Housing and wellbeing: analysing English Housing Survey data 2013-2020

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About the author

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About the What Works Centre for Wellbeing

We are an independent collaborating centre and the aim of our work is to improve wellbeing and reduce misery in the UK. We believe that this is the ultimate goal of effective policy and community action. By accelerating research and democratising access to wellbeing evidence, we develop and share robust evidence for governments, businesses, communities and people to improve wellbeing across the UK.

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Introduction

Shelter is central to meeting our basic needs, so it is no surprise that where we live plays an important role in our ability to feel good and function well.

Research indicates that the condition, location and cost of housing underpins drivers of wellbeing including health, relationships, security and environment.[1] For example, those who live in damp-free homes or who have access to a garden report higher life satisfaction and more frequent feelings of happiness. These effects are smaller than major life events, but still substantial. Existing evidence also shows that neighbour noise and local vandalism have a negative impact on life satisfaction. This suggests it's not only where we live, but the behaviour of who we live near, that can impact our subjective wellbeing.

A more complicated question is whether owning or renting affects wellbeing. The evidence is more mixed. It seems that becoming a home-owner does not have a positive impact on mental health. The absence of a clear "home-owner effect" may be due to the increased financial pressures taken on by buying, both immediately and in the long term, which offset positive influences associated with owning your home.

To further understand the relationship between housing and wellbeing, we have analysed data from the English Household Survey April 2013-2020 . We look at wellbeing over time, and how it differs according to social-economic characteristics such as age, income, and health conditions, and household variables, such as type of tenure, type of dwelling, and housing dimensions (in square metres) and conditions (if decent or not).

Some of these findings confirm our expectations: good health, employment, and to be married are positively related with wellbeing. Conditions that can reduce wellbeing are to be a lone parent, to live in a house that did not pass the criteria for being a decent house, to rent a house instead of owning it, even with a mortgage. The type of dwellings does not seem to have a strong correlation with wellbeing, as living in an overcrowded house.

The data

The English Housing Survey (EHS)

The EHS is an annual national survey commissioned by the Department for Levelling UP, Housing and Communities (DLUHC) that collects information about people's housing circumstances and the condition and energy efficiency of housing in England.

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[1] https://hact.org.uk/publications/the-social-impact-of-housing-providers/

It consists of two main elements: an interview survey with an annual sample of approximately 13,300 households and a follow up physical inspection of the dwelling of 6,000 of the participating households together with an inspection of around 200 vacant dwellings. The interview surveys are analysed on an annual, financial year basis. The data from the physical survey are analysed on a two year rolling basis.

The English Housing Survey (EHS) datasets

The EHS datasets are released to external users through the UK Data Service. Data are available via an End User Licence and a Special Licence[2]. Two separate datasets are available:

1. **EHS Household Dataset** – The full sample primary 'raw' interview survey data (available via the Special Licence only), plus associated derived variables[3] (available via both the End User Licence and the Special Licence) for all cases where an interview has been completed – approximately 13,300 households per annum. Datasets are provided for single financial years together with annual weights. This dataset should be used for any analysis where only information from the household interview is required.

2. **EHS Housing Stock Dataset** – The paired sample primary 'raw' interview survey and physical survey data (available via the Special Licence only), plus associated derived variables (available via both the End User Licence and the Special Licence) for all cases where a physical survey has been completed. Housing stock data on occupied dwellings consist of data from the household interview as well as data from the physical survey. The Housing Stock Dataset should be used for any analysis requiring information relating to the physical characteristics and energy efficiency of the housing stock. The housing stock data are made available for a two-year rolling sample with the appropriate two-year weights[4]. This means that users who use more than one housing stock dataset must use either odd or even years[5].

Methodology

In this analysis we use both datasets: the EHS Household Dataset for the period April 2013- April 2020 and the Housing Stock Dataset for the years 2014, 2016, 2018.

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[2] Special Licence data contain more raw and derived variables. Wellbeing variables are available only with Special Licence data.
[3] These are variables created by modelling or by recording the basic survey data.
[4] For example, the EHS Housing Stock Dataset for '2019' covers the period April 2018 to March 2020. This dataset comprises up to 12,400 cases.
[5] This means that one must use the Housing Stock Dataset for '2017' and '2019' or '2016' and '2018', but not the dataset for '2018' and '2019' as that would double-count the cases surveyed between April 2018 and March 2019

We use socio-demographic variables (age, sex, ethnicity, marital status, economic activity, presence of dependent children, household income quintiles, health), household variables (type of household, type of tenure and accommodation, satisfaction with tenure and accommodation) and a variable for UK regions.

From the Housing Stock Dataset we will take housing variables such as overcrowding, presence of damp, floor in square metres, a variable for a decent house and comprehensive repair costs[6].

With Special Licence data[7] the four wellbeing variables are available (life satisfaction, happiness, worthwhile, anxiety), as measured by the ONS4 questions (table 1).

Table 1: ONS4 questions

Measure	*Question*
Life Satisfaction	Overall, how satisfied are you with your life nowadays?
Worthwhile	Overall, to what extent do you feel that the things you do in your life are worthwhile?
Happiness	Overall, how happy did you feel yesterday?
Anxiety	On a scale where 0 is "not at all anxious" and 10 is "completely anxious", overall, how anxious did you feel yesterday?

Source: Office for National Statistics

Life satisfaction, worthwhileness and happiness are measured on a scale from 0 to 10, where 0 corresponds to not at all and 10 corresponds to completely. Anxiety is measured on a scale from 0 to 10, where 0 is not at all anxious and 10 is completely anxious.

Given this coding, high values of life satisfaction, happiness and worthwhileness correspond to a higher wellbeing, while high values of anxiety correspond to a lower wellbeing.

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[6] Comprehensive repairs include urgent work required in the short term to tackle problems presenting a risk to health, safety, security or further significant deterioration plus any additional work, including replacement of elements that will become necessary within the next 10 years.

[7] Wellbeing variables are available in the identity_sl_protect.dta dataset.

As well as looking at raw scores of these variables, we will also consider the proportion that fall into the ONS' defined bins of "high" or "low" for each of these scores[8]. This allows us to more easily identify those with high or low levels of wellbeing and potentially enables policy makers to more easily target policies.

Quantitative results

Initial correlational analysis allowed us to understand how wellbeing has changed over time and whether the sample from the EHS reflects what we know of the general population from other samples.

Looking at EHS Household data, wellbeing appears to have been quite stable for the period April 2013- April 2020, with the median values remaining the same for all the years and life satisfaction, happiness and worthwhile showing the same value. Worthwhile showed the highest mean values for all the years, while anxiety presented slightly decreasing values in 2014 and 2015. Correlations matrices show a negative relationship of anxiety with the other subjective wellbeing variables. High and low proportions for all wellbeing variables look quite stable over the years considered and with values close to the ones calculated by the ONS in the Annual Population Survey.

Overall, these findings are broadly consistent with trends in other national wellbeing datasets. Detailed results of the analysis are presented in Appendix B.

## Wellbeing by sociodemographic and household characteristics

We explored how wellbeing varies according to different sociodemographic and household characteristics such as age, ethnicity, employment status, health conditions, type of households and presence of dependent children.

This section sets out the difference in mean wellbeing for these groups, without controlling for the other characteristics which could be influencing this difference. An OLS regression is carried out in the .

When looking at mean wellbeing by 6 age groups, we found the usual U-shaped relationship, with younger and older people showing higher mean levels of wellbeing (figure 1). People aged 65 and over also show lower mean levels of Anxiety.

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[8] High scores correspond to individuals answering 9 or more out of 10 for life satisfaction, worthwhileness and happiness (very high wellbeing), and 6 or more out of 10 for anxiety (low wellbeing) . People with low scores for life satisfaction, worthwhileness and happiness are those answering 4 or less out of 10 (low wellbeing) while people with low scores of anxiety are those answering 1 or less out of 10 (high wellbeing).

Figure 1: Mean Life Satisfaction, Happiness, Worthwhile and Anxiety by age groups over 2013-2020
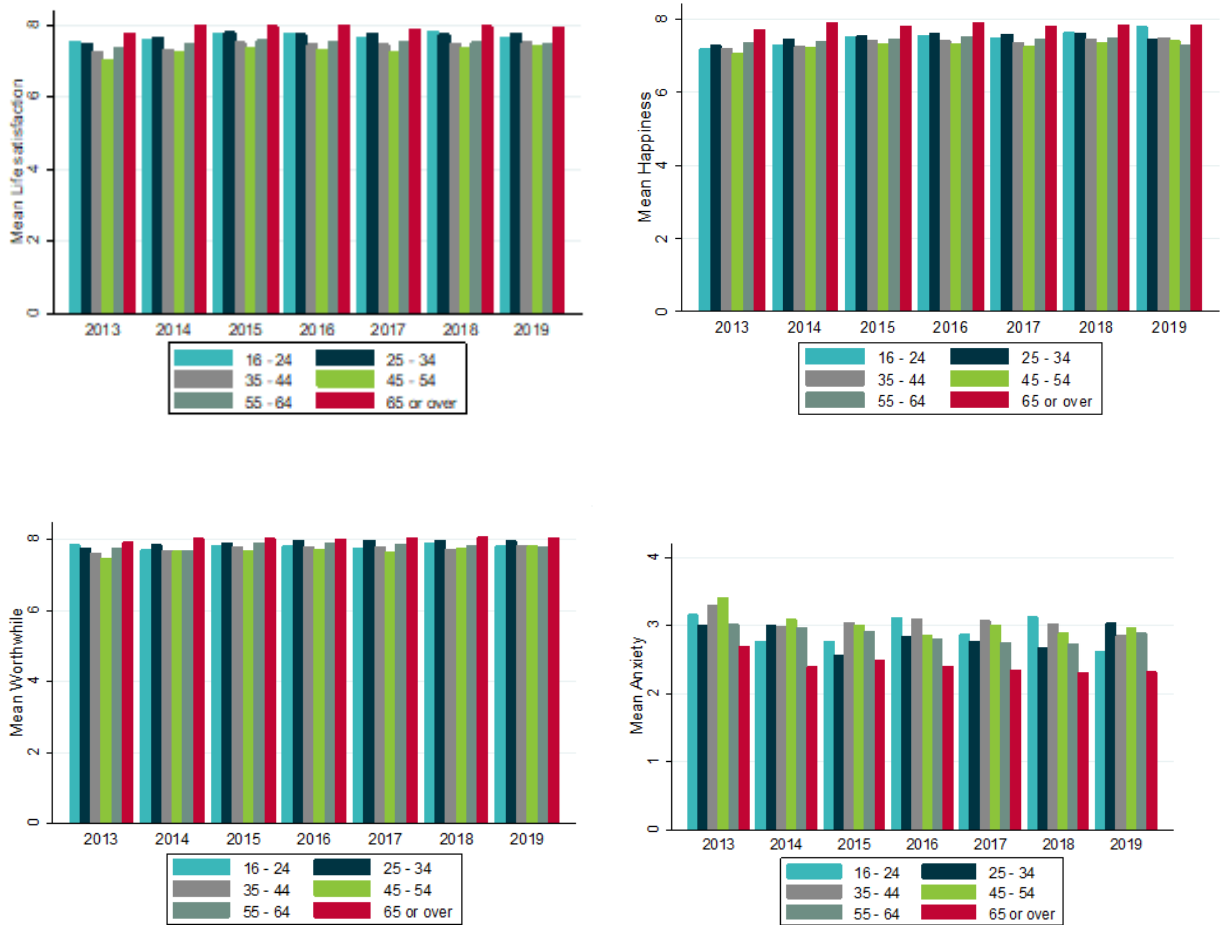

We then considered wellbeing by ethnic groups. From figure 2 we can see that White, Indians, Pakistani or Bangladeshi show the highest mean levels of life satisfaction. White and Indians are also those who show the lowest mean levels of anxiety but Whites in the early years, while Indians in the later years.

Figure 2: Mean Life Satisfaction and Anxiety by ethnicity over 2013-2020
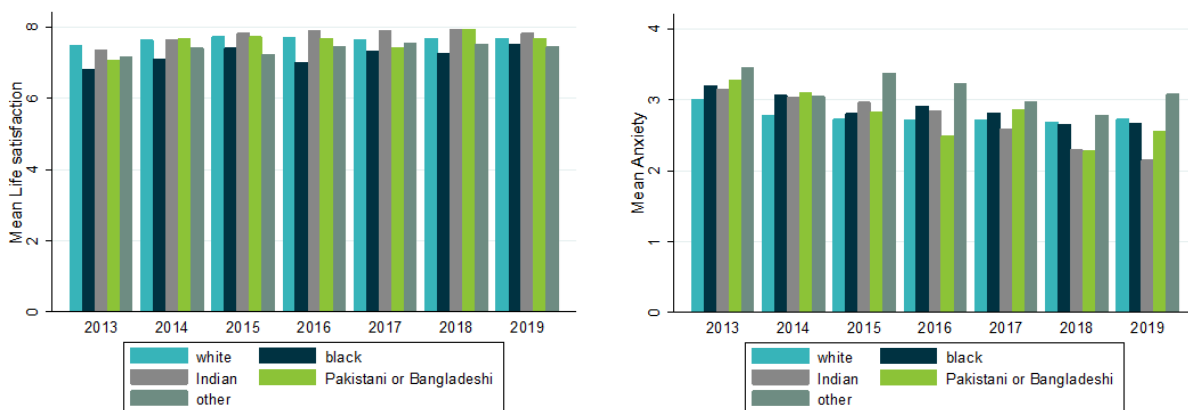
With reference to economic status, those who are unemployed show the lowest mean level of life satisfaction, happiness and worthwhile and highest mean levels of anxiety. Full- and part-time workers, and retired people, present the highest mean levels of wellbeing for all the years considered (figure 3).

