

# Mental Health & Wellbeing in Blackburn with Darwen

Beyond Imagination Life Survey  
ImaginationLancaster

June 2022





## Executive Summary

This report summarises the findings of the **Mental Health & Wellbeing** case study proposed by Blackburn with Darwen Borough Council. In the analysis of the data collected from 1,300 people in Blackburn with Darwen the following key findings were established:

**Those with the poorest mental health and wellbeing are likely to have one of the following characteristics:**

- Self-report (very) bad health or have a long-term health condition, particularly those that make everyday activities harder and prevent economic activity.
- Self-report finding it (very) difficult on their income, have lower household incomes or have lower educational attainment.
- Are renters or are the sole adult in the household, particularly single-parent adults.

## Background

Lancaster University, Lancaster City Council and Blackburn with Darwen Council have come together to initiate the Beyond Imagination Life Survey. Commissioned by Lancaster University and undertaken by BMG Research the survey of just under 3,000 residents aims to gather a representative picture of views, attitudes and experiences, which will in turn inform strategy, activities and research opportunities for ImaginationLancaster, the local authorities and other local partners.

Lancaster City Council and Blackburn with Darwen Council priorities have formed a key part of the survey development throughout, resulting in a survey structure which combines the needs of different stakeholders, based on four themes:

- Health and Wellbeing
- Wealth and Opportunity
- Sustainability, Transport and Travel
- Connected Communities and Services

## Bringing the data to life

Connected Places Catapult were commissioned to develop an interactive data dashboard solution to explore and visualise the Life Survey data, and to enable future interactive data analysis, research and visualisation. To this end, a series of case studies have been produced by Connected Places Catapult based on research themes developed with the project partners in Beyond Imagination workshops. Within the series, this case study serves as an example that demonstrates how bespoke data processing and statistical analysis can enhance the Life Survey data.

## Introduction

This is the report for the Mental Health & Wellbeing case study for the Beyond Imagination Life Survey created by Connected Places Catapult in collaboration with ImaginationLancaster and Blackburn with Darwen Borough Council. The results and findings presented here were extracted from the analysis and visualisations produced in the Mental Health & Wellbeing Dashboard.



Blackburn with Darwen Public Health Team are developing a Wellbeing and Inequalities Framework to address inequalities and inform council policy. The framework will provide a guide for policy makers and council workers to ensure equity of services and resources to reach an equal 'high standard' outcome for all residents.

The Life Survey includes the self-reported wellbeing of residents, and so is a useful source to better understand mental health and wellbeing in the borough and investigate some of its relationships, correlations and drivers with other variables and characteristics, such as health, economic activity and living circumstances. By analysing the Life Survey through a wellbeing lens, this case study can test intelligence from national studies and will help to inform the new framework and future strategy.

## Methodology

The data in the Life Survey was collected by BMG Research who took measures to increase the representativeness of the participants of the survey. The data collection for the survey consisted of online surveys and (offline) in-person interviews. The anonymised data were securely transferred to Connected Places Catapult, where the data was verified, cleansed and processed using a Jupyter Python Data Science environment, which included the joining to geospatial data provided by Ordnance Survey and Office for National Statistics. The data was loaded into a PostgreSQL database and connected to Apache Superset. Here the dashboard solution was developed, the data analysis was carried out, the dashboards built, and the visualisations created. The Exploratory Dashboard was used to discover relationships in the data, and only then were custom visualisations created for the case study dashboard.

Here mental health and wellbeing was analysed through question 35 (Q35), The Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) ©University of Warwick, 2006, all rights reserved. WEMWBS was developed by the Universities of Warwick, Edinburgh and Leeds in conjunction with NHS Health Scotland. Q35 is comprised of 14 subquestions, and the responses to these are each converted into a 5-point scale and summed to an overall WEMWBS score between 14 and 70. This can also be categorised as low (<44), medium (45-59) and high (60-70). In past studies, scores in the low category have been correlated with possible and probable depression.

