

Literacy and life expectancy

An evidence review exploring the link between literacy and life expectancy in England through health and socioeconomic factors

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Introduction

To mark the National Literacy Trust's 25th anniversary, we will be publishing a series of reports throughout 2018 to refresh and redefine the evidence base on literacy in the UK.

Literacy and life expectancy, the first report in our series, provides the first overview of the evidence linking literacy and life expectancy in England through the conduits of health and socioeconomic factors.

It builds on the evidence outlined a decade ago in our *Literacy Changes Lives*¹ report, where we established a relationship between literacy and life chances through the lenses of physical and mental health, economic wellbeing, family life, civic engagement and crime.

This report explores existing research from a wide range of sources, including longitudinal data and analysis, academic journals, and domestic and international surveys, to establish the depth of the relationship between literacy and life expectancy.

Our fresh new analysis of national and local data shows that inequalities in both literacy and life expectancy in England are intensely localised. Children growing up in wards with the greatest literacy challenges in the country have significantly shorter life expectancies than those growing up in wards with the fewest literacy challenges.

Whilst we recognise that the relationship between literacy and life expectancy is complex, our report finds that people with low levels of literacy are more likely to live in deprived communities, be financially worse off, and have poorer health – all of which are precursors for shorter life spans. The gravity of the extreme local inequalities in mortality makes the challenge to close the literacy gap between communities all the more urgent.

We believe that by tackling the nation's literacy crisis at a local level, we can start to reduce the inequalities in life expectancy that exist across the whole of society. This localised approach sits at the heart of our work². By closing gaps in education, employment and health at a local level, we can ensure that every child has the chance to live a happy, healthy, successful and long life, regardless of their background.

A note on terminology

This report defines *life expectancy* as the average number of years a person may be expected to live at birth, unless otherwise specified. The term *longevity* is used synonymously with *life expectancy*. The term *mortality* refers to the relative frequency of deaths or a death rate in a given population. *Healthy life expectancy* refers to the time one is expected to live in good health³.

¹ Clark, Dugdale (2008), *Literacy Changes Lives*. National Literacy Trust

² Information on National Literacy Trust Hubs and local campaigns: <https://literacytrust.org.uk/communities/>

³ Public Health England (2017), *Life expectancy and healthy life expectancy definitions*

Summary of key findings

Literacy and life expectancy in England are linked through the conduits of socioeconomic factors and health

- Literacy is linked to life expectancy through a range of **socioeconomic factors**. People with poor literacy skills are more likely to be unemployed, have low incomes and poor health behaviours, which in turn can be linked to lower life expectancy.
 - People with poor literacy skills earn 12% less than those with good literacy skills⁴. Low incomes are associated with higher mortality; the World Health Organization found that children born into low income families live 17 years shorter than children born into high income families (62 years vs 79 years)⁵.
- Literacy is linked to life expectancy through **health**. Those with low levels of literacy are more likely to have poor health, low health literacy and engage in harmful health behaviours, which in turn puts them at a higher risk of living a shorter life.
 - 43% of working-age adults in England don't have the literacy skills they need to understand and make use of everyday health information (known as 'health literacy')⁶. Low health literacy is associated with a 75% increased risk of dying earlier than people who have high literacy levels⁷.

Inequalities in literacy and life expectancy in England are intensely localised

- Our new data analysis shows that people living in areas of England with the most serious literacy challenges are more likely to have shorter life expectancies than people living in communities with the fewest literacy challenges.
 - Our analysis compared ward level life expectancy data from the ONS and Public Health England against ward level data from our work with Experian in 2017 to pinpoint the communities in England with the most acute literacy problems. Working with Experian, we created a *literacy vulnerability score* for every parliamentary constituency and electoral ward in the country by analysing data from Experian's socio-demographic classification system, *Mosaic*, and the 2011 Census on the social factors most closely associated with low literacy: low levels of education, low income and high unemployment.
- Our analysis also found that the link between literacy and life expectancy is stronger at the bottom end of the scale. Once people have acquired a basic level of literacy, they pass the *autonomy threshold* where their choices and actions are the overriding

⁴ McIntosh, Vignoles (2001) *Micro-analysis of the Effects of Literacy and Numeracy*. In: Bynner et al. (2001), [Improving Adult Basic Skills: Benefits to the Individual and to Society](#). Institute of Education, University of London and Centre for Economic Performance, London School of Economics

⁵ World Health Organization (2015) [World Health Statistics 2014](#); and Statista (2018), [Average life expectancy at birth worldwide in 1990 and 2013, by income group \(in years\)](#)

⁶ Rowlands, Protheroe, Winkley, et al. (2016), [A mismatch between population health literacy and the complexity of health information: an observational study](#). *British Journal of General Practice*, 65(635): e379-e386

⁷ Bostock, Steptoe (2012), [Association between low functional health literacy and mortality in older adults: longitudinal cohort study](#). *BMJ*, 344: e1602

factors in determining their life chances, rather than the circumstances that low levels of literacy dictate for them.

- The national gap in life expectancy between children from communities with the highest and lowest vulnerability to literacy problems in the country is staggering:
 - A boy growing up in a ward with one of the highest vulnerabilities to literacy problems in the country has a life expectancy **26.1 years shorter** than a boy growing up in a ward with one of the lowest vulnerabilities to literacy problems.
 - A girl growing up in a ward with one of the highest vulnerabilities to literacy problems in the country has a life expectancy **20.9 years shorter** than a girl growing up in a ward with one of the lowest vulnerabilities to literacy problems.

A localised approach is needed to improve literacy and life expectancy in England

- Improving local literacy levels could raise life expectancy in the most deprived wards in England by reducing inequalities in health and socioeconomic circumstances:
 - Compared to people with poor literacy skills, those with good literacy skills are less likely to exhibit poor health behaviours, have lower incomes or live in more deprived communities – all of which are risk factors to longevity.
- Inequalities in literacy and life expectancy are related to geographic community and solutions therefore need to be tailored to meet local need and built on local assets.
- This is a model that sits at the heart of the National Literacy Trust’s work and which we know works:
 - Since 1995, the National Literacy Trust has worked with local partners to develop long-term campaigns to drive up local literacy levels.
 - Since 2013, we have launched six long-term literacy campaigns in some of the most deprived regions, cities and towns in England. We have launched five National Literacy Trust Hubs in Bradford, Middlesbrough, Peterborough, Stoke-on-Trent and, most recently to mark our 25th anniversary, Swindon, in addition to regional campaigns in Manchester and the North East.
 - During 2018, our 25th anniversary year, we will be doubling our presence in local communities by launching new literacy campaigns in social mobility cold spots throughout the UK, starting in Swindon and Nottingham.

Literacy and life expectancy in England

Literacy in England

Being literate is the ability to read, write, speak and listen well. Good literacy enables us to communicate effectively, understand written information and make sense of the world.

Our research shows that lacking vital literacy skills holds a person back at every stage of their life: as a child they won't be able to succeed at school, as a young adult they will be locked out of the job market, and as a parent they won't be able to support their children's learning. This intergenerational cycle makes social mobility more difficult.

In England:

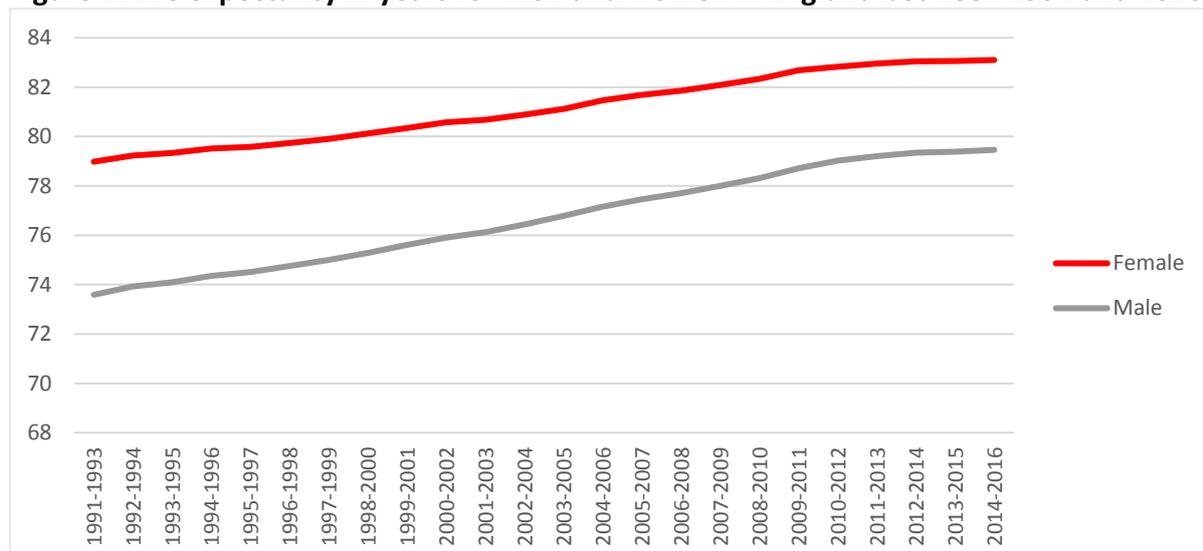
- 28% of 11-year-olds were unable to read well by the time they left primary school in 2017, rising to 44% of disadvantaged children⁸
- 36% of 16-year-olds failed to achieve good GCSE grades in English and maths in 2017, rising to 60% of disadvantaged young people⁹
- 5.1 million adults don't have the literacy skills expected of an 11-year-old¹⁰

The nation's literacy challenge is intensely localised and hits those from the poorest communities the hardest. Our analysis with Experian in 2017 found that 86% of constituencies in England contained at least one ward vulnerable to serious literacy issues¹¹.

Life expectancy in England

Life expectancy at birth in England reached 79.5 years for males and 83.1 years for females in 2014-2016¹². As can be seen in **Figure 1**, the gains in life expectancy at birth in England for men and women have been substantial over time.