Figure 3: Mean Life Satisfaction, Happiness, Worthwhile and Anxiety by economic status over 2013-2020
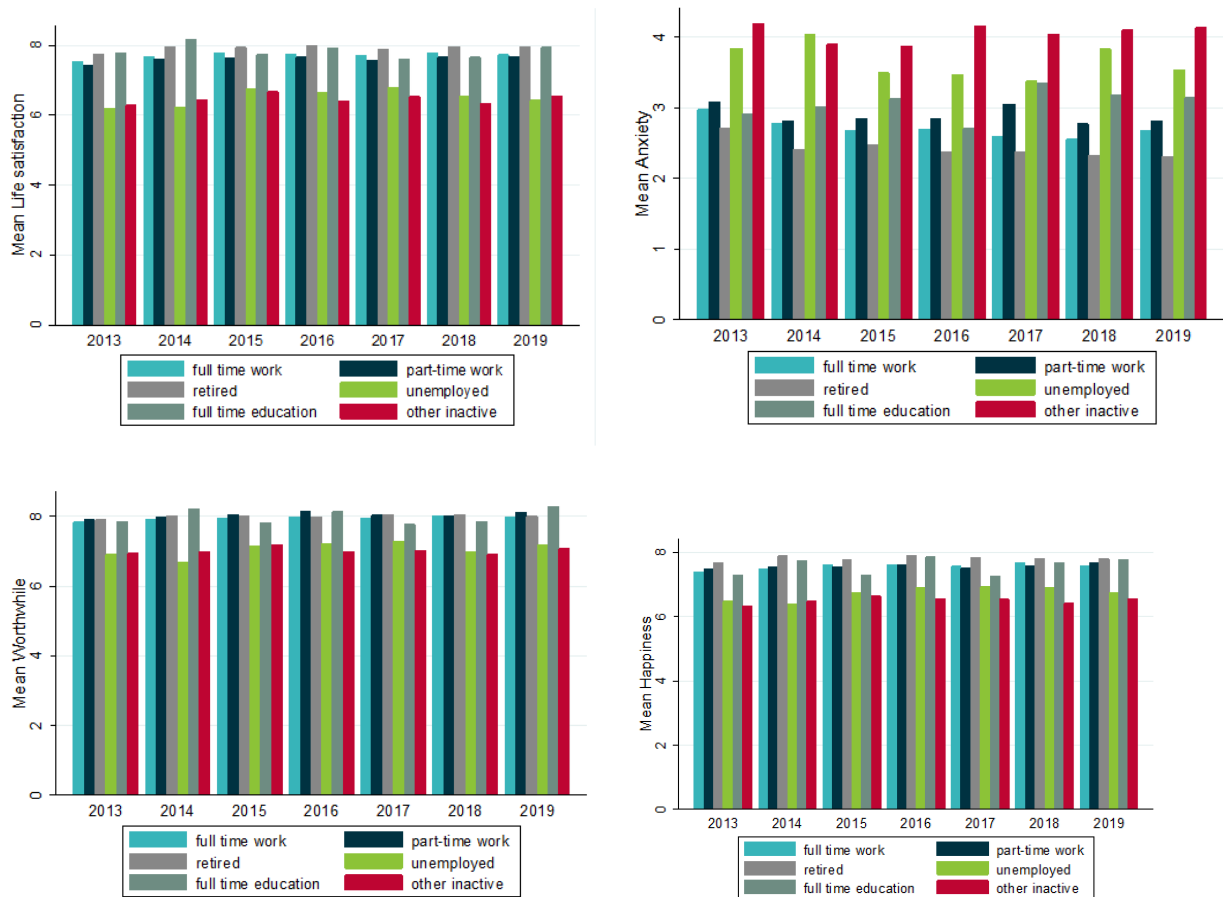
Looking at types of households (figure 4) we can see that the highest mean levels of wellbeing (low Anxiety) are present in couples without dependent children, followed by couples with dependent children who, however, show almost always the same mean levels of Worthwhile of couples with no dependent children. Lone parents with dependent children are those showing the highest mean levels of Anxiety.

Figure 4: Mean life satisfaction, Happiness, Worthwhile and Anxiety by type of households over 2013-2020
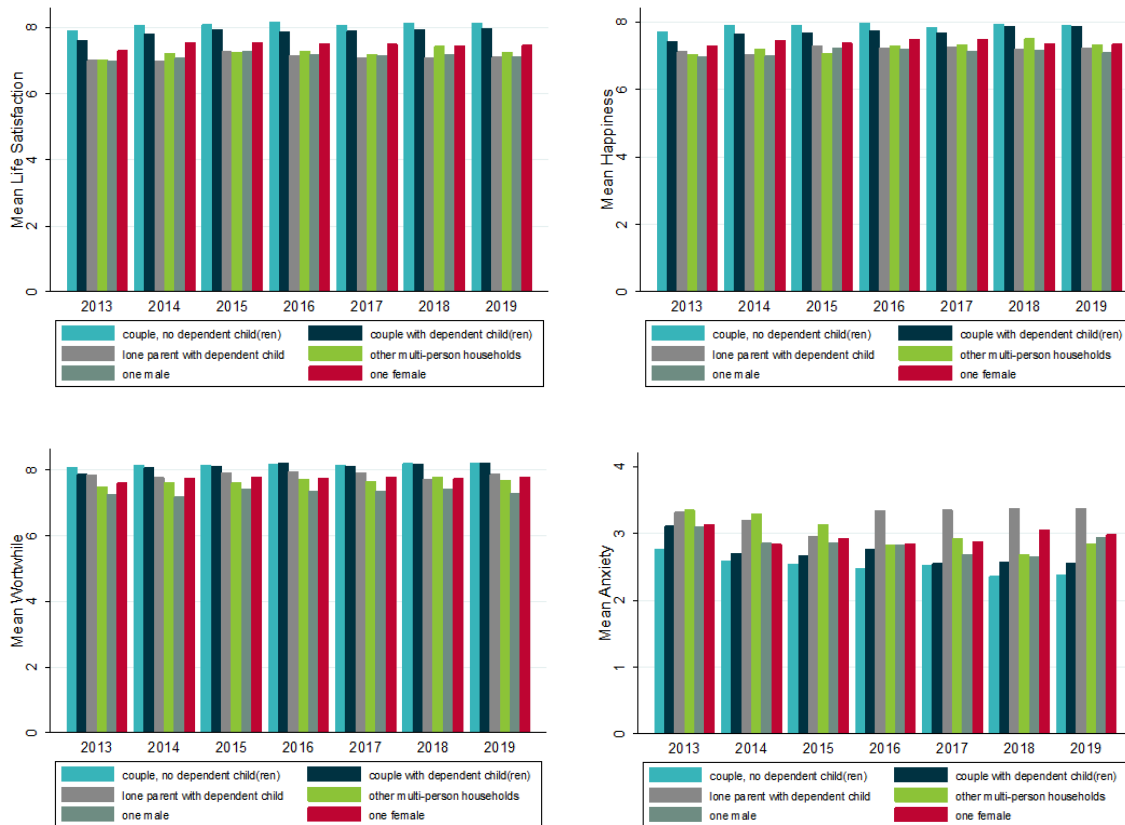
We then looked at two variables related to health:
1) The presence in the household of a person with long-term illness or disability;
2) Self-reported health.

We found that the presence of a person with long term illness or disability corresponds to lower mean levels of life satisfaction, happiness and worthwhileness and higher mean levels of anxiety (figure 5).

These results are also confirmed when looking at proportions of high and low wellbeing scores: higher proportions of low wellbeing scores (high anxiety and low life satisfaction) and lower proportions of high wellbeing scores are present (low anxiety and high life satisfaction) when a long term ill or disabled person is present in the household (figure 6).

Figure 5: Mean life satisfaction, Happiness, Worthwhile and Anxiety if long term ill or disabled person is present in the household over 2013-2020
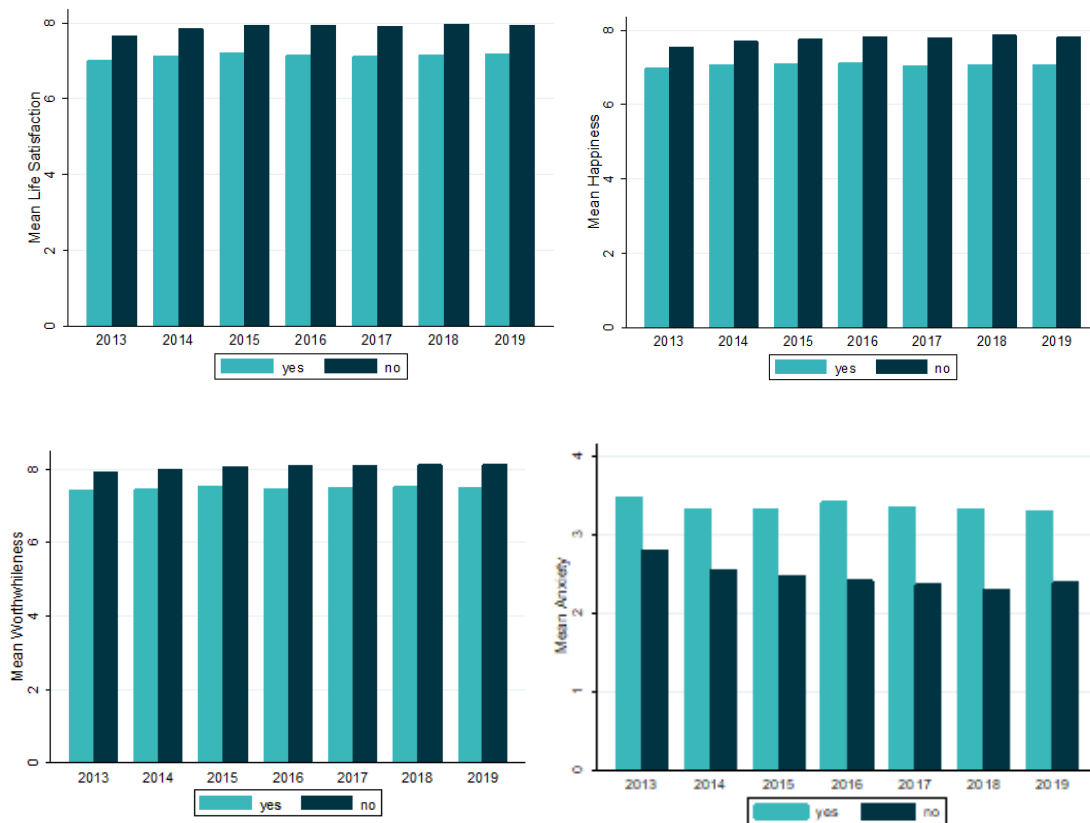
Figure 6: Proportions of high and low Life Satisfaction and Anxiety if long term ill or disabled person is present in the household over 2013-2020

If we look at self-reported health and wellbeing, we can see that as self-reported health rises, the mean levels of life satisfaction, happiness and worthwhile increase and the mean level of anxiety decreases (figure 7). We get the same results when in households nobody uses a wheelchair, either all the time or only indoor or outdoor (figure 8).

