Investigating the relationships between individual and place-based community wellbeing

In the Understanding Society survey and qualitative interviews

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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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Ethical approval

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Executive summary

Understanding how community wellbeing and individual wellbeing are related is important because community-level interventions or initiatives may not have the same impacts on different individuals or groups within these communities.

At the same time, targeting certain individuals may differentially impact sub-groups and communities. The introduction of online community support groups would have more relevance for those who can access support online, for example, than for those who are less digitally literate.

An initiative provided to parents may not benefit those who are living alone without any children or family nearby, but any benefits realised by parents could help teachers, too, by improving their relationships with families. We need to better understand how interventions at different levels impact both individuals and communities.

Overall, the aim of this project was to answer following question:

"What are the relationships between community wellbeing and the wellbeing of different individuals and identified groups within that community?"

The project looked at individual and group differences, mechanisms or 'links' between individual and community wellbeing and their different components, and the distribution of subjective reports of wellbeing, including how people feel day-to-day, psychological functioning, and if they liked living in their neighbourhoods.

While there are many different types of communities, such as workplaces, schools, or communities of identity, such as religion and sexuality, this research project mainly considered place-based wellbeing in local authorities due to data availability and because many funding structures are geographically bound. The conclusions may still be applicable beyond geographic communities.

There were three main phases in the project:

Phase 1

In Phase 1, we conducted a rapid evidence review and held a project consultation group. There were three main conclusions from the rapid evidence review:

- Participation in community initiatives may be associated with better subjective wellbeing (individual and community), but levels of participation vary across groups, and this may widen inequalities.
- Key mechanisms or 'links' between objective community and subjective individual wellbeing were feelings of belonging, sense of cohesion, perceptions of social support and collective control, and social networks.
- Communities are malleable and multiple, people belong to many communities

and their sense of the boundaries of a community can shift. They are influenced by 'wellbeing spillovers' and 'tipping points' whereby wellbeing in one community impacts wellbeing in another either positively or negatively. There may be a threshold at which this occurs.

We drew upon the literature review and held a consultation with researchers and those working in the third sector and local government to develop a draft model of the relationships between individual and community wellbeing. The main purpose of the model is to inform how future initiatives and interventions occurring after this project are evaluated and designed.

Phase 2

In Phase 2, we mapped measures from a large national survey called 'Understanding Society' onto the model and conducted quantitative analyses of data from the survey. The mapping included measures of individual subjective wellbeing and community subjective wellbeing. Some of the analyses also included data imported from the Community Life Survey, UK Parliament, and Office for National Statistics, including UK Census, HM Revenue and Customs, and Annual Population Survey data. The main results showed:

- 'Different people, same place' – there were sub-group differences in the relationships of area-level social and economic characteristics with subjective wellbeing. For example, in areas where people regularly talked to the neighbours ('sociable areas', an area-level social characteristic), people who regularly talked to their neighbours ('sociable individuals' – a sub-group difference) had better mental wellbeing than those who did not regularly talk to their neighbours. Less sociable individuals also had worse mental wellbeing in sociable areas than in unsociable areas. While rural areas had better community subjective wellbeing than urban areas, when local voting rates were higher, the difference in community subjective wellbeing between rural and urban areas was smaller.

- 'The measure matters' – we used four different measures of subjective wellbeing and found that the measure used affected the findings. For example, local authority-level sense of belonging was more closely associated with community subjective wellbeing, whereas voting rates were more closely associated with individual subjective wellbeing, when adjusting for other factors. Including factors that could act as possible mechanisms or 'links' in statistical models affected absolute and relative civic pride measures differently, showing that using distributional measures of subjective wellbeing changes our understanding of its correlates. When we select subjective wellbeing measures, we can change what shows as mattering for subjective wellbeing.

Overall, these analyses provided a cross-sectional 'snapshot' illustration of associations and patterns between the concepts linked in the model developed during Phase 1.

Phase 3

In Phase 3 we conducted individual semi-structured qualitative interviews with people working in local government, the third sector, politics, and academia to contextualise

the wider social, political, and economic context of the model, and to consider risks of negative outcomes from community-level initiatives and interventions, barriers and enablers, and trade-offs in the relationships between individual and community wellbeing. The main analytic themes were about co-production and power-sharing, the limitations of available data for monitoring and evaluation at local levels, horizontal and vertical gaps in funding and commissioning, and lobbying, legislation, and leadership.

The interview participants suggested that future work can use the model and its variants to guide co-production and co-creation of future community-level initiatives and interventions, when reporting outcomes, and as tool to guide commissioning and service planning. Key areas for future work to consider are developing and measuring a consistent set of local area indicators of individual and community wellbeing, including subjective wellbeing, which may be complemented by tailored indicators for different communities; an in-depth exploration of links between community wellbeing and wider national and international contexts; the mapping of different measures onto the developed models; consideration of population sub-groups; and using the model and its variants as tools to stimulate discussion about informing the design and evaluation of initiatives.

Introduction

Background and rationale

Overall, this research aimed to explore the relationships between individual and community wellbeing, focussing on individual differences, mechanisms that 'link' individual and community wellbeing together, and inequalities. We were commissioned by the What Works Centre for Wellbeing (WWCW) to develop and test a theoretical model that could inform future community wellbeing interventions and initiatives occurring after this project. The model aimed to illustrate the answer to the question:

> *"What are the relationships between community wellbeing and the wellbeing of different individuals and identified groups within that community?"*

A lack of information about individual and group differences, as well about the mechanisms or 'links' between individual and community wellbeing, were identified by What Works Centre for Wellbeing as a limitation of existing knowledge. Increasing the wellbeing of individuals and communities is important in and of itself, and because wellbeing drives economic and social progress, with impacts in areas such as employment, productivity, physical health, and civic behaviours (Maccagnan et al., 2019).

Definitions of individual and community wellbeing

There are many ways to define individual and community wellbeing. We conceptualise individual wellbeing generally as subjective and objective aspects that are of interest at the level of an individual as opposed to the community, national, or international levels. This definition is intended to encompass concepts from more specific definitions that specify what aspects of wellbeing are of interest, such as objective circumstances, individual attributes, behaviours, functioning, thoughts, or feelings (Parfit, 1984; Stewart-Brown et al., 2009; Angner, 2010; Dolan, Kudrna and Testoni, 2017; Atkinson et al., 2020).

Community wellbeing is defined here as subjective and objective aspects that are of interest at the level of a community as opposed to individual, national or international levels (Atkinson et al., 2020). Again, the definition is intentionally unspecific about what aspects of wellbeing. This may include social, economic, environmental, cultural, or political conditions within a community; the 'something extra' reflecting a subjective perception of something about a community that is more than the sum of individual parts; or community-driven bottom-up definitions (Wiseman, 2008; Curmi, 2017; Atkinson et al., 2020; Royal Society for Public Health, 2021). It can encompass many types of communities, such as place-based communities, workplaces, schools, online groups, or communities of identity.

The different levels of individual and community may be seen as sitting within layers, similar to the Dahlgren-Whitehead 'rainbow model' of social health factors or ecological models of human development that locate individuals within different

systems (Bronfenbrenner, 1979; ESRC, 2019; Pennington et al., 2021). See Figure 1 for stylised depiction of individual and community factors in these models. This model is not without its limitations. Communities may be at different levels, too, including more intimate communities of families or romantic partner dyads versus typically less intimate relationships of colleagues or neighbours. It is also hierarchical, placing the individual at the centre, when it may be that communities are more central and bi-directional relationships exist between the layers.

Figure 1 – Stylised model of wellbeing using layers

Note: drawn from Dahlgren-Whitehead 'rainbow model' of social health factors and ecological models of human development that locate individuals within different systems (Bronfenbrenner, 1979; ESRC, 2019; Pennington et al., 2021)

Research questions

There were three phases of work and associated research questions developed through discussion with the What Works Centre for Wellbeing and the project funders:

- Phase 1 - Model development (rapid evidence review and consultation group). What are the relationships between community wellbeing and the wellbeing of different individuals and groups within that community?

- Phase 2 - Quantitative model mapping and testing (secondary data analysis). How can these relationships be modelled quantitatively using measures of community, individual wellbeing and measures for the quantity and quality of relationships and sense of belonging to a place?

- Phase 3 – Qualitative exploration of model, barriers, enablers (individual qualitative interviews). What are the barriers and enablers (context and social infrastructure) to achieving a cycle of positive outcomes for individuals and communities, while addressing any trade-offs or risks of negative outcomes for different individuals/ groups? How does the developed model of community wellbeing resonate with users and can it be applied?

Timeline

All research activities were conducted virtually from the United Kingdom (UK) between December 2020 and November 2021 (see Timeline in Figure 2).

Project Timeline

Rapid evidence review and consultation group	Quantitative model mapping and testing	Qualitative exploration of model + barriers, enablers, tradeoffs
Key activities included developing search terms, contacting and meeting authors, extracting study details, quality assessment, writing up the results, and the draft model	Key activities included writing the analysis plan (public and expert versions); ethical approval for local area data; locating, downloading, and merging data; and conducting analyses and robustness tests	Key activities included ethical approval, topic guide development, emailing participants to invite them to participate, conducting interviews, data security and privacy, thematic analysis
December 2020 – February 2021 Virtual project consultation group meeting held 9 February 2021	**March 2021 – June 2021**	**July 2021- November 2021** Virtual project consultation group meeting held 21 July 2021

Figure 2: Project timeline

Phase 1: Rapid evidence review and consultation group

Note: a full discussion of the methods and results of Phase 1 are available on the Open Science Foundation in the Phase 1 report: DOI 10.17605/OSF.IO/3DBE9

Rapid evidence review

Methods

Approach

We approached the rapid review as "a type of knowledge synthesis in which components of the systematic review process are simplified or omitted to produce information in a short period of time" (Tricco et al., 2015). Note that a full systematic review was beyond the scope of the project due to time and resource constraints. Further details including the extraction template, quality assessment, and inclusion criteria are available in the Phase 1 report on the Open Science Foundation.

Data extraction

Data were extracted from studies in the following categories: individual wellbeing measure, community wellbeing measure, initiative or intervention, description of the community, design and analytic approach, mechanisms or 'links', barriers and enablers, individual or group differences, and findings (see Open Science Foundation - Phase 1 report). Note that we interpreted wellbeing as encompassing both objective and subjective dimensions.

Analyses

We provided a narrative overview to synthesise the key themes emerging from the studies in the literature review, consistent with the rapid review approach (Tricco et al., 2015). The narrative overview was complemented by quality appraisal informed by the Mixed Methods Appraisal tool (Hong et al., 2018), and studies were reported as relatively high, medium or low quality. We selected original studies because systematic and conceptual reviews of community wellbeing have already been conducted with the WWCW (Atkinson et al., 2017; Bagnall et al., 2017).

Results

Overview

Consistent with the vast quantity of literature identified by the prior scoping review of community wellbeing indicators (Bagnall et al., 2017), there were many papers that incorporated research about community wellbeing alongside individual subjective wellbeing. The literature summary is, therefore, a necessarily selective review.

What does prior literature tell us about the relationship between community wellbeing and the wellbeing of different individuals and groups within that community (the research question)? In the data extraction, the studies located covered many different types of communities, approaches to assessing individual and community wellbeing, and included diverse individuals and groups within these communities. We examined whether any factors were analysed as mechanisms or 'links' between individual and community wellbeing, as well as, separately, if there were any barriers or enablers discussed.

Below, we summarise the extracted data, and key findings and common themes: inequalities in participation and wellbeing, mechanisms or 'links' between individual and community wellbeing, and the malleability of perceived community boundaries.

Data extracted

Communities identified

Most of the communities included were place-based, including regions in England (Mendip in Somerset, West Midlands, Bristol, London, Manchester, and 150 'relatively deprived' regions), Scotland (Glasgow), Wales (middle super output areas - MSOAs), Northern Ireland (Derry/Londonderry), Republic of Ireland (Dublin, Cork, Limerick, and Galway), Germany (Wuppertal), and the United States (counties). Other studies included communities centred upon workplaces, schools, and online social networks, or analysed data from those that may be thought of as communities of identity (ethnic or gender and sexual identities).

Individual subjective wellbeing

The studies included quantitative questions and qualitative topics about individual subjective wellbeing. The quantitative questions included the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) (Tennant et al., 2007) and its short form (SWEMWBS, Stewart-Brown et al., 2009), questions in a mobile phone app that asked how people felt 'in the moment' (experience sampling method, Napa Scollon, Prieto and Diener, 2009) and during daily activities reported in a diary (day reconstruction method, Kahneman et al., 2004), the Office for National Statistics personal wellbeing items (life satisfaction, worthwhile activities in life, happy yesterday, anxious yesterday; see Office for National Statistics, 2021), and positive and negative affect yesterday (enjoyment, happy, smiled, laughed, stress, worry, anger, sadness; see Graham and Pinto, 2021). The qualitative topics covered perceptions of mental wellbeing and quality of life, including stress and loneliness.

Community wellbeing

Assessments of community wellbeing varied, included objective and subjective approaches covering quantitative items and qualitative topics. Consistent with prior literature, it was not always clear what was a mechanism or 'link' (see below) and what was community wellbeing itself (Atkinson et al., 2017, 2020). Objective quantitative items of community wellbeing included area-based emergency hospital admissions and levels of area deprivation. Subjective quantitative items included satisfaction with aspects of the area (such as infrastructure, service, education, culture, and environmental quality), perceptions that the community takes action on health and wellbeing, perceptions of community and individual control, area-level belonging, and area satisfaction, among others. The qualitative topics included perceptions of life in the community, social capital and social networks, and the climate and ethos of the community.

Individual and group differences

Some of the studies analysed differences according to individual and group factors. There were differences identified according to how individuals felt (engaged, connected, content), demographic factors (age, relationship status, educational level, income, sex, employment including retired, an individual's disability status, an individual's health, parenthood, ethnicity), time constraints, amount of social contact, and social interactions. It was decided that some aspects of community wellbeing would be included as sub-group differences if relevant, given the nebulous nature of the topic (Atkinson et al., 2017, 2020). Community-level factors included amount of participation in, or exposure to, area-based initiatives (project 'head counts' per capita, Phillips et al., 2014a), and the rural/urban nature of the local area. While there were fewer group differences (identified at the community-level) than there were individual differences (identified at the individual-level), it is not possible to conclude whether this is reflective of the literature at large given the selective nature of the review.

Mechanisms

In some cases, there were mechanisms ('links') that were proposed (such as in the Discussion of the results of a study) but not explicitly tested, which we included to inform our model. As above, we decided to include some factors even if they were also aspects of community wellbeing, and some individual or group differences were included, too, because they could be a mechanism (depending on the outcome chosen). Mechanisms acting as 'links' included social connectedness, group-up versus top-down leadership, relationship-building, building on existing infrastructure, qualitative themes of sharing information, perceptions of group identity, shared understanding, empowerment, perceptions of community control, satisfaction with the area, people getting along in the area, feeling of belonging, approachable leadership, mobility, relationships with nature, social capital, sustainable neighbourhood design, fear of crime, respect for others, and discrimination and stereotyping, among others.

Barriers and enablers

There were some factors that acted to make better individual subjective wellbeing less (barriers) or more (enabler) likely. Many of these were about how to promote access to community interventions and initiatives that subsequently improved wellbeing. For example, people who are not physically mobile may have difficulty accessing community interventions that are not brought to them, inhibiting wellbeing (Abel et al., 2018). Sensory and learning difficulties may make participation in community initiatives challenging if there are forms required and no assistance to complete them (Health Connections Mendip, 2016, 2020). The location of community projects may be a barrier if they are unfriendly to some, or associated with negative memories (in one case, the location was a former base for a political party, Health Connections Mendip, 2016, 2020).

Other barriers included lack of time, lack of interest, poor health, and limited social networks (Fujiwara, Cornwall and Dolan, 2014), or local area factors like poor paving or benches, lack of public toilets, and unaffordable or inaccessible public transport (Calvert, Buser and Williams, 2020). More directly, having more green space in a local area, and less noise, enabled better mental wellbeing, although these relationships may be confounded by income (Haake and Ludwigs, 2019).

Key findings and common themes

1. **Participation in community initiatives may be associated with better subjective wellbeing (individual and community), but levels of participation vary across groups, and this may widen inequalities.**

The prior What Works Centre for Wellbeing conceptual review identified inequality as an aspect of the community requiring greater attention (Atkinson et al., 2017), and several studies in this review noted the difficulties of encouraging widespread participation in community initiatives (Derges et al., 2014; Phillips et al., 2014a, 2014b; Nightingale et al., 2019). When community initiatives only attract participation from the most advantaged to begin with, such as those who are most physically able to participate (Fujiwara, Cornwall and Dolan, 2014; Abel et al., 2018; Calvert, Buser and Williams, 2020), have higher income and education (McGowan et al., 2021), or more free time (Nightingale et al., 2019), as examples, this may serve to widen inequalities in participation according to disability, socio-economic status, or time use. Because low subjective individual wellbeing may be associated with lack of trust in others, this could drive low participation, too, and lead to issues linking cause and effect (Lyubomirsky, King and Diener, 2005). If participation is linked with better individual subjective wellbeing, and there are inequalities in participation, this may widen inequalities in individual subjective wellbeing (Office for National Statistics, 2018).

A key area for designers of community initiatives to attend to is their inclusivity. More engaged and connected communities could worsen the wellbeing of those who are not engaged and connected if they feel left out, and an unequal distribution of these benefits may not optimise wellbeing (Villalonga-Olives and Kawachi, 2017). The survey results of one high quality trial concluded that area-based initiatives "attract highly educated residents in greater numbers than those from lower educational background, [which] may be widening inequalities within communities as the benefits of involvement are not equally distributed" (McGowan et al., 2021, p.8). Another high-quality study conducted a cluster randomised controlled trial of a multi-component intervention to improve local area wellbeing in London. The results showed no effect of the intervention, which the authors attributed to a lack of time and resources available for local co-production and intervention development – investments that could have affected inclusivity (Phillips et al., 2014b).

Other studies, however, show that the wellbeing of one individual has an impact on the wellbeing of others (Fowler and Christakis, 2009; Kramer, Guillory and Hancock, 2014; Hill, Griffiths and House, 2015). Interpreted positively, if someone's wellbeing improved as a result of a community initiative, this could improve others' happiness and protect them from aspects of low wellbeing like depression – even if these others did not engage in the initiative themselves. Therefore, the benefits of an intervention mostly taken up by the 'highly educated', for example, could improve the wellbeing of those who did not engage – reducing, rather widening, inequalities. Admittedly, it would require those who did not engage to encounter diverse people in their social networks to spread any benefits.

It may be difficult to demonstrate whole area-based effects, which are manifest in data collected from a variety of people across the local area. Only one initiative from our review showed whole area-based positive effects. The intervention was a multi-component local area program in Somerset that aimed to 'bring networks to people', which reduced whole-area emergency hospital admissions, as reported in a medium

quality study (Abel et al., 2018), and, as reported in a lower-quality study with 89 participants, led to improved WEMWBS scores (Health Connections Mendip, 2016, 2020). Inclusive design initiatives like these were identified in several studies in the review. For example, a medium quality quantitative study showed a positive association between the age-friendliness of the area (assessed on walkability, safety, and service accessibility for older residents) and individual subjective wellbeing (Gibney, Zhang and Brennan, 2020). A medium quality qualitative ethnographic study co-produced inclusive design ideas to promote wellbeing by reducing the risk and stigma of suicide in public places, such as by creating artwork from shared historical knowledge (Bichard et al., 2018). This shows that overall outcomes may depend on the population structure, such as the distribution of age or mental health.

2. **Key mechanisms or 'links' between objective community and subjective individual wellbeing were feelings of belonging, sense of cohesion, perceptions of social support and collective control, and social networks.**

Several studies identified similar mechanisms or 'links' between objective features of communities (such as neighbourhood disadvantage) and subjective wellbeing outcomes (such as perceptions of how well life is going or civic pride). One high-quality qualitative study looked at the effects of participating in area-based initiatives in relatively deprived areas in London, and found that 'feeling of belonging to the area' was associated with better SWEMWBS scores (McGowan et al., 2019).

A follow up study on the same initiative found that better mental wellbeing was associated with certain aspects of social cohesion and control – 'people in area are willing to help each other' and 'collective control over decisions in area' (McGowan et al., 2021). Another medium-quality study analysed the relationship between area disadvantage and mental wellbeing (on WEMWBS) in England, finding that perceived 'sense of neighbourhood cohesion' mediated the link (Curtis et al., 2020). There are, however, issues with relating these mechanisms or 'links' to outcomes like WEMWBS because there is conceptual overlap.

Other studies looked at the link between similar mechanisms or 'links' but treated them as determinants. For example, a high-quality study of residents in Glasgow, Scotland found that certain measures of social capital more strongly predicted mental wellbeing on WEMWBS than others: items reflecting 'cognitive social capital' (a scale asked of individuals with items about 'feeling valued as a member of community', influencing decisions, if neighbours look out for each other, etc.) were more strongly associated with mental wellbeing than perceived social or environmental incivilities (like drug activity or assaults, or noise or disturbance in area, respectively) (Jones et al., 2014).

The results of a relatively lower-quality study collecting data using mobile phone apps in Germany reported that city residents "engaged and feeling connected to their city are more content" (Haake and Ludwigs, 2019). High-quality work in the United States suggests that 'prime aged' (25-54 years) white males out of the labour force have the starkest indicators of despair, which varies across both place and people – the ability to be mobile matters to individual subjective wellbeing (that is, to leave areas of despair), as do informal support networks and hope (Graham, 2019, 2021; Graham and Pinto, 2019, 2021).

3. Communities are malleable, multiple, and influenced by 'wellbeing spillovers' and 'tipping points'.

Data from many of the qualitative studies questioned the focus of many of the quantitative studies on easily identifiably communities such as geographic areas, workplaces, and schools[1]. Although these are convenient units for quantitative analyses, they may not represent the communities that people most identify with or that most matter for wellbeing (Kudrna, 2017). There are many possible 'frames of reference' that people may identify with and these are not limited to objective boundaries alone, such as communities of identity according to characteristics like ethnicity, race, or religion (Shibutani, 1955). In local areas, the boundaries that people subjectively perceive as their neighbourhoods do not always correspond with those used by researchers to define them (Campbell et al., 2009).

There are also trade-offs between communities and qualitative aspects of community that might best be elicited by speaking to or observing groups, such as the idea of 'assemblage' that recognises wellbeing as relational and situated (Atkinson et al., 2017). Quantitatively, people might be asked what they think about their communities rather than about themselves – or about themselves within their communities (Pennington et al., 2021).

As one example, a medium quality longitudinal qualitative study looking at the experience of COVID-19 for older adults within communities in Manchester, found that 'friends' were often a more important community than 'families' for older LGBT people, despite much of the government rhetoric around 'families' during times of COVID-19 (Yarker et al., 2020). While it is more difficult to capture networks of friends and families than local areas, schools, or workplaces, there have been efforts made to so. For example, some social network studies identify connection or 'social ties' between people according to reports about who are friends, family, neighbours, or co-workers. One of the well-known findings is that happiness is contagious within networks, with the probability of happiness increased if someone else in the network becomes happier (Fowler and Christakis, 2009; Kramer, Guillory and Hancock, 2014; Hill, Griffiths and House, 2015). As mentioned above, it is possible that uneven participation in community-level initiatives does not widen inequalities if there are positive wellbeing spillovers between individuals and groups who benefit from the initiative.

In addition to contagion effects between individuals, there may be contagion effects between community spheres. For example, one medium quality qualitative study from our review showed that teachers' wellbeing influenced that of pupils', and, moreover, that teachers' wellbeing at school was influenced by negative events at home (such as domestic violence or bereavement). This illustrates that wellbeing can spill over from one community (home) to the next (schools), particularly if it reaches a 'tipping point' where it is too difficult or intense to contain within one community (Glazzard and Rose, 2019). An example of a manifestation of this phenomenon is that riots in one community often spill over into the next (Drury et al., 2020). Another medium quality qualitative study made a similar point that preventing suicide in public places with inclusive design can affect "the mental health and wellbeing of friends, family, the community and a place" (Bichard et al., 2018). The strength and quality of connection may also be considered an inherent aspect of individual wellbeing itself.

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1   Some quantitative studies questioned this, too – see, for example Phillips et al. (2014b)

Another aspect of community malleability is that their composition may be in flux. A qualitative study with older adults, identified in our review as relatively lower quality, nevertheless provided rich detail about perceived community changes: *"...Some feel that Staple Hill [geographic area in Bristol] is losing a sense of community and community-mindedness"* which *"may be due in part to changes within the neighbourhood, such as demographics shifting towards younger people"* (Calvert, Buser and Williams, 2020). The concept of change within a community over long periods time is a challenging phenomenon to capture quantitatively due to data availability at local levels over time, although it may be possible to so in similar ways to individual change. For example, the results of a study on income dynamics suggested that poverty is not a fixed concept and many people are touched by poverty at some point in their lives even if they do not remain in poverty (Jenkins, 2011). Communities are likely to change in similar ways.