Figure 1: Life expectancy in years for men and women in England between 1991 and 2016



Source: ONS (2017): National life tables, UK: 2014 to 2016

⁸ Department for Education (2017), [National curriculum assessments: key stage 2, 2017 \(revised\)](#)

⁹ Department for Education (2018), [Revised GCSE and equivalent results in England: 2016-2017](#)

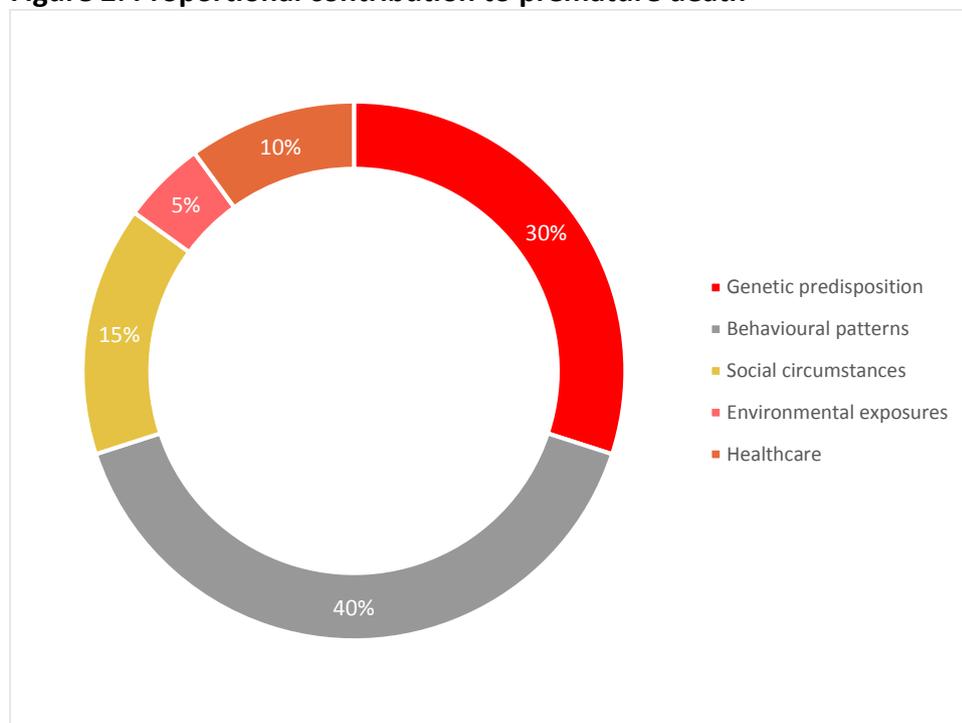
¹⁰ Department for Business, Innovation and Skills (2011), [2011 Skills for Life Survey](#)

¹¹ National Literacy Trust and Experian (2017), [Literacy score – Identifying the places with the greatest literacy need](#)

¹² ONS (2017), [National life tables, UK: 2014 to 2016](#)

How long we live is determined by a variety of factors, including our genetic inheritance, the healthcare we receive, our place and position in society and our behaviour patterns, such as how we eat, how much alcohol we consume and whether we smoke (see **Figure 2**).

Figure 2: Proportional contribution to premature death



Source: Public Health England (2016): *Strategic plan for the next four years: Better outcomes by 2020*

According to the Office for National Statistics (ONS), the population in England and the UK is now living longer and spending more years in good health than ever before¹³. However, Public Health England warns that, as a nation, we still continue to see deep-seated inequalities between those with the most and those with the least in our society, as well as across different regions¹⁴. Indeed, the inequality between the local areas with the highest and lowest newborn life expectancy has increased despite improvements across local areas over the last two decades¹⁵.

Modelling the relationship between literacy and life expectancy through socioeconomic status and health

As we set out in our *Literacy Changes Lives* report in 2008¹⁶, low literacy is linked to inequalities in mental and physical health, economic wellbeing, family life, civic engagement and crime. Inequalities in these same factors, particularly when it comes to socioeconomic wellbeing and health, have been shown to also play a role in determining longevity. This report will therefore explore how inequalities in literacy, through the mediating factors of health and socioeconomic status, impact on life expectancy.

¹³ ONS (2016), [Life Expectancy at Birth and at Age 65 by Local Areas in England and Wales: 2012 to 2014](#)

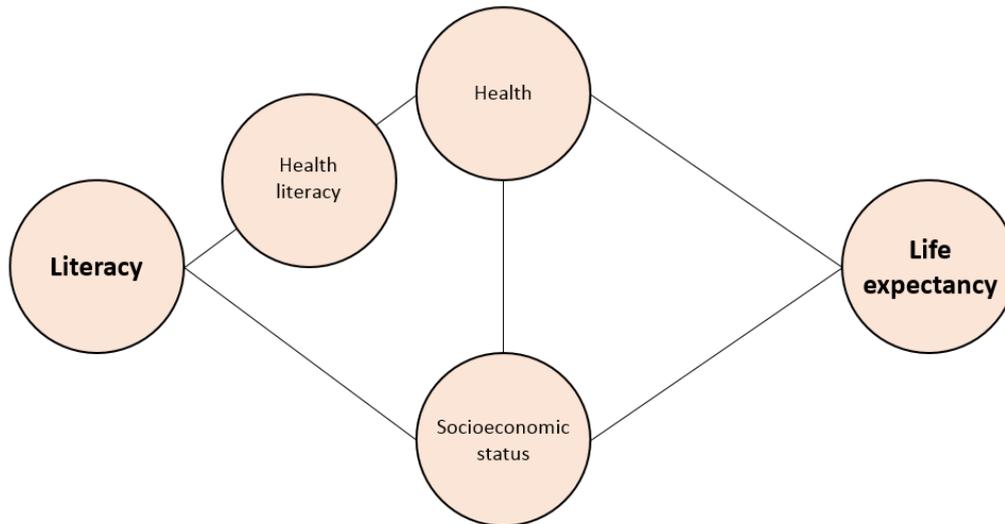
¹⁴ Public Health England (2016), [Strategic plan for the next four years: Better outcomes by 2020](#)

¹⁵ ONS (2015), [Statistical bulletin: Life Expectancy at Birth and at Age 65 by Local Areas in England and Wales: 2012 to 2014](#)

¹⁶ Dugdale, Clark (2008) [Literacy Changes Lives](#). National Literacy Trust

A model of this relationship is presented in **Figure 3**.

Figure 3: Model of the relationship between literacy and life expectancy through socioeconomic status and health



Source: National Literacy Trust (2018)

The report will now explore these relationships in more depth.

Exploring the link between literacy and life expectancy through socioeconomic factors

This section will look at how literacy and socioeconomic factors are linked and how this relationship is connected to life expectancy.

Literacy and socioeconomic factors

Socioeconomic factors have a strong relationship with literacy and educational achievement in the UK. This link is already apparent by the time children are five years old. According to the Early Intervention Foundation (2017), “The UK prevalence rate for early language difficulties is between 5% and 8% of all children and over 20% for those growing up in low-income households.”¹⁷

Children living in poverty face a much greater risk of falling behind. Indeed, in 2017, 29% of five-year-olds did not reach a good level of development by the time they started primary school, rising to 44% of children from disadvantaged backgrounds¹⁸.

Furthermore, The Sutton Trust (2012) highlights a substantial gap in the vocabularies of children from low and high income households:

Studies of the UK cohort of children born at the millennium have found that, at the age of three, children in the lowest income group have

¹⁷ Law, Charlton, Asmussen (2017), [Language as a child wellbeing indicator](#). Early Intervention Foundation

¹⁸ Department for Education (2017), [Early years foundation stage profile results: 2016 to 2017](#)

language skills on average 17 months behind children in the highest-income group. At age five, the gap is 19 months¹⁹.

This gap continues into primary school and beyond. In 2017, 72% of 11-year-olds achieved the expected level in reading for their age compared with just 56% of children who received free school meals (a proxy indicator of socioeconomic status)²⁰. This gap of 16 percentage points widens to 24 percentage points by the time students take their GCSEs. In 2017, only 40% of students receiving free school meals achieved good grades in English and maths (equivalent to A*-C) compared with 64% of all students²¹.

Progress to narrow the GCSE attainment gap between disadvantaged young people and their peers has been slow. According to the Education Policy Institute (2017):

The gap between disadvantaged 16-year-old pupils and their peers has only narrowed by three months of learning between 2007 and 2016. [...] In fact, disadvantaged pupils fall behind their more affluent peers by around two months each year over the course of secondary school²².

As outlined in our *Literacy Changes Lives* 2014 report, which we produced on behalf of the Read On. Get On. coalition to further explore the relationship that poor literacy has with a range of health inequalities, employment outcomes and criminal offending, people with better literacy skills in adulthood are more likely to be employed and more likely to earn higher incomes²³.

On average, those with functional literacy skills (above Level 1) earn more than those with poorer literacy skills²⁴. Even after factoring in education levels, better literacy skills still equate to 12% higher earnings, although it is important to note that this research was carried out in 2001 and is the most recent analysis available. To put this into context: at the level of the national minimum wage, a 12% rise in earnings would equate to an increase of £0.90 per hour (rising from £7.50 to £8.40). Applying this to the national full-time average salary²⁵, this would equate to an annual increase of £3,451 (rising from £28,758 to £32,209).

Similarly, data from the most recent Skills for Life Survey in 2011²⁶ gives an even more detailed picture of what this means in the UK:

- 1 in 4 (24%) of those who were not in work had entry-level literacy skills; by contrast, 1 in 10 (11%) of those who were in work had entry-level literacy skills

²⁷ The Sutton Trust (2012), [The Social Mobility Summit: Report of the Summit held at the Royal Society London 21-22 May 2012](#)

²⁰ Department for Education (2017), [National curriculum assessments: key stage 2, 2017 \(revised\)](#); and data provided to the National Literacy Trust by the Department for Education on the attainment of pupils at the end of key stage 2 by free school meal eligibility and local authority

²¹ Department for Education (2018), [Revised GCSE and equivalent results in England: 2016-2017](#)

²² Andrews, Robinson, Hutchinson (2017), [Closing the gap? Trend in Educational Attainment and Disadvantage](#). Education Policy Institute

²³ Morrisroe (2014) [Literacy Changes Lives](#). National Literacy Trust on behalf of Save the Children and the Read On. Get On. coalition

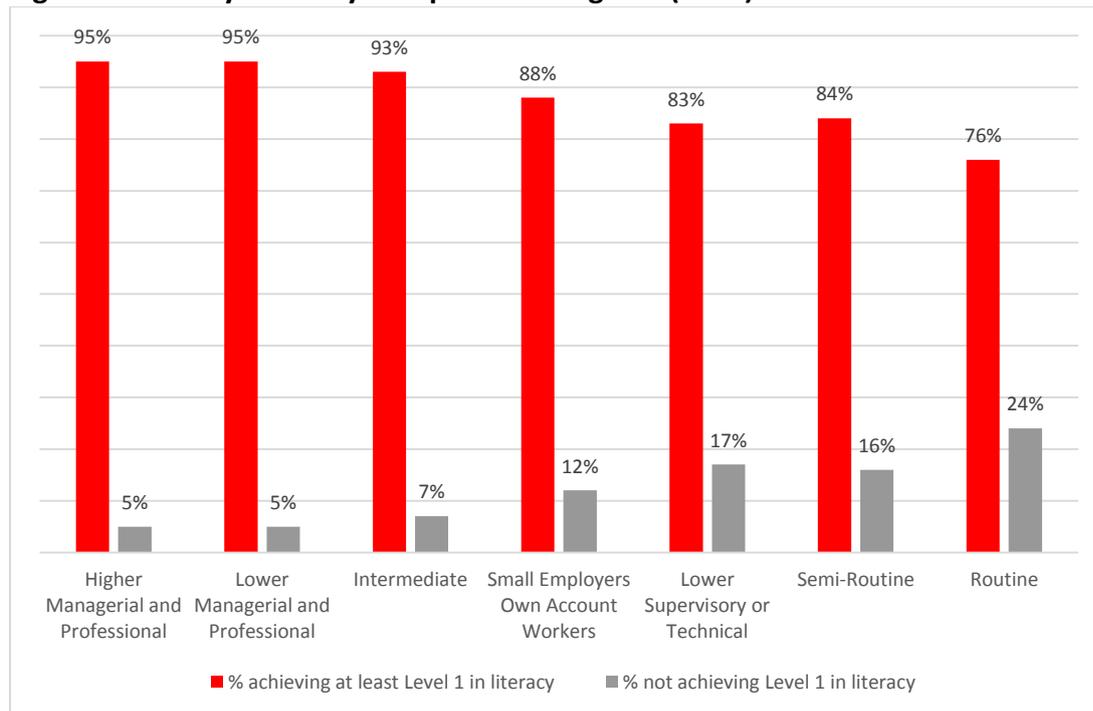
²⁴ McIntosh, Vignoles (2001) *Micro-analysis of the Effects of Literacy and Numeracy*. In: Bynner et al. (2001), [Improving Adult Basic Skills: Benefits to the Individual and to Society](#). Institute of Education, University of London and Centre for Economic Performance, London School of Economics