The Life Survey data is inherently categorical (as opposed to numerical) as respondents are given a set of discrete answers to choose from for each question. However, the WEMWBS provides an example of a numerical variable, which allows for enhanced geospatial and statistical analysis, such as the calculation of the mean score and the Gini inequality. The latter is a measure of relative inequality ranging between 0 (complete equality) and 1 (complete inequality), or 0-100%, and is the average difference between scores from the group scaled by the mean score. The Life Survey also provides various variables and characteristics that can help to investigate mental health and wellbeing, which can be found in the Appendix.

## Results & Discussion

Within the borough, and in most wards, the average respondent reported wellbeing on the lower end of medium WEMWBS score, and the highest wellbeing inequality was found in the north east of the Borough. Figure 1a shows that the WEMWBS score is distributed around the mean of 49.5 sites in the medium (or national average) category. The long tail indicates a number of respondents suffering from low mental wellbeing, which suggests a high prevalence of depression and other mental illnesses. With more samples the data is expected to tend to a normal distribution. Figure 1b shows that the average wellbeing is medium/average in most wards in the borough. Figure 1c shows the inequality of WEMWBS scores within wards is highest in the more urban, north east area around Blackburn, but that the inequality is roughly equal (between 9-14%) over the borough.

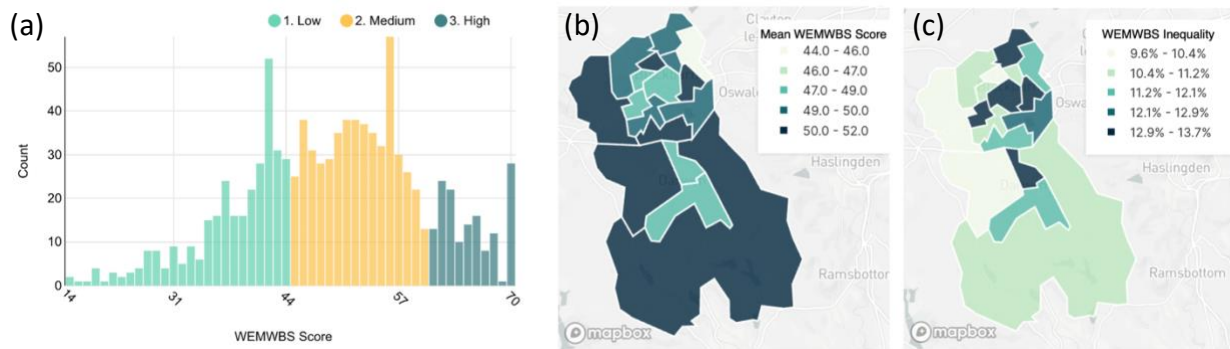


Figure 1: (a) The distribution of WEMWBS score across Blackburn with Darwen, and colour-coded by wellbeing category. (b) The average WEMWBS score per ward. (c) The relative WEMWBS (Gini) inequality per ward ranging from 0% (complete equality) to 100% (complete inequality).

**Wellbeing was strongly correlated with general health, and those with long term health conditions experience significantly lower mental health.**

It was found that the health of most respondents was fair or (very) good (for additional charts see the dashboard). However, those that reported (very) bad health, were more likely to also score low on the WEMWBS, as shown in the boxplot Figure 2a. Regression analysis found that on average the WEMWBS score is increased by 5 points for 1 health category increment (e.g. Fair to Good). The coefficient of determination  $R^2$  indicated that general health accounted for 20% of the variance in WEMWBS. It was found that two thirds of the almost 1,000 respondents did not have a long-term condition or illness, but for the third that did, there was a significant increase in likelihood of lower mental health as shown in Figure 2b. This corresponded to an 8-point decrease in WEMWBS score on average (44 no, 52 yes). Further, those with a long-term issue that reduced their ability to carry out day-to-day activities showed over a 1-in-2 chance of scoring low WEMWBS, as shown in Figure 1c, and for those out of work due to ill health the chance of a low score was over 3-in-4. This indicates that these groups are at increased risk of conditions associated with poor mental health, such as depression.

