2020 UNDP Human Development Report
BACKGROUND PAPER NO. 6-2020

A Bird's-Eye View of Well-Being: Exploring a Multidimensional Measure for the United Kingdom

Sabina Alkire and Fanni Kovesdi

Sabina Alkire is the Director of the Oxford Poverty and Human Development Initiative in the Department of International Development, University of Oxford. ***Fanni Kovesdi*** is a research analyst with the Oxford Poverty and Human Development Initiative in the Department of International Development, University of Oxford.

ABSTRACT

This paper explores a new approach to capturing well-being and human development in a single, joint multidimensional index that is at once intuitive, rigorous and policy salient. Based on Amartya Sen's capability approach and the Alkire-Foster method as adapted in Bhutan's Gross National Happiness Index, the paper presents a new exploratory Multidimensional Well-being Index (MWI) for the United Kingdom. The aim of the paper is twofold: Inform the debate on the measurement of well-being and of human development more generally, and illustrate the added value of a single rigorous metric in the form of an index as a complementary headline measure to gross domestic product (GDP). The MWI presented here follows a subset of the domains and indicators from the official national well-being dashboard for the United Kingdom and is constructed from a single wave of Understanding Society (Wave 9) data. Findings are presented at the national level and decomposed by population subgroups and regions to reveal inequalities in well-being across the population. The indicators are data constrained so we recommend the results be interpreted as illustrating a methodology that could be insightful for policy if appropriate indicators were agreed by due process. Results show that 44 percent of the population enjoys satisfactory levels of well-being, but this varies greatly. For instance, across ethnic groups, 53 percent of people from a White background enjoy favourable well-being, but that is the case for only 35 percent of people from all other ethnic groups combined and only 27 percent of persons who self-identify as being of a Black/African/Caribbean/Black British background. Many people report lacking a balanced diet and minimum physical exercise, as well as feeling unhappy, anxious and unsatisfied with income or leisure time. This highlights the need for policy focus on these areas if well-being is to be raised and maintained for all.

Introduction

Recent public discourse evinces a clear hunger to bring well-being to the centre of the frame of articulate societal objectives. For many, this is in light of the ongoing COVID-19 pandemic, which refocused attention on topics previously often perceived as 'personal' or secondary to economic and political affairs. Such topics include health behaviours, food security, family relationships, mental health and psychological well-being, physical exercise, access to natural and sacred spaces, community engagement, and acts of generosity and solidarity. Such changes in discourse and priorities reflect the new circumstances many have experienced. Living in the shadow of grave dangers to human life (from the disease but also from threats ranging from food insecurity to domestic violence), and accompanied by the stress of unemployment, uncertainty and waiting, many suddenly entered a world in which economic activities were not the overwhelming lodestar. Even though the economic calculus, very rightly, is ever part of the discussion, and the forthcoming recession is viewed with great trepidation, many were exposed to new challenges affecting quality of life. Boundaries between work, school and personal activities became unexpectedly porous as many were catapulted into remote working alongside children and other household members, while regular social contact with relatives, friends and colleagues ceased overnight. What space does this open for policy-salient measures of well-being?

It is very much hoped that the pandemic will be controlled, any recession will be short-lived and life will again take a more predictable cadence. Nevertheless, the uprooting of well-established habits offers an opportunity to reassess public policy priorities—including measures by which progress is assessed. If a country road has been used by tractors for many seasons, the tracks cut deeply into the earth, making it nearly impossible to waver from the usual course. But after a storm, when the ground is soft, if the tractor suddenly skates across at a different angle due to an overpowering wind, then the possibility of taking a new course or some modification of it persists for some time. The pandemic has softened the ground in terms of societal markers of success and created a fresh space in which to consider holistic well-being measures. Such measures could better encapsulate the wider aspects of life that gained centre ground over the last year. With countries considering how to restart a 'new normal', this offers an opportunity to address human well-being in a new context, complementing well-established economic indicators of progress. Monetary measures cannot alone capture the multidimensional nature of human life nor are they well-equipped to capture and track changes in psychological and physical well-being, education, employment or living conditions. The pandemic has highlighted the centrality of these issues, confirming that well-being is indeed multidimensional and that human development does not necessarily equate to economic progress.

Moreover, it may be desirable to identify and consciously hone beneficial changes that occurred during the pandemic, such as increased attention to issues of food security, loneliness and social connections, or the uptake in physical activity, online learning, volunteering and community initiatives under national lockdowns.

Many of these activities add value to people's lives, but GDP—the single monetary measure used to track the progress of a country—does not account for unpaid activities such as caring or volunteering. Being a unidimensional measure, it fails to address the complex nature of human well-being. Likewise it may be desirable to consciously focus on new priorities that became more visible and articulated as contributing to well-being, such as the desire for flexible working, green spaces or time spent with loved ones. How could investigations into measurement help to improve and consolidate some of these new tracks and ensure that well-being is placed at the centre of governance in the campaign to 'build back better'?

This paper proposes for public discussion a trial Multidimensional Well-being Index (MWI) for the United Kingdom. It could equivalently be considered a Multidimensional Index of Human Flourishing, a second generation multidimensional measure of human development. But to avoid any possible confusion with the famous Human Development Index (HDI), this paper will refer to the measure as the MWI.

The MWI presented in this paper is an easy to understand, intuitive measure with the potential (once data constraints are addressed) to complement GDP as a headline statistic of human well-being. Based on the Alkire-Foster method, the MWI is statistically rigorous and methodologically precise, and, most essentially, is suitable for designing policy interventions and monitoring improvements in well-being over time. Methodologically, the proposed measure uses the person-centred counting methodology of Bhutan's Gross National Happiness (GNH) Index, which has been used for over 10 years to shape programmes and policies, and to spark public discussion. Conveniently for the human development family of measures, the MWI, and the underlying GNH Index, adapt the Alkire-Foster method, which is already widely used in poverty measurement, such as the global Multidimensional Poverty Index (MPI) released annually by the Oxford Poverty and Human Development Initiative and UNDP. Conceptually, this approach is coherent with a number of theoretical approaches to well-being, including the human development and capability approach of UNDP. Empirically, the paper illustrates the MWI using trial indicators covering the 10 domains of well-being in the United Kingdom, identified by the Office for National Statistics, to the extent possible from the ninth wave of the nationally representative Understanding Society survey. And while the proposed index is data-constrained, and challenges remain in adopting indicators related to environmental conditions, employment, safety or group membership, to name a few, the index nevertheless offers a new approach that is policy relevant, and can demonstrate the benefits of using an index to measure and analyse well-being across the population.

The paper proceeds as follows. The next, second section outlines the motivation for this study, and its relationship to human development and well-being measurement. It also sketches the example of Bhutan's innovative GNH Index to illustrate how the MWI could track changes and provide a focus for public policy. The section finishes with an overview of the well-being landscape in the United Kingdom over the last decade. The third section presents the Alkire-Foster method and its innovative application to well-being in the GNH Index, and proposes the trial MWI for the United Kingdom. The fourth section introduces the data and specifications

for the selected indicators and dimensions, and sets out two proposed indices and weighting structures. The fifth section presents headline statistics from the MWI across the five gradients and decomposed by subgroups and indicators to focus on disparities in well-being across the population. The sixth section sets out some closing ideas around the findings, and suggestions on how to improve well-being in the United Kingdom. Finally, the paper concludes by highlighting the limitations of the index and the data used, and proposes future ideas and improvements for a well-being index.

Background and motivation

GLOBAL AGENDA

In 1990, the pioneering *Human Development Report* led by Pakistani economist Mahbub ul Haq, and drawing on Amartya Sen's capability approach, articulated the concept of people-centred development. It set as the central objective of human development the expansion of human freedoms and capabilities across multiple dimensions. Other phenomenon such as economic growth were to be advanced not as ends in themselves but insofar as they contributed to this objective. To demonstrate the impact of this shift in perspective empirically, a new and elementary index, the HDI, was developed. It contained national data on education and health (life expectancy) in addition to GDP per capita, and ranked countries according to a composite score. Interestingly, the ranking differed, at times markedly, from country rankings according to gross national product (GNP) per capita, revealing a disjuncture between economic growth and human progress and well-being as captured by the non-monetary indicators of the HDI (UNDP 1990). This simple technique of widening the goalposts by which success is evaluated sparked practical changes in terms of investments in health and education. Over time, the introduction of the HDI opened up a new avenue for research on multidimensional measurement of well-being and poverty, which always considered information on non-income capabilities.[1]

The fundamental driving idea of the *Human Development Reports*—namely, their focus on human lives and capabilities rather than on political or economic objectives—garnered widespread interest, although it took time to swing the focus of mainstream discourse. Policy discussion during the 1990s mainly focused on the role of economic growth, austerity and post-conflict strategies, although the *Human Development Reports* and the World Bank's *World Development Reports* also explored wider considerations ranging from empowerment and poverty to environment and gender. During the next two decades, a parallel literature in economics emerged that, while advocating a move beyond income to proxy human well-being, pursued a unidimensional approach focused on happiness and subjective-well-being in the form of self-reported happiness, evaluative life

[1] Alkire 2002; Anand and Sen 1996, 2000; Clark 2002; Fukuda-Parr 2003; Gasper 2004; Nussbaum 2001; Ranis, Stewart and Samman 2006; ul Haq 1995; UNDP 1990.

satisfaction, mood, domain satisfaction and positive affect.[2] With this literature in full blossom, the *World Happiness Report* was launched to provide a view of Western measures of evaluative subjective well-being across countries and to focus on topics related to happiness.[3]

By making visible the shortcomings of GDP per capita, the HDI opened a conversation that many joined about how to improve such measures—with new dimensions including health, education, subjective well-being, and others like political voice, relationships, environment, work and time use. Similarly, in an effort to address the increasingly evident limitations of economic indicators such as GDP and gross national income (GNI), the Beyond GDP Initiative was set up in Europe to develop non-monetary indicators of progress that capture environmental and social aspects of well-being. These political and academic developments, coupled with public dissatisfaction with existing statistical measures of social and economic progress, also led to the formation of a commission by France's then President Sarkozy to explore new ways of capturing information on human and economic development. Co-chaired by Amartya Sen, Joseph Stiglitz and Jean-Paul Fitoussi, the Commission published its report in 2009, stating that the "time is ripe for our measurement system to shift emphasis from measuring economic production to measuring people's well-being" (Sen, Stiglitz and Fitoussi 2009, p. 12). One of the three themes addressed quality of life, and emphasized the need for multidimensional measures to capture the complexities of well-being, laying bare the foundation for emerging work on the topic. As a follow-up to the recommendations of the Commission, in 2011, the Organisation for Economic Co-operation and Development (OECD) launched its Better Life Initiative to inform and unify measurement across countries and organizations. As part of the initiative, it introduced the Better Life Index (BLI), an HDI-style composite index that compiles 11 indicators, with an online platform offering users the chance to adjust weights to reflect differing personal values and preferences. The BLI captures many of the topics outlined by the Commission, with indicators on material deprivations and quality of life. In addition, the biannually released *How's Life* reports provide an assessment of well-being across OECD nations, alongside evolving and best practices in measurement.

In international fora, 2018-2019 was a landmark period for global work on well-being with the release of the final, three-volume report of the International Panel on Social Progress at Princeton. A summary "Manifesto" proposed alternatives to GDP and also canvassed, systematically, different dimensions of well-being (IPSP 2018; Fleurbaey et al. 2018). The authors called for an adaptation of the agenda and framework for sustainable development, and advocated new ideas and institutions to ensure sustained social progress, manifested in

[2] For various perspectives, see Argyle 1991; Cummins 2000; Diener et al. 2009; Helliwell and Wang 2012; Layard 2005; Kahneman 201;, Ricard 2007 and Seligman 2012, among others.

[3] *The World Happiness Report* was launched to mark World Happiness Day, an initiative of the Royal Government of Bhutan endorsed by the UN General Assembly. Bhutan's GNH Index, however, which had generated such international interest, was not pursued. A single-indicator ranking from the Gallup Poll has been used to rank countries in terms of evaluative life satisfaction.

equity and freedom for all, and environment sustainability. Simultaneously, the OECD released two volumes on the follow-up to the Stiglitz-Sen-Fitoussi Commission, now co-led by Joseph Stiglitz, Jean-Paul Fitoussi and Martine Durand (2018a and 2018b).

Beyond the international response, many national initiatives sprung up, involving citizen consultations to articulate the appropriate domains of well-being and inform the work of statistical offices designing new indicators and measures (Stiglitz, Fitoussi and Durand 2018a). For instance, New Zealand invested in a new generation of work on well-being and public policy, and produced a dashboard of well-being indicators and a conceptual framework for the Treasury that led to the launch of the world's first ever well-being budget in 2019 (New Zealand, Treasury 2019b). In Europe, Germany (Germany, Federal Government 2020), Iceland (Iceland, Prime Minister's Office 2019) and Scotland (Scotland, Scottish Government 2020) have all adopted well-being frameworks and indicators for public policy and spending assessment. Most recently, the Green Party in Ireland has published a paper as part of its campaign advocating for using well-being indicators to measure the welfare of the country (Green Party Ireland 2020). Perhaps due to the multitude of information offered by the literature, experts and the population, however, most national adaptations have focused on extended statistical dashboards despite the Commission's recommendations for a single summary measure that goes beyond population averages and captures information on multiple (joint) deprivations.

Overall, we might conclude that in well-being conversations since the Stiglitz-Sen-Fitoussi Commission, an increasing number of governments, organizations and academics have sought to measure well-being, broadly conceived. Yet as initiatives proliferate, there is not yet gathering consensus on what kinds of measures will be most intuitive, rigorous and policy salient. The recommendations from the report call for a multidimensional approach that captures the different components of well-being, and stress the need for disaggregated data to understand variations within the population. The report also identifies the importance of placing well-being at the centre of policy making and including it in every stage of the process from agenda setting to policy formulation, implementation, and monitoring and evaluation (Stiglitz, Fitoussi and Durand 2018a, ch. 4).