²⁵ ONS (2017), [Annual Survey of Hours and Earnings: 1997 to 2017 selected estimates](#)

²⁶ Department for Business, Innovation and Skills (2011), [2011 Skills for Life Survey](#)

- More than 1 in 4 (26-27%) of those with earnings of less than £10,000 had entry-level literacy skills; by contrast, only 4% of those who earned over £30,000 had entry-level literacy skills
- 24% of those receiving working-age benefits had entry-level literacy skills, while 13% of those not receiving working-age benefits had entry-level skills
- Only 5% of those in higher managerial, lower managerial or professional occupations had entry-level literacy skills, while 25% of those in routine occupations had entry-level literacy skills (see **Figure 4**)

Figure 4: Literacy levels by occupation in England (2011)



Source: Department for Business, Innovation and Skills: 2011 Skills for Life Survey

In addition to income, low literacy is also connected to higher unemployment. For example, an England-specific analysis of the OECD International Survey of Adult Skills (2013) revealed that adults in full-time employment, those who work part time and those who are studying or retired have higher literacy levels than those who are unemployed²⁷. Those in full-time employment were the most likely to have the highest levels of literacy (Levels 4 and 5) and over twice as many adults in full-time employment achieved Level 4 or above in literacy compared with those who were unemployed. Unemployed people in England also have poorer literacy skills than the average for OECD countries.

These findings have also been borne out by longitudinal studies. Analysis based on data from the 1970 British birth cohort study shows a link between low literacy and unemployment, with 34-year-olds who have poor literacy and numeracy skills being much less likely to have a full-time job compared with those with better literacy skills (Bynner and

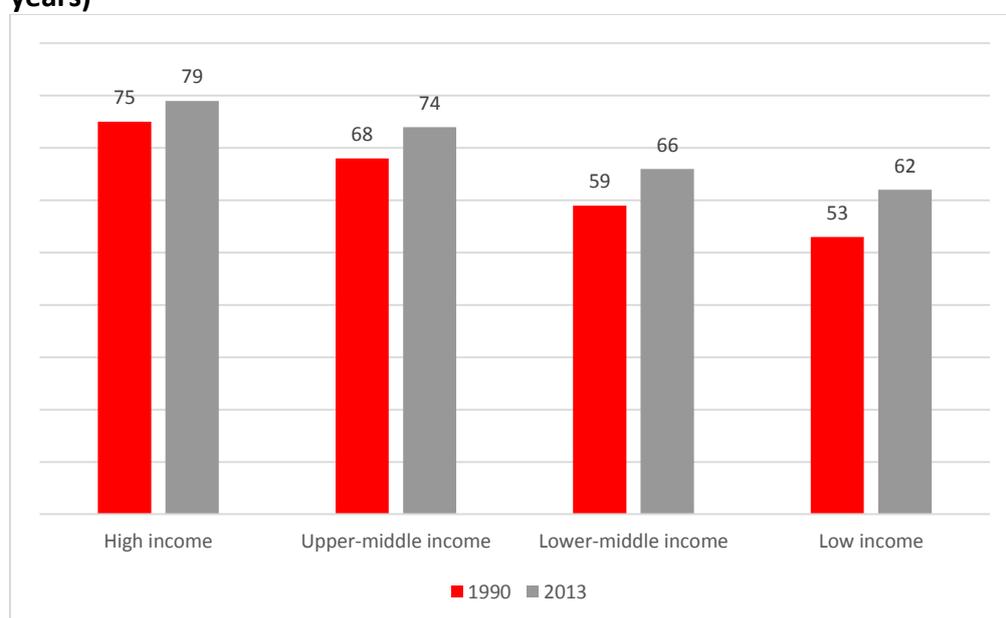
²⁷ Department for Business, Innovation and Skills (2013), [Adult skills international survey 2012](#)

Parsons, 2006)²⁸. Half of 34-year-old women with high literacy skills were in full-time employment, compared with only one in four women with low literacy skills.

Socioeconomic factors and life expectancy

As well as being strongly linked to literacy levels, a person's economic background can play a significant role in determining life expectancy. As can be seen in **Figure 5**, a child born into a high-income family has a considerably longer life expectancy at birth than a child born into a low-income family. While there have been improvements in closing the gap worldwide since 1990 (when the gap was 22 years), in 2013, a child born into a low income family still had a life expectancy 17 years shorter than a child born into a high income family (62 years vs 79 years)²⁹.

Figure 5: Average life expectancy at birth worldwide in 1990 and 2013 by income group (in years)



Source: World Health Organization (2015) and Statista (2018): Average life expectancy at birth worldwide in 1990 and 2013 by income group (in years)

Another stark and more detailed example on the differential in life expectancy depending on income comes from the US. Analysis by Chetty and colleagues in 2016³⁰ explored income and life expectancy based on 1.4 billion anonymised US tax records between 1999 and 2014. They found that women in the top 1% of the income distribution were expected to live 10.1 years longer than women in the bottom 1%. For men, the difference was even more dramatic at 14.6 years between the top 1% and bottom 1%. These figures are sobering.

In the UK, differences between income groups are also substantial. **Figure 6** highlights the differences for men and women in terms of their life expectancy at birth depending on their occupation. It shows there is a steady increase in life expectancy, for both men and women,

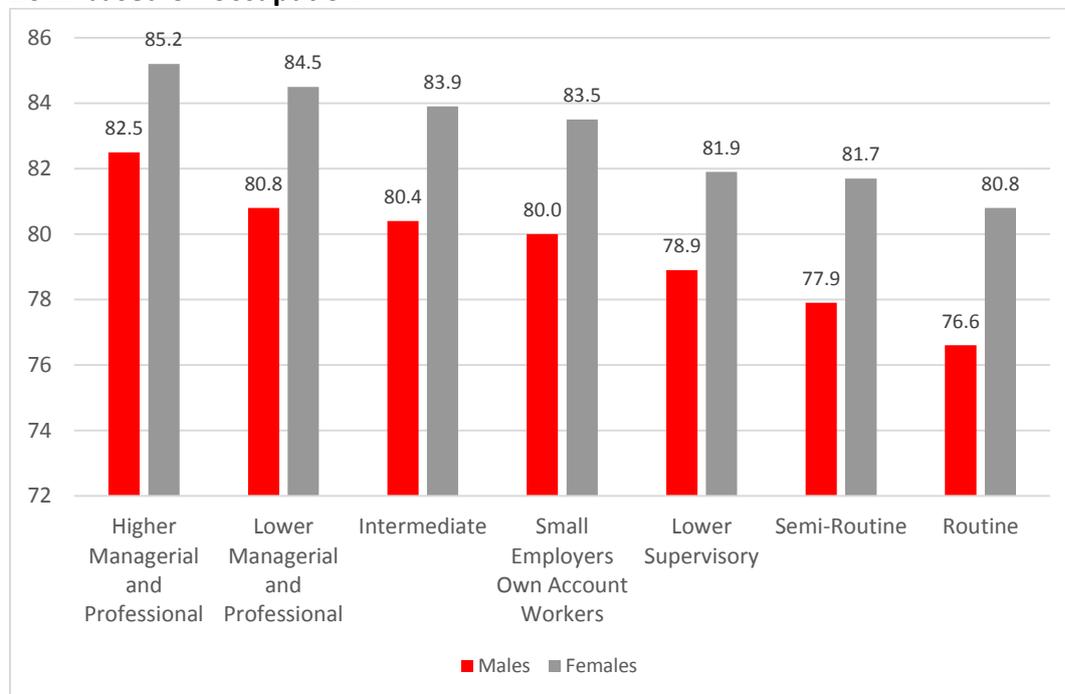
²⁸ Bynner, Parsons (2006), [New light on literacy and numeracy](#). National Research and Development Centre for adult literacy and numeracy, Institute of Education, University of London

²⁹ World Health Organization (2015) [World Health Statistics 2014](#); and Statista (2018), [Average life expectancy at birth worldwide in 1990 and 2013, by income group \(in years\)](#)

³⁰ Chetty, et al. (2016), [The Association Between Income and Life Expectancy in the United States, 2001-2014](#). American Medical Association. *JAMA*, 315(16): 1750-66

the higher up the occupation ladder one moves. Indeed, men and women in routine occupations have a far shorter life expectancy than men and women in managerial and professional occupations, equating to 5.9 years for men and 4.4 years for women.

Figure 6: Life expectancy at birth for males and females in England between 2007 and 2011 based on occupation



Source: ONS (2015): Dataset: ONS Longitudinal Study (LS) based estimates of Life Expectancy (LE)

The differences between income and life expectancy can also be observed regionally. A study by the King’s Fund (Buck and Maguire, 2015)³¹, which looked at life expectancy in England from 1999-2003 and 2006-2010, found that the majority of areas with persistently low life expectancy during these years also had a high proportion of people earning low or no wages – and vice versa.

However, the study also suggested that the link between income and life expectancy is not always direct. It found that income *per se* is not a significant factor when considering the range of other influences on life expectancy. Instead, income acts as a gateway to resources that determine health, such as material goods, services and psychological factors related to stress, as well as education, and – as a result – literacy.

How are literacy, socioeconomic factors and life expectancy linked?

