

**Well-being patterns uncovered:**  
An analysis of UK data

**nef** is an independent think-and-do tank that inspires and demonstrates real economic well-being.

We aim to improve quality of life by promoting innovative solutions that challenge mainstream thinking on economic, environmental and social issues. We work in partnership and put people and the planet first.

## **nef** programme areas:



Climate Change  
and Energy



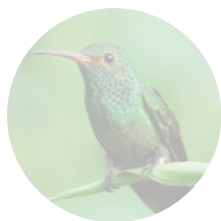
Connected  
Economies



Democracy and  
Participation



Finance and  
Business



Natural  
Economies



Social Policy



Valuing What  
Matters



Well-being

**nef** (the new economics foundation) is a registered charity founded in 1986 by the leaders of The Other Economic Summit (TOES), which forced issues such as international debt onto the agenda of the G8 summit meetings. It has taken a lead in helping establish new coalitions and organisations such as the Jubilee 2000 debt campaign; the Ethical Trading Initiative; the UK Social Investment Forum; and new ways to measure social and economic well-being.



## Contents

<b>Executive summary</b>	<b>2</b>
<b>1. Introduction</b>	<b>4</b>
<b>2. Subjective well-being in the Annual Population Survey</b>	<b>8</b>
<b>3. An overview of well-being in the UK</b>	<b>10</b>
<b>4. Ethnicity</b>	<b>13</b>
<b>5. Employment and Unemployment</b>	<b>17</b>
<b>6. Working Hours</b>	<b>23</b>
<b>7. Place and geography</b>	<b>28</b>
<b>8. Inequality in well-being</b>	<b>35</b>
<b>9. Findings and recommendations</b>	<b>39</b>
<b>Glossary</b>	<b>42</b>
<b>Technical Appendix</b>	<b>44</b>
<b>Further reading</b>	<b>47</b>
<b>Endnotes</b>	<b>49</b>

# Executive summary

The UK has a unique resource. As of April 2011, the UK's largest survey, the Annual Population Survey (APS), has included four questions on subjective well-being. The data from the survey will allow analysts both inside and outside government to better understand the determinants of well-being.

This will provide opportunities to:

1. Identify policies that are likely to lead to improving population well-being.
2. Identify population groups with low well-being and for whom targeted action may be appropriate.
3. Highlight population groups and areas with high well-being that might provide clues for others to learn from.

This report presents an analysis of these data by **nef** (the new economics foundation). It provides an overview of well-being in the UK, and uncovers interesting patterns related to ethnicity, employment patterns, working hours, local variation in well-being, and well-being inequality.

The subjective well-being questions in the APS ask:

- Overall, how **satisfied** are you with your life nowadays?
- Overall, how **happy** did you feel yesterday?
- Overall, how **anxious** did you feel yesterday?
- Overall, to what extent do you feel the things you do in your life are **worthwhile**?

Together, these four questions measure a range of well-being dimensions – hedonic, evaluative, and eudaimonic. As well as examining the different patterns of these measures, we combine them into a measure of overall well-being. Below are some of our key findings.

## Disability

- Our analysis shows that one of the biggest determinants of well-being is disability. **Having a disability reduces life satisfaction** by 0.70 points, increases anxiety by 0.81, and decreases overall well-being by 0.66.

## Ethnicity

- We find that **Black, Arab, Bangladeshi, Pakistani, and Indian people experience significantly lower well-being** than White people in the UK, even when controlling for individual characteristics (excluding household income which is not measured in the survey). In other words, two people with similar socioeconomic situations are likely to have differing well-being depending on their ethnic group.

## Impact of work

- Individuals who are unemployed experience significantly lower well-being. The **well-being of those who have been unemployed for more than six months is significantly lower** than those who have been unemployed for less time.

- **Individuals who have temporary employment contracts experience lower well-being** than those who do not, even when controlling for other factors.
- Public sector workers find their lives more satisfying and feel that what they do is more worthwhile than those in the private sector, and those working in local government experience higher levels of well-being than those working in central government or the civil service.
- **Individuals who work part-time out of choice experience higher levels of well-being** than those who work full-time, even when controlling for other factors.
- Controlling for other factors, **those who work very long hours (over 55 hours per week) experience lower levels of happiness and higher levels of anxiety** than those working more typical hours, but they also feel that what they do in life is more worthwhile. Even below this threshold, there is a negative association between working hours and happiness, and a positive association between working hours and levels of anxiety.
- **Being retired has a large positive effect on well-being**, with overall well-being 0.79 points higher for retired people than for economically inactive people, all else being equal. Compared to employed people, retired people have an overall well-being score of 0.26 higher.

### Local variation

- All other things being equal, **people living in rural areas have higher well-being** than those in urban areas.
- The highest proportion of people who score well on all four measures and the lowest proportion of people scoring badly on at least one measure are to be found on the small islands of the British Isles and the northern and southern coastal extremities of the country. **The lowest levels of well-being are found in London and the Welsh Valleys.** At regional level, these differences are statistically significant even when controlling for individual and household characteristics, with Scotland, Northern Ireland and the South West having higher than expected well-being, and London having lower than expected well-being.
- An area's *Index of Multiple Deprivation* is a strong predictor of well-being, with crime and low income being the most important elements of deprivation. Much remains unexplained by these objective metrics, however, highlighting the importance of using subjective well-being measures to assess the situation in different parts of the country.

### Well-being inequalities

- The average well-being of those in the bottom 20% of the well-being distribution is 4.8 – compared to 9.5 for those in the top 20%. This is a difference of 4.6 points.
- **Well-being inequality is highest in the Welsh Valleys and in and around Glasgow.** The existence of local well-being inequalities suggests that local areas should seek to better understand who are the people with high and low well-being in their areas, and explore methods for reducing well-being inequality. Areas with high well-being inequality are not necessarily those with high income inequality, and vice versa.
- Relatively high levels of inequality in well-being are found amongst older age groups, demonstrating that they should not be neglected in well-being analyses.

The government has signalled that it sees its role to be about enhancing the well-being of the population. Given that role, these results will be invaluable, not only to policymakers seeking to improve well-being, but for civil society organisations and advocacy groups that want to hold the government to account. Well-being is no longer a vague concept; it is something that can be measured, assessed, and ultimately improved.

# 1. Introduction

The UK has a unique resource. In April 2011, the UK Office of National Statistics (ONS) began collecting data on people's subjective well-being – their assessments of their overall experience of life – in its largest national survey, the Annual Population Survey (APS).

The data, made available this autumn, provide invaluable insights into the well-being of the nation. In the context of a growing field of research in subjective well-being, they offer lessons and direction for any government policymakers looking to improve the well-being of the UK's population. The potential to identify population groups and areas of the country with lower or higher well-being is important, not just for central and local government, but also for advocacy and civil society groups.

Like anything new, it will take time for the full potential of these data to be realised. The aim of this report is to help potential users take the first steps by highlighting some of the stories that come out of the data; stories that could be of interest for policymakers and advocates alike. This is not meant to be a thorough presentation of *all* the data. Rather, we've chosen to explore a few themes where we found interesting results: ethnicity, employment patterns, working hours, local variation in well-being, and well-being inequality.

## Why gather well-being data?

Subjective well-being data are useful because they provide an overall assessment of how people are doing without directing respondents' thoughts to particular aspects of their lives (Chapter 2 outlines the four subjective well-being questions used in the APS). Respondents decide for themselves what is important and respond accordingly. By analysing the subjective well-being data in conjunction with other information from the survey, we can identify the features of people's lives that are associated with higher or lower well-being. For example, we can look at whether people living in urban or rural areas have higher well-being. We do not need to ask people directly where they would like to live, but rather compare their levels of well-being. If people in rural areas tend to report having higher well-being than those in urban areas (which they do), then we can assume that there is some advantage to rural life. If, as we explain in the Technical Appendix, we also 'control' for other factors, such as education level and employment status, essentially holding their effects constant, then we can test whether those in rural areas have higher well-being simply because they are more likely to be employed, or have higher levels of education. This allows us to model a comparison between two notional people who are identical in every way except for whether they live in a rural area or an urban area. If there is *still* a difference in well-being between them, there is good reason to believe that this difference has something to do with where they live.

This kind of information is useful for policymakers for at least three reasons:

1. It will help them identify what kinds of policies are likely to lead to improved population well-being. The example quoted would suggest that policies which encourage migration from rural areas to urban areas would, all else remaining the same, not have a positive effect on well-being in the UK. The data we present in this report provide evidence of this type in relation to working conditions and working hours.
2. It will help identify population groups with low well-being – thus highlighting where targeted action may be required. This report looks at ethnicities and localities with low well-being in the UK.

3. Highlighting which population groups have *high* well-being can provide clues as to what policies or activities may enhance well-being for the population as a whole.

Of course, the value of the survey will grow year-on-year as it provides a tool for monitoring the development of well-being in the UK over time and for holding governments to account for their impact on well-being. As similar data begin to be collected across the world, they will allow robust comparisons between countries and between population groups within countries.

### The rise of well-being

In November 2010, the ONS launched the Measuring National Well-Being Programme. The Programme's aims are to produce a comprehensive suite of measures to complement GDP (Gross Domestic Product) as a headline policy indicator, 'provide a fuller understanding of how society is doing', and help people understand and discuss what is important to the country.<sup>1,2</sup> In the words of Prime Minister David Cameron speaking at the outset of the programme, no longer would we measure our progress as a country 'just by how our economy is growing, but by how our lives are improving, not just by our standard of living, but by our quality of life'.<sup>3</sup>

The Programme has included a public consultation to identify the key domains of quality of life and technical work such as developing measures of human capital and enhancing environmental accounting. The inclusion of four subjective well-being questions in the ONS's largest social survey, the APS, however, is perhaps the best known part of this programme. With over 160 000 respondents, this is now the biggest national survey in the world that includes subjective well-being items.

The initiative did not come out of the blue. Academics and civil society organisations have been calling for governments to measure progress differently for a long time.<sup>4,5,6,7,8</sup> **nef**, for example, developed the Happy Planet Index in 2006, which measures the ecological resource efficiency with which countries achieve long and happy lives for their citizens.<sup>9</sup>

The Department for Environment, Food and Rural Affairs (Defra) began exploring alternative indicators of progress in 2007, and a well-being working group was set up across Whitehall. In 2009, Liberal Democrat MP Jo Swinson established an All-Party Parliamentary Group on Wellbeing Economics. Across the Channel, in France, then President Nicolas Sarkozy set up a high-level commission including five Nobel Prize winners, to produce recommendations on revising the measurement of economic performance and social progress.

At the international level, the European Commission and the Organisation for Economic Co-operation and Development (OECD) have both begun to focus on well-being measurement, the latter calling for a 'commitment to measuring and fostering the progress of societies in all dimensions, with the ultimate goal of improving policy-making, democracy and citizens' wellbeing'.<sup>10</sup> The OECD has continued to work in this area, producing a set of guidelines on measuring and using subjective well-being.<sup>11</sup> The European Statistics Agency, Eurostat, has also continued work on measuring well-being, and intends to launch a first set of indicators early in 2013. In the same year, two of the well-being questions included in the UK survey will also be asked in a well-being module in the largest official social survey carried out across the European Union.<sup>12</sup>

## Box 1. Why subjective well-being?

Assessing someone's well-being by directly asking them how their life is going may seem like an obvious thing to do, but it is only recently that it has begun to receive serious policy attention. There are many reasons why *subjective* well-being should and can be used in policy:

1 Well-being is inherently subjective. It is people that experience, or don't experience well-being. As such, one cannot assess well-being without taking people's judgements into consideration. Imagine if somebody were to ask you a series of questions about various aspects of your life (your income, your job, your education, your marital status), and then, based on your responses tell you – 'I conclude that you have high well-being.' They may be right, but they could also be wrong – whatever your objective circumstances, you might not feel pleased with your life. The validity of their judgement can only be tested based on your assessment of your well-being. As the UN World Happiness Report states:

*'The most fundamental indicator of your happiness is how happy YOU feel, not whether others see you smiling, your family thinks you are happy, or you have all the presumed material advantages of a good life.'*<sup>13</sup>

2 The importance of incorporating a subjective approach is most apparent when considering what the alternative approach would be. In the past, statisticians and policymakers have focused on 'objective' indicators – things like GDP, life expectancy, and education expenditure, and used these to assess well-being. Which indicators are used is typically decided by researchers, policymakers or 'expert groups'. This can be paternalistic. Instead, asking people directly how they feel allows them to decide what is important to them and respond accordingly.

3 Feeling like life is going well is universally desirable.<sup>14</sup> Of course, not everyone will agree on the means of achieving this goal – for example, for some it might entail living in the countryside, for others it might entail living in a town or city – but it is clear that almost everyone has a desire that their own lives go well.

4 Evidence suggests that people believe that government has a role to play in supporting people to achieve high well-being. A survey conducted by a leading market research agency in 2006 found that 81% of people supported the idea that the government's primary aim should be the 'greatest happiness' rather than the 'greatest wealth'.<sup>15</sup> The French think tank *La Fabrique Spinoza* reports that 75% of French survey respondents think that a measure of well-being which combines objective measures with levels of satisfaction would be valuable to guide policymakers.<sup>16</sup>

5 Consensus is emerging, both in academia and amongst leading statistical bodies, that whilst subjective well-being has to be measured with care, good measurement is valid and reliable.<sup>17,18,19,20,21</sup> Subjective well-being measures correlate with things you would expect, such as income and social capital. They can be validated with other measures such as observer judgements and brain scans;<sup>22</sup> they can change over one's life course;<sup>23</sup> and they even predict future outcomes, such as longevity.<sup>24</sup> Whilst there appear to be some cultural biases influencing how people respond to subjective well-being items,<sup>25</sup> these seem to depend on the questions asked and are small enough not to invalidate analyses.

For more on the case for measuring subjective well-being, look out for the forthcoming OECD *Guidelines for Measuring Subjective Well-Being*, as well as **nef's** *Measuring our Progress* report.

### This report

The next chapter of this report explains how subjective well-being is being measured by the ONS and how we have combined the measures into an overall indicator of well-being. Following that, Chapter 3 provides a brief overview of the basic results from the survey. Afterwards, five chapters present stories in the following five domains:

- Ethnicity (Chapter 4)
- Employment and unemployment (Chapter 5)
- Working hours (Chapter 6)
- Place and geography (Chapter 7)
- Well-being inequality (Chapter 8)



The final chapter (Chapter 9) provides an overall summary of the implications of the results, and includes suggestions for the ONS on the measurement process itself. The survey questions on which this analysis is based are classified as 'experimental statistics', meaning that they are still work in progress. The more analysis carried out in the early stages, the better the refinements will be to the questions and the methodology, so as to ensure that the UK develops a robust set of indicators to assess how the population of the country is doing.

The report includes a section entitled 'Further reading' which brings together useful papers and reviews which explore the drivers of well-being discussed here. There is also a glossary of technical terms.

## Box 2. The work of the Centre for Well-being at **nef**.

**nef** has been promoting the idea that well-being data can be a useful guide for policy-making for a decade, and is recognised internationally as a leader in the field. In 2004, our *Well-Being Manifesto* first posed the question of how policy could be different if promoting people's well-being was the government's main aim. The ground-breaking *Happy Planet Index*, measuring the resource efficiency with which countries produce well-being for their citizens, was launched in 2006, receiving coverage worldwide and generating interest in many businesses, governments, universities and NGOs. The *National of Accounts of Well-Being* in 2009 represented the first attempt to construct a detailed set of subjective accounts of well-being for countries across Europe.

Our response to the ONS National Debate on Measuring National Well-being, *Measuring our Progress*, a report described by the UK's National Statistician Jil Matheson as "a fantastic contribution", put well-being in the context of an overall framework for measuring progress. **nef** has been at the forefront of calls for the ONS to measure well-being, and has been involved in shaping the approach that the ONS has taken in doing so, sitting on the Technical Advisory Group convened by the ONS to shape their work. We also advise Eurostat, the European statistics agency, sitting on the Expert Group for measuring quality of life.

Measuring well-being, of course, is not just something for central government to do. Much of our work has involved helping local bodies across the UK to collect data on well-being and understand it, including Dumfries and Galloway, Caerphilly, Torfaen, Lambeth and Hampshire, to name a few. And we've worked with many in the third sector, including the Big Lottery Fund, Action for Children, Shelter, UNICEF, and Oxfam. Our work on well-being also extends beyond measurement. The *Five Ways to Well-Being*, developed by **nef** for the Government Office for Science, has become a widespread tool for communicating about well-being and shaping services to promote it, inspiring work from New Zealand to Norway.

For more information, see [www.neweconomics.org/programmes/well-being](http://www.neweconomics.org/programmes/well-being)

## 2. Subjective well-being in the Annual Population Survey

The APS uses four subjective well-being questions, representing three different philosophies and theories for understanding well-being – hedonic, eudaimonic and evaluative. Experts are now building a consensus that these three philosophies are complementary and that a full picture of well-being should involve all of them.<sup>26,27,28</sup>

The four questions are as follows:

- Overall, how **satisfied** are you with your life nowadays? (evaluative)
- Overall, how **happy** did you feel yesterday? (hedonic)
- Overall, how **anxious** did you feel yesterday? (hedonic)
- Overall, to what extent do you feel the things you do in your life are **worthwhile**? (eudaimonic)

All four questions are asked on scales of 0 to 10, where 10 is the maximum and 0 is the minimum. As such, the highest well-being is indicated by high scores for three of the questions (satisfaction, happiness and worthwhile), and by low scores in the anxiety question.

The **hedonic** school of well-being<sup>29</sup> stresses the importance of frequent positive emotion (e.g. happiness), and infrequent negative emotion (e.g. anxiety). Because people have been found to be rather poor at remembering their past emotions, researchers have advocated that such questions are asked only about the very recent past. The fact that the respondent may have had an unusually good or bad day yesterday doesn't matter when over 160 000 respondents are being interviewed – it should all average out.

The **eudaimonic** school of well-being<sup>30,31,32</sup> argues that one should consider more than just emotions, and that an understanding of well-being involves what it takes to 'live well' such as a sense of meaning, self-worth, autonomy, relatedness, and engagement. Eudaimonic well-being is typically understood as multi-dimensional, but given the costs attached to the inclusion of additional questions in large surveys, the ONS has only included one eudaimonic item in the APS – a question on whether people feel that what they do in life is worthwhile. This is intended to capture the concepts of meaning and purpose in life.

The last question, on satisfaction with life overall, is the most commonly used measure in the science of well-being, and is considered to be an '**evaluative**' question. Respondents are expected to consider everything they believe to be important to their lives and provide an overall evaluation of how their lives are going.

As this report shows, the patterns produced by these four questions can be quite different. This is important – well-being is not unidimensional, and some policies might improve some aspects of well-being while damaging others. Likewise some population groups may experience low well-being in one dimension, but not another.

### Box 3. Scoring well and scoring badly.

What exactly does an average overall well-being score of 7.2 mean? For an analyst working on well-being this may not be too hard a question. But to the wider public, the figure 7.2 does not mean all that much.

That's why in this report we often report another type of statistic: the percentage of people scoring well and scoring badly across the well-being measures. This allows us to talk about percentages of people, rather than averages of well-being – which we think has a more intuitive, immediate meaning that is easier to communicate.

Using the APS data, we define someone as 'scoring well on all four measures' if they score 8 or more out of 10 on the three positively worded questions, and 2 or less on the anxiety question. Hence they have high levels of life satisfaction and happiness yesterday, low levels of anxiety yesterday, and a sense that what they do in life is worthwhile. We define someone as 'scoring badly on at least one measure' if they score 4 or less on any positively worded item, or 6 or more on the anxiety item.<sup>33</sup> Hence they have experienced at least one of low life satisfaction, low happiness yesterday, high anxiety yesterday or not feeling that what they do in life is worthwhile.

We believe that percentage-based statistics (like the ones we have used) are very useful in comparing the well-being of different groups and how well-being changes over time. We expect the precise design of these statistics will evolve over time. Further work is required, for example, on how best to combine well-being measures which cover narrow time periods (such as anxiety yesterday) with those which cover longer time periods (such as life satisfaction). The ONS is currently undertaking cognitive testing on how people respond to well-being questions, which will be helpful in informing improvements to the design of statistics which combine multiple well-being measures.

