposium*, 23 June 2022 [Edinburgh, UK]

*Consultation Response Second State Pension age review: independent report call for evidence* by Emily T Murray, Nicola Shelton, Jenny Head and Paul Norman. DOI: 10.13140/RG.2.2.24310.68165 [published 24 April 2022]

'Measuring the health of people in places: A scoping review of OECD member countries' by Emily T Murray, Nicola Shelton, Paul Norman and Jenny Head. *Health & Place 2022*; 73(102731).

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## About ILC

The International Longevity Centre UK (ILC) is the UK's specialist think tank on the impact of longevity on society. The ILC was established in 1997, as one of the founder members of the International Longevity Centre Global Alliance, an international network on longevity. We have unrivalled expertise in demographic change, ageing and longevity. We use this expertise to highlight the impact of ageing on society, working with experts, policy makers and practitioners to provoke conversations and pioneer solutions for a society where everyone can thrive, regardless of age.

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**International Longevity Centre UK**

Vintage House

36-37 Albert Embankment

London SE1 7TL

Tel : +44 (0) 203 242 0530

**www.ilcuk.org.uk**

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