Figure 7: Mean Life Satisfaction, Happiness, worthwhile and Anxiety and self-reported health over 2013-2020
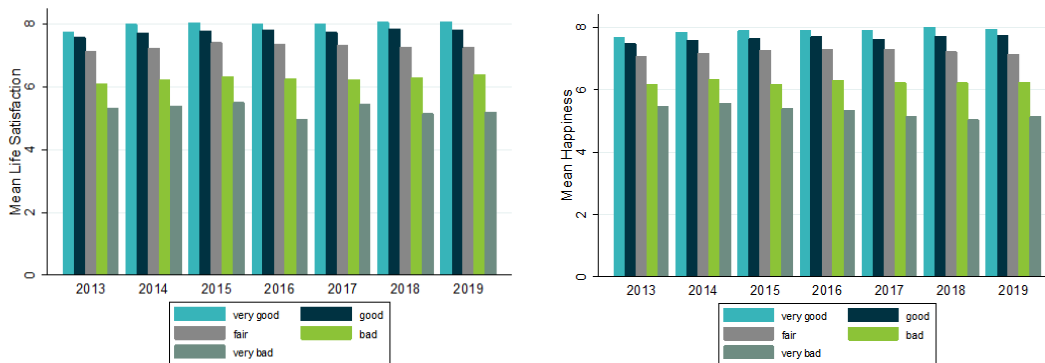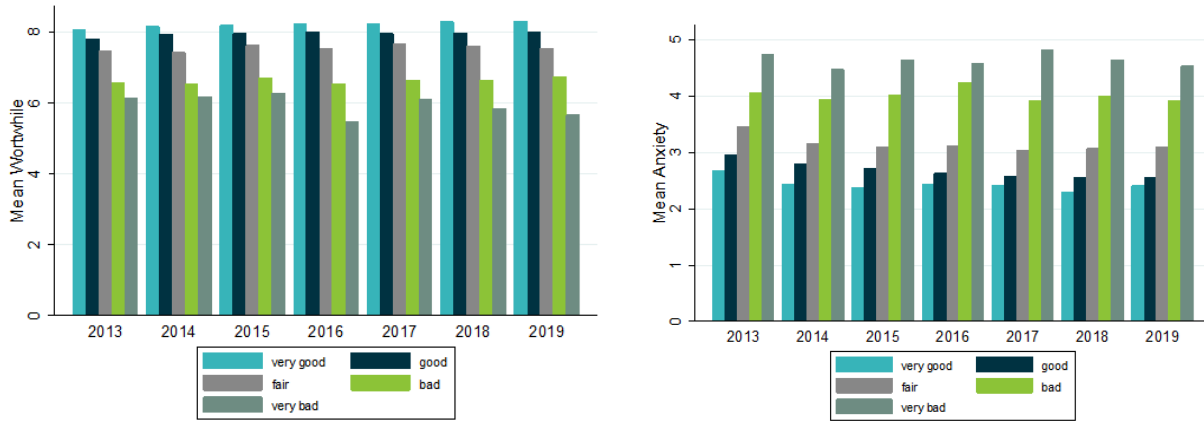
Figure 8: Mean Life Satisfaction, Happiness, Worthwhile and Anxiety and use of wheelchair in the household over 2013-2020
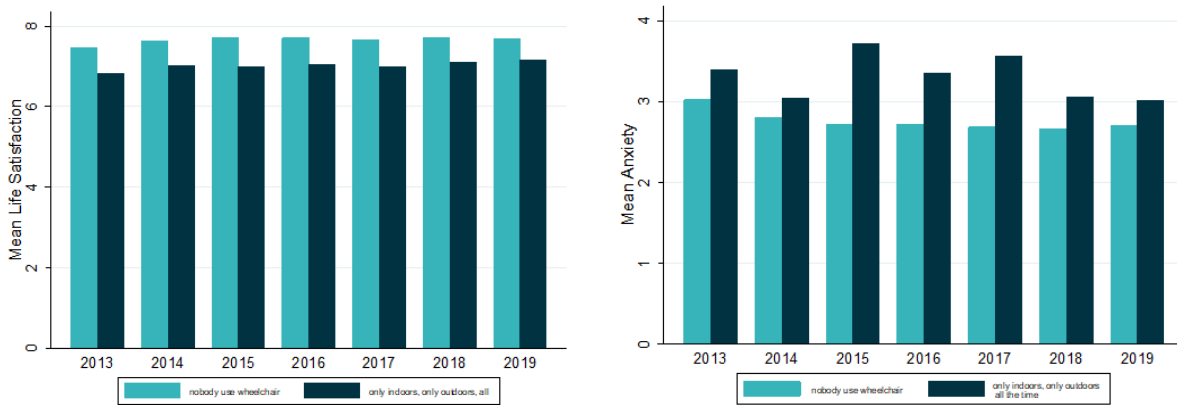
We finally looked at household income in quintiles. As we can see from figure 9, when we pass from the first (low incomes) to the fifth quintiles(high income), wellbeing increases (anxiety decreases) for all the years considered.

Figure 9: Mean Life Satisfaction, Happiness, Worthwhile and Anxiety by income quintiles over 2013-2020
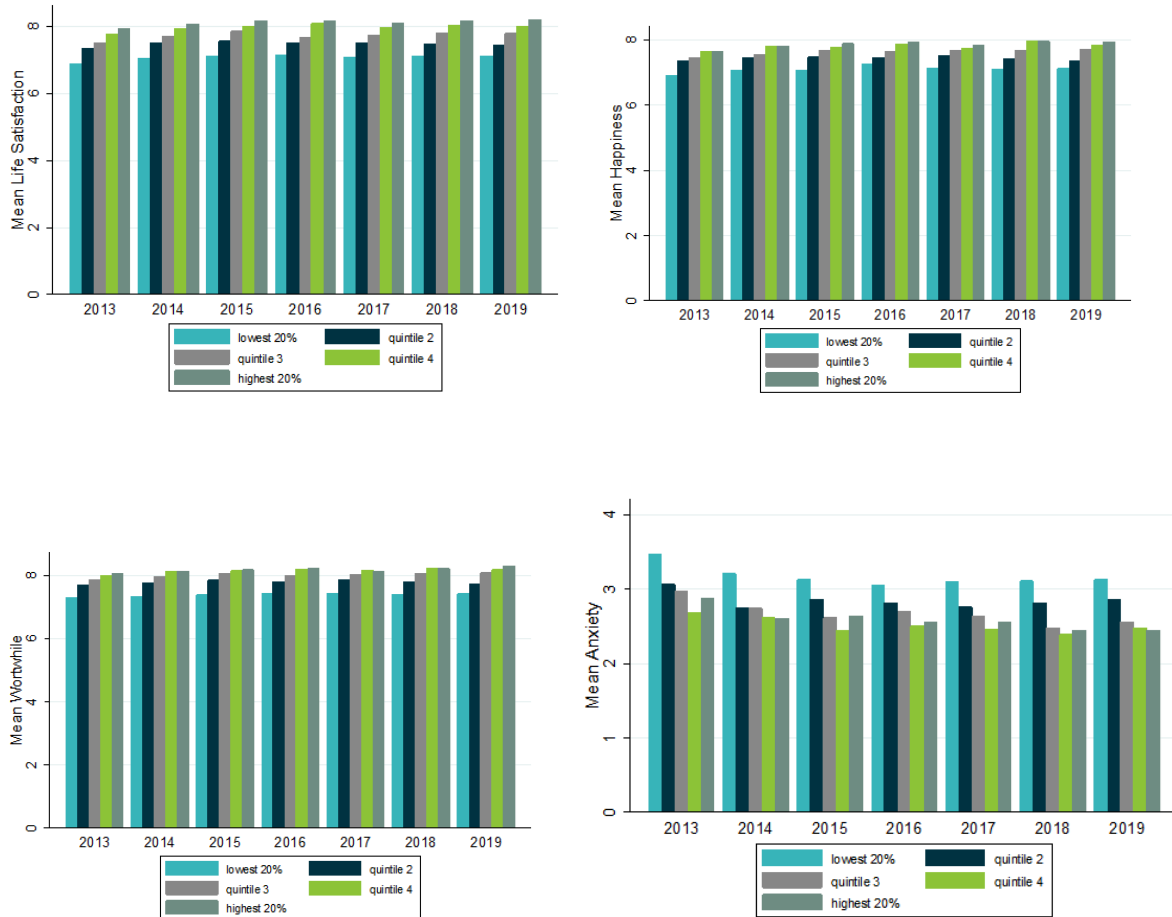
Wellbeing by tenure, accommodation types and housing characteristics

This section sets out the difference in mean wellbeing by tenure, accommodation and housing characteristics, without controlling for the other characteristics which could be influencing this difference. An OLS regression is carried out in the following section on page 24.

The context

In 2019-2020 in England the estimated households were almost 24 million, of which more than 15 million were owner occupiers (65%). This percentage is higher than the value present in 2013-2014 (63.4%), corresponding to a bit more than 14 million of owner occupiers (table 5). Private renters (as a percentage of all households) show the same values in 2013-2014 and 2019-2020. equal to 19%. Also renters from housing associations (social rented sector) are unchanged in the two years considered[9] and equal to 10%.

Table 5: Percentage tenure of UK household over the period 2013-2019

Extended tenure of household	2013	2014	2015	2016	2017	2018	2019
own with mortgage	30.7%	30.4%	29.0%	28.4%	29.6%	29.4%	29.7%
own outright	32.7%	33.2%	33.9%	34.1%	33.9%	34.4%	34.9%
privately rent	19.4%	19.0%	19.9%	20.3%	19.5%	19.3%	18.7%
rent from LA	7.3%	7.3%	7.0%	6.8%	6.8%	6.8%	6.6%
rent from RSL	10.1%	10.1%	10.2%	10.3%	10.2%	10.1%	10.1%
Total	100%	100%	100%	100%	100%	100%	100%

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[9] The proportion of households in the social rented sector has not changed for more than a decade starting from 2010-2011
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/945013/2019-20_EHS_Headline_Report.pdf

If we consider the type of tenure by age and ethnicity, in 2019-2020 63% of outright owner households had a Household Reference Person (HRP)[10] aged 65 or over (61% in 2013-2014), while 59% of households with a mortgage had a HRP aged 35-54 (63% in 2013-2014). In the private rented sector about two thirds (67%) (in 2013-2014 70%) of households have a HRP aged under 45 years.

As for ethnicity, the percentage of household owner occupiers with white HRP was 86% in 2013-2014 (82% in 2019-2020). Households with white HRP present the highest percentage of private rented houses with respect to all other ethnicities (69% in both periods).

From figure 10 we can see that 3% of dwellings (801,000 homes) had problems with damp in 2018, a percentage that decreased from 2.6 million (13%) homes in 1996. Of all homes having problems with damp, 2% were problems with condensation and mould, 1% were problems with rising damp and 1% with penetrating damp. Damp problems were more prevalent in the rented sectors. Some 7% of private rented dwellings had some type of damp problem, compared with 4% of social rented dwellings and 2% of owner occupied dwellings.

Figure 10: percentages of homes having problems with damp over 2013-2018[11]
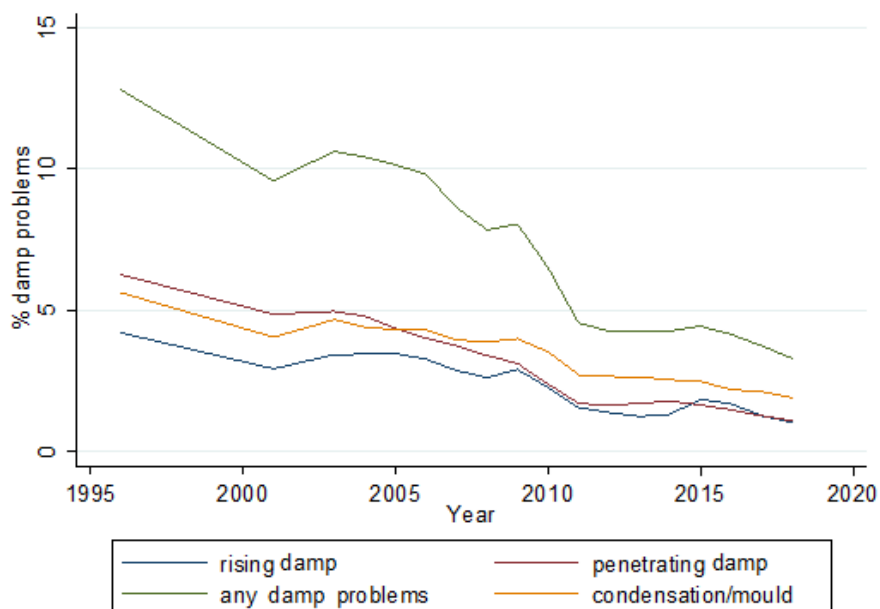
Source: WWC elaboration on data EHS

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[10] The HRP is the person in whose name the dwelling is owned or rented or who is otherwise responsible for the accommodation. In the case of joint owners and tenants, the person with the highest income is taken as the HRP. Where incomes are equal, the older is taken as the HRP. This procedure increases the likelihood that the HRP better characterises the household's social and economic position.

[11] This graph was produced by the WWC on data downloaded from https://www.gov.uk/government/statistics/english-housing-survey-2019-to-2020-headline-report. Data are imported from the 2019-20_EHS_Headline_Report_Section_2_Stock_Annex_Tables(18).xlsx"

Wellbeing densities and mean values by type of tenure and type of accommodation

We checked for densities and they resulted quite similar, even if the Kolmogorov-Smirnov test shows that there are some differences (figure 11).