However, to convey a headline message, we produce an **overall well-being** measure by taking an average of the answers to all four questions.<sup>34</sup> Many of the analyses reported here use this overall well-being measure, which allows patterns to be understood at a single glance. Furthermore, by combining data from four items, the indicator is more sensitive,<sup>35</sup> but also more robust to any individuals responding unusually to any one particular question. An alternative approach would be to report data on just one of the well-being questions, but this would ignore the multi-dimensionality of well-being.

# 3. An overview of well-being in the UK

## Summary

- Across the country, just over one-quarter of the population scores well on all four well-being measures and just over one-quarter of the population scores badly on at least one measure.
- The most important determinants of overall well-being, of those we considered, were disability, age, marital status, and employment status.
- The different measures of well-being displayed different patterns. For example, whilst having children was associated with a positive effect in terms of feeling that what one does in life is worthwhile, it did not have a positive effect in terms of anxiety.

## Introduction

This chapter briefly sets out the main determinants of well-being in the UK according to the model we have constructed from the APS data, and sets the foundations for the analyses carried out in later chapters.

## Scoring well and scoring badly overall

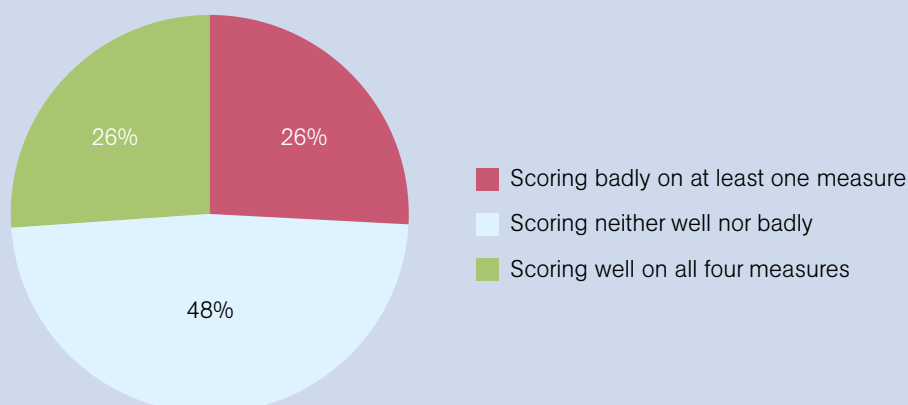
Figure 1 shows that just over a quarter of the population scores well on all four measures, just over a quarter scores badly on at least one measure, leaving just under half of the population scoring neither well or badly.

## Predictors of well-being across the UK

Table 1 presents the results of our statistical model of the relationships between key individual, household, and geographical factors (*variables*) and each of the four subjective well-being measures, as well as the overall well-being score.<sup>36</sup> The colours in the table indicate the strength and direction of each variable (see key). So, based on the first row, we can see women report having higher levels of life satisfaction and happiness than men, and feel more strongly that what they do in life is worthwhile. On the other hand, they report more anxiety than men.








The numbers in the table are the unstandardised coefficients for each variable – the exact size of each effect. So women have, on average, a life satisfaction of 0.13 points higher than men, and an anxiety level of 0.23 points higher (both on scales of 0 to 10). Furthermore, as the results are based on *multivariate regression* (see

Figure 1. Proportions scoring well and badly in the UK.



**Table 1. Effects of individual, household and geographical characteristics on well-being.**

	Life Satisfaction	Happy Yesterday	Anxious Yesterday	Worthwhile	Overall Well-being
Individual and family characteristics					
Female	0.13	0.06	0.23	0.26	0.05
Married or Cohabiting	0.55	0.39	-0.16	0.34	0.36
Divorced or Separated	-0.17	-0.13	0.11	-0.07	-0.12
Widowed	-0.32	-0.32	0.15	-0.09	-0.22
Disability limiting work or day to day activities	-0.70	-0.68	0.81	-0.47	-0.66
No. of dependent children (<19 years)	0.04	0.05	n/s	0.11	0.06
Religion stated	0.14	0.19	n/s	0.21	0.12
Age/5 (effect for younger people)	-0.52	-0.43	0.46	-0.31	-0.43
Age squared/100 (effect for older people)	0.11	0.10	-0.10	0.08	0.10
Housing and local area characteristics:					
Live in urban area (population >25,000)	-0.12	-0.12	0.08	-0.10	-0.10
Homeowner	0.27	0.22	-0.19	0.16	0.21
Highest level of education:					
Degree or Higher Education	0.16	0.16	n/s	0.31	0.16
A-level or equivalent	0.10	0.09	-0.09	0.20	0.12
GCSE or equivalent	n/s	0.07	-0.13	0.14	0.09
Occupational Status (compared to being economically inactive):					
Employed or self-employed	0.58	0.46	-0.48	0.63	0.53
Full-time student	0.61	0.35	n/s	0.63	0.37
Retired	0.87	0.79	-0.87	0.65	0.79
Unemployed (and seeking work)	-0.31	n/s	n/s	-0.09	-0.07
Looking after family	0.47	0.41	-0.46	0.68	0.50

Key <sup>37</sup>	Effect
	<b>Negative (large)</b>
	<b>Negative (moderate)</b>
	<b>Negative (small)</b>
	<b>n/s</b>
	<b>Positive (small)</b>
	<b>Positive (moderate)</b>
	<b>Positive (large)</b>

Technical Appendix for details), these numbers represent independent effects. This means that they represent the differences between two groups when all other variables in the model have been held constant. For example, according to the table, married respondents have a life satisfaction of 0.55 points higher than single respondents. This difference is not to do with age, or education or any other variable – these have all been controlled for. The value of 0.55 therefore represents the difference one would expect to see between two people who are identical in every way (according to the model) except that one is married, and the other is single. For more details on the meaning of the coefficients see Box 4.

All the variables presented in this table come from questions asked within the APS, and are all related to characteristics that have been found in previous research to be related to well-being.<sup>38</sup> One important gap is household income – one of the strongest determinants of well-being. Unfortunately, no question on household income is asked in the APS.<sup>39</sup> In other cases we have chosen to omit variables which are sometimes included in similar models, for example self-assessed health status (see Technical Appendix for details).

Overall, the table highlights that the most important determinants of well-being in this model were disability, age, marital status, and employment status. The following findings are worth highlighting:

- Having a **disability** reduced life satisfaction by 0.70 points, increased anxiety by 0.81, and decreased overall well-being by 0.66.
- **Married/cohabiting** people have a life satisfaction of 0.55 higher than single people. **Widowed** people have life satisfaction of 0.32 lower than people who have not been widowed and therefore 0.86 lower than married/cohabiting people (calculated by combining the effects for being widowed and for being married in the table).
- Being **retired** has a large positive effect (even controlling for age), with overall well-being 0.79 points higher for retired people than for economically inactive people, all else being equal. Compared to employed people, retired people have an overall well-being score of 0.26 higher.
- Being **unemployed**, compared to being inactive, makes little difference, but it makes a huge difference compared to being employed (a deficit of 0.89 for life satisfaction and 0.60 overall).
- All other things being equal, people living in **rural** areas have higher well-being than those in urban areas.

#### Box 4. Understanding the numbers in the table.

Many of the variables in Table 1 are binary variables – which treat each person in the survey as either in or out of a particular category.<sup>40</sup> (You are either female or not female; you are either married/cohabiting, or not married/cohabiting). In the case of education, for each of the three variables, comparisons are being made with people who report not completing their GCSEs. In the case of occupational status, comparisons are made with people who are 'economically inactive' (i.e. they do not have a job and are not looking for one), but are not students or retired or looking after a family. That's why the effect of being unemployed does not appear that big in the table – because it is in comparison with people who are economically inactive.

For three variables in the table, the numbers must be interpreted differently. For the number of dependent children, the figures in the table represent the increase in well-being for each additional child. For age, the figures in the table represent the decline in well-being for each additional five years. However, the relationship between age and well-being is U-shaped.<sup>41</sup> At a certain point, as one gets older well-being stops declining and starts to increase. To represent this effect, a separate variable (age squared) is also introduced into the model. For older respondents (beyond about 50 years) it is this variable that is stronger. For a more detailed explanation, see the Technical Appendix.

## 4. Ethnicity

### Summary

Black, Arab, Bangladeshi, Pakistani, and Indian people experience significantly lower well-being than White people in the UK. The differences are large in size, apply across multiple measures of well-being, and persist even after taking into account a number of factors known to affect well-being such as relationship status, labour market status, and home ownership.

### Introduction

While it is widely recognised that there is considerable variation in poverty rates and health outcomes across different ethnic groups in the UK,<sup>42</sup> there have been very few UK-based studies examining the relationship between well-being and ethnicity. Most of the evidence on this subject comes from the USA, where differences in well-being have been found between White and African Americans (see Further Reading), but there have been relatively few examinations of other ethnicities.

In this chapter, we use the APS data to examine how well-being varies across different ethnic groups in the UK. We first look at the proportions of individuals scoring well and scoring badly across different groups. We then examine differences in individual characteristics (e.g. relationship status, family size, and employment status) across different ethnic groups, and investigate the extent to which these differences might explain the variation in well-being.

The data reveal that well-being levels for those reporting themselves as Arab, Black, Bangladeshi, Indian, and Pakistani are significantly lower than for those reporting themselves as White. The differences are large in size, apply across multiple measures of well-being and persist even after factors known to affect well-being (such as relationship status and employment status) are taken into account.

### Which ethnicities experience lower well-being?

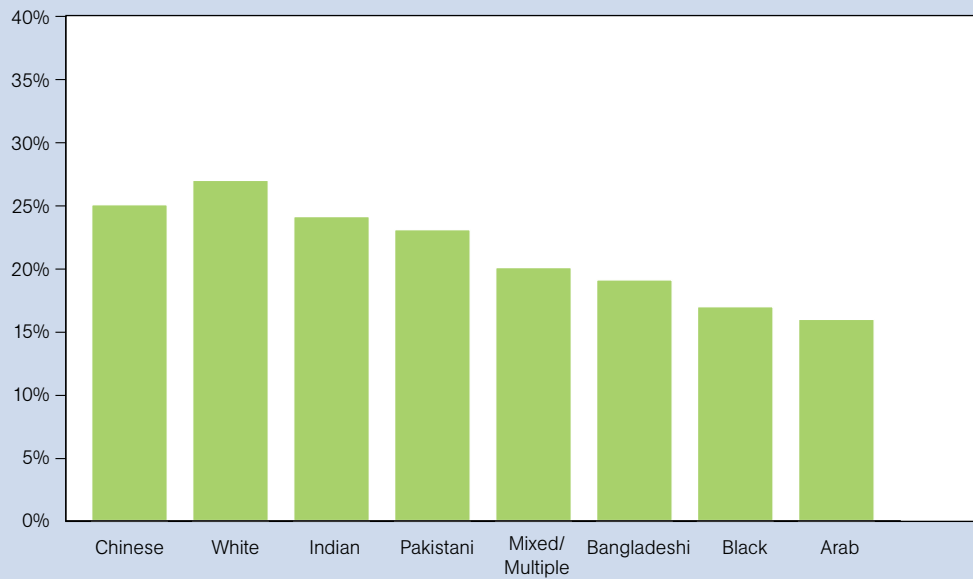
A quick glance at the proportion of individuals in each ethnic group who score well on all four measures and score badly on at least one measure suggests there are considerable variations in well-being across different ethnicities (Figures 2a and 2b). Only 16% of Arab people, 17% of Black people, and 19% of Bangladeshi people score well on all four measures in the UK, compared with 25% and 27% of Chinese and White people, respectively. And 38% of Arab people and 36% of Black people score badly on at least one measure, compared with 26% of Chinese people and 29% of White people. Looking at individual well-being measures reveals a similar picture. Average life satisfaction and happiness for those reporting themselves as Black is considerably lower than those reporting themselves as White. And levels of anxiety for those reporting themselves as Arab and Bangladeshi are considerably higher than for those reporting themselves as White.

### Could differences in the individual circumstances of different ethnic groups explain the difference in well-being?

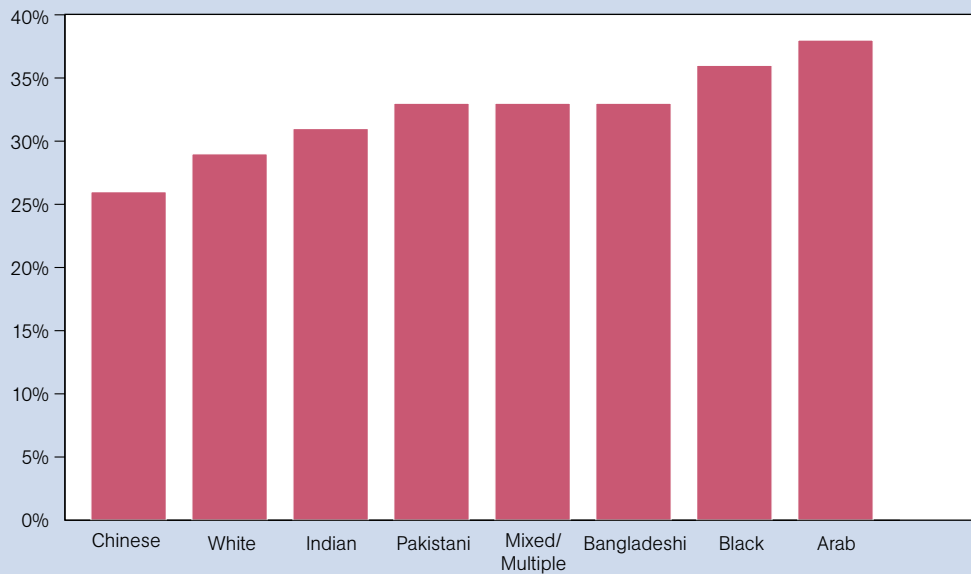
One reason for the variation in well-being between the different groups might be differences in certain areas of life such as education, income, and employment conditions.<sup>43</sup> We examined how individual characteristics varied by ethnicity, and found considerable differences in many factors (such as relationship status and labour market status) which are widely accepted to be drivers of well-being.

**Figures 2a & 2b. Proportion of individuals scoring well and badly across different ethnic groups.**

**Scoring well on all four measures**



**Scoring badly on at least one measure**

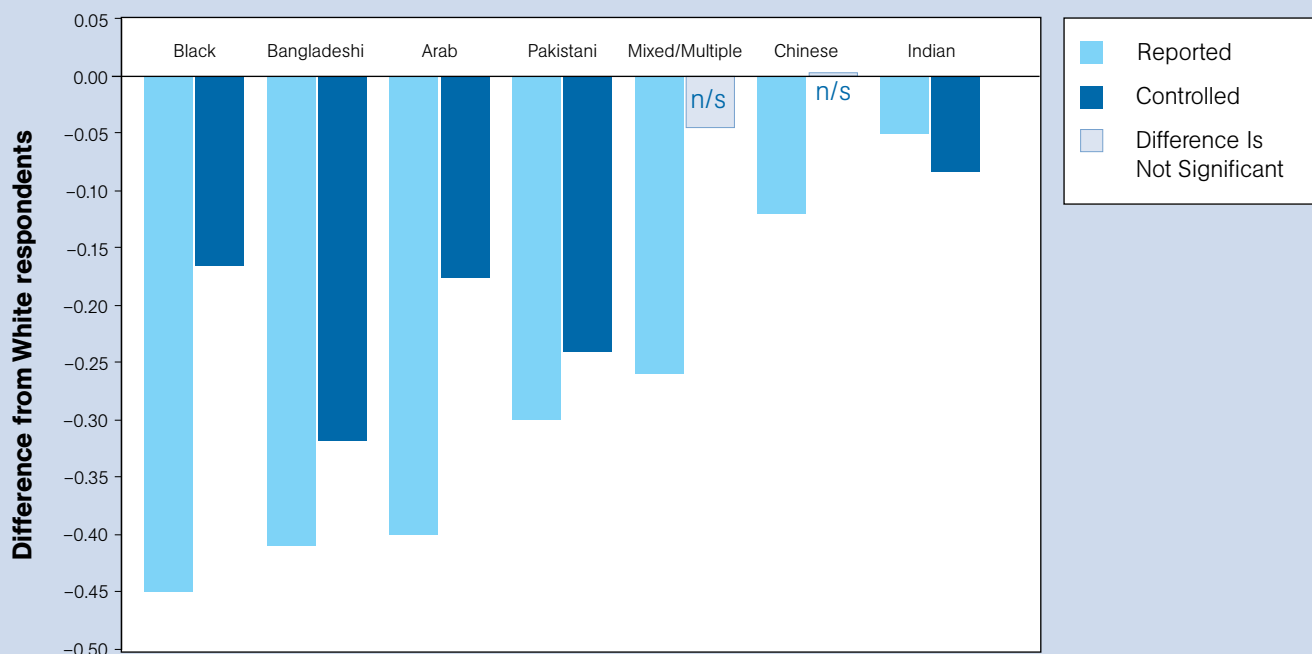


**Table 2. Individual and household characteristics for different ethnic groups.**

Ethnic Group	Arab	Bangladeshi	Black	Chinese	Indian	Mixed/Multiple	Pakistani	White
Age	35.1	31.5	40.3	33.6	39.4	34.6	35.9	47.9
Female (%)	30%	41%	54%	47%	41%	55%	40%	52%
Married or cohabiting (%)	49%	53%	33%	37%	61%	38%	63%	58%
Divorced or separated (%)	12%	8%	18%	7%	6%	9%	8%	13%
Number of Children	1.0	1.6	0.9	0.4	0.7	0.7	1.4	0.5
Reported Religion (%)	94%	97%	91%	37%	95%	60%	98%	69%
Lives in urban area (%)	99%	99%	98%	98%	97%	92%	99%	78%
Homeowner (%)	21%	33%	29%	39%	65%	41%	60%	66%
Disability (%)	17%	18%	20%	7%	16%	21%	23%	26%
Degree (%)	47%	24%	40%	57%	54%	38%	36%	33%
Full-time Student (%)	28%	24%	15%	36%	12%	12%	13%	5%
Employment (%)	44%	50%	54%	46%	68%	62%	53%	57%
Unemployed (%)	8%	15%	14%	4%	7%	13%	11%	5%



**Figure 3. Difference in overall well-being of ethnic minority groups compared to White group, before and after controlling for individual characteristics.**



**Table 3. Differences in well-being from White group by ethnicity (after taking into account individual characteristics).**

	Arab	Bangladeshi	Black	Chinese	Indian	Mixed/ Multiple	Pakistani
<b>Overall WB</b>	- 0.18	- 0.32	- 0.17		- 0.08		- 0.24
<b>Life satisfaction</b>	- 0.17	- 0.47	- 0.49		- 0.06	- 0.15	- 0.19
<b>Happy yesterday</b>		- 0.16	- 0.16	+ 0.16			- 0.20
<b>Anxious yesterday</b>	+ 0.32	+ 0.21	- 0.09		+ 0.23	+ 0.13	+ 0.24
<b>Worthwhile</b>	-0.09	- 0.41	- 0.14		- 0.08		- 0.33

**Key** Well-being of ethnic group compared to White group

Size of difference

- Lower** Large (>0.25)
- Lower** Moderate (0.1–0.25)
- Lower** Small (<0.1)
- Not significantly different**
- Higher** Small (<0.1)
- Higher** Moderate (0.1–0.25)
- Higher** Large (>0.25)

Compared to White people, individuals from ethnic minority groups are far more likely to reside in a large urban area, be unemployed (with the exception of Chinese people), and less likely to own their own home (with the exception of Indian and Pakistani people). Black people are far less likely to be married or cohabiting, and are more likely to be divorced or separated.

In order to see whether well-being continues to vary across different ethnicities after these differences in individual characteristics are taken into account, we used the well-being model presented in Chapter 3, allowing comparisons in the well-being of different ethnic groups on a like-for-like basis. The model tells us what difference in well-being we should expect if we were to find two individuals who belong to different ethnic groups but are identical in other characteristics for which we had information, including age, education and employment status. The results of this analysis are presented in Figure 3.