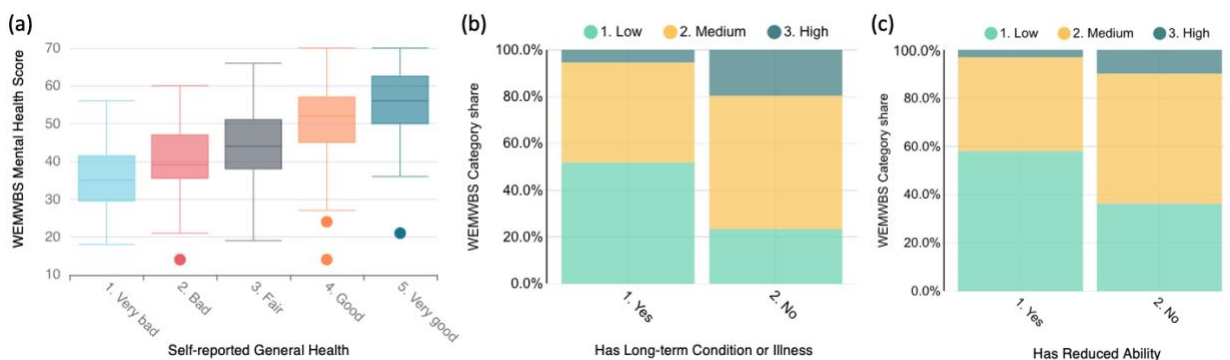


Figure 2: (a) Boxplot showing the distribution of WEMWBS score by self-reported general health category. (b) Distribution of WEMWBS category share for those with and without a long-term condition or illness. (c) Distribution of WEMWBS category share for those with a long-term condition grouped by if they suffer from reduced ability to carry out day-to-day activities.

**Lower wellbeing is more likely in those struggling with their income, renting, or the only adult in the household.**

Under the theme of economic activity, it was found that those on lower incomes or reported finding it hard on their income had an increased chance of a lower wellbeing score. This was also the case for respondents that had reached lower education levels. Analysis of living circumstances found that although the majority of respondents either own outright, or own with a mortgage or loan, the remaining 25% that rent had nearly a 20% higher chance of scoring low on the WEMWBS. Those that were the only adult in the household also had



an increased likelihood of a lower score, with this chance increasing if the household contained children (most of these adults were female). There are additional charts in the dashboards supporting these findings.

## Outlook

This case study investigated mental health and wellbeing in Blackburn with Darwen using the Life Survey and bespoke geospatial and statistical analysis. In summary, it was found that those with any of poorer general health, long term illness, lower income, lower educational levels, rent or live alone are more likely to experience lower wellbeing. The key results have been presented here, but further exploration and analysis of the data is possible with the accompanying Dashboard. These findings are coherent with intelligence from national evidence, but this case study did not find conclusive evidence about middle-age being an at-risk group, so this analysis should be revisited. Another area of interest for future work is whether participants with poorer mental health have access to and are confident using digital and online resources. It could be the case that the increase in online support (rather than face-to-face) during the Covid-19 pandemic was disadvantageous to some of the more vulnerable residents. Some initial work is presented in the Dashboard, but this complex topic requires further investigation.



## Partners & Funding

### **ImaginationLancaster**

Imagination is Lancaster University's cross-disciplinary design research lab. In 2019 ImaginationLancaster was awarded £13.2m for a multi-year project titled Beyond Imagination. Funded by UKRI Research England and led by Professor Leon Cruickshank, Director of Research at ImaginationLancaster, Beyond Imagination explores and demonstrates how cutting-edge design research can create a healthier, more prosperous and sustainable world.

<http://imagination.lancaster.ac.uk>

### **Data Science Institute**

Lancaster University's Data Science Institute (DSI) supports interdisciplinary data intensive research across the University, with core themes of: foundations, health, environment, society. It has 155 academic members from 19 depts and works with business, government and third sector partners. Current member activities include work understanding the needs of looked after children, links between the quality of the urban environment and health as well as projects in cyber security.

<https://www.lancaster.ac.uk/dsi/>

### **Blackburn with Darwen Council**

Blackburn with Darwen is a semi-rural unitary borough located in the south east of Lancashire. It has compact urban areas predominately located around the towns of Blackburn and Darwen, surrounded by countryside. These contrasting areas include some of most and least deprived in England. The current corporate plan has the aim of enabling borough residents to achieve a good quality of life in a vibrant and thriving place, with strong community values, in an inclusive society.