Figure 11: Wellbeing variables density by type of tenure and type of accommodation
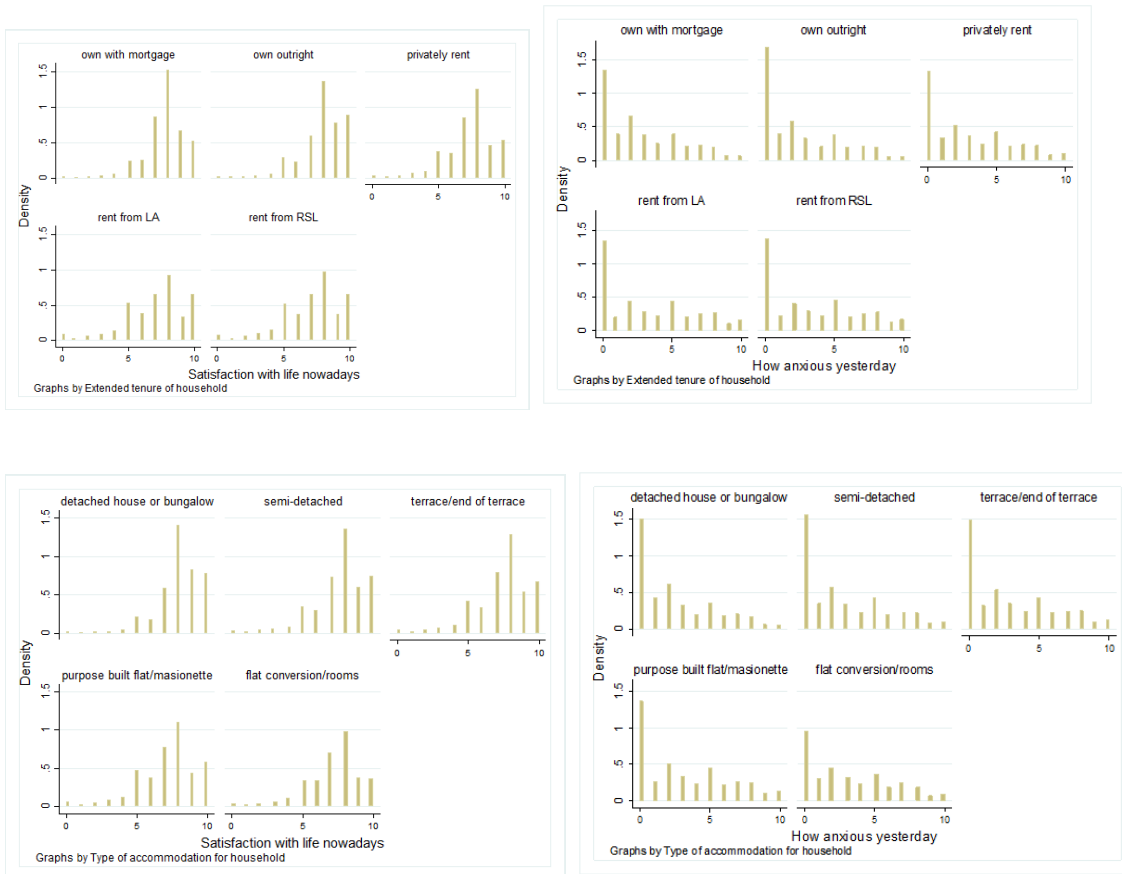
Over 2013-2019, people who own a home, even with a mortgage, show the highest mean levels of life satisfaction, happiness and worthwhile (and the lowest mean level of anxiety), while social renters (either from Local Authorities or RSL) show the highest mean levels of anxiety (figure 12).

Figure 12: Wellbeing by type of tenure over 2013-2019
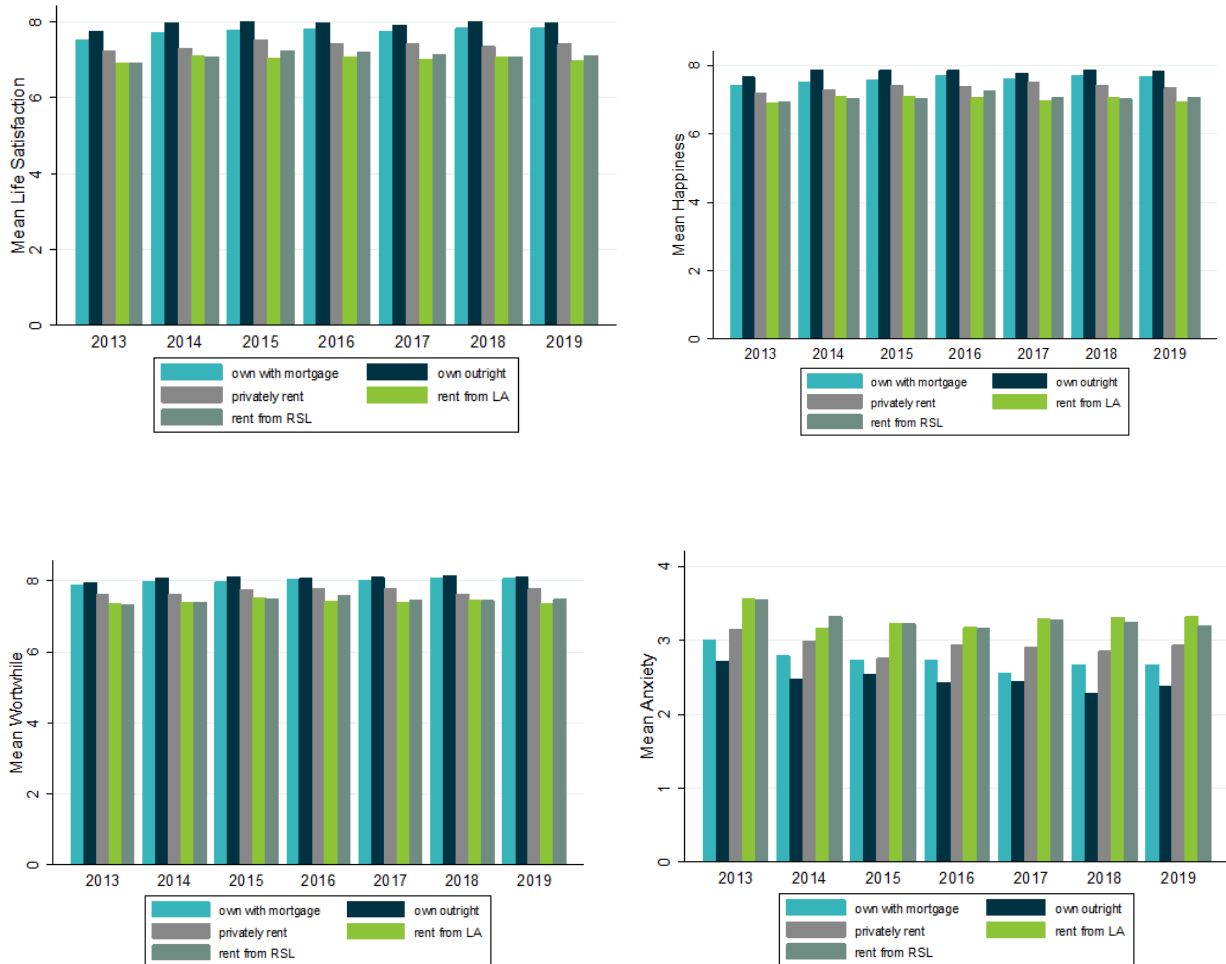
Looking at accommodation types, people living in detached houses, semi detached houses and bungalows reported the highest mean level of wellbeing and the lowest mean levels of anxiety. Those living in purpose built flats or converted spaces show the lowest mean level of wellbeing (figure 13).

Figure 13: Mean Life Satisfaction, Happiness, Worthwhile and Anxiety by type of accommodation over 2013-2019
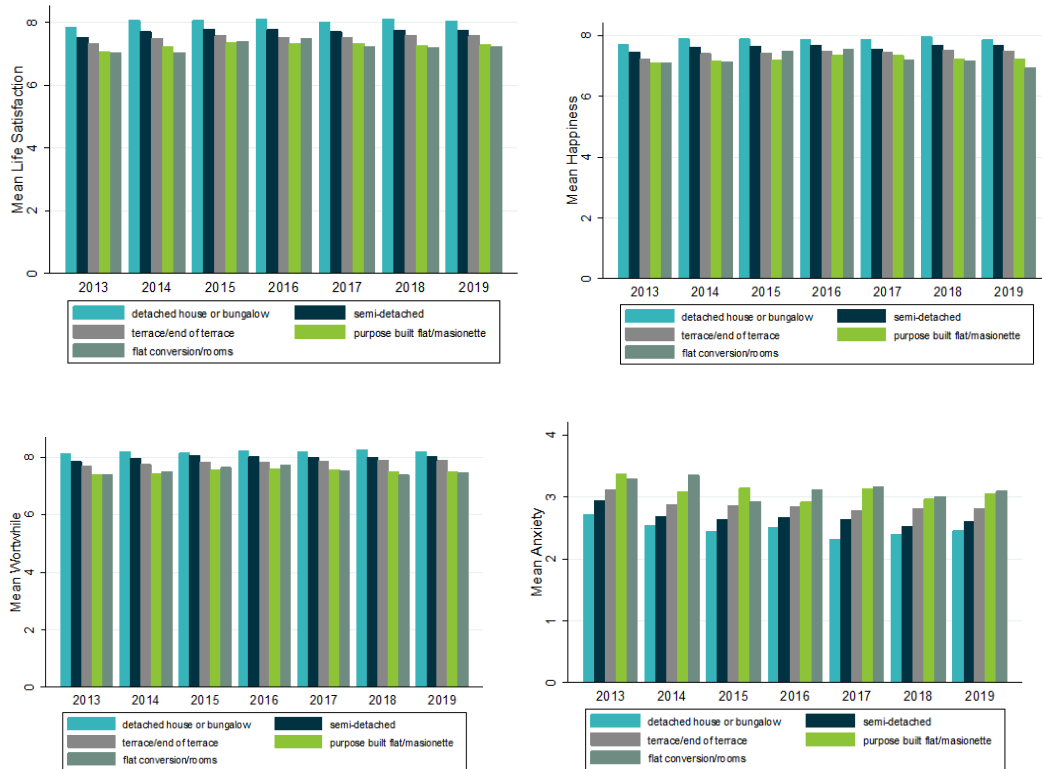
The EHS contains two questions on satisfaction with tenure and accommodations (figure 14). The least satisfied with current tenure are those who are privately renting a house, while the most satisfied are those owning their houses, even with a mortgage. The most satisfied with their current accommodation are those who live in a detached or semi-detached house or in a bungalow, while the least satisfied are those living in a converted flat.

Figure 14: Mean Satisfaction with tenure and accommodation type
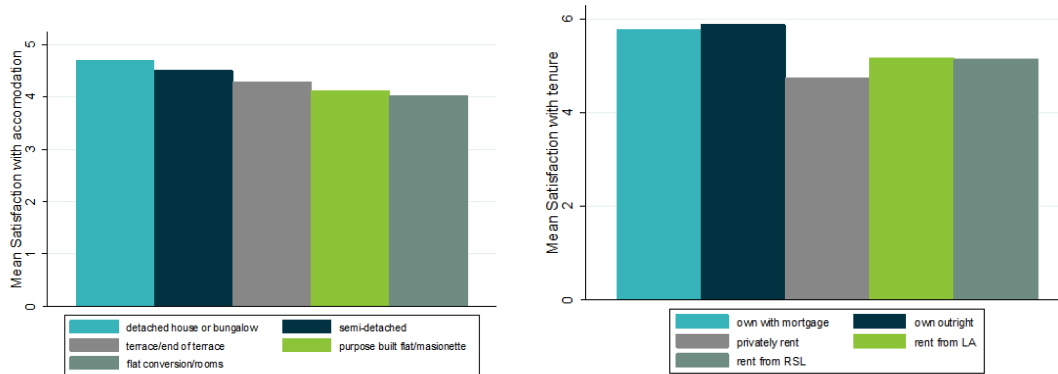
Wellbeing by regions

We then used a variable that identifies the 9 UK regions (North East, North West, Yorkshire and the Humber, East Midlands, West Midlands, East, London, South East, South West) to see if there are some geographical differences in wellbeing (figure 15). While the mean life satisfaction levels are almost the same for all regions, London shows the highest mean level of anxiety, while the South West shows the lowest mean anxiety level.