GROSS NATIONAL HAPPINESS INDEX OF BHUTAN

Among the Stiglitz-Sen-Fitoussi Commission's recommendations was a proposal that any measure of well-being should be multidimensional and incorporate a basic set of objective indicators capturing material living standards, health, education, the environment, personal activities including work, social connections, insecurity, political voice and governance, as well as subjective indicators of well-being concerned with cognitive evaluation, and positive and negative affect (Stiglitz, Sen and Fitoussi 2009). The Commission also called on statistical offices to produce aggregate information on quality-of-life dimensions that allow for the construction of single, summary measures that are more tractable for policy than 'large eclectic dashboards' with uncertain priorities. In the United Kingdom, Allin and Hand voiced their concern that "without a single

national well-being number, the hegemony of GDP will never successfully be challenged" (2016, p. 21), despite significant focus and investment in the measurement of various well-being indicators. To take us one step closer to complementing GDP as a leading national statistic and to address the concern mentioned above, this section presents the innovative approach of Bhutan's GNH Index to demonstrate the value added of a people-centred approach to multidimensional well-being measurement, and to illustrate how an MWI could permit policymakers to accurately assess and monitor disadvantages in the United Kingdom.

Preceding the report of the Stiglitz-Sen-Fitoussi Commission and its focus on well-being as an alternative indicator of social progress, since the 1970s, the Royal Government of Bhutan has advanced the concept of gross national happiness. In 2008, it designed and launched the first official multidimensional index of human well-being, the GNH Index. That first national measure was followed by the first index disaggregated by *dzongkhag* (district), which revealed disparities in well-being across population groups and was used to elucidate policy responses by the Government of Bhutan (Ura et al. 2012). Besides simply measuring and monitoring well-being in the country, the GNH Index enables policymakers to accurately assess disadvantages along particular dimensions and among certain subgroups, and design policies that eliminate human suffering while simultaneously increasing quality of life and well-being. The index is introduced by Ura et al. (ibid., p. 8) as follows:

> One of several tools for public policies to advance GNH is an index of Gross National Happiness that enables policymakers to track progress across the different aspects of GNH. Caveats are natural: an index cannot include all aspects of GNH that are relevant. Nor is it sufficient to guide policy—it must be complemented by an in-depth, narrower analysis of policies and programmes, tailored to local realities. Further, it must be advanced by a plurality of institutions. Because advancing GNH depends upon actions by civil servants, government workers, the private sector, and civil society, the objective of maximising GNH must resonate with plural groups across Bhutanese civil service and society. So while an index alone is limited and insufficient, a robust and compelling index—rigorously formulated and clearly presented—can do what no other single tool can do, which is sketch roughly how GNH is evolving across Bhutan as a whole over time, as well as for different groups, regions and people. It can also convey *how* people are happier—or unhappier—than previously, and thus inform practical action.

Methodologically, the index uses a well-being application of the dual-cutoff methodology of Alkire and Foster (2011) to measure well-being in nine dimensions: good health, education, living standards, environmental diversity and resilience, good governance, time use, community vitality, cultural diversity and resilience, and psychological well-being. Since its initial publication, the GNH Index has been updated using data from 2010 and 2015. Levels and changes in the index and its component indicators were analysed for each of Bhutan's 20 districts, as well as by gender, rural and urban areas, age and occupation, between 2010 and 2015. Although descriptions of many of the policy activities that drew on this information have been published elsewhere,[4] a

[4] For examples of how GNH is used for policy formulation, see the GNH Screening Tool and the Gross National Happiness Commission.

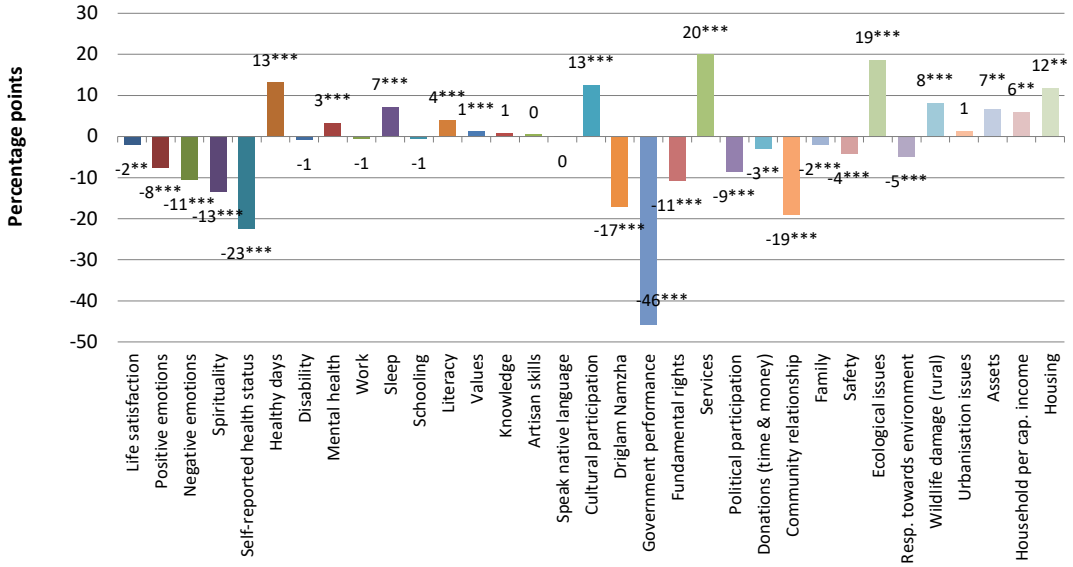
simple example might serve to illustrate the value added of a composite index that is decomposable by demographic characteristics and geographic regions, as well as broken down by indicators to allow for more refined analysis.

Figure 1 reports the absolute change in the percentage of people enjoying sufficiency in each of the indicators, while the relative changes are presented in Figure 2. The indicators with the highest improvements since 2010 were services under the governance domain, which increased 20 percentage points (49 percent), and ecological issues, which increased 19 percentage points (27 percent). In general, living standard, health and education indicators improved. The most prominent decreases in sufficiency level were in the perception of government performance, which fell 46 percentage points (corresponding to a 58 percent reduction), followed by self-reported health status, which fell 23 percentage points. Note that changes in these indicators create only a small impact on the overall change in the GNH Index value because both indicators are subjective and have a lower weight.[5] All indicators of psychological well-being decreased, as did a few indicators under community vitality. Indicators that did not register any statistically significant change between 2010 and 2015 were disability, work, schooling, knowledge, artisan skills, speaking the native language and urbanization issues.

The results from 2010-2015 show a society in rapid transition, with great gains in economic and social areas, but strains appearing in psychological and community domains. In the absence of the GNH Index, it would not be possible to see these diverging trends or to readily open a public discussion about priorities given these trends.

[5] For more information on weights for GNH, see Ura et al. 2012. For a discussion of weights for subjective indicators, see the fourth section of this paper.

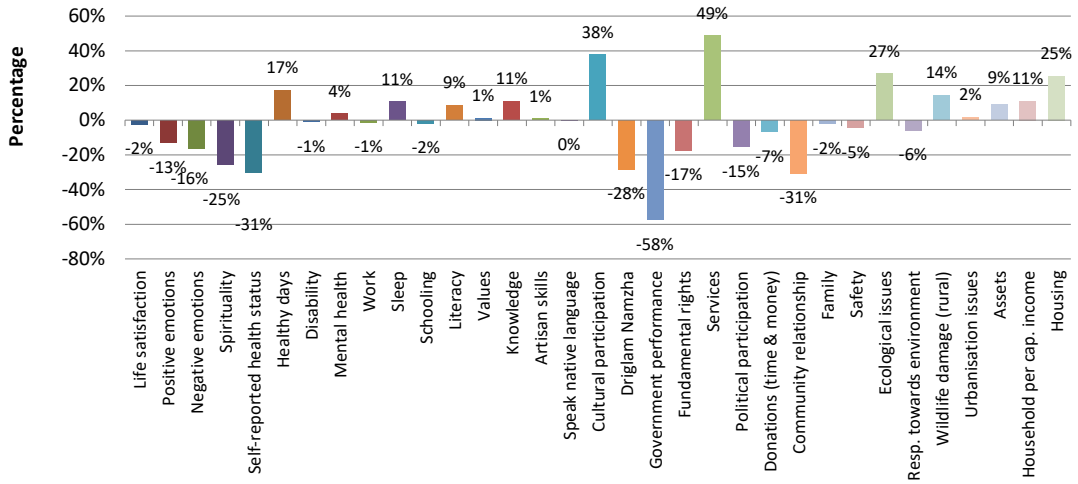
Figure 1. Absolute change in the percentage of people enjoying sufficiency



Note: ***statistically significant at 1 percent, **statistically significant at 5 percent, *statistically significant at 10 percent.

Source: Ura et al. 2015.

Figure 2. Relative change in the percentage of people enjoying sufficiency



Source: Ura et al. 2015.

WELL-BEING IN THE UNITED KINGDOM

In the United Kingdom, while Layard and others started a powerful earlier discussion mainly around the measurement of happiness, the policy shift towards well-being gained visibility in 2010 when a new Government announced a strategy and focus on well-being with the aim of "measuring our progress as a country, not just by how our economy is growing, but by how our lives are improving; not just by our standard of living, but by our quality of life" (Cameron 2010). Subsequent statistical strategies were developed to include well-being measures in national surveys and to use the information for evaluating existing and planned policies.[6] Institutionally, an independently functioning organization, the What Works Centre for Well-being, was founded to publish guidance and research on well-being. Simultaneously, an independent Commission on Well-being and Policy was formed by the Legatum Institute; it included Martin Durand, Angus Deaton and Richard Layard, among others, and focused on advancing the debate on measurement of subjective well-being and its importance for public policy, with the final report of the Commission published in early 2014 (O'Donnell et al. 2014).

Beyond designing policies for the well-being of individuals and communities, the Government of the United Kingdom in 2010 announced plans for a national measurement agenda on well-being. While initially focused on exactly four subjective well-being indicators, the inability of those indicators to track changes and distinguish between different regions, plus the results of national consultations, led to the development of a national well-being dashboard by the Office for National Statistics. The framework reflected national consultations on what well-being is, key themes, as well as purposes and uses for the new measure. Importantly, the consultations concluded that well-being is inherently multidimensional, and that no single, coherent definition exists among members of the public on what constitutes a 'good life' (United Kingdom, Office for National Statistics 2011). Initially presented in the form of a wheel, the national dashboard contains 10 domains and 41 indicators[7] (shown in Table 1) covering both subjective and objective aspects of well-being. The dashboard provides a richness of indicator detail, and avoids the need for data to be available for the same set of persons or households. Combining information at the individual, household and aggregate level across indicators, however, hinders the analysis of overlapping deprivations, while the mixing of achievements and deprivations makes it hard to get an overall understanding of the state of well-being across the population. The national measure thus aimed to assess "how we are doing as individuals and as a nation and how sustainable this is for the future" (United Kingdom, Office for National Statistics 2016). Yet while informative on specific indicators, it does not offer a summary statistic equivalent to GDP or other monetary measures of progress that would help elevate well-being to the same standing as indicators or economic growth. As of now,

[6] See Fujiwara and Campbell 2011; United Kingdom, HM Treasury 2020.

[7] Note that two of the indicators, healthy life expectancy and physical safety, are reported separately for women and men, hence the reference to 43 indicators in some Office for National Statistics publications.

no well-being measures have saturated mainstream public and political discussion in the United Kingdom. Since the initial introduction of the measure in 2010, no subsequent governments, parties or politicians have directly taken on the issue of well-being as part of their political agenda and vision for the country.

Despite the lack of clear political development on the agenda, recent years have brought a renewed interest in measuring certain aspects of well-being in the United Kingdom. The release of a nationwide report on loneliness by the late Member of Parliament Jo Cox (Jo Cox Commission on Loneliness 2017) led to the appointment of a ministerial lead and a cross-country strategy to measure and combat loneliness, with the first annual report published in early 2020, and new loneliness indicators adapted for surveys (United Kingdom, HM Government 2018 and 2020; What Works Wellbeing 2019). Devolved administrations in Scotland and Wales have further advanced the agenda on well-being over the last decade. In 2015, the Welsh Assembly adopted the Well-being of Future Generations Act, which includes seven well-being goals and places sustainable growth at the centre of governance and policymaking (Future Generations Commissioner for Wales 2020). In Scotland, a National Performance Framework was introduced in 2018 to move beyond GDP as a solitary measure of progress; it captures success using 81 indicators across 11 areas of life that reflect the shared values and aspirations of the population (Scotland, Scottish Government 2020).

In addition to governments and statistical offices, many civil society organizations[8] have presented new approaches to measuring quality of life in the United Kingdom, with examples ranging from individual to community measures. These include the Thriving Places Index, which uses data from different government sources to create a dashboard at the local authority level; the Co-op Community Well-being Index, which measures well-being at the sublocal authority level (neighbourhoods) with a focus on relationships, people and place; the Index of Well-being in Later Life by the charity Age UK, an individual-level measure focused exclusively on people aged 60 and over and using data from a single survey; and the recently published Gross Domestic Wellbeing measure by the Carnegie Trust, which uses data from the Office for National Statistics. To date, however, only a dashboard approach to measuring well-being has been used in an official capacity in the United Kingdom. More than data availability, the low uptake of multidimensional indices in national well-being measurement (in the United Kingdom and more broadly) might also reflect statisticians' presumptions that it is not possible to build an index with both credibility and policy salience.

This paper aims to present an alternative approach to existing measures of well-being. In line with the recommendations of the Stiglitz-Sen-Fitoussi Commission, it develops an MWI for the United Kingdom as a policy tool. The next section outlines the methodology and innovative approach of Bhutan's GNH Index, then applies that method to the United Kingdom to create two alternative multidimensional indices that build on

[8] Many internationally comparable indices of quality of life exist, including the Global Peace Index, Legatum Prosperity Index, Social Progress Index, World Happiness Index and the OECD Better Life Index.

the official dashboard by the Office for National Statistics. The paper then presents the results at the national level and decomposed by age group, gender, geographical region and ethnicity, and provides an analysis of the joint distribution of deprivations and the contribution of each indicator to overall levels of well-being. It closes with a discussion of the public policy outcomes of the findings and ideas for future research.