The analysis reveals that the large well-being deficits of Bangladeshi, Pakistani, Arab, Black, and Indian people compared to White people persist even after individual characteristics included in our model are taken into account. Two people who were identical in every other way (according to our model) would be likely to report different levels of well-being if one was White and the other was from one of the ethnic minority groups listed. On the other hand, we find that differences in well-being between White people and those with Chinese and Mixed/Multiple ethnicity disappear once individual characteristics are taken into account.

The direction and magnitude of differences in well-being across different ethnic groups vary depending on the well-being measure being considered (Table 3). Pakistani and Bangladeshi people fare worst, with considerably lower well-being than White people across all four individual well-being measures.

## **Conclusions**

Our analysis reveals striking differences in the levels of well-being across different ethnicities. We find that the well-being of Arab, Bangladeshi, Black, Indian, and Pakistani people is significantly lower than that of White people, and that these differences persist after taking into account a wide range of factors known to affect well-being.

The findings highlight the need for further research into the well-being of ethnic minorities living in the UK. Potential areas for investigation include whether drivers of well-being vary across different ethnicities, and whether there are any factors which are likely to exacerbate or help mitigate low well-being within different ethnic groups. It will also be important to corroborate our findings controlling for household income, if and when such data become available. Exploratory analysis we have carried out with other UK data suggests our findings do hold controlling for income.<sup>44</sup>

# 5. Employment and unemployment

## Summary

- Individuals who are unemployed experience significantly lower well-being than their employed and self-employed counterparts.
- The well-being of those who have been unemployed for more than six months is significantly lower than those who have been unemployed for less time.
- There appears to be no significant difference in well-being between employees and self-employed workers, once individual circumstances are controlled for.
- Individuals who have permanent employment contracts experience higher well-being than those who don't, even after individual circumstances are controlled for.
- On average, those working in the health sector have higher well-being than others in the public sector; those in the public sector have higher well-being than those in the private sector; and those working in local government have higher well-being than those working in central government.

## Introduction

In this chapter, we examine the well-being effects of employment and unemployment. In particular, we examine differences in well-being between the unemployed, employed, and self-employed; the association between well-being and the duration of unemployment; the links between job security and flexibility and well-being; and the differences in well-being between public and private sector workers.

## Employment and unemployment

The impacts of unemployment are widely documented in the well-being literature (see Further Reading). Unemployment is strongly negatively associated with almost all measures of subjective well-being; the loss of well-being generally exceeds the reduction of income, and individuals do not appear to adapt to being unemployed.

A quick comparison of the proportions of individuals who score well and badly across the well-being measures (Figures 4a and 4b) illustrates the negative association between unemployment and well-being:

- 41% of those who are unemployed score badly on at least one measure compared with 27% of those who are employed and self-employed.
- 26% of those employed and 29% of those self-employed score well on all four measures, compared with only 16% of those who are unemployed.
- As the duration of unemployment increases beyond six months, the proportion of people scoring badly on at least one measure increases (from 39% to 44%) and the proportion of people who score well on all four measures decreases (from 17% to 13%).

Figure 4a & 4b: Proportion of individuals scoring well and badly by employment status.

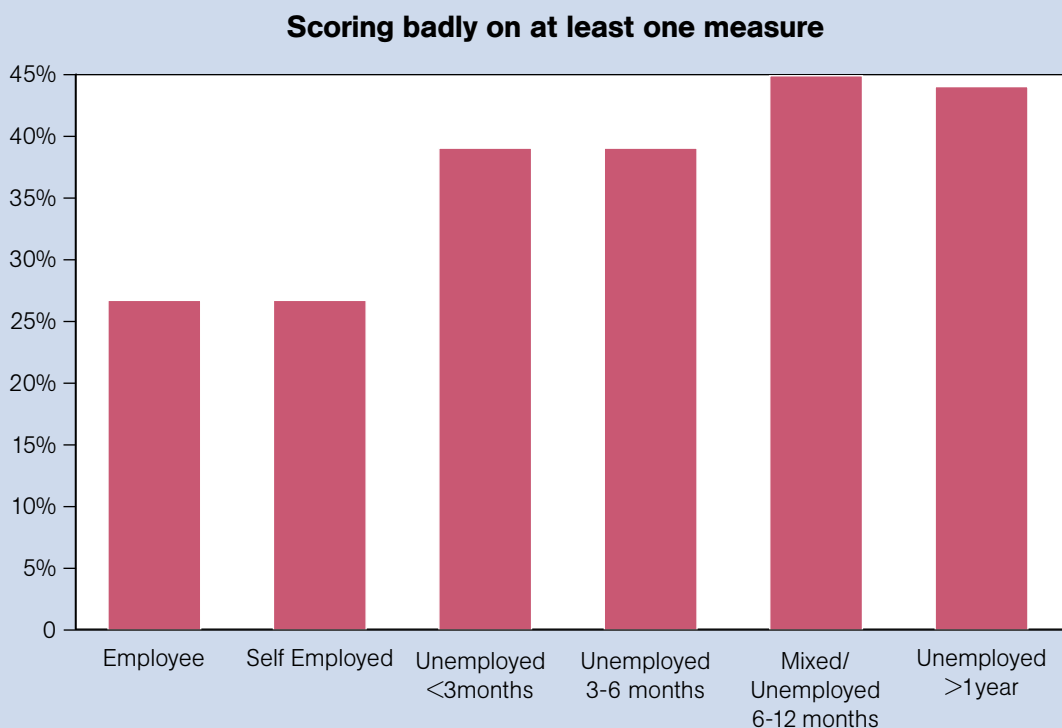
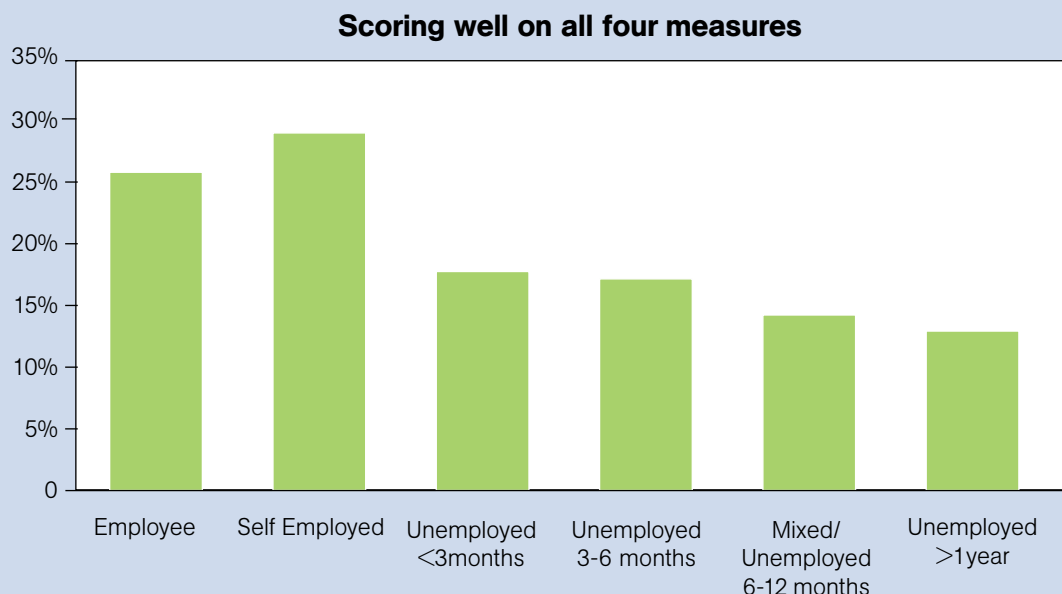


Table 4. Summary of changes in well-being with increases in unemployment duration.

	Change in duration of unemployment		
	From under 3 months to 3–6 months	From 3–6 months to 6–12 months	From 6–12 months to over 12 months
Change in well-being	No significant change in <u>any</u> well-being measure.	Large and significant decrease in overall well-being, happiness, life satisfaction, and worthwhile.	Moderate and significant increase in anxiety. No significant changes in any other measure.

### **Well-being significantly lower for those unemployed more than six months**

Building on the literature examining adaptation to unemployment (and the economics literature on the costs of long-term unemployment), we examined the extent to which well-being changes with the duration of unemployment.

We did not identify a gradual decrease in overall well-being as the duration of unemployment increased, as might have been expected. Rather, we only identified a significant drop in overall well-being between those unemployed for 3–6 months, and those unemployed for 6–12 months (the effect, a fall of 0.32 points on a scale of 0 to 10, is very large – only slightly less than the effect size of getting married). There was no *significant* reduction in overall well-being associated with the duration of unemployment among individuals unemployed for less than six months, or for individuals unemployed for more than 12 months.

### **Self-employed and employees**

Not much attention has previously been paid to differences in well-being between those who are employees and those who are self-employed – a pertinent issue given that the current economic climate has pushed many individuals into self-employment.<sup>45</sup>

A quick examination of the APS data suggests that those who are self-employed enjoy higher levels of well-being than those who are employees. A higher proportion of the self-employed score well on all four measures (29% compared to 26% for employees). Compared to employees, the self-employed report slightly higher levels of happiness and a stronger sense that the things that they do in life are worthwhile, but report slightly lower levels of life satisfaction.

The raw numbers, however, do not tell us whether it is the employment status that is driving the differences in well-being, or whether differences in well-being arise because individuals with different employment statuses differ in other ways that also affect well-being (e.g. age, education, and marital status). We used the well-being model from Chapter 3 to control for these differences, allowing us to compare those who are employed and self-employed on a like-for-like basis.

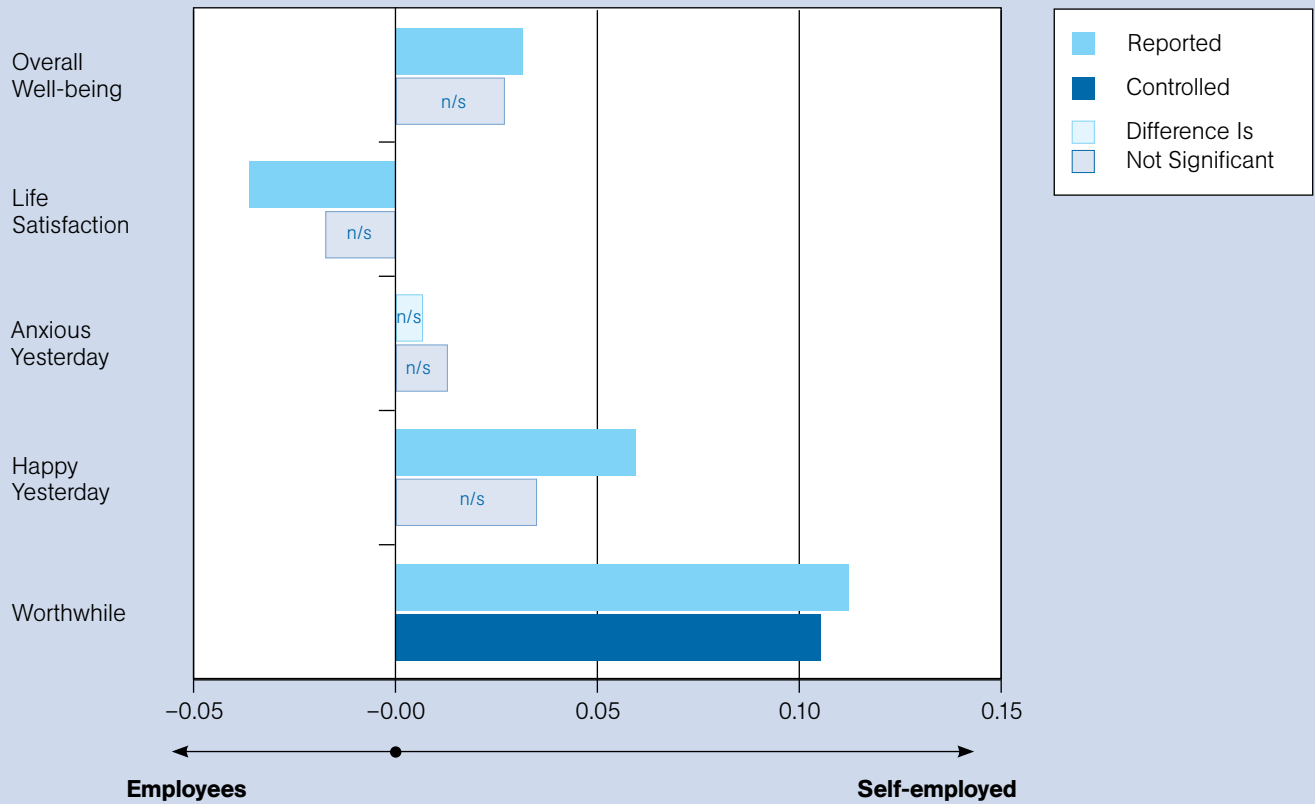
In doing so, we found no differences between the two groups with respect to overall well-being, life satisfaction, happiness, or anxiety. We did however find that someone who is self-employed is likely to find the things they do in their life slightly more worthwhile than a similar person who is an employee. Figure 5 presents the differences in reported well-being alongside the differences in well-being once individual characteristics have been controlled for.

### **Temporary and permanent work contracts**

We examined differences in well-being between individuals on permanent and temporary contracts using the same methodology used to compare employees and the self-employed.<sup>46</sup>

We found that compared to those on permanent contracts, those with temporary contracts have lower well-being on all four measures. Moreover, as illustrated in Figure 6, we found that the difference in well-being between those on temporary contracts and those on permanent contracts increased once differences in individual characteristics between the two groups had been controlled for. This suggests that the negative well-being associated with being on a temporary contract is likely to be greater than that observed by simply comparing the reported well-being levels of the two groups.

**Figure 5. Well-being of self-employed compared to well-being of employees before and after controlling for individual characteristics.**



**Figure 6. Well-being of workers on temporary contracts compared to those on permanent contracts, before and after controlling for individual characteristics.**

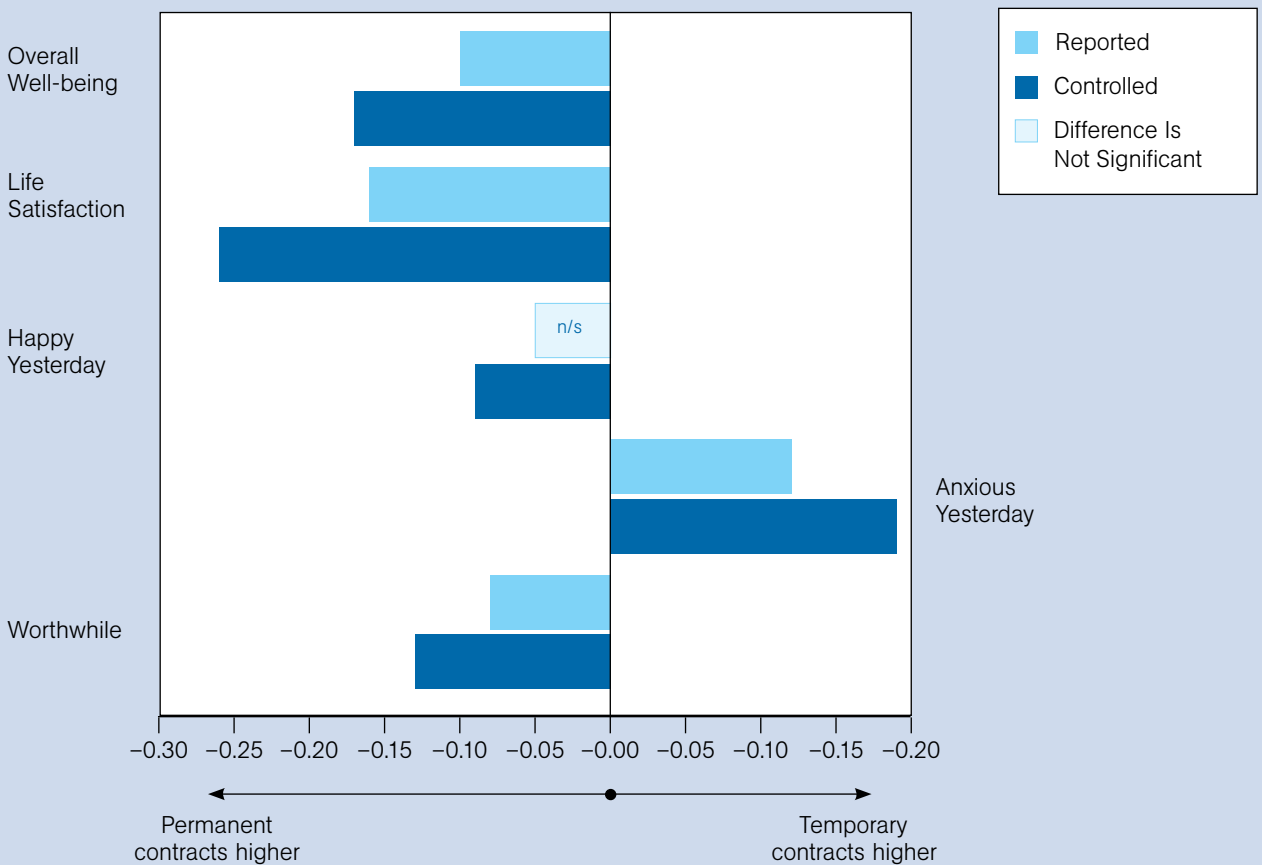
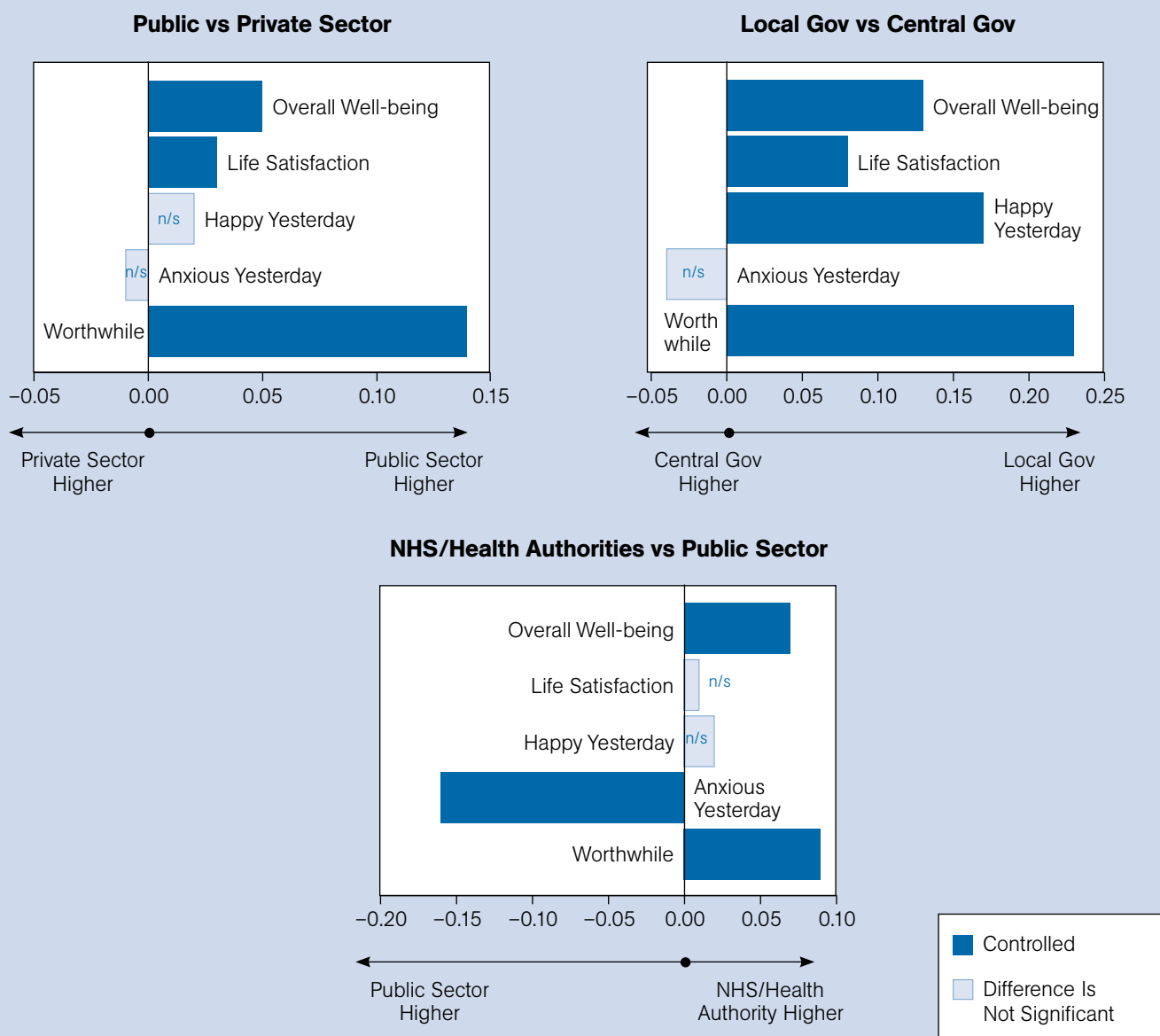


Figure 7. Comparisons of well-being by employer type (after controlling for individual characteristics).<sup>47</sup>



### Private and public sector workers

We made a number of different comparisons of well-being based on work sector (Figure 7): between public sector workers (overall) and private sector workers, between local government workers and central government workers, and between health workers (NHS and health authorities) and the rest of the public sector. As with comparisons between different types of worker in this chapter, we used the model introduced in Chapter 3 to compare groups on a like-for-like basis to control for differences in individual characteristics across different groups.