Figure 15: Mean Life Satisfaction and Anxiety over regions
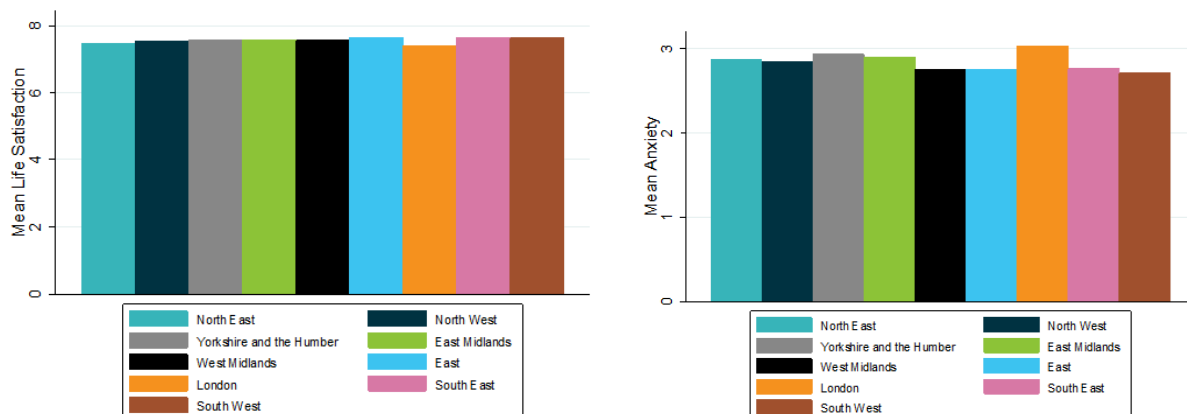
Looking at mean life satisfaction and anxiety by income quintiles over regions (figure 16), we can see that while mean life satisfaction always increases as income grows, anxiety does not always decrease as income rises, in particular in London, South East and East Midlands.

Figure 16: Mean Life Satisfaction and Anxiety by income quintiles over regions
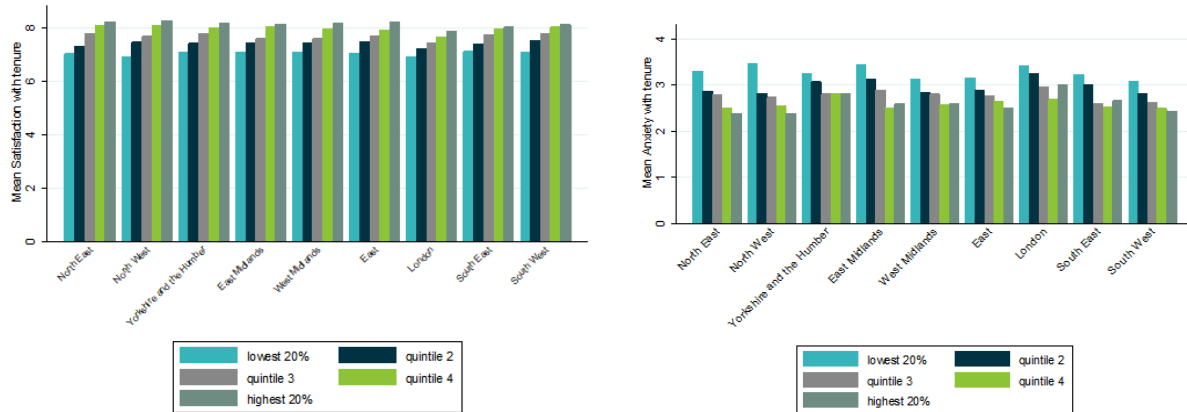
We then looked at mean wellbeing by accommodation type over regions (figure 17). While in all regions detached houses or bungalows always show the highest mean levels of life satisfaction, converted flats present the highest mean level of anxiety in 7 regions, with the North East and the East Midlands showing the highest values.

Figure 17: Mean Life Satisfaction and Anxiety by accommodation type over regions
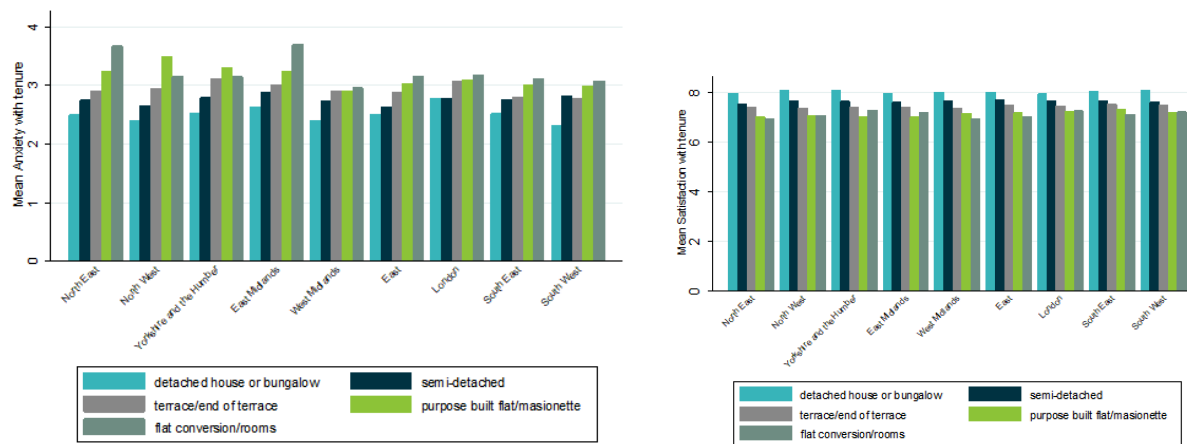
The regression analysis

In this section we present the results of the OLS regression analysis in which we use the English Housing Stock dataset. It was necessary to employ this dataset because we were interested in some housing characteristics in addition to socio-demographic and household variables, and these variables are present only in the English Housing Stock dataset (paired dataset). As noted above, when using more than one Housing Stock dataset it is necessary to use either odd or even years. Given our data availability, we chose the year 2014, 2016, 2018.

We prepared the data in the following way:
1. for each year we merged the relevant datasets and saved them (2014-2016-2018)
2. we appended the three datasets to get a pooled dataset
3. we prepared the variables relevant for the analysis
4. we ran an OLS regression analysis

The dependent variables are the subjective wellbeing measures (happiness, life satisfaction, worthwhileness and anxiety)[12] and the independent variables are personal and households conditions and circumstances (age, sex, ethnicity, marital status, economic activity, type of household, presence of dependent children, household income quintiles, self-reported health, presence of long term illness or disable person in the household, type of tenure, type of dwelling), and some housing characteristics (presence of damp, usable floor area, overcrowding[13], decent home[14]).

We employ OLS technique that allows us to look at the relationship of each characteristic or circumstances to personal wellbeing while holding all other possible influences on wellbeing equal.

What we get are only correlations and not causal effects. When interpreting the results, it is also necessary to consider that the analysis uses survey data, in particular EHS Housing Stock Dataset for the year 2014, 2016 and 2018. These data are made available for a two-year rolling sample with the two-year weights[15].

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[12] The questions on wellbeing are asked only to the Household Reference Person (HRP).

[13] Households are said to be overcrowded if they have fewer bedrooms available than the notional number needed according to the bedroom standard definition. We created a dummy variable called overcrowded that takes value 1 if the number of bedrooms is below standard and 0 if the number of rooms is at standard or above.

[14] For a dwelling to be considered 'decent' under the Decent Homes Standard it must:
• meet the statutory minimum standard for housing (the Housing Health and Safety System (HHSRS) since April 2006), homes which contain a Category 1 hazard under the HHSRS are considered non-decent
• provide a reasonable degree of thermal comfort
• be in a reasonable state of repair
• have reasonably modern facilities and services

[15] There are two weights in the Housing Stock dataset: average dwelling weights for cases in the two years considered that had oth the interview and the physical survey conducted (paired cases) called aagpdxx; average household weights for cases in the two years considered that had both the interview and the physical survey conducted (paired cases) called aagphxx.

The results of the regressions analysis and summary statistics are presented in table A1 and A2 in the Appendix. The F-test and P-values confirm that all dependent variables have explanatory value[16].

Type of tenure
All other things being equal, those owning their houses show a higher level of life satisfaction and worthwhileness than those who own with a mortgage or privately rent a house. The type of tenure does not seem to have a significant relationship with happiness and anxiety.

Type of dwelling
Coefficients related to type of housing are not statistically significant with the exceptions of end terrace and bungalow that show higher levels of anxiety than detached houses.

Usable floor area and overcrowding
Other things being equal, for houses of more than 90 square metres, the more square metres available, the higher the level of anxiety compared to houses with less than 50 square metres. The relationship between wellbeing variables and overcrowded homes is statistically insignificant. This result can be explained by the fact that overcrowding is measured with an objective measure, but individuals may not perceive their home as overcrowded despite it being assessed as such by the bedroom standard.

Decent houses and presence of damp
All other things being equal, people living in a house that meets the criteria for decent houses show higher levels of life satisfaction, happiness and worthwhileness and lower levels of anxiety than those living in a house that does not meet the criteria. The presence of rising damp in one or more rooms does not present a statistically significant relation with wellbeing.

Comprehensive repair costs
Looking at comprehensive repairs (costs for urgent work required in the short term to tackle problems presenting a risk to health, safety, security or further significant deterioration), passing from the lower band (from 0 to 50£) reduces happiness and worthwhileness. Then, life satisfaction is lower when costs are in the band from £200-250. Overall the variable doesn't seem to have a strong negative relationship with wellbeing.

Age
The relationship between age and life satisfaction, happiness and anxiety is statistically significant. After controlling for other factors, wellbeing is higher among young people and older people and is lower among middle aged

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[16] Given the F-test and P-values, it is possible to reject the null hypothesis that all coefficients are jointly equal to zero.

people. This result is in line with ONS and other research findings that show a U shaped relationship between age and personal wellbeing.

Sex

Holding other factors equal, women are more satisfied and find things they are doing more worthwhile than men, but they are also more anxious.

Ethnicity[17]

With respect to ethnicity, we found two significant results. Firstly, respondents who self-identify as Black African, Black Caribbean or Black other report lower life satisfaction than respondents who identify as White British, White Irish, White gypsy/traveller or White other. Secondly, respondents who self-identify as Bangladeshi, Chinese, Indian, Pakistani or Asian other report higher happiness than respondents who identify as White. When looking at these differences we need to take into account that differences among ethnic groups may be in part due to a cultural bias: people from different cultures may interpret the question scales in different ways or may give more extreme or moderate ratings when asked to make an assessment of their life.

Marital status

All other things being equal, those who are single, separated or widowed show lower life satisfaction and happiness than married. Single people and widows also show a significantly lower level of worthwhileness than married people. Overall to be in a married couple is associated with higher wellbeing.

Employment status

After controlling for all other factors, unemployed people show lower life satisfaction, happiness and worthwhile and higher anxiety than full time workers. Retired people and those in full time education show higher levels of life satisfaction, happiness and worthwhileness. Retired people also show lower anxiety than full time workers. This result confirms what is already well known in the literature: unemployment is a major source of unhappiness. It contributes to depression, suicide, ill health, low self-esteem, and the effects are quite strong (Inglehart 1990, Argyle 2001).

Income quintiles

All other things being equal, those who fall in the lowest income quintile show lower levels of life satisfaction, happiness and worthwhile with respect to people falling in the higher income quintiles. It is worth noting that for happiness and worthwhileness the coefficient for those in the highest income quintile is lower than the coefficient of those in the fourth quintiles. This result is in line with other analysis showing that at a low level of income, a rise in income raises

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[17] For further details on ethnic groups used in national surveys see
https://www.ethnicity-facts-figures.service.gov.uk/style-guide/ethnic-groups

wellbeing, but once higher levels of income have been reached, a rise in income has a smaller effect on happiness and worthwhile (Frey and Stutzer 2002).

Household type

All other things being equal, couples with no dependent children show higher life satisfaction than couples and lone parents with dependent children. Lone parents with dependent children show also a lower level of happiness than couples with no dependent children. A lone person, either male or female, presents lower levels of wellbeing than couples with no dependent children. It seems that being alone has a negative relationship with wellbeing with respect to being in a couple, and the presence of dependent children can contribute to the reduction.

Health

The variables related to health, self-reported health and the presence in households of someone with long term illness or disability, present two consistent results: being in good health shows a positive relationship with wellbeing. For self-reported health, all people rating themselves less than "very good" (good, fair, bad, very bad) show lower life satisfaction, happiness and worthwhile and higher anxiety than those who rate themselves as being in very good health. We also get lower levels of wellbeing and higher anxiety if in the household there is a person with long term illness or disability with respect to the household where there are not disabled or long term ill persons.

Regions

Regions have a significant relationship with anxiety. The results show that those living in London show higher levels of anxiety than those living in the North East, North West, West Midlands, East, South East and South West.

Discussion

In this report we described wellbeing variables of life satisfaction, happiness, worthwhile and anxiety over time, over regions and by sociodemographics, household and housing characteristics using both the English Household dataset and the English Stock dataset.

It should be noted that the first part of our analysis does not hold other factors constant. For example, while those who live in detached houses may report higher levels of wellbeing, this partially reflects that they have higher incomes, which in turn impact wellbeing. The type of dwelling itself does not appear to have a significant impact on wellbeing, as shown by our regression analysis.

Similarly, overcrowding or the presence of damp does not show a significant relationship with wellbeing. One reason for this could be that the standards for decent housing include a standard on damp / mould, this impact may have been captured through this variable instead.

While some physical features of housing show a positive relationship with wellbeing - like living in a decent house - we found that sociodemographic characteristics have a stronger relationship with wellbeing than housing variables.