<https://blackburn.gov.uk>

### **Lancaster City Council**

The Lancaster district includes diverse and attractive city, coast and countryside locales. Lancaster City Council's vision is for the district to thrive as a vibrant regional centre in the north west of England. In December 2021 the council set out its four priorities for 2030, along with strategies for how these can be achieved: A Sustainable District, An Inclusive and Prosperous Local Economy, Healthy and Happy Communities and A Co-operative, Kind and Responsible Council.

<https://www.lancaster.gov.uk>

### **Connected Places Catapult**

Connected Places Catapult is the UK's Innovation Accelerator for cities, transport and places. We provide impartial 'innovation as a service' for mobility and built environment businesses, infrastructure providers and public institutions to catalyse step-change improvements in the way people live, work and travel. We help develop, implement and commercialise the latest technology and innovation for existing markets, as well as create demand and grow new markets in the UK and globally.

<https://cp.catapult.org.uk>

### **BMG Research**

Established since 1988, we have more than 30 years' experience of working with our clients to build and deepen our understanding of changing and ever more complex markets, people and society. We work with our clients to fully understand the challenges faced by their organisations, identify priorities for action, and evaluate the impact of change.

<https://www.bmgresearch.co.uk/>

### **Research England**

We are responsible for funding and engaging with English higher education providers to create and sustain the conditions for a healthy and dynamic research and knowledge exchange system in the higher education sector.

<https://www.ukri.org/councils/research-england/>



## Appendix

### Data sets used

Data Set	Source
Life Survey	Imagination Lancaster
Ordnance Survey / Office for National Statistics census and administrative boundaries and postcode lookups	Open Geography Portal

### Life Survey questions used

No.	Description
35	WEMWBS mental health score
31	General Health
32	Long Term Condition
33	Reduced Ability
46	Internet Access

No.	Description
67	Household Income
70	Employment Status
68	Feelings Towards Income
69	Education Levels
50	Digital Confidence

No.	Description
69	Housing Tenure
60	Adults in Household
61	Children in Household
3	Gender
2	Age

### Further details

Respondents that did not respond to a question (answered don't know, prefer not to say, etc) were not included in the analysis. The Gini inequality is a measure of relative inequality ranging between 0 (complete equality) and 1 (complete inequality), or 0-100%, and is the average difference between scores from the group scaled by the mean score. Statistical analysis used linear regression to model the relationship between WEMWBS score and other variables, and 95% confidence interval bootstrap was used to significance test differences in the mean scores of groups, which accounts for variance and small sample groups.

## Data Access Statement

### Beyond Imagination Life Survey Dataset

Due to ethical issues, data underpinning this publication cannot be made openly available. Access to the Beyond Imagination Life Survey dataset is restricted to Lancaster University researchers and officers within Lancaster City Council and Blackburn with Darwen Council. Further information about the data and conditions for access are available from Lancaster University's Institutional Repository at: <https://doi.org/10.17635/lancaster/researchdata/540>

### Beyond Imagination Life Survey: Topline Reports and Case Studies

Topline Reports of the Life Survey findings and six case studies created in collaboration with Connected Places Catapult are openly available from Lancaster University's Institutional Repository at: <https://doi.org/10.17635/lancaster/researchdata/542>

### Beyond Imagination Life Survey: Data Dashboard

Due to participant consent obtained for the Life Survey access to the data dashboard is restricted to Lancaster University researchers, officers in Lancaster City Council and Blackburn with Darwen Council. Lancaster University host and manage the data dashboard with access granted on a role-based basis. A password protected log on to the Life Survey data dashboard can be requested by emailing: [imagination@lancaster.ac.uk](mailto:imagination@lancaster.ac.uk)

# Acknowledgements

ImaginationLancaster would like to thank: Research England, Jez Bebbington at Lancaster City Council and Elise Carol at Blackburn with Darwen Council. Sharon Gowland and Jack Harper at BMG Research. Elliot Christou, William Daubney, Louise Files and Darren Pangbourne at Connected Places Catapult. Professor Jo Knight at Lancaster University's Data Science Institute. Officers of Lancaster City Council, Blackburn with Darwen Council and researchers in ImaginationLancaster who contributed to the design of the Life Survey Questionnaire and Catapult Case studies.

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ISBN: 978-1-86220-383-9