Methodology

To develop an MWI for the United Kingdom, this paper follows the innovative adaptation of the Alkire-Foster method by Bhutan, which constructs individual well-being profiles for each person, aggregated to a single score and divided into gradients to depict the levels of well-being across the population. The next section outlines the basic principles of the Alkire-Foster method, the adaptation of the methodology for well-being measurement pioneered by Bhutan's GNH Index and the formal notation for calculating the MWI for the United Kingdom.

ALKIRE-FOSTER METHOD

The basic methodology is a counting-based approach to measuring multidimensional poverty and well-being, developed by Sabina Alkire and James Foster (2011). The method enables a rigorous and detailed analysis of multidimensional conditions; its most common application has been in the field of multidimensional poverty measurement.[9] The index can be tailored to each individual country context (or cross-country analysis) by selecting indicators, dimensions, weights and cut-offs that reflect the context and policy priorities, insofar as data permit. To identify populations of interest (e.g., who is poor) the Alkire-Foster method uses a dual cut-off approach. It first assesses whether a person's achievements fall short of a standard for each indicator using deprivation cut-offs. This creates a profile showing indicators in which each person's achievements fall short of the standard. A person's deprivations are summarized into a deprivation score showing the percentage of weighted indicators in which each person is deprived. Next, a cross-dimensional cut-off is applied that identifies individuals as multidimensionally poor (for example) if their deprivation score is equal to or greater than the poverty threshold. This identification process gives the headcount ratio (H), the percentage of people who are poor according to the index, and the intensity of their poverty (A), that is, the average weighted deprivation score among the poor. The adjusted headcount ratio (M0) or the MPI is the product of the two, calculated by multiplying incidence and intensity (M0 = H x A). By including intensity, the M0 measure reflects any changes

[9] The most well-known application of the method is the global MPI developed by the Oxford Poverty and Human Development Initiative and UNDP. It is used to measure acute poverty in over 100 developing countries. Other applications include regional, subgroup and national MPIs, many of which are used as official statistics.

in deprivations and can differentiate between those above the cross-dimensional cut-off (Alkire and Foster 2011; Alkire et al. 2015).

Besides providing a single headline statistic that is at once able to capture any improvements or changes in deprivations, multidimensional indices based on the Alkire-Foster method feature multiple properties that make them useful tools for policymaking. Alkire-Foster indices can be decomposed by subgroups and geographical area, and broken down by indicator to provide more refined understanding of poverty among the population and highlight any inequalities in progress (Alkire and Robles 2016). This also provides incentives to policymakers to target the most deprived subgroups and areas of the population by focusing on particular deprivations identified by the index, and to monitor changes in poverty levels over time to ensure that the most vulnerable are not left behind. Further, the index can also be broken down to present the percentage of the population deprived in each of the indicators before and after applying the cross-dimensional cut-off. Thus, Alkire-Foster indices invite a focus on the deprivations experienced by the largest share of the poor, and allow for multi-agency responses that reflect the multiple overlapping deprivations captured by the measure. Lastly, the contribution of each indicator to overall poverty shows the deprivations that have the largest impact on people's lives, and can ameliorate agenda and priority setting among policy practitioners (Alkire and Foster 2011; Alkire et al. 2015).

WELL-BEING APPLICATION

Beyond its application to poverty measurement (see national and international measures such as the global MPI), the Alkire-Foster method is well-suited to measuring the well-being and happiness of the population using a multidimensional index (Alkire 2016). Deprivation in quality of life may be concentrated among poorer subgroups; for instance, the same people lacking sufficiency in good health might also be deprived in psychological well-being or employment. But loneliness or mental health challenges or sudden job loss may also strike population groups who were not poor at all before. Understanding the multiple overlapping deprivations people face can enable better policy responses with interventions and programmes designed to target multiple indicators at once. Indices based on the Alkire-Foster method have the advantage of presenting a summary headline figure that reflects the incidence and intensity of people's well-being (or poverty), while also conveying information on the joint distribution, as opposed to a dashboard, which simply presents the headcount ratio for each indicator without providing an overarching picture of well-being across the population.

Bhutan's study of GNH introduced the first extension of the Alkire-Foster method to well-being measurement by reconceptualizing the deprivation cut-offs and poverty cut-off(s), with the index reported in positive terms as $(1 - M_0)$ to reflect well-being rather than poverty (Alkire 2016). While the detailed methodology is presented

in Ura et al. (2012), an abbreviated introduction is provided here to summarize the key methodological features of the index.

Sufficiency cut-offs were used to identify whether a person has sufficient achievement in a given indicator to create the 'causes and conditions' of happiness or whether they are deprived. Justification for the chosen cut-offs came from a variety of sources, such as international and national standards, value judgments and the findings of nationwide participatory studies (ibid., p. 28).

Weights for each indicator and domain were defined normatively, relying on a variety of information from technical and policy objectives (e.g., subjective indicators receiving smaller weights), to participatory exercises where respondents assigned weights based on their own opinions on what counts for well-being. Different weighting structures were tested to determine the robustness of the measures and any changes in the composition of indicators or the ranking of disaggregated subgroups, with results of the final weighting structure for the GNH Index published online to invite wider public discussion.

Happiness thresholds implemented in the GNH Index divide society into 'gradients' or degrees of well-being. The index did not pretend to identify who is happy, but rather, who enjoys the causes and conditions of happiness that could be supported by public policy. As such, the happiness threshold permits diverse routes to happiness and does not require sufficiency in absolutely every indicator. There is freedom of choice, of vocation and of leaving some paths untravelled.

The GNH Index is equal to $\mathbf{1–M_0}$, and mathematically, the percentage of people who are happy is (1–H), that is, 100 percent minus the headcount ratio of the associated M_0. Dimensional content can be presented as the percentage of persons attaining sufficiency (to see what is going well) or the percentage lacking sufficiency (to see where policy actions are required).

The intuition of a well-being index, in comparison with an MPI using the Alkire-Foster method, is straightforward. Recall that in a poverty measure, a deprivation threshold is set such that everyone whose achievements fall short of the deprivation cut-off is identified as deprived. In a well-being measure, 'sufficiency' cut-offs dichotomize the population into two groups, with a focus on those whose attainments are 'sufficient'. This simple shift of focus from the deprived to the non-deprived (with new terminology of sufficiency) extends to the computation of the sufficiency score and identification of the population that has attained different gradients of well-being. For each person, a sufficiency score is generated by summing the weighted indicators in which a person's achievements meet or exceed the sufficiency cut-off. A person's position in a well-being gradient is classified by comparing her or his sufficiency score to the overall happiness cut-off(s).

CALCULATING A MULTIDIMENSIONAL WELL-BEING INDEX

Following the example of the GNH Index, different well-being cut-offs are applied based on the weighting structure, dividing British society into five well-being gradients. The first cut-off is set at 50 percent to identify those enjoying sufficiency in less than half of the weighted indicators **(low)**. The second cut-off identifies those enjoying **narrow** levels of well-being with sufficiency in 50 to 62.5 percent of indicators, while the third threshold identifies those with **moderate** levels of well-being and with sufficiency in 62.5 to 75 percent of the indicators. Next, those with a **decent** level of well-being and sufficiency in 75 to 87.5 percent of indicators are identified. The last gradient captures people who enjoy **high** levels of well-being and are sufficient in over 87.5 percent of the indicators.

The MWI for the United Kingdom is calculated by summing the percentage of people classified as enjoying favourable well-being levels (high or decent level) and the product of the percentage of people with less favourable well-being levels (moderate, narrow, low) multiplied by their average sufficiency. This gives a summary score for the MWI that ranges from 0 to 100, representing total well-being in the population. The simple equation follows as,

$$MWI = H^F + H^{LF} \times A^{LF}_{suff}$$

where, H^F denotes the percentage of the population with favourable well-being

H^{LF} denotes the percentage of the population with less favourable well-being (1-H^F)

A^{LF}_{suff} denotes average sufficiency among the population with less favourable well-being.

The MWI presents an intuitive and simple summary score of well-being across the population while also being sensitive to changes in well-being and allowing the tracking of progress over time. By design, the index captures changes in both the incidence of those with favourable well-being and changes in the average sufficiency in the population with below-favourable well-being. Thus if any of the two values increase over time—that is, more people acquire favourable well-being or those with less favourable well-being acquire sufficiency in more dimensions—the MWI will also increase, making it easy to follow changes in well-being over time and analyse underlying patterns that led to or hindered progress.

Data and specifications

DATA

Reflecting the joint distribution of achievements in different dimensions, Alkire-Foster indices usually rely on a single data set to construct all indicators although merged data sets can also be used. To construct the MWI

for the United Kingdom, a single data source was selected that covers many domains of well-being identified in the official national measure.[10] Data from the ninth wave of Understanding Society[11] permits identification at the individual level and disaggregation of the results by age, ethnic group and gender to provide an analysis of intrahousehold dynamics. Running since 2010, Understanding Society, also known as the United Kingdom Household Longitudinal Survey (UKHLS), is one of the largest panel surveys in the world. It incorporates 6,000 households from Wave 2 that were part of the British Household Panel Survey from 1991 to 2008. The UKHLS covers all four countries of the United Kingdom and collects data at the individual level from all ages, with each member of the household interviewed using a household questionnaire, and specific questionnaires for children (under age 10), youth (aged 10–15) and adults (aged 16 and over). The questionnaires contain core modules asked in each wave of the survey with additional modules introduced on a periodic or one-off basis. The later waves of Understanding Society also feature an ethnic minority and immigrant boost sample that permits disaggregation of the results by ethnicity. The survey is representative by region, area and country, as well as by age group and gender, permitting disaggregated analysis of inequalities.

The fieldwork for each wave of Understanding Society covers a nearly two-year period, with households sampled on a rolling basis each month.[12] The Wave 9 data were collected from January 2017 to May 2019 and contain information for nearly 25,000 households and 50,000 adults aged 16 and over, and an additional 12,000 children and youth. Besides the general questions, the special modules included in Wave 9 (and conducted every two years) address social care, discrimination and harassment, exercise and nutrition, family networks, parents and children, and child maintenance. Four additional modules (repeated every three years) are also included, asking respondents about neighbourhood conditions, membership in groups and organizations, social networks, and news and media use. Finally, Wave 9 also includes self-completed questionnaires on neighbourhood belonging, sexual orientation, political engagement and an event-specific questionnaire on the 2017 general election.

The MWI uses information from individuals aged 16 and over from all available samples, including the ethnic minority and immigrant boost sample. The indicators rely on information from both the household and individual adult questionnaires, including the self-completion questionnaire module. Due to this requirement, the analysis includes individuals who successfully completed all three interviews. Respondents who did not

[10] While this exercise uses cross-sectional data, it is feasible to track changes in well-being over time using the MWI and panel data if data on all indicators are available across the waves. At the moment, some modules of Understanding Society are administered periodically, which prevents such analysis with the proposed index structure.

[11] University of Essex et al. 2019.

[12] More detail on the survey design and sampling frame and method is available at the website of The UK Understanding Society Household Longitudinal Study.

complete all three questionnaires were not considered.[13] Additionally, since the MWI captures data on all indicators for each person, those with missing information on one or more of the indicators were excluded from the estimation.[14] Note that for this academic exercise we used the same sample for both measures to facilitate comparison; if one was selected, the sample size would increase as fewer indicators would be considered.

The estimation uses the cross-sectional weights included by the data providers, which in the case of Understanding Society contain zero weights for parts of the final sample. Documentation for the survey states that zero weights are assigned either by sample design or as a result of fieldwork issuing rules.[15] The estimation excludes individuals who are assigned zero weights, thus the final analytical sample for the MWI consists of N=26,508 individuals aged 16 and over. Of the weighted final sample, 54.6 percent of participants were surveyed in 2017, 41.4 percent in 2018 and a smaller 4 percent in the first half of 2019.

The survey allows for results to be decomposed by age group, gender, region, area and ethnicity among other dimensions.[16] The analysis uses the collapsed five category ethnicity breakdown (also used by the Office for National Statistics[17]) containing the categories of White (British, English, Welsh, Scottish, Northern Irish, Irish, Gypsy or Irish Traveller, any other White background; mixed or multiple ethnic groups (White and Black Caribbean, White and Black African, White and Asian, any other mixed or multiple ethnic background); Asian or Asian British (Indian, Pakistani, Bangladeshi, Chinese, any other Asian background); Black, African, Caribbean or Black British (African, Caribbean, any other Black, African or Caribbean background); and other ethnic group (Arab, any other ethnic group). The paper also presents analysis by comparing results among people of a White background and people belonging to all other ethnic groups combined.[18] Age group disaggregation uses the variable available in the data that dissects the sample into seven different age

[13] This includes respondents who only completed the household grid and not the questionnaire (884 observations), or did not complete the self-completion module (2,363 observations) due to refusal (839 observations), inability to complete (443 observations), missing (4 observations) or proxy (1,077 observations).

[14] Respondents with 'truly missing values' (missing, refusal, don't know) are excluded from the final analytical sample. Meanwhile, individuals who were not asked the question (inapplicable) are considered sufficient by default as they could not be assessed. Table B1 in Appendix B lists the missing values for all indicators prior to constructing the final sample.

[15] Some temporary sample members and non-eligible members living in households with individuals sampled for the ethnic minority and immigrant boost samples are assigned zero weights. Additionally, as opposed to being dropped from the sample, households that missed previous waves are still issued fieldwork to prevent attrition. Those that missed a previous wave receive zero longitudinal weights, and subsequently zero cross-sectional weights since those are derived from longitudinal weights. This is the case for the analysis presented here, with all 4,800 individuals with zero cross-sectional weights also having zero longitudinal weights. For more information on weights and sampling, see question 13 on p. 11 of "Weighting and sample representation: Frequently asked questions" (Kaminska and Lynn 2019).

[16] University of Essex et al. 2019.

[17] See the list of ethnic groups.