Changes within communities may affect how concepts like social capital, social comparisons, and social cohesion interact to impact wellbeing within these communities (Cheung, 2016; Cheung and Lucas, 2016; Villalonga-Olives and Kawachi, 2017). It is also important to consider how communities can reproduce the inequalities between them. Areas with good facilities, high quality shared spaces, and safety are likely to attract people who have the resources to live in these areas and who prefer them, and people who choose to live in a particular place shapes the place itself (Tammaru et al., 2021). This raises questions for how to intervene in ways that don't contribute to the reproduction of inequalities.

Project consultation group

In the project consultation group, we presented the results of the literature review and used an approach informed by concept mapping methodology to create a model showing the relationships between individual and community wellbeing (Trochim, 1989; Bickman et al., 2016). The purpose of the model was to inform future interventions and initiatives occurring after this project.

Methods

Approach

The Phase 1 project consultation group was held virtually on 9 February 2021. The research team provided some initial concepts related to individual and community wellbeing, categories to represent the concepts, and a representational arrangement of the concepts, all based on the existing literature. Participants provided feedback on the concepts, categories, and their representation. Further details are available the Phase 1 report on the OSF.

Participants

Members of the virtual consultation group were selected by the What Works Centre for Wellbeing based on their availability and interest in the project. The group was attended by 24 individuals from local government organisations and charities, as well as by academics, the research team, funder representatives, and members of the What Works Centre for Wellbeing.

Results

The consultation group was initially provided with the representation of individual and community wellbeing in Figure 3, which was developed by the research team and What Works Centre for Wellbeing.
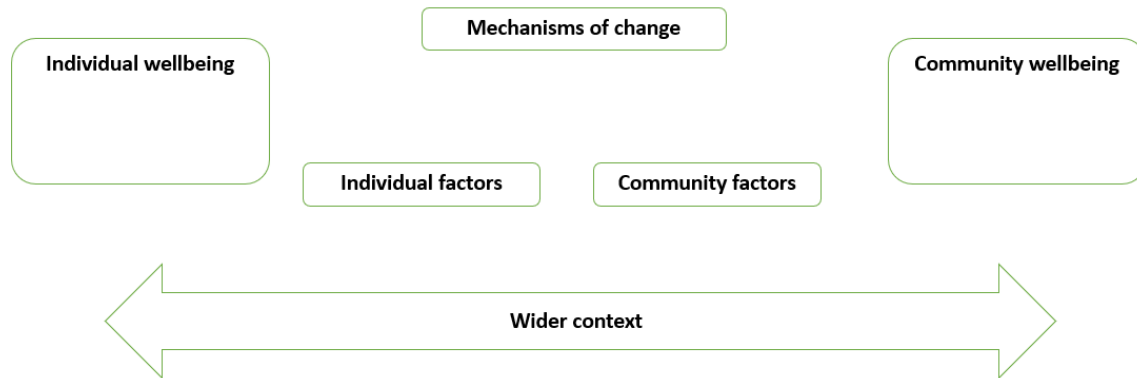

Figure 3 – Initial model of the relationships between individual and community wellbeing

After discussion (see Phase 1 report on OSF linked at the start of the chapter), the research team developed Figure 4 (see next page) guided by feedback from the consultation group and existing literature. Some of the key decisions in going from Figure 3 to Figure 4 were:

- To separate objective wellbeing from subjective wellbeing, which was important to group members and aligns with policy work on the subjective measurement of wellbeing (Stiglitz, 2009; HM Treasury, 2021);

- Consider 'fluid' factors that may be perceived as relatively modifiable and easier to change than 'fixed' factors that are relatively non-modifiable and harder to change, aligned with public health viewpoints on risk factors (Sniderman and Furberg, 2008);

- To use a simplified causal chain approach (Pearl and Mackenzie, 2018) because the purpose was to inform the development and evaluation of interventions and initiatives occurring after this project. Notably, while it may be possible to understand complex interventions using such a chain (Campbell et al., 2000) it is more difficult to understand complex systems (Bronfenbrenner, 1977; Rutter et al., 2017).

Following the development of Figure 4, the funders requested alternative visualisations, and an artistic visualisation was produced in consultation with a graphic designer (see Figure 5 on page 21).
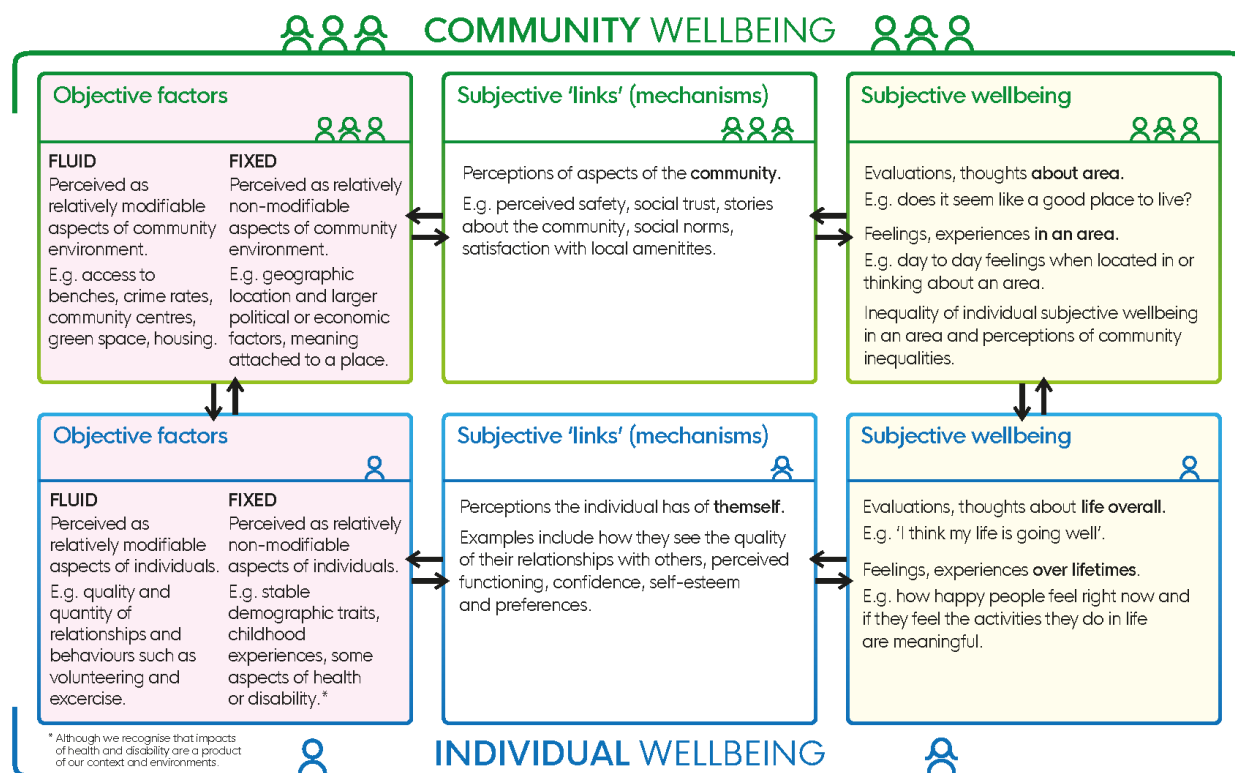
Figure 4 – Box model of the relationships between individual and community wellbeing.

Notes:

- *Fluid factors are perceived as relatively easier to change than fixed factors, which are perceived as harder to change.*

- *Examples within boxes (geographic location, age) are not exhaustive, and some fixed factors could be mechanisms, too.*

- *Arrows may be added or removed to represent different pathways. The functioning aspect of WEMWBS falls under individual subjective links and the feelings aspect under individual subjective wellbeing.*

Box 1: Description of draft 'box' model of the relationship between individual and community wellbeing

The box model of individual and community wellbeing (Figure 4) shows some of the pathways through which different interventions and initiatives might impact individual and community wellbeing. It can be complex to change wellbeing and so the model does not seek to explain everything. Instead, the purpose of the model is to inform work in this area by providing more clarity about the relationships between individual and community wellbeing.

On the top there are three components of community wellbeing, which are community-level objective factors, subjective 'links' or mechanisms, and subjective wellbeing. Communities may be groups like local areas, schools, or workplaces,

Continued on next page.

although the text in this model is about local areas (and it could be modified to be about another community). On the bottom there are the three components of individual wellbeing, which refer to people within these communities: individual-level objective factors, subjective psychological 'links' or mechanisms, and subjective wellbeing.

The model could be arranged differently, in terms of what is on the left and what is on the right, because there are bidirectional relationships between these concepts, represented by bidirectional arrows. More arrows could be added, too, depending on the relationships proposed for a particular context. Currently, the model is arranged from the perspective of decision-makers who have access to levers that allow them to alter the objective community factors shown on the upper left. Sometimes objective community factors are perceived as more fluid and easier to change, such as benches in the local area or housing availability. Sometimes they are seen as more fixed and relatively harder to change, such as whether a community is in an urban or rural location and wider political factors.

On the right are subjective reports of wellbeing, which are at the individual level (on the bottom) and the community level (on the top). For individuals, these could be thoughts about life overall or their day-to-day feelings. At the community level, these could be thoughts about the community, feelings when in the community, or inequalities in subjective wellbeing. Individual subjective welling is about individuals' reports of their own feelings and lives. Community subjective wellbeing is about individuals' perceptions of their communities or the qualitative 'something extra' that is more than the sum of individual subjective wellbeing (Atkinson et al., 2021).

In the middle, linking the objective factors to wellbeing experiences, are subjective 'links' or mechanisms. These are the process by which changes on the left-hand side might convert into wellbeing on the right hand side. Mechanisms might be at the individual level, such as if an individual has high self-esteem, or at the community-level, such as individual perceptions that local facilities like shops and parks are satisfactory, or the proportion of people in an area that have positive perceptions about the area.

The difference between the subjective mechanisms and subjective wellbeing is that the mechanisms are about certain aspects of people's lives or their communities (relationships, local amenities) whereas subjective wellbeing is more purely about thoughts and feelings irrespective of these aspects (thinking and feeling life is going well, happy, cheerful, stressed, sad, joy, meaning).

As an example of a pathway cutting through some of the model, local-level income inequality (a fluid community objective factor) could be associated with someone feeling sad (individual subjective wellbeing) because people feel like they don't belong to their local area (a subjective community mechanism). Of course, however, subjective wellbeing can drive community or individual objective factors – happier people might be more likely to volunteer, for example. And the individual and community boxes are related: communities experiencing positive feelings about their area (on the top right) are likely to have individuals within them who are happier (on the bottom right), as has been shown for workplace communities (Whitman, Van Rooy and Viswesvaran, 2010). In addition, the same fluid community intervention on the left, such as a park, may affect people with different fixed individual factors differently, like those who can't access the park because they are not mobile due to long-standing physical disability.
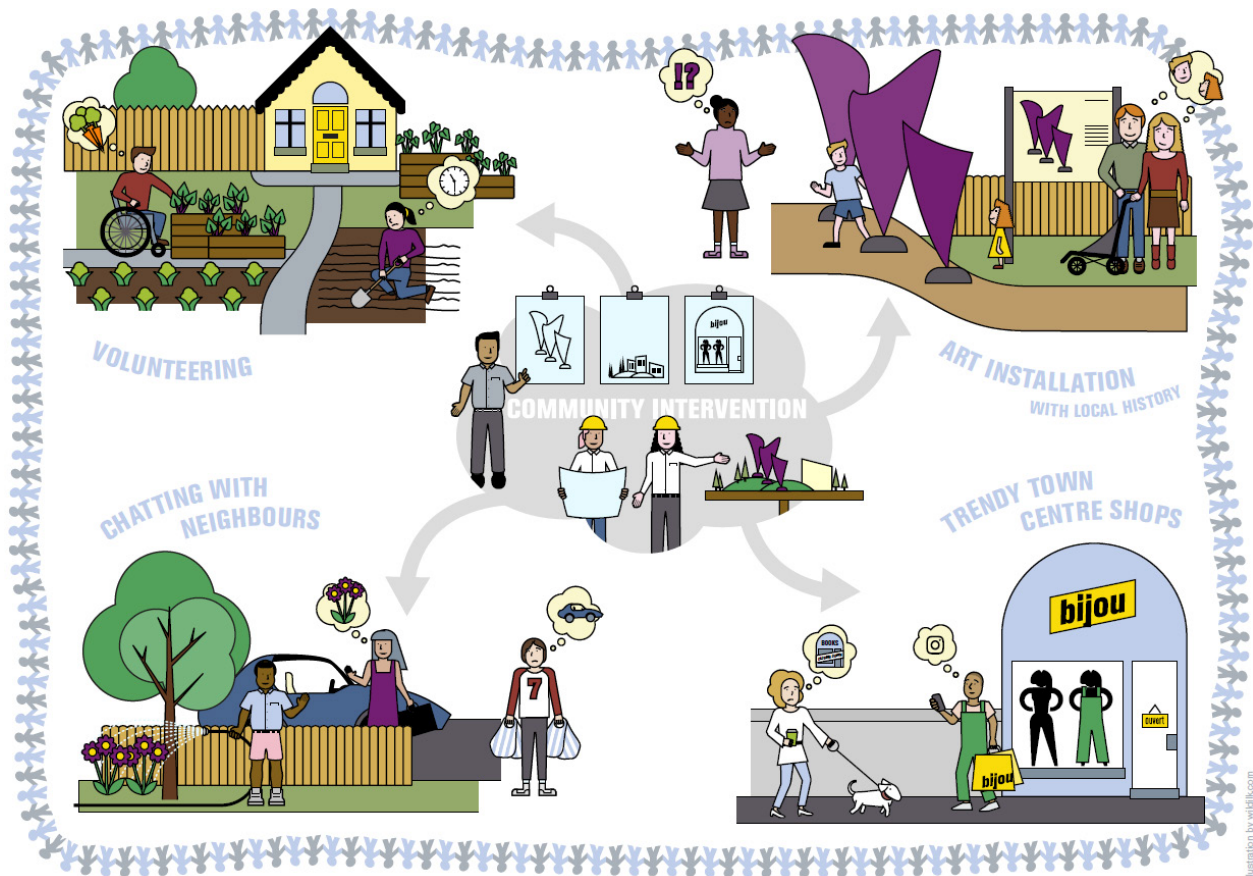
Figure 5 – Artistic visualisation of the relationships between individual and community wellbeing.

The graphic in Figure 5 shows different reactions to the same intervention in a place. In the middle are people in hard hats creating the interventions on the outside. Community wellbeing is represented by the figures holding hands on the edge. In each corner is a different intervention – volunteering, an art installation, trendy town centre shops, and chatting with neighbours. There are different reactions by the people in each corner. On the upper left, the man who is volunteering and planting carrots appears to be enjoying the experience, whereas the woman digging is worried about the time. On the upper right, a family is enjoying the art, but a woman is not and wondering why the art is there. On the bottom right, a shopper is smiling about their purchase but a woman walking her dog is wondering what happened to the bookshop that used to be there. On the bottom left, some neighbours like the flowers but one neighbour doesn't like the car being there.

Linking Phase 1 to Phase 2

Prior work has developed other models of individual and community wellbeing and tested aspects of these models. For example, the model in Figure 6 below was used to inform analyses of Understanding Society data (Curtis et al., 2020). Using Lower Super Output Area-level data on the Index of Multiple Deprivation (IMD), the Social Fragmentation Index, and individual characteristics to explain changes in the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) over time (Stewart-Brown et al., 2009), the authors found that greater deprivation and social fragmentation were associated with worse mental wellbeing, even after controlling for individual characteristics. The results also showed that sense of neighbourhood cohesion appeared to be a mediating variable between area disadvantage and wellbeing, and that those in areas with geographical barriers (a sub-domain of the IMD) had better mental wellbeing – likely reflecting better wellbeing in remote rural areas.
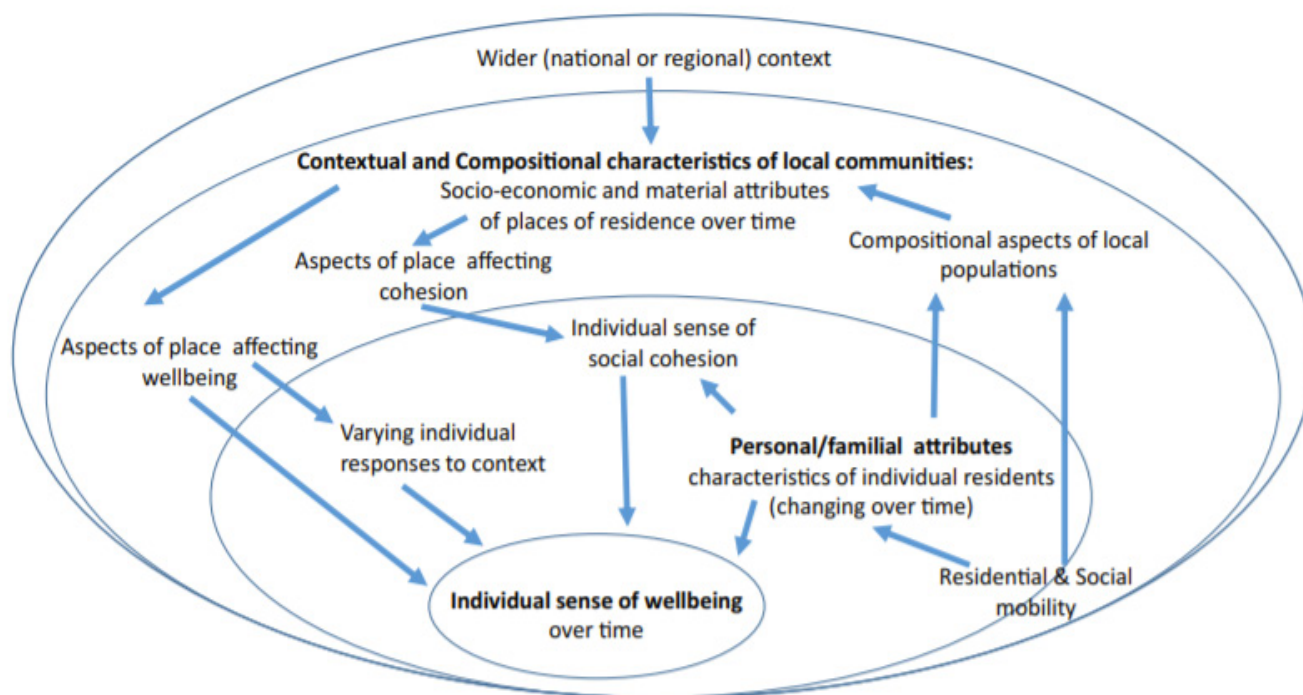
Wider (national or regional) context

Contextual and Compositional characteristics of local communities:
Socio-economic and material attributes of places of residence over time

Aspects of place affecting cohesion

Compositional aspects of local populations

Aspects of place affecting wellbeing

Individual sense of social cohesion

Varying individual responses to context

Personal/familial attributes characteristics of individual residents (changing over time)

Individual sense of wellbeing over time

Residential & Social mobility

Figure 6 – Factors likely to be associated with individual sense of wellbeing – conceptual model drawing on previous research (Curtis et al., 2020).

We draw upon this work in Phase 2 because we decided to use Understanding Society data due to the availability of rich measures to populate many aspects of the boxes model. Our work builds upon it primarily by using more subjective wellbeing outcomes, including community subjective wellbeing and different objective community factors, and exploring interactions between individual- and community-level characteristics.

There are many other models that include individual and community wellbeing. One is a wellbeing tree that shows the ecosystem of wellbeing and how interventions and initiatives may impact down the different branches (see Figure 7).

The accompanying toolkit provides a systematic way to establish how to reduce inequalities in the impacts of different interventions and initiatives by considering their expected impacts, the direction of impacts, the groups affected, creating recommendations, and ranking priorities for action (Pennington et al., 2021).

While this tree illustrates the rich complexity of community wellbeing, allowing users to follow different pathways and branches for interventions and initiatives, it does not draw attention to mapping causation by identifying the specific factors to act as 'levers' for intervention and their associated mechanisms or 'links' with outcomes (Pearl and Mackenzie, 2018).

Figure 7 – The community wellbeing tree (Pennington et al., 2021)

Community wellbeing has been defined as 'being well together' and comprised of 'people, place, and power' (Atkinson et al., 2017). These elements fit together in various ways that have been described as 'inherently messy'[2].

As shown in the theory of change in Figure 8 on the next page, people, place, and power are seen as part of 'community conditions' sitting within 'community wellbeing' broadly, and long-term outcomes could be both 'community wellbeing' or 'individual wellbeing'.

The messiness leads to some seemingly overlapping concepts, such as community wellbeing being both the system described and the final outcome, and the social aspects of communities being part of their conditions in (1) and mechanisms of change in (3) (South et al., 2016). This 'messiness' is not always perceived as problematic among community wellbeing researchers.

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2   https://whatworkswellbeing.org/category/places-and-community/

Figure 8 – Theory of change for community wellbeing (South et al., 2016).

There are other models that informed the link between our work in Phase 1 and Phase 2. The model in Figure 9 separates objective and subjective aspects of wellbeing but includes a third element – intersubjective wellbeing. Intersubjective wellbeing is captured with items starting with 'How would you evaluate…', versus satisfaction items, beginning with 'how satisfied are you with…'. However, the authors find evaluations and satisfaction are highly correlated with r = 0.9 (Choi, Kim and Lee, 2020).

Therefore, we situate evaluations with certain domains, and satisfaction with certain domains, under 'subjective mechanisms' in our model – at both individual and community levels. Separating domain (job, work) from overall (life) evaluations and satisfaction is consistent with the approach taken in other research on individual subjective wellbeing (Kaiser, Hennecke and Luhmann, 2020).
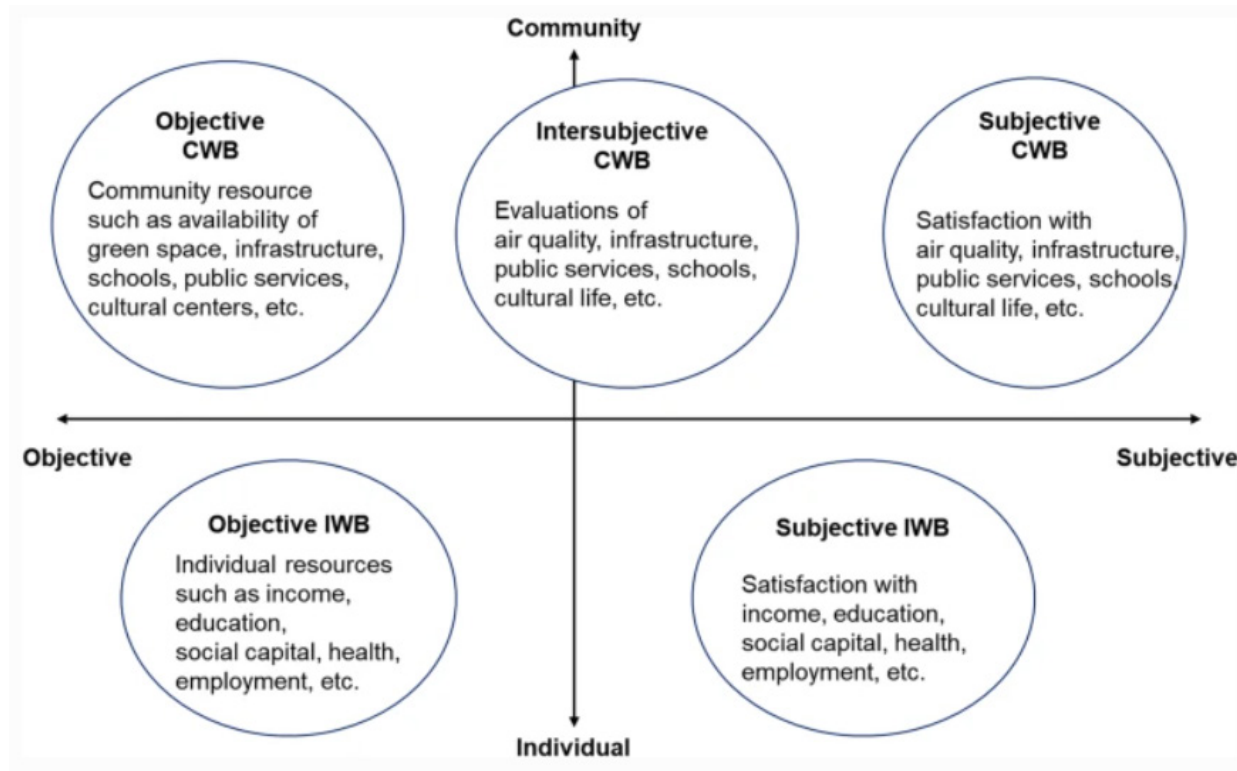
Figure 9 – Intersubjective framework of wellbeing (Choi, Kim and Lee, 2020).
Note: CWB=Community wellbeing, IWB =Individual wellbeing

Our boxes model is otherwise agnostic about any 'ultimate outcome' for subjective wellbeing, accommodating multiple interpretations – evaluations of life and communities overall, as well as day-to-day feelings during life and when in a particular community. This is important because there are different approaches to measuring subjective wellbeing and no agreement about how to decide which approach is best, such as by using existing theory, argument, tradition, public deliberation and involvement, or psychometric testing.