We found that:

- Compared to private sector workers, public sector workers have higher life satisfaction and a stronger sense that what they do in life is worthwhile.
- Compared to central government workers, local government workers have higher life satisfaction, higher levels of happiness, and a stronger sense that what they do in life is worthwhile.

- Compared to other public sector workers, employees of health authorities and the NHS have significantly lower levels of anxiety and a stronger sense that what they do in life is worthwhile. The differences remained significant after we used our model to control for individual characteristics.

## Conclusions

The analysis in this chapter examines the well-being effects associated with unemployment, and various types of employment. We find that:

- Well-being decreases significantly once unemployment duration exceeds six months.
- There is no significant difference in overall well-being between employees and self-employed workers.
- Those on temporary contracts experience lower well-being than those on permanent contracts.
- Public sector workers have higher well-being than those working in the private sector and well-being among those working in local government is higher than those working in central government.

The large sample size and the breadth of labour market data in the APS means that analysts can now undertake much more detailed research on these areas than was previously possible. It is, for example, possible to disaggregate the impact of self-employment on well-being by industry type or earnings, or differences in the well-being of different employer types by an individual's position in the managerial hierarchy.

In an environment of rising long-term unemployment, heightened levels of self-employment, public sector redundancies, and pay freezes, further research on these topics is likely to be highly relevant to policymakers, trade unions, human resource professionals, and civil society organisations alike.



# 6. Working hours

## Summary

- We find that longer working hours are associated with higher levels of anxiety and lower levels of happiness, and these associations persist even after we control for differences in the types of people who tend to work long and short hours.
- Conversely, we find that working longer hours is associated with higher life satisfaction among people working less than 55 hours a week. The pattern for feeling that what one does in life is worthwhile is more complex: falling, rising and then falling again as working hours increase.
- Women appear to be more adversely affected by working longer hours than men.
- Those working part-time because they don't want a full-time job have higher levels of well-being than full-time workers (across all four well-being measures). But those working part-time because they are unable to find a full-time job have considerably lower levels of happiness and life satisfaction than those who work full-time.

## Introduction

Previous research provides mixed evidence on the link between working hours and subjective well-being, but is suggestive of a relationship where working hours positively correlate with subjective well-being up until a certain level, beyond which additional hours have a negative effect on well-being (see Further Reading).

The APS combines questions on subjective well-being with questions on work patterns (whether someone works full-time or part-time, and the reason for part-time work) and hours worked, permitting an in-depth analysis of issues relating to working hours.

In this chapter, we first take a look at full-time workers, and examine how each of the four well-being measures varies with working hours. We then examine differences in well-being between full-time and part-time workers, depending on whether those who are working part-time are doing so because they don't want a full-time job or because they are unable to find a full-time job.

As in other sections of this report, the analysis in this chapter makes use of the well-being model from Chapter 3 which controls for differences in individuals characteristics, and allows us to better understand the relationship between well-being and working hours.

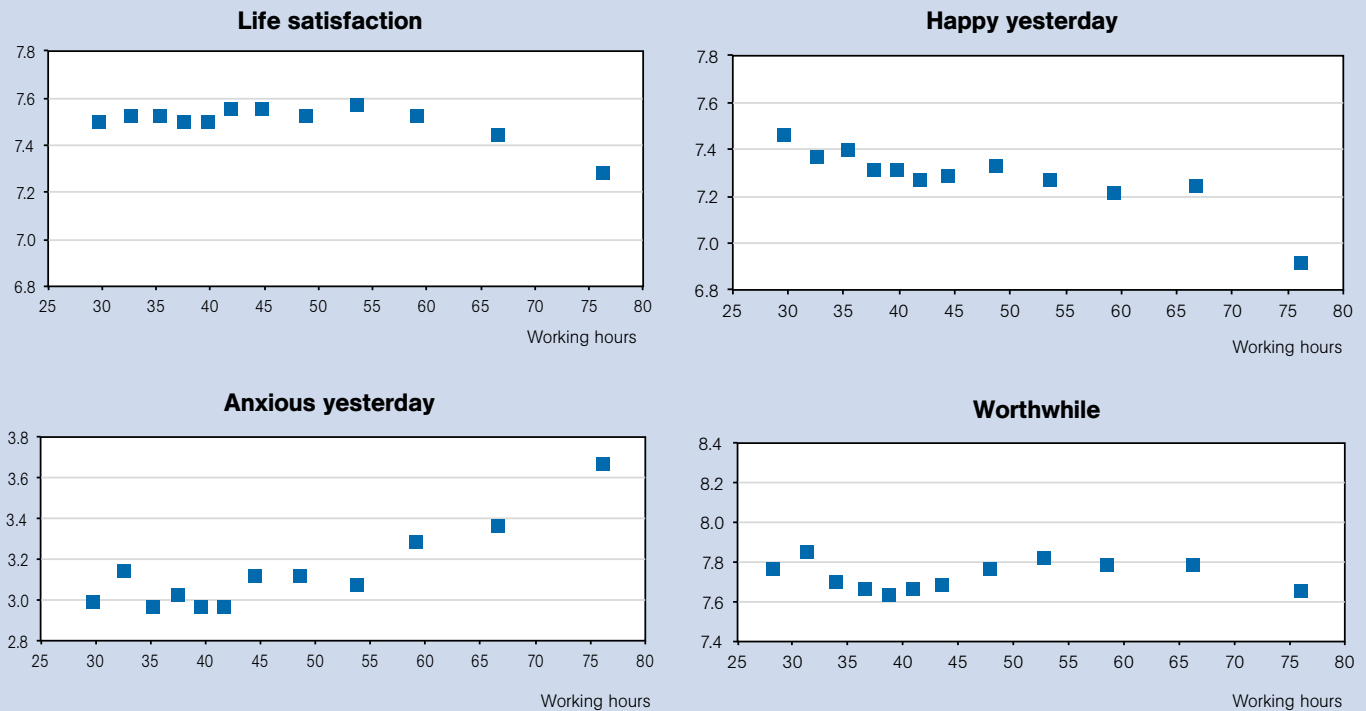
### **The relationship between working hours and well-being for full-time workers**

In this chapter, we examine the relationship between working hours and different measures of well-being for full-time workers. We first visually present how each well-being measure varies with working hours.

We then test to see whether the patterns observed visually are statistically robust, and whether they persist after controlling for the fact that there are likely to be considerable differences in the individual characteristics of people who work short and long hours. We also examine whether the relationships identified hold for both men and women.

Figures 8a–8d provide a visual representation of how each well-being measure varies with working hours. Each individual measure shows a slightly different

Figure 8a, 8b, 8c & 8d: Well-being measures against working hours for full-time workers.



relationship with working hours when hours are between 28 and 55 hours a week. Beyond 55 hours a week, however, all four measures appear to be negatively associated with working hours.

- For life satisfaction, well-being appears to increase slightly with working hours up until 55 hours a week, after which it declines relatively sharply.
- Happiness appears to decline as working hours increase, but the relationship appears to flatten slightly between 38 and 60 hours per week.
- Anxiety appears to slightly increase with working hours between 28 and 55 hours a week, and increase at a faster rate as working hours increase beyond 55 hours.
- Feeling that the activities one does in life are worthwhile appears to follow a more complex relationship with working hours, decreasing between 28 and 40 hours, increasing between 40 and 55 hours, and then falling again beyond 55 hours per week.

### Do working hours explain observed differences in well-being?

Are the patterns we have just described statistically significant, and do they hold when other factors like marital status, education, and having children are controlled for? Looking at Figure 8, it seemed clearest that there was a distinctive drop in well-being for those working extremely long hours, so we first tested this. We compared those working extremely long hours (55–80 hours) with those working moderate to long hours (28–55 hours) on each of the four well-being measures.

Figure 9 shows that those working extremely long hours have lower levels of happiness and considerably higher levels of anxiety than those working moderate to long hours, whether we control for individual characteristics or not. On the other hand, those working extremely long hours have a slightly stronger sense that what they do in life is worthwhile. There is no difference in life satisfaction between the two groups. The effect on overall well-being is negative.

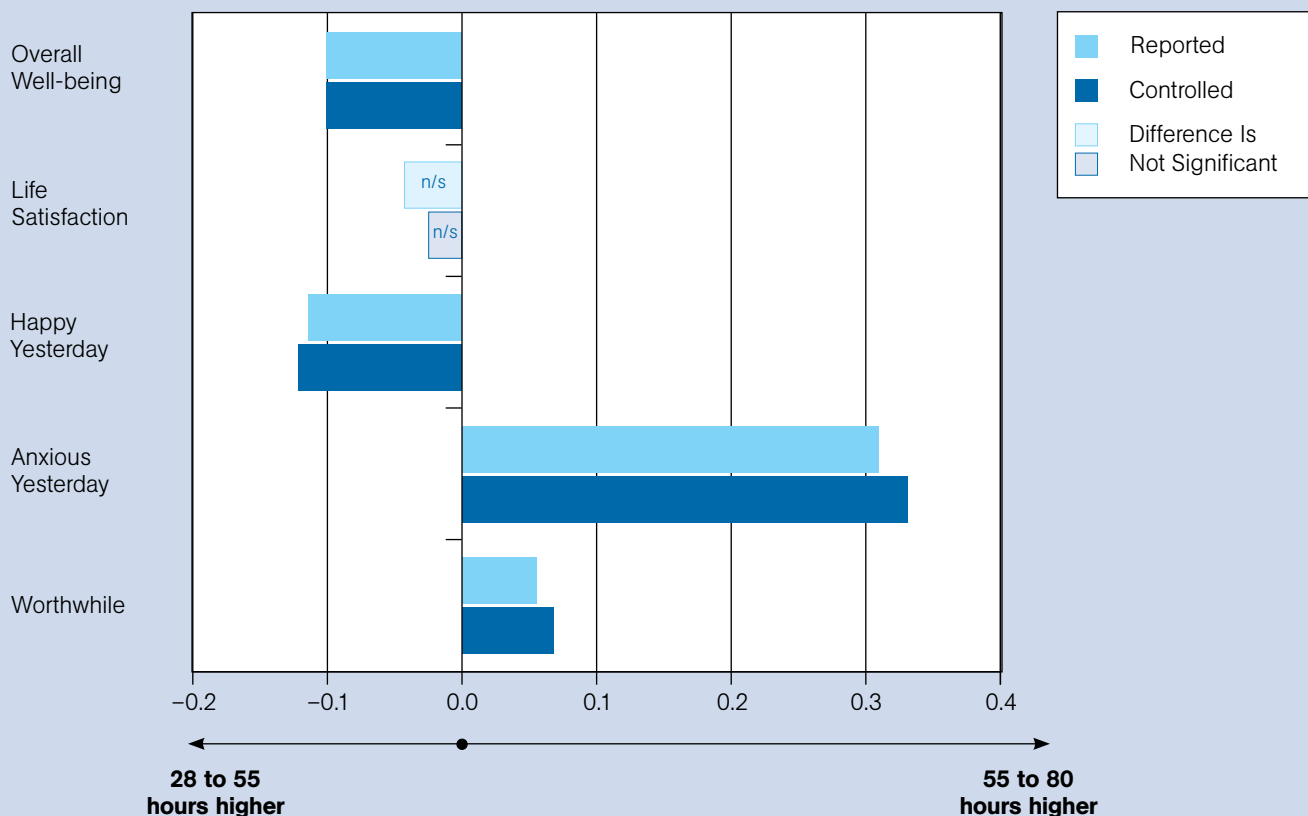
The next question is whether there is any significant relationship between working hours and well-being for those working fewer than 55 hours. Figure 10 presents the direction and relative size of the *correlations* between working hours and the four well-being measures, both before and after individual characteristics have been controlled for, amongst those working between 28 and 55 hours. Working hours are positively correlated with life satisfaction, but negatively correlated with happiness and positively correlated with anxiety. While there is a strong positive correlation between working hours and feeling that what one does in life is worthwhile, a visual examination of the data, even when controlling for other factors, suggests a U-shaped relationship (i.e. declining well-being as working hours increase up to a point, after which well-being increases with additional working hours).

**Women are more adversely affected by longer working hours than men**

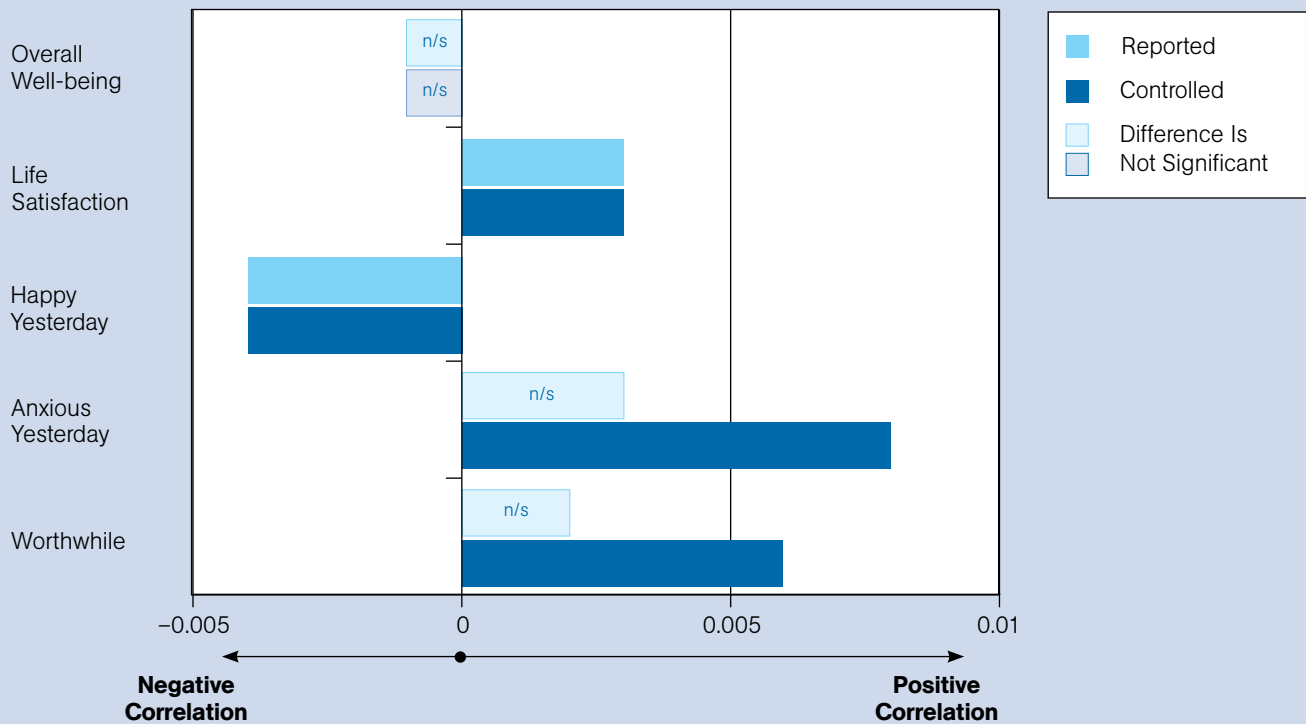
The large sample size allowed us to explore whether the relationship between working hours and well-being might be different for men and women. The data suggest that women are more adversely affected by increases in working hours than men.

After separating men and women, we found that working hours were negatively correlated with overall well-being for women, but not for men. We found similar effects for anxiety and happiness, in both cases demonstrating that women are more adversely affected by longer working hours than men. Unlike men, women who work longer hours do not report feeling that what they do in their lives is more worthwhile.

**Figure 9. Comparing the well-being of people working 28–55 hours per week to those working 55–80 hours per week, before and after controlling for individual characteristics.**



**Figure 10. Correlation between working hours and individual well-being measures for people working between 28 and 55 hours per week, before and after controlling for individual characteristics.**



**Table 5. How well-being of part-time workers differs from the well-being of full-time workers, before and after controlling for individual characteristics.**

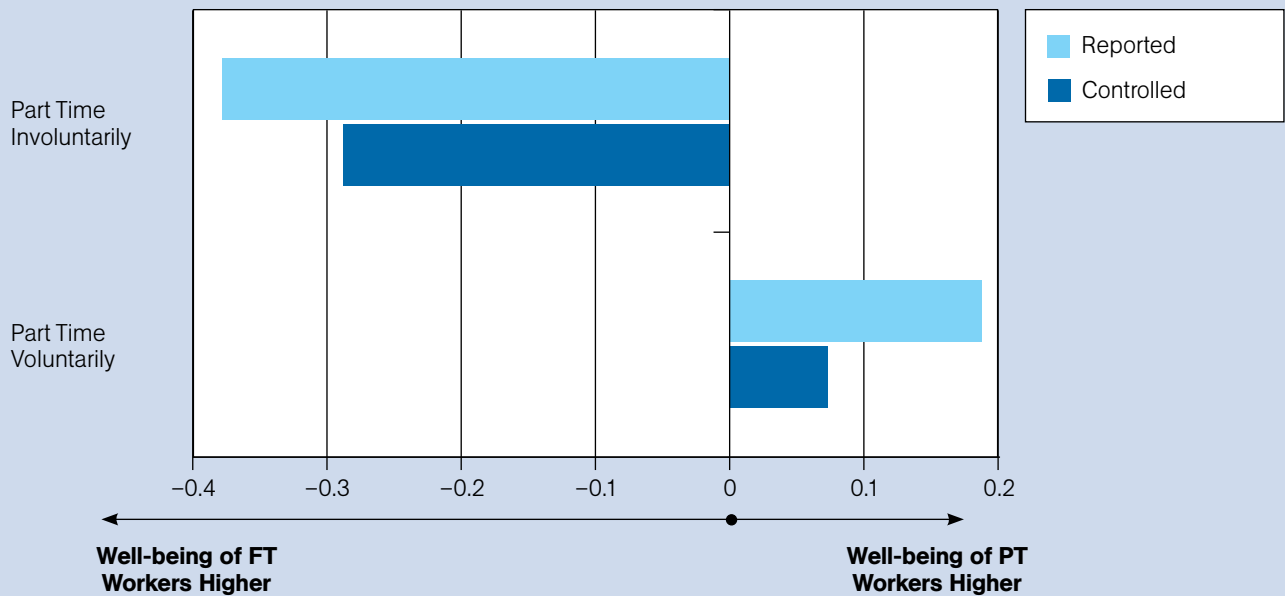
Well-being measure	PT voluntarily		PT involuntarily		Key	Effect
	Reported	Controlled	Reported	Controlled		
Overall well-being	+ 0.19	+ 0.07	- 0.38	- 0.29		Negative (large)
Life satisfaction	+ 0.18	+ 0.05	- 0.62	- 0.50		Negative (moderate)
Happiness yesterday	+ 0.21	+ 0.08	- 0.40	- 0.30		Negative (small)
Anxious yesterday	n/s	- 0.11	+ 0.15	n/s		No significant effect
Worthwhile	+ 0.31	+ 0.05	- 0.33	- 0.27		Negative (small)

**Full-time and part-time workers**

As in other sections of this report, we used the well-being model introduced in Chapter 3 to control for the fact that different types of people are likely to end up working full-time and part-time. Figure 11 illustrates the differences in well-being between full-time and part-time workers before and after controlling for individual characteristics. Those who work part-time involuntarily (i.e. they are unable to find a full-time job) have significantly lower well-being than those who work full-time. On the other hand, those who work part-time voluntarily (i.e. because they don't want a full-time job) have slightly higher well-being than those working full-time. After controlling for individual characteristics, the differences in well-being between full-time and part-time workers reduce slightly in magnitude, but remain statistically significant.