[18] The category 'White' includes people from a White background (including White minorities). The category 'all other ethnic groups' includes people from mixed/multiple ethnic group, Asian/Asian British, Black/African/Caribbean/Black British and other ethnic group background.

groups: 16–19 (since children and youth are omitted), 20–29, 30–39, 40–49, 50–59, 60–69, and 70 years and over. Gender disaggregation is by female and male categories. Regional disaggregation follows the 12 government regions, while disaggregation by place of residence distinguishes between urban and rural parts of the country. The sample sizes for each disaggregation are shown in Table 4, and Table A1 in Appendix A.

BUILDING A MULTIDIMENSIONAL WELL-BEING INDEX

The proposed MWI for the United Kingdom takes its starting point from the Measure of National Well-being Dashboard of the Office for National Statistics, shown in Table 1, which presents information on 10 domains of well-being. The dashboard collates data from multiple sources including Understanding Society for 11 out of the 41 indicators. As data for some indicators are only collected periodically, however, the dashboard combines information from various data sets ranging from 2013 to 2017 to construct the indicators.

Table 1. Measures of National Well-being Dashboard

Personal well-being	Our relationships	Health	What we do	Where we live
Life satisfaction	Unhappy relationships	Healthy life expectancy	Unemployment rate	Crime
Worthwhile	Loneliness	Disability	Job satisfaction	Feeling safe
Happiness	People to rely on	Health satisfaction	Satisfaction with amount of leisure time	Accessed natural environment
Anxiety		Depression or Anxiety	Volunteering	Belonging to neighbourhood
Population mental well-being			Art and culture participation	Access to key services
			Sports participation	Satisfaction with accommodation

Personal finance	Economy	Education and skills	Governance	Environment
Low income	Disposable income	Human capital	Voter turnout	Greenhouse gas emissions
Household wealth	Public sector debt	Not in education, employment or training (NEET)	Trust in government	Protected areas
Household income	Inflation	No qualifications		Renewable energy
Satisfaction with household income				Household recycling
Difficulty managing financially				

Source: United Kingdom, Office for National Statistics 2019a.

Additionally, the dashboard combines information across multiple levels with some indicators, such as those relating to personal well-being or relationships, referring to individual conditions with variation across the population, while indicators under the domain of the economy or environment capture macro conditions that do not vary across groups or relate directly to individual well-being.

To remedy these issues and ensure that the unit of analysis is consistent across the indicators, the MWI considers a subset of 41 indicators and 10 domains outlined in the dashboard for which information is available from a single data source, Wave 9 of Understanding Society. The two trial MWIs retain or approximate 21 of

the original 41 indicators to a degree that is sufficient for an illustrative academic study, and add five new indicators. Some limitations remain due to data constraints, mainly around the domains of environment, where we live, what we do, as well as education and skills, for which data were not available or only periodically collected as part of the Understanding Society survey. Future work will aim to explore alternative indicators to capture these aspects of well-being using additional waves, as well as exploring new data sources with the aim to present improved indicators that replicate well-being as understood by the public and implemented in the national measure.

Bearing in mind these restrictions, a total of 25 indicators were created for the index, grouped into eight dimensions, and shown in Table 2 (and Figures 3a and 3b). The number of indicators used in these measures (25 and 22) is higher than any official multidimensional poverty index but lower than the number used by Bhutan (33 indicators) and serves to open this conversation. Because the number and content of some indicators differ from the Office for National Statistics dashboard, the precise dimensional groups and indicators could not be replicated. Instead, multiple trial measures were considered, testing different hypotheses and weighting structures, and the sensitivity of the index to subjective well-being questions. Table 2 (and Figures 3a and 3b) shows the indicators and dimensions for two illustrative trial measures alongside the selected weights. Measure 1 is the closest approximation of the Office for National Statistics dashboard, with satisfaction questions distributed throughout the different dimensions and questions on psychological well-being grouped in the personal well-being dimension. Measure 2 groups all of the satisfaction questions (with self-reported health instead of health satisfaction) in a personal well-being dimension, and has fewer indicators in the what we do, education and personal finance dimensions, because those indicators focus on objective aspects of well-being such as unemployment or low income.

Table 2. Multidimensional Well-being Index (Measures 1 and 2)

	Measure 1		Measure 2	
Dimension	**Indicator**	**Weight**	**Indicator**	**Weight**
Personal well-being	Life satisfaction	1/32	Life satisfaction	1/40
	Worthwhile	1/32	Job satisfaction	1/40
	Unhappiness	1/32	Satisfaction with leisure time	1/40
	Anxiety	1/32	Satisfaction with income	1/40
			Self-reported health	1/40
Our relationships	Unhappy relationships	1/32	Unhappy relationships	1/32
	Loneliness	1/32	Loneliness	1/32
	Social networks	1/32	Social networks	1/32
	Neighbourhood belonging	1/32	Neighbourhood belonging	1/32
Health	Disability	1/48	Disability	1/40
	Limited activity	1/48	Limited activity	1/40
	Self-reported health	1/48	Evidence of depression (GHQ)	1/40
	Evidence of depression	1/48	Fruit and vegetable consumption	1/40
	Fruit and vegetable consumption	1/48	Exercise	1/40
	Exercise	1/48		
What we do	Unemployment	6/64	Unemployment	1/8
	Job satisfaction	1/64		
	Satisfaction with leisure time	1/64		
Education	No A level or equivalent	1/8	No A level or equivalent	1/8
Personal Finance	Low income	6/64	Low income	7/64
	Satisfaction with income	1/64	Difficulty with finances	1/64
	Difficulty with finances	1/64		
Living standards	Adequate heating	1/16	Adequate heating	1/16
	Housing tenure	1/16	Housing tenure	1/16
Governance	Voting	1/16	Voting	1/16
	Political efficacy	1/16	Political efficacy	1/16

Source: Authors' original study.

It may be appropriate to clarify the use of subjective indicators. As articulated above, it seems entirely appropriate for a measure of well-being to include a dimension of subjective well-being comprising indicators of satisfaction, positive and negative affect, and meaning. Amartya Sen (2009) argued that happiness should be considered an important functioning alongside other functionings, and Stiglitz, Sen and Fitoussi (2009) listed subjective well-being as one of the dimensions of quality of life. A number of well-known difficulties in accurately measuring and interpreting trends in subjective well-being, however, range from adaptive

preferences (Graham 2010; Clark 2012) to the influence of extraversion and optimism and the issue of frames of reference and even the placement of the questions in the survey. For that reason, this paper trials two well-being measures that differ, in particular, in their treatment of subjective data.

Weighting for the indicators and dimensions also varies slightly between the two structures. Being a dashboard, the Office for National Statistics' national measure does not assign weights to the domains and indicators. Furthermore, the nationwide consultation preceding the work on the dashboard found a variation in what people considered most important to their well-being (United Kingdom, Office for National Statistics 2011). Since no large-scale participatory exercise was carried out as part of this study, the proposed weighting structure is justified normatively. In both indices, each dimension is equally weighted while subjective indicators within a dimension receive a smaller weight compared to objective indicators. This step ensures that trends in well-being over time are not overly influenced by subjective indicators. There are two reasons for this. First, these indicators have short recall periods (e.g., "How happy did you feel yesterday?") and are therefore subject to potential fluctuation. Second, the trends could change because of a change in the frame of reference rather than in the underlying condition.

In Measure 1, each dimension receives a weight of one eighth, and subjective well-being indicators are allocated one eighth of the dimensional weight, with all weights across the indicators and dimensions adding up to one. The second index maintains equal weights across dimensions; however, the grouped satisfaction indicators under the personal well-being dimension receive equal nested weights, and a smaller weight for subjective well-being indicators applies in the personal finance dimension.

The next section outlines the sufficiency cut-off for each indicator, based on information from the national dashboard as well as wider literature on the United Kingdom and the set of objective and subjective indicators recommended for well-being measurement (Stiglitz, Sen and Fitoussi 2009). Additional information on the questions and definitions and a more detailed description of the coding for each indicator is presented below, while missing values for each final indicator are presented in Appendix B alongside results of the redundancy analysis.

Personal well-being

Guidelines focusing on subjective well-being indicators identify three measurement strategies: *life evaluation,* covering satisfaction with income, health and work; *affect or experience*, capturing momentary emotions and feelings such as happiness or kindness, or anger or worry; and *eudaemonic well-being*, encompassing deeper and psychological processes such as meaning and purpose, autonomy or competence that focus on the realization of one's potential (Dolan, Layard and Metcalfe 2011; OECD 2013). Stone and Krueger (2018) broaden this categorization to evaluative measures, experimental measures and eudaemonia, while also

extending the conceptualization of affect or hedonistic well-being to include pain and misery, which they argue form significant parts of people's momentary emotions.

As an indicator, life satisfaction provides a general evaluation of one's life with regards to health, education, relationships, work and others. For the question on life satisfaction, respondents answer on a scale of 1 (completely dissatisfied) to 7 (completely satisfied), and those who say they are completely or mostly satisfied (6 or 7) with their lives are considered to experience sufficient life satisfaction.

Eudaemonia is captured by General Health Questionnaire (GHQ) questions on feeling worthwhile and playing a useful role. For the first question, respondents are asked: "Have you recently been thinking of yourself as a worthless person?" with answers ranging from "not at all" (1) to "much more than usual" (4). Those with a score of 1 are considered to meet the sufficiency cut-off for feeling worthwhile. As the Office for National Statistics question refers to feelings of worth related to things a person does, we have combined the question of "believe worthwhile" with a second GHQ question on "playing a useful role", which ranges from 1 (more so than usual) to 4 (much less than usual). Those who answer "more than" (1) or "same as usual" (2) are considered to meet the sufficiency threshold. The final indicator combines information on the two variables, and considers a person to be insufficient if they have felt worthless OR less useful than normal. This captures both feelings that are deeper and more prolonged, as well as momentary feelings of being less useful that could result from changes in circumstances or activities in a person's life.

The remaining indicators in the dimension capture affect, both positive and negative, measured by questions on unhappiness and anxiety. While the Office for National Statistics uses an indicator on happiness, the decision was made to replace this with the question on unhappiness and depression as the emotions of happiness (positive affect) and unhappiness (negative affect) are not polar opposites, and are therefore best kept separate when constructing an index. Given the choice of indicators in the dimension, the negative affect, asking participants if they felt unhappy or depressed, was selected. Those who answer "not at all" (1) are considered to have sufficiency, while people saying they felt unhappy or depressed "no more than usual" (2), "rather more than usual" (3) or "much more than usual" (4) are classed as being insufficient.

While there is no specific question on anxiety, the indicator was recreated using information from two variables in the GHQ: being constantly under strain and loss of sleep. Those who answer "not at all" to both questions are considered to have sufficient equanimity. Those reporting feeling constantly under pressure or losing sleep "no more than usual", "rather more than usual", and "more than usual" are considered to enjoy insufficient peace of mind.

Our relationships

Self-reported happiness with one's relationship taps concepts of social connectedness, trust and happiness. Respondents who are married, in civil partnerships or living as a couple are asked to rate their happiness with the relationship on a scale of 1 (extremely unhappy) to 7 (perfect). In line with the Office for National Statistics dashboard, the indicator considers those reporting they are "extremely unhappy" (1) or "fairly unhappy" (2) with a relationship to be insufficient. Unmarried individuals, and widowed, divorced or separated partners are not asked the question and are therefore considered sufficient by default.

The second indicator in the dimension focuses on loneliness, a key measure of subjective well-being and social relations. The questions included in Wave 9 of Understanding Society were developed as part of a government initiative to establish appropriate indicators for measurement that can inform policy debates on tackling loneliness across all age groups. The indicator for the MWI considers the indirect questions on loneliness included in the survey and was constructed following the guidance published by the Office for National Statistics (2018) and the What Works Centre for Well-being (2019), albeit with some modifications to fit the selected methodology. The indirect questions come from the three-item scale from the University of California Los Angeles (UCLA) that asks respondents how often they feel left out, isolated or feel a lack companionship, while the direct question asks how often they feel lonely. Answers range from 1 (hardly ever) to 3 (often) for all four questions. The three indirect questions are scored according to the guidance by Office for National Statistics (2018). While it simply uses the mean score from the UCLA scale to track changes in loneliness over time, the MWI applies a sufficiency cut-off, with a score of 4 and above constituting insufficiency (thus, only those answering "hardly ever" to all three questions are considered to have sufficiently avoided loneliness).

While there were no available data to recreate the Office for National Statistics indicator of 'someone to rely on' in the ninth wave of Understanding Society, the data set contains questions relating to the number of close friends that can be used to proxy social support networks but not as an exact match for the Office for National Statistics indicator. To extend the scope of the indicator, information on signs of social ties and support networks was included (whether individuals respond that they regularly talk to their neighbours or can borrow items from them). For the final indicator, those who do not talk regularly with their neighbours or cannot borrow from them and have less than three close friends are considered to have insufficient social support networks.

Given that the information for the 'where we live' dimension was limited, the indicator relating to community ties was moved to the dimension of our relationships. The question on belonging to the neighbourhood was used to construct an indicator that captures trust and cohesion in one's close surroundings. Respondents are asked to rate to what extent they agree that they belong to their neighbourhood, with answers ranging from 1 (strongly agree) to 5 (strongly disagree). Those who agree (1 or 2) are considered to meet the sufficiency cut-off, while those who neither agree nor disagree (3) and those who disagree (4 or 5) are considered insufficient in community ties.

Health

The disability indicator in the Office for National Statistics dashboard was constructed in line with the Government Statistical Services guidelines[19] and includes two questions for the population aged 16–64. According to this criterion, disability is defined as a 'long-term' and 'substantial' physical or mental impairment affecting one's ability to carry out normal daily activities. The data in the latest wave of Understanding Society have been designed in line with the government guidance, with respondents asked about conditions that have lasted for at least 12 months or that are likely to continue over 12 months or more. The follow-up questions ask all respondents whether they have substantial difficulties with one of the following: mobility; lifting, carrying or moving objects; manual dexterity; continence; hearing; sight; communication or speech; memory or ability to concentrate, learn or understand; recognizing when you are in physical danger; your physical coordination; difficulties with own personal care; other health problem or disability; or none of the above. In order to fulfil the 'substantial' element of the government definition, individuals who report a disability (answer yes to the first question) and mention one of the listed conditions in the second question are identified as living with disabilities. Those aged 65 or over are considered to meet the sufficiency cut-off.