Other approaches are more careful to specify what the 'ultimate' outcome should be. Recent work (see Figure 10) uses the analogy of an eye to show how attention filters objective circumstances, including objective community circumstances, into an 'ultimate' outcome of day-to-day feelings in terms of experiential (individual) subjective wellbeing (Dolan, Laffan and Kudrna, 2021). This ultimate outcome does not include satisfaction, evaluations, or functioning – only feelings, including positive and negative feelings and sentiments like joy, sadness, meaning, and futility.

In Phase 2, we focus specifically on the interactions between individual-level (e.g. age) and community-level (e.g. local area income) objective circumstances, considering subjective perceptions of selves and communities (e.g. individual sense of financial security, sense of belonging to local areas), and relationships with subjective reports of wellbeing (including experiential individual subjective wellbeing, as well as individual mental wellbeing, and subjective community wellbeing - perceptions of absolute and relative civic pride).
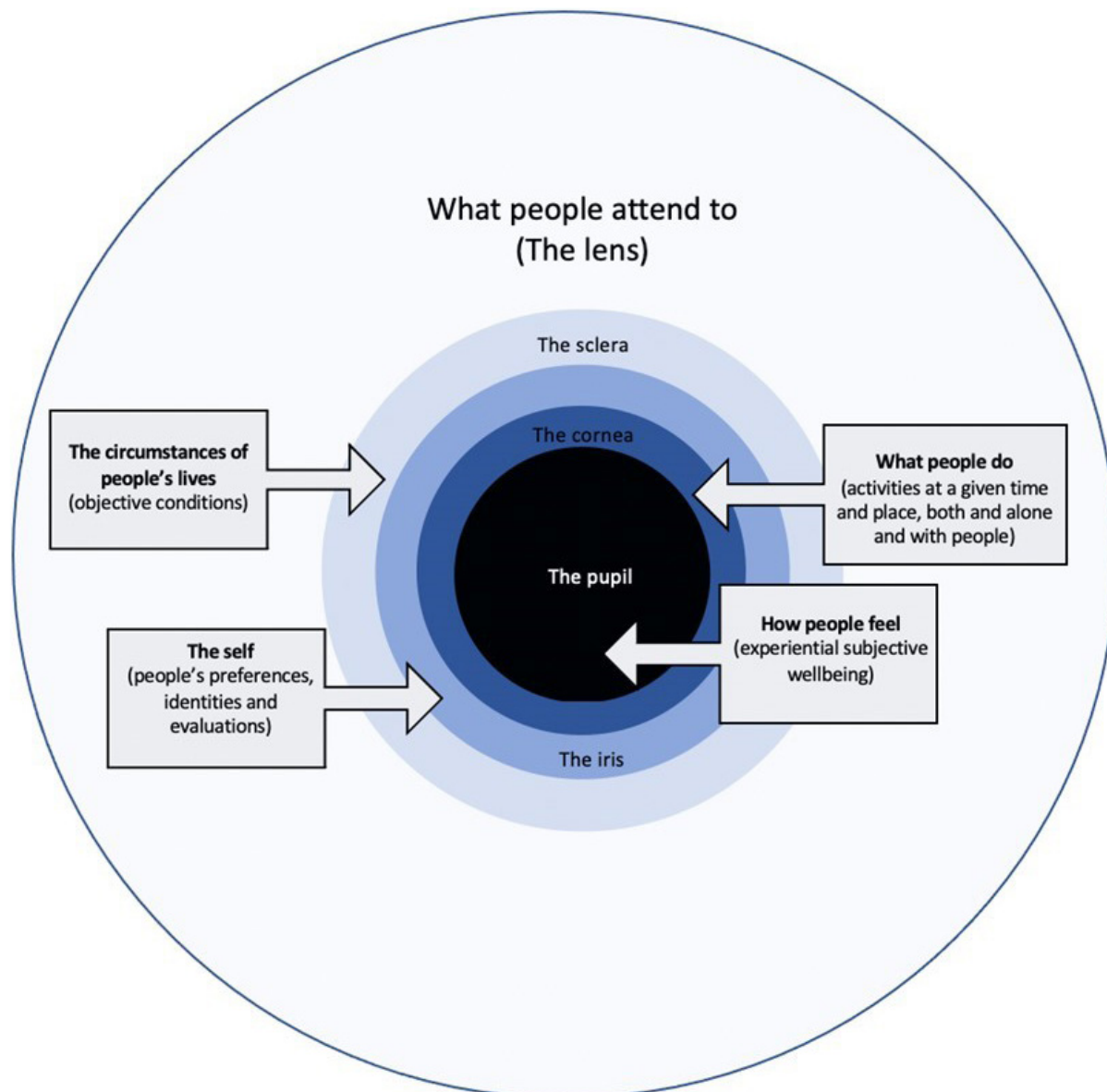
What people attend to
(The lens)

The sclera

The cornea

The circumstances of people's lives (objective conditions) →

What people do (activities at a given time and place, both and alone and with people) ←

The pupil

The self (people's preferences, identities and evaluations) →

How people feel (experiential subjective wellbeing) ←

The iris

Figure 10 – Welleye framework of wellbeing (Dolan, Laffan and Kudrna, 2021)

Other approaches also make normative arguments about wellbeing measurement. For example, the neighbourhood resilience programme emphasises that resilience is better understood at the level of neighbourhood systems rather than individuals experiencing legitimate challenges in adverse contexts who may not perceive themselves as resilient (Neighbourhood Resilience, 2021).

There are other models of individual and community wellbeing that are bottom-up, dynamic, and iterative, allowing communities to define what wellbeing is and how to address it, such as the Community Spirit Level Index (Royal Society for Public Health, 2021). In these approaches, definitions of wellbeing are co-produced and vary across place and time, which can make them more relevant at local levels but create challenges when aiming to find consistencies in the causes and consequences of wellbeing and to integrate findings beyond a local context.

Phase 2: Quantitative model mapping and testing

In Phase 2, we conducted quantitative analyses of existing data from the Understanding Society survey to further explore the relationships between community wellbeing and the wellbeing of different individuals and identified groups within that community.

In line with the research questions, we used measures of community, individual wellbeing, and measures for the quantity and quality of relationships and sense of belonging to a place, which we mapped onto the model developed in Phase 1.

The Understanding Society survey has been running for many years. Its predecessor project, the British Household Panel Survey, began in 1991. Households were randomly selected to take part and people from these households are followed over time. It is not possible for volunteers to join, which reduces the biases that can be associated with volunteer ('self-selected') participants. In the survey questionnaire, participants are asked questions about their wellbeing, relationships, and social and economic circumstances. More information about this survey is available online[3].

We selected the Understanding Society survey because it contained both individual and local authority-level data on many aspects of wellbeing. It was particularly important to some members of the research and funding teams at the time that we include local authority data and a measure of community subjective wellbeing that asked people about their perceptions of their local geographic areas (rather than using measures that asked people about their perceptions of their own lives, and then subsequently aggregating these to the local area level).

On this basis, we selected the measure, "Overall, do you like living in this neighbourhood?" to represent an aspect of community subjective wellbeing. We describe it throughout as a measure of civic pride, acknowledging that definitions of civic pride are contested (Collins, 2016) and others have described this measure more generally as a one of perceived neighbourhood quality (Emerson et al., 2014). Notably, this measure is not perfectly aligned with our model and description of community subjective wellbeing because participants are asked whether they 'like' living in the local area. It could be argued that asking about 'liking' is a preference-oriented question and more of a subjective mechanism than subjective wellbeing. Nevertheless, it is a measure that is about communities generally rather than specific aspects of communities (like safety or social trust, which would be classified as mechanisms in the boxes model). Notwithstanding this limitation, it was the most suitable measure we were aware of at the time of selecting the analytic approach.

The availability of the measure of civic pride, alongside other key measures, drove our selection of data from the Understanding Society survey. Civic pride was only available in Waves 3 and 6 but another key measure – volunteering – was only available in even Waves (2,4,6,8,10), so including Wave 6 but not Wave 3. Looking broadly across measures and Waves, most of our desired measures were in Wave 6 (see also Appendix 1). Our analyses thus focus on a 'snapshot' cross-sectional picture of individual and community wellbeing in Wave 6, which took place in 2014-2016.

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3   See https://www.understandingsociety.ac.uk/

Guided by existing literature, including the findings in Phase 1, we make several contributions in our approach:

Measures of subjective wellbeing

- We use two measures of individual subjective wellbeing (SWEMWBS[4], and feelings of enjoyment, happiness, and depression from the General Health Questionnaire, GHQ-12), and two measures of community subjective wellbeing (absolute and relative civic pride).

- One of our community subjective wellbeing measures – relative civic pride – considers an individuals' position in the distribution of subjective wellbeing. Our approach thus goes beyond aggregating individual subjective wellbeing within an area, such as with an average or percentage of subjective individual wellbeing measures.

- We do not use a measure of life satisfaction because the research team considered it a poor proxy of feelings of wellbeing, and had concerns about its sensitivity (Atkinson, 2020) and validity in that life satisfaction appears to align more closely with a preference-based rather than subjective account of welfare (Dolan, Kudrna and Testoni, 2017; Dolan, Laffan and Kudrna, 2021).

These decisions allowed us to assess how the outcome measure of subjective wellbeing that we selected impacted upon the results when using the most valid measures of subjective wellbeing available in the data.

Measures of objective factors and subjective 'links' or mechanisms

Using the wide range of indicators available in Understanding Society data, we were able to include some of the objective factors and mechanisms found in the literature review and mentioned by the project consultation group. This included population flux or transience, which we captured as internal and external migration; age, sex, ethnicity, employment, income, disability, and rural or urban area; and perceptions of belonging to the area.

Methods

We follow the STROBE checklist of items that should be included in reports of cross-sectional studies (Von Elm et al., 2007). Although Understanding Society is a longitudinal survey, we focussed on analyses from Wave 6 due to the availability of measures (as discussed above) and thus we consider a cross-sectional 'snapshot' association between our variables. Further details of the methodology are available on the Open Science Foundation (OSF: DOI 10.17605/OSF.IO/3DBE9).

Study design

The study reported in Phase 2 is a cross-sectional survey analysis of existing individual and local authority-level geographic data on individual wellbeing and community wellbeing.

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4   As with the measure of civic pride for community subjective wellbeing, this is arguably an imperfect measure of individual subjective wellbeing because the short form of WEMWBS focusses on functioning not feelings, and the boxes model conceptualises functioning as a mechanism separate from feelings (see Figure 4).

Setting

The quantitative analyses were primarily conducted using Understanding Society survey data. Understanding Society is a national survey that interviews around 20,000-40,000 UK households each year. There are ethnic minority boost samples to ensure sufficient sample sizes for sub-group analyses. Special permission was granted from the data owners to analyse local authority-level data. Full details about the survey are available online (https://www.understandingsociety.ac.uk/). Our analyses mostly used data collected from 2014-16 (Wave 6) due to the availability of measures.

Where data of interest were not available in Wave 6 of Understanding Society, we merged data from other sources: later waves of Understanding Society, the Community Life Survey, UK Parliament House of Commons Library Election Data, and the Office for National Statistics (including data from the 2011 UK Census, HM Revenue and Customs, and Annual Population Survey – further details in 'variables', below).

Participants

Complete case analyses were conducted with all individuals who provided data for every variable used from the Understanding Society survey and whose area-level information could be matched to the additional data imported from other sources[5].

Variables

The item wording and main source of all variables is in Appendix 1. A summary of the variables drawn from sources additional to Wave 6 of Understanding Society is in Table 1 and the files (where permitted based on ethical agreements) are available on the OSF in line with the principles of open data and replication. Further details on these sources are in Appendix 2, and the names of the outcome, predictor, and control variables used in the analyses are in Table 2.

Table 1: Sources of variables additional to Wave 6 of Understanding Society (see further information in Appendix 2).

Variable	Source
Voter turnout (area-level)	House of Commons Library Election Data - UK Parliament*
Unemployment (area-level)	Office for National Statistics - Annual Population Survey*
Gross Disposable Household Income (area-level)	Office for National Statistics - HM Revenue and Customs*
Walkable assets (area-level)**	Community Life Survey
Index of ethnic dissimilarity (area-level)	Office for National Statistics - 2011 UK Census*
Population turnover (area-level)	Office for National Statistics*
SWEMWBS	Understanding Society - Wave 7
Low experienced wellbeing	Understanding Society - Wave 7
Individual voting behaviour	Understanding Society - Wave 7
Loneliness	Understanding Society - Wave 9***

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5   The exceptions were for voting and loneliness, only asked of a sub-set of participants, and models with a reduced number of cases were conducted when these items were included.

Notes: *Data files used are available on OSF. **The walkable assets were general/ grocery shop, pub, park, library, community centre/hall, sports centre/club, youth centre/ club, health centre/GP, chemist, post office, primary school, secondary school, church/ place of worship, public transport links *** Supplementary analyses only due to gap between waves.

Table 2: Names of variables (see further information in Appendix 2).

Outcome variables	
Community subjective wellbeing	**Individual subjective wellbeing**
Low absolute civic pride	Low mental wellbeing
Low relative civic pride	Low experienced wellbeing
Predictor variables	
Local authority-level	**Individual-level**
% Talking to neighbours	Talks to neighbours
% Voter turnout	Votes
% Volunteered	Volunteers
% Unemployed	Unemployed
Average income	Household income
11+ walkable assets (yes/no)	Mobility difficulties
Index of ethnic dissimilarity (yes/no)	Ethnicity
Rural or urban	Sex
% Belonging to neighbourhood	Age
% Friendships and associations with others mean a lot	Perceptions of current financial situation
	Perceptions of future financial situation
% Can access local resources when needed	Feelings of loneliness
Control variable	
Population turnover	

Note: The walkable assets were general/grocery shop, pub, park, library, community centre/hall, sports centre/club, youth centre/club, health centre/GP, chemist, post office, primary school, secondary school, church/place of worship, public transport links

Outcome variables

We had four outcome variables, which were all about subjective wellbeing for the community or individuals. To facilitate comparisons across measures, some of which were originally binary, we created binary outcome variables across all measures. Throughout,

lower subjective wellbeing was the outcome with higher subjective wellbeing as the reference category. However, the interpretation could be either way (as high vs. low or low vs. high) and we do not aim to draw attention to either interpretation in particular.

The community subjective wellbeing outcomes were:

1. Low absolute civic pride. The measure of civic pride was, "Overall, do you like living in this neighbourhood?" (Yes/No). It was analysed at the individual-level and considered a measure of community subjective wellbeing because it asked about the neighbourhood community, rather than only asking about a perception of one's own self and life[6]. People who did not like living in their neighbourhood were compared to others who did.

2. Low relative civic pride. The measure of relative civic pride was based on absolute civic pride but also considered an individual response in the context of others' responses in their local authorities. An individual was considered to have low relative pride if they reported not liking their neighbourhood and they lived somewhere with high proportions of people liking neighbourhoods. A high proportion was coded as being 90% or greater (see Appendix 1 for further details).

The individual subjective wellbeing outcome variables were:

1. Low mental wellbeing (individual subjective wellbeing). Individual scores on the short form of the Warwick Edinburgh Mental Wellbeing Scale - SWEMWBS (Stewart-Brown et al., 2009). To create a binary outcome variable, a cut-off of 20 was used for low mental wellbeing[7].

2. Low experienced wellbeing (individual subjective wellbeing). Individual average of items from the General Health Questionnaire on enjoyment, unhappiness and depression (Goldberg and Hillier, 1979). To create a binary variable, responses were dichotomised based on whether the individual enjoyed activities less or much less than unusual, or was unhappy and depressed rather more or much more than usual (versus all other responses).

Predictor variables – community

The key community predictor variables were all at the local authority level: the proportion of people who reported talking to their neighbours (from Understanding Society), voting rates (from House of Commons data), volunteer rates (from Understanding Society), unemployment rate (from Office for National Statistics), average ('relative'[8]) income in the local authority (from Office for National Statistics), the number of amenities located within a 15-20 minute walk from home ('high' at 11+ or 'low' at < 11 – from Community Life Survey)[9], and the index of ethnic dissimilarity[10] (calculated from Office for National

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6   As discussed earlier, may also be argued that liking is a preference-based measures of wellbeing, which would not about subjective wellbeing but rather a subjective psychological mechanism.

7   A cut-off of 20 indicates probably depression and anxiety, see https://warwick.ac.uk/fac/sci/med/research/platform/wemwbs/using/howto. Because SWEMWBS asks about both feeling and functioning, some of the functioning items may be considered psychological mechanisms rather than the outcome of subjective wellbeing in the model.

8   Relative is used in the sense of the relative income effect; that is, how others' earnings and consumption affect subjective wellbeing - see (Luttmer, 2005; Cheung and Lucas, 2016)

9   Due to very wide confidence intervals in model-based estimates, this variable was dichotomised around the median (11+). See Appendix 1.

10   Due to very wide confidence intervals in model-based estimates, this variable was dichotomised around the average. See Appendix 1.

Statistics, see Box 2 - Duncan and Duncan, 1955; Gorard and Taylor, 2002; Howell and Emerson, 2018)

These measures were chosen in consultation with the funders and do not represent an exhaustive list of community factors but rather those perceived as relevant and available, while maximising our degrees of freedom, minimising the risks of multicollinearity or type II error – although the risks of type II error may be interpreted as reduced because the tests are dependent (Altman et al., 2013). We decided not to use an index (such as the IMD - index of multiple deprivation) so that we could consider how specific rather than general social and economic circumstances of areas interacted with individual characteristics. Finally, we also included a variable indicating if the area was urban or rural, and other community predictors (analysed as mechanisms) were the proportions of people who agreed they felt like they belonged to their neighbourhood, that friendships and associations with other people in the neighbourhood meant a lot, and that people perceived they could access local resources when needed.

Predictor variables – individual

There were individual-level measures of sex, age, ethnicity, and further individual-level measures complementing those at the local authority-level above: whether an individual talks to their neighbours, has mobility difficulties (and can walk to amenities), votes, volunteers, their household income, and if they are unemployed. Other individual-level measures (analysed as mechanisms) were perceptions of their current and future financial situation and feelings of loneliness.

Control variables. We controlled for the objective community factor 'population turnover' (net internal and international migration in the year to mid-2016) at the local authority level to ensure our results held across areas with different levels of turnover.

We mapped these variables onto the model in Figure 4 – see Figure 11.

Box 2: What is the index of dissimilarity?

"The standard measure of segregation is the index of dissimilarity, which captures the degree to which blacks and whites [sic] are evenly spread among neighbourhoods in a city. Evenness is defined with respect to the racial composition of the city as a whole. If a city is 10% black, then an even residential pattern requires that every neighbourhood be 10% black and 90% white. Thus, if a neighbourhood is 20% black, the excess 10% of blacks must move to a neighbourhood where the black percentage is under 10% to shift the residential configuration toward evenness. The index of dissimilarity gives the percentage of blacks [sic] who would have to move to achieve an "even" residential pattern— one where every neighbourhood replicates the racial composition of the city." (Duncan & Duncan, 1955; see also Sundstrom, 2004).

In 'Understanding Society' data, we calculate the contribution of each local authority to the overall index of dissimilarity across local authorities, rather than the contribution of each neighbourhood to the overall pattern across cities, as described above. We can thus interpret the index as 'ethnic unevenness' which is relative to the pattern across all local authorities in the sample. Further, we classify individuals into one of two groups: "White" or from a "Black and minority ethnic" group. Hence diversity is not fully captured.
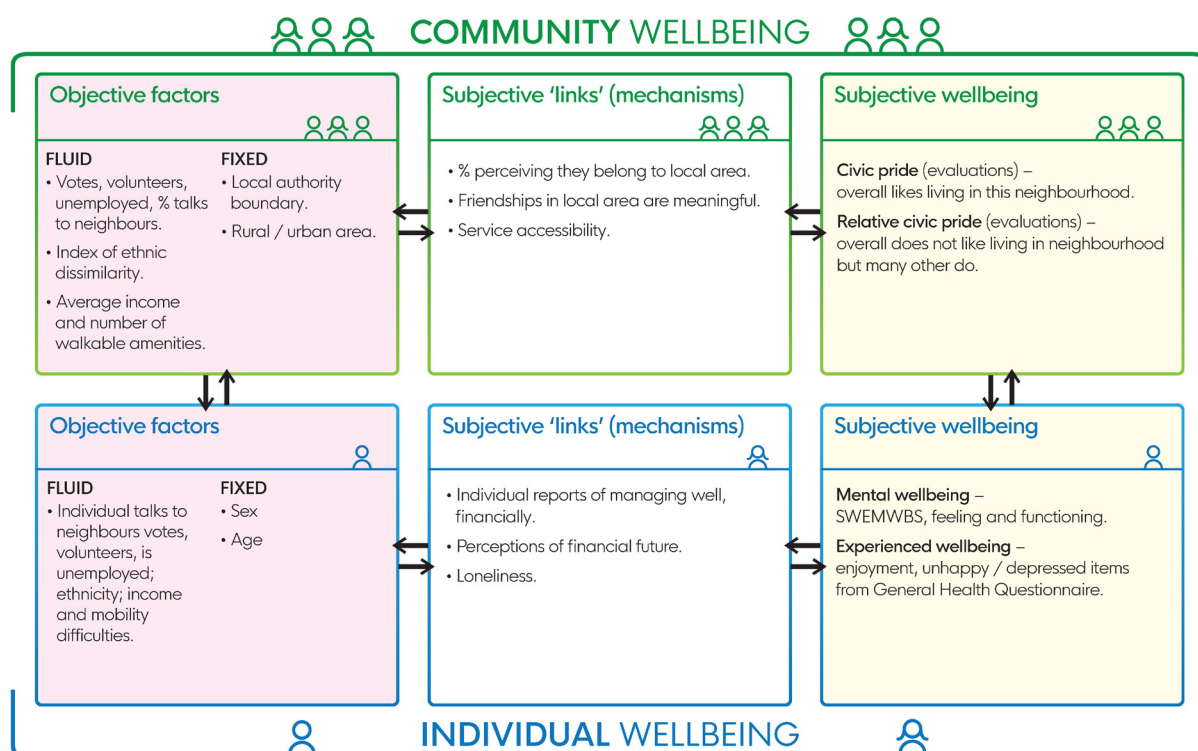

COMMUNITY WELLBEING

Objective factors

FLUID
• Votes, volunteers, unemployed, % talks to neighbours.
• Index of ethnic dissimilarity.
• Average income and number of walkable amenities.

FIXED
• Local authority boundary.
• Rural / urban area.

Subjective 'links' (mechanisms)

• % perceiving they belong to local area.
• Friendships in local area are meaningful.
• Service accessibility.

Subjective wellbeing

Civic pride (evaluations) – overall likes living in this neighbourhood.
Relative civic pride (evaluations) – overall does not like living in neighbourhood but many other do.

Objective factors

FLUID
• Individual talks to neighbours votes, volunteers, is unemployed; ethnicity; income and mobility difficulties.

FIXED
• Sex
• Age

Subjective 'links' (mechanisms)

• Individual reports of managing well, financially.
• Perceptions of financial future.
• Loneliness.

Subjective wellbeing

Mental wellbeing – SWEMWBS, feeling and functioning.
Experienced wellbeing – enjoyment, unhappy / depressed items from General Health Questionnaire.

INDIVIDUAL WELLBEING

Figure 11: Mapping of variables used in the analyses onto the draft 'box' model from Figure 4.

Notes on figure 11:

- *We interpret ethnicity as self-defined, in line with the Office for National Statistics[11].*

- *Fixed and fluid factors are based on the perception of those inputting into the model, which may include community members involved in co-production.*

- *Note that these are a selection of variables used in this report only and not an exhaustive list of individual and community factors.*

Analyses

Individual and community measures were summarised. Categorical variables were summarised using counts and percentages, and numeric variables were summarised using means and standard deviations.

We estimated associations between the subjective wellbeing outcomes and measures of community factors using mixed effects models. All outcomes were coded as binary, and mixed effects logistic regression was used. A random effect was added to allow for clustering at the community level. Odds ratios and 95% confidence intervals were reported. Analyses were conducted in STATA 16. Interactions were explored using the STATA lincom command.

Separate sets of models were run to explain the association between each of the four wellbeing outcomes and key community objective factors: proportions of people who reported talking to their neighbours ('sociable neighbourhoods'), voting rates,

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11   ons.gov.uk/methodology/classificationsandstandards/measuringequality/ethnicgroupnationalidentityandreligion

volunteering rates, and unemployment rates[12]; average ('relative') income; 11+ amenities located within a 15-20 minute walk from home[13], and high scores on the index of ethnic dissimilarity[14].