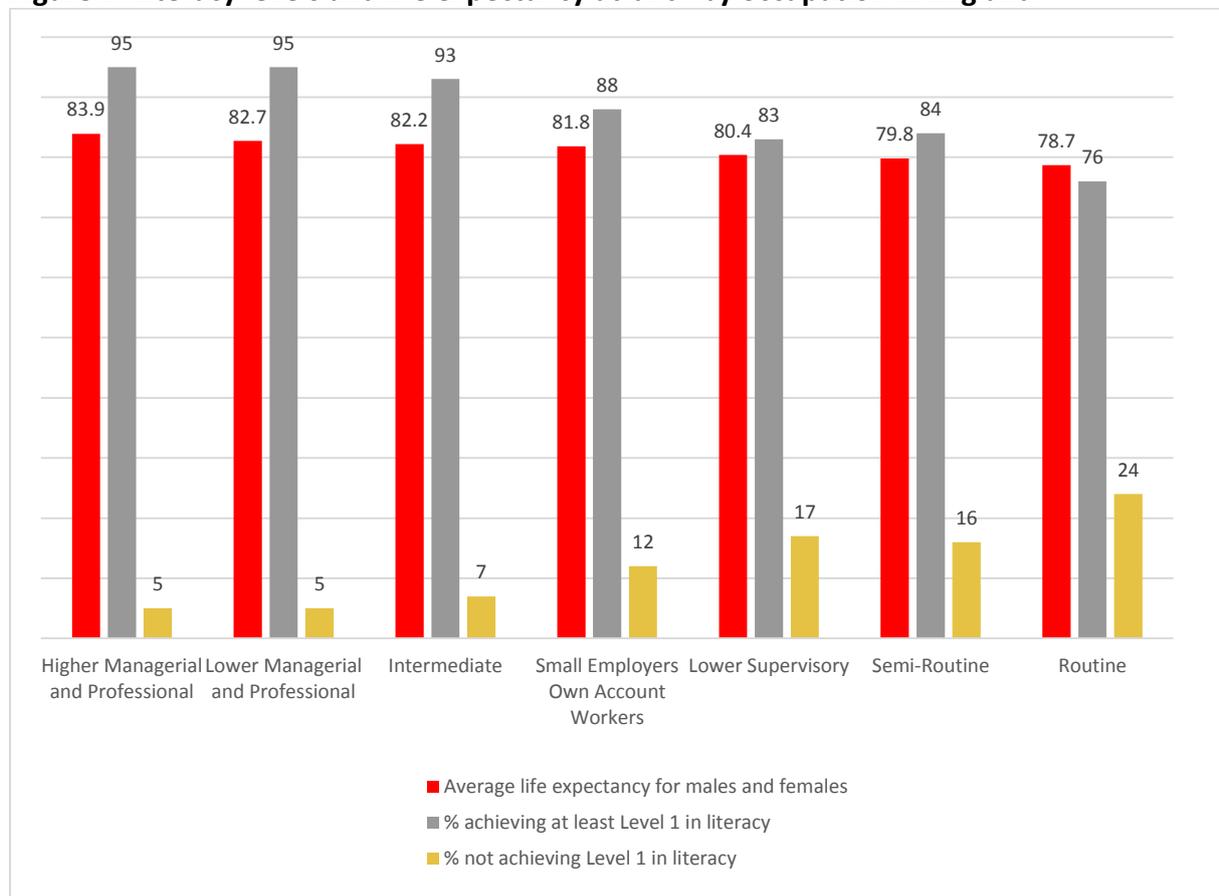
Both literacy and life expectancy are linked to socioeconomic factors. While a lack of data makes it difficult to establish a direct link between these three factors, our review of existing research suggests that people with low literacy skills are more likely to suffer from unemployment and low income, which in turn may reduce their life expectancy.

Figure 7 combines information about life expectancy at birth and literacy levels by occupation in England. It shows that, as literacy skills increase, so too does life expectancy. It

³¹ Buck, Maguire (2015), [Inequalities in life expectancy: Changes over time and implications for policy](#). The King’s Fund

also shows that those in higher managerial or professional occupations have a life expectancy 5.2 years higher than those in routine occupations. Furthermore, only 1 in 20 (5%) people in higher managerial and professional occupations have non-functional literacy levels, compared with nearly one quarter (24%) of those in routine occupations.

Figure 7: Literacy levels and life expectancy at birth by occupation in England



Source: ONS (2015) and Department for Business, Innovation and Skills (2011)

The link is also borne out by the juxtaposition of different datasets, as outlined earlier in this report. Through our analysis of the inequalities in literacy and life expectancy, we know that the local and regional areas with the lowest life expectancies in England are also the most at risk of low literacy. As our *literacy vulnerability score* is calculated using several different data measures – including the percentage of households where no one has ever worked and the percentage of people with no formal qualifications – we can conclude that the same areas experiencing low life expectancy and low literacy also struggle with low economic wellbeing.

Our analysis also found that the link between literacy and life expectancy is stronger at the bottom end of the scale. Once people have acquired a basic level of literacy, they pass the *autonomy threshold* where their choices and actions are the overriding factors in determining their life chances, rather than the circumstances that low levels of literacy dictate for them.

Finally, unemployment statistics in the UK show that the areas affected by low literacy and low life expectancy are also largely affected by poorer economic wellbeing. The latest employment statistics in the UK (ONS, 2018)³² show that the North East has the second-highest unemployment rate in the UK (5.0%) while the South East has the lowest unemployment rate (3.0%).

In summary, the fact that the same areas of the country struggle with literacy, low life expectancy and economic wellbeing suggests that these variables are interrelated. People with poor literacy skills are more likely to be unemployed and have low incomes, which in turn can be linked to lower life expectancy. By contrast, those with higher literacy skills are more likely to be employed and receive a higher income, which in turn is associated with longer life expectancy, possibly through experiencing fewer stressors caused by limited financial resources that are associated with poorer physical and mental health.

Exploring the link between literacy and life expectancy through health

This section will look at the link between literacy and health and how this relationship impacts on life expectancy.

Literacy and health

There is a strong relationship between literacy and health. Indeed, literacy is one social determinant of health that can make access to healthcare more challenging for individuals.

As our *Literacy Changes Lives* (2008) report highlighted, those with low literacy are:

- 1.5 to 3 times more likely to have poorer health outcomes
- Up to 18 times more likely to take their prescriptions incorrectly
- Significantly less likely to understand symptoms of a medical condition, such as diabetes or asthma
- More likely to rate their health as ‘very poor’ than those with better literacy skills

This report looks in more detail at the relationship between literacy and health behaviours, health literacy, access to healthcare and mental health, and identifies a connection between literacy and life expectancy through these health variables.

Health behaviours

Health behaviours, such as smoking and alcohol use, are linked to literacy³³. For example, in the UK, men with low literacy skills are twice as likely to smoke regularly than men with higher literacy skills (Department for Business, Innovation and Skills, 2012)³⁴, while an Australian study into adolescent drug use found that low literacy levels were correlated with having smoked in the past month as well as high alcohol consumption (1997)³⁵.

³² ONS (2018), [Regional labour market statistics in the UK: January 2018](#)

³³ Fredrickson, Washington, Pham, et al. (1995), [Reading grade levels and health behaviors of parents at child clinics](#). *The Journal of the Kansas Medical Society*, 96(3): 127-9

³⁴ Department for Business, Innovation and Skills (2012), [The Contribution of Basic Skills to Health Related Outcomes During Adulthood: Evidence from the BCS70](#)

³⁵ Hawthorne (1997), [Preteenage drug use in Australia: the key predictors and school-based drug education](#). *The Journal of Adolescent Health*, 20(5): 384-95

Studies from the US show that higher reading levels have also been linked with greater knowledge and concern about the negative health effects of smoking (2001)³⁶, while smokers with higher literacy levels are also more likely to stop smoking (2014)³⁷. Low literacy is also a significant predictor of missing health appointments when combined with mental ill health³⁸.

Health literacy and access to healthcare

Health literacy is the ability to obtain, understand and communicate basic information needed to make appropriate health-related decisions (Institute of Medicine, 2014)³⁹.

The Institute of Education (2010) reports a positive correlation between literacy and health⁴⁰. For example, people with higher reading skills are better able to understand media coverage of new results from preventative health literature as well as government health awareness campaigns and can better interpret and follow medical prescription directions. These findings are also reflected internationally⁴¹.

In England, just under half (43.4%) of the adult population do not have the literacy skills needed to discuss a medical condition with a doctor or health specialist⁴², while two-fifths (43%) of working-age adults are unable to understand and make use of commonly used health information materials (Rowlands et al., 2015)⁴³. Using data from the English Longitudinal Study of Ageing, researchers found that a third of older adults in England have difficulties reading and understanding basic health-related written information (Bostock and Steptoe, 2012)⁴⁴.

As with the link between health and life expectancy, literacy and health is also stronger in certain parts of the country. A recent paper by the ONS (2017)⁴⁵ found that the gap in reported health, using education as a measure, was wider in the areas of the country with the lowest healthy life expectancies: the difference in those reporting their general health as either very good or good was 34.8% between the highest and lowest educated, while the difference in the areas with the highest life expectancies was only 18%. As literacy is a prerequisite for education, we can surmise that the role of literacy in improving health might be even more important in areas of poor health.

³⁶ Arnold, Davis, Berkel, et al. (2012), [Smoking status, reading level, and knowledge of tobacco effects among low-income pregnant women](#). *Preventative Medicine*, 32(4):313-20

³⁷ Martin, Haas, Schonlau, et al. (2012), [Which Literacy Skills are Associated with Smoking?](#) *Journal of Epidemiol and Community Health*, 66(2): 189-192

³⁸ Miller-Matero, Clark, et al. (2016), [Depression and literacy are important factors for missed appointments](#). *Psychology, Health and Medicine*, 21(6): 686-95

³⁹ Nielsen-Bohlman, Panzer, Kinding (2004), [Health literacy: a prescription to end confusion](#). Institute of Medicine, (US) Committee on Health Medicine. *National Academies Press*, 2004

⁴⁰ De Coulon, Meschi, Yates (2010), [Education, basic skills and health-related outcomes: research report](#). National Research and Development Centre for Adult Literacy and Numeracy, Institute of Education, King's College London

⁴¹ Ciampa, Vaz, Blevins, et al. (2012), [The association among literacy, numeracy, HIV knowledge and health-seeking behavior: a population-based survey of women in rural Mozambique](#). *PLOS ONE*, 7(6): e39391

⁴² Department for Business, Innovation and Skills (2011), [Skills for Life 2011](#); and Department of Health (2009), [Health literacy and health improvement](#)

⁴³ Rowlands, Protheroe, Winkley, et al. (2016), [A mismatch between population health literacy and the complexity of health information: an observational study](#). *British Journal of General Practice*, 65(635): e379-e386

⁴⁴ Bostock, Steptoe (2012), [Association between low functional health literacy and mortality in older adults: longitudinal cohort study](#). *BMJ*, 344: e1602

⁴⁵ ONS (2017): [An overview of lifestyles and wider characteristics linked to Healthy Life Expectancy in England: June 2017](#)

Mental health

Literacy has a strong connection to mental health, particularly in terms of prevention and access to healthcare. Research shows that people with chronic mental illnesses may be particularly vulnerable to the negative effects of low literacy, as it can act as a barrier to accessing mental-health services effectively (Christensen and Grace, 2006)⁴⁶.

After analysing a range of data sets, including British longitudinal studies, Chevalier and Feinstein (2006)⁴⁷ found that education reduces the risk of poor mental health. Good levels of education also reduce the risk of becoming depressed as an adult by 5-6%. These results suggest that investing in education has long-term causal benefits on mental health.

Overall, people who have spent less time in education tend to have higher levels of depression and anxiety, and lower levels of enjoyment, hope, happiness, fitness and energy compared with those who are better educated⁴⁸.