Additionally, two of the physical components from the SF-12 questionnaire[20] included in Wave 9 are considered for assessing limits to physical activity for the whole population. The questions are asked with a four-week recall period with respondents assessing to what extent their health limits them in moderate activities (such as moving a table, pushing a vacuum cleaner, bowling or playing golf) or in climbing several flights of stairs. Those who are not limited in either are considered to enjoy sufficient well-being, while those expressing limitation with one or both activities are considered to be insufficient. Further, while data for health satisfaction are available, the decision was made to include self-reported health for a more direct assessment of personal health, without the additional, subjective assessment of satisfaction. Answers range from excellent (1) to poor (5). Those reporting fair or poor self-reported health are considered insufficient in the indicator.

To capture evidence of depression, the MWI considers two different indicators used for each of the structures presented below. The first indicator is constructed using a question from the SF-12 item scale, asking respondents whether they have felt down or depressed during the last four weeks. Answers range from "all of the time" (1) to "none of the time" (5). Respondents who have stated that they feel down or depressed "all" or "most of the time" (1 or 2) are considered to lack sufficiency. Alternatively, the second indicator relies on information from the 12-item GHQ, designed to capture the current mental state of respondents by asking if it differs from their usual state. Although wording may depend on the questions, answers feature five values:

[19] See Smith 2019.

[20] SF is a short 12-item questionnaire designed to capture health and quality of life based on the Medical Outcomes Study. For information on the questions, see Ware, Kosinski and Keller 1996.

much more/more, same as usual, less/much less OR much better/better, same as usual, worse/much worse. The Understanding Society data set provides two variables that aggregate results from the 12-item GHQ: a Likert-scale ranging from 0 (least depressed) to 36 (most depressed), and a Caseness scale ranging from 0 (least depressed) to 12 (most depressed).[21] To indicate evidence of depression, the MWI relies on the second variable where individual items are scored on a scale of 1 to 4. The combined Caseness score is then calculated "by recoding 1 and 2 values on individual variables to 0, and 3 and 4 values to 1, and then summing, giving a scale running from 0 (the least distressed) to 12 (the most distressed)" (ISER 2019). In line with the Office for National Statistics measure, the indicator considers those with a score of 4 or more to lack sufficient well-being because they exhibit signs of mild to moderate depression and/or anxiety.

To assess the general health of British society, we include two additional indicators related to healthy diet and exercise. Following the nutritional guidance by the National Health Service (2018a, 2018b) and using information on fruit and vegetable consumption, those who do not consume at least five portions of fruit and/or vegetables every day are considered to fall below the sufficiency threshold for the nutrition indicator. Further, Wave 9 includes data on time spent doing physical exercise during a week. By using the question on minutes and hours of vigorous or moderate activities and following national guidelines on physical activity (National Health Service 2019), those with less than 150 minutes of moderate intensity or less than 75 minutes of vigorous intensity exercise per week are considered to lack sufficient well-being.

What we do

While the Office for National Statistics dashboards include the rate of unemployment (calculated by dividing the unemployed population by the economically active population), this analysis considers this deprivation at the level of the individual and assesses whether a person is unemployed. In line with the definition of unemployment used by the Office for National Statistics (2020b), people aged 16 to 64 who did not complete any paid work during the last week (and who are otherwise not in paid employment) and are available to start a new position in the next two weeks, and have actively looked for work in the last four weeks are considered to be deprived, as well those individuals who are out of work and waiting to start a job. Those aged 65 or over are not considered to lack sufficient employment. As mentioned later, this indicator may need to be improved.

The last two indicators of the dimension match the indicators in the Office for National Statistics dashboard and concern satisfaction with job and satisfaction with amount of leisure time. Similarly to the life satisfaction questions, answers are given on a seven-item scale with values ranging from 1 (completely dissatisfied) to 7 (completely satisfied). For both indicators, those not mostly (6) or completely satisfied (7) were considered to be insufficient.

[21] For information on the questions, see Goldberg et al. 1997.

Personal finance

For the income indicator, data on household disposable income (after tax) are equivalized according to the modified-OECD scale. The Household Below Average Income reports published by the Department for Work and Pensions define income poverty in the United Kingdom as follows: "A household is said to be in relative low income if their equivalised income is below 60 percent of median income" (United Kingdom, Department for Work and Pensions 2020). Income values are adjusted for inflation using the consumer prices index, deflating them to January 2017 prices based on data from the Office for National Statistics.[22] This is followed by a calculation of the poverty line, and the final indicator considers individuals living in households with income below this line to lack a sufficient level of well-being.

Satisfaction with income is coded similarly to the life satisfaction indicator with those "not completely" (7) or "mostly satisfied" (6) considered insufficient. Additionally, the indicator assessing difficulty with finances is included in the index, with answers to one's subjective financial situation ranging from "living comfortably" (1) to "finding it very difficult to get by" (5). Those who report they are "just about getting by" (3) or finding it "quite difficult" (4) or "very difficult" (5) to get by are considered to meet the sufficiency cut-off.

Living standards

Besides the Office for National Statistics measures, two new indicators on tenure and heating are added to the MWI. Home ownership has been linked to changes in inequality (Causa, Woloszko and Leite 2019), and the issue is at the core of the political and economic agenda in the United Kingdom. The idea of a home is one closely linked to well-being and life satisfaction (United Kingdom, Office for National Statistics 2019b). Feelings of anxiety and depression have been shown to be affected by the instability of housing conditions (McPhillips 2017). For the tenure indicator, respondents are considered to be sufficient if they own their house outright or with a mortgage, and insufficient if living in local authority rented, housing association rented, rented from employer, rented private (unfurnished), rented private (furnished) or other rented accommodation. Lastly, adequate heating is added as a new indicator that strongly underpins physical and mental well-being, with individuals who are not able to heat their homes adequately during winter considered as insufficient. Individuals to whom this question did not apply are considered to meet the sufficiency cut-off.

Education

The education indicator considers those aged 16–64 with below A level qualifications as having insufficient levels of well-being, a stricter measure than the Office for National Statistics specification, which only considers people without any qualifications as deprived in education. In the Understanding Society survey, respondents

[22] See the Office's consumer price inflation tables.

are asked to list their highest qualification, comprising degrees, A levels, technical qualifications, General Certificate of Secondary Education (GCSE and equivalents) or qualifications gained abroad. Respondents 16–64 with a highest qualification below A level[23] are considered to have insufficient education. Those aged 65 or over are considered to meet the sufficiency cut-off.

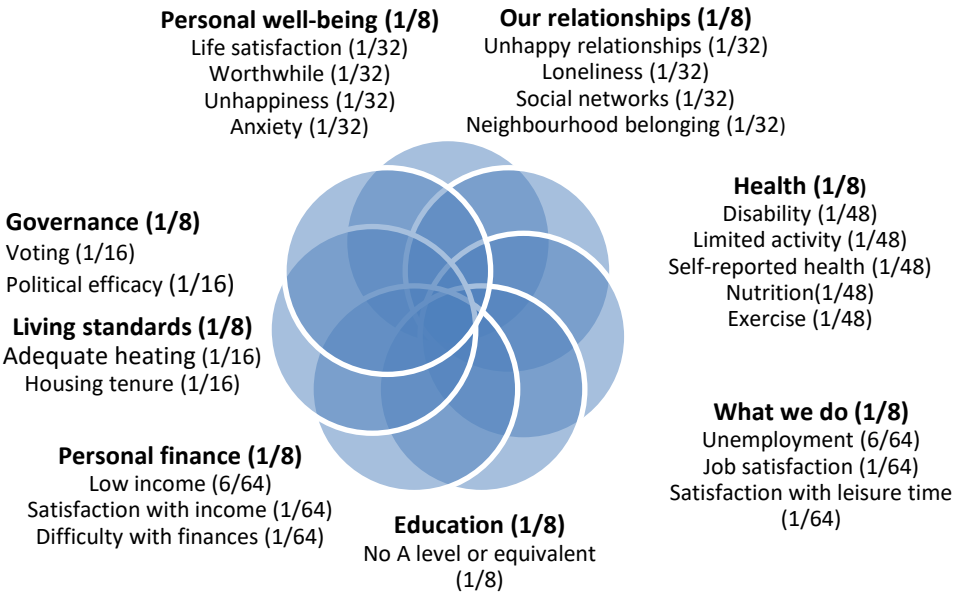
Governance

While Wave 9 of Understanding Society contains data on voting, the question, "Did you vote in this (past) year's general election?", was only issued to those interviewed after the 2017 general election and who were issued a sample between June 2017 and May 2018. This means that a large number of people were not asked the question, making the non-applicable population (by default considered sufficient) quite large. Nevertheless, the index includes this indicator as a proxy of governance. Additionally, while trust in government is included as an indicator in the Office for National Statistics dashboard, this information is not available in the Wave 9 data. To proxy citizens' trust in government upholding their interests, and their belief in the extent to which they can influence political affairs, two questions (out of four) on **political efficacy** are added to the index. Respondents are asked to rate to what extent they agree or disagree with the following statements: "Public officials don't care much about what people like me think" and "People like me don't have any say in what the government does." Responses range from "strongly agree" (1) to "strongly disagree" (5). For both questions, those who agree (1 or 2) with the statements are considered insufficient, and those who "neither agree or disagree" (3), "disagree" (4) or "strongly disagree" (5) are considered to be sufficient. The final variable considers a person insufficient if they have low self-perceived efficacy in one or both of the variables, proxying dissatisfaction and disengagement with politics.

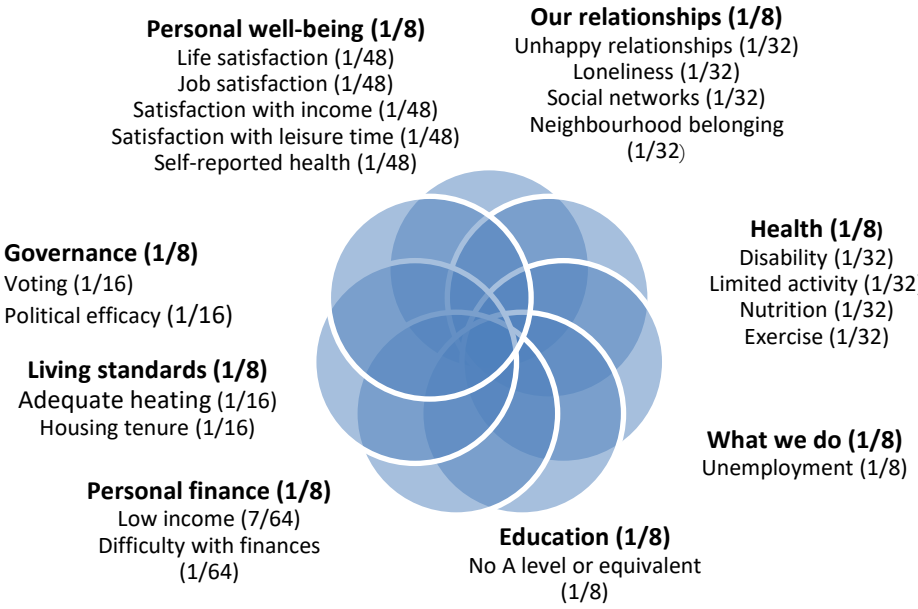
[23] Based on the *hiqual_dv* variable, the following categories were considered insufficient: GCSE/O level, Ordinary/Standard Grade (if no higher qualification was obtained), GNVQ/GSVQ, NVQ/SVQ Level 1-2, CSE, other school leaving exam certificate or matriculation, key skills (if no higher qualification was obtained), basic skills (if no higher qualification was obtained), entry level qualifications (Wales) (if no higher qualification was obtained), RSA/OCR/clerical and commercial qualifications (e.g., typing/shorthand/bookkeeping/commerce), City and Guilds Certificate, other vocational, and technical or professional qualification.

Figure 3a and 3b. Multidimensional Well-being Index

Measure 1



Measure 2



Source: Authors' original study.

Results

COMPARING TWO TRIAL WELL-BEING MEASURES

Table 3 presents the headline results for the population from the two proposed measures. Multiple cut-offs are used to construct five well-being gradients. The *incidence* shows the proportion of people across each of the five well-being gradients, while *average sufficiency* gives the share of dimensions for which a person enjoys sufficiency, broken down by the five gradients. It also presents a dichotomous classification based on average sufficiency, with those enjoying sufficiency in at least three quarters of the weighted indicators classified as having favourable well-being, and people who fall short of this classed as enjoying less favourable well-being.

Overall, the results show a roughly equal split of the population into those enjoying favourable levels of well-being (H^f), with sufficiency in at least three quarters of the weighted indicators, and those with less favourable levels of well-being (H^{lf}), who enjoy sufficiency in less than 75 percent of the indicators. Breaking the results into five gradients shows that although more than 44 percent of the population falls under favourable well-being, this share is largely composed of people with decent as opposed to the highest level of well-being according to the MWI. Worryingly, narrow well-being has the second highest incidence across both measures, and although the percentage of people with the lowest level of well-being is small, they are sufficient in only 43 percent of the indicators on average. The results vary slightly between the two measures, with more people enjoying favourable well-being according to Measure 2, which groups the satisfaction questions in the personal well-being dimension.

Table 3. Incidence and average sufficiency across the five well-being gradients

Well-being gradient	Sufficient in…	Insufficient in…	Incidence		Average sufficiency	
			Measure 1	Measure 2	Measure 1	Measure 2
Favourable	**75–100%**		**44%**	**51%**	**84%**	**84%**
High	87.5–100%	1/8 or less	13%	16%	92%	92%
Decent	75–87.49%	More than 1/8	31%	35%	81%	80%
Less favourable	**0–74.99%**		**56%**	**49%**	**62%**	**64%**
Moderate	67.5–74.99%	More than 1/4	20%	21%	71%	71%
Narrow	50–67.49%	More than 3/8	30%	24%	60%	61%
Low	0–49.99%	More than 1/2	6%	4%	43%	43%

Source: Authors' calculations.