Set one models – unadjusted

The first set of models were unadjusted without any controls and only the key community objective factor variable:

$$log \frac{\text{Pr}(LowSWB_{ij} = 1)}{1 - \text{Pr}(LowSWB_{ij} = 1)} = \beta_0 + \beta_1 Community\ objective\ factor_{1ij} + u_j$$

Where SWB_{ij} is the subjective wellbeing outcome for an individual i in each local authority district j, β_0 is the constant, β_1 *Community factor*$_{1ij}$ is the fixed community objective factor and u_j is random effect for local authorities. Separate models were created in each set for each of four subjective wellbeing outcomes and for each community objective factor.

Set two models – adjusted

The second set of models was adjusted with controls for the individual factor associated with the community factor (individual talks to neighbours, votes, volunteers, is unemployed, household income, mobility, and ethnicity), as well as age, sex, rural or urban area, net internal migration, and net international migration:

$$\begin{aligned}
log \frac{\text{Pr}(LowSWB_{ij} = 1)}{1 - \text{Pr}(LowSWB_{ij} = 1)} \\
= \beta_0 + \beta_1 Community\ objective\ factor_{1j} \\
+ \beta_2 Individual\ objective\ factor_{2ij} + \beta_3 Age_{3ij} + \beta_4 Sex_{4ij} \\
+ \beta_5 Rural_{5j} + \beta_6 Net\ internal\ migration_{6j} \\
+ \beta_7 Net\ international\ migration_{7j} + u_j
\end{aligned}$$

Again, separate models were created for each of four subjective wellbeing outcomes and for each community-level objective factor.

Set three models – interactions

The third set of models included main effects and interactions with the individual-level objective factor associated with the community-level objective factor (individual talks to neighbours, votes, volunteers, is unemployed, household income, mobility, and ethnicity), as well as age, sex, rural or urban area, net internal migration, and net international migration.

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12   Sociable neighbourhoods, voting rates, volunteering rates, and unemployment rates were split into 10% intervals.

13   Due to very wide confidence intervals in model-based estimates, this variable was not analysed as an average and instead dichotomised around the median (11+). See Appendix 1.

14   Due to very wide confidence intervals in model-based estimates, this variable was dichotomised around the average. See Appendix 1.

$$\log \frac{\Pr(LowSWB_{ij} = 1)}{1 - \Pr(LowSWB_{ij} = 1)}$$

$$= \beta_0 + \beta_1 Community\ factor_{1j} + \beta_2 Individual\ objective\ factor_{2ij}$$
$$+ \ \beta_3 Age_{3ij} + \ \beta_4 Sex_{4ij} + \ \beta_5 Rural_{5j}$$
$$+ \ \beta_6 Community\ objective\ factor * Individual\ objective\ factor_{6ij}$$
$$+ \ \beta_7 Community\ objective\ factor * Age_{7ij}$$
$$+ \ \beta_8 Community\ objective\ factor * Sex_{8ij}$$
$$+ \ \beta_9 Community\ objective\ factor * Rural_{9ij}$$
$$+ \ \beta_{10} Net\ internal\ migration_{10ij} + \beta_{11} Net\ international\ migration_{11ij}$$
$$+ \ u_j$$

Again, separate models were created for each of four subjective wellbeing outcomes and for each community-level objective factor.

Set four models – mechanisms

The fourth set of models was for possible mechanisms. These models included the individual-level objective factors associated with the community-level objective factors, as well as age, sex, urban/rural area, net internal migration, and net international migration, and some possible mechanisms: feelings of belonging, importance of local friendships, able to access services, and perceived difficulty with finances currently and thoughts that finances will be worse in the future[15].

$$\log \frac{\Pr(LowSWB_{ij} = 1)}{1 - \Pr(LowSWB_{ij} = 1)}$$

$$= \beta_0 + \beta_1 Community\ factor_{1j} + \beta_2 Individual\ objective\ factor_{2ij}$$
$$+ \ \beta_3 Age_{3ij} + \ \beta_4 Sex_{4ij} + \ \beta_5 Rural_{5ij} + \ \beta_6 Belonging_{6ij}$$
$$+ \ \beta_7 Friendships_{7ij}$$
$$+ \ \beta_8 Access\ services_{8ij} + \beta_9 Financial\ difficulties\ now_{9ij}$$
$$+ \ \beta_{10} Future\ finances\ worse_{10ij} + \ \beta_{11} Net\ internal\ migration_{11ij}$$
$$+ \ \beta_{12} Net\ international\ migration_{12ij} + u_j$$

As before, separate models were created for each of four subjective wellbeing outcomes and for each community-level objective factor.

As a robustness test, any substantive interactions from the set three models were also tested in a reduced model, with any substantive differences reported in the results text:

$$\log \frac{\Pr(LowSWB_{ij} = 1)}{1 - \Pr(LowSWB_{ij} = 1)}$$

$$= \beta_0 + \beta_1 Community\ factor_{1j}$$
$$+ \ \beta_2 Individual\ objective\ factor, age, sex, or\ rural_{ij}$$
$$+ \ \beta_3 Community\ objective\ factor$$
$$* \ Individual\ objective\ factor, age, sex, or\ rural_{6ij} + u_j$$

All model outputs are reported in full on the OSF. We focus on reporting the second (adjusted) and third set of models here (with interactions) because these models are

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15   Loneliness was included in separate supplementary models alongside the other mechanisms due to limited observations.

adjusted for possible confounders and illustrate individual and group differences in subjective wellbeing, which addresses the research questions – 'wellbeing of different individuals and identified groups within that community.' Note that no survey weights were applied as these were analytic and not descriptive analyses; that is, we do not aim to estimate population values for the 2014-16 UK population (associated with Wave 6 of Understanding Society), but rather analytic relationships between individual and community wellbeing that could apply more broadly (Pfeffermann, 1993; Rabe-Hesketh and Skrondal, 2006).

Results

Participants and descriptive data

There were 45,188 individuals in Wave 6 of Understanding Society, and we conducted analyses using 25,250 individuals (56%) who were not missing data on any analysed measure[16]. Summary information on all variables in the full and analysed samples are available in Appendices 3 and 4, respectively. All individuals were adults (16+ years), with 50% of adults in the analysed sample aged less than 50 years, 37% aged 50-70 years, and 13% aged 70+ years. The analysed sample was 56% female, 24% lived in a rural area, and 16% reported being from a black and minority ethnic group. Participants lived in England (84%), Wales (8%) and Scotland (8%)[17].

Outcome data

A summary of key results is in Appendix 5, including an update to Figure 11 based on the results. Full Tables of all results and the associated analysis files are available on the OSF. The adjusted odds ratios from the second set of models are shown in Figure 12. Most of the substantive interactions are summarised in Figure 13 for an overall view and Figure 13 is broken apart into sub-graphs within each relevant section for closer viewing.

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16   A selected subset of models with self-reported voting behaviour had only 9,914 (22%) responses because questions about voting were was only asked in the self-completion questionnaire. Another selected subset of models with loneliness had only 20,221 (44.7%) responses because this item came from later waves and there was attrition.

17   Local authority-level data from Northern Ireland could not be matched to all the variables and 2,719 (6%) of responses were excluded on this basis.
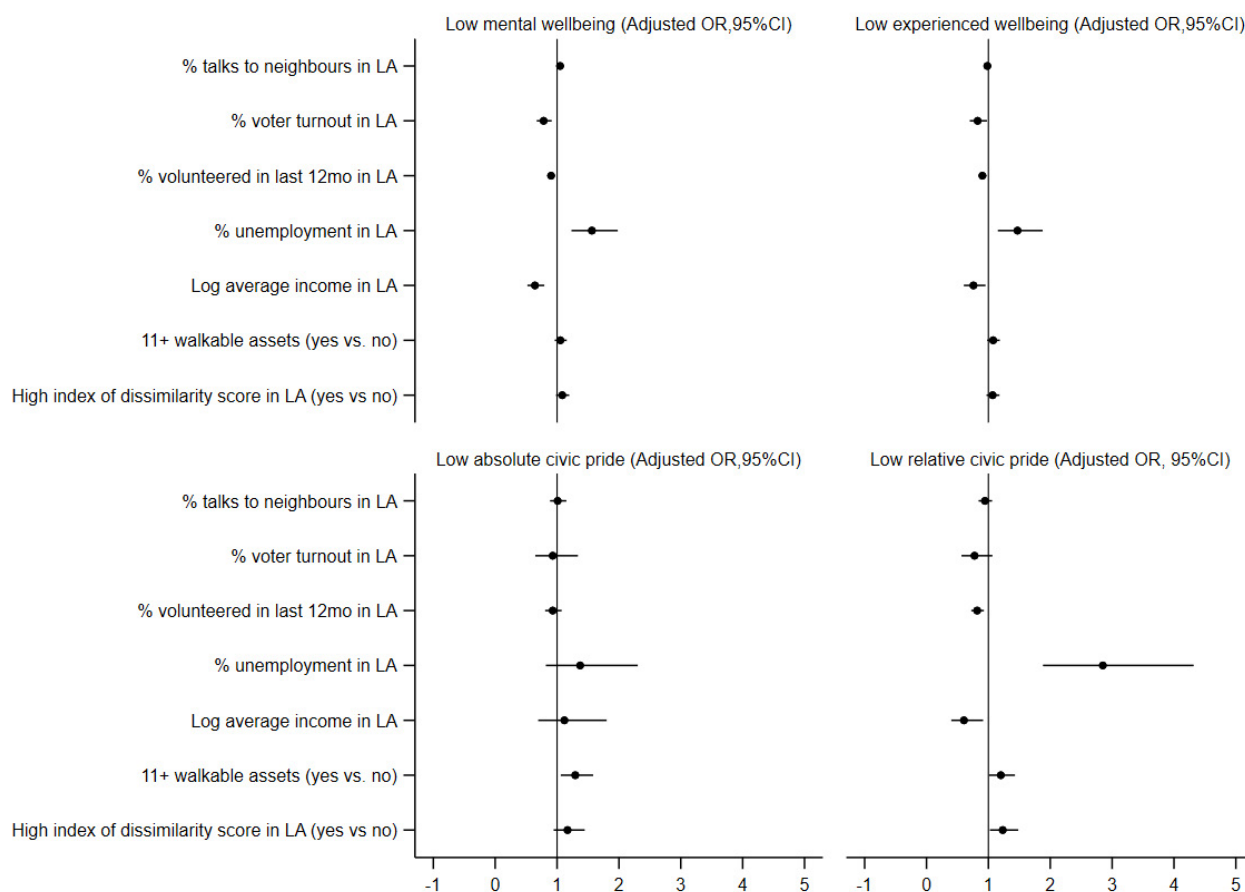
Figure 12: Adjusted odds ratios and 95% CIs from mixed effects logistic regression models.

Note: Models explain variance in low mental wellbeing, low experienced wellbeing, low absolute civic pride, and low relative civic pride, from community objective factors, adjusted for individual objective factors and controls. LA= local authority

Proportions of people who reported talking to neighbours in local authorities ('sociable areas') and individuals who reported talking to their neighbours ('sociable individuals')

In adjusted models for the four outcomes, people living in more sociable areas had similar odds of low mental wellbeing (OR=1.05, 95% CI=0.99, 1.12), experienced wellbeing (OR=0.98, 95% CI=0.92, 1.05), absolute civic pride (OR=0.94, 95%CI = 0.84, 1.06), and relative civic pride (OR=1.01, 95% CI=0.89, 1.15) compared to people living in less sociable areas.

In the interactions models for the four outcomes, the relationships of outcomes for mental wellbeing, absolute civic pride, and relative civic pride with the proportion of people who talked to their neighbours differed depending on whether individuals themselves were sociable and their age group (see Figure 13, Graphs A-E).
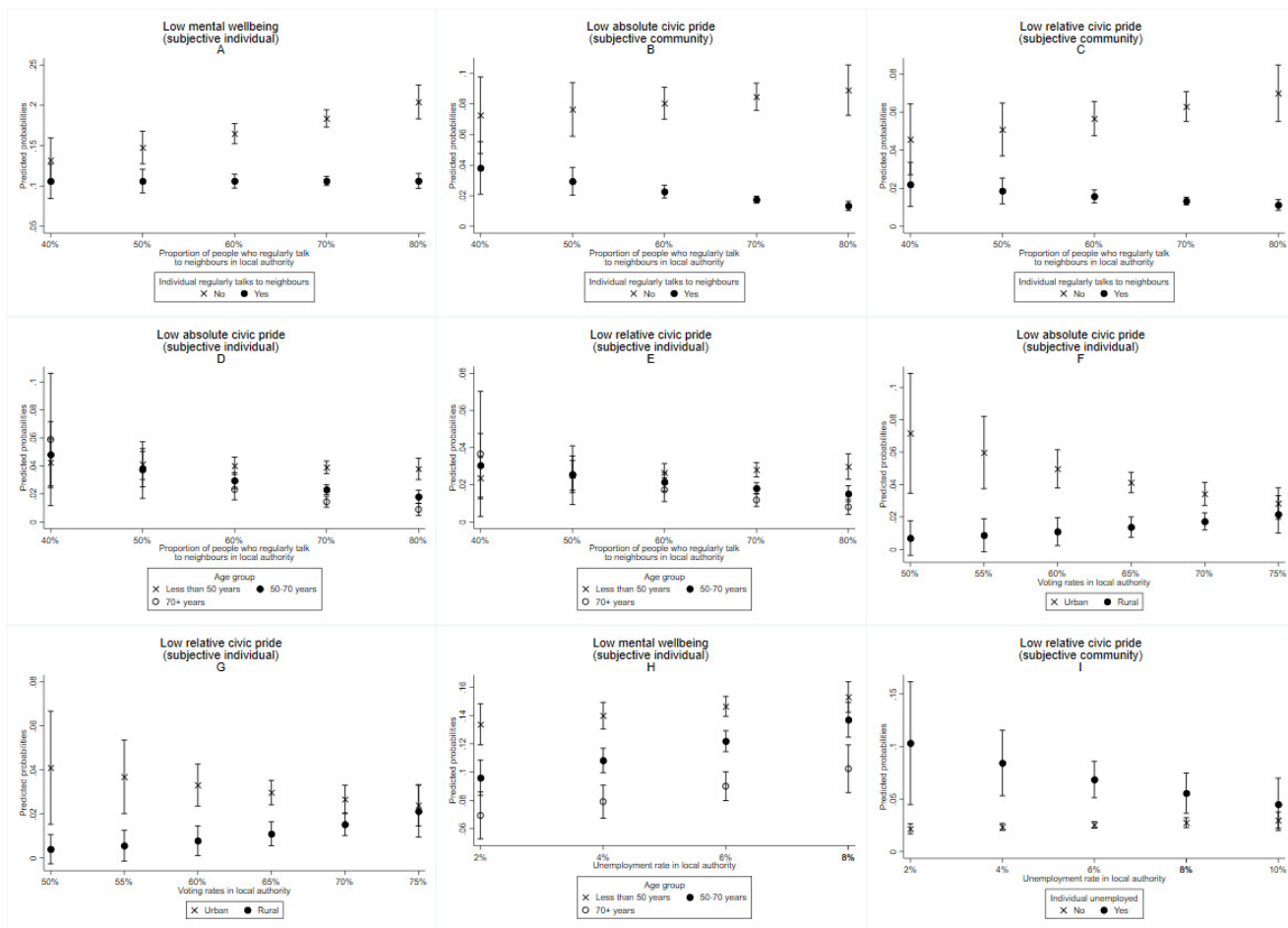
Figure 13: Interaction graphs summary.

The interaction between sociable individuals and sociable areas for the outcome of low mental wellbeing is shown in Figure 13, Graph A. For individuals who were not sociable, the odds of having low mental wellbeing were 15% higher for each 10% increase in the proportion of people who talked to their neighbours (OR=1.15 95%CI = 1.03, 1.28). For individuals who were sociable, the odds of low mental wellbeing were similar regardless of the sociable areas rate (OR=1.0, 95%CI=0.90, 1.12).[18] This pattern of results was repeated for the other subjective wellbeing outcomes (see Figure 13 – Graphs B and C)[19].
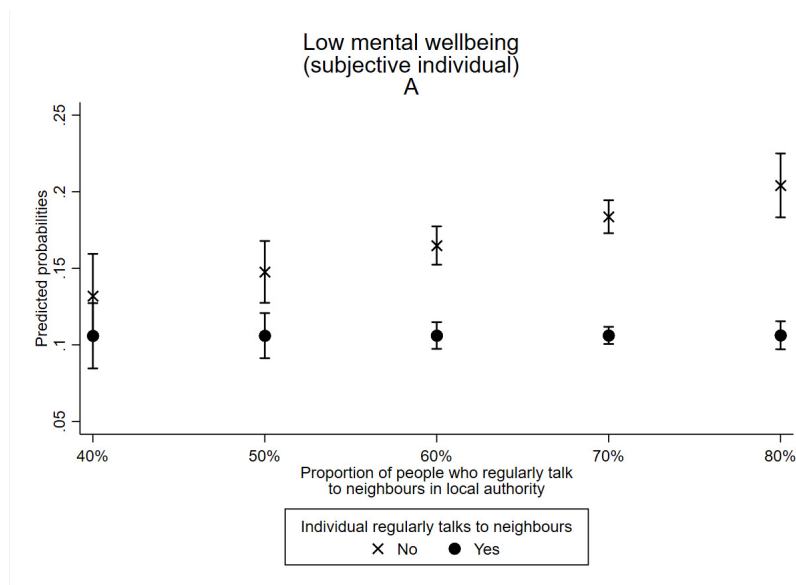

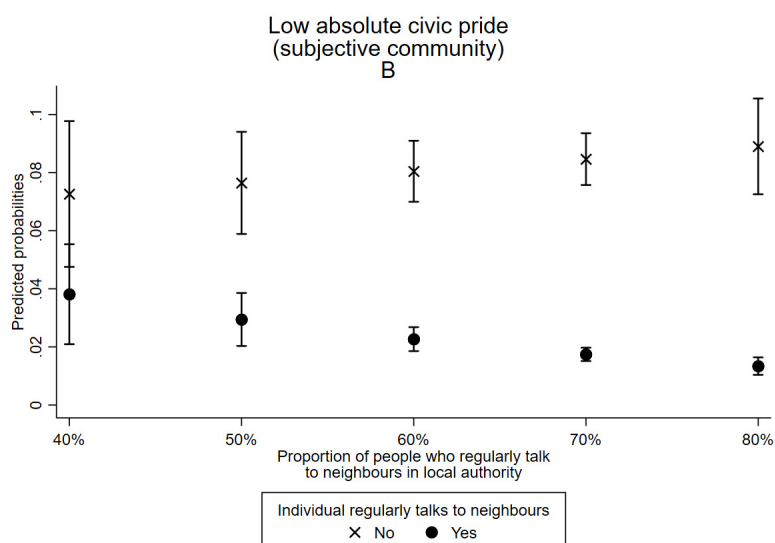Figure 13, sub-graph A: Low mental wellbeing, sociable areas, sociable individuals (interaction).

Figure 13, sub-graph B: Low absolute civic pride, sociable areas, sociable individuals (interaction).

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18   Put differently, the results also show that in more sociable areas, people who did not regularly talk to their neighbours had worse mental wellbeing than those who did regularly talk to their neighbours. For example, when the sociable areas rate was 80%, the odds differed by 62% (OR=0.48, 95%CI=0.42, 0.55) but there was no evidence of a difference when the sociable areas rate was 40% (OR=0.84, 95%CI=0.63, 1.11). Precise cut-offs for no differences differed in reduced form of model and for other subjective wellbeing outcomes (around 20-40%), though general pattern held – further results available upon request.
19   In the reduced form model for robustness, the results did not hold for absolute and relative civic pride.
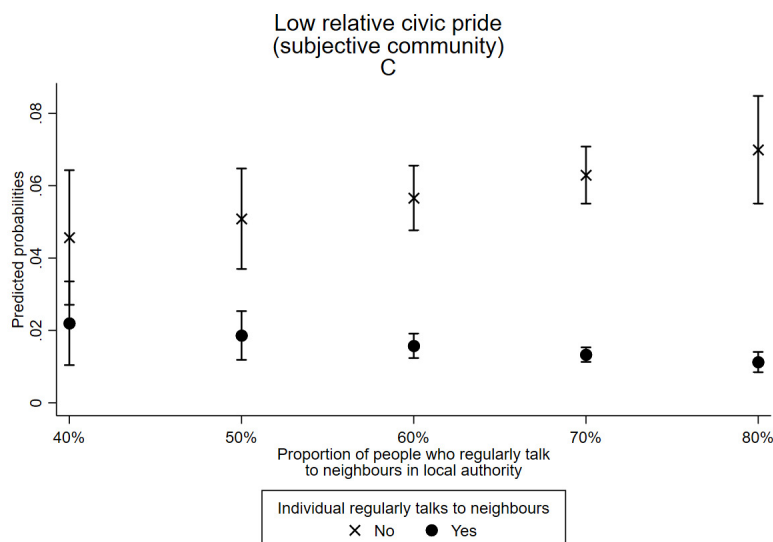
Figure 13, sub-graph C: Low relative civic pride, sociable areas, sociable individuals (interaction)

The interaction between age group and the sociable areas rate for the outcome absolute civic pride is shown in Figure 13, Graph D. From the graph it appears that there was no difference between age groups until the sociable areas rate reaches 70% and this was confirmed in linear combination tests[20]. For example, at a sociable areas rate of 70%, the odds of low absolute civic pride were 24% less for those aged 50-70 years compared to those aged less than 50 years (OR=0.76, 95%CI = 0.65, 0.88), and the odds of low absolute civic pride were 46% less for those aged 70+ years compared to those aged less than 50 years (OR=0.54, 95%CI = 0.41, 0.71).

However, at a sociable areas rate of 60%, there was no evidence of a difference in the odds of low absolute civic pride between those aged 50-70 years and those aged less than 50 years (OR=0.91, 95%CI=0.76, 1.01), and there was also no evidence of a difference in the odds of low absolute civic pride between those aged 70+ years and those aged less than 50 years (OR=0.80, 95%CI = 0.58, 1.10). This pattern of results was similar for relative civic pride (Figure 13, Graph E)[21].

There was no evidence of interactions between the sociable areas rate and gender or rural/urban area for all the outcomes.

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20   In the reduced form model for robustness, age differences were observed at 55-60% for relative civic pride.

21   It would also be possible to interpret changes in subjective wellbeing according to different sociable areas rates by age group. For example, for those aged less than 50 years, a sociable areas rate that is 10% higher is associated with 25% higher odds of low absolute civic pride (95%CI= 1.04, 1.49). There was no association for those aged 50-70 years (OR=1.04, 95%CI=0.84, 1.29) or 70+ years (OR= 0.84, 95%CI=0.61, 1.17). This pattern was repeated for relative civic pride (Figure 13, Graph C). However, this pattern of results does not correspond with those in the Figure, which may be due to holding covariates constant at their means in the marginal results in the Figure versus (which was not done in linear combination tests), or to particular values at the tails of the distribution of the sociable areas rate. Further details are available upon request.
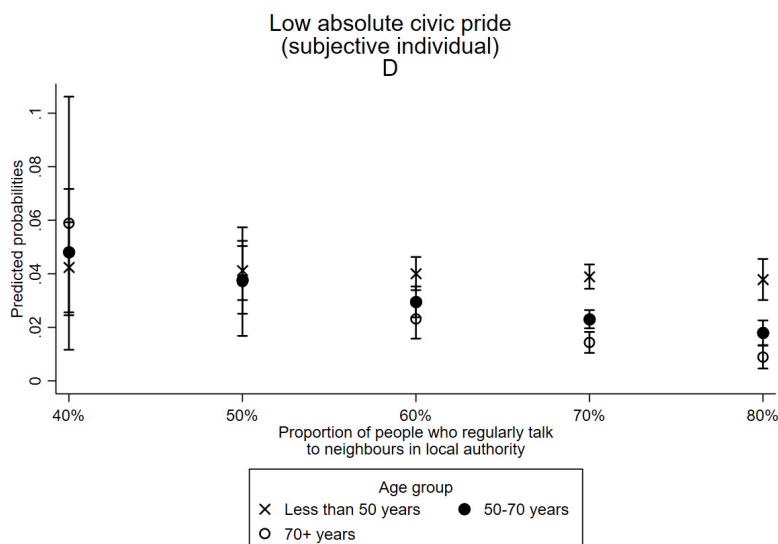
Figure 13, sub-graph D: Low absolute civic pride, sociable areas, age group (interaction).
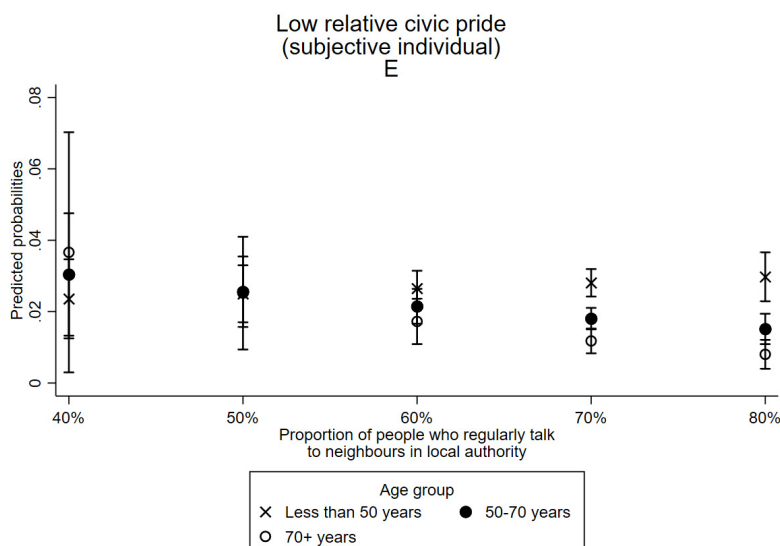
Figure 13, sub-graph E: Low relative civic pride, sociable areas, age group (interaction).