Table 5 reports how much the well-being of the two groups of part-time workers differs from that of full-time workers. Controlling for individual characteristics, those

**Figure 11. Difference in overall well-being between part-time workers and full-time workers, after controlling for individual characteristics.**



who work part-time involuntarily have substantially lower levels of life satisfaction and happiness than those who work full-time, but the differences in levels of anxiety are not statistically significant. On the other hand, when we control for individual characteristics, part-time workers who do not want to work full-time are revealed to have considerably lower levels of anxiety.

### Conclusions

The analysis in this chapter has built on the existing literature concerning the relationship between subjective well-being and working hours. We find:

- Longer working hours are associated with higher levels of anxiety and lower levels of happiness. On the other hand, they are also broadly associated with a greater sense that what one does in life is worthwhile. These associations persist even after controlling for differences in individual characteristics.
- Women appear to be more adversely affected by longer working hours than men.
- There are significant differences between the well-being of full-time and part-time workers, but the direction and magnitude of the difference depends on the reason for part-time work.
  - Those working part-time voluntarily (the majority of part-time workers) score better on all four well-being measures when compared to full-time workers.
  - Those working part-time involuntarily score worse on life satisfaction, happiness, and the sense that what they do in life is worthwhile when compared to full-time workers.

The APS data provide ample opportunity for further research into the relationship between well-being and working hours. Further analysis should be done to investigate whether the relationships we have found continue to hold across different population groups (e.g. among different classes of worker or employer type). Unfortunately, the APS does not provide information on household income. Having this would allow analysts to consider whether the well-being benefits of working fewer hours only apply to those in wealthier households, or are found across the income spectrum.

# 7. Place and geography

## Summary

The highest proportion of people scoring well on all four well-being measures and lowest proportion of people scoring badly on at least one measure are to be found on Britain's small islands and the northern and southern extremities of the country. The lowest levels of well-being are found in London, Luton, and the Welsh Valleys. At regional level, these geographical differences are statistically significant even when controlling for individual and household characteristics, with Scotland, Northern Ireland and South West England having higher than expected well-being, and London having lower than expected well-being. The *Index of Multiple Deprivation* is a strong predictor of well-being in local areas, with crime and low income being the most important elements of deprivation. However it still only explains less than half of the variation in average levels of well-being in England and Scotland, and just under two-thirds in Wales.

## Introduction

For many years, the relatively small sample sizes of the surveys which have collected well-being data meant that we have had to content ourselves with reporting 'average' levels of well-being for countries, knowing very well that these are likely to obscure big differences in well-being between different regions and local areas. The APS allows us, for the first time ever, to map well-being within the country to the level of 143 local areas (unitary authorities and counties).<sup>48</sup> This chapter presents that story, identifies areas with low and high well-being, and identifies what drivers might explain the well-being pattern in the country. Knowing which areas have low well-being can help identify where targeted action is necessary. Knowing which areas have high well-being might provide clues as to what conditions are conducive to well-being in the country as a whole.

## Which parts of the country have the highest and lowest well-being?

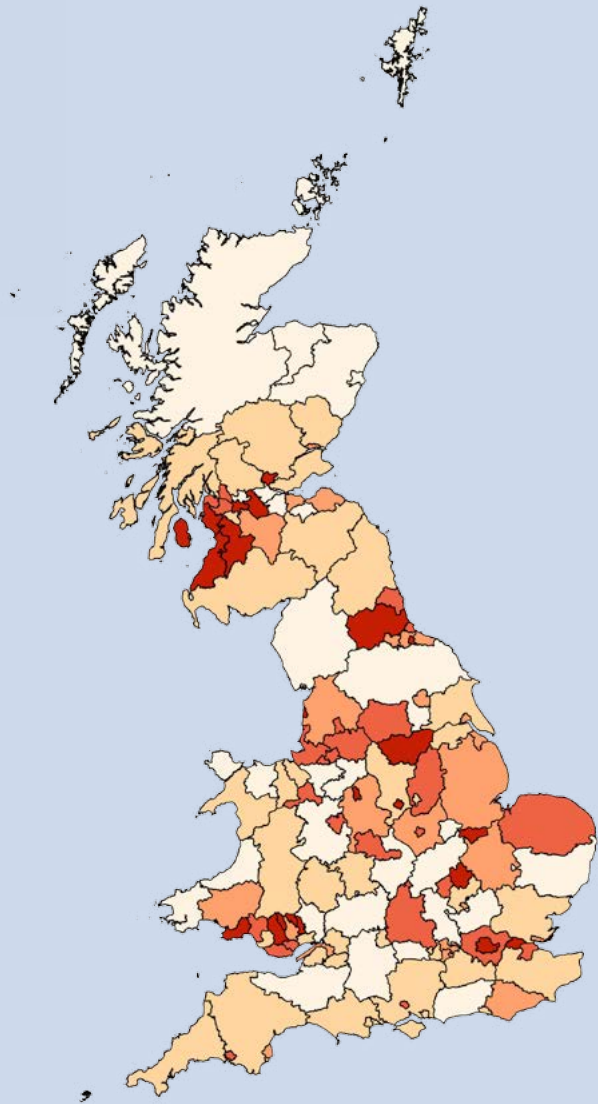
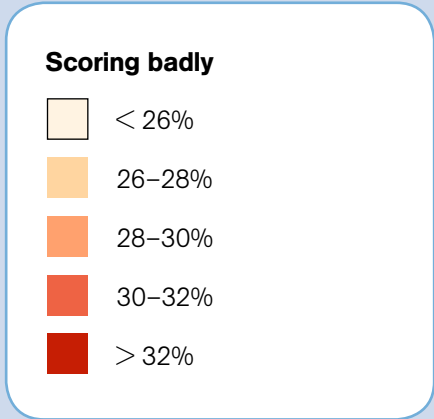
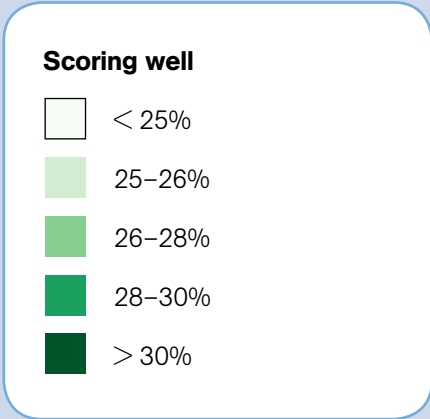
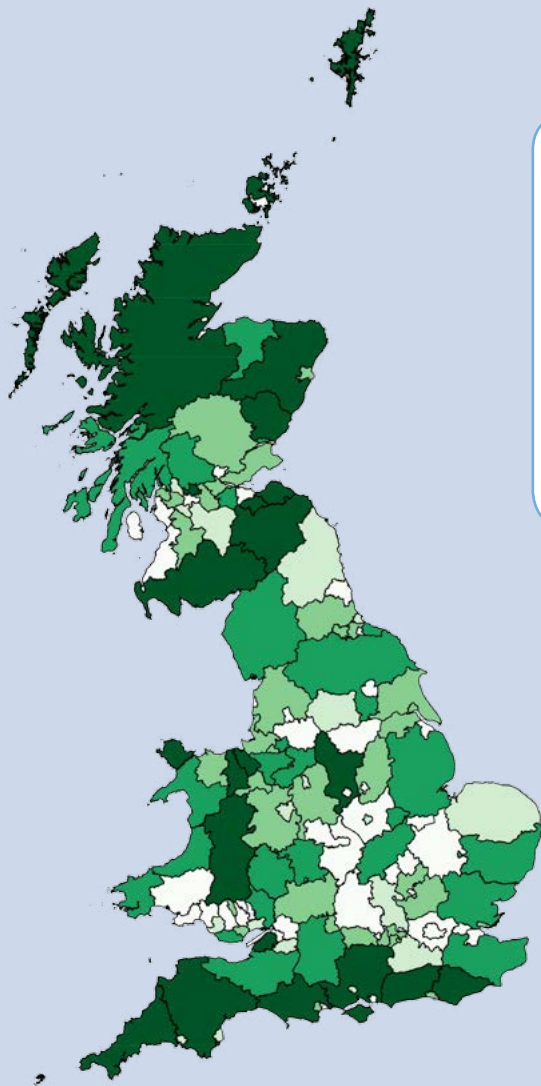
Figure 12a and 12b map out percentages scoring well on all four measures and percentages scoring badly on at least one measure across Britain.<sup>49,50</sup>

Table 6 lists the top and bottom 10 local areas by these two statistics.

The Scottish Islands – the Western Isles (Eilean Siar), Orkney, and Shetland – come first in both rankings, with 41% of the population scoring well on all four measures and only 20% scoring badly on at least one measure. The Scottish Highlands come second for scoring well on all four measures, followed by the Isle of Anglesey in Wales, Aberdeenshire, and Flintshire. Next is the highest ranking English area, the Isle of Wight, followed by Dumfries and Galloway – a pioneer area in well-being promotion, which had already conducted its own well-being survey in 2007.<sup>51</sup> Areas which have low percentages of people scoring badly on at least one measure include Moray, the Highlands, and Aberdeen City, followed by Cardigan (Ceredigion) and North Yorkshire.

The area with the lowest proportion of people scoring well on all four measures, only 20%, is actually the richest part of the country – Inner London.<sup>52</sup> Luton and Reading join it to make up the bottom three. Meanwhile, the areas with the highest proportions of people scoring badly on at least one measure are in the Welsh Valleys – Merthyr Tydfil and Blaenau Gwent – at 37% each. South Ayrshire in Scotland completes the bottom three.

Figure 12a & 12b. Proportions scoring well and badly in different parts of Britain.



**Table 6. Top and bottom 10 local areas, based on percentages of people scoring well on all four measures and scoring badly on at least one measure.**

Areas with the biggest proportions scoring well on all four measures			Areas with the smallest proportions scoring badly on at least one measure		
Rank			Rank		
1	Eilean Siar, Orkney & Shetland	41 %	1	Eilean Siar, Orkney & Shetland	20 %
2	Highland	37 %	2	Moray	23 %
3	Anglesey, Isle of	36 %	3	Highland	23 %
4	Aberdeenshire	36 %	4	Aberdeen City	24 %
5	Flintshire	35 %	5	Ceredigion	24 %
6	Isle of Wight	34 %	6	North Yorkshire	24 %
7	Dumfries and Galloway	33 %	7	Aberdeenshire	24 %
8	East Dunbartonshire	33 %	8	Wiltshire	24 %
9	Midlothian	33 %	9	Buckinghamshire	24 %
10	Dorset	33 %	10	West Berkshire	25 %

Areas with the smallest proportions scoring well on all four measures			Areas with the largest proportions scoring badly on at least one measure		
Rank			Rank		
134	Outer London	23 %	134	Torfaen	34 %
135	Edinburgh, City of	23 %	135	Glasgow City	35 %
136	Torfaen	23 %	136	Rhondda, Cynon, Taff	35 %
137	Clackmannanshire	22 %	137	Blackpool	35 %
138	Thurrock	22 %	138	North Ayrshire	35 %
139	Slough	22 %	139	County Durham	35 %
140	Blackburn with Darwen	21 %	140	Middlesbrough	35 %
141	Reading	21 %	141	South Ayrshire	36 %
142	Luton	20 %	142	Blaenau Gwent	37 %
143	Inner London	20 %	143	Merthyr Tydfil	37 %

### What factors explain the variation in well-being levels across the country?

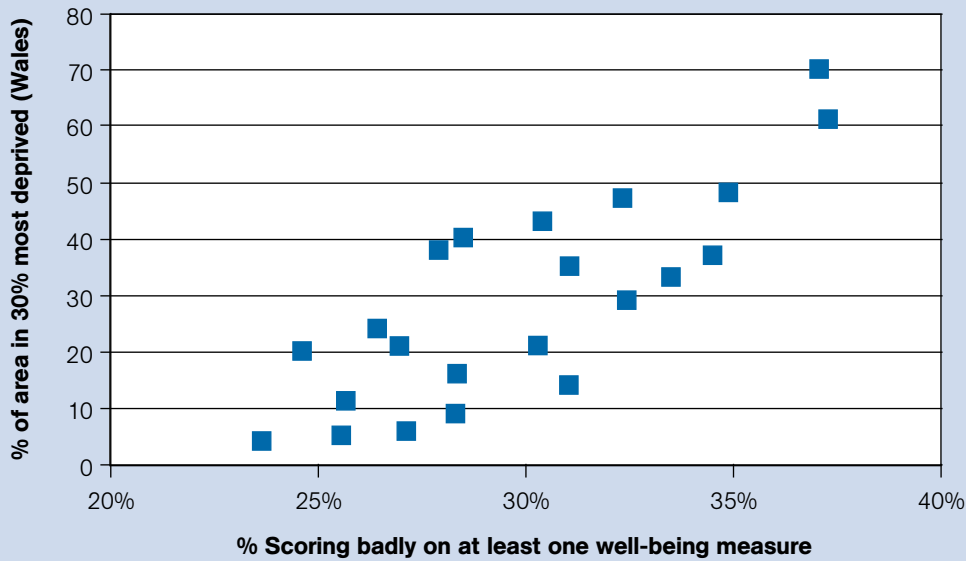
We developed a model, using local level variables, to attempt to understand the variation in well-being across local areas. The best predictor of well-being in this model was the *Index of Multiple Deprivation*.<sup>53</sup> The Index is a widely used measure of area-based deprivation which covers seven domains including income, employment, education, health, crime, housing, and living environment.<sup>54</sup> IMD tables are produced separately for England, Wales, and Scotland, meaning analyses had to be carried out separately within each country.<sup>55</sup> In all countries, though, areas with higher levels of deprivation had lower levels of well-being. Figure 13 illustrates this for Welsh areas, where 65% of the variation in well-being between local areas can be explained by differences in deprivation.<sup>56</sup> The *Index of Multiple Deprivation* can also be broken down into its seven dimensions, which we did for the English local areas. Doing so allows us to see which of the dimensions of deprivation were the most important in predicting well-being. In England, it was crime and then income. Figure 14 shows how crime deprivation maps against the percentage of people scoring well on all four measures for each local area in England.

### Are there any parts of the country that do better or worse than expected?

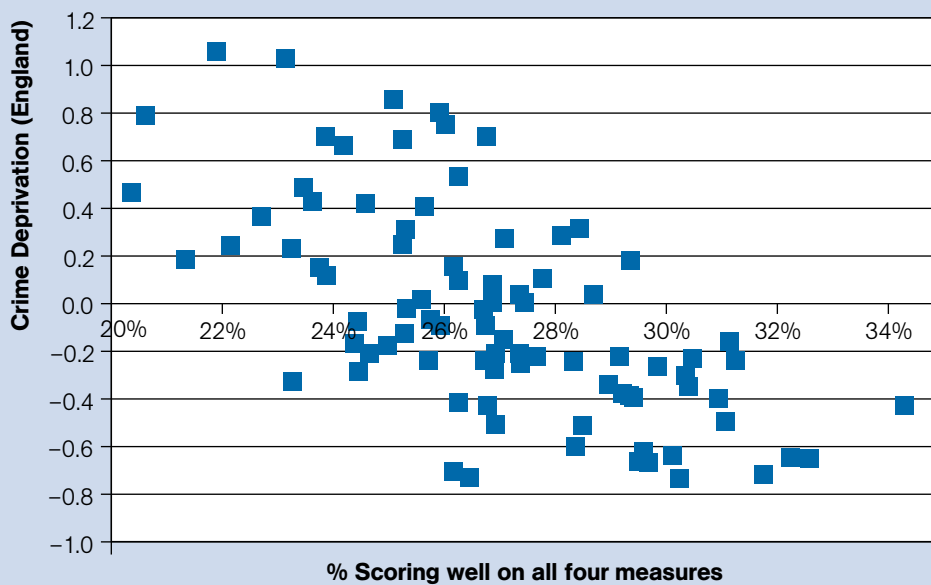
The Index is useful, but still leaves plenty of variation between local areas unexplained. In England, only 31% of the variation in well-being could be explained by deprivation – 69% of the variation remained unexplained. Figure 15 maps



**Figure 13. Percentage scoring badly on at least one well-being measure versus level of deprivation for 22 Welsh areas.**



**Figure 14. Percentage scoring well on all four measures versus crime deprivation component of the Index of Multiple Deprivation for English areas.**



'residual' well-being once the Index is controlled for – in other words, which areas of the country have higher or lower well-being than one would expect given the levels of deprivation in the area.<sup>57</sup> Table 7 lists the areas whose well-being scores deviate most from what would be expected based on their deprivation levels – the top five, having higher levels of well-being than expected, and the bottom five having lower levels of well-being than expected.

The analysis presented here provides just an overview of the possibilities for the local level well-being data. At **nef**, we intend to explore further the determinants of well-being at the local level in Britain using data on social capital, the economy, and other factors. It is worth noting the preponderance of coastal areas in the top of the rankings for overall well-being, a finding which echoes recent research at the

Figure 15. Well-being residuals, after controlling for deprivation.

