

Technical appendix: levelling up outlook #5

Methodology note, April 2022

Cost of living vulnerability index

This appendix sets out the methods and sources used to produce the Cost of Living Vulnerability Index, as featured in [CPP's fifth Levelling Up Outlook](#).¹

Approach and indicator selection

We expect place based vulnerability to the cost of living crisis to be closely linked to levels of income deprivation in the population. While the English Indices of Multiple Deprivation (IMD) is the official measure of deprivation and income deprivation in England, our index intends to go further with respect to the cost of living crisis by focusing on indicators of poverty that correspond with the specific cost pressures associated with the cost of living crisis. This allows us to identify places where there may be a greater impact on poverty within a place as a result of the crisis, that is not captured through their IMD Income Deprivation ranking.

Given that rising energy, food, and housing costs have emerged as some of the most significant drivers of general inflation at this point of the crisis, we initially set out to include indicators within our index that reflected these.² Therefore our initial set of indicators chosen can be seen in Table 1:

Table 1: Our Initial Indicators

Indicator	Description	Data Source
Food insecurity	The % of adults within a local authority experiencing food insecurity	The University of Sheffield: Adult food insecurity at Local Authority scale (2021) https://smarthinking.org.uk/article/one-thing-spring-budget/
Fuel poverty	The % of households within a local authority	Department for Business, Energy & Industrial Strategy: Fuel poverty statistics (2019)

	living in fuel poverty	https://www.gov.uk/government/collections/fuel-poverty-statistics
Child poverty	The % of children living in households with below 60% median income before housing costs	Loughborough University: Local indicators of child poverty after housing costs 2019/20 (2020) http://www.endchildpoverty.org.uk/local-child-poverty-data-2014-15-2019-20/
Universal Credit claimant count	The % of the population aged 18 to state pension age claiming universal credit	Office for National Statistics (2022) https://www.ons.gov.uk/employmentandlabourmarket/peoplenotnwork/unemployment/datasets/claimantcountbyunitaryandlocalauthorityexperimental
Economic inactivity (working age population)	The % of the population aged 16–64 not in employment and not actively seeking employment	Office for National Statistics (2022) https://www.ons.gov.uk/employmentandlabourmarket/peoplenotnwork/economicinactivity
Low pay	The % of jobs that pay two-thirds or below the UK median gross hourly pay by local authority	The Health Foundation: Proportion of low-paid jobs by local authority (2021) https://www.health.org.uk/evidence-hub/work/job-quality/proportion-of-low-paid-jobs
Median earnings	The weekly median earnings in a local authority	Office for National Statistics (2022) https://www.ons.gov.uk/employmentandlabourmarket/peoplenotnwork/economicinactivity
Housing affordability ratio	The ratio between median house prices and	Office for National Statistics (2022). https://www.ons.gov.uk/peoplepopulationand

¹ Centre for Progressive Policy. April 2022. The levelling up outlook 5. Available here: <https://www.progressive-policy.net/publications/the-levelling-up-outlook-5>
² For more on this see ONS. (2022). Impact of increased cost of living on adults across Great Britain. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhousehold>

[inances/expenditure/articles/impactofincreasedcostoflivingonadultsacrossgreatbritain/november2021tomarch2022](https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdincomes/expenditure/articles/impactofincreasedcostoflivingonadultsacrossgreatbritain/november2021tomarch2022); & Zoopla (2022). House Price Index Report. Available at: <https://advantage.zpg.co.uk/house-price-index-report/?member=true>

	median gross annual earnings in a local authority	ndcommunity/housing /datasets/ratioofhouse pricetoworkplacebase dearningslowerquartil eandmedian
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In order to ensure that our indicators were all relevant to general income deprivation, we ran a multiple regression model of the indications on local authority level income deprivation, the results of which can be seen in full in *Annex 1*.

The model was a good fit for IMD Income Deprivation with $R^2=0.88$, in addition to all of our indicators being statistically significant. Yet two of our indicators – Housing Affordability Ratio & Median Earnings – were negatively correlated with IMD Income Deprivation, and were therefore dropped from our index. We made this call as we see a negative relationship with IMD Income Deprivation that may be indicative of median earnings and household affordability ratios reflecting as measurements of affluence, rather than deprivation, in our model. This then left us with the remaining six indicators– food insecurity; fuel poverty; child poverty; universal credit claimant count; economic inactivity; and low pay.

As all of our indicators were statistically significant and with no clear way of weighing them, we opted to assign them equal weight in our index. To ensure that our index is robust, we created several versions, assigning different weightings to each of the indicators and found there to be no significant difference in the most and least vulnerable places identified, and most of the trends that we identify within our index.