Voter turnout rates in local authorities (from ONS data) and individuals who reported voting

In adjusted models for the four outcomes, on low mental wellbeing, the odds of having low mental wellbeing were 22% less for each 10% increase in the proportion of people who voted in the area (OR=0.78, 95%CI= 0.67, 0.91) and the odds of low experienced wellbeing were 17% less for each 10% increase in the voting rate (OR=0.83, 95%CI= 0.70, 0.98), while the odds of low absolute civic pride (OR=0.78, 95%CI = 0.57, 1.06) and low relative civic pride were similar (OR=0.93, 95%CI= 0.65, 1.34) across voting rates.

In the interactions models for the four outcomes, the relationship of absolute and relative civic pride with voting depended on if the area was rural or urban (see Figure 13, Graphs F-G). The interaction between rural or urban area and local voting rates for the outcome of low absolute civic pride is shown in Figure 13, Graph F. While rural areas had better absolute civic pride than urban areas, it appeared that when local voting rates were

higher, the difference in absolute civic pride between rural and urban areas was smaller, and this was confirmed in linear combination tests. For example, at a local voting rate of 50%, the odds of having low absolute civic pride were 89% less for people in rural areas compared to urban areas (OR=0.11, 95%CI = 0.02, 0.55). However, when local voting rates were at 75%, there was no evidence of a difference in the odds of low absolute civic pride (OR=0.94, 95%CI=0.51, 1.72) between rural and urban areas. This pattern of results was repeated for the outcome of relative civic pride[22].

There was no evidence of interactions between local voter rates and age or gender for all the outcomes[23].

Low absolute civic pride
(subjective individual)
F

Figure 13, sub-graph F: Low absolute civic pride, local voting rates, urban versus rural area (interaction).

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22   It would also be possible to interpret changes in subjective wellbeing according to different voting rates by rural or urban area. For example, in rural areas, having a 10% higher voting rate was associated with 194% worse absolute civic pride (OR=2.94, 95%CI = 1.09, 7.93). In urban areas, there was no association between voting rates and absolute civic pride (OR=1.16, 95%CI = 0.60, 2.25). Further details are available upon request.

23   It was not possible to estimate the interaction between individual- and area-level voting in the absolute and relative civic pride models because there were implausibly wide (300+) confidence intervals on the main effects for individual-level self-reported voting behaviour. The wide confidence intervals persisted with only the main effect and interaction with no other covariates. For this reason, we do not interpret the interaction between individual-level self-reported voting behaviour and area-level voting. Wide confidence intervals could indicate multicollinearity, high uncertainty, or an insufficient sample size, although the last explanation is unlikely given there were 9,914 individuals analysed in these models. The reported results for the interaction between area-level voting and area-level urban-rural held when removing the interaction between individual-level self-reported voting behaviour and area-level voting from the model.
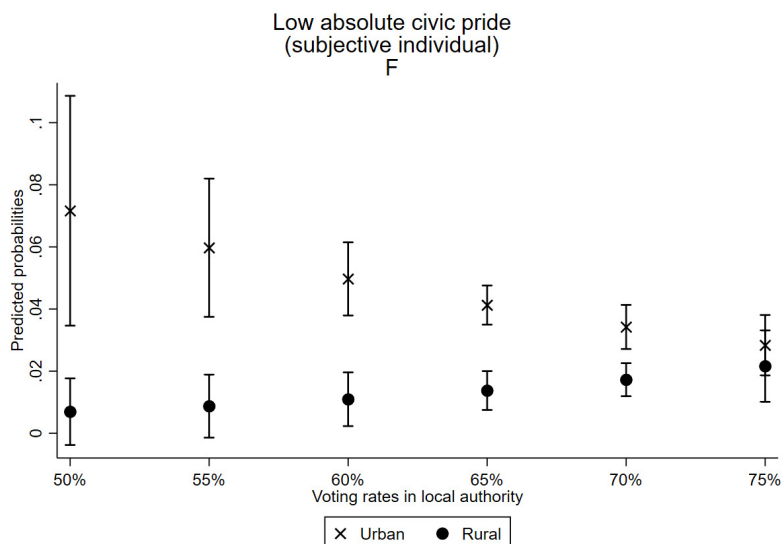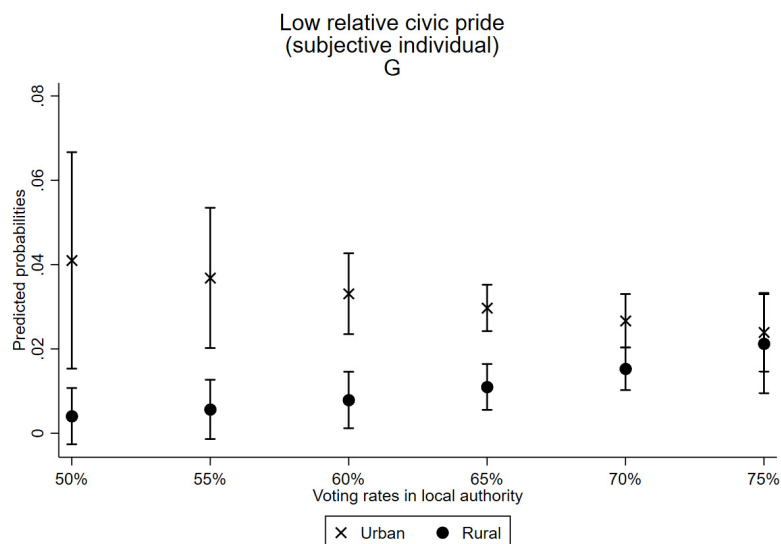
Figure 13, sub-graph G: Low relative civic pride, local voting rates, urban versus rural area (interaction).

Volunteering rates in local authorities and individuals who reported volunteering

In adjusted models for the four outcomes, the odds of low mental wellbeing were 10% less for each 10% increase in the proportion of people who volunteered in the area (OR=0.90, 95% CI=0.85, 0.96). The odds of low experienced wellbeing were 12% less for each 10% increase in the local volunteering rate (OR=0.88, 95% CI= 0.82, 0.94), and the odds of low absolute civic pride were 18% less for each 10% increase in local volunteers (OR=0.82, 95% CI=0.72, 0.93), but the odds of low relative civic pride were similar between different rates of local volunteers (OR= 0.93, 95% CI = 0.81, 1.07).

In the interactions models for the four outcomes, there was no evidence of interactions between local volunteer rates and whether individuals themselves volunteered, their age or gender, or urban/rural area for all the subjective wellbeing outcomes.

Unemployment rates (from ONS) and individual unemployment

In adjusted models for the four outcomes, the odds of low mental wellbeing were 56% higher for each 10% increase in the proportion of unemployed people in the area (OR=1.56, 95%CI = 1.23, 1.98). The odds of low experienced wellbeing were 47% higher for each 10% increase in the local unemployment rate (OR=1.47, 95%CI = 1.15, 1.88), and the odds of low absolute civic pride were 185% higher for each 10% increase in local unemployment rates (OR=2.85, 95%CI = 1.88, 4.32). There was no evidence that the odds of low relative civic pride differed across local unemployment rates (OR=1.37, 95%CI = 0.82, 2.30).

In the interactions models for the four outcomes, there was an interaction between local unemployment rates and age for the outcome of low mental wellbeing (Figure 13, Graph H), and there was an interaction between whether individuals were unemployed and local unemployment rates for the outcome of low relative civic pride (Figure 13, Graph I).

In Figure 13, Graph H, it appears that those aged 50-70 years had better mental wellbeing than those aged less than 50 years when unemployment was less than eight percent. Linear combination tests confirmed this. For example, at an unemployment rate of four percent, the odds of low mental wellbeing were 33% less for the 50-70 year age group compared to those aged less than 50 years (OR=0.77, 95%CI = 0.69, 0.86), but at

an unemployment rate of eight percent there was no evidence of a difference in the odds of low mental wellbeing (OR=0.91, 95%CI = 0.81, 1.02)[24].
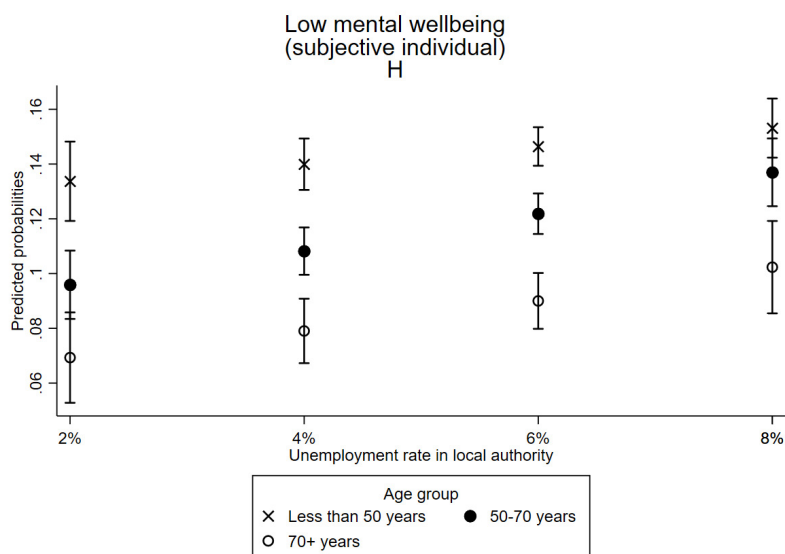
Figure 13, sub-graph H: Low mental wellbeing, local unemployment rates, age group (interaction).

The interaction in Figure 13, Graph I appears to show that the relationship between the outcome relative civic pride and local unemployment rates depended on if an individual was unemployed. However, linear combination tests did not confirm this: among individuals who were employed, there was no evidence of a difference in the odds of low relative civic pride (OR=1.33, 95%CI = 0.60, 2.92) across different local unemployment rates; among individuals who were unemployed, there was also no evidence of a difference of low civic pride (OR=0.29, 95%CI = 0.07, 1.22) across different local unemployment rates. However, in a reduced model with only area-level unemployment, the interaction was confirmed. Among those who were employed, the odds of low relative civic pride were 120% higher for each 10% in the local unemployment rate (OR=2.20, 95%CI=1.36, 3.55), and there was no evidence of a difference for the unemployed (OR=0.43, 95%CI = 0.11, 1.63).
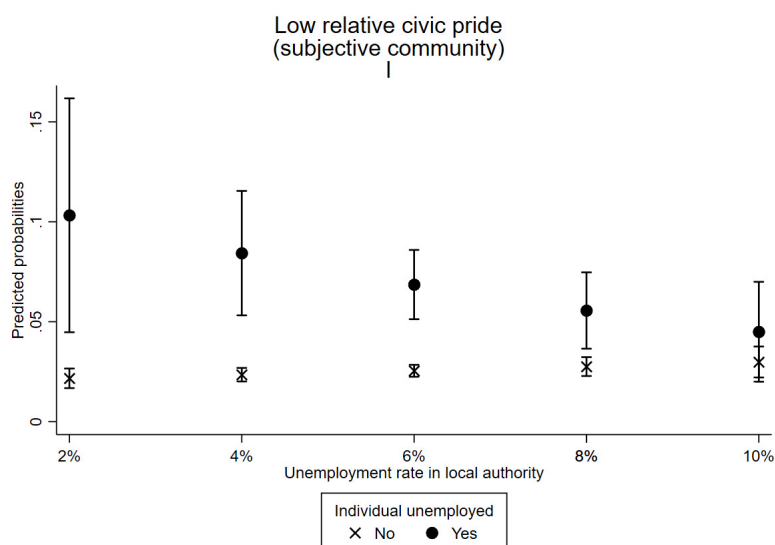
Figure 13, sub-graph I: Low relative civic pride, local unemployment rates, individual unemployment (interaction).

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24   It would also be possible to consider other ways of interpreting this interaction, such as relative to 70 years or older, and further details are available upon request.

There was no evidence of an interaction between local unemployment rates and gender or urban/rural area for each of the outcomes.

Local area income (from ONS) and individual income

In adjusted models for each of the four outcomes, for mental wellbeing, the odds of low mental wellbeing were 36% less for each £10,000 increase in average log local income (OR=0.64, 95% CI=0.52,0.79), the odds of low experienced wellbeing were 24% less for each $10,000 increase in average log local income (OR=0.60, 95%CI=0.60, 0.95), and the odds of absolute civic pride were 39% less for each £10,00 increase in average log local income (OR=0.61, 95%CI=0.40, 0.92). There was no evidence of a difference in the odds of low relative civic pride (OR=1.12, 95% CI=0.70,1.80) across different average log local incomes.

In the interactions models for the four outcomes, there was an interaction between average log local income and individual-level income for the outcome of low mental wellbeing (see Figure 14). In Figure 14, it appears that higher average log local income was associated with reduced odds of low mental wellbeing for those with lower incomes but not those with higher incomes. There was no evidence of an interaction between average log local income and age, gender, urban/rural area for all outcomes.

Figure 14: Interaction graph for the interaction between area and household-level income for models with mental wellbeing on SWEMWBS.

High number of walkable assets 15-20 minutes from home (11+ assets) and individuals who reported mobility difficulties

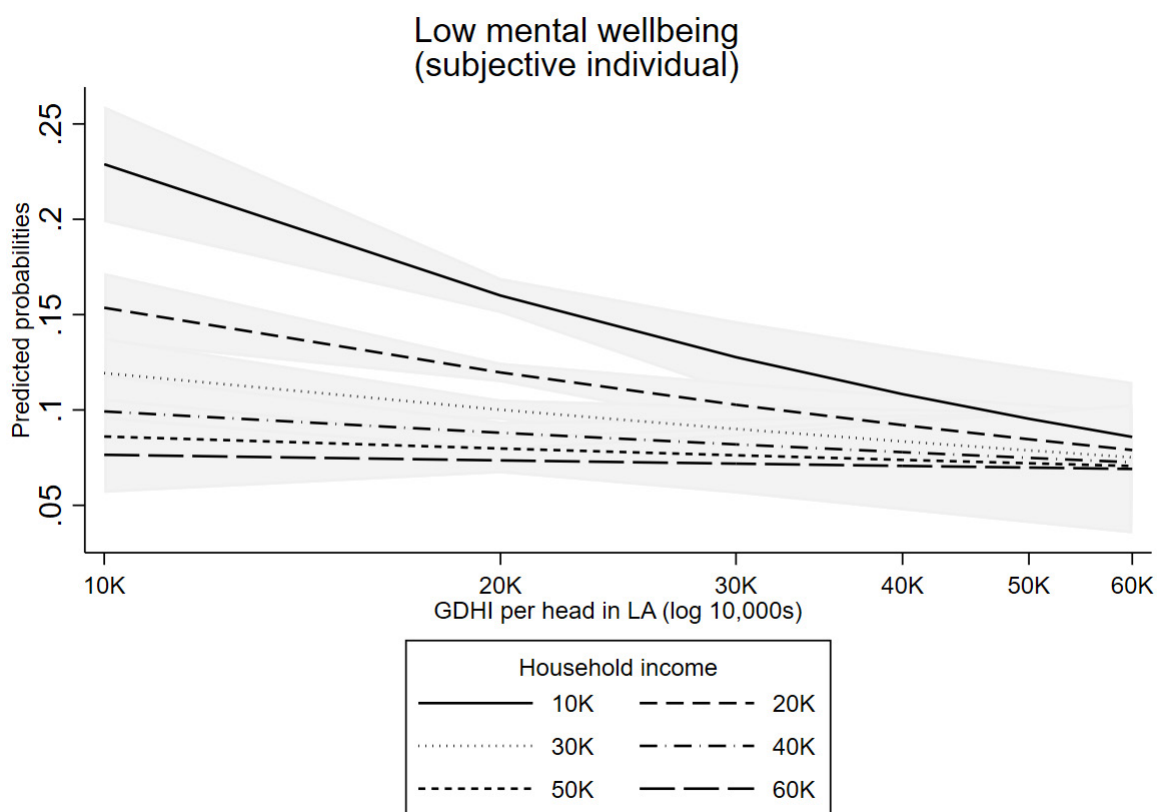As a reminder, the walkable assets were general/grocery shop, pub, park, library, community centre/hall, sports centre/club, youth centre/club, health centre/GP, chemist, post office, primary school, secondary school, church/place of worship, and public transport links.

In adjusted models for the four outcomes, there was no evidence that the odds of low subjective wellbeing differed according to the number of walkable assets in the local area, apart from the outcome of low relative civic pride. The odds of having low relative civic pride were 30% higher for people living in areas where the average perceived number of local assets was more than 11 (95%CI = 1.06, 1.58) compared to areas where the average perceived number of assets was less than 11.

In the interactions models for the four outcomes, there was evidence of an interaction between walkable assets and age for the outcome of low experienced wellbeing (Figure 15). For those aged 70+ years, the odds of having low experienced wellbeing were 40% higher for people who had more than 11 walkable assets in the local area compared to those who had fewer than 11 walkable assets (OR=1.40, 95%CI =1.03, 1.91).

In the interactions models for the four outcomes, there was no evidence of an interaction between number of walkable assets whether individuals had mobility difficulties, gender, urban/rural area for any of the outcomes.

Post hoc tests of walkable assets and relative civic pride with perceived safety

In post hoc analyses, we explored if the relationship between walkable assets and relative civic pride was affected by perceptions of safety within the local area. The safety item was, "How safe do you feel walking alone in this area after dark?", and it was analysed as binary variable comparing the responses 'very unsafe' or 'a bit unsafe' versus 'fairly safe 'or very safe'. There were 23,431 observations analysed because 1,783 individuals spontaneously said they never went out after dark and there were 36 missing observations. As a reminder, the walkable assets were general/grocery shop, pub, park, library, community centre/hall, sports centre/club, youth centre/club, health centre/GP, chemist, post office, primary school, secondary school, church/place of worship, and public transport links.

In results from unadjusted models, having more than 11 walkable assets in the local area was associated with 27% lower odds of feeling safe (OR=0.73, 95%CI = 0.65, 0.82), and feeling unsafe was associated 382% higher odds of low relative civic pride (OR=4.82, 95%CI=4.13, 5.62). In unadjusted models with the outcome of low relative civic pride, , having more than 11 walkable assets in the local area was associated with 38% higher odds of low civic pride (OR=1.38, 95%CI = 1.13, 1.69). Including feelings of safety in an adjusted model reduced these odds from 38% to 27%, (OR=1.27, 95%CI = 1.03, 1.55), and in an adjusted model with other mechanisms (the fourth set of models – see equations above), there was no evidence of an association between walkable assets and relative civic pride when including feelings of safety (OR=1.16, 95%CI=0.93, 1.44)[25].

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25   Without feelings of safety in the mechanisms model, more walkable assets no longer associated with worse relative civic pride in the restricted safety model with 23,432 observations (OR=1.19, 95%CI = 0.96, 1.48). Further details of these analyses are available upon request.
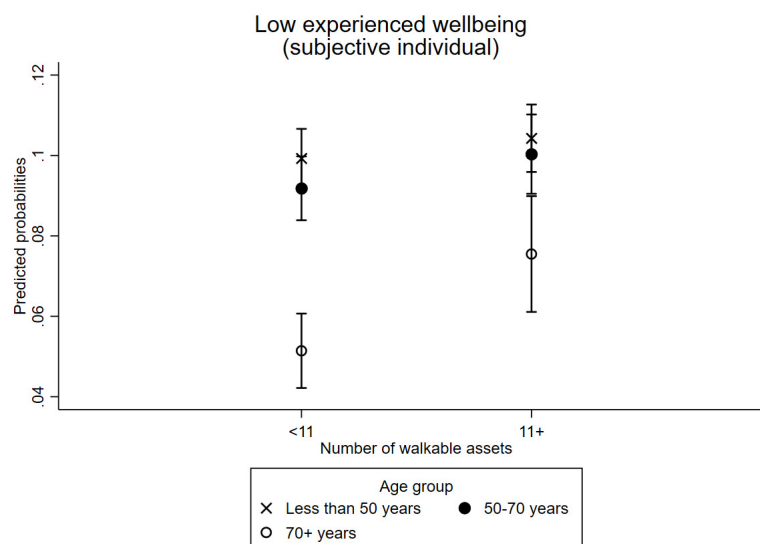
Figure 15: Interaction graph for the interaction between area-level walkable assets and age for models with experienced wellbeing.

Index of ethnic dissimilarity (from ONS) and individual ethnicity

In adjusted models for the four outcomes, there was no evidence that the odds of low subjective wellbeing across outcomes differed according to the index of dissimilarity. In interaction models for the four outcomes, there was no evidence of an interaction between the index of dissimilarity and whether individuals had mobility difficulties, gender, urban/rural area for any of the outcomes.

Mechanisms

Recap – what were the models? To check if the identified mechanisms (potential 'links') were important in the relationships we have identified, we conducted adjusted models including community-level objective factors as well as the mechanisms (models in set four from above).

Recap - what were the mechanisms? The community-level mechanisms were the proportion of people in local areas who reported that they felt they belonged, that their local friendships meant a lot, and that they were able to access services. At the individual-level, these were perceptions of difficulties managing financially, thinking that finances would be worse in the future, and loneliness.[26]

What mechanisms were associated with subjective wellbeing? Generally, in the adjusted models with the mechanisms, when more people felt as if they belonged to their neighbourhoods, the odds of low subjective wellbeing in the local area were lower – particularly for the community subjective wellbeing models. However, the odds of low subjective wellbeing did not differ according to the proportion of people in local areas who reported that their local friendships meant a lot and that they were able to access services (when also adjusting for belonging and other factors). At the individual-level, perceptions of difficulties managing financially, thinking that finances would be worse in the future, and loneliness were associated with higher odds of low subjective wellbeing –

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26   Loneliness analyses were supplementary due to low case counts (see Methods).

particularly individual subjective wellbeing for thoughts about finances being worse in the future.

How did the mechanisms change the relationships between community-level objective factors and subjective wellbeing? In some cases, the size of the unadjusted (models set one) versus adjusted coefficients in mechanisms models (from models set four) on objective community factors (social areas, local unemployment, etc) was reduced, or their estimation because less precise, when including these variables. While it could be these measures are acting as mechanisms in some models, further tests would be needed to specify the exact relationship – particularly because the coefficients on the objective community factors in adjusted models from set two often did not very change much with the addition of mechanisms in set four. Not all of the subjective wellbeing measures changed in the same way when including these possible mechanisms and other covariates. For example, the unadjusted relationships of social areas, unemployment rates, and the index of ethnicity dissimilarity disappeared when including the additional mechanisms and covariates in the models for relative but not absolute civic pride; however, the relationships for walkable assets disappeared for absolute but not relative civic pride.

Summary of key results

We set out to explore the relationships between community wellbeing and the wellbeing of different individuals and identified groups within that community. We used measures of community, individual wellbeing and measures for the quantity and quality of relationships and sense of belonging to a place.

Considering the magnitude and precision of the relationships found, one of our most conclusive results was for the proportions of people who reported talking to their neighbours (sociable areas). In more sociable areas, people who did not regularly talk to their neighbours had worse mental wellbeing than those who did regularly talk to their neighbours, and less sociable individuals also had worse mental wellbeing in sociable areas than in unsociable areas. We also found some evidence that higher area-level unemployment was associated with worse civic pride for the employed but not the unemployed, consistent with previous research using the GHQ-12, which is about feelings of strain, depression, inability to cope, anxiety-based insomnia, and lack of confidence, among items (Clark, 2003).

Throughout our data, unemployment rates were consistently negatively associated with community subjective wellbeing and individual subjective wellbeing. This illustrates that the circumstances of unemployment are not only associated with how individuals perceive their own lives but how they perceive lives in their communities. Area-level volunteering rates were also associated with both community subjective wellbeing and individual subjective wellbeing, although there were no sub-group differences. Higher voting rates and area average income were associated with better individual subjective wellbeing, and there were some sub-group differences.