The MWI can be calculated by summing two numbers: the percentage of people with favourable well-being and the product of the percentage of those with less favourable well-being multiplied by the average sufficiency among the not yet happy. This gives an MWI of 0.790 for Measure 1 and 0.824 for Measure 2. By combining information on the happy, who are treated as having achieved sufficiency across all indicators, and the not yet happy, whose sufficiency is captured for the MWI, the index provides an intuitive summary score that is also

responsive to changes in incidence or average sufficiency. The MWI will increase if either the proportion of people with favourable well-being (happy) increases or the average sufficiency of those with less favourable well-being (not yet happy) increases. These qualities mean that the MWI is a useful tool for tracking the happiness of the population over time and provides different avenues for improving human well-being.

Additionally, national results for the MWI can be decomposed by different population subgroups to reveal disparities in well-being. The next sections dig deeper into the composition of well-being and the disparities across the population to provide a detailed picture of well-being in the United Kingdom. The analysis explores the variation in well-being levels across subgroups of the population and areas of the country, followed by a presentation of indicator-level results of the MWI and an analysis of the form and composition of well-being in the United Kingdom. Lastly, the paper offers a brief comparison with life satisfaction before setting forth a roadmap with suggestions for using the measure and improving well-being through public policy.

WHO ENJOYS WELL-BEING?

Table 4 presents the key findings from the disaggregated analysis, including the MWI and its subsequent statistics by age, gender, ethnicity and place of residence using results from Measure 2.[24] The findings shed light on piercing internal inequalities and demographic patterns that have cross-cutting impacts on well-being in the United Kingdom. The results from this analysis illustrate the importance of decomposition for any national well-being measure.

[24] The disaggregated results for Measure 1 can be found in Table A1 of Appendix A.

Table 4. Headlines figures for MWI (using Measure 2)[25]

Disaggregation	MWI	H^f (%)	H^{lf} (%)	AS^f (%)	AS^{lf} (%)	Population share (weighted, %)	Sample size (weighted)
National	0.824	51	49	84	64	100.0	26,501
Urban	0.814	49	51	84	64	75.5	19,999
Rural	0.854	59	41	85	65	24.5	6,502
16-19	0.851	59	41	85	64	5.8	1,549
20-29	0.768	37	63	82	63	13.0	3,434
30-39	0.760	35	65	82	63	13.9	3,684
40-49	0.789	42	58	83	64	15.8	4,175
50-59	0.800	46	54	83	63	18.3	4,842
60-69	0.874	64	36	86	65	15.4	4,080
70 years and older	0.919	75	25	86	68	17.9	4,744
North East	0.803	47	53	84	63	4.4	1,167
North West	0.827	52	48	84	64	11.3	2,985
Yorkshire and Humber	0.823	51	49	84	64	8.8	2,324
East Midlands	0.846	57	43	84	64	7.7	2,029
West Midlands	0.819	50	50	84	64	8.8	2,320
East England	0.833	54	46	85	64	9.8	2,586
London	0.789	42	58	83	63	11.2	2,959
South East	0.831	53	47	85	64	13.7	3,620
South West	0.836	54	46	85	64	8.9	2,346
Wales	0.830	54	46	84	63	4.7	1,232
Scotland	0.824	51	49	84	64	8.3	2,193
Northern Ireland	0.826	51	49	84	64	2.8	740
Men	0.829	53	47	84	64	47.9	12,689
Women	0.819	50	50	84	64	52.1	13,819
White	0.830	53	47	84	64	92.7	24,530
Mixed/multiple ethnic groups	0.752	35	65	83	62	1.2	321
Asian/Asian British	0.771	38	62	83	63	4.1	1,081
Black/African/Caribbean/Black British	0.713	27	73	81	61	1.6	429
Other ethnic group	0.692	26	74	83	58	0.4	113
White	0.830	53	47	84	64	92.7	24,530
All other ethnic groups combined	0.751	35	65	82	62	7.3	1,944

Source: Authors' calculations.

[25] Results for some disaggregated groups with small sample size require further verification. Thus, the results should be interpreted as illustrative findings.

The largest differences in MWI are by age group, ethnicity and geographical region, with less pronounced differences by place of residence and gender. Across age groups, those 60 and over and aged 16–19 have the highest well-being, highlighting an interesting pattern in well-being levels decreasing as people progress into adulthood and rising again nearing retirement age. Further analysis using repeated cross-sections or longitudinal measures is needed to confirm whether this trend is specific to the life cycle or birth cohorts. People 70 and over report the highest levels of well-being with an MWI of 0.919, in contrast to those aged 20–50 who have MWIs ranging from 0.760 to 0.789 and the lowest incidence of favourable well-being. Despite such distinctions in MWI and incidence, the average sufficiency of those with favourable well-being is fairly similar across all age groups (ranging from 82 to 86 percent), while it varies more across those with less favourable well-being (from 63 to 68 percent). The distinctions between men and women are less pronounced but statistically significant, with more women (50 percent) having less favourable well-being than men (47 percent).

Disaggregating the results by place of residence and governmental regions shows that quality of life varies significantly across parts of the country. For instance, the MWI reveals a statistically significant gap in well-being among urban and rural populations across the United Kingdom, with a 10-percentage point difference in the proportion of people enjoying favourable well-being. The percentage of people reporting 'decent' well-being is similar across the areas, but the difference grows across the other gradients, with more of those living in rural areas enjoying 'high' well-being, while 'narrow' well-being is more common among those in urban areas. Similarly, while nationally 51.3 percent of people have favourable well-being according to the MWI, there are stark inequalities across regions, with the incidence of those with favourable well-being ranging from 42 percent in London to 57 percent in the East Midlands. Perhaps surprisingly, London has the highest proportion of unhappy people, with less than half the city's population reporting sufficiency in three quarters or more of the indicators. Based on the incidence of those with less favourable well-being, the capital is significantly different from all regions except the North East of England. There are also significant differences for the East Midlands, the region with the highest level of well-being, where the headcount ratio is significantly different from the West Midlands, North East, East England, South East, London, Scotland and Northern Ireland. There are also statistically significant differences between the South West and North East, Scotland and Northern Ireland. The disparity across regions is also notable across gradients, with only 11 percent of Londoners reporting high well-being. This figure is close to 20 percent in the East Midlands and South West.

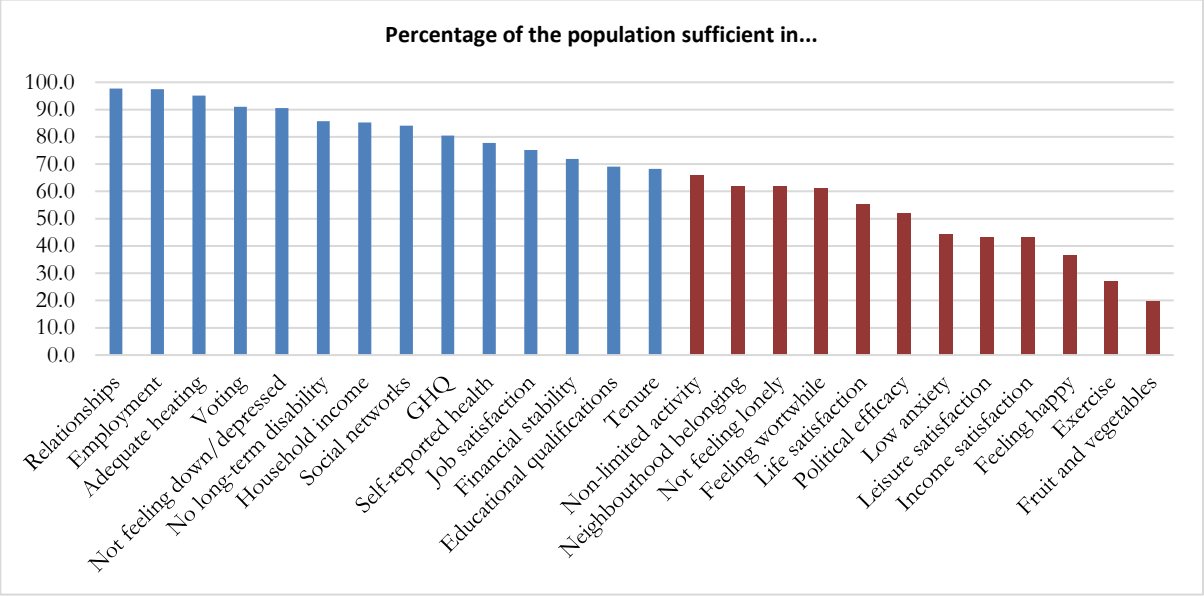
The largest differences in well-being, however, appear across ethnic groups, where the MWI ranges from 0.692 to 0.830. Whereas 53 percent of people who self-identify as White have favourable well-being, among those who identify as part of all other ethnic groups, it is a startling 35 percent. Breaking down the results further by ethnic groups according to the census classification is difficult because of small sample sizes. But if interpreted with caution, we see that these distinctions may become even more prevalent, with 73 percent of people from

a Black/African/Caribbean/Black British background lacking sufficiency in more than a quarter of the indicators. Similarly, the average number of indicators an individual is sufficient in is distinctively higher for people in the White group across both the favourable/happy and the less favourable/unhappy population. Delving further into the data shows that more than 10 percent of all people from a Black/African/Caribbean/Black British background and more than 18 percent of people from the other ethnic group background have the lowest level of well-being, with sufficiency in less than half of the indicators, compared to less than 4 percent of people who self-identify as White.

WHAT DOES WELL-BEING LOOK LIKE AND HOW CAN IT BE IMPROVED?

Figure 4 presents the analysis of the results by indicator, showing the percentage of people who are sufficient in each of the indicators before applying any of the well-being thresholds. There is a large variation across the indicators, ranging from only 2 percent of people living in unhappy relationships to over 80 percent of people not meeting the sufficiency threshold for nutrition (consumption of five fruits/vegetables per day). The orange bars refer to indicators where less than two thirds of the population has sufficiency, while the indicators in blue point to areas of life in which the majority of people meet the sufficiency cut-off. For instance, five of the indicators have an incidence of over 90 percent, with only a minority of people reporting feeling unhappy with their personal relationships or feeling down or depressed during the last four weeks.

Figure 4. Sufficiency across indicators for the total population



Source: Authors' calculations.

Some of the objective well-being indicators such as unemployment, voting or low income also have low incidence. For instance, fewer than 3 percent of individuals report being unemployed, and fewer than 15

percent live in households below the income poverty line, while fewer than 5 percent report not being able to heat their home adequately during winter, which aligns with official statistics.[26]

Meanwhile, less than half the population meets the sufficiency threshold for 6 of the 25 indicators. Looking across the dimensions, the smallest values are presented for the health indicators on nutrition and exercise with less than a third of the population lacking the necessary level for sufficiency. For instance, less than 20 percent of people consumes at least five portions of fruit or vegetables a day and less than 27 percent engages in at least 150 minutes of moderate or 75 minutes of vigorous exercise a week per National Health Service guidance. Studies have shown that lack of exercise and a diet poor in vegetables and fruit—which contain high amounts of fibre, vitamins, minerals and natural as opposed to refined sugar—significantly increases the chance of obesity, which has been linked to Type 2 diabetes, cardiovascular diseases and other chronic health conditions.[27] Similarly, the subjective well-being indicators capturing levels of unhappiness, anxiety, loneliness and lack of worth have lower levels of sufficiency. These findings amplify and reinforce the discourse around the importance of both physical and mental health to well-being. At a time when health is at the forefront of government policy and media attention, and health services struggle, the findings present a striking picture of the general health of the British population. They echo the importance of refocusing attention on all aspects of health including psychological well-being, and implementing a public health campaign to increase sufficiency in fruit and vegetable consumption and physical activity, both of which are related to growing levels of obesity and chronic illness.

The issue of loneliness has received renewed attention following the report by the Jo Cox Commission and the subsequent government strategy on loneliness, and as a result of the ongoing COVID-19 pandemic, with research indicating increased levels of loneliness, especially among those who were the loneliest preceding the pandemic.[28] Understanding Society data from 2017–2019 show that more than 63 percent of the population reports feeling unhappy or depressed, and more than 44 percent says they have felt anxious, indicated by feeling under strain, and losing sleep more than usual. While these questions capture momentary emotions with short recall periods, the indicator on feeling down or depressed in the last four weeks, and the GHQ indicator on overall mental health both show higher levels of sufficiency for the population.