Consistent with previous literature, we found that age presents a U shape relationship with wellbeing, females show higher levels of life satisfaction and worthwhile but also higher levels of anxiety than men, to be unemployed reduces wellbeing as does being a lone parent with dependent children. Health is strongly correlated with wellbeing, whether measured as self reported health or as the presence in the household of a long term ill or disabled person. Income as well shows a positive correlation with wellbeing, even if happiness and worthwhile increase up to a certain level, then they decrease in correspondence with the highest income levels.

Looking at wellbeing over regions, we only found significantly higher levels of anxiety for those living in London.

Conclusion and implications for future research

Housing is more than the four walls within which we shelter; this study highlights that while physical aspects of housing matter - and standards for decent housing should be met by local authorities and landlords - sociodemographic factors have stronger associations with wellbeing.

Those living alone, living as a lone parent, or living in a household with a long term ill or disabled person report lower wellbeing.

Does this have to be the case? Or can housing be designed and organised in a way which provides support and meaningful engagement? Can social structures and housing architecture be developed to enable relief for those who need it most?

Across the world, there are examples of housing developments where smaller individual flats have central, shared spaces for informal interactions, enabling ad-hoc support structures to develop; or where those with caring responsibilities are linked up with neighbours or potential tenants who are interested and willing to help. In some countries, shared housing for adults is more common. In the UK, housing developments for the elderly have been designed with a day-care creche or kindergarten on the ground floor. An interesting question for research is if and how these structures impact on the wellbeing of these groups and whether there could be lessons learnt for housing in the UK.

This study demonstrates that wellbeing is lower for those who rent privately, an unsurprising finding for those who have been faced with the uncertainty of landlords, evictions and rent rises, without control over the conditions in which one lives. However, aspects of this can be controlled. Countries, such as Germany and Scotland, have higher renter protection. How do these differences in regulation impact on wellbeing? And what are the implications of this for England and Wales? The recent changes in Scotland may provide an interesting test case to understand priorities for renter wellbeing.

References

Argyle, M. (2001). The Psychology of Happiness (2nd ed.). Routledge.
https://doi.org/10.4324/9781315812212

Baker, E., Bentley, R., & Mason, K. (2013). The mental health effects of housing tenure: causal or compositional?. Urban Studies, 50(2), 426-442.

Bucchianeri, G. W. (2009). The American dream or the American delusion? The private and external benefits of home-ownership. Wharton School of Business. Retrieved July, 31, 2009

Cattaneo, M. D., Galiani, S., Gertler, P. J., Martinez, S., & Titiunik, R. (2009). Housing, health, and happiness. American Economic Journal: Economic Policy, 75-105.

Clapham D., Foye C. and J. Christian, (2017)"The Concept of Subjective Wellbeing in Housing Research",
https://pure-oai.bham.ac.uk/ws/portalfiles/portal/42570356/the_concept_of_subjective_wellbeing_Clapham_Foye_Christian.pdf

Diener, E., Larsen, R. J., Levine, S., & Emmons, R. A. (1985). Intensity and frequency: dimensions underlying positive and negative affect. Journal of Personality and Social Psychology, 48(5), 1253.

Frey, B. S., & Stutzer, A. (2002). What Can Economists Learn from Happiness Research? *Journal of Economic Literature*, *40*(2), 402–435.
http://www.jstor.org/stable/2698383

Fujiwara, D. (2013). The social impact of housing providers. HACT. UK http://www.hact.org. uk/sites/default/fil es/uploads/Archives/2013/02/The% 20S oficial% 20Impact% 20of%20Housing% 20FI NALpdf. pdf.

Inglehart R. (1990), Culture Shift in Advanced Industrial Society , European Sociological Review, Vol. 8, No. 1 (May, 1992), pp. 95-98 , Oxford University Press

Pevalin, D. J., Taylor, M. P., & Todd, J. (2008). The dynamics of unhealthy housing in the UK: A panel data analysis. Housing Studies, 23(5), 679-695

Appendix A

Table A1: Regressions Results

	Satisfaction with life nowadays	How happy yesterday	Things done in life are worthwhile	How anxious yesterday
age of household reference person (HRP)	-0.0514***	-0.0156***	-0.00555	0.0219***
	(0.00469)	(0.00558)	(0.00479)	(0.00742)
age of HRP squared	0.000565***	0.000238***	0.000118**	-0.000316***
	(0.0045)	(0.00531)	(0.00467)	(0.00705)
female	0.0825**	0.00290	0.229***	0.306***
	(0.0324)	(0.0387)	(0.0317)	(0.0540)
Ethnicity: reference category White				
black	-0.193***	0.0866	0.0426	-0.0655
	(0.0713)	(0.0780)	(0.0654)	(0.107)
asian	0.0989	0.245***	0.0674	0.0622
	(0.0666)	(0.0731)	(0.0653)	(0.103)

other	-0.0190	-0.104	0.110	0.187
	(0.0725)	(0.0884)	(0.0677)	(0.114)
Marital status: reference category Married				
single	-0.172***	-0.178***	-0.192***	0.0998
	(0.0369)	(0.0447)	(0.0365)	(0.0633)
separated	-0.261***	-0.262***	-0.109	0.0541
	(0.0760)	(0.0912)	(0.0737)	(0.117)
divorced	-0.0755	-0.0231	-0.0579	-0.0820
	(0.0473)	(0.0563)	(0.0468)	(0.0772)
widowed	-0.200***	-0.142**	-0.107**	-0.106
	(0.0539)	(0.0634)	(0.0533)	(0.0860)
current or former same-sex civil partnership	0.303*	0.432*	0.393**	-0.456
	(0.161)	(0.224)	(0.157)	(0.396)
Employment status: reference category Fulltime work				

part-time work	0.0553	0.163***	0.0972**	0.0138
	(0.0417)	(0.0502)	(0.0396)	(0.0685)
retired	0.307***	0.441***	0.174***	-0.364***
	(0.0454)	(0.0543)	(0.0456)	(0.0733)
unemployed	-0.485***	-0.292***	-0.472***	0.502***
	(0.0744)	(0.0838)	(0.0737)	(0.108)
full time education	0.434***	0.256**	0.342***	0.122
	(0.0828)	(0.116)	(0.0907)	(0.162)
other inactive	-0.447***	-0.265***	-0.508***	0.605***
	(0.0529)	(0.0610)	(0.0526)	(0.0779)
Income in 5 bands : reference category Quintile 1				
quintile 2	0.140***	0.0922**	0.127***	-0.0224
	(0.0360)	(0.0416)	(0.0361)	(0.0538)
quintile 3	0.238***	0.220***	0.249***	-0.102
	(0.0405)	(0.0474)	(0.0401)	(0.0632)

quintile 4	0.337***	0.287***	0.280***	-0.158**
	(0.0447)	(0.0535)	(0.0446)	(0.0729)
quintile 5, highest 20%	0.382***	0.232***	0.203***	-0.0109
	(0.0494)	(0.0601)	(0.0492)	(0.0824)
Household type: reference category couple, no dependent child(ren)				
couple with dependent child(ren)	-0.0969**	0.00305	0.0525	-0.0989
	(0.0401)	(0.0489)	(0.0388)	(0.0685)
lone parent with dependent child(ren)	-0.447***	-0.197***	0.00343	0.0139
	(0.0629)	(0.0753)	(0.0607)	(0.102)
other multi-person households	-0.524***	-0.347***	-0.335***	0.115
	(0.0539)	(0.0635)	(0.0537)	(0.0858)
one male	-0.443***	-0.297***	-0.328***	0.149*
	(0.0466)	(0.0566)	(0.0470)	(0.0768)
one female	-0.406***	-0.240***	-0.283***	0.179**
	(0.0511)	(0.0616)	(0.0505)	(0.0839)

General health: reference category Very good				
good	-0.323***	-0.343***	-0.301***	0.281***
	(0.0253)	(0.0308)	(0.0250)	(0.0436)
fair	-0.623***	-0.625***	-0.527***	0.630***
	(0.0359)	(0.0423)	(0.0358)	(0.0579)
bad	-1.347***	-1.399***	-1.236***	1.079***
	(0.0606)	(0.0699)	(0.0610)	(0.0862)
very bad	-2.125***	-2.152***	-1.719***	1.575***
	(0.108)	(0.119)	(0.112)	(0.139)
Presence in households of someone with long term illness or disability	-0.416***	-0.368***	-0.248***	0.644***
	(0.0284)	(0.0333)	(0.0281)	(0.0453)
Uk regions: Reference category: London				
North East	-0.00226	-0.0506	-0.0244	-0.293***

	(0.0621)	(0.0731)	(0.0617)	(0.0947)
North West	0.0545	0.0212	0.0331	-0.151**
	(0.0478)	(0.0558)	(0.0479)	(0.0763)
Yorkshire and the Humber	0.0488	0.0619	0.0527	-0.0755
	(0.0513)	(0.0600)	(0.0512)	(0.0813)
East Midlands	0.0644	0.104*	0.0112	-0.141*
	(0.0524)	(0.0629)	(0.0530)	(0.0848)
West Midlands	0.109**	0.0575	0.130**	-0.264***
	(0.0515)	(0.0611)	(0.0520)	(0.0820)
East	0.0195	0.0989*	0.0817*	-0.224***
	(0.0481)	(0.0562)	(0.0478)	(0.0762)
South East	0.0378	0.101*	0.0416	-0.196***
	(0.0452)	(0.0527)	(0.0452)	(0.0721)
South West	0.00389	0.113*	-0.0329	-0.275***
	(0.0504)	(0.0596)	(0.0520)	(0.0812)
Type of tenure: reference category				

Own outright				
own with mortgage	-0.0713*	0.0148	-0.109***	0.0282
	(0.0370)	(0.0459)	(0.0373)	(0.0637)
privately rent	-0.230***	0.0192	-0.138***	0.0841
	(0.0422)	(0.0493)	(0.0421)	(0.0667)
rent from LA	-0.0375	-0.00256	-0.0496	0.106
	(0.0452)	(0.0522)	(0.0451)	(0.0695)
rent from RSL	-0.0301	-0.00788	-0.0605	0.0874
	(0.0402)	(0.0480)	(0.0410)	(0.0636)
Type of dwelling: reference category Detached houses				
end terrace	-0.0419	0.0277	-0.0338	0.173**
	(0.0495)	(0.0619)	(0.0504)	(0.0846)
mid terrace	-0.0298	0.0541	-0.0208	0.102
	(0.0444)	(0.0550)	(0.0448)	(0.0765)
semi detached	-0.00861	0.0971**	0.0423	0.00827

	(0.0392)	(0.0488)	(0.0399)	(0.0695)
bungalow	0.00546	0.0706	0.0374	0.166**
	(0.0500)	(0.0616)	(0.0508)	(0.0844)
converted flat	-0.0485	0.0265	0.00491	0.180
	(0.0714)	(0.0851)	(0.0713)	(0.117)
purpose built flat, low rise	-0.0734	0.0289	-0.0828	0.129
	(0.0511)	(0.0624)	(0.0519)	(0.0853)
purpose built flat, high rise	-0.00916	0.0270	-0.0269	0.195
	(0.0875)	(0.107)	(0.0888)	(0.143)
overcrowded houses (n. rooms below bedroom standard 2011)	-0.102	-0.000535	-0.0142	-0.133
	(0.0731)	(0.0812)	(0.0688)	(0.109)
Usable floor area: reference category less than 50 sqm				
50 to 69 sqm	-0.0249	-0.0128	0.0164	0.0664
	(0.0383)	(0.0449)	(0.0386)	(0.0588)
70 to 89 sqm	-0.0656	-0.0693	0.0194	0.0706

	(0.0426)	(0.0511)	(0.0431)	(0.0675)
from 90 to 109 sqm	-0.0808	-0.0801	-0.0176	0.219***
	(0.0506)	(0.0611)	(0.0516)	(0.0826)
110 sqm or more	-0.0371	-0.0572	0.0161	0.214**
	(0.0513)	(0.0631)	(0.0519)	(0.0858)
decent (passed criteria of hhsrs 26 model)	0.101***	0.134***	0.103***	-0.156***
	(0.0303)	(0.0357)	(0.0305)	(0.0484)
presence of rising damp in one or more rooms	-0.155	-0.105	0.0668	0.164
	(0.112)	(0.131)	(0.102)	(0.170)
comprehensive repair costs[18] (per square metres): reference category from 0 to 50£				
from 50 to 100£	-0.0451	-0.104**	-0.0720**	0.0521
	(0.0354)	(0.0416)	(0.0356)	(0.0554)
from 100 to 150£	-0.0590	-0.0138	-0.0455	0.0431

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[18]

	(0.0442)	(0.0518)	(0.0440)	(0.0701)
from 150 to 200£	0.000274	-0.00444	0.0369	-0.0522
	(0.0650)	(0.0756)	(0.0628)	(0.0963)
from 200 to 250£	-0.146*	-0.163	-0.0637	-0.0757
	(0.0859)	(0.101)	(0.0869)	(0.131)
from 250 to 300£	-0.119	-0.220	-0.216*	0.0206
	(0.124)	(0.145)	(0.120)	(0.192)
more than 300£	0.160	0.0637	0.00849	-0.275
	(0.106)	(0.131)	(0.115)	(0.179)
Constant	9.207***	7.909***	8.109***	2.014***
	(0.156)	(0.188)	(0.158)	(0.252)
Observations	25,821	25,807	25,732	25,794
R-squared	0.197	0.120	0.134	0.083