In several cases, there were sub-group differences according to age, however, these relationships were somewhat weaker than the other associations just described. In more sociable areas, people older than 50 years of age had better absolute and relative civic pride than those less than 50 years, suggesting older people are less at risk of low community subjective wellbeing than younger people in local areas that facilitate social connection. Those aged 50-70 years had better mental wellbeing than those

aged less than 50 years when unemployment was relatively low. However, with higher unemployment rates, there were no age differences: the risk of low individual subjective wellbeing in areas with higher unemployment was similarly high for those aged 50-70 and less than 50 years. Older people had worse mental wellbeing when the number of walkable assets in local areas was higher versus when walkable assets were fewer, suggesting that it may be important to engage with older people when implementing initiatives that increase walkable assets to ensure they are not left out.

There were also differences in subjective wellbeing according to if the area was rural or urban and individual-level income - but again, these were relatively weaker relationships. People living in urban areas had worse absolute and relative civic pride than those living in rural areas, particularly where voting rates were low. This suggests urban areas are at a higher risk of low community subjective wellbeing, especially when citizens are less engaged democratically. While higher area-level income was associated with proportionally better mental wellbeing, this relationship was weaker for households with larger incomes. It could be that any positive effects of socio-economically mixed neighbourhoods, such as shared socio-economic capital, mean less to those at the top who are already advantaged (Putnam, 2001; Marshall et al., 2014). Those at the top may still be making upward social comparisons to others in ways that harm their subjective wellbeing, too (Cheung, 2016; Cheung and Lucas, 2016; Hecht, 2017; Dolan et al., 2021).

Throughout, it was more important for subjective wellbeing that people felt a sense of belonging to their local area, and that they did not feel lonely, than that they perceived their local friendships mattered or perceived they were able to access local services. Belonging was more closely associated with community than individual subjective wellbeing. However, it is not possible to say that belonging and loneliness were more important than friendship or services; it could be that local friendships and services drive a sense of belonging or loneliness, which longitudinal or interventional data would be needed to explore and test. At the individual-level, perceptions of difficulties managing financially and thinking that finances would be worse in the future were associated with higher odds of low subjective wellbeing. In some cases, the size of the coefficients on the objective community factors was reduced when including these variables, suggesting they were mediating the relationships and acting as mechanisms or 'links' – particularly for relative, versus absolute, civic pride. However, further analyses would be needed to test these relationships about mechanisms more precisely. In general, the measure of subjective wellbeing mattered, which shows that the outcome of subjective wellbeing selected may influence what is discovered about its correlates, drivers, and consequences (Dolan, Kudrna and Stone, 2017).

Limitations

A limitation of our analyses is that we did not include all possible measures and analyses of objective factors, subjective mechanisms, or subjective wellbeing, and selected based on the available data and existing literature. For example, we could have looked at sub-group differences in analyses according to the objective community factor population turnover, rather than holding it constant as a control variable. In post-hoc tests, we included another community subjective factor: perceived safety of the local area. We included the perceived safety item because our results showed that a high number of walkable assets in the local area was associated worse relative civic pride, which we suspected may have been due to confounding by an omitted variable. The results showed that there was less of a relationship between walkable assets and civic pride when accounting for perceptions of safety in the local area, suggesting that it was a confounding factor. It is also possible that there is another confounding factor associated with all three of these things that we did not include in the analyses. As a reminder, the

walkable assets were general/grocery shop, pub, park, library, community centre/hall, sports centre/club, youth centre/club, health centre/GP, chemist, post office, primary school, secondary school, church/place of worship, and public transport links.

From these results, we conclude that the measure of subjective wellbeing matters – for example, feelings of belonging were more closely related to community subjective wellbeing than individual subjective wellbeing, and local voting rates were more closely associated with individual subjective wellbeing in adjusted models. The inclusion of additional covariates affected absolute and relative civic pride measures differently, showing that including distributional measures of subjective wellbeing changes our understanding of its correlates. The results also provide support for the idea of 'different people in the same place' – the relationship of subjective wellbeing with sociable neighbourhoods depended on whether individuals were sociable, and the relationship between subjective wellbeing and unemployment rates depended on whether individuals were unemployed. To a lesser extent, the relationship of subjective wellbeing with social and economic area-level factors depended on age, income, and urban versus rural areas, though sex was not a relevant sub-group differences in these analyses. Future work should consider sub-group differences and use multiple subjective wellbeing measures – or specify their 'ultimate' subjective wellbeing outcome a priori – to ensure the most important relationships are captured.

Linking Phase 2 to Phase 3

There are limitations to looking at the links between individual and community wellbeing quantitatively, particularly using only pre-existing cross-sectional quantitative data on geographic communities to explore these links. First, a focus on individual and community wellbeing does not consider different types of communities, like families or workplaces, nor the wider social and economic context (see Figure 1 – layers model). Second, there may be important aspects of the links between individuals, communities, and the wider context that are important for wellbeing but omitted in existing quantitative data. In the final phase, we address these limitations by conducting qualitative interviews about barriers and enablers to improving individual wellbeing and community wellbeing, considering trade-offs for different groups. We also ask about perceptions of the boxes model itself.

Phase 3: Qualitative exploration of barriers, enablers, and model

In Phase 3, we explored the barriers and enablers to achieving wellbeing for individuals and communities in terms of context and social infrastructure, considering trade-offs or risks of negative outcomes for different individuals and groups.

We also gathered perceptions of the boxes model in Figure 4 and the artistic visualisation in Figure 5, asking if the developed models of community wellbeing resonated with users and how they could be applied.

Methods

We follow the Standards for Reporting Qualitative Research (SRQR) guidelines (O'Brien et al., 2014).

Qualitative approach

Semi-structured individual interviews were conducted virtually. A deductive approach informed by the literature was combined with an inductive approach from the interviews, shaped by a social constructionist philosophical viewpoint - viewing truth and knowledge as subjective but with some versions of truth better than others based on evidence (Berger and Luckmann, 1966).

Researcher characteristics and reflexivity

The interviews were conducted by a Research Fellow in Applied Psychology with a BSc in Psychology, MSc Social Research Methodology, and PhD Social Policy. Her experience was shaped by working within the discipline of behavioural science, acknowledging automatic and unconscious influences on behaviour and wellbeing (Tversky and Kahneman, 1974), and individual mis-predictions about what affects people's subjective wellbeing (Wilson and Gilbert, 2005; Kahneman et al., 2006). An Associate Professor and two Professors working in Public Health reviewed the outputs. The Associate Professor has a background in natural and neuroscience, is trained in public health, and primarily works on non-communicable diseases. Epistemologically, she draws on 'split brain' evidence about the limits of introspection and risk of confabulation in qualitative research evidence (Turk et al., 2003).

Context

All interviews were conducted virtually from England. The researcher was always in a private room. Some participants were in public spaces, such as cafes and coffee shops, and had other people in the background.

Sampling strategy

Participants with knowledge of individual and community wellbeing alongside community interventions or initiatives were initially identified by the What Works Centre for Wellbeing, Centre for Ageing Better and Spirit of 2012. Snowball sampling was used to identify further participants, whereby the identified participants recommended others.

Ethics

The qualitative research was approved by the University of Birmingham ethics committee (ERN_20-1785).

Data collection methods and data processing

Virtual one-to-one semi-structured interviews were conducted over Zoom from August – September 2021. The transcriptions were automatically transcribed using the transcription feature in Zoom and verified by re-listening to the recordings.

Data collection instruments

The topic guide is in Appendix 6. The key topics were understanding of and experience with individual and community wellbeing, positive and negative changes in individual and community wellbeing, model feedback, and wellbeing trade-offs.

Units of study

There were 24 interviews conducted with individuals who worked in local government, the third sector, politics, and academia. Ten further people were invited to interview but did not take part. One invited individual declined as they felt they could not contribute, one reported being too busy, two had left their organisation, and six did not respond to initial invitation emails despite follow ups from the What Works Centre for Wellbeing and the funders.

Data processing

All interview transcripts were downloaded from Zoom and stored in a password-protected document. Names associated with participants' Zoom accounts were removed from the transcripts. At the end of the project, all of the data held on Zoom were planned to be deleted, and the downloaded transcriptions moved to long-term storage on the Research Data Store at the University of Birmingham.

Analyses

Reflexive thematic analysis was used to conceptualise analytic themes about barriers and enablers, as well as reactions to the models in Figures 4 and 5 (Braun and Clarke, 2006, 2019). Laura Kudrna conducted and recorded the interviews, generated initial analytic themes by coding the data, and shared and refined the codes with the research team.

Techniques to enhance trustworthiness

All researchers developed content that fed into the topic guide, and Laura Kudrna, Oyinlola Oyebode, and Sarah Stewart-Brown approved the topic guide. The key analytic themes were reviewed by all researchers. Oyinlola Oyebode checked four transcripts for validity.

Results

Themes

Summary

In summary, the main themes were (in)adequate power-sharing, 'what ifs' in monitoring and evaluation, horizontal and vertical funding gaps, and leadership and culture. When discussing risks of adverse outcomes and trade-offs between groups, the main theme was that approaches to improve wellbeing should adequately draw on power-sharing between decision-makers and target communities; however, power-sharing is sometimes inadequate because it can be challenging to gain consensus, lack authenticity, or lead to inaction.

The perception was that knowledge and awareness of adverse outcomes and trade-offs was sometimes lacking, in part because there were many 'what ifs' in monitoring and evaluation – what if we had consistent local-level data? Included more diverse voices? And more carefully evaluated what would have happened in the absence of an initiative? Private and public sector funding could provide a path to addressing some of these issues; however, funding silos created gaps in service commissioning and provision, and there were challenges associated with austerity and funding being tied to positive outcomes. Some of these issues could be addressed with legislation, as well as open and flexible culture and leadership that recognises the complexity of systems while also being solutions-focussed.

(In)adequate power-sharing

Overwhelmingly, the consensus was that approaches building in co-production and genuine power-sharing at the beginning of initiatives were less likely to lead to negative outcomes for different individuals and groups. These may fit within objective factors in the boxes and arrows model (Figure 4) but measures of co-production, such whether people felt genuinely involved in the development of their communities, were not available in the quantitative data. Participants expressed that if those who might be disadvantaged by the initiative were involved and heard early on, this could prevent negative outcomes by incorporating and addressing their viewpoints and perspectives. Many examples were provided where co-production seemed to work well. For example, one participant discussing a local-level initiative in Northern Ireland gave an example of participatory budgeting leading to a successful renewal of the local area during the policy response to COVID-19:

> "...[they] chose to do participatory budgeting programmes with the money... to actually build the capacity of local people to engage with the democratic process... a different way of doing things that isn't about a top-down determination, but actually about a bottom-up listening exercise in terms of what the community themselves feel is a priority...They had a... sort of derelict site that they transformed into a basketball court for the young people... small interventions, but actually massively significant, particularly since they did that during COVID and the physical activity aspect of it... massively important."[27]

Despite the importance of power-sharing approaches, some of these seemed to lack substance or had associated risks and concerns. For instance, there was concern that funders and others external to the communities involved could push their view of what

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27   Participant 61

'community wellbeing' is or should be onto these communities and the people within them, which could make the initiative irrelevant or even harmful. Another risk was the burden associated with designing and delivering community initiatives. A participant reflected on hyper-local mutual aid groups that formed during COVID-19, identifying burnout as a possible reason for their closure:

"The burnout element of being involved with some of these groups was a massive negative effect on people's wellbeing and that's why, in my opinion, a lot of these groups closed over recent times."[28]

There was also the perceived impossibility of tailoring initiatives for all groups. One participant reported receiving many messages about a change to a local transportation scheme. She discussed the challenges associated with a lack of consensus:

"...Sadly, we haven't got a consensus about it so we're going through the trial now, which is about shutting off some roads... potentially 700 houses that's impacted by this... We had 120 people on the zoom meeting... you can imagine gain[ing] consensus in that sort of scenario... it's just an example of trying to do co-production and working collectively... you cannot do consensus politics in that sort of setup where you've got potentially six or 700 people impacted by something."[29]

Other issues with the power-sharing approach were stagnation, inaction, and becoming 'stuck' in a co-production process, without moving onto implementing the initiative; the perceived authenticity of co-production processes, including whether there has been genuine community outreach and power-sharing; and the challenges of doing co-production well under resource constraints, including funding, time, and the availability of staff. These findings illustrate some of the objective factors (e.g. co-production meetings) that may interact with other objective factors (e.g. time, funding) and subjective mechanisms (e.g. perceived authenticity) to create wellbeing – or, at least, to create the conditions for wellbeing.

'What if's' in monitoring and evaluation

It can be a challenge to evaluate community-level initiatives because community-level data is not always available – that is, it can be difficult to populate a sensible model with measures. Although there are large national surveys like the Understanding Society Survey, Annual Population Survey, or the Community Life Survey, used in this report, these datasets are not representative at small local levels, which limits their accuracy and usefulness in understanding local and place-based wellbeing. Participants said that there is no dataset that compares small local areas across the UK on a consistent set of indicators. This raised questions about what could be known and done differently if these data were available.

A related issue emerged, which was about the people involved in and responding to area-based initiatives, interventions, and research. In general, community-level initiatives and research seemed to attract the most engaged, motivated, and advantaged, as noted by one participant:

"It was voluntary... you weren't required to engage in it... emotionally and health literate... people are doing it because they want to make improvements, and so I guess you could argue that a disadvantage is that you're widening inequalities

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28   Participant 83
29   Participant 9

potentially. By it not being... universal... expecting every employee to do this..."[30]

There were significant efforts made to include groups who might not as readily engage, such as a community worker who described gaining the trust of families with low literacy rates by offering free childcare, and then empowering women to better engage with their local communities by providing English language classes alongside childcare. Generally, there was a desire to have both initiatives and research represent the voices of diverse people at local levels. For example, one participant discussing workplace health and wellbeing initiatives noted voluntary participation as a challenge, which affected inequalities. It could be that a seemingly 'successful' initiative only serves to improve wellbeing for those who are relatively more privileged to begin with in terms of qualities like income, education, motivation, or the time to engage. Having very low levels of these factors are likely to be proxies of low wellbeing. These findings illustrate the importance of considering community-level alongside individual-level factors and working to include those who stand to benefit most.

Finally, there was also the question of "what if an initiative had not occurred?". One participant working to coordinate local areas emphasised that some consideration of counterfactuals was needed. There are many ways this could be achieved, such as with a randomised trial or experiment (whereby one group receives the initiative and other does not - or one group receives it later, so that nobody misses out). Or it could be achieved by sampling and surveying people from across local areas both before and after an intervention or initiative, and comparing their responses to another, similar, local area – such as by using a booster sample in a national survey. Mapping out the boxes and arrows of what might happen with and without a community-level initiative would show the counter-factual.

However, there were also concerns about comparing areas. For example, local surveys can be expensive, and some perceived that local areas are too different to compare. Although local areas could be matched on observable characteristics, like ethnic composition, using census data, there are arguably less tangible aspects of areas that would be omitted from the matching, such as community relationships with staff in local businesses. One participant discussed working on a project about the close relationships between people living in local areas and those working in local areas, which may constitute and contribute to community wellbeing. Such factors are likely to be important but perhaps unstable and dependent on the wellbeing of the local business. Nevertheless, those working on national policy indicated there was a move towards developing such a dataset that is representative at the local level and had consistent indicators, which would enable these comparisons. Digital methods of data collection, such as mobile phones or social media, could improve the timeliness of the data but have limitations in terms of representativeness.

Vertical and horizontal funding gaps

The strongest reactions to questions about risks of adverse or negative outcomes appeared to be driven by concerns about gaps in funding. The context of austerity made operating in communities difficult, as the participant below describes for an initiative on social isolation. The participant discusses seeing service users with higher levels of need because of austerity:

> *"...We started in 2011, which was the beginning of austerity, so to be completely frank, we never operated in a world where libraries or community centres were well funded... The lack of money for community resources was very, very difficult...*

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30   Participant 55

It's the policy [of] austerity and... reduction in services [that] has meant that we are now encountering people who ten years ago would have been protected by the state in some way, and now we're getting people with advanced mental health difficulties and we're getting people with advanced dementia..."[31]

There was also reluctance among some participants to disclose any risks of adverse outcomes, or negative outcomes themselves, perhaps because of concerns about the impact on future funding and relationships with funders. For example, one participant discussed a co-production approach to disseminating the five ways to wellbeing in their local community where any consideration of negative outcomes was seemingly absent:

Interviewer: *"Do you think, or were you aware of any risks of adverse outcomes for particular individuals or groups, as a result of the communications that you did? Do you think there's anyone who could have been excluded or anyone who's wellbeing could have been adversely affected by the .... campaign?"*

Participant: *"To be honest, I've not really thought about that, and we've not received any negative... or anything that needed to be improved along on those lines."[32]*

It is possible that funding structures tied to positive outcomes led to a reluctance to disclose and think about adverse outcomes. Using approaches that encourage the consideration of these may help to encourage learning from them (BBC News, 2012). Those who did more freely discuss risks and negative outcomes tended to view them as learning opportunities, at both levels of the funders and funded, and some perceived that a climate of being open to discussing challenges as learning opportunities was emerging.

Other participants noted that a lack of consistent and adequate funding can lead to over-stretched staff or communities who might feel abandoned if a successful initiative was discontinued:

"You know that's really hard because in lots of communities a service is taken away from them so they think, 'Well, you're just going to come in, you know, tick your boxes, and then you're going to go and then we're left with nothing again,' so and I think that can be quite a challenge."[33]

Alongside the discussion of gaps in service provision, there was a discussion of overlaps in service engagement and lack of anyone with an overarching responsibility to make decisions, which seemingly emerged from vertical and horizontal funding gaps:

"That silo mentality is absolutely fundamental to ... the difficulties that we have in improving community wellbeing because nobody... normally has a place-based policy in the United Kingdom. They have a place policy that they put... alongside an education policy or a health policy ... alongside a separate transport policy... All the policies have equal status in law and in practice so none of them trump each other, so they all just carry on doing their own thing. Then they get annoyed when the other departments won't come and play with their plan, because the other departments are busy working on their own plan to their own...management structures, hierarchies and, ultimately, ... committees and parliamentarians. It's just a disastrously inefficient way to run a system.... It's particularly communities that experience poverty who get repeatedly asked over and over again, what would

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31   Participant 29
32   Participant 3
33   Participant 50

make a difference to them, and they give the same answer every time and nobody ever does anything about it, because the answer is not in the domain of the person who asked the question – it's in somebody else's domain."[34]

Therefore, consistent funding alone is not enough to cover the gaps if the funding is channelled vertically through silos (other people's domains) or targeted at the wrong level. An example of horizontal silos is that someone with the responsibility for reducing teenage pregnancy locally is restricted to implementing options such as providing contraception, even if they identify that the most important determinant of teenage pregnancy is childhood poverty; because of hierarchies and structures, they are unable to influence the causes of poverty. The issue of horizonal and vertical gaps in funding is longstanding and effective initiatives, including new legislation and lobbying, that tackle fragmentation in ways that are flexible to changing and shifting economic and policy circumstances were reported to still be needed. There were some efforts to tackle these through integrated ways of working at neighbourhood levels.

Leadership and culture

Participants believed that strong and successful community initiatives were underpinned by strong leaders. These were both 'bottom-up' community leaders and 'top-down' leadership from management. For example, one participant discussed how community leaders were more important than informational campaigns:

"I think for me it's having those key connecting people within communities - those community leaders. The fact that we already have a workforce that works very closely with our communities... we have the knowledge, what is going on, what the current feeling is, but also who those identifiable connectors are who are influences within that community. We can put as many social media messages [out on] our national campaigns [and] all of that, but actually it's those key people who... are going to be reaching those people that we're not going to reach."[35]

Another participant described introducing a new service delivery model but finding staff defaulted back to the original model because managers lacked a tolerance for uncertainty:

"And the managers deviate back to a very traditional model of service delivery, despite all of the opportunity for innovation, they all defaulted back to where they were comfortable and then within a year, the services become a very referral based traditional delivery service... We had to keep pushing them to remember that this was not what needed... and that we were trying to test out new ways of working. It's because... we are individualistic generally as people... and the managers who have been managing, for a long time, ...services of some description, [and they] needed certainty... If you don't do well with uncertainty... you revert back to the certainty that you need in your life."[36]

Good leaders were also seen as those who fostered a culture that viewed mistakes and negative outcomes as opportunities for learning, rather than sources of shame or blame. Tolerance for uncertainty and a growth mindset are associated with higher subjective wellbeing (Strout et al., 2018; Zhao et al., 2021). Cultures that encouraged the identification of solutions, as well as the documentation of problems, were perceived as rare but valuable:

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34   Participant 61
35   Participant 3
36   Participant 39

"Part of the culture of local government gives ... a status to identifying problems rather than creating solutions... I don't mean to sound too critical... it's a culture we live in."[37]

However, there was also a concern that some initiatives might try to address complex issues with reductionist approaches that could be characterised as 'solutionising':

"They call it 'solutionising'... where I felt it went wrong... [was when] deciding that there were these pillars that you could build this thing upon... and that they were set, and they were recordable ... What worries me about these kinds of approaches in particular is that you might call it 'urban regeneration', certainly 'top down regeneration', and approaches to things like high streets and pedestrianisation... our places are becoming 'everyplace'- they're all the same, they've lost that 'genius loci' that architects and designers talk about... the thing that makes the place gets lost by solutionising..."[38]

Overall, the perceived need to have a culture of developing straightforward and actionable responses to problems related to community wellbeing was seemingly at odds with the complexity of the system of community wellbeing.

Models

Summary

Overall, reactions to the boxes model in Figures 4 and the artistic visualisation in Figure 5 were polarised and much of the feedback was conflicting. Those who reported that the box model in Figure 4 resonated with them were less likely to report that the artistic visualisation in Figure 5 resonated and vice versa. In general, the boxes model in Figure 4 was perceived to have value as a co-production tool, to stimulate discussion with funders and staff, to be useful for reporting, and a tool to use in commissioning and service planning. The artistic visualisation in Figure 5 was generally perceived to be a useful conversation piece to remind people there can be different reactions to the same community-level initiative or intervention. Therefore, the boxes model in Figure 4 may be more appropriate for people who design, deliver, evaluate, and commission community interventions and initiatives, whereas the artistic visualisation in Figure 5 for people who design and deliver community interventions to prompt conversation, although there may be overlap in these functions where both could be useful and applicable.

Perceptions of boxes model

Some participants found the boxes in Figure 4 to be reductionist and overly simplistic ('solutionising', as above), stifling for creativity, or unhelpful for thinking about how to operate within complex systems:

"The reason I'm always uncomfortable with any sort of model about any sort of community is that it's so changeable... I think that if you try to... create a technocratic concept around something that is intrinsically human and messy and subjective and it's not just subjective... I'm looking at a flow diagram and thinking... this is 'management consultancy for community', and that doesn't work... I don't really understand it. I don't think it can be applied to one community, let alone

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every community."[39]

"The idea that really very simple box and arrow diagrams can provide a solution just makes my hackles go up now."[40]

Others seemed relieved that Figure 4 was not more complex, comparing it to other, more complex 'systems-levels' models with lots of arrows that they found difficult to use in practice:

"I looked at [it] and thought, 'I can't even use that model' [referring to complex systems models rather than the box model shown to the participant] because it's just arrows everywhere, and whilst yes, it does explain the complexity of how it all fits together, I didn't feel like it necessarily made my life easier without a specific case... so I personally prefer, something that is a bit more stripped back like this that shows you the major interactions between things and then, once you're then applying... [you can] add in the complexity."[41]

Not all participants accepted the idea that community wellbeing could be subjective, arguing that subjective reports of wellbeing could only be elicited at individual- and not community-levels:

"Honestly, I don't think there's such a thing as community wellbeing... I think it falls apart when you get to the end, 'how stressed people feel when they're local' [to] me was the same as how stress[ed] people feel when they're in there, so that's the individual stress level was still felt by a person."[42]

This quote speaks to the idea that there are both inner and outer influences on wellbeing. The stress within a community impacts the individuals within it, and more resilient individuals can tolerate more community stress without becoming stressed themselves. Nevertheless, this particular participant did not perceive 'stress within a community' to be different from the individual experience of stress.

However, others were interested in using measures of community subjective wellbeing to inform their own work. They found the community subjective box to resonate and pointed out they knew of some communities that had poor objective economic wellbeing but high subjective community wellbeing. Others mentioned being interested in individual differences, such as community subjective wellbeing elicited from residents and non-residents, or in qualitative perceptions of the 'something extra' that is difficult to capture with indicators and scales. As a final example, the circular arrows were viewed as both confusing, for those who wanted more direction, and important, for those who wanted more complexity.