Data from the British Cohort studies, made available to us by John Bynner and Samantha Parsons for our *Literacy Changes Lives* report in 2008⁴⁹, showed that women with low literacy skills were five times more likely than those with average or good literacy skills to be depressed. Other analysis by Bynner and Parsons (2006) found that men and women with low literacy skills were more than twice as likely to feel that they 'never got what they wanted from life' and up to four times more likely to feel that 'whatever they did had no effect on what happened to them' than those with higher literacy skills⁵⁰.

Depression is now the leading cause of disability worldwide, and the World Health Organization predicts that, by 2030, it will be the leading cause of disease burden globally⁵¹. Given the link established between literacy and depression, we could assume that by improving literacy levels in England, we could reduce the burden of the disease.

Health and life expectancy

The relationship between health and life expectancy is well established. Indeed, increases in life expectancy in England over the past decades have been largely attributed to medical advancements, greater access to healthcare and improved lifestyle factors⁵².

As shown earlier in the report (**Figure 2**), behavioural risk factors, such as smoking and eating an unhealthy diet, make the greatest contribution to years lost to early death or disability (40%). **Figure 8** explores the leading causes of death in England associated with behavioural risk factors in 2013 (taken from a study published in *The Lancet*⁵³).

⁴⁶ Barney, Griffiths, Jorm, Christensen (2006), [Stigma about depression and its impact on help-seeking intentions](#). *The Australian and New Zealand Journal of Psychology*, 40(1): 51-4

⁴⁷ Chevalier, Feinstein (2006), [Sheepskin or Prozac? The Casual Effect of Education on Mental Health](#). Centre for the Economics of Education, London School of Economics

⁴⁸ Ross, Van Willigen (1997), [Education and the subjective quality of life](#). *Journal of Health and Social Behavior*, 38(3): 275-97

⁴⁹ Clark, Dugdale (2008), [Literacy Changes Lives](#). National Literacy Trust

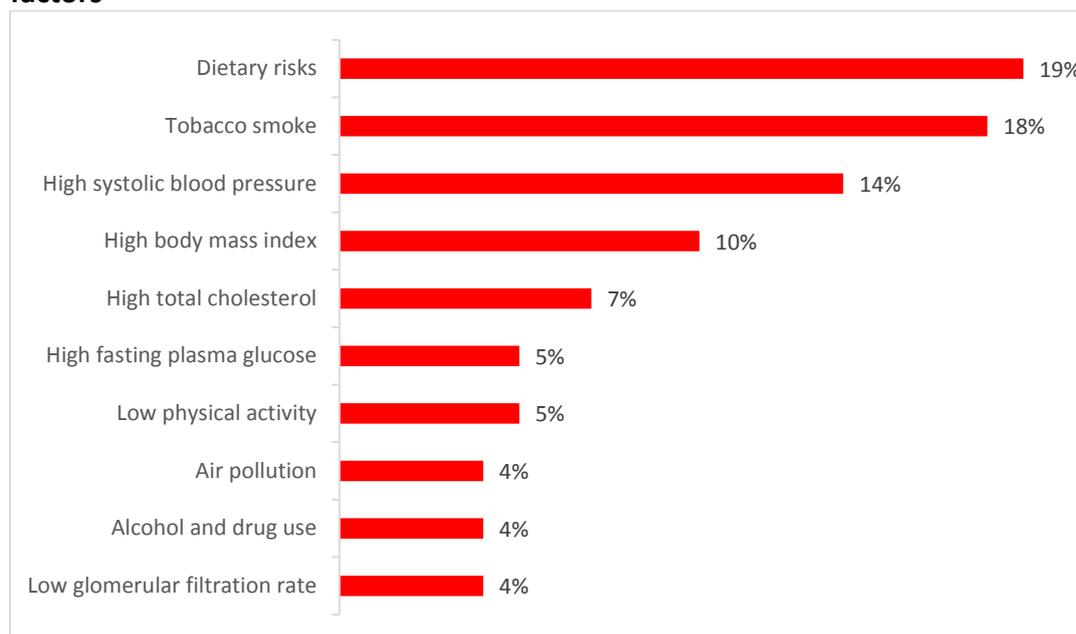
⁵⁰ Bynner, Parsons (2006), [New light on literacy and numeracy](#). National Research and Development Centre for Adult Literacy and Numeracy, Institute of Education, University of London

⁵¹ World Health Organization (2011), [Global burden of mental disorders and the need for a comprehensive, coordinated response from health and social sectors at the country level](#)

⁵² Government Office for Science (2015), [Trends in life expectancy and health life expectancy](#)

⁵³ The Lancet (2014): [Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013](#)

Figure 8: Leading causes of death in England in 2013 associated with behavioural risk factors



Source: *The Lancet* (2014)

Smoking

In the UK, smoking remains one of the primary causes of preventable death. In 2017, 16.9% of adults in Great Britain smoked⁵⁴. The British Doctors Cohort Study (2004) reported that smokers have a life expectancy of between four and 10 years shorter than non-smokers in Britain⁵⁵. Looking internationally, a US cohort study (2012) found that, relative to non-smokers, the risk of death for smokers increased by 25.4% over a 20-year period between 1986 and 2006⁵⁶.

There are stark geographical inequalities when it comes to rates of smoking and life expectancy. For example, people in Hull, who are three times more likely to smoke than people in Wokingham, have a healthy life expectancy 15 years shorter than their peers in Wokingham (ONS, 2017)⁵⁷.

There are also inequalities in income levels, with adults who earn less than £10,000 a year two times more likely to smoke than those who earn £40,000 or more (21.9% vs. 10.8%)⁵⁸.

Poor diet and obesity

Poor diet is a factor in one in five deaths around the world, and the second-highest risk factor for early death after smoking according to the Global Burden of Disease cohort study (2016)⁵⁹.

⁵⁴ ONS (2017), [Adult smoking habits in Great Britain](#):

⁵⁵ Doll, Peto, Boreham, Sutherland (2004) [Mortality in relation to smoking: 50 years' observations on male British doctors](#). *BMJ*, 328:1519

⁵⁶ Mehta, Preston (2012), [Continued Increases in the Relative Risk of Death From Smoking](#). Emory University. *AMJ Public Health*, 102(11):2181–2186

⁵⁷ ONS (2017), [An overview of lifestyles and wider characteristics linked to Healthy Life Expectancy in England: June 2017](#)

⁵⁸ ONS (2017), [Adult smoking habits in the UK: 2015](#)

⁵⁹ Institute for Health Metrics and Evaluation (2017), [Global, regional, and national age-sex specific mortality for 264 causes of death, 1980–2016: a systematic analysis for the Global Burden of Disease Study 2016](#). Bill & Melinda Gates Foundation. *The Lancet*, 390(10100):1151-1210

The latest data available for England show that, in the adult population, 68% of men and 58% of women are overweight or obese (NHS Digital, 2015)⁶⁰. In the child population, 22.1% of five-year-olds and 34.2% of 11-year-olds are overweight or obese (NHS Digital, 2016)⁶¹. This is a serious concern as moderate obesity has been found to reduce life expectancy by around three years, with severe obesity shortening a person's life expectancy by 10 years (The University of Oxford, 2009)⁶².

Data gathered from 20 large international studies from the US, Sweden and Australia found that adults with extreme obesity have increased risks of dying at a young age from cancer, heart disease, stroke, diabetes, kidney disease and liver disease (Kitahara et al., 2014)⁶³. The data also revealed that people with extreme obesity saw a dramatic reduction in life expectancy compared with people of normal weight, ranging from a loss of 6.5 years for participants with a body mass index (BMI) of 40-44.9 to a loss of 13.7 years for those with a BMI of 55-59.9.

Levels of obesity are more prevalent in the north of England than in the south of England (NHS Digital, 2015), matching the pattern of regional inequalities we have identified across both life expectancy and literacy vulnerability. These inequalities are also strengthened at a local level: in Barnsley, where 1 in 3 adults are obese, healthy life expectancy is 12.7 years less for men and 10 years less for women than in Kensington and Chelsea, where 1 in 7 adults are obese⁶⁴.

On the flip side, research has also pointed to the benefits for life expectancy when people engage in healthy lifestyle activities. For example, not smoking, maintaining a good weight and drinking alcohol in moderation can increase life expectancy by seven years⁶⁵.

Physical and mental health

In the UK, areas where physical activity is low tend to have shorter healthy life expectancies compared with areas where people are more physically active (ONS, 2017)⁶⁶. For example, less than 45% of people in Newham meet the government recommendation of 150 minutes of moderate-intensity physical activity per week and are only expected to spend 60 years of their life in good health. In contrast, 70% of people in York meet the recommended amount of physical activity and can expect to live 66 years in good health.

In addition to physical health, mental health also has a significant impact on life expectancy. Analysis by psychiatrists from the University of Oxford in 2014 found that serious mental illnesses can reduce life expectancy by up to 20 years, with the average reduction in life expectancy in people with bipolar disorder being between 9 and 20 years, between 10 and 20 years for schizophrenia, between 9 and 24 years for drug and alcohol abuse, and

⁶⁰ NHS Digital (2017), [Statistics on Obesity, Physical Activity and Diet](#)

⁶¹ NHS Digital (2016), [National Child Measurement Programme: England, 2015-16](#)

⁶² The University of Oxford (2009), [Body-mass index and cause-specific mortality in 900 000 adults: collaborative analyses of 57 prospective studies](#). Medical Research Council, British Health Foundation, Cancer UK. *The Lancet*, 373(9669):1083-96

⁶³ Kitahara, Flint, et al. (2014), [Association between Class III Obesity \(BMI of 40–59 kg/m²\) and Mortality: A Pooled Analysis of 20 Prospective Studies](#). *PLoS Med*, published online on 8 July 2014

⁶⁴ ONS (2017), [An overview of lifestyles and wider characteristics linked to Healthy Life Expectancy in England: June 2017](#)

⁶⁵ Mehta, Myrskylä (2017), [The Population Health Benefits Of A Healthy Lifestyle: Life Expectancy Increased And Onset Of Disability Delayed](#). Project HOPE, National Institute on Aging and European Research Council. *Health Affairs*, 36(8)

⁶⁶ ONS (2017), [What affects an area's healthy life expectancy?](#)

between 7 and 11 years for recurrent depression⁶⁷. Similarly, the World Health Organization (2014)⁶⁸ estimates a 10- to 25-year reduction in life expectancy for those with severe mental disorders (defined as psychosis, bipolar mood disorder and moderate/severe depression).

Suicide is a major factor in decreasing life expectancy and is often compounded by mental health problems. Indeed, it is estimated that 90% of people who attempt or die by suicide have one or more mental health conditions⁶⁹. Depressive disorders are associated with the highest rates of suicide; the mortality rate due to suicide among people with schizophrenia is estimated to be over 12 times greater compared with the general population (WHO, 2014), while people with bipolar disorder are 20 times more likely to attempt suicide than the general population⁷⁰.

However, while the research on higher death rates associated with mental illness has focused on the elevated risk of suicide, research from the University of Western Australia found that 80% of deaths associated with mental illness can actually be attributed to physical illness (Lawrence, 2013)⁷¹.