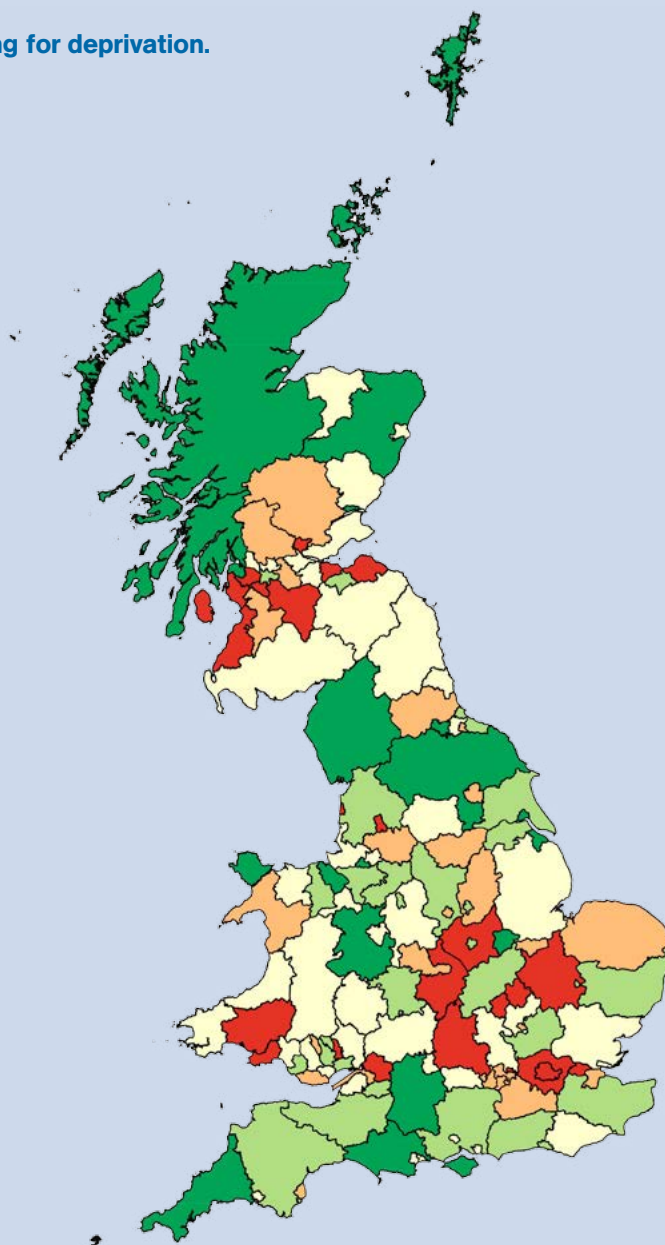
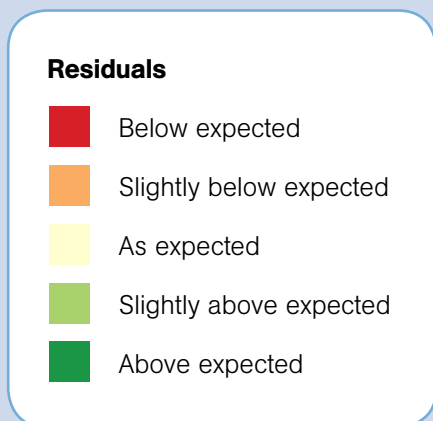
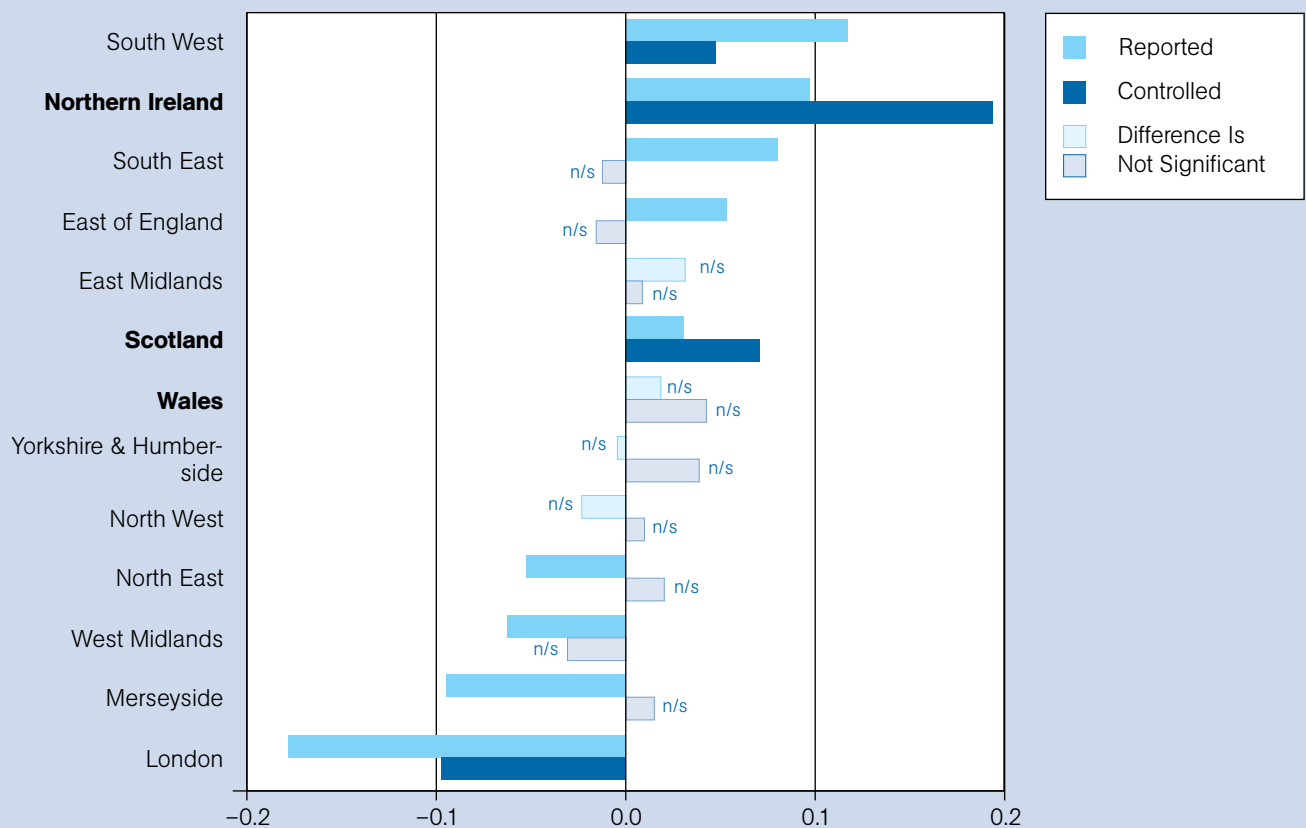


Table 7. Areas ranked according to residual well-being scores.

Ranked according to residual after controlling for deprivation	Residual
<i>Well-being above expected - Top 5 areas</i>	
Eilean Siar, Orkney & Shetland	0.45
Dundee City	0.30
Anglesey, Isle of	0.27
Highland	0.26
Rutland	0.24
<i>Well-being below expected - Bottom 5 areas</i>	
Inner London	-0.19
South Ayrshire	-0.21
Warwickshire	-0.22
Bedford	-0.27
Thurrock	-0.33

**Figure 16. Difference in overall well-being between English Regions/UK countries and the UK average, before and after controlling for individual characteristics.**



London School of Economics which found that people are happier when spending time in coastal areas.<sup>58</sup> The only places in the top 10 for scoring well on all four measures that don't have a coastline are East Dunbartonshire and Midlothian. And the top places for scoring well on all four measures in England, Wales, and Scotland are all islands. Cities generally don't do as well as more rural areas, but there are exceptions: Dundee ranks 28th overall for scoring well on all four measures, but comes second if we control for deprivation; when ranked for proportions of people scoring badly on at least one measure, Aberdeen has the fourth lowest percentage.

#### What do these differences look like at regional level?

Figure 16 presents the difference in overall well-being between each UK region and the UK average.

Before differences in individual characteristics are controlled for, several regions have average levels of well-being that are significantly above the UK average (South West, Northern Ireland, South East, and East England) and several have average levels of well-being significantly below the UK average (North East, West Midlands, Merseyside, and London).

After variations in individual characteristics across the UK regions are controlled for, the difference in overall well-being between most regions and UK average disappears. The exceptions to this are Northern Ireland, Scotland, and the South West (where average well-being remains higher), and London (where average well-being remains lower). Interestingly, the difference between levels of well-being in Northern Ireland and Scotland and the rest of the UK increases after controlling for individual characteristics,

suggesting that there may be aspects associated with living in these countries which are positive for well-being.

## Conclusions

There are large differences in well-being at local level which will be of interest to local government and deserve further exploration. At the regional level, the key differences appear to include higher than expected well-being in Scotland, Northern Ireland, and the South West, and lower than expected well-being in London. These differences provide a complementary though distinct pattern to that seen in the *Index of Multiple Deprivation*. Further exploration is needed of factors that explain why places like Dundee and the Isle of Anglesey do much better than one would expect given their deprivation levels, whilst places like Thurrock and Bedford do much worse than expected.

# 8. Inequality in well-being

## Summary

We can, and should, look at the dispersion in well-being within an area, not just the average. Doing so reveals that the largest well-being inequalities are in the Welsh Valleys and around Glasgow. Typically the places with the highest well-being inequalities are not those with the highest income inequality. Rather, they tend to be places with high levels of deprivation.

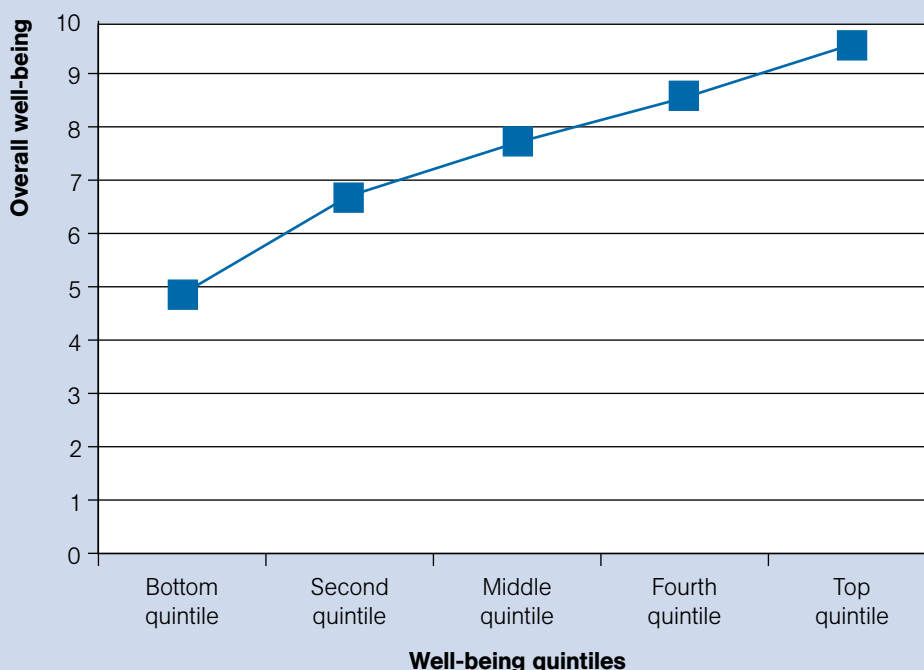
Meanwhile, whilst older age groups have higher proportions of people scoring well on all four well-being measures, they also have relatively high levels of inequality in well-being.

## Introduction

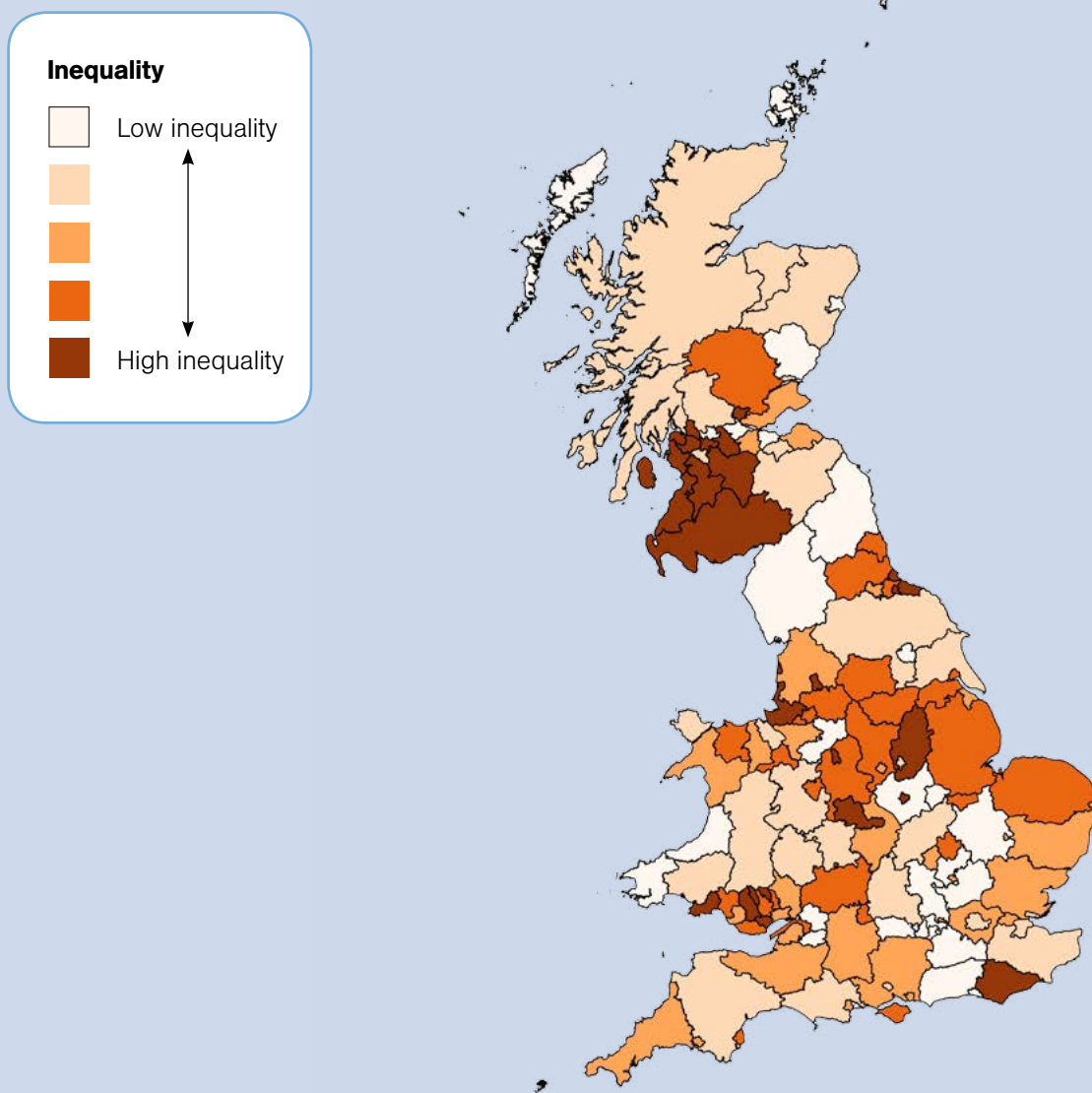
Inequality and the gaps between the rich and poor have become an ever more prominent issue in recent years. Whilst people normally think about income inequality, well-being inequality is just as important as it is an inequality of outcomes, not resources. This chapter will consider well-being inequality in the UK as a whole, then look at well-being inequality within each county and unitary authority, to identify those that are more or less equal. We will also consider differences in well-being inequality across age groups.

Figure 17 shows the difference in well-being between those with the highest well-being and those with the lowest for the UK as a whole. People in the bottom well-being quintile (i.e. bottom 20%) have an average overall well-being score of 4.8 out of 10. Those in the top well-being quintile have an average score of 9.5 – a difference of 4.6 points.

Figure 17. Overall well-being for each well-being quintile in UK.



**Figure 18. Inequality (difference in overall well-being between top and bottom quintile for well-being in an area).**



**Table 8. Local areas ranked by equality (difference between top and bottom quintile).**

<i>Most unequal areas</i>	<i>Average overall well-being</i>	<i>Difference between top and bottom</i>	<i>Most equal areas</i>	<i>Average overall well-being</i>	<i>Difference between top and bottom</i>
Merthyr Tydfil	7.1	5.7	Rutland	7.7	3.9*
North Lanarkshire	7.2	5.3	West Berkshire	7.4	3.9
Rhondda, Cynon, Taff	7.2	5.3	Cheshire East	7.5	4.0
North Ayrshire	7.0	5.3	Central Bedfordshire	7.4	4.0*
Blackpool	7.0	5.2	Wokingham	7.4	4.0
Merseyside Met County	7.2	5.2	Buckinghamshire	7.4	4.1
Glasgow City	7.0	5.1	Bath and North East Somerset	7.5	4.1
Blaenau Gwent	7.1	5.1	Brighton and Hove	7.4	4.1
Blackburn with Darwen	7.1	5.1	Bracknell Forest	7.3	4.1
Swansea	7.1	5.1	Eilean Siar, Orkney, and Shetland	8.0	4.2

\* Rutland and Central Bedfordshire had small samples – 272 in total in Rutland, and 474 in Central Bedfordshire.

### Inequality from area to area

Is this variation the same across the country, or are there parts of the country where well-being inequality is larger or smaller? The map of well-being inequality in the UK (Figure 18) is the first of its kind. Areas (counties and unitary authorities) in bright red are those where the differences between the highest and lowest well-being are the biggest – often exceeding 5 points on a scale of 0–10. Areas in paler colours are those where the difference is the smallest.<sup>59</sup> Table 8 ranks the 10 most and least unequal areas of the country, with the differences between highest and lowest well-being, as well as the mean for the area.

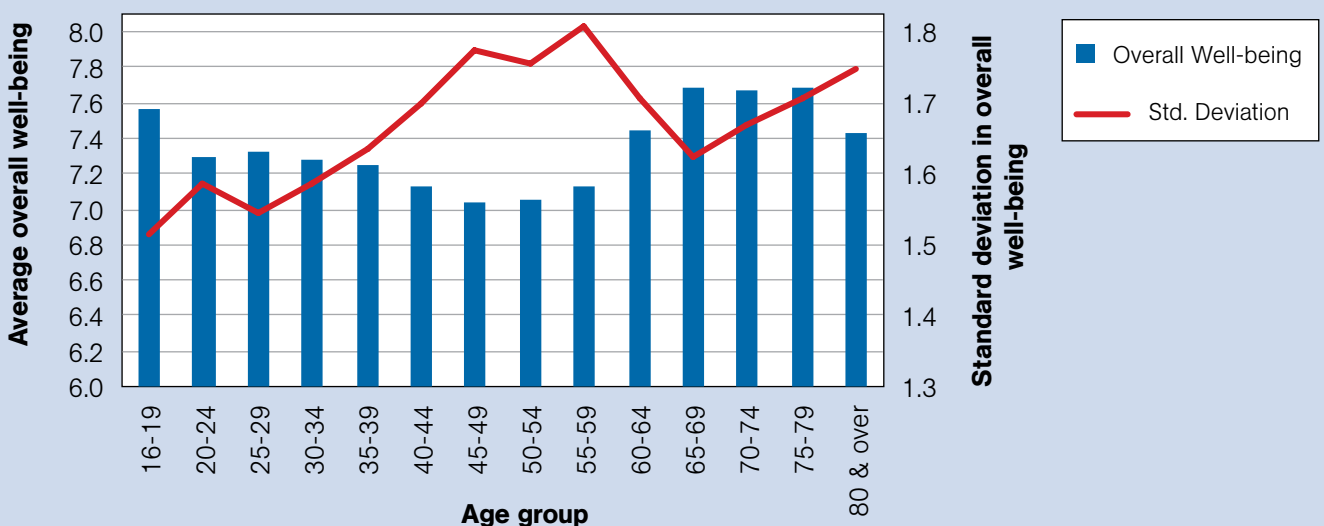
All 10 areas with the highest well-being inequality also have low average overall well-being scores – they are all in the bottom 30 out of 143. Three are in the Welsh Valleys, with other hotspots being Glasgow and nearby areas, Blackpool, and Merseyside.

The 10 areas with the lowest well-being inequality are more mixed. The most equal – Rutland – is also one of the areas with the highest well-being (4th highest mean). The Scottish Islands, as well as having the highest average levels of well-being are also 10th in terms of well-being equality. On the other hand, some of the areas in this list have relatively low average well-being – West Berkshire, for example, only ranks 62nd in terms of percentage of people scoring well on all four measures. There is a mix of more rural areas (such as the Scottish Islands), and cities (Brighton & Hove, and Bath); richer areas (e.g. Buckinghamshire), and poorer (e.g. Rutland).

### What predicts well-being inequality?

As with average levels of well-being, we attempted to predict well-being inequality at the local area level using a range of local level variables. Our analysis revealed deprivation levels in an area to be a strong predictor, with more deprivation leading to greater inequality in well-being. In general, lower income areas were also more likely to see greater well-being inequality. Together, overall deprivation and income predicted more than half of the variation in well-being inequality between local areas in England, highlighting that tackling deprivation would serve to both increase average well-being and reduce well-being inequality. Places which had higher income inequality (e.g. London) did not tend to have greater well-being inequality, a finding which corroborates the academic literature.<sup>60</sup> This highlights that parts of the country which do not have high income inequality may not necessarily be so equal in terms of well-being.

**Figure 19. Overall well-being and well-being inequality (standard deviation) by age group.**



### **Inequality in different age groups**

Figure 19 shows average overall well-being scores and the inequality of overall well-being scores (measured by standard deviation) for a series of age groups.<sup>61</sup> As discussed in Chapter 3, average well-being shows a U-shaped curve with age, declining from the teenage years up to the late forties, before rising again. Inequality in well-being, meanwhile, rises towards midlife, but does not fall that much in later years. All age groups beyond retirement age have higher well-being inequality than groups in their 20s and 30s, despite much higher proportions of people scoring well on all four measures among the older age groups. Further research is needed to better understand this inequality in well-being amongst older people – is it driven by wealth inequalities, or different social contexts, or perhaps health?

### **Conclusions**

Well-being inequality can and should be monitored by policymakers. Doing so can highlight some of the local social inequalities not captured by income data and put the spotlight on parts of the country that might otherwise be ignored. At the same time, the more equal distributions of well-being in areas such as West Berkshire and Bath and North East Somerset warrant better understanding.