Interestingly, 48 percent of people lack sufficiency in political efficacy—agreeing that public officials don't care about people like them or that they don't have any say in what the Government does. It is without doubt that increasing support for policies and confidence in elected officials are crucial in a time where successful

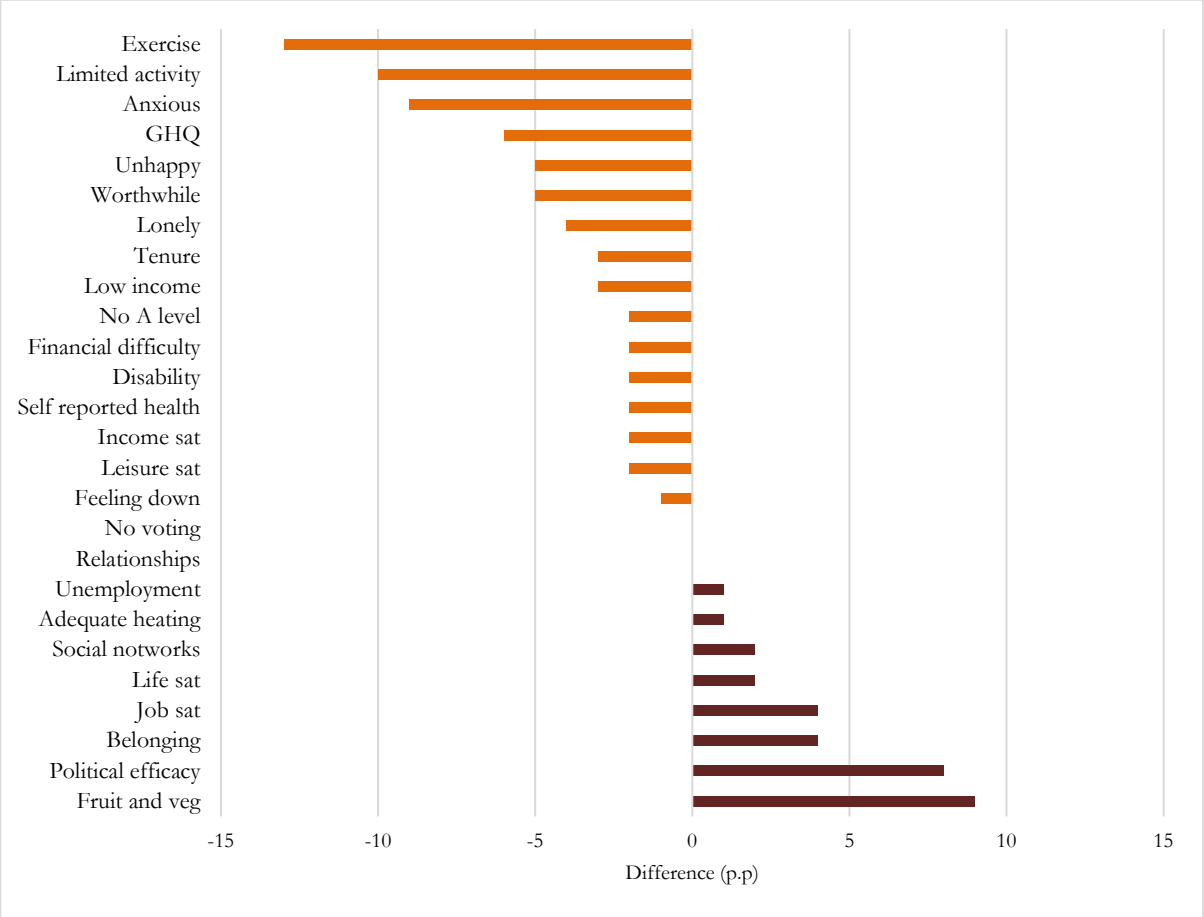
[26] See the Office for National Statistics data on "Unemployment"; United Kingdom, Department for Work and Pensions 2020; and the Eurostat data browser on "Population unable to keep home adequately warm by poverty status."

[27] See the World Health Organization website on obesity and overweight and the National Health Service webpage on obesity.

[28] See What Works Wellbeing 2020.

responses to the ongoing COVID-19 pandemic rely heavily on mutual trust between governments and members of the public. Although these results hint at a large segment of society feeling disengaged only 9 percent of people lack sufficiency in the indicator on voting.[29]

Figure 5. Gender gap in sufficiency



Source: Authors' calculations.

Analysing the difference in deprivations by gender reveals a gap, with women reporting higher deprivation in 17 of the 26 of indicators as opposed to men, as shown in Figure 5. Women have lower sufficiency in indicators related to physical health, psychological well-being and material deprivation, while fewer men are sufficient in indicators concerning social relations and belonging, life and job satisfaction, political efficacy and nutrition. Nine of the indicators have a more than 3 percentage point difference in deprivation between the two genders. For instance, there is a 13-percentage point difference in the proportion of men and women who complete the

[29] Only a subsection of the sample was asked this question following the 2017 general election. Thus, a large share of the sample is considered sufficient by default, which likely contributes to the high level of sufficiency.

required minimum amount of exercise as defined by the National Health Service, and a 9 percentage point difference in the proportion of women and men who report feeling anxious. These patterns reinforce the need to view well-being through a gendered lens with appropriate policies focusing on decreasing inequalities in quality of life between the two groups.

HOW ARE PEOPLE ENJOYING WELL-BEING?

An advantage of the well-being index is that it enables us to view the contribution of each indicator and dimension to the overall MWI. Mathematically, indicator or dimensional contributions are a function of the censored headcount ratios (in this case, the percentage of people with favourable well-being who are sufficient in each of the indicators) and the weights. Indicator contributions are simply summed to obtain the dimensional contribution. This means that indicators with larger weights or those with higher headcount ratios will have a larger contribution to the MWI. Table 5 shows the contribution of each dimension to the MWI, indicating the differences in the ways in which people enjoy well-being according to the two measures. Overall, contributions are more evenly spread across Measure 2, which groups the satisfaction questions in a single dimension and uses the GHQ to capture psychological well-being. Across both measures, the 'what we do' dimension makes the largest contribution, implying that employment status and quality, and amount of leisure time are important for good quality of life. The dimension with the lowest contribution across both measures is personal well-being, with the indicators related to psychological well-being and satisfaction having lower censored headcount ratios.

Table 5. Percentage contribution of each dimension to the MWI

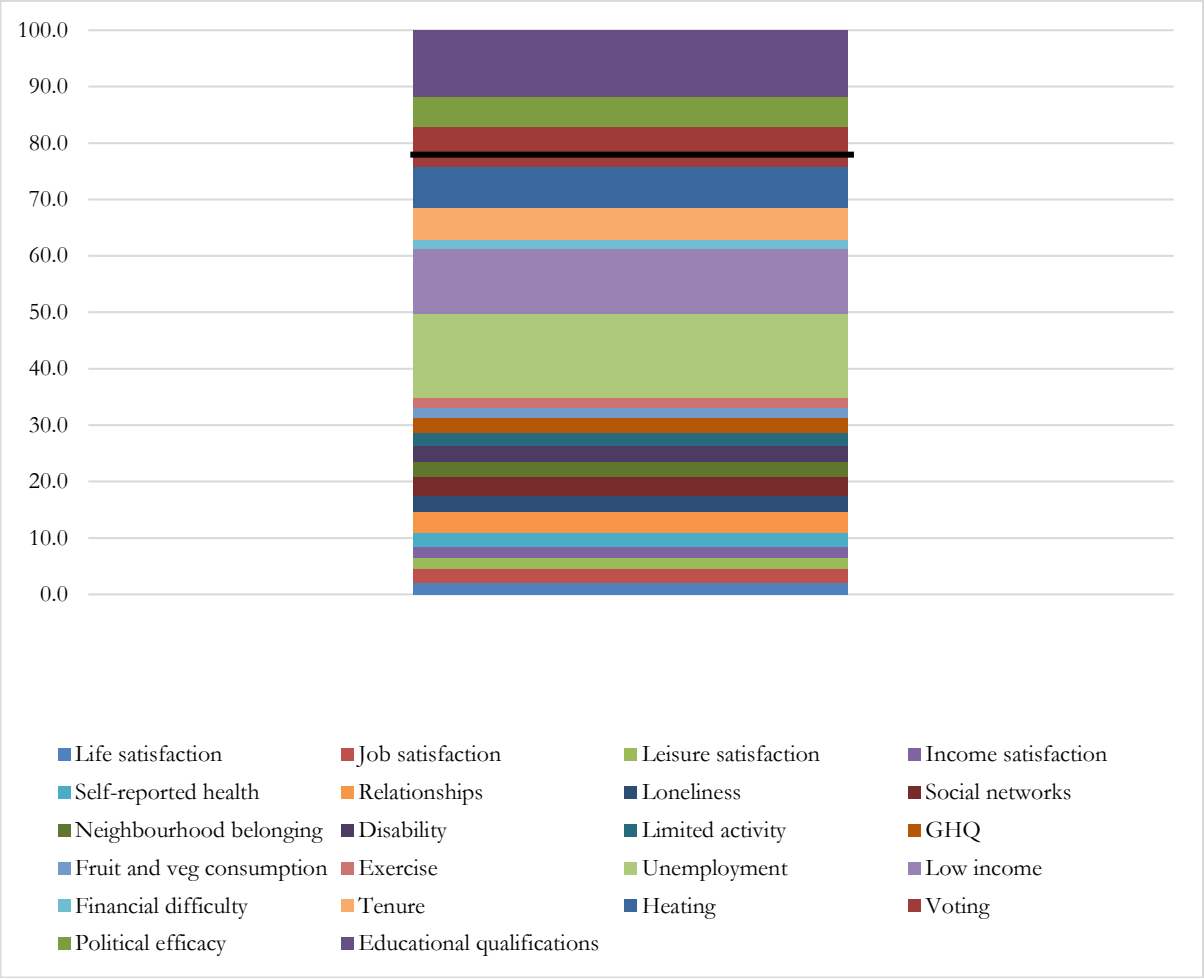
Dimension	Percentage contribution to MWI	
	Measure 1	Measure 2
Personal well-being	10	11
Our relationships	13	13
Health	12	11
What we do	14	15
Education	13	13
Personal finance	13	13
Living standards	13	12
Governance	12	12

Source: Authors' calculations.

Moving beyond dimensions, Figure 6 presents the percentage contributions of the 21 indicators to the MWI, using the results from the second measure. The black dividing lines mark the eight dimensions of well-being. Sufficiency in employment (15 percent) makes the largest contribution to individual well-being, followed by having a qualification of A level or above (12 percent) and sufficient household income (12 percent). Other indicators with a larger contribution are adequate heating (7 percent), voting (7 percent) and owning a house outright or with a mortgage (6 percent). The indicators in the personal well-being and health dimensions

contribute between 2 and 3 percent, while the indicators relating to social relationships have slightly larger contributions ranging from 3 to 4 percent.

Figure 6. Percentage contribution of each indicator to the MWI (Measure 2)



Source: Authors' calculations.

HOW DOES WELL-BEING ALIGN WITH LIFE SATISFACTION?

Life satisfaction captures an assessment of one's life over various dimensions, providing an overall indication of happiness. As a result, it is often used to proxy individual well-being. Table 6 compares answers to the life satisfaction questions in Understanding Society with the results from the MWI. Two-thirds of those satisfied with their lives overall are identified as having less favourable well-being according to the MWI, with nearly a quarter of people classified as having narrow or low well-being. In contrast, 17 percent of those who are dissatisfied with their lives have favourable well-being according to the MWI, enjoying sufficiency in at least three quarters of the indicators.

Table 6. Life satisfaction by well-being gradient (Measure 2)

Life satisfaction	Well-being gradients (percentage)					
	Favourable		Less favourable			
	High	Decent	Moderate	Narrow	Low	Total
Satisfied	23	43	19	14	1	100
Dissatisfied	1	16	21	50	12	100
Total	13	31	20	30	6	100

Source: Authors' calculations.

Closing observations

The ongoing COVID-19 pandemic has positioned well-being in the centre of public discourse, with many feeling the negative effects of national lockdowns that disrupted well-known patterns of working and social interaction. The pandemic has highlighted key aspects of social well-being such as physical and mental health, the presence of community and family, and access to green spaces and adequate living spaces (Fujiwara et al. 2020; Office for National Statistics 2020a and 2020c; What Works Wellbeing 2020). To maintain a focus on these issues and improve well-being beyond the pandemic requires a direct and targeted effort in public policy and political and public debate on nurturing well-being. A visible, policy-relevant MWI with its associated information platform can support this. In assessing the official well-being measure for the United Kingdom, Allin and Hand (2016) rightly highlight that while the Sustainable Development Goals and political commitments have elevated well-being to the public agenda, these commitments largely refer to measurement, and measures implemented to date have fuelled more discussion than action. Thus, while the last decade has seen new developments in the field, including the creation of a new official dashboard in the United Kingdom, among other steps, strong integration of well-being into policymaking has not yet followed. They argue that "if we are to go beyond the 'old', or at least well-established, national accounts measures then we must understand how new measures will be used in addition to GDP" (ibid., p. 21), and commit to *who* will be responsible and *how* they will use the data to improve people's quality of life. If the overarching aim is placing human development and non-monetary indicators of progress on the wider political and public agenda, measures need to accurately capture and track the well-being of the population to provide information to policymakers, while also providing a vital counterpart to existing monetary measures of progress in public discourse.

This paper has presented two early models of an MWI using data from a single wave of Understanding Society. Multidimensional poverty indices employing a similar methodology are used now in dozens of countries as

official permanent poverty statistics. They are communicated widely and inform budgeting, targeting, policy coordination, and monitoring and management. In turning to well-being, the MWI follows the innovative example of Bhutan's GNH Index, which itself is accompanied by a set of policy and programme screening tools, so that human well-being is truly at the centre of governance. This illustrative exercise demonstrates how a multidimensional index based on the Alkire-Foster method could measure and track well-being across the population, and provide single-headline statistics appropriate for policymaking and communicable to the public. Unlike many conventional measures, the MWI and its associated information platform offer an intuitive approach that illuminates the complexities of well-being, while being easy to communicate to politicians, policymakers and members of the public alike. By applying the Alkire-Foster method, the MWI captures both the incidence and the intensity of well-being, showing the average share of dimensions in which people enjoy sufficiency, and thus going beyond a simple dashboard. While this current paper does not extend to analysis of well-being over time, the index is applicable to tracking changes in levels of well-being across time points, data permitting.

The MWI also retains the rich and intricate details provided in dashboards so it can be decomposed by gender, ethnic group, age group and region, and broken down by indicator to understand the composition of well-being across the population. It goes even further by capturing overlapping deprivations across different indicators and dimensions as information is collated on all selected indicators for all individuals. This can help allocate budgets to areas and groups highlighted by the index, and assess new (or existing) policies against their impact on MWI across the population. Looking at deprivations and indicators in detail can help to coordinate policy action and create integrated, multisectoral policies that focus on overlapping deprivations faced by those with less favourable well-being conditions. By increasing their attainments, either by raising the proportion of those with favourable well-being or by decreasing the intensity of deprivations among those with less favourable status, the MWI will also increase.

The illustrative findings of the trial MWIs, using data from a single wave of Understanding Society from 2017–2019, are data constrained. A key priority going forward would be to explore new surveys and collaborate with other actors to generate a final set of indicators. But if these initial indicators are accurate, they paint a picture of well-being rooted in employment, education and happy relationships, while the largest deficiencies appear to be in health and subjective well-being indicators. The findings reinforce the discourse around the importance of addressing loneliness and poor mental health, and encouraging healthier lifestyles through exercise and nutrition.

As the MWI collates information on each individual in the data to create an aggregate measure of national well-being, the results were decomposed by subgroups and indicator to reveal the underlying inequalities in quality of life across the country, showing stark differences between White and other ethnic groups, for example. Policy responses could thus use MWI evidence to address differences in well-being identified across

ethnic groups, age groups and regions of the country to ensure no one is being left behind, and all have the chance for a happy and fulfilled life.