Social isolation

Finally, social isolation has been found to be detrimental to health outcomes and to be linked to higher mortality, with reported loneliness increasing the likelihood of death by 26%, social isolation by 29% and living alone by 32%⁷². These risks are comparable to those reported for physical inactivity, obesity, smoking and high blood pressure⁷³. Being unmarried and/or childless are also significant social-isolation factors that predict mortality for both men and women, while having adult children or surviving parents increased life expectancy⁷⁴.

How are literacy, health and life expectancy linked?

The above sections demonstrate how health is not only linked to life expectancy but also to literacy. This suggests that those with low literacy skills are more likely to have poor health and engage in harmful health behaviours, which in turn puts them at a higher risk of living a shorter life. Using Blackpool as an example:

⁶⁷ Chesney, Goodwin, Fazel (2014), [Risks of all-cause and suicide mortality in mental disorders: a meta review](#). University of Oxford. *World Psychiatry*, 13(2):153-60

⁶⁸ World Health Organisation (2014), [Information sheet: Premature death among people with severe mental disorders](#)

⁶⁹ Randall, Walld, Finlayson, et al. (2014), [Acute Risk of Suicide and Suicide Attempts Associated With Recent Diagnosis of Mental Disorders: A Population-Based, Propensity Score-Matched Analysis](#). *Canadian Journal of Psychiatry*, 59(10): 531-538

⁷⁰ Tidemalm, Haglund, Karanti, et al. (2014), [Attempted Suicide in Bipolar Disorder: Risk Factors in a Cohort of 6086 Patients](#). *PLOS ONE*, published online on 4 April 2014

⁷¹ Lawrence, Hancock, Kisely (2013), [The gap in life expectancy from preventable physical illness in psychiatric patients in Western Australia: retrospective analysis of population based registers](#). The University of Western Australia. *BMJ*, 346:1

⁷² Holt-Lunstad, Smith, Baker, Harris, Stephenson (2015), [Loneliness and social isolation as risk factors for mortality: a meta-analytic review](#). *Perspectives on Psychological Science*, 10(2):227-37

⁷³ Pantell et al. (2013), [Social Isolation: A Predictor of Mortality Comparable to Traditional Clinical Risk Factors](#). *American Journal of Public Health*, 103(11): 2056-2062

⁷⁴ Drefahl (2012), [Do the Married Really Live Longer? The Role of Cohabitation and Socioeconomic Status](#). *Journal of Marriage and Family*, 74(3): 462-475; and Robards, Evandrou, Falkingham, Vlachantoni (2012), [Marital Status, Health and Mortality](#). *Maturitas*, 73(4): 295-299; and Modig, Talbäck, Torssander, Ahlbom (2017), [Payback time? Influence of having children on mortality in old age](#). *Journal of Epidemiol and Community Health*, published online first: 14 March 2017

Blackpool is one of the most deprived areas in England⁷⁵. It has some of the greatest literacy challenges in the country as well as some of the worst health behaviours, with adults in Blackpool far more likely to smoke than adults in the general population (25.3% vs. 16.9%)⁷⁶. The city also has the lowest life expectancy for men and the second-lowest life expectancy for women across the country (see **Table 3**).

The role of literacy in improving health is most important in local areas where poor health is endemic. We have shown that these are the areas where the link between literacy and life expectancy is strongest, so they have the most to gain from efforts to improve literacy levels.

How do socioeconomic and health factors connect literacy with life expectancy?

Socioeconomic factors

People with poor literacy skills earn 12% less than those with good literacy skills⁷⁷. Low incomes are also associated with higher mortality, with the World Health Organization finding that children born into low income families live 17 years shorter than children born into high income families (62 years vs 79 years)⁷⁸.

Social inequalities play a clear role in driving health and life expectancy inequalities (The Marmot Review, 2010)⁷⁹. Moreover, the social gradient of health has been found to be stronger in areas with the highest levels of deprivation, such as the North of England (ONS, 2017)⁸⁰.

The Marmot Review (2010) highlighted that the higher one's social position, the better one's health is likely to be. In other words, social and economic differences in health are caused by social and economic inequalities in society. The House of Commons Health Committee (2009)⁸¹ also claims that the lifestyle-related causes of health inequalities reflect the underlying causes, that is, income, socioeconomic group, employment status and educational attainment, just as the socioeconomic factors of poverty, disadvantage and employment are known to be associated with poor mental health. These same factors are known to be closely linked to literacy, as discussed in the previous chapter.

It has been suggested that education in particular is a prominent social determinant of health (Zimmerman, Woolf & Haley, 2015)⁸². This is not surprising as education provides the

⁷⁵ Ministry of Housing, Communities and Local Government (2015), [English Indices of deprivation 2015](#)

⁷⁶ ONS (2017), [Adult smoking habits in the UK: 2015](#)

⁷⁷ McIntosh, Vignoles (2001) *Micro-analysis of the Effects of Literacy and Numeracy*. In: Bynner et al. (2001), [Improving Adult Basic Skills: Benefits to the Individual and to Society](#). Institute of Education, University of London and Centre for Economic Performance, London School of Economics

⁷⁸ World Health Organization (2015) [World Health Statistics 2014](#); and Statista (2018), [Average life expectancy at birth worldwide in 1990 and 2013, by income group \(in years\)](#)

⁷⁹ Marmot, Goldblatt, Allen, et al. (2010), [Fair Society Healthy Lives \(The Marmot Review\)](#). Strategic Review of Health Inequalities in England post-2010

⁸⁰ ONS (2017): [An overview of lifestyles and wider characteristics linked to Healthy Life Expectancy in England: June 2017](#)

⁸¹ House of Commons, Health Committee (2009), [Health Inequalities, Third Report of Session 2008-09](#)

⁸² Zimmerman, Woolf (2014), [Understanding the Relationship Between Education and Health](#). Virginia Commonwealth University, Institute of Medicine of the National Academies

basic skills needed to understand, access and act on information about health. However, some studies have also found that literacy might in fact be a better predictor of health than education; for example, Sentell and Halpin (2006)⁸³ found that when literacy is included in the model predicting health status, education and race lost their predictive power.

One of the reasons why socioeconomic circumstances may be linked to poor health is that future health is not a high priority for people who face much more immediate and serious problems, such as unemployment and crime (House of Commons, 2009). This might suggest that addressing the underlying causes of health inequalities might be a solution for improving health and therefore life expectancy. Indeed, the Marmot Review (2010) highlights that:

[...] addressing continued inequalities in early child development, in young people's educational achievement and acquisition of skills, in sustainable and healthy communities, in social and health services, and in employment and working conditions will have multiple benefits that extend beyond reductions in health inequalities.

As with health in general, limited access to public health services is likely to stem from socioeconomic inequalities. Buck and Jabbal (2014)⁸⁴ established the cycle of health and poverty, with poor health connected to diminished income due to lower wages or no income, greater vulnerability and risk of catastrophic healthcare costs. This leads to poverty and greater susceptibility to poor health.

Health

In England, 43% of working-age adults don't have the literacy skills they need to understand and make use of everyday health information (Public Health England, 2015)⁸⁵. In turn, people with low health literacy have a 75% increased risk of dying earlier than people who have high literacy levels (Bostock and Steptoe, 2012)⁸⁶.

Literacy has a strong relationship with health, particularly when it comes to health literacy. Health literacy means having the appropriate skills, knowledge, understanding and confidence to access, understand, evaluate, use and navigate health and social care information and services.

The correlation between literacy and health literacy is high (Baker, 2006)⁸⁷ so it is probable that the same people who struggle with low literacy also struggle with poor health literacy. According to the European Health Literacy Consortium (Sørensen et al., 2012)⁸⁸:

⁸³ Sentell, Halpin (2006) *Importance of Adult Literacy in Understanding Health Disparities*. *Journal of General Internal Medicine*, 21(8): 862-866

⁸⁴ Buck, Jabbal (2014), *Tackling poverty: Making more of the NHS in England*. The King's Fund

⁸⁵ Public Health England and UCL Institute of Health Equity (2015), *Local action on health inequalities Improving health literacy to reduce health inequalities*

⁸⁶ Bostock, Steptoe (2012), *Association between low functional health literacy and mortality in older adults: longitudinal cohort study*. *BMJ*, 344: e1602

⁸⁷ Baker (2006), *The Meaning and the Measure of Health Literacy*. *The Journal of General Internal Medicine*, 21(8): 878-883

⁸⁸ Sørensen et al. (2012), *Health literacy and public health: A systematic review and integration of definitions and models*. *BMC Public Health*

Health literacy is linked to literacy and entails people’s knowledge, motivation and competences to access, understand, appraise and apply health information in order to make judgements and take decisions in everyday life concerning health care, disease prevention and health promotion to maintain or improve quality of life during the life course.

Indeed, the World Health Organization (2013)⁸⁹ suggests that “how limited general literacy affects people’s health cannot always be clearly separated from how limited health literacy affects people’s health.”

In addition, according to the Royal College of General Practitioners, health information is ‘too complex’ for more than 60% of working-age adults to understand, which means that they are unable to understand and use health information effectively⁹⁰. Those with lower levels of health literacy are therefore more likely to suffer from health inequalities that lead to the poorest health outcomes.

Health literacy is also linked to longevity. A report by the People and Communities Board (2017)⁹¹ for NHS England claims that the strongest correlation to ill health – stronger than education level, deprivation, age or ethnicity – is health literacy. Furthermore, limited health literacy has been found to predict behaviours such as poor diet, smoking and a lack of physical activity – independent of age, education, gender, ethnicity and income (Public Health England, 2015)⁹². It has also been linked to other health-related outcomes, such as increased hospitalisations, greater use of emergency care, and a lower ability to demonstrate taking medications appropriately and interpret labels and health messages (Berkman et al., 2011)⁹³.

Using data from the English Longitudinal Study of Ageing, Bostock and Steptoe (2012)⁹⁴ found that:

A third of older adults in England have difficulties reading and understanding basic health-related written information. Poorer understanding is associated with higher mortality.

Their findings showed that adults with low health literacy were more than twice as likely to die within five years compared with adults with no health-literacy limitations. Even after adjusting for cognitive function, low health literacy predicted mortality. Similarly, Berkman and colleagues (2011)⁹⁵ found that differences in health literacy for older people were

⁸⁹ World Health Organization, Regional Office for Europe (2013), [The solid facts: Health literacy](#)

⁹⁰ Royal College of General Practitioners (2014), [Health Literacy: Report from a RCGP-led health literacy workshop](#)

⁹¹ People and Communities Board (2017), [A new relationship with people and communities: Actions for delivering Chapter 2 of the NHS Five Year Forward View](#)

⁹² Public Health England and UCL Institute of Health Equity (2015), [Local action on health inequalities: Improving health literacy to reduce health inequalities](#)

⁹³ Berkman, Sheridan, Donahue, Halpern, Crotty (2011), [Low health literacy and health outcomes: an updated systematic review](#). *Annals of Internal Medicine*, 155(2): 97-107

⁹⁴ Bostock, Steptoe (2012), [Association between low functional health literacy and mortality in older adults: longitudinal cohort study](#). *BMJ*, 344: e1602

⁹⁵ Berkman, Sheridan, Donahue, Halpern, Crotty (2011), [Low health literacy and health outcomes: an updated systematic review](#). *Annals of Internal Medicine*, 155(2): 97-107

associated with higher mortality rates. Moreover, Bostock and Steptoe (2012)⁹⁶ found that, compared with high health literacy, people low and medium health literacy were at a 75% and 24% increased risk of mortality respectively. Therefore, improving literacy would improve health literacy, which in turn could lead to increased life expectancy.