*** p<0.01, ** p<0.05, * p<0.1

Table A2: Summary statistics: mean, standard deviation, min max

Variable	Obs	Mean	Std. Dev.	Min	Max
Life satisfaction	29,855	7,6	1,831303	0	10
Happiness	29,84	7,5	2,113722	0	10
Worthwhile	29,753	7,8	1,766557	0	10
Anxiety	29,824	2,7	2,876536	0	10
Age	35,978	53	1,737218	16	85
Age squared	35,978				
Female	35,978			0	1
Ethnicity	35,978			1	4
Civil status	30,827			1	6
Employment	35,978			1	6
Income (quintiles)	35,978			1	5
Type of household	35,978			1	6

Self reported health	35,952			1	5
Presence of long term ill or disable in household	35,899			1	2
Type of tenure	35,978			1	5
UK regions	37,151			1	10
Overcrowded	35,978			0	1
Floor in squared metres	37,151			1	5
Type of dwelling	37,151			1	8
Decent house	37,151			0	1
Presence of damp	37,151			0	1

Table A3: Tenure of household in UK over the period 2013-2019

Extended tenure of household	2013	2014	2015	2016	2017	2018	2019
own with mortgage	6933396	6849015	6597502	6563154	6892006	6922077	7057611
own outright	7385755	7474520	7732194	7880903	7891771	8096399	8304186
privately rent	4377202	4278287	4527999	4692068	4529653	4551832	4437942
rent from LA	1641238	1639371	1604752	1565791	1581153	1591389	1580523
rent from RSL	2279018	2272317	2313486	2381165	2377222	2371823	2397848
Total	22616609	22513510	22775933	23083081	23271805	23533520	23778110

Appendix B

Wellbeing densities

For this part of the analysis we used the EHS Household dataset, where data are available from April 2013 to April 2020.

After downloading the data from UK Data Service[19], we carried out the following steps:

1. merged the relevant datasets and save them for each year
2. appended all datasets to get a pooled dataset
3. prepared the variables relevant for the analysis
4. looked at wellbeing over time, by sociodemographic, household and housing characteristics.

First, we looked at the wellbeing densities over time. They appear quite similar (Figure B1), but the two sample Kolmogorov-Smirnov tests[20] show that there are some differences.

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[19] Both End User data and Special Licence Data are made available through UK Data Service.
[20] The two-sample Kolmogorov-Smirnov test is used to test whether two samples come from the same distribution.

Figure B1: Life Satisfaction and Anxiety densities over 2013-2020
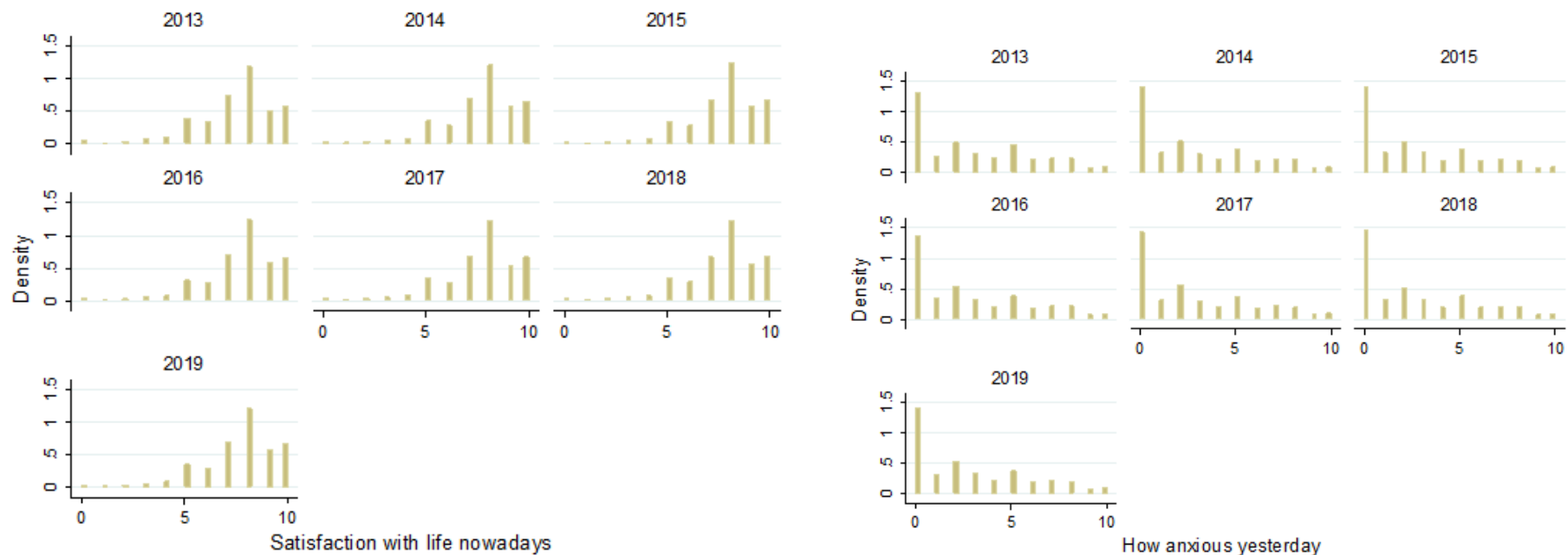
Wellbeing over time

Next, we looked at changes to wellbeing from April 2013 to the moment when the first lockdown came into force in March 2020. We calculate the mean and median values of the four wellbeing variables (figure B2). The median values for the four wellbeing variables remained the same constant. In comparison, the mean values of worthwhile were the highest for all years, while anxiety presented slightly decreasing values in 2014 and 2015.

Figure B2: Mean and median wellbeing variables over 2013-2019
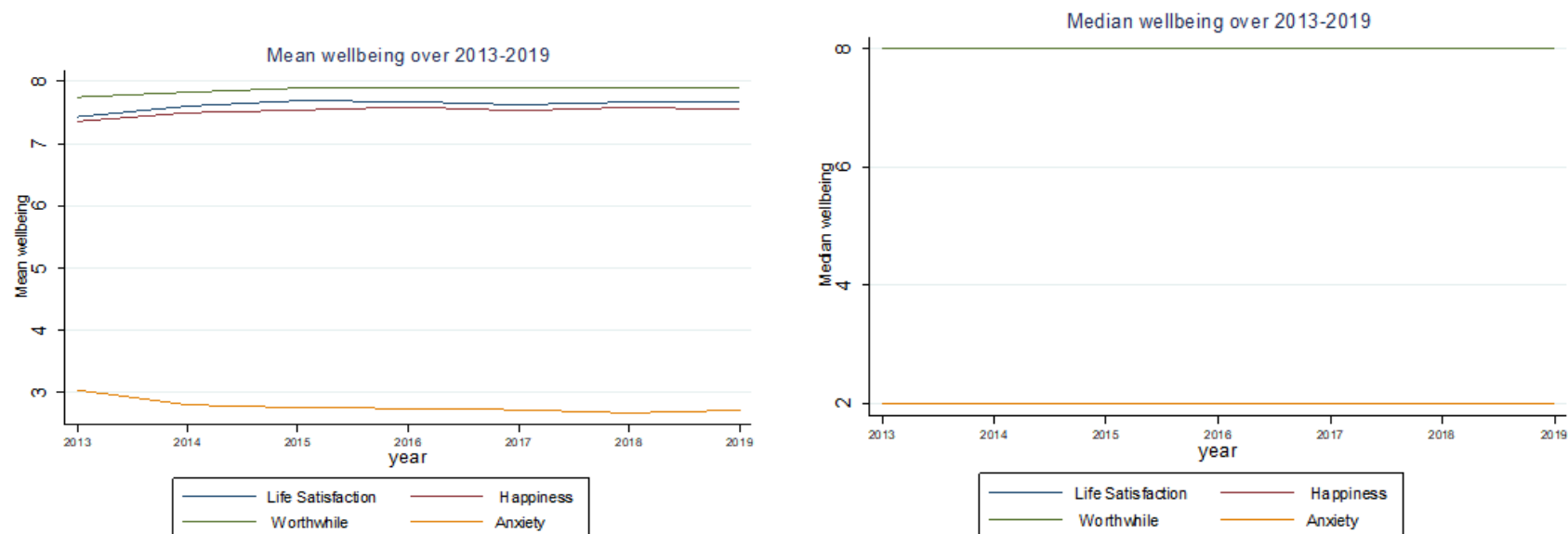
If we consider the first and the last year available, 2013-2014 and 2019-2020 (figures B3-6), we can see that the densities for all wellbeing variables look quite similar, even if Kolmogorov- Smirnov test does not always confirm it.

As noted before, mean anxiety shows a decrease from 3 in 2013-2014 to 2.7 in 2019-2020 (figure B6) whereas worthwhile presents the highest mean values, very close to the median values especially in 2019-2020 (figure B5).