Boxes model changes and pathways

There were some suggestions that were not conflicting and that could be used to modify the model further. Fixed and fluid factors were viewed as 'in the eye of the beholder', with transport, for example, seeming fixed by some but fluid by others. It was seen as important to take an asset-based approach to individuals and, especially, communities, and not just a health risk-based approach labelling risks as 'fluid' or 'fixed'. Within the objective community factors box, participants perceived a great deal of interaction between factors, which could be visualised with a 'tornado' or spiral of interaction to

39   Participant 29
40   Participant 45
41   Participant 11
42   Participant 39

encourage the consideration of inter-relationships and underlying factors. Some preferred systems-based approaches wanted to see the wider social and economic context visualised, too. A model incorporating all of this feedback might look like the one in Figure 16. Note that this is an example of the way that the main model (Figure 4) might be developed and extended if of interest for a particular context.
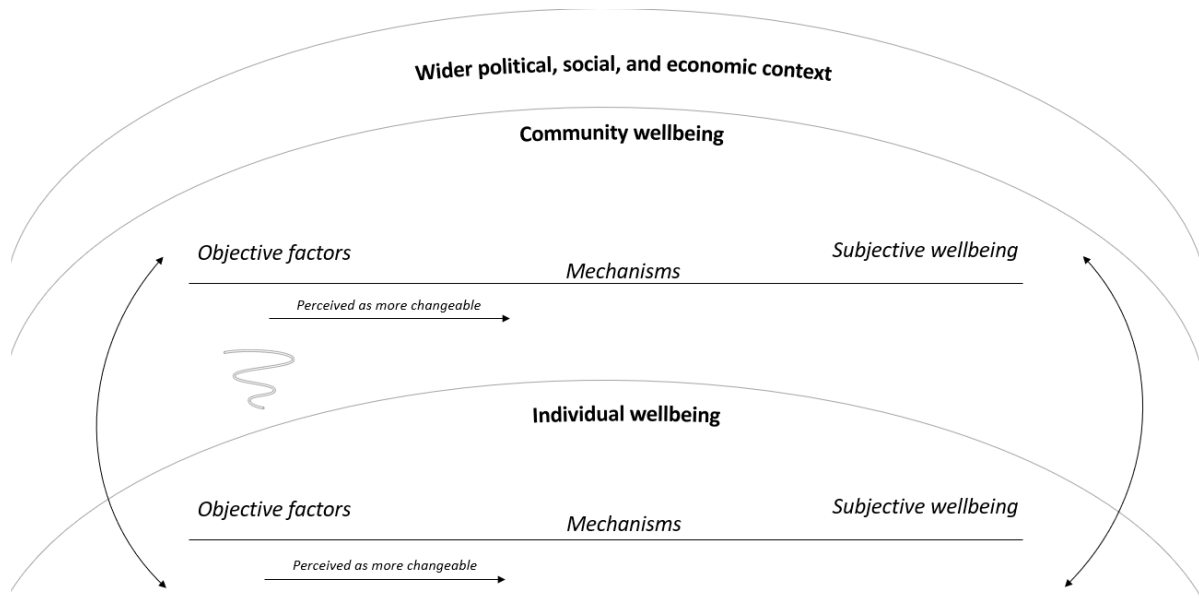
Figure 16: A layers model of the relationships between individual and community wellbeing.

While most participants quickly understood that the examples in the boxes of Figure 4 were not exhaustive, there were nevertheless three consistent examples for the suggestions: include gender identity in the fluid box, use more 'concrete' examples of fluid factors (like benches or community centres), represent power-sharing and co-production, and use narrative examples of pathways through the model. An example of an updated model considering the feedback about examples is in Figure 17, which also includes the above feedback on fixed and fluid factors perceived as being changeable and the tornado or spiral of interaction in community objective factors (but not the systems approach). Examples using transportation through the model pathways are in Figures 18 and 19, which show identical wording in red represented in different visualisations.

COMMUNITY WELLBEING

Objective factors

PERCEIVED AS MORE FLUID

Geographic location.

History of shared space.

Benches, community centres.

Co-production used in community building.

Subjective 'links' (mechanisms)

PERCEPTIONS OF THE COMMUNITY

Sense of community cohesion.

Community leaders listen.

Community safety and solcial trust.

Subjective wellbeing

Evaluations, thoughts **about area** – such as thinking the area is a good place to live.

Feelings, experiences **in an area** – day to day feelings when located in or thinking about area.

Inequality subjective wellbeing in an area.

Objective factors

PERCEIVED AS MORE FLUID

Sex

Age

Personal history

Gender identity.

Voting behaviour.

Subjective 'links' (mechanisms)

PERCEPTIONS THE INDIVIDUAL HAS OF THEMSELVES

Quality of relationships with others.

Functioning, confidence, self esteem.

Subjective wellbeing

Evaluations, thoughts about **life overall** e.g. "I think my life is going well".

Feelings, experiences **over lifetimes** e.g. how happy they feel right now and if they feel the activities they do in life are meaningful.

INDIVIDUAL WELLBEING

Figure 17: Revised 'box' model of the relationship between individual and community wellbeing.

COMMUNITY WELLBEING

Objective factors

PERCEIVED AS MORE CHANGEABLE BY COMMUNITY DECISION-MAKERS

Road infrastructure.

Boundaries of local area.

National emissions standards.

Road closures.

Community consultation groups.

Traffic patterns.

Subjective 'links' (mechanisms)

PERCEPTIONS OF THE COMMUNITY

Satisfaction with road safety and clean air.

Community leaders listen.

Fairness of road closures.

Subjective wellbeing

Thinking about the local area as a place to live.

Feelings of stress, anxiety, happiness, joy, contentment and meaning when in local area.

Inequalities in life satisfaction, area satisfaction, feelings in area, feelings and experiences anywhere.

Objective factors

PERCEIVED AS MORE CHANGEABLE BY COMMUNITY DECISION-MAKERS

Family size.

Mobility.

Car ownership.

Household income.

Prior use of public transport.

Subjective 'links' (mechanisms)

PERCEPTIONS THE INDIVIDUAL HAS OF THEMSELVES

Good driver.

Sensitivity to noise.

How well an individual functions in their daily lives.

Subjective wellbeing

Thinking that life is going well overall.

Feelings of stress, anxiety, happiness, joy, contentment, and meaning during daily life.

INDIVIDUAL WELLBEING

Figure 18: Example pathways though box model using transportation (road closures).

Figure 19: Example pathway though layers model using transportation.

Box 3: Description of example pathway though box and layers model using transportation

Pathways through the box and layers models of individual and community wellbeing may be considered with an example. One example is changes to transportation in the local area, as shown in Figures 18 and 19.

Community objective factors. A decision-maker might consider an intervention or initiative to close some roads to traffic, perhaps to improve safety or air quality. The traffic modifications will need to work within existing road infrastructure, which may be perceived as relatively difficult to change.

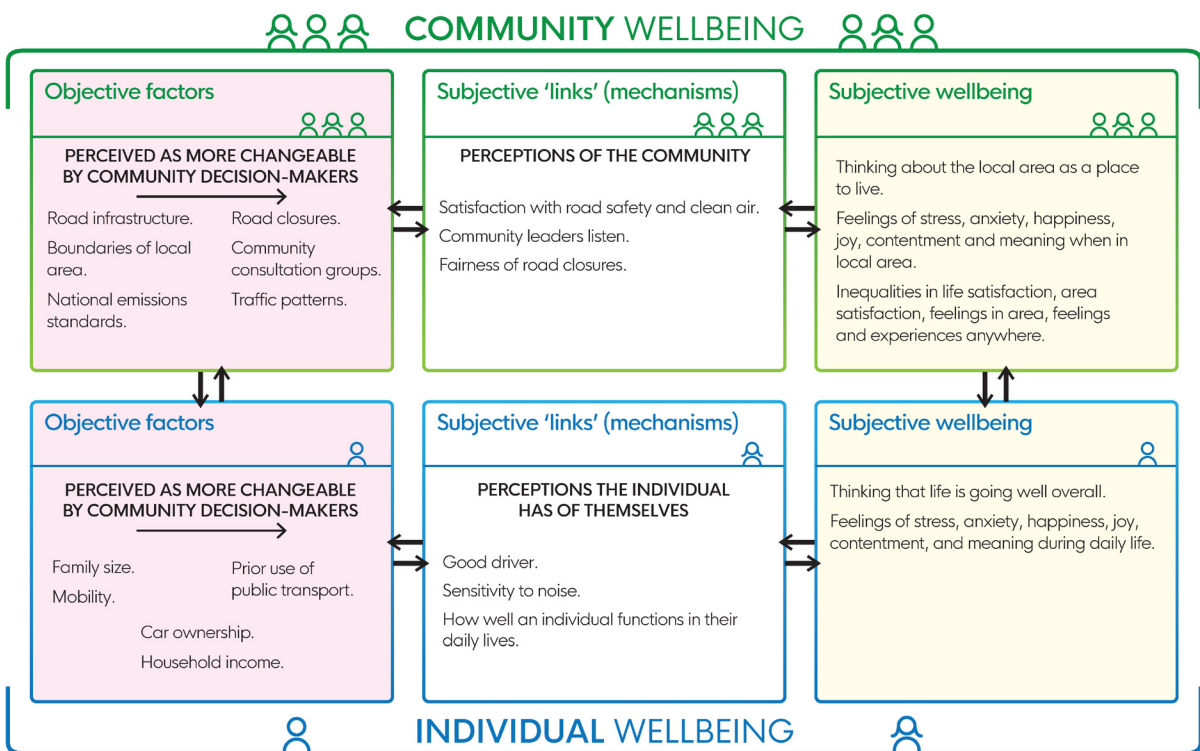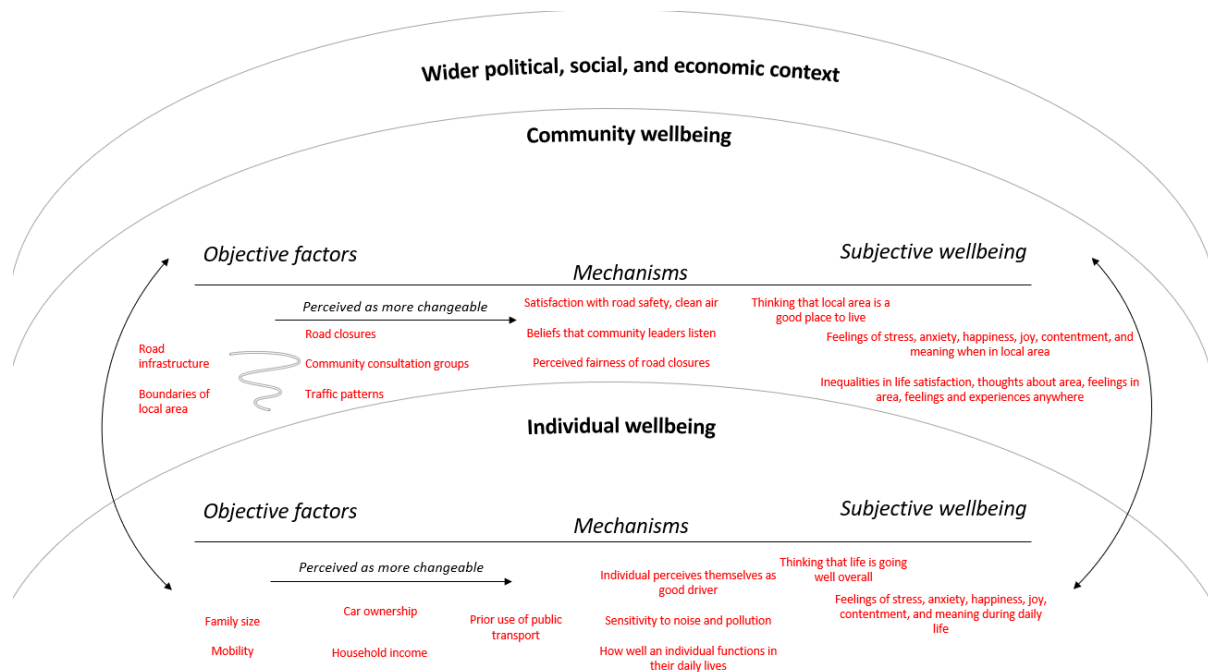**Individual objective factors.** An initiative to modify traffic patterns could affect individuals with different objective characteristics differently. For example, people who use cars or public transport might feel differently than those who travel by walking, bicycle, or scooter. Families in which a family member has a disability or long-standing illness affecting their mobility might find it hard to get around without using a car on some roads, which is perceived as something about individual circumstances that is difficult to change.

Individual subjective mechanisms or 'links'. The degree to which anyone is affected by changes to traffic rules will depend not only on if they drive on the roads but subjective perceptions that act as mechanisms of change. Examples of these are if individuals consider themselves to be good drivers, good world citizens, or their sensitivity to noise. They might prefer a longer route to the shops if it means a smaller contribution to climate change or less noise day-to-day.

Community subjective mechanisms or 'links'. How communities are affected by changes in traffic patterns will depend on how they perceive these changes. For example, they might benefit more from the change if they feel as if community leaders listened to and consulted them before making the change. Community consultation might reveal other issues that are more relevant, such as traffic patterns related to the school run that could be modified without closing roads.

Individual subjective wellbeing. Changes to traffic may ultimately affect how people think about their lives and how stressed or anxious they feel. For example, cleaner air may improve an individual's health, which contributes to feelings of better wellbeing even when at work in the nearby town.

Community subjective wellbeing. Changes to traffic may ultimately affect how people think about their local area as a place to live and how stressed or anxious they feel when in their local areas. For those reliant on cars, increased journey times may contribute to feelings of stress, and for those who don't use vehicles quieter streets may lead to less daily stress - contributing to changes in relative subjective wellbeing, which could make things more equal or unequal.

Boxes model limitations

There were limitations of the boxes model in Figure 4 described in interviews that could not be – or were not – addressed by a transformation into a layers model in Figure 19. These included 'solutionising', as previously described; a lack of attention to how communities might overlap and change over time; and including more detail about the national context and things that are imposed upon communities (there is only a broad category in the layers model). One participant commented that greater explication was needed of how individual fixed objective factors interactive with community subjective norms and movements, such as how gender and ethnicity are affected by movements related to civil and voting rights. Despite these limitations, and the possible modifications and adaptations to the boxes model, we still propose Figure 4 as what should guide future interventions and initiatives, encouraging it to be adapted for local contexts.

Perceptions of artistic visualisation

There was general consensus that the artistic visualisation in Figure 5 represented the idea of 'different people in the sample place' well. It appeared to convey this idea better than the boxes model. However, many commented that a narrative summary of the visual was needed to point out people's different reactions, otherwise they may not be noticeable. The artistic visualisation prompted participants to share stories that fit into the visualisation, such as local residents complaining when a shop closed or about a new art installation. The terminology on the artistic visualisation was sometimes critiqued, such as 'intervention' or 'initiative' being too prescriptive, or 'trendy shops' not aligning with language around regeneration. It was also pointed out that sometimes the issue is less about people reacting differently to a single intervention or initiative itself; rather, it is about concerns that money could have been spent elsewhere, such as on school meals instead of art.

Discussion

Summary with reference to study objectives and existing literature

This research aimed to show the relationships between community wellbeing and the wellbeing of different individuals and identified groups within that community, informing the design, evaluation, and targeting of future interventions and initiatives for place-based communities after this project. A lack of evidence on individual and group differences was identified by the What Works Centre for Wellbeing, and a recent systematic review confirms that this is a limitation in this area of the literature: Cassarino, Shahab and Biscaya (2021) screened over 2,000 studies of urban interventions, including ten in a synthesis, but none of the included studies investigated the experiences of people with disabilities, migrants, or racial minorities. Our research aimed to focus attention on sub-group differences like these and show how community wellbeing interventions might be better designed and evaluated. It also aimed to simplify some of the complexity characterising current approaches to community wellbeing to aid the design of interventions and initiatives such as by informing their theories of change – including community-led, bottom-up initiatives (Curtis et al., 2020; Pennington et al., 2021).

Results from the rapid evidence review showed that participation in community-level initiatives was often unequal according to factors like income and time freedom, which could lead to inequalities between different individuals and groups. Our quantitative analyses supported the idea of sub-group differences in the relationships between community-level initiatives and subjective wellbeing. For example, we found that in more sociable areas, people who did not regularly talk to their neighbours had worse mental wellbeing than those who did regularly talk to their neighbours, and less sociable individuals also had worse mental wellbeing in sociable areas than in unsociable areas. Higher area-level unemployment was associated with worse civic pride for the employed but not the unemployed. Qualitative interview participants suggested co-production as a way to address inequalities because co-production allows under-represented groups to present ideas of how interventions might work better for them. However, there is limited evidence on whether and how co-production affects subjective wellbeing and participation alone is not enough – there are also concerns about who participates and the quality of engagement (What Works Centre for Wellbeing, 2017). This research again raises well-known questions about how community voices can meaningfully feed into decision-making. Future research should explore the relationship between co-production of interventions and subjective wellbeing outcomes given its prominence in the qualitative findings but lack of evidence on efficacy in changing subjective wellbeing outcomes.

The rapid evidence review identified many 'mechanisms' between individual wellbeing and community wellbeing but there was no agreement in the literature about what was a mechanism, outcome, or determinant, a finding confirmed in the project consultation group. To provide more clarity, we drew upon existing literature on the importance of a conceptual 'box and arrow' model to inform intervention design and evaluation (Pearl and Mackenzie, 2018), which requires observations across a causal chain to show effectiveness. Given the general lack of causal approaches in the evaluation of the effectiveness of community-level initiatives, it is a contribution of this research to show how to ground evaluations in causal models, like the boxes and arrows model, to demonstrate their impact and consider individual differences. Qualitative interview participants thought the model could be used to stimulate discussion with funders and staff, guide co-production of community-level initiatives and interventions, when reporting outcomes, and as tool to guide commissioning and service planning.

It can be difficult to conduct 'community' wellbeing research because interpretations of communities are heterogenous and the boundaries between communities are unclear. Our rapid evidence review found that communities are malleable, multiple, and influenced by 'wellbeing spillovers' and 'tipping points' (Kramer, Guillory and Hancock, 2014; Hill, Griffiths and House, 2015; Glazzard and Rose, 2019). An important limitation of the boxes and arrows model, and of the quantitative analyses, is that only one type of community (place-based geographic) communities were represented and interactions between different communities were not shown. The quantitative analyses were even more limited in scope as they were about local authorities rather than place more generally. The qualitative interviews found that leaders could champion wellbeing within communities and were important to ensure the effective implementation of any community-level initiative. It may be that leaders can promote wellbeing spillovers between and not just within communities – that is, wellbeing going from one community to the next, such as between local area, work, and higher-level policy contexts. Systematically studying the ways that leaders do this, and considering how to promote their wellbeing in ways that lead to a tolerance for uncertainty, change, and a growth mindset, may be areas for future research (Strout et al., 2018; Glazzard and Rose, 2019; Zhao et al., 2021). And, in this regard, it is important to avoid top-down approaches that assume leaders' wellbeing and wellbeing literacy is greater than the wellbeing of those in communities they are helping. Compromised wellbeing is a potent contributor to the overuse of power and control.

What, if anything, does this change about our understanding of the relationships between individual and community wellbeing? This is the first study that we are aware of to build a causal representation of the way that individual and community wellbeing outcomes are related. Most prior research is systems or layers-based with many different interacting factors, does not encourage separating determinants from outcomes and mechanisms acting as 'links' using boxes and arrows, and places more emphasis on community objective than community subjective wellbeing (whereas our model places equal emphasis on both in approach, with equal sized boxes). Our research shows that the ways individual and community wellbeing are related can occur across causal pathways that account for individual and group differences, which draws attention to inequalities and can stimulate discussions about interactions between individuals and groups.

We populated the model with measures from an existing dataset and updated it based on quantitative analyses of the dataset. We found that some sub-groups had worse subjective wellbeing, such as those in urban areas, particularly urban areas with low voting rates, and those who were unsociable but living in social areas. If these patterns are replicated in more recent data, these sub-groups could be the target for future interventions and initiatives. The community subjective mechanisms 'feelings of belonging' affected how community-level objective factors were related to subjective wellbeing, as did the individual subjective mechanisms for feeling lonely and perceptions of financial circumstances. For walkable assets, the relationship with subjective wellbeing appeared to be confounded by feelings of safety or another factor. Evaluations of initiatives to change subjective wellbeing using community objective levers may want to measure these mechanisms to evaluate their role in creating change, depending on the local context. The results were different across individual and community subjective wellbeing measures, showing that normative decisions about wellbeing measurement (that is, what the best wellbeing measures are) can affect the conclusions of research. Overall, these results show the kind of insights that can be gained by considering and applying a 'boxes and arrows' approach to evaluating the relationships between individual and community wellbeing.

However, the qualitative interviews raised concerns about a 'boxes and arrows' approach to individual and community wellbeing - especially that it may not suit all

situations. For example, it may encourage convergent rather than divergent thinking, limiting people's creativity in identifying novel approaches to community challenges. The qualitative interviews also emphasised that individual and community wellbeing should be considered within the wider context, including how power is shared across individuals and groups, access to appropriate and timely data with both community and individual-level outcomes, funding structures, and wider leadership and culture. These wider factors that will influence the 'cycle' of individual and community wellbeing outcomes, too, alongside aspects of individual and community wellbeing themselves.

Final reflections on the study

This research can inform the design and evaluation of future community-level initiatives and interventions occurring after this project, ideally rigorous mixed methods evaluations that consider counterfactuals, relationality, and systems complexity, given funding limitations. It has also suggested some possible targets and mechanisms. However, the research cannot dictate where and how to intervene. Those seeking to select community-level initiatives and interventions might look to systematic reviews of what has and has not worked to improve subjective wellbeing, considering their generalisability, headroom for improvement, fit with the strengths and weaknesses of the local area, the challenges and importance of co-production, horizontal and vertical funding gaps, and working within any challenges associated with wider economic and political factors, including austerity. There has been no intervention in this project to allow our analyses to inform causal interpretations and normative conclusions about what should be done - only ideas to enhance thinking about wellbeing and how wellbeing might be improved, as well as suggest possible groups to target. Selecting between different initiatives, interventions, and targets will ideally be based on evidence from many studies and not just a single project – ideally, including information on their interactions between different initiatives and their relative importance, which our analyses did not explore.

The rapid evidence review was not systematic and thus it cannot be used to determine all the factors that may affect the relationship between individual and community wellbeing. A full identification of mechanisms and sub-groups may be a topic for a future systematic approach. However, the rapid review highlighted analytic themes guiding the work: the importance of considering inequalities and distributions, mechanisms, and inter-relationships between communities (and not just the individuals within them), as well as the need to gain clarity on individual- and community-level wellbeing relationships – now provided by the boxes and arrow model. It was a challenge to gain consensus on mechanisms versus determinants and outcomes in the project conclusion group, and future research may consider using a Delphi process or systems mapping if seeking to further explicate the relationships between individual and community wellbeing (McGill et al., 2021).

We used a quantitative dataset with many measures of individual and community wellbeing across objective factors, subjective mechanisms, and subjective wellbeing. However, again, it was limited because it only focussed on place-based communities in local authorities, and these may not be the communities that most matter for people's subjective wellbeing. Future work could look at other levels of analysis, too, which may have more predictive power (Whitman, Van Rooy and Viswesvaran, 2010). By focussing on quantitative data with a variety of measures, we did not empirically investigate change over time or the relationships between different communities and social networks. As identified in the literature review in Phase 1, the boundaries that people subjectively perceive as their neighbourhoods do not always correspond with those used by researchers (or policymakers) to define them (Campbell et al., 2009). Due to the nature of the quantitative data analysed, we could not show how wellbeing might spill over from one community or individual to the next (Fowler and Christakis, 2009; Kramer, Guillory

and Hancock, 2014; Hill, Griffiths and House, 2015), or how subjective wellbeing might drive motivation and participation in community initiatives over time (Lyubomirsky, King and Diener, 2005). Thinking in linear and quantitative terms omits the circularity and complexity of wellbeing in systems, although prior work has already addressed much of this. Future work could aim to capture potential entry points to break negative wellbeing cycles within systems.

Generalisability

The quality of intervention effectiveness evaluations in the area of community wellbeing is not very high, which some participants attributed to the lack of consistent, easily accessible, local-level data on individual subjective wellbeing and community subjective wellbeing. Data availability and access should be addressed in the future. Other work can use the boxes and arrow model to guide and improve the quality of future effectiveness evaluations using a causal lens, perhaps as part of a menu of models presented together during co-production and modified depending upon the context (Atkinson et al., 2017; Choi, Kim and Lee, 2020; Curtis et al., 2020; Dolan, Laffan and Kudrna, 2021; Pennington et al., 2021).

The quantitative analyses and qualitative interviews were never intended to be statistically representative and thus strictly generalisable to a particular population of people. Survey weights were not used in Understanding Society and qualitative research is usually not designed to be sample representative (Pfeffermann, 1993; Braun and Clarke, 2014). Nevertheless, we can learn from the associations in the quantitative descriptive findings about where to look in the future. For example, community-level objective factors had different relationships with subjective wellbeing according to age, income, if the area was urban or rural, and, for walkable assets, perceived safety of the local area, suggesting future community-level initiatives in these areas may wish to consider these characteristics. Given our results that rates of socialising and unemployment in local areas depended on individual sociability and employment, initiatives that affect these areas may wish to consider individual differences in socialising and employment.