Having established a relationship between literacy and life expectancy through socioeconomic factors and health, we conducted new analysis of national data sets to explore how deep this relationship goes. Our findings are outlined in the next section of this report.

Identifying inequalities in literacy and life expectancy throughout England

In 2017, we worked with Experian to pinpoint the communities in England with the most acute literacy problems⁹⁷. We analysed data from Experian's socio-demographic classification system, *Mosaic*, and the 2011 census on the social factors most closely associated with low literacy: low levels of education, low income and high unemployment. From this analysis, we created a *literacy vulnerability score* for every parliamentary constituency and electoral ward in England.

We found that – far from being restricted to regions of low income, low employment and social deprivation – the nation's literacy crisis is in fact intensely localised, with 86% of constituencies in England containing at least one ward with serious literacy challenges.

For the purposes of this report, we have mapped the *literacy vulnerability scores* of every region, local area and ward in England against the corresponding life expectancy figures from the ONS and Public Health England⁹⁸ to explore the strength of the connection between inequalities in literacy and life expectancy. This is the first analysis of its kind⁹⁹.

Inequalities at a regional level

Starting at a regional level, our analysis with Experian found that London (61.4%), the North East (60.8%) and the North West (43.3%) contained the highest number of wards in the top three deciles of literacy vulnerability in England, whilst the South West (11.6%) and the South East (16%) contained the fewest wards in the top three deciles of literacy need¹⁰⁰ (see **Table 1**).

⁹⁶ Bostock, Steptoe (2012), [Association between low functional health literacy and mortality in older adults: longitudinal cohort study](#). *BMJ*, 344: e1602

⁹⁷ National Literacy Trust and Experian (2017), [Literacy score – Identifying the places with the greatest literacy need](#)

⁹⁸ Public Health England, Local Health website: <http://localhealth.org.uk/>

⁹⁹ Across 6,538 wards in England, we mapped Experian's *literacy vulnerability scores* against the ONS and Public Health England's data on the life expectancies of men and women at birth in England between 2011 and 2015. 1,169 wards out of 7,707 in England were excluded from the analysis due to no corresponding data across the two data sets.

¹⁰⁰ Local areas with the highest *literacy vulnerability scores* are at the greatest risk of serious literacy problems and sit within deciles 1-3 of literacy vulnerability; local areas with the lowest *literacy vulnerability scores* are deemed to be at the least risk of serious literacy problems and sit within deciles 8-10 of literacy vulnerability.

Table 1: Regions in England with the greatest vulnerability to literacy issues

Rank*	Region	% of wards in top three deciles of literacy vulnerability
1	London	61.4
2	North East	60.8
3	North West	43.3
4	Yorkshire and the Humber	39.3
5	West Midlands	36.7
6	East Midlands	29
7	East	19.9
8	South East	16
9	South West	11.6

* Where 1 = greatest literacy vulnerability

Source: Experian and the National Literacy Trust (2017)

Our subsequent analysis of ONS data on life expectancy from birth for men and women in England found the same regional divide (see **Table 2**). The majority of local areas in the bottom 50 for lowest life expectancy at birth were in the North East and the North West, whilst the majority of local areas in the top 50 for high life expectancy at birth were the South East, South West and the East of England.

Table 2: Life expectancy at birth for males and females in years in 2012-14 ranked by region in England

Male			Female		
Rank	Region	Life expectancy	Rank	Region	Life expectancy
1	North East	78	1	North East	81.7
2	North West	78.1	2	North West	81.9
3	Yorkshire and The Humber	78.7	3	Yorkshire and The Humber	82.4
4	West Midlands	78.9	4	West Midlands	82.9
5	East Midlands	79.4	5	East Midlands	83
6	South West	80.2	6	East	83.8
7	London	80.3	7	South West	83.9
8	East	80.4	8	South East	84
9	South East	80.5	9	London	84.2

* Where 1 = shortest life expectancy from birth

Source: ONS (2015) Statistical bulletin: Life Expectancy at Birth and at Age 65 by Local Areas in England and Wales: 2012 to 2014

A notable exception is London where life expectancy and literacy need are both relatively high across the board. This could be explained by local areas in London having large and dense populations – at levels not seen elsewhere in the country – which enable greater variance when it comes to demographics as well as education, health and economic wellbeing.

The link between literacy and life expectancy is apparent at a regional level. When we look at the relationship at a local level, we see that it strengthens.

Inequalities at a local level

The most recent figures for life expectancy in England by local area (defined as the 269 lower tier local authorities in England) highlight that Blackpool, Manchester, Middlesbrough,

Liverpool, Blackburn and Burnley are all in the top 10 lowest life expectancy areas for both men and women¹⁰¹ (see **Table 3**). Men in Blackpool (74.2 years) and women in Manchester (79.4 years) have the lowest life expectancy at birth in England.

Mapping this data against the *literacy vulnerability scores* from Experian, we see that local inequalities in life expectancy largely match those found in literacy (also **Table 3**).

Table 3: Shortest life expectancy at birth for men and women in years by local area in England in 2011-2015 and local area literacy vulnerability

Male				Female			
Rank	Local area (lower tier local authority)	Life expectancy	Decile of literacy vulnerability*	Rank	Local area (lower tier local authority)	Life expectancy	Decile of literacy vulnerability*
1	Blackpool	74.2	1	1	Manchester	79.4	1
2	Manchester	75.5	1	2	Blackpool	79.5	1
3	Middlesbrough	75.8	1	3	Middlesbrough	79.6	1
4	Corby	76.1	6	4	Kingston upon Hull, City of	80.1	1
5	Blackburn with Darwen	76.2	3	5 =	Liverpool	80.3	1
6	Kingston upon Hull, City of	76.3	1	5 =	Knowsley	80.3	1
7 =	Liverpool	76.4	1	7 =	Burnley	80.5	2
7 =	Stoke-on-Trent	76.4	1	7 =	Oldham	80.5	2
7 =	Hartlepool	76.4	1	9 =	Rochdale	80.6	1
10 =	Knowsley	76.7	1	9 =	Blackburn with Darwen	80.6	3
10 =	Burnley	76.7	2	9 =	Halton	80.6	2

* Where 1 = decile of greatest literacy vulnerability

Source: ONS (2017) and the National Literacy Trust and Experian (2017)

When comparing the shortest and longest life expectancies of men and women in local areas (lower tier local authorities) across England, we find that men in Kensington and Chelsea are expected to live 9.6 years longer than men in Blackpool, and women in Camden are expected to live 7.4 years longer than women in Manchester (see **Table 4**).

¹⁰¹ ONS (2017), [Health state life expectancies at birth for males and females, United Kingdom, 2014-2016](#)

Table 4: Longest life expectancy at birth for men and women in years by local area in England in 2011-2015 and local area literacy vulnerability

Male				Female			
Rank	Local area (lower tier local authority)	Life expectancy	Decile of literacy vulnerability*	Rank	Local area (lower tier local authority)	Life expectancy	Decile of literacy vulnerability*
1	Kensington and Chelsea	83.7	4	1	Camden	86.8	3
2	East Dorset	82.9	10	2	Kensington and Chelsea	86.4	4
3	Chiltern	82.7	10	3	Hart	86.3	10
4 =	Hart	82.5	10	4 =	Westminster	86	5
4 =	Harrow	82.5	5	4 =	Chiltern	86	10
6	Westminster	82.4	5	6 =	Richmond upon Thames	85.9	8
7 =	Vale of White Horse	82.3	10	6 =	Harrow	85.9	5
7 =	South Cambridgeshire	82.3	10	8 =	East Dorset	85.6	10
7 =	Richmond upon Thames	82.3	8	10 =	East Hertfordshire	85.5	8
-	-	-	-	10 =	Hambleton	85.5	9
-	-	-	-	10 =	South Oxfordshire	85.5	8

* Where 1 = decile of greatest literacy vulnerability

Source: ONS (2017) and the National Literacy Trust and Experian (2017)

These findings show that boys and girls born in local areas with the lowest life expectancies in England are far more likely to face serious literacy problems as they grow up than their peers born in places with the highest life expectancies. This link is strongest at the bottom end of the scale.

Notable exceptions are local areas in London where life expectancy and literacy need are both relatively high across the board. This could be explained by local areas in London having large and dense populations – at levels not seen elsewhere in the country – which enable greater variance when it comes to demographics as well as education, health and economic wellbeing.

Inequalities at ward level

We know from our work with Experian that 86% of local areas in England contain at least one ward with significant literacy problems. Our new analysis of ward-level life expectancy data shows a remarkably similar pattern, with inequalities in life expectancy deeply entrenched in communities.

Spotlight on Middlesbrough

Middlesbrough is one of the most disadvantaged local authority areas in England (2015 Index of Multiple Deprivation)¹⁰². It has the highest proportion of neighbourhoods among the most deprived in England (49%) and a third (35.7%) of children live in income-deprived households. In 2013, we established our first National Literacy Trust Hub in Middlesbrough,

¹⁰² Ministry of Housing, Communities and Local Government, [English indices of deprivation 2015](#)

branded the *Middlesbrough Reading Campaign*, to break the cycle of poverty and intergenerational low literacy that impacts on children’s life chances.

Boys and girls born in Middlesbrough have some of the lowest life expectancies and most serious vulnerabilities to literacy problems in the country. When we look at life expectancy and literacy vulnerability within the different wards of the city, we see huge inequalities (see **Table 5**).

A boy born in the ward of Marton East in Middlesbrough is expected to live **11.6 years longer** than a boy born just 2 miles away in the ward of North Ormesby; for girls, this gap is **9.4 years**. Not only are children expected to live longer than their peers in North Ormesby, but they are also significantly less likely to face serious literacy problems as they grow up, with their ward ranking in the eighth decile of literacy need compared with North Ormesby in the first decile of need.

Table 5: Literacy vulnerability and life expectancy at birth for men and women (2011-2015) in Middlesbrough¹⁰³

Ward	Male life expectancy at birth	Female life expectancy at birth	Decile of literacy vulnerability*
North Ormesby	71.4	76.5	1
Park End & Beckfield	74.3	80.1	1
Park	75.4	77	1
Ladgate	76.8	81.7	1
Stainton & Thornton	78	79.1	2
Ayresome	78.2	81.3	1
Hemlington	78.2	84.3	1
Coulby Newham	78.7	78.7	3
Kader	80.9	84.7	6
Acklam	81.9	85.3	6
Nunthorpe	81.9	84.9	7
Marton West	82	84.7	8
Marton East	83	85.9	8

* Where 1 = decile of greatest literacy vulnerability

Source: ONS (2017) and the National Literacy Trust and Experian (2017)

Comparison of wards across England

The inequalities identified in Middlesbrough are also apparent between wards from different parts of the country (see **Appendix A**).