Figure B3: Life Satisfaction densities for 2013-2014 and 2019-2020
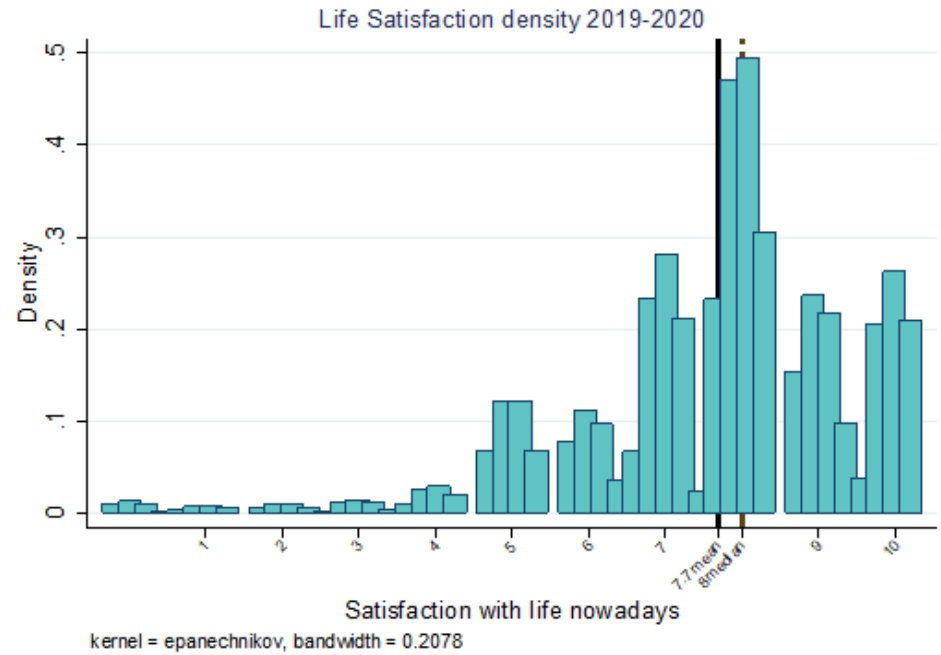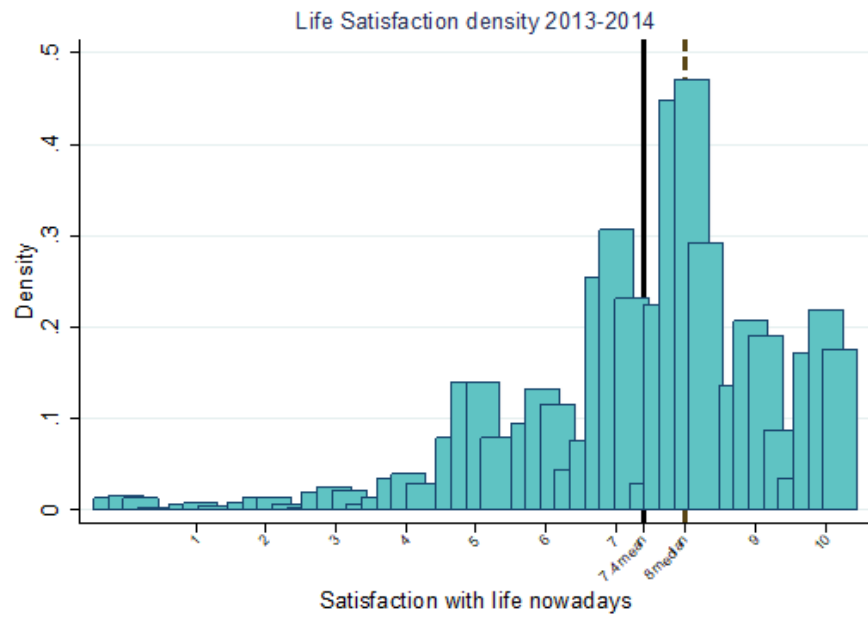
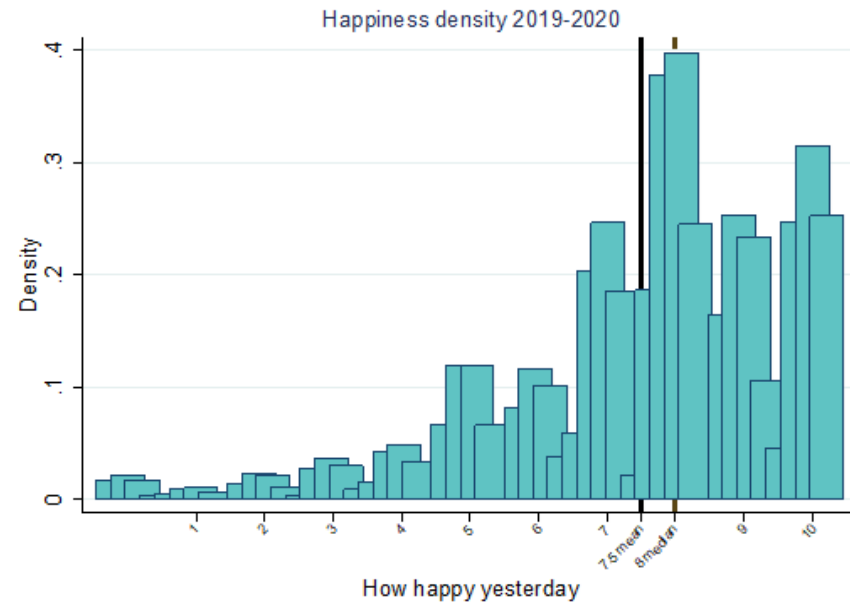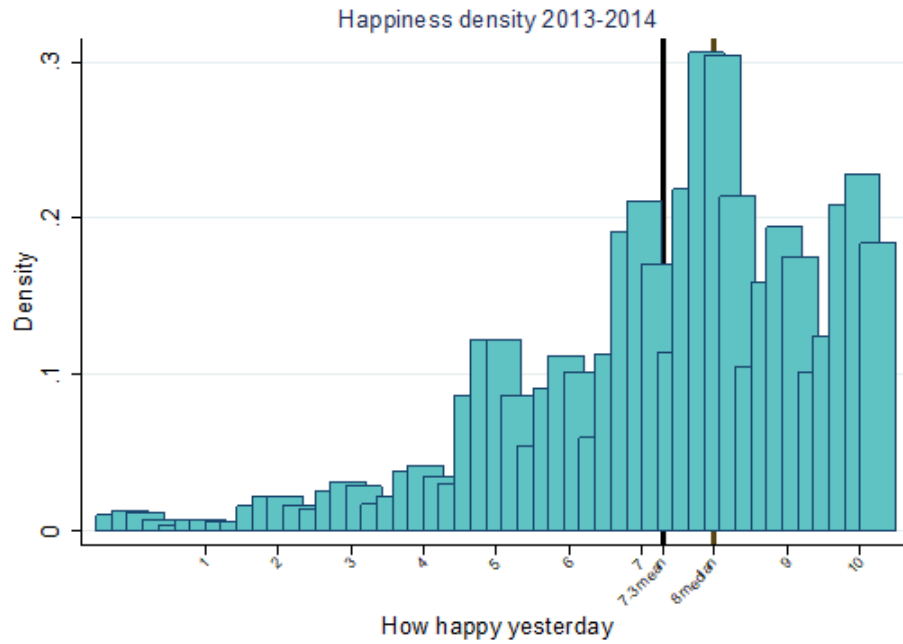**Figure B4: happiness densities for 2013-2014 and 2019-2020**

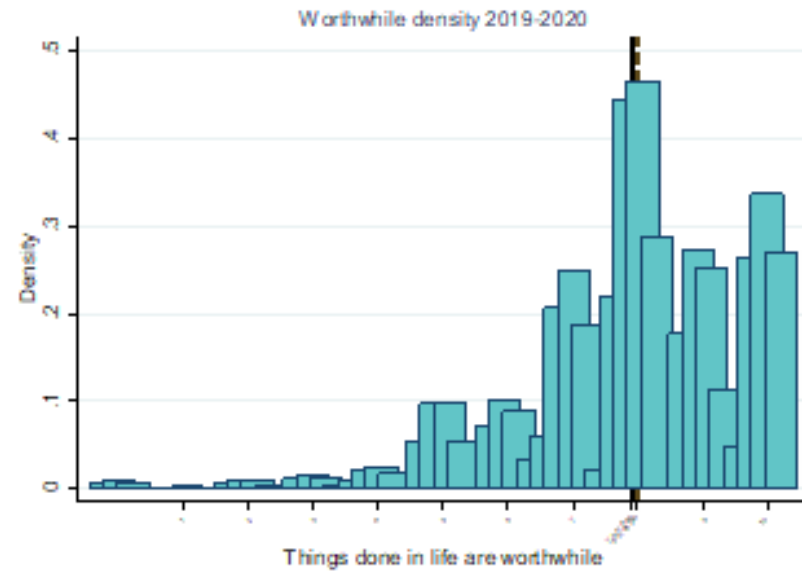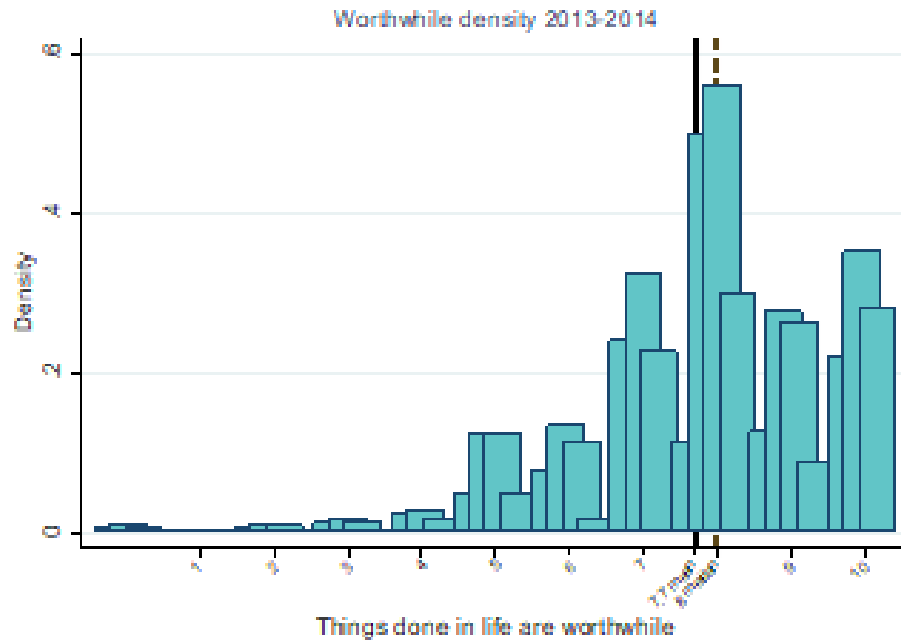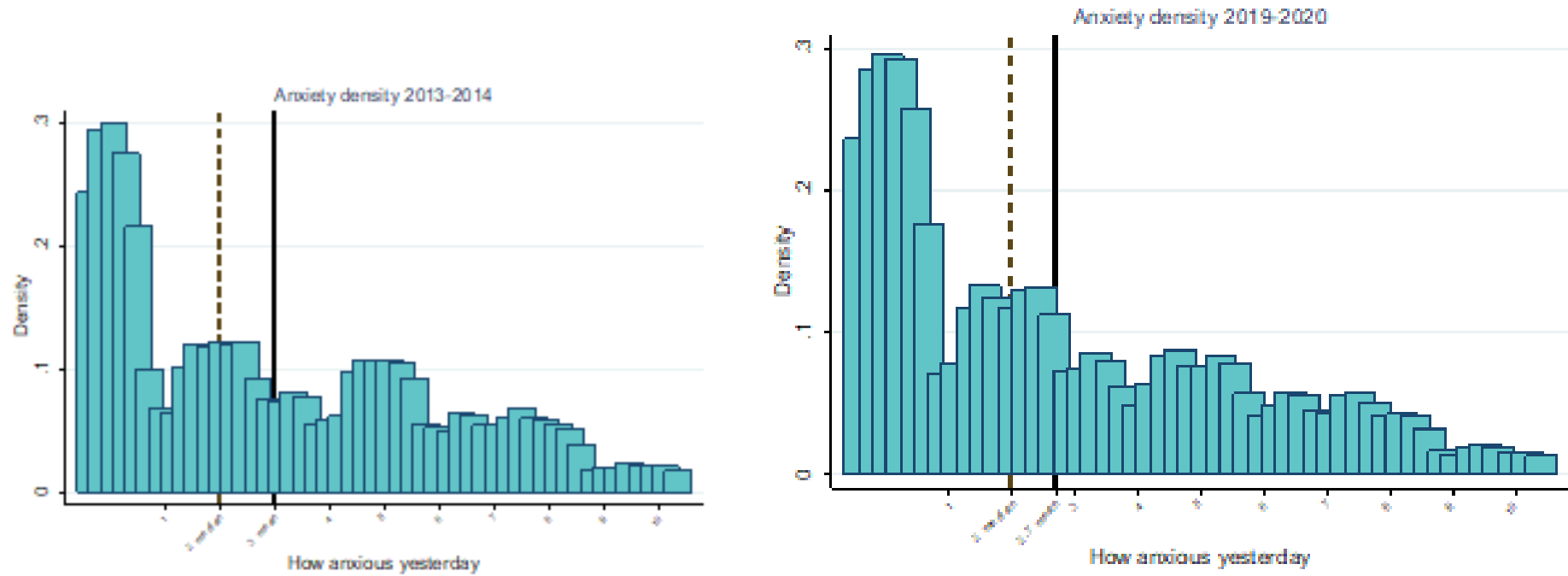**Figure B5: Worthwhile densities for 2013-2014 and 2019-2020**

Figure B6: Anxiety densities for 2013-2014 and 2019-2020

Correlation matrices show a negative relationship of Anxiety with the other subjective wellbeing variables. This negative correlation increased slightly between 2013-2014 and 2019-2020 (tables B2 and B3).

Table B2: correlation matrix[21] of wellbeing variables 2013-2014

	Life Satisfaction	Happiness	Worthwhile	Anxiety
Life Satisfaction	1.000			
Happiness	0.5705*	1.000		
Worthwhile	0.6334*	0.5142*	1.000	
Anxiety	-0.3117*	-0.4343*	-0.2548*	1.000

Table B3: correlation matrix of wellbeing variables 2019-2020

	Life Satisfaction	Happiness	Worthwhile	Anxiety
Life Satisfaction	1.000			
Happiness	0.5881*	10.000		
Worthwhile	0.6469*	0.5218*	1.000	
Anxiety	-0.3523*	-0.4848*	-0.2697*	1.0000

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[21] The correlation matrix shows the correlation coefficients between several wellbeing variables. If the coefficient is positive, it indicates that the two variables are strongly positively correlated. In table 2, Life Satisfaction and Worthwhile are quite strongly positively correlated. Higher values of Life Satisfaction are strongly related to having feelings that things people are doing in life are Worthwhile.

Looking at the Skewness and Kurtosis (table 4) for the wellbeing variables, Anxiety shows positive skewness, meaning that the distribution is right-skewed, while Happiness, Life Satisfaction and Worthwhile show negative skewness, indicating that the distributions are left-skewed (figures 4-7).

The Kurtosis of Life Satisfaction, Happiness and Worthwhile results higher than 4, indicating that the distributions are more heavy-tailed compared to the normal distribution. In this case the frequency of outliers is high.

Table B4: Skewness and Kurtosis wellbeing variables

		2013-2014	**2019-2020**
Anxiety	*Skewness*	0.6107	0.8088
	Kurtosis	2.2061	2.5445
Worthwhile	*Skewness*	-1.0454	-1.2138
	Kurtosis	4.7758	5.3512
Happy	*Skewness*	-0.9685	-1.17455
	Kurtosis	3.8074	4.446343
Life Satisfaction	*Skewness*	-1.1016	-1.21407
	Kurtosis	4.8811	5.415676

Finally we looked at proportions of high and low wellbeing for the period 2013-2020 (figure B8). High and low proportions for all wellbeing variables look quite stable and with values close to the ones calculated by the ONS in the Annual Population Survey[22]. Only in 2013-2014 there are lower proportions of high Life Satisfaction, Happiness and Worthwhile (and low Anxiety) than the following years, as well as higher proportions of low Life Satisfaction, Happiness and Worthwhile (and high Anxiety).

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[22]https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/bulletins/measuringnationalwellbeing/april2021tomarch2022

Figure B7: Proportions of high and low Life Satisfaction, Happiness, Worthwhile and Anxiety scores.