Whilst evidence has repeatedly highlighted that older age groups have higher well-being in Western European countries like the UK, the evidence from the APS data is that they also experience relatively high levels of inequality in well-being, demonstrating that those groups should not be neglected in well-being analyses.



# 9. Findings and recommendations

## Key findings

The inclusion of subjective well-being measures in the APS offers an unprecedented opportunity to better understand the determinants of well-being. The substantial sample sizes allow groups hitherto ignored to be explored in a national level survey. It allows the interactions of different variables to be explored in intricate ways. It allows analysts to zoom right in to the map of the country and study well-being at small geographical levels.

This report has presented some of the ways the data can be used to produce policy-relevant findings. Key findings from the report include:

- Well-being in some ethnic groups (particularly Black, Bangladeshi, and Arab groups) is significantly below the UK average, even when controlling for individual characteristics. In other words two people with identical individual characteristics (included in our model) are likely to have differing well-being depending on their ethnic group. Ethnicity is still a force for inequality in well-being in the UK.
- There appears to be no significant difference in average well-being between employees and self-employed workers, all else being equal. This suggests that any shift to greater levels of self-employment in response to the economic crisis may not have a negative impact on well-being.
- Individuals who have permanent employment contracts experience higher well-being than those who do not, even when controlling for other factors included in our model, highlighting the dangers to well-being of temporary work contracts.
- Public sector workers find their lives more satisfying and feel that what they do is more worthwhile than those in the private sector, and those working in local government experience higher levels of well-being than those working in central government or the civil service.
- Individuals who work part-time out of choice experience higher levels of well-being than those who work full-time, even when controlling for other factors.
- Controlling for other factors, men who work very long hours (over 55 hours per week) experience lower levels of happiness and higher levels of anxiety than those working more typical hours, but they also feel that what they do in life is more worthwhile. Even below this threshold, there is a negative association between working hours and happiness, and a positive association between working hours and levels of anxiety.
- For women, both the effects on happiness and anxiety were stronger than for men and overall well-being was lower amongst those working long hours. Furthermore, the positive effect on feeling that what one does in life is worthwhile does not apply for women.
- All told, these results highlight that a shift to lower working hours could be beneficial for some aspects of well-being.
- The highest proportion of people scoring well on all four well-being measures and lowest proportion of people scoring badly on at least one measure are to be found on the small islands of the British Isles and the Northern and Southern extremities of the country. The lowest levels of well-being are found in London and the Welsh Valleys. At regional level, these differences are statistically significant even when controlling for individual and household characteristics, with Scotland, Northern Ireland, and the South West having higher than expected well-being, and London having lower than expected well-being. These results highlight trouble spots which local and central government should work to tackle, but also offer positive examples to be explored and learnt from.

## BOX 5. Recommendations to the ONS.

The first and most important recommendation to the ONS is to **keep at it**. This report, and the analyses that academics and analysts around the country are beginning to produce, demonstrate the richness of the data they have produced. The large sample sizes achieved by the APS allow analysts to bore down into quite small population segments and study how different variables interact. The inclusion of questions on all three aspects of subjective well-being (evaluative, hedonic, and eudaimonic) allow the differential effects of different well-being drivers to be teased apart.

Having said that, there is room for improvement in the way data are collected and reported. We recommend that the ONS should:

- 1. Collect household income data** alongside subjective well-being data. The biggest gap in the analyses we have produced here has been the lack of household income data. Household income is known to be an important determinant of well-being. To understand any other determinants of well-being, it is important to be able to control for income, and sometimes to segment the population into different income groups. We hope that the ONS will include some measure of household income in future APS waves.
- 2. Refine the subjective well-being questions.** The four well-being items used in this first wave are a good first step, and demonstrate that the ONS recognises the multi-dimensionality of well-being. However, there is reason to believe that the nature in which the questions are being asked does not differentiate sufficiently between the dimensions. We were able to distinguish the different aspects of well-being, but the differences were not as great as studies based on other surveys have found.<sup>62</sup>
- 3. Report proportions scoring well and badly.** Whatever well-being questions are used, communicable headline results are vital to ensure public interest. For that reason, we urge the ONS to continue to use thresholds on individual questions to help people understand what is 'high' or 'low' well-being, but also to develop methods to apply such thresholds to an overall indicator combining all the well-being items.
- 4. Integrate with other surveys.** The APS is a particular type of survey – it reaches a large sample, but does not include detailed questions on anything other than employment. The government runs many other surveys on issues such as health, community and transport use. Ensuring that these surveys also include the same well-being items and that the results can be read in parallel to those from the APS will allow a fuller picture of the determinants of well-being in the UK. For example, the four questions analysed here are already included in the General Lifestyle Survey and the Living Costs and Food Survey, although the data are not yet available.

- The *Index of Multiple Deprivation* in an area is a strong predictor of well-being, with crime and low income being the most important elements of deprivation. Much remains unexplained by standard metrics, however, highlighting the importance of using subjective well-being measures to assess the situation in different parts of the country.
- The well-being disadvantage of urban areas compared to rural ones should be investigated further.
- The average well-being of those in the bottom 20% of the well-being distribution is 4.8 – compared to 9.5 for those in the top 20%. This is a difference of 4.6 points.
- Well-being inequality is highest in the Welsh Valleys and in and around Glasgow. The existence of local well-being inequalities suggests that local areas should seek to better understand who are the people with high and low well-being in their areas, and explore methods for reducing well-being inequality. It is also important to highlight that areas with high well-being inequality are not necessarily those with high income inequality, and vice versa.
- Whilst previous evidence has repeatedly highlighted that older age groups have higher well-being in rich countries such as the UK, the evidence from the APS is that they also demonstrate relatively high levels of inequality in well-being, demonstrating that they should not be neglected in well-being analyses.

We at **nef** will continue to analyse the data from this survey to explore a range of questions, including:

- What protective factors might mitigate the negative effects on well-being of unemployment or under-employment?
- For who exactly are the effects on well-being of high and low working hours strongest?
- What data at the local level might explain the differences in well-being we found between different parts of the country?
- What drives well-being inequality within each part of the country?

### Where next?

The most important factor that will determine the success of this venture is not the data that the ONS produces, but the extent to which they are used. Analysts both inside and outside government no longer have an excuse not to consider well-being when making important decisions about people's lives.

Those outside government can, and should, make use of these data to highlight both challenges and positive stories. For example, the lower well-being of many ethnic groups, even controlling for economic and other factors, demonstrates a failing in terms of achieving equality in this country. At the same time, the well-being advantage of those working fewer hours points towards some of the potential benefits of making reduced working hours more of a norm, something **nef** has argued for elsewhere.<sup>63</sup> The government has already expressed its intention to ensure that well-being evidence guides policy.<sup>64</sup> As such civil society and advocacy groups that are able to make a well-being case, and use well-being data to hold government to account, will have a powerful tool in their hands.

Meanwhile, those inside government can start to use these and other data to identify important policy areas, appraise the potential impacts of policies, identify groups with low well-being, and in time evaluate the impacts of policies in terms of well-being. In the face of the current economic crisis, such techniques will be vital in ensuring the wise and effective deployment of scarce resources to enhance the well-being of the nation.

# Glossary

We have tried to use plain language throughout this report, but sometimes, to be concise and precise, technical language is necessary. This glossary explains the terms used.

**Binary variable** (or dummy variable): A variable which can only be one of two things, for example, female or not female, Indian or not Indian. These are often used to allow categorical variables such as ethnicity or employment status to be analysed in *multivariate linear regression*.

**Control** (verb): Controlling is something we have done when we want to understand the relationship between two variables (an *independent* and a *dependent* variable) without other variables influencing the relationship. For example, if we want to understand the effect of being retired on well-being, then we would compare retired and non-retired people whilst controlling for age. The difference we find once we have controlled for age is the difference that we would expect between a retired person and a non-retired person of the same age.

**Correlation:** A correlation between two *variables* occurs when differences in one variable are associated with differences in the other. For example, a person's height and weight are correlated – people who are taller tend to weigh more. The correlation is not perfect; you cannot be certain about somebody's weight if you know their height. But more often than not somebody who is taller will weigh more. Correlations can also be negative. In geography, there is a negative correlation between latitude and average temperature, with places at higher latitudes (i.e. the North Poles and the South Pole) having lower average temperatures.

**Dependent variable:** Dependent variables are *variables* whose variation we are trying to understand. Often dependent variables are things that we would like to see increase (like life satisfaction) or decrease (like anxiety).

**GDP (Gross Domestic Product):** GDP is a measure of the total value of all the economic transactions taking place within a particular place over a particular timeframe. Whilst it sounds straightforward, in reality, its calculation involves the aggregation of a large variety of data sets and many adjustments and calculations.

**Independent variable:** Independent variables are the *variables* that might explain variation in a dependent variable. In many cases, independent variables are things in the real world which we might have an influence over, such as income or working hours.

**Individual characteristics:** We use the shorthand 'individual characteristics' to talk about all the individual, household, and geographical variables included in the regression in Chapter 3 – including age, gender, marital status, number of children, disability, employment status, education level, being a homeowner, having a religion, living in an urban area and average household income in an area.

**Logarithmic:** A logarithmic relationship between two *variables* is one where multiplying the *independent variable* by a given amount will have the same effect on the *dependent variable*, no matter where one is on the distribution. So, when people say the relationship between household income and life satisfaction is logarithmic, what they mean is that if doubling a person's income from £10,000 to £20,000 is expected to increase their well-being by 1 point (say from 5 to 6), then doubling another person's income from £100,000 to £200,000 would also increase their well-being by 1 point – say from 7 to 8.

**Multivariate linear regressions:** These are *regressions* where more than one *independent variable* is used to predict the *dependent variable*, where the dependent variable is assumed to be treated as continuous. This means that 4 can be understood as bigger than 6, but also that it is meaningful to think of 6.5 (or 6.2 or 6.35) as in between 6 and 7. Dress size, where there is no such thing as 8.5, is an example of a variable which is not continuous.

**n/s:** See *significant (statistically)*.

**Regression analysis:** Regressions are used to estimate how well one or several *independent variables* predict variation in a *dependent variable*. In effect, regressions attempt to create an equation which estimates the relationship between the variables (see multivariate linear regression).

**Residual:** Residuals are an output of *regressions*. They are the difference, for an individual, between what the *dependent variable* is for that individual, and what the dependent variable is predicted to be given the equation produced by the regression. See the Technical Appendix for more detail.

**Significant (statistically):** Statistical tests work by looking at a pattern or relationship seen in the data from a sample, and testing whether it is likely to be 'real' – i.e. that it reflects a real pattern or relationship in the general population. If a result is found to be significant, then this means that there is only a small chance that it was just found in the sample by chance (typically 1% or 5% are used as thresholds). If a result is not found to be significant, then this means that we would be unwise to treat it as anything other than a fluke pattern – like seeing three red cars drive past in a row and then concluding that all cars in the country are red. Where results shown in graphs are not significant, we have lightened the colour and written 'n/s' (not significant).

**Subjective well-being:** An individual's experience of how their life is going assessed through questions in surveys. Happiness, satisfaction with life, an absence of anxiety, and feeling that what one does in life is worthwhile are all elements of subjective well-being, but so are a sense of autonomy, self-esteem, and feeling that one's relationships are supportive, amongst other things.

**Unstandardised coefficient:** *Multivariate linear regression* generates a number for each variable called the unstandardised coefficient. This is the literal effect on the *dependent variable* of a change in one unit of the *independent variable*. So, in a regression with life satisfaction as the dependent variable, if the unstandardised coefficient for the *binary variable* 'being married' was 0.8, that would mean that, all else being equal, people who are married have a life satisfaction score of 0.8 points more than people who are not married. If we had a variable for household income, and the unstandardised coefficient was 0.01, then this would mean that for every £1 increase in income, one would expect to see a 0.01 point increase in life satisfaction.

**Variable:** Literally, something which can vary, and which describes a particular person, or group, or place. In this report, there are *independent variables* (e.g. age, gender, deprivation level in local area) and *dependent variables* (e.g. life satisfaction of an individual, average life satisfaction of an area).

# Technical Appendix

This Appendix is intended for a general audience wishing to get an understanding of the statistical techniques used in this report. It explains how we used the APS data, including weighting, and selecting and transforming variables, and presents two of the key techniques which we used in the analyses: multivariate linear regression and residual analysis.

## Using the APS to produce population estimates

Our starting point for analysis was the APS Subjective Well-Being data set for April 2011 to March 2012, Special License Access version which we downloaded from the UK Data Archive.<sup>65</sup> The APS is actually a combination of several labour force surveys, including the main Labour Force Survey, the English Local Labour Force Survey, the Welsh Labour Force Survey, and the Scottish Labour Force Survey. The surveys include people of all ages, but only adults (aged 16 or over) were asked the subjective well-being questions – over 160,000 respondents.

A key aim of any survey is to ensure that the sample interviewed is representative of the population one is trying to understand. In the case of the APS well-being questions, the population of interest is the whole population (aged 16 and over) of the UK. So, if 50% of the country's population is female, then 50% of the sample should be female too. If 8.1% of the population are unemployed, then 8.1% of the sample should be unemployed. The ONS takes great pains to ensure this is achieved. A process of randomised sampling is used to achieve a survey sample free from biases in selecting who takes part. While these techniques are effective, they do not guarantee that the match will be precise. Where there are discrepancies, a process of 'weighting' is used to ensure that the averages produced from the sample as a whole are representative. So, for example, if 45% of the achieved survey sample was female (when 50% of the population overall is known to be female), then the responses of each woman in the survey would be 'weighted up', while the responses of each man in the survey would be 'weighted down', so that the average of all respondents reflected the population as a whole. The ONS provides these weightings for analysis in the data set.

## Variables analysed

The APS dataset we analysed contained around 200 variables. We included in the regressions data connected to those variables which we expected to have some relationship with well-being based on previous research (see *Further Reading* section). One exception was the exclusion of the item on self-assessed health status. Health, of course, is associated with subjective well-being. However, some of the association that is found with self-assessed health is due, not to the genuine relationship between health and subjective well-being, but rather due to the fact that some people tend to respond more positively to such questions in surveys than others – a response bias.<sup>66</sup>

The risk is that including this variable in the regression would 'drown' out the effects of the other variables, which are all much more clearly 'objective' in that they rely less on people's judgements about themselves. This is not to deny the value of the subjective health question, and health is a very important determinant of subjective well-being. However, in the context where we wanted to look at multiple determinants of well-being at the same time, including subjective variables and more objective variables as drivers can be problematic.

Although we decided not to include the subjective health variable in our core regression model, we did undertake analysis to explore what the impact of including the subjective health variable would have had on our results. When we included the subjective health variable in our regressions, the overall explanatory power of the regressions increased, but the size of the coefficients on several labour market variables decreased. Including the subjective health variable also decreased the size of the coefficient on the variable for disability significantly, suggesting that in our core model, the variable for disability is capturing a lot of the variance that could be attributed to health in general.

Some of the variables of interest in the APS were categorical variables, such as ethnicity or employment status, where respondents had several categories to choose from. These variables had to be recoded into multiple binary variables for regression analysis, each corresponding to single categories in the original question. One category from the original variable is, however, not coded into a new binary variable, but treated as the reference category to which the new binary variables are compared. For example, the ethnicity variable was recoded into several binary variables – one for each ethnicity, except for White, which was treated as the reference category. If someone responded that they considered themselves to be Indian, then the Indian binary variable would be coded ‘yes’ (or 1), and all the other ethnic group binary variables (Black, Pakistani, etc.) would be coded ‘no’ (or 0).

Another complexity was the inclusion of age in the regression models. The relationship between age and well-being is known to be U-shaped. Well-being falls with age to about 40-50 years, flattens out, and then begins rising again. If one were to just put age into a regression model then this quite clear pattern would be missed – should the coefficient be positive or negative? As such, researchers typically use what is known as a ‘quadratic’ term. Age and age squared are included in the model with different coefficients. At low ages, it is the age coefficient (which is negative) that changes most and so dominates, so well-being is modelled to go down. At higher ages, it is the age squared coefficient (which is positive) which begins to dominate, allowing one to model rising well-being at this point. The table below shows how age and age squared contribute to life satisfaction with a few worked examples:

Age	Age squared	Effect of age	Effect of age squared	Estimated life satisfaction
20	400	-2.1	0.5	7.38
22	484	-2.3	0.6	7.27
70	4900	-7.3	5.6	7.34
72	5184	-7.5	5.9	7.46

Age coefficient: -0.104

Age squared coefficient: +0.0011

As noted in Chapter 3, we also included the logarithm of average gross disposable household income in an area, taken from a separate source on the ONS website. We added this variable to the APS data set using the local area identifier for each individual – so if someone was identified as living in Wiltshire, we would ascribe to them the average household income in Wiltshire. This is a measure of affluence in a locality, not a proxy for household income. Research has shown that the relationship between well-being and indicators such as income or GDP is best represented as one of diminishing returns. So, increasing a household’s income by £5,000 per year when they were previously on £10,000 a year is likely to have a bigger impact on their well-being than the same increase for a household on £100,000 per year. This intuitive pattern is best captured mathematically as *logarithmic*.<sup>67</sup>

### Regression analyses

The analysis in Chapters 3 to 7 relies heavily on *multivariate linear regression*. Regressions are a statistical technique that allow analysts to simultaneously explore multiple relationships between variables. Without regressions, we would be restricted to looking at one relationship at a time, which can lead to important patterns being overlooked.<sup>68</sup> For example, imagine we looked for a relationship between average temperature in a country and average well-being, but found no pattern. However, there may indeed be a relationship with warmer temperatures generally contributing positively to well-being, but one that is counteracted by

those countries being poorer – a factor which is likely to reduce average well-being. In other words, a lack of an immediate apparent correlation does not necessarily mean that there is no relationship. Regressions, where multiple variables can be considered at the same time, allow one to test for this. In the example above, a regression analysis would enable us to find a positive significant relationship between GDP and well-being, but also between average temperature and well-being. The interpretation is that, if we were to find two countries with the same GDP level but differing climates, then we would expect the country with a higher average temperature to have higher well-being.

The opposite can also occur, whereby just looking at the relationship between well-being and one other variable would indicate an association, but, incorporating another variable would provide evidence that the initial variable did not fully explain the association. For example, the relationship between GDP and average well-being is greatly diminished when one also considers average trust in that country.<sup>69</sup> This suggests that one of the reasons people have higher well-being in wealthier countries is that those countries tend to have high levels of trust, and that trust is what is leading to higher well-being, not just the wealth per se.

A textbook approach would suggest the well-being data we analyse are not strictly suitable for linear regressions because they are measured on an 'ordinal scale'. This means that, whilst we can be sure that 7 is higher than 6, and 4 is higher than 3, we don't know how *much* higher, nor whether the differences in these two cases are equivalent. Linear regression techniques are designed to be used to model determinants of variables that are measured as 'interval data' (i.e. data where one can be sure that the difference between 6 and 7 means the same as the difference between 3 and 4). However, several studies have demonstrated that using linear regressions is acceptable for well-being data and that the results do not differ from those one would find using more complex techniques (see Ferrer-i-Carbonell & Frijters, 2004). As a result, much of the academic literature, like us, uses linear regressions for the sake of simplicity and ease of interpretation.

Many of our analyses had to exclude respondents from Northern Ireland as we did not have data identifying them as living in an urban or rural area – which was an important variable in our regression model.

## Residuals

In Chapters 5 and 6, we make use of the *residuals* from our baseline regression model to control for differences in individual characteristics and compare the well-being of different groups on a like-for-like basis. The residual, for any given individual in the survey is the difference between their reported well-being and the well-being you would expect them to have given the regression model. So, if the regression model predicts that a 'typical' single woman, aged 30, employed, with A-level education, and living in an urban area with a mean household income of £20,000 per head 'should' have a life satisfaction of 7.19, then a respondent matching that description and reporting a life satisfaction of 8 out of 10 would have a residual of +0.81. This means her well-being is 0.81 points higher than one would expect given her individual characteristics. Similarly, if the same person reported a life satisfaction of 7.00 out of 10, she would have a residual of -0.19. Using these residuals allow us to 'freeze' the individual effects, and see what other determinants of well-being lie beyond them.