Starkly, a boy born in Stockton Town Centre (which ranks in decile 1 for literacy vulnerability) has a life expectancy of 64 years, which is **26.1 years shorter** than a boy born in North Oxford (which ranks in decile 10 for literacy vulnerability) who has a life expectancy of 90.1 years.

¹⁰³ The data in Table 5 represents all of the wards in Middlesbrough for which we have both Experian literacy vulnerability scores and ONS/Public Health England data on life expectancies of men and women at birth between 2011 and 2015. For this reason, the following wards in Middlesbrough are not included in this analysis: Berwick Hills and Pallister, Brambles and Thorntree, Central, Longlands and Beechwood, Newport and Trimdon.

Similarly, a girl born in Queensgate, Burnley (decile 1 for literacy vulnerability) has a life expectancy of 72.1 years, which is **20.9 years shorter** than a girl born in Mayfield, Wealdon (decile 10 for literacy vulnerability) who has a life expectancy of 93 years.

Similar inequalities in literacy and life expectancy exist in other parts of the UK. In 2008, the World Health Organization reported that a boy growing up in a very deprived part of Glasgow (Calton) had a life expectancy **28 years shorter** than that of a boy growing up in an affluent part of Glasgow (Lenzie) only a few miles away¹⁰⁴. The city's stark health and life expectancy disparities have earned it the label, 'the Glasgow effect'.

Applying our new knowledge of the relationship between low life expectancy and low literacy to this example, the Scottish Index of Multiple Deprivation 2016¹⁰⁵ shows that Calton has some of the worst levels of education and skills¹⁰⁶ in the city (ranking in the first decile of need) compared with Lenzie which has some of the best (ranking in the ninth decile).

It is clear from our analysis that the most socially and economically disadvantaged groups in our society are at the highest risk of low literacy and low health literacy, and have the poorest health outcomes and lowest life expectancies.

Conclusion

Literacy and life expectancy underscores the importance of health and socioeconomic factors as vital transmission mechanisms between literacy and life expectancy.

Furthermore, our analysis shows that inequalities in the nation's life expectancy and literacy levels are deep-rooted in local communities. This relationship is intense and focused on specific communities. Our experience shows us that local solutions are needed to address local literacy challenges, so we believe this localised approach will start to reduce the inequalities in life expectancy that exist throughout the country.

Having worked with local partners to tackle community literacy challenges since 1995, we launched our first National Literacy Trust Hub in Middlesbrough in 2013. After extensive scoping activity to identify the area's specific literacy challenges, we brought together local businesses, plus health, school, housing, sport and cultural partners in a long-term campaign to change literacy levels in the city.

Five-year-olds in Middlesbrough have some of the lowest communication, language and literacy skills in the country. This means these children start school at a real disadvantage, from which most don't recover during their school life.

¹⁰⁴ Marmot (2008), [Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health](#). World Health Organization

¹⁰⁵ Scottish Government (2016), [Scottish Index of Multiple Deprivation 2016](#)

¹⁰⁶ In the absence of Experian *literacy vulnerability scores* for Scotland, we have used levels of education and skills as a proxy for literacy vulnerability. It is important to note that we have used education levels alone here, whereas the literacy vulnerability scores used earlier in the report amalgamate education levels with income, employment and housing factors.

To address this challenge, the National Literacy Trust Hub in Middlesbrough, branded the *Middlesbrough Reading Campaign*, ran an early-intervention programme in nurseries throughout the town alongside a public-awareness campaign to get parents reading with their child from birth.

As a result, the percentage of children reaching the expected level of language and communication by the age of five has risen 31% since 2013 – that’s more than twice the increase seen nationally (14%) during this time.

We have subsequently launched National Literacy Trust Hubs in Bradford, Peterborough and Stoke-on-Trent, as well as regional campaigns in Manchester and the North East.

Whilst we are beginning to see real improvements in the communities where we have established local campaigns, as this report highlights, it is just the tip of the iceberg. We need to redouble our efforts. As a starting point, during 2018, we have and will be launching new literacy campaigns in social mobility cold spots across the UK, starting in Swindon and Nottingham, to mark our 25th anniversary year.

The Department for Education has adopted this same place-based approach to tackling inequality and improving social mobility for its Opportunity Areas strategy¹⁰⁷, as have Save the Children UK for its Children’s Communities programme¹⁰⁸ and a host of local community-led groups. These initiatives all share an analysis that inequality is related to geographical community and that solutions need to be tailored to local need and built on local assets.

This report demonstrates the extreme gravity of local inequality and makes the challenge to close the literacy gap between communities. By closing gaps in education, employment and health at a local level, we can ensure that every child has the chance to live a happy, healthy, successful and long life, regardless of their background.

¹⁰⁷ Department for Education (2017), [Social mobility and opportunity areas](#)

¹⁰⁸ Save the Children, [Children’s Communities](#)

Appendix A

The 20 shortest and longest life expectancies at birth for men and women by ward in England and literacy vulnerability

20 shortest life expectancies at birth for men and women in years by ward in England in 2011-2015 mapped against literacy vulnerability of ward

Male				Female			
Rank	Ward	Life expectancy	Decile of literacy vulnerability*	Rank	Ward	Life expectancy	Decile of literacy vulnerability*
1	Stockton Town Centre; Stockton-on-Tees	64	1	1	Queensgate; Burnley, Lancashire	72.1	1
2	Bloomfield; Blackpool	65.8	1	2	Stockton Town Centre; Stockton-on-Tees	73.6	1
3 =	Talbot; Blackpool	69.4	1	3	Spring Hill; Hyndburn, Lancashire	73.9	1
3 =	Waterloo; Blackpool	69.4	1	4	Riverside; Halton	75	1
5	St Andrew's; Kingston upon Hull, City of	69.5	1	5 =	Central; Barrow-in-Furness, Cumbria	75.3	1
6 =	Ilfracombe Central; North Devon, Devon	70.2	10	5 =	Moss Bay; Allerdale, Cumbria	75.3	1
6 =	Pier; Tendring, Essex	70.2	1	7	Mirehouse; Copeland, Cumbria	75.5	1
8 =	Claremont; Blackpool	70.5	1	8	East Marsh; North East Lincolnshire	75.7	1
8 =	Miles Platting and Newton Heath; Manchester	70.5	1	9 =	St Peter's; Tameside	75.8	1
10 =	Central; Hyndburn, Lancashire	70.8	2	9 =	Glastonbury St Benedict's; Mendip, Somerset	75.8	3
10 =	Westgate; Newcastle upon Tyne	70.8	2	11 =	St Andrew's; Kingston upon Hull, City of	75.9	1
12 =	Hindpool; Barrow-in-Furness, Cumbria	70.9	1	11 =	Margate Central; Thanet, Kent	75.9	1
12 =	St Peter's; Tameside	70.9	1	11 =	Burham and Wouldham; Tonbridge and Malling, Kent	75.9	5
14 =	Linacre; Sefton	71	1	11 =	Headingley; Leeds	75.9	7
14 =	Poulton; Lancaster, Lancashire	71	1	15	Chapel St Leonards; East Lindsey, Lincolnshire	76	4
16	Central; Barrow-in-Furness, Cumbria	71.1	1	16	Chester City; Cheshire West and Chester	76.1	4
17 =	Burslem Central; Stoke-on-Trent	71.2	1	17 =	Poulton; Lancaster, Lancashire	76.2	1
17 =	Hendon; Sunderland	71.2	1	17 =	Kingswood; Stroud, Gloucestershire	76.2	10
19 =	Earcroft; Blackburn with Darwen	71.3	1	19 =	Miles Platting and Newton Heath; Manchester	76.3	1
19 =	Weston-super-Mare Central; North Somerset	71.3	1	19 =	Linacre; Sefton	76.3	1
-	-	-	-	19 =	Croft; Northumberland	76.3	1

* Where 1 = decile of greatest literacy vulnerability

Source: ONS (2017) and the National Literacy Trust and Experian (2017)

20 longest life expectancies at birth for men and women in years by ward in England in 2011-2015 mapped against literacy vulnerability of ward

Male				Female			
Rank	Ward	Life expectancy	Decile of literacy vulnerability*	Rank	Ward	Life expectancy	Decile of literacy vulnerability*
1	Courtfield; Kensington and Chelsea	91.9	5	1	Alconbury and The Stukeleys; Huntingdonshire, Cambridgeshire	95.7	8
2	Norland; Kensington and Chelsea	90.6	3	2 =	Kingsgate; Thanet, Kent	94.8	7
3	North; Oxford, Oxfordshire	90.1	10	2 =	Town; South Norfolk, Norfolk	94.8	9
4	Pound Hill South and Worth; Crawley, West Sussex	90	8	4	Barton; South Cambridgeshire, Cambridgeshire	93.9	9
5	Broughton Astley-Astley; Harborough, Leicestershire	89.4	10	5 =	Rowlands Castle; East Hampshire, Hampshire	93.8	9
6	Cripplegate; City of London	89.3	6	5 =	Rogate; Chichester, West Sussex	93.8	9
7	Downland; East Hampshire, Hampshire	89.2	10	7	Winkleigh; Torridge, Devon	93.7	7
8	Ducklington; West Oxfordshire, Oxfordshire	89.1	9	8	Detling and Thurnham; Maidstone, Kent	93.3	9
9 =	Bishop Monkton; Harrogate, North Yorkshire	88.7	10	9 =	Greater Marlow; Wycombe, Buckinghamshire	93.1	9
9 =	Queen's Gate; Kensington and Chelsea	88.7	6	9 =	Laverstock, Ford and Old Sarum; Wiltshire	93.1	6
9 =	Alton Whitedown; East Hampshire, Hampshire	88.7	9	9 =	Oakham South East; Rutland	93.1	6
12	Bury; Chichester, West Sussex	88.5	10	12	Mayfield; Wealden, East Sussex	93	10
13 =	Marchwood; New Forest, Hampshire	87.8	6	13	Pattingham and Patshull; South Staffordshire, Staffordshire	92.8	7
13 =	Riverview; Gravesham, Kent	87.8	8	14	Plumstead; Broadland, Norfolk	92.7	8
15	Campden; Kensington and Chelsea	87.7	5	15 =	Boley Park; Lichfield, Staffordshire	92.5	8
16	Sleaford Quarrington and Mareham; North Kesteven, Lincolnshire	87.5	7	15 =	Weald North; Ashford, Kent	92.5	8
17 =	Newton Poppleford and Harpford; East Devon, Devon	87.4	9	15 =	Cripplegate; City of London	92.3	6
17 =	Great Barton; St Edmundsbury, Suffolk	87.4	10	18 =	Bashley; New Forest, Hampshire	92	9
19	Tattenhall; Cheshire West and Chester	87.3	10	18 =	Warboys and Bury; Huntingdonshire, Cambridgeshire	92	9
19 =	Brompton & Hans Town; Kensington and Chelsea	87.3	4	20	Hertford Rural South; East Hertfordshire, Hertfordshire	91.9	8

* Where 1 = decile of greatest literacy vulnerability

Source: ONS (2017) and the National Literacy Trust and Experian (2017)