The analytic themes emerging from this research have relevance in other contexts. This includes the idea of 'different people in the same place' (Villalonga-Olives and Kawachi, 2017), that the measure of subjective wellbeing matters – including whether it is a distributional measure at the community-level (Dolan, Kudrna and Stone, 2017), how flexible community-level leadership can promote and shape subjective wellbeing outcomes between and across communities (Glazzard and Rose, 2019), and gaps in the available data at local levels for subjective individual wellbeing and subjective community wellbeing that need to be filled.

Conclusion

In designing and evaluating future community-level initiatives and interventions, it is important to consider observations across a causal chain to understand effectiveness. A boxes and arrows model can be used to visualise this chain, guiding co-production and service commissioning and planning. For a full picture of subjective wellbeing, it is important to allow a more complex model, one in which there are differential impacts across the distribution of individual subjective wellbeing in that community. Identification of the effects of interventions and initiatives on disadvantaged and vulnerable sub-groups, including negative outcomes or trade-offs, should be built into the design and evaluation of community-level initiatives and interventions.

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Appendix 1 – Item wording and coding for quantitative analyses

Variable	Item wording	Item coding	Waves[+]	Variable name	Notes
Local authority district (LA/LAD)	N/A	Categorical, name of LA	All	*_oslaua	
Census 2011 urban/rural indicators	N/A	Urban = 0 Rural= 1	All	urban_dv ru11ind	Urban is 10K+, rural <10K
% who talk to neighbours (at LAD level)	"I regularly stop and talk with people in my neighbour-hood."	Continuous % of agree / strongly agree	1, 3, 6, 9	scopngbhh	
Average number of amenities walkable from home (in LAD)	Which of these are located within a 15-20 minute walk from your home?	Average (continuous) number of: General/grocery shop, pub, park, library, community centre/hall, sports centre/club, youth centre/club, health centre/GP, chemist, post office, primary school, secondary school, church/place of worship, public transport links, none of these	4, 5, 6, 7	AssetsA-O	From the Community Life Survey. Merged by interview year using output area classifications – matching output areas to local authorities using Output Area to LSOA to MSOA to Local Authority District[1] Binary variable created to avoid inflated standard errors, average of 11+ vs. less than 11 assets (11 is the median of the average assets
% who vote in local authority	Voter turnout at local authority level	% turnout	1, 2, 5, 6, 7, 8, 9, 10	Merged in from House of Commons Library	House of Commons Library Election Data[2] average of constituency and year and local authority level, merged at interview year and local authority level

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1   https://geoportal.statistics.gov.uk/datasets/fe6c55f0924b4734adf1cf7104a0173e_0.
2   https://commonslibrary.parliament.uk/research-briefings/cbp-8647/

Variable	Item wording	Item coding	Waves[+]	Variable name	Notes
Index of dissimilarity score for local authority	The contribution of each local authority to the UK score on index of dissimilarity at the local authority level	Continuous score	3 (2011)	Merged in from Census data	NOMIS Census Group ethnic data; Table ID KS201UK[3]. It is the contribution of each local authority to the overall index of dissimilarity score across regions. Binary variable created to reflect above/below average (0.002)
% Volunteering in local authority	In the last 12 months, have you given any unpaid help or worked as a volunteer for any type of local, national or international organisation or charity?	Continuous % of yes	2, 4, 6, 8, 10	volun	
Average ('relative') income in LAD	Annual gross disposable household income (GDH) per head at the local authority level	Continuous, numeric	1–6	Merged in from ONS/HMRC data	ONS/HMRC data on Gross Disposable Household Income in the UK[4]
Unemployment rate	ONS item	Continuous, % unemployed	All	Merged from ONS data	ONS data from Annual Population Survey Claimant Count averaged over 12 months[5]
Sex	Derived variable	Female = 1 Male = 0	All	sex_dv	Understanding Society[6]
Age	Derived variable	< 50 years (0), 50-70 (1), 71+ (2)	All	age_dv	Understanding Society[7]
Ethnicity	Derived variable	BME, 1= BME, 0 = White	All	racel_dv	Understanding Society[8]
Talks to neighbour (individual)	"I regularly stop and talk with people in my neighbour-hood."	Strongly agree or agree (1), neither agree/disagree, disagree, strongly disagree (0)	1, 3, 6, 9	scopngbhh	

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3   https://www.nomisweb.co.uk/census/2011/ks201uk
4   https://www.ons.gov.uk/economy/regionalaccounts/grossdisposablehouseholdincome/bulletins/regionalgrossdisposablehouseholdincomegdhi/1997to2018
5   https://www.ethnicity-facts-figures.service.gov.uk/work-pay-and-benefits/unemployment-and-economic-inactivity/unemployment/latest
6   https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation/variable/sex_dv
7   https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation?search_api_views_fulltext=w_age_dv
8   https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation/variable/racel_dv

Variable	Item wording	Item coding	Waves+	Variable name	Notes
Mobility difficulties	"Do you have any health problems or disabilities that mean you have substantial difficulties with any of the following areas of your life?"	Mobility difficulties reported, (1) Yes (0) No	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	disdif1	
Voting behaviour	Did you vote in this (past) year's general election?	(1) Yes (0) No/Can't vote	2, 7, 8. 9. 10	vote7	Wave 7 used, merged into Wave 6 at individual-level
Household income	Net household income (equivalised)	Continuous, numeric	4, 6, 8, 10	fihhmnnet1_dv	X 12 for annual values and equivalised using w_ ieqmoecd_dv[9]
Volunteered last year	In the last 12 months, have you given any unpaid help or worked as a volunteer for any type of local, national or international organisation or charity?	1 = Yes, 0 = No	2, 4, 6, 8, 10	volun	
% individuals agreeing they feel like they belong to local area in LAD	"I feel like I belong to this neighbour-hood."	Strongly agree, agree (1), neither agree nor disagree, disagree, strongly disagree (0)	1, 3, 6, 9	scopngbha	Attitudinal aspect of Buckner's social cohesion scale; see Wilkinson, D. (2007). The multidimensional nature of social co-hesion: Psychological sense of community, attraction, and neigh-bouring. American journal of community psychology, 40(3-4), 214-229.
% agreeing other people in neighbourhood mean at lot to them in LAD	"The friendships and associations I have with other people in my neighbourhood mean a lot to me."	Strongly agree, agree (1), neither agree nor disagree, disagree, strongly disagree (0)	1, 3, 6, 9	scopngbhb	Attitudinal aspect of Buckner's social cohesion scale; see Wilkinson, D. (2007). The multidimensional nature of social co-hesion: Psychological sense of community, attraction, and neigh-bouring. American journal of community psychology, 40(3-4), 214-229

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9   https://www.understandingsociety.ac.uk/documentation/mainstage/user-guides/main-survey-user-guide/household-income-variables

Variable	Item wording	Item coding	Waves[+]	Variable name	Notes
% who can report they can access resources in local area when they need to in LAD	"Are you able to access all services such as healthcare, food shops or learning facilities when you need to?" [local area]	1 = Yes, 2 = No	3, 6	servacc	Perceived access is very different to the opportunity to access - thus, it is a mechanism
If managing well financially these days	"How well would you say you yourself are managing financially these days? Would you say you are..."	Finding it quite difficult / very difficult (1), just about getting by / doing alright / living comfortably (0)	All	finnow	
If financial future will be better	"Looking ahead, how do you think you will be financially a year from now, will you be..."	Worse off (1) versus better off or about the same (0)	All	finfut	
Loneliness	"How often do you feel lonely?"	Hardly ever or never (0), some of the time, often (1)	9, 10	sclonely	There are three other items on loneliness in Understanding Society but they don't use that word - rather, lack of companionship, left out, isolated; Wave 9 used and merged into Wave 6 at individual-level
Absolute civic pride	Overall, do you like living in this neighbour-hood?	1 = No, 0 = Yes	3, 6	llknbrd	
Relative civic pride	Overall, do you like living in this neighbour-hood?	1 = No, 0 = Yes	3, 6	llknbrd	If individual doesn't like living in their area and less than 10% (90th percentile) of people don't like living in that local area (versus everyone else). Percentile selected based on model convergence – at other percentiles, some models did not converge.
Warwick Edinburgh Mental Wellbeing Scale (short form)	Scale - see notes	1 = Low mental wellbeing, 0 = Not low	1, 4, 7 10	swemwbs_ dv	Cut-off of 20 used for low mental wellbeing (possible and probably depression / anxiety) Warwick University[10] Understanding Society[11]

10   https://warwick.ac.uk/fac/sci/med/research/platform/wemwbs/using/howto
11   https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation/variable/swemwbs_dv

Variable	Item wording	Item coding	Waves[+]	Variable name	Notes
Enjoys day-to-day activities	"Have you recently been able to enjoy your normal day-to-day activities?"	Enjoyed activities less or much less than unusual, or was unhappy and depressed rather or much than usual = 1; otherwise = 0	All	scghqg	
Feeling unhappy or depressed recently	"Have you recently been feeling unhappy or depressed?"		All	scghqi	
Population turnover	Net internal / international migration	Numbers of people at local authority level			Mid-2016 estimtes (ONS[12])

12   https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland

Appendix 2 – Sources of variables additional to Wave 6 of Understanding Society

Variable	Original level	Matching notes	Source
Walkable assets	Output area	Merged into Understanding Society local authority-level data by interview year, using a lookup matching output area classifications to local authorities	Community Life Survey (AssetsA-O) – UK Data Service[1]
Voter turnout	Parliamentary constituency	Merged into Understanding Society local authority-level data by interview year, using a lookup matching parliamentary constituencies to local authorities	House of Commons Library Election Data - UK Parliament - https://commonslibrary.parliament.uk/research-briefings/cbp-8647/; for lookup - https://data.gov.uk/dataset/7b9300c5-2b8b-481c-b1ca-ec086132ff89/ward-to-westminster-parliamentary-constituency-to-local-authority-district-december-2016-lookup-in-the-united-kingdom
Ethnicity (used to create Index of Dissimilarity)	Local authority	Merged into Understanding Society local authority-level data	Office for National Statistics - 2011 UK Census - Official Labour Market Statistics (NOMIS) - https://www.nomisweb.co.uk/census/2011/ks201uk (run by University of Durham on behalf of the Office for National Statistics)
Gross Disposable Household Income in the UK	Local authority	Merged into Understanding Society local authority-level data	Office for National Statistics - HM Revenue and Customs - https://www.ons.gov.uk/economy/regionalaccounts/grossdisposablehouseholdincome/bulletins/regionalgrossdisposablehouseholdincomegdhi/1997to2018
Unemployment	Local authority	Merged into Understanding Society local authority-level data	Office for National Statistics - https://www.ethnicity-facts-figures.service.gov.uk/work-pay-and-benefits/unemployment-and-economic-inactivity/unemployment/latest
Population turnover	Local authority	Merged into Understanding Society local authority-level data	Office for National Statistics - https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland, mid 2019
Warwick Edinburgh Mental Wellbeing Scale (short-form)	Individual-level	Merged into Understanding Society Wave 6 at person-level	Understanding Society - Wave 7

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1   https://ukdataservice.ac.uk/ ; for lookup - https://geoportal.statistics.gov.uk/datasets/fe6c55f0924b4734adf1cf7104a0173e_0

Variable	Original level	Matching notes	Source
		Merged into Understanding Society Wave 6 at person-level	Understanding Society - Wave 7 (derived from Warwick Edinburgh Mental Wellbeing Scale, short-form, and General Health Questionnaire items on enjoyment, unhappiness, depression
Individual voting behaviour	Individual-level	Merged into Understanding Society Wave 6 at person-level	Understanding Society - Wave 7
Loneliness	Individual-level	Merged into Understanding Society Wave 6 at person-level	Understanding Society - Wave 9 (supplementary analyses only)

Appendix 3 – Summary information for variables in quantitative analyses (analysed sample)

Variable	No	Yes	Total	Variable	N	mean	sd	min	max
Talks to neighbours (freq,%)	7562	17688	25250	Internal migration (net)	25250	-155	1702	-7956	4886
	30%	70%	100%	International migration (net)	25250	1414	2178	-40	11136
Mobility difficulties (freq,%)	22358	2892	25250	% talks to neighbours in LA	25250	6.88	0.81	4.48	9.23
	89%	11%	100%	% voter turnout in LA	25250	6.66	0.45	5.40	8.10
Voted in last general election (freq,%)	2123	7791	9914	% volunteered in last 12mo in LA	25250	2.13	0.69	0.56	5.00
	21%	79%	100%	GDHI per head in LA (log 10,000s)	25250	0.58	0.20	0.17	1.85
Volunteered in last 12mo (freq,%)	19562	5688	25250	% unemployment in LA	25250	0.58	0.20	0.18	1.25
	77%	23%	100%	% feels belongs to neighbourhood in LA	25250	6.94	0.76	3.33	9.29
Unemployed (freq,%)	24351	899	25250	% local friendships mean a lot	25250	5.74	0.76	2.73	8.48
	96%	4%	100%	% able to accesses services in LA	25250	9.78	0.19	7.73	10.00
Black and minority ethnic (freq,%)	21308	3942	25250	Household income (log equiv. 10,000s)	25250	0.67	0.56	-8.53	5.49
	84%	16%	100%						
Female (freq,%)	11161	14089	25250						
	44%	56%	100%						
Rural area (freq,%)	19234	6016	25250						
	76%	24%	100%						
Difficulty managing financially (freq,%)	23736	1514	25250						
	94%	6%	100%						
Think finances worse in future (freq,%)	22686	2564	25250						
	90%	10%	100%						
Low mental wellbeing (freq,%)	21882	3368	25250						
	87%	13%	100%						
Low experienced wellbeing (freq,%)	22687	2563	25250						
	90%	10%	100%						
Low relative civic pride (freq,%)	24428	822	25250						
	97%	3%	100%						
Low absolute civic pride (freq,%)	24172	1078	25250						
	96%	4%	100%						
Feels lonely (freq,%)	13167	7054	25250						

Appendix 4 – Summary information for variables in quantitative analyses 6 (full sample)

	No	Yes	Total		N	mean	sd	min	max
Talks to neighbours (freq,%)	10958	**24789**	35747	Internal migration (net)	43341	-485	1934	-7956	4886
	31%	69%	100%	International migration (net)	43341	1708	2475	-580	11136
Mobility difficulties (freq,%)	39111	4984	44096	% talks to neighbours in LA	45188	6.86	0.83	4.48	9.23
	89%	11%	100%	% voter turnout in LA	45190	6.58	0.49	5.33	8.10
Voted in last general election (freq,%)	3066	10017	13086	% volunteered in last 12mo in LA	45188	2.09	0.66	0.56	5.00
	23%	77%	100%	GDHI per head in LA (log 10,000s)	45041	0.58	0.22	0.17	1.85
Volunteered in last 12mo (freq,%)	29583	7807	37390	% unemployment in LA	41771	0.59	0.20	0.18	1.25
	79%	21%	100%	% feels belongs to neighbourhood in LA	45188	6.98	0.77	2.86	9.58
Unemployed (freq,%)	42895	2239	45134	% local friendships mean a lot	45188	5.79	0.77	2.73	8.48
	95%	5%	100%	% able to accesses services in LA	45188	9.79	0.19	7.73	10.00
Black and minority ethnic (freq,%)	32015	11669	43684	Household income (log equiv. 10,000s)	44078	0.61	0.59	-8.53	5.49
	73%	27%	100%						
Female (freq,%)	20920	24258	45178						
	46%	54%	100%						
Rural area (freq,%)	34981	10200	45181						
	77%	23%	100%						
Difficulty managing financially (freq,%)	38422	3217	41639						
	92%	8%	100%						
Think finances worse in future (freq,%)	36351	4052	40403						
	90%	10%	100%						
Low mental wellbeing (freq,%)	29222	4607	33829						
	86%	14%	100%						
Low experienced wellbeing (freq,%)	35758	4103	39861						
	90%	10%	100%						
Low relative civic pride (freq,%)	35881	1332	37213						
	96%	4%	100%						
Low absolute civic pride (freq,%)	35510	1703	37213						
	95%	5%	100%						
High index of Dissimilarity Score in LA (freq,%)	20279	22183	42462						

	No	Yes	Total			N	mean	sd	min	max
	48%	52%	100%							

Correlations between the subjective wellbeing measures

	Low mental wellbeing	Low experienced wellbeing	Low absolute civic pride	Low relative civic pride
Low mental wellbeing	1			
Low experienced wellbeing	0.4421	1		
Low absolute civic pride	0.0779	0.0704	1	
Low relative civic pride	0.0632	0.0544	0.8686	1

Appendix 5 – Summary of key Phase 2 results

Result	SWB outcome	Result description	Evidence quality
Sociable areas, sociable individuals (interaction)	Mental wellbeing	For individuals who were not sociable, the odds of having low mental wellbeing were higher when there were higher proportions of people who talked to their neighbours. For individuals who were sociable, the odds of low mental wellbeing were similar regardless of the sociable areas rate.	Good evidence
Sociable areas, sociable individuals (interaction)	Absolute civic pride, relative civic pride	For individuals who were not sociable, the odds of having low absolute/relative civic pride were higher when there were higher proportions of people who talked to their neighbours. For individuals who were sociable, the odds of low absolute/relative civic pride were similar regardless of the sociable areas rate.	Moderate evidence
Sociable areas, age (interaction)	Absolute civic pride, relative civic pride	In more sociable areas, people older than 50 years of age had better absolute and relative civic pride than those less than 50 years.	Moderate evidence
Voting rates (adjusted)	Mental wellbeing, experienced wellbeing	People who lived in areas with higher voting rates had better mental wellbeing and better experienced wellbeing.	Good evidence
Voting rates, rural and urban areas (interaction)	Absolute civic pride, relative civic pride	People living in urban areas had worse absolute and relative civic pride than those living in rural areas, particularly where voting rates were low.	Moderate evidence
Volunteering rates (adjusted)	Mental wellbeing, experienced wellbeing, absolute civic pride	Higher volunteering rates in local areas were associated with better mental wellbeing, experienced wellbeing, and absolute civic pride.	Good evidence
Unemployment rates (adjusted)	Mental wellbeing, experienced wellbeing, absolute civic pride	Higher unemployment rates in local areas were associated with worse mental wellbeing, experienced wellbeing, and absolute civic pride.	Good evidence
Unemployment rates and age (interaction)	Mental wellbeing	Those aged 50-70 years had better mental wellbeing than those aged less than 50 years when unemployment was relatively low. However, at higher unemployment rates, there were no age differences between these age groups.	Moderate evidence
Unemployment rates and individual unemployment (interaction)	Relative civic pride	Among those who were employed, the odds of low relative civic pride were higher when the unemployment rate was higher, but there was no evidence of a difference for the unemployed	Moderate evidence
Average income (adjusted)	Mental wellbeing, experienced wellbeing, absolute civic pride	Areas with higher average income had better mental wellbeing, experienced wellbeing, and absolute civic pride.	Good evidence
Average income and household income (interaction)	Mental wellbeing	While higher area-level income was associated with proportionally better mental wellbeing, this relationship was weaker for households with larger incomes.	Moderate evidence
Walkable assets (adjusted)	Relative civic pride	Having greater than 11 walkable assets in the local area was associated with worse relative civic pride (but this relationship was smaller when accounting for perceived safety of the local area).	Moderate evidence

Result	SWB outcome	Result description	Evidence quality
Walkable assets and age (interaction)	Experienced wellbeing	For those aged 70+ years, the odds of having low experienced wellbeing were higher for people who had more than 11 walkable assets in the local area compared to those who had fewer than 11 walkable assets.	Moderate evidence
Walkable assets and perceived safety (adjusted mechanisms model, post-hoc)	Relative civic pride	There was no relationship between walkable assets and civic pride when accounting for perceived safety of the local area and other factors, suggesting omitted variable bias.	Moderate evidence
All (mechanisms)	All	It was more important for subjective wellbeing that people felt a sense of belonging to their local area, and that they did not feel lonely, than that they perceived their local friendships mattered or perceived they were able to access local services. At the individual-level, perceptions of difficulties managing financially and thinking that finances would be worse in the future were associated with higher odds of low subjective wellbeing. The size of the objective community effects coefficients was sometimes reduced, or became less precise, when including these variables and other covariates, suggesting they could be mediating the relationships and acting as mechanisms – particularly for relative, versus absolute, civic pride.	Good evidence

Note: evidence classified according to size of effect and whether it sustained in robustness tests. Results from adjusted models (set two), interaction models (set three), and mechanisms models (set four) – see page 34-35.

Appendix 5, Model A

Revised model of relationship between community and individual wellbeing from Understanding Society results.

COMMUNITY WELLBEING

Objective factors

FLUID	FIXED
• Votes, volunteers, unemployed, % talks to neighbours.	• Local authority boundary.
• Index of ethnic dissimilarity.	• Rural / urban area.
• Average income and nuber of walkable amenities.	

Subjective 'links' (mechanisms)

Perceptions of belonging to local area.

Subjective wellbeing

Evaluations –
overall, do you like living in this neighbourhood?

Low individual subjective wellbeing –
proportion of people with low experienced and mental wellbeing scores (from below) at local authority level.

Objective factors

FLUID	FIXED
• Individual talks to neighbours	• Age
• Unemployed	
• Ethnicity	
• Income	

Subjective 'links' (mechanisms)

If managing well financially, perceptions of financial future, loneliness.

Subjective wellbeing

Mental wellbeing –
SMEMWBS, feeling and functioning.

Experienced wellbeing –
enjoyment, unhappy / depressed items from General Health Questionnaire.

INDIVIDUAL WELLBEING

Appendix 6 – Topic guide

Individual and Community Wellbeing – Semi Structured Topic Guide

INTRO

Thank you for agreeing to complete this interview about your perceptions about the relationship between individual and community wellbeing. This interview should take around 45 minutes depending on your answers.

To confirm, have you already consented to take part? YES/NO

IF NO: Provide PIS and Consent Form and re-take consent

IF YES: Do you confirm that you understand:

- Your participation is voluntary
- You can stop this interview at any time without having to give a reason for doing so
- I will record the interview with your permission

Are you happy to take part in the interview?

Turn on Zoom recording.

START

Part	Topic
1	<u>Introduce self and project background</u> My name is Laura Kudrna and I am a Research Fellow at the University of Birmingham. I'm working with the What Works Centre for Wellbeing, Centre for Ageing Better, and Spirit of 2012 on a project about better understanding the relationships between individual and community wellbeing.
2	<u>Role in your organisation</u> I'd like to get to know you a bit better. Could you please tell me a bit about who you are and where you work?
3	<u>Understanding of and experience with individual and community wellbeing</u> Lets start with a little reflection. What words come into your head when you think of the word 'wellbeing'? *[Probe for around five]* What are your understandings of individual wellbeing and community wellbeing? *[Probe for individual, community separately]* What experience do you have with individual wellbeing and community wellbeing? *[Probe for if they have been involved in projects or programmes that seek to influence individual and community wellbeing, and seek examples from professional and personal life]* What are your perceptions about the relationship between individual and community wellbeing? *[Probe specifically on how they are related and the 'links' between them]*

Part	Topic
4	<u>Positive/negative changes in individual and community wellbeing</u> Thank you. Now, lets talk about changes in wellbeing. Please could you give me [an example that you've come across / a project or programme that you have been involved in] that sought to change individual or community wellbeing, and how it went about trying to create the change? *[Depending on how above question on involvement is answered – go for involvement unless none]* Probes: • Were there any changes that seemed to be related to the project or programme? What were they? [note positive / negative changes] • How did you come to know about the changes – was it based on people's perceptions or other types of data? • Were there specific barriers and enablers to the change, e.g. a particular policy context? • Were there trade-offs between different groups? • Trade-offs between individual and community wellbeing? • Risks of adverse outcomes for different individuals/groups? • Did some people's experience in one group affect their experience in another? • Is this a programme you were directly involved in delivering or evaluating? • How does your role shape decision-making about individual and community wellbeing and changes like these?
5	<u>Model feedback</u> We have been conducting some research about community wellbeing and developed this model to show how different interventions might impact individual and community wellbeing *[show model 1, the Powerpoint slide]* Does this model resonate with your experiences? Why / why not / how? Could you see ways in which this model might be helpful in guiding your work? Why / why not / how? *[Show alternative models if appropriate – with more words, stories, visualisations]*
6	<u>Which do you think is better, a policy which achieves a reasonable level of wellbeing for everyone, or a policy which leads to higher total wellbeing overall, but results in high wellbeing for some people and low wellbeing for others?</u> Bearing in mind this may be a 'false binary' (not necessarily one or the other) and we are looking for your thoughts and perceptions. *[Better could be 'maximising total wellbeing' or not]* *[Probe for why - should resources be targeted at low wellbeing to level up? By targeting or taking comprehensive or universal approach? Does this question apply to, say, income more than health or wellbeing? Their experience with distributions of wellbeing and trade-offs?]*