We also used residuals in Chapter 7 when looking at well-being averages in local areas.



# Further reading

This report builds upon a large literature of research exploring well-being drivers. Much of the evidence mentioned was identified in a major literature review conducted by **nef**:

Stoll, L., Michaelson, J. and Seaford, C. (2012). *Well-being evidence for policy: A review*. London: **nef**.

Here we list some of the other key research on the different drivers.

## General

BIS (Department for Business, Innovation and Skills). (2008). Foresight Mental Capital and Wellbeing Project. Final Project report. London: The Government Office for Science. Retrieved from <http://www.bis.gov.uk/foresight/our-work/projects/published-projects/mental-capital-and-wellbeing/reports-and-publications>.

Centre for Well-Being. (2011). *Measuring our Progress*. London: **nef**.

Dolan, P., Peasgood, T. and White, M. (2006). Review of research on the influence of personal well-being and application to policy making. London: Defra.

Van Praag, B.M.S., Frijters, P. and Ferrer-i-Carbonell, A. (2003). The anatomy of subjective well-being. *Journal of Economic Behaviour and Organization*, 51, 29–49.

## Ethnicity

Aldous, J. and Ganey, R.F. (1999). Family Life and the Pursuit of Happiness: The Influence of Gender and Race. *Journal of Family Issues*, 20(2), 155–180.

Alesina, A., Di Tella, R., and MacCulloch, R. (2004). Inequality and happiness: Are Americans and Europeans different? *Journal of Public Economics*, 88, 1009–2042.

## Unemployment

Clark, A., Georgellis, Y. and Sanfey, P. (2001). Scarring: The Psychological Impact of Past Unemployment. *Economica*, 68(270), 221–241.

Clark, A. and Oswald, A. (1994). Unhappiness and Unemployment. *The Economic Journal*, 104 (424), 648–659.

Luechinger, S., Meier, S. and Stutzer, A. (2010). Why does unemployment hurt the employed?: Evidence from the life satisfaction gap between the public and private sector. *Journal of Human Resources*, 45(4), 998–1045.

## The self-employed

Blanchflower, D. G. and Oswald, A. J. (1998). What makes an Entrepreneur? *Journal of Labor Economics*, 16 (1), 26–60.

Alesina, A., Di Tella, R., and MacCulloch, R. (2004). Inequality and happiness: Are Americans and Europeans different? *Journal of Public Economics*, 88, 1009–2042.

## Temporary work contracts

Bardasi, E. and Francesconi, M. (2004). The impact of atypical employment on individual well-being: Evidence from a panel of British workers. *Social Science and Medicine*, 58, 1671–1688

Blanchflower, D. G., and Oswald, A. J. (2011). International Happiness: A New View on the Measure of Performance. *Academy of Management Perspectives*, February 6–22.

Gracia, F., Ramos, J., Maria Peiro, J., Caballer, A. and Sora, B. (2011). Job attitudes, behaviours and well-being among different types of temporary workers in Europe and Israel. *International Labor Review*, 150(3–4), 235–254

Silla, I., De Cuyper, N., Gracia, F.J., Peiro, J.M., De Witte, H. (2009). Job insecurity and well-being: Moderation by employability. *Journal of Happiness Studies*, 10, 739–751

## Private and public sectors

Luechinger, S., Meier, S. and Stutzer, A. (2010). Why does unemployment hurt the employed?: Evidence from the life satisfaction gap between the public and private sector. *Journal of Human Resources*, 45(4), 998–1045.

## Part-time work and working hours

Harter, J. K. and Arora, R. (2009). The impact of time spent working and job-fit on well-being around the world. In E. Diener, D. Kahneman and J.F. Helliwell (Eds.). *International differences in well-being*. Oxford, UK: Oxford University Press.

Luechinger, S., Meier, S. and Stutzer, A. (2010). Why does unemployment hurt the employed?: Evidence from the life satisfaction gap between the public and private sector. *Journal of Human Resources*, 45(4), 998–1045.

Meier, S. and Stutzer, A. (2008). Is volunteering rewarding in itself? *Economica*, 75(297), 39–59.

## Geographical analysis of well-being in the UK

Ballas, D. and Tranmer, M. (2012). Happy people or happy places? A multi-level modelling approach to the analysis of happiness and well-being. *International Regional Science Review*, 35(1), 70–102.

Deacon, L. et al. (2011). *Northwest Mental Wellbeing Survey 2009*. North West Public Health Observatory. Retrieved from <http://www.nwph.net/nwpho/NorthWestMentalWellbeingSurvey.pdf>

Shields, M. and Price, S.W. (2005). Exploring the economic and social determinants of psychological well-being and perceived social support in England. *Journal Royal Statistical Society Part 3*, 513–537.

#### **Well-being inequality**

Abdallah, S. (forthcoming). Analysis, implementation and dissemination of well-being indicators: Task 8 - Inequalities and disparities. Report to Eurostat (should be publicly available in 2013).

Kalmijn, W. and Veenhoven, R. (2005). Measuring inequality of happiness in nations. *Journal of Happiness Studies* 6, 357–396.

Ott, J. (2005). Level and inequality of happiness in nations: does a greater happiness of a greater number imply greater inequality of happiness? *Journal of Happiness Studies*, 6, 397–420.

# Endnotes

- 1 ONS (2011) *Measuring National Well-Being Discussion paper on domains and measures*. Retrieved from [www.ons.gov.uk/ons/rel/wellbeing/measuring-national-well-being/discussion-paper-on-domains-and-measures/index.html](http://www.ons.gov.uk/ons/rel/wellbeing/measuring-national-well-being/discussion-paper-on-domains-and-measures/index.html)
- 2 ONS (2010) *Measuring national well-being: Consultation document*. Retrieved from [www.ons.gov.uk/ons/about-ons/consultations/closed-consultations/measuring-national-well-being/index.html](http://www.ons.gov.uk/ons/about-ons/consultations/closed-consultations/measuring-national-well-being/index.html)
- 3 Prime Minister David Cameron's speech, 25th November 2010. Retrieved from [www.number10.gov.uk/news/pm-speech-on-well-being](http://www.number10.gov.uk/news/pm-speech-on-well-being)
- 4 Daly, H., and Cobb, J. (1989). *For the Common Good – redirecting the economy towards community, the environment and sustainable development*. Boston: Beacon Press.
- 5 Diener, E. (2000). Subjective well-being: The science of happiness, and a proposal for national index. *American Psychologist*, 55, 34–43.
- 6 Diener, E., & Seligman, M. E. P. (2004). Beyond money: Toward an economy of well-being. *Psychological Science in the Public Interest*, 5, 1–31.
- 7 QUARS: Index of the Quality of Regional Development. Retrieved from [www.sbilanciamoci.org/quars/](http://www.sbilanciamoci.org/quars/) (in Italian).
- 8 Canadian Index of Well-Being. Retrieved from [www.ciw.ca](http://www.ciw.ca)
- 9 Marks, N., Abdallah, S., Simms, A., and Thompson, S. (2006). *The(un)Happy Planet Index: An index of human well-being and environmental impact*. London: nef.
- 10 See <http://www.oecd.org/turkey/istanbulworldforum-measuringandfosteringtheprogressofsocieties.htm>
- 11 OECD (forthcoming) *Guidelines on the Measurement of Subjective Well-Being*. Paris: OECD.
- 12 Eurostat. (2012). *EU-SILC 2013 Module on Well-Being: Description of SILC secondary target variables*. Retrieved from [http://epp.eurostat.ec.europa.eu/portal/page/portal/income\\_social\\_inclusion\\_living\\_conditions/documents/tab/Module%202013/Guidelines%202013%20Module%20ver%20March%202012.pdf](http://epp.eurostat.ec.europa.eu/portal/page/portal/income_social_inclusion_living_conditions/documents/tab/Module%202013/Guidelines%202013%20Module%20ver%20March%202012.pdf)
- 13 Helliwell, J. F. & Wang, S. (2012). 'The state of world happiness' In J Helliwell, R Layard & J Sachs (Eds.). *World Happiness Report*. New York: The Earth Institute.
- 14 Ryan, R. and Deci, E. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, 52, 141–166.
- 15 Poll carried out by GfK NOP in 2006 on behalf of the BBC. Retrieved from [http://news.bbc.co.uk/1/hi/programmes/happiness\\_formula/4771908.stm](http://news.bbc.co.uk/1/hi/programmes/happiness_formula/4771908.stm)
- 16 La Fabrique Spinoza (2012). *Le bonheur: un sujet sérieux en période présidentielle?* Retrieved from [www.fabriquespinoza.org/wp-content/uploads/2012/03/CSA-pour-La-Fabrique-Spinoza-1200-205-Les-Français-et-le-bonheur.pdf](http://www.fabriquespinoza.org/wp-content/uploads/2012/03/CSA-pour-La-Fabrique-Spinoza-1200-205-Les-Français-et-le-bonheur.pdf)
- 17 Eurostat Feasibility study for well-being indicators: Critical review. Retrieved from [http://epp.eurostat.ec.europa.eu/portal/page/portal/gdp\\_and\\_beyond/documents/Feasibility\\_study\\_Well-Being\\_Indicators.pdf](http://epp.eurostat.ec.europa.eu/portal/page/portal/gdp_and_beyond/documents/Feasibility_study_Well-Being_Indicators.pdf)
- 18 Centre for Well-being. (2011). *Measuring our Progress*. London: nef.
- 19 Helliwell, J., Layard, R. and Sachs, J. (2012). *World Happiness Report*. New York: The Earth Institute.
- 20 Abdallah, S. and Mahony, S. (2012). *Stocktaking of Subjective Well-Being*. Part of the FP7 project e-Frame . Retrieved from <http://www.eframeproject.eu/index.php?id=28>.
- 21 OECD (forthcoming) *Guidelines on the Measurement of Subjective Well-Being*. Paris: OECD.
- 22 Diener, E. & Tov, W. (2011). 'National accounts of well-being'. In K. C. Land, Michalos, A.C., & Sirgy, M.J. (Eds.), *Handbook of social indicators and quality-of-life research*. New York & London: Springer.
- 23 Clark, A., Georgellis, Y. and Sanfey, P. (2001). Scarring: The Psychological Impact of Past Unemployment. *Economica*. 68(270), 221–241.
- 24 Diener, E. and Chan, M. (2011). 'Happy people live longer: Subjective well-being contributes to health and longevity' *Applied Psychology: Health and Well-being*, 3, 1–43.
- 25 nef has conducted a review of the cultural biases on subjective well-being as part of a project for Eurostat, available on request.
- 26 Diener, E. and Kahnemann, D. (2010). Income's Association with Judgments of Life Versus Feelings. In E. Diener, J. F. Helliwell and D. Kahneman (Eds.). *International Differences in Well-Being*. Oxford: Oxford University Press.

- 27 Centre for Well-being. (2011). *Measuring our Progress*. London: **nef**.
- 28 OECD (forthcoming) *Guidelines on the Measurement of Subjective Well-Being*. Paris: OECD.
- 29 Krueger A, Kahneman D, Fischler D, Schkade D, Schwarz N & Stone A. (2009). Time use and subjective well-being in France and the U.S. *Social Indicators Research*, 93, 7–18.
- 30 Ryan, R., Huta, V., & Deci, E. (2008). Living well: A self-determination theory perspective on eudaimonia. *Journal of Happiness Studies*, 9, 139–170.
- 31 Seligman, M. (2011). *Flourish: A New Understanding of Happiness and Well-Being – and How to Achieve Them*. London: Nicholas Breasley Publishing.
- 32 Huppert, F. and So, T. (2011). Flourishing Across Europe: Application of a New Conceptual Framework for Defining Well-Being. *Social Indicators Research*, Dec 2011, 125.
- 33 These definitions produce a distribution of well-being whereby roughly one quarter of the UK population is scoring well on all four measures and one quarter is scoring badly on at least one measure.
- 34 Taking an unweighted average like this implicitly assumes that all four aspects of well-being covered in the survey are equally important. We have done this because we have no empirical evidence as to the greater importance of any particular measure. Before calculating an average, responses to the anxiety question were reversed so that high scores would indicate high well-being.
- 35 Combining data from four questions on 0–10 scales, means there are 41 possible different total scores.
- 36 Variables for each ethnic group and region were also analysed but are not presented in this table for simplicity. They will be considered in Chapters 4 and 8.
- 37 Given the large sample size and the large number of analyses, we used a significance threshold of 0.01, to avoid false positive results. Colours are also based on the T-values in the regression (T-values are used to determine the significance of an effect, with larger Ts indicating more significant differences). The lightest shades indicate Ts less than 20. The middle shades represent Ts between 20 and 40. The darkest indicate Ts above 40. Note that it is only possible to compare the T scores between regressions because the sample sizes for the regressions are roughly the same.
- 38 Stoll, L., Michaelson, J. and Seaford, C. (2012). *Well-being evidence for policy: A review*. London: **nef**.
- 39 A measure of affluence in a locality was also included in the regression (Regional Gross Disposable Household Income: retrieved from <http://www.ons.gov.uk/ons/rel/regional-accounts/regional-household-income/spring-2012/tsd-regional-gdhi-2010.html>). A logarithm of this value had a mild positive relationship with life satisfaction, happiness and overall well-being, but a non-significant relationship with anxiety and the sense that what one does in life is worthwhile. However, bear in mind that this is average household income in the local area, not the household income of the individual respondent.
- 40 In regression statistics, these are normally called 'dummy variables'.
- 41 Stoll, L., Michaelson, J. and Seaford, C. (2012). *Well-being evidence for policy: A review*. London: **nef**.
- 42 Parliamentary Office of Science and Technology (2007) 'Ethnicity and Health'. *Postnote*. January 2007: 276. Retrieved from <http://www.parliament.uk/briefing-papers/POST-PN-276.pdf>
- 43 ONS. (2012). 'First ONS Annual Experimental Subjective Well-being Results' p12. Retrieved from [http://www.ons.gov.uk/ons/dcp171766\\_272294.pdf](http://www.ons.gov.uk/ons/dcp171766_272294.pdf)
- 44 We explored the relationship between ethnicity and well-being using data from the Understanding Society survey, which does include household income, but has a much smaller sample size. We found that life satisfaction is significantly lower among those reporting themselves as Black, Bangladeshi, Indian or as having Mixed/Multiple ethnicity, even when household income and other characteristics were controlled for. We did not find significant differences for the Middle-Eastern/Iranian and Pakistani groups, but the sample size for these groups was very small.
- 45 Philpott, J. (2012). *The rise in self-employment*. London: Chartered Institute of Personnel and Development.
- 46 We use the word temporary to refer to the response category in the APS defined as 'not permanent in some way'.
- 47 In these figures, the anxiety scores are *not* reversed – so higher anxiety means greater levels of anxiety and therefore lower well-being.
- 48 Another excellent endeavour in this field has been carried out by the Department of Communities and Local Government (DCLG, see <http://opendatacommunities.org/data>). They use various other data sources to estimate well-being down to the super output area level. This approach relies on using the relationships between objective data sources for which data is available at very low geographical levels, and the well-being data for which less data are available. This is a very powerful technique, but it is important to remember that the data presented by the DCLG for super output areas is not based on representative samples in those areas, but rather estimates based on objective characteristics in those areas. Therefore local level factors that effect well-being, but are not captured by objective data, will be ignored.
- 49 Due to lack of independent variable data, we had to exclude Northern Ireland from the maps and the analyses in the remainder of this section. It is, however, included in the rankings, where it comes 13th in terms of percentage scoring well on all four well-being measures (32%) and 35th in terms of percentage scoring badly on at least one measure (27%).

- 50 Thresholds for the colours were chosen in each map to produce five roughly equal groups.
- 51 NHS Dumfries & Galloway. (2007). *Whit Fettle: The Dumfries and Galloway Well-being and Lifestyle Survey*. Retrieved from <http://www.dgcommunity.net/dgcommunity/xdocuments/23178.pdf.ashx>
- 52 Inner London was identified as the richest local area based on the variable mean gross disposable household income, as used in the regression model in Chapter 3.
- 53 We carried out a regression including various operationalisations of the IMD, mean gross disposable household income (as in Chapter 3), and the median income in an area, based on the Annual Survey of Household Earnings. Once the IMD was included in the regression, the two income variables were not significant.
- 54 IMDs are actually calculated for Super-Output Areas, which are much smaller than the unitary authorities and countries covered here (there are over 32,000 in England alone). We therefore used 'extent' measures which capture the proportion of Super-Output Areas in each county or unitary authority that are amongst the most deprived.
- 55 We did not have IMD data for Northern Ireland, nor did we have any geographical data within Northern Ireland.
- 56 This figure is based on the  $R^2$  (the multiple regression correlation coefficient) of 0.65. Meanwhile in Scotland an  $R^2$  of 0.49 was found, and in England an  $R^2$  of 0.31.
- 57 These residuals were calculated in three separate regressions – one for each country. We then had to add a factor for each country, given the different averages for Scotland, Wales and England.
- 58 MacKerron, G. (2012). *Happiness and environmental quality*. PhD thesis., London: London School of Economics and Political Science.
- 59 Thresholds for the colours were chosen so that areas were divided into five roughly equal groups.
- 60 Ott, J. (2005). Level and inequality of happiness in nations: does a greater happiness of a greater number imply greater inequality of happiness? *Journal of Happiness Studies*, 6, 397–420.
- 61 Standard deviation is used here rather than the difference between the highest and lowest well-being quintiles as it is quicker and easier to calculate. In any case, as Kalmijn & Veenhoven argue (see Further Reading section), standard deviation is a good measure of well-being inequality.
- 62 Michaelson, J., Abdallah, S., Steuer, N., Thompson, S., & Marks, N. (2009). *National Accounts of Well-being: Bringing real wealth onto the balance sheet*. London: **nef**.
- 63 Coote, A., Simms, A. and Franklin, J. (2010). *21 hours: Why a shorter working week can help us all flourish in the 21st century*. London: **nef**
- 64 Prime Minister David Cameron's speech, 25th November 2010. Retrieved from [www.number10.gov.uk/news/pm-speech-on-well-being](http://www.number10.gov.uk/news/pm-speech-on-well-being)
- 65 Data code SN 7092. Retrieved from <http://www.esds.ac.uk/findingData/snDescription.asp?sn=7092>. Researchers wishing to analyse this data need to apply for Approved Researcher status as the data set includes sensitive information. Those without Approved Researcher status can download a data set (SN 7091) excluding geographical data.
- 66 Okun, M. A., & George, L. K. (1984). Physician- and self-ratings of health, neuroticism, and subjective well-being among men and women. *Personality and Individual Differences*, 5, 533–540.
- 67 *Ibid.*
- 68 Dolan, P., Peasgood, T. and White, M. (2008). Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of Economic Psychology*, 29, 94–122.
- 69 Helliwell, J. F. and Putnam, R. (2004). The social context of well-being. *Philosophical Transactions of the Royal Society of London*, 359, 1435–1446.





**Written by:** Saamah Abdallah and Sagar Shah

**With contributions, advice, and support from our colleagues at nef (the new economics foundation):** Carys Afoko, Ross Haig, Elna Kotze, Sorcha Mahony, Juliet Michaelson, Jacob Mohun, Charles Seaford, Faiza Shaheen, and Laura Stoll.

**Thanks to:** Dimitris Kallis at the University of Sheffield, Dimitris Kavroudakis at the University of the Aegean, and the UK Data Archive.

**Edited by:** Mary Murphy

**Design:** the Argument by Design – [www.tabd.co.uk](http://www.tabd.co.uk)

**new economics foundation**

3 Jonathan Street  
London SE11 5NH  
United Kingdom

Telephone: +44 (0)20 7820 6300

Facsimile: +44 (0)20 7820 6301

E-mail: [info@neweconomics.org](mailto:info@neweconomics.org)

Website: [www.neweconomics.org](http://www.neweconomics.org)

Registered charity number 1055254

© November 2012 **nef** (the new economics foundation)

ISBN 978-1-908506-31-3



This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/3.0/> and [www.neweconomics.org/publications](http://www.neweconomics.org/publications)