Data and ranking

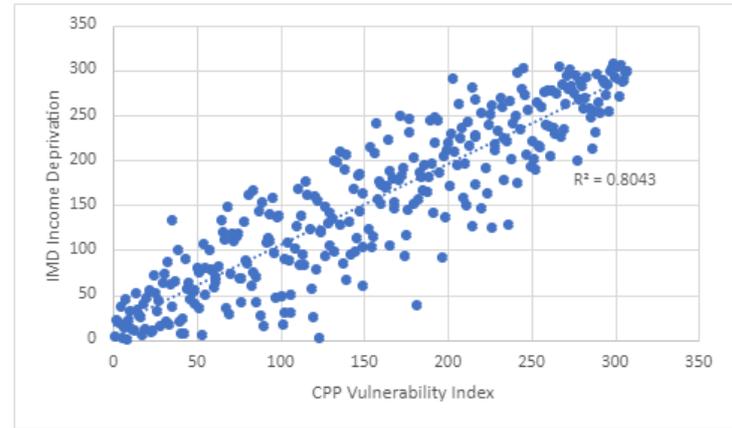
Data for the indicators is assigned at lower tier local authority (LTLA) level in England where data was available. Due to a lack of data we did not include both the City of London and Isles of Scilly. To normalise the data, each of the 307 local authorities is ranked on each indicator, ranking 307 if they have the highest level of vulnerability (i.e. highest proportion of population living in fuel poverty), and ranking 1 if they have the lowest level of vulnerability (i.e. lowest proportion of population living in fuel poverty). For our final rankings, this is then reversed so that 1 = the most vulnerable LTLA.

Our data sources come from several different years, and within that time several local authorities that had existed in our older datasets have become subsumed into three new authorities – Buckinghamshire, North Northamptonshire, and West Northamptonshire. Where data for these older authorities exists, we took a population weighted average of the older authorities data

and used that figure to reflect that of the newer authorities.

Index relationship with IMD income deprivation

Chart 1: Relationship between IMD Income Deprivation (2019) and CPP Vulnerability Index (2022)



We see in *Chart 1* that while places who have the highest and lowest ranks in our vulnerability index tend to see strong correlation with their IMD Income Deprivation rank, there is notable variance across middle ranking places.

The most significant differences that we can see are rural areas whose overall vulnerability index rank is far higher than their IMD Income Deprivation rank, with Craven, Rutland, West Northamptonshire, and Richmondshire, having some of the largest differences. While in West Northamptonshire this is driven by higher levels of existing levels of deprivation relative to their work-based vulnerability, elsewhere the divergence is driven in large part by a high prevalence of low paying jobs in these places.

We also see that places that appear less vulnerable to the cost of living crisis relative to their IMD Income Deprivation rank are mostly concentrated in the South East and the East of England, although there few clear commonalities among places regarding the specific drivers of their vulnerability. While in places such as Foklestone & Hythe and Broxbourne the divergence is driven by deprivation factors, elsewhere in Stevenage and Lewes, economic factors are the key drivers.

Council tax and universal credit analysis

To calculate the cost of the council tax rebate, we multiplied the cost of the rebate (£150) by local authority dwelling stock in bands a-d, which amounted to the £2.9bn figure as set out by the government to fund this. In order to calculate this per capita, we divided the spend of each local authority by the local population.

To calculate the cost of covering the cost of the energy price cap rise for those receiving universal credit, we took the average increase in energy bills (£693)³ and multiplied that by the number of households receiving universal credit in each local authority. In order to calculate this per capita, we divided the spend of each local authority by the local population.

³ Ofgem. (2022). Price cap to increase by £693 from April. Available at: <https://www.ofgem.gov.uk/publications/price-cap-increase-ps693-april>

Annex 1. Regression Table Results

<i>Regression Statistics</i>				
Multiple R	0.939985384			
R Square	0.883572522			
Adjusted R Square	0.880425834			
Standard Error	0.015674822			
Observations	305			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.004696337	0.012797698	0.366967322	0.713905596
Food Insecurity	0.069768329	0.028111249	2.481865139	0.013624424
Claimant Count	1.83818151	0.114589928	16.04138818	4.17324E-42
Fuel Poverty	0.068812585	0.037515418	1.834248141	0.067620862
Child Poverty	0.090942162	0.028421456	3.199771346	0.001524718
Economic Inactivity	0.081970314	0.021649017	3.786329602	0.00018512
Low Pay	0.069058262	0.026923955	2.564937549	0.010812374
Housing Affordability Ratio	-0.002088005	0.000300118	-6.957277845	2.23182E-11
Median Earnings	-1.71797E-05	1.51316E-05	-1.135350962	0.257146777