With its level of detail and appropriate statistical properties, the MWI could be appropriately revised and extended across time, and could include robustness tests. This would give it the potential to complement and accompany key measures of human progress such as GDP. In its present form, the trial MWI is constrained by data issues and requires further work to make it pertinent as a well-being measure of the British population. Some limitations arise from constructing the measure from a single data source, due to the irregularity of data collection and lack of available data on some key indicators of well-being (e.g., sports or arts participation, volunteering and group memberships). With the advancement of the well-being agenda, these limitations could be addressed. Future work should also consider a linked MPI based on a subset of dimensions and indicators and more stringent cut-offs in order to explore insights that might arise from a joint approach to measuring poverty and well-being and its relevance for public policy. Additional work might also look at changes in well-being levels over time across the United Kingdom and the effects of the COVID-19 pandemic.

References

Alkire, S. 2002. "Dimensions of human development." *World Development* 30(2): 181-205.

———. 2016. "Capability approach and well-being measurement for public policy." In *The Oxford Handbook of Well-being and Public Policy,* M. D. Adler and M. Fleurbaey, eds. New York: Oxford University Press.

Alkire, S., and J. Foster (2011). "Counting and Multidimensional Poverty Measurement." *Journal of Public Economics* 95(7-8): 476-487.

Alkire, S., and G. Robles. 2016. "Measuring multidimensional poverty: Dashboards, union identification, and the Multidimensional Poverty Index (MPI)." OPHI Research in Progress 46a. . Oxford Poverty and Human Development Initiative, University of Oxford.

Alkire, S., et al. 2015. *Multidimensional Poverty Measurement and Analysis*. Oxford: Oxford University Press.

Allin, P., and D. J. Hand. 2016. "New statistics for old? Measuring the well-being of the UK." *Journal of the Royal Statistical Society Series A (Statistics in Society)* 180(1): 3-43.

Anand, S., and A. Sen. 1996. "Sustainable human development: Concepts and priorities." UNDP Human Development Report Office 1994 Occasional Papers. New York: UNDP.

———. 2000. "The income component of the Human Development Index." *Journal of Human Development* 1(1): 83-106.

Argyle, M. 1991. *Cooperation: The basis of sociability.* London: Routledge.

Cameron, D. 2010. "PM Speech on Well-being." 25 November.

Causa, O., N. Woloszko and D. Leite. 2019. "Housing wealth accumulation and wealth distribution: Evidence from stylized facts." Economics Department Working Papers 1588. Paris: OECD.

Clark, D. A. 2002. *Visions of development: A study of human values*. Cheltenham, United Kingdom: Elgar.

Clark, D. A., ed. 2012. *Adaptation, Poverty and Development: The Dynamics of Subjective Well-Being*. London: Palgrave Macmillan.

Cummins, R. A. 2000. "Objective and subjective quality of life: An interactive model." *Social Indicators Research* 52(1): 55-72.

Diener, E., et al. 2009. *Well-being for Public Policy*. New York: Oxford University Press.

Dolan, P., R. Layard and R. Metcalfe. 2011. "Measuring subjective well-being for public policy." Office for National Statistics. February.

Fleurbaey, M., et al. 2018. *A Manifesto for Social Progress: Ideas for a Better Society*. Cambridge: Cambridge University Press.

Fujiwara, D., and R. Campbell. 2011. *Valuation Techniques for Social Cost-Benefit Analysis: State Preference, Revealed Preference and Subjective Well-being Approaches*. HM Treasury and Department for Work and Pensions. July.

Fujiwara, D., et al. 2020. *The Well-being Costs of Covid-19 in the UK: An Independent Research Report by Simetrica-Jacobs and the London School for Economics and Political Science.*

Fukuda-Parr, S. 2003. "The human development paradigm: Operationalizing Sen's ideas on capabilities." *Feminist Economics* 9(2-3): 301-317.

Future Generations Commissioner for Wales. 2020. *The Future Generations Report 2020*. May.

Gasper, D. 2004. *The Ethics of Development: From Economism to Human Development*. Edinburgh: Edinburgh University Press.

Germany, Federal Government. 2020. Indicators.

Goldberg, D. P., et al. 1997. "The validity of two versions of the GHQ in the WHO study of mental illness in general health care." *Psychological Medicine* 27: 191-197.

Graham, C. 2010. *Happiness Around the World: The Paradox of Happy Peasants and Miserable Millionaires.* New York: Oxford University Press.

Green Party Ireland. 2020. *Wellbeing Indicators*. 10 November.

Helliwell, J. F., and S. Wang. 2012. "The State of World Happiness." In *World Happiness Report 2012,* J. F. Helliwell, R. Layard and J. Sachs, eds. New York: UN Sustainable Development Solution Networks.

Iceland, Prime Minister's Office. 2019. *Indicators for Measuring Well-being.* September.

IPSP (International Panel on Social Progress). 2018. *Rethinking Society for the 21st Century: Report of the International Panel on Social Progress*. Cambridge: Cambridge University Press.

Jo Cox Commission on Loneliness. 2017. *Combatting Loneliness One Conversation at a Time: A call to action*. December.

Kahneman, D. 2011. *Thinking Fast and Slow*. New York: Farrar, Straus and Giroux.

Kaminska, O., and P. Lynn. 2019. "Weighting and sample representation: Frequently asked questions." Institute for Social and Economic Research, University of Essex.

Layard, R. 2005. *Happiness: Lessons from a New Science*. London: Penguin.

McPhillips, M. 2017. "The Impact of Housing Problems on Mental Health." *Shelter Research Report*, April.

National Health Service. 2019. *Eat Well Guidance*. 27 March.

National Health Service. 2018a. *Physical Activity Guidelines*.

National Health Service. 2018b. *Physical Activity Guidelines for Older Adults.*

New Zealand, Treasury. 2019a. *Measuring Well-being: The LSF Dashboard.* 12 December.

New Zealand, Treasury. 2019b. *The Wellbeing Budget*, 30 May.

Nussbaum, M. 2001. "Adaptive Preferences and Women's Options." *Economics and Philosophy* 17(1): 67-88.

O'Donnell, G., et al. 2014. *Well-being and Policy*. *Report of the Commission on Wellbeing and Policy*. London: Legatum Institute.

OECD (Organisation for Economic Co-operation and Development). 2013. *Guidelines on Measuring Subjective Well-being*. Paris: OECD Publishing.

Ranis, G., F. Stewart and E. Samman. 2006. "Human development: Beyond the Human Development Index." *Journal of Human Development and Capabilities* 7(3): 323-358.

Ricard, M. 2007. *Happiness: A Guide to Developing Life's Most Important Skills*. Boston: Little, Brown and Company.

Scotland, Scottish Government. 2019. *Scotland's Wellbeing: Delivering the National Outcomes.* May.

Scotland, Scottish Government. 2020. *National Performance Framework*.

Seligman, M.E.P. 2012. *Flourish: A Visionary New Understanding of Happiness and Well-being*. New York: Simon and Schuster.

Sen, A. 2009. *The Idea of Justice.* Cambridge, MA: Harvard University Press.

Smith, C. 2019. *Measuring disability for the Equality Act 2010 Harmonisation Guidance.* 25 June.

Stiglitz, J. E., J. Fitoussi and M. Durand. 2018a. *Beyond GDP: Measuring What Counts for Economic and Social Performance*. Paris: OECD Publishing.

———. 2018b. *For Good Measure: Advancing Research on Well-being Metrics Beyond GDP*. Paris: OECD Publishing.

Stiglitz, J. E., A. Sen and J. Fitoussi. 2009. *Report by the Commission on the Measurement of Economic Performance of Social Progress*. Paris: Commission on the Measurement of Economic Performance and Social Progress.

Stone, A., and A. Krueger. 2018. "Understanding subjective well-being." In *For Good Measure: Advancing Research on Well-being Metrics Beyond GDP,* J. E. Stiglitz, J. Fitoussi and M. Durand, eds. Paris: OECD Publishing.

ul Haq, M. 1995. *Reflections on Human Development.* New York: Oxford University Press.

UNDP (United Nations Development Programme). 1990. *Human Development Report 1990: Concept and Measurement of Human Development*. New York: Oxford University Press.

United Kingdom, Department for Work and Pensions. 2020. *Households below average income: an analysis of the income distribution 1994/95 to 2018/19.* 26 March.

United Kingdom, HM Government. 2018. *A connected society. A strategy to tackle loneliness—laying the foundations for change*. October.

United Kingdom, HM Treasury. 2020. *The Green Book: Central Government Guidance on Appraisal and Evaluation*.

United Kingdom, HM Government. 2020. *Loneliness Annual Report.* January.

United Kingdom, Office for National Statistics. 2011. *Measuring What Matters: National Statistician's Reflection on the National Debate on Measuring National Well-being.* July.

———. 2016. *Measuring National Well-being: Life in the UK 2016.* 23 March.

———. 2018. *Measuring Loneliness: Guidance for Use of the National Indicators on Surveys*. 5 December.

———. 2019a. *Measuring national Well-being: Domains and Measures*. 23 October.

———. 2019b. *Personal and Economic Well-being: What Matters Most to our Life Satisfaction?* May.

———. 2020a. *Consumer Price Inflation tables.* June.

———. 2020b. *Coronavirus and depression in adults: Great Britain Articles*. Statistical bulletin.

———. 2020c. *Coronavirus and the social impacts on Great Britain*. Statistical bulletin.

———. 2020d. *A guide to labour market statistics*, 16 June.

University of Essex, Institute for Social and Economic Research, NatCen Social Research and Kantar Public. 2019. *Understanding Society: Waves 1-9, 2009-2018 and Harmonised BHPS: Waves 1-18, 1991-2009 (data collection).* 12th edition, UK Data Service.

Ura, K., et al. 2012. *An Extensive Analysis of GNH Index, Centre for Bhutan Studies*. Thimphu.

Ware Jr., J., M. M. Kosinski and S. D. Keller. 1996. "A 12-item short-form health survey: Construction of scales and preliminary tests of reliability and validity." *Medical Care* (34)3: 220-233.

What Works Wellbeing. 2019. *A Brief Guide to Measuring Loneliness*. February.

———. 2020. *Covid-19 and loneliness: How has Covid-19 and associated lockdown measures affected loneliness in the UK?* Briefing.

Appendices

APPENDIX A: RESULTS FOR MEASURE 1

Table A1. Headline figures for MWI (Measure 1)

Disaggregation	MWI	H^s	H^{us}	A^s	A^{us}	Pop. share (weighted)	Sample size (weighted)
National	0.790	45	55	84	62	100.0	26,501
Urban	0.780	42	58	84	62	75.5	19,999
Rural	0.822	52	48	85	63	24.5	6,502
16–19	0.817	50	50	84	63	5.8	1,549
20–29	0.728	30	70	82	61	13.0	3,434
30–39	0.721	28	72	82	61	13.9	3,684
40–49	0.751	35	65	82	62	15.8	4,175
50–59	0.763	38	62	83	62	18.3	4,842
60–69	0.845	57	43	85	63	15.4	4,080
70 years and older	0.895	69	31	85	67	17.9	4,744
North East	0.770	41	59	83	61	4.4	1,167
North West	0.793	45	55	84	62	11.3	2,985
Yorkshire and Humber	0.789	44	56	84	62	8.8	2,324
East Midlands	0.811	48	52	84	63	7.7	2,029
West Midlands	0.785	43	57	84	62	8.8	2,320
East England	0.802	47	53	84	62	9.8	2,586
London	0.753	35	65	83	62	11.2	2,959
South East	0.797	46	54	84	63	13.7	3,620
South West	0.803	48	52	84	62	8.9	2,346
Wales	0.797	47	53	84	62	4.7	1,232
Scotland	0.792	45	55	84	62	8.3	2,193
Norther Ireland	0.792	44	56	84	63	2.8	740
Men	0.799	46	54	84	62	47.9	12,689
Women	0.782	42	58	84	62	52.1	13,819
White	0.796	46	54	84	62	92.7	24,530
Mixed/multiple ethnic groups	0.720	31	69	83	59	1.2	321
Asian/Asian British	0.738	32	68	83	62	4.1	1,081
Black/African/Caribbean/Black British	0.694	24	76	81	60	1.6	429
Other ethnic group	0.664	24	76	82	56	0.4	113
White	0.796	46	54	84	62	92.7	24,530
All other ethnic groups combined	0.721	29	71	82	60	7.3	1,944

Source: Authors' calculations.

APPENDIX B: MISSING VALUES

Table B1. Missing values for selected indicators of the MWI

Variable	Missing	Total	Percentage missing
Life satisfaction	197	32,808	0.60
Worthwhile	129	32,808	0.39
Unhappiness	159	32,808	0.48
Anxiety	122	32,808	0.37
Unhappy relationships	141	32,808	0.43
Loneliness	208	32,808	0.63
Social networks	40	32,808	0.12
Neighbourhood belonging	217	32,808	0.66
Disability	43	32,808	0.13
Limited activity	143	32,808	0.44
Health satisfaction	189	32,808	0.58
Self-reported health	64	32,808	0.20
GHQ	78	32,808	0.24
Feeling down/depressed	207	32,808	0.63
Fruit and vegetable consumption	21	32,808	0.06
Exercise	213	32,808	0.65
Unemployment	72	32,808	0.22
Job satisfaction	138	32,808	0.42
Satisfaction with leisure time	196	32,808	0.60
Low income	24	32,808	0.07
Satisfaction with income	202	32,808	0.62
Difficulty with finances	129	32,808	0.39
Housing tenure	208	32,808	0.63
Adequate heating	80	32,808	0.24
Voting	69	32,808	0.21
Political efficacy	526	32,808	1.60
No A level or equivalent	71	32,808	0.22

Source: Authors' calculations.

UNDP Human Development Report Office
304 E. 45th Street, 12th Floor
New York, NY 10017, USA
Tel: +1 212-906-3661
Fax: +1 212-906-5161
http://hdr.undp.org/