Data Profile: Priority Places for Food Index

Introduction

This data profile describes the Priority Places for Food Index, released as an Open dataset on the CDRC data portal. It is a composite index formed of data compiled across seven different dimensions relating to food insecurity for the four nations in the UK.

The Priority Places for Food Index is constructed using open data to capture complex and multidimensional aspects of food insecurity. It has been developed in response to the 2022 cost of living crisis which puts many of our communities under severe financial pressure and at an increased risk of food insecurity.

Building on the CDRC e-food desert index (EFDI) (Newing and Videira, 2020, available via the CDRC data portal at: https://data.cdrc.ac.uk/dataset/e-food-desert-index/), but with additional domains relating to fuel poverty and family food support, the goal of the priority places for food index is to identify neighbourhoods that are most vulnerable to increases in the cost of living and which have a lack of accessibility to cheap, healthy, and sustainable sources of food.

The index can be used to inform supermarket location analytics and improve the availability of budget food lines.

Scale and Extent

Field	Value
Data Provider	CDRC
Analytical Units	2011 Lower Super Output Area in England; 2011 Data Zones in Scotland, 2011 Super Output Areas in Northern Ireland.
Data Format	csv
Temporal Extent	Index designed for 2022. Some indicators use older

	data which are described in detail below.
Geographical Extent	UK
Variables	11
Observations	42,618

Citation Information

The following statement should be included when citing the use of this dataset:

"The data for this research have been provided by the Consumer Data Research Centre, an ESRC Data Investment, under project ID CDRC [Project Number if relevant], ES/L011840/1; ES/L011891/1. The Priority Places for Food index was developed by the Consumer Data Research Centre at the University of Leeds in collaboration with Which?"

Data Classification and Access Summary

These data are classified as open and are freely available to download for any purpose following simple registration at https://data.cdrc.ac.uk/.

Content

The data comprises of a ranking within each country in the UK for each geographical area across seven different domains relating to food insecurity. The derivation of each of the domains is described in the technical appendix below. Also included is a combined index, which weights and combines the seven domains to construct an overall ranking of Priority Places for Food within each country.

Novelty

The Priority Places for Food Index is constructed using open data. The data sources are described in the technical index below. The index is novel because it incorporates both

aspects of neighbourhood vulnerability such as material deprivation and access to food outlets.

Quality

The data is built on open data sources. In some cases, indicator data is not available for certain countries or is not captured at an appropriate level of geography. Where this lack of availability has been problematic for the construction of the index, the indicator has been omitted from the construction of the corresponding domain. Other indicators have been estimated at the necessary level of geography by using statistics at a higher level where it was appropriate to do so. The details of the domain construction and the geographic coverage of each indicator is detailed in the technical appendix below.

Representation and Bias

The data consists of ranks on a country-by-country basis, leading to reliable comparisons between areas within countries. Comparison of the indicators across countries is not recommended due to differences in the source data across countries.

Related Datasets

The Priority Places Index is based upon the CDRC e-food desert index available at: https://data.cdrc.ac.uk/dataset/e-food-desert-index

The Priority Places Index also uses indicator data from the Index of Multiple Deprivation (available as a CDRC dataset at https://data.cdrc.ac.uk/dataset/index-multiple-deprivation-imd), the 2018 Internet User Classification dataset (https://data.cdrc.ac.uk/dataset/internet-user-classification) and the National Market Traders Federation data available from the CDRC

(https://data.cdrc.ac.uk/dataset/national-market-traders-federation).

A description of each of the indicators and the derivation of the domains and the resulting index is provided in the technical appendix below.

Data Profile: Priority Places for Food Index

Field Level Metadata

Field Name	Data Type	Missing Data	Note(s)
geo_code	TEXT	None	2011 Lower Super Output Area Code in England and Wales.
domain_supermarket_proximity	INT	None	Rank of geo_code area within country against the priority places domain for proximity to supermarket retail facilities (1=highest priority).
domain_supermarket_accessibility	INT	None	Rank of geo_code area within country against the priority places domain for accessibility to supermarket retail facilities (1=highest priority).
domain_ecommerce_access	INT	None	Rank of geo_code area within country against the priority places domain for access to online deliveries (1=highest priority)
domain_socio_demographic	INT	None	Rank of geo_code area within country against the priority places domain for socio-demographic barriers (1=highest priority)
domain_nonsupermarket_proximity	INT	None	Rank of geo_code area within country against the priority places domain for proximity to non-supermarket food provision (1=highest priority).
domain_food_for_damilies	INT	None	Rank of geo_code area within country against the priority places domain for need for family food support (1=highest priority)
domain_fuel_poverty	INT	None	Rank of geo_code area within country against the priority places domain for fuel poverty (1=highest priority)
country	TEXT	None	The country within which the geo_code area sits. E=England, S=Scotland, W=Wales, NI=Northern Ireland
country_denominator	INT	None	The total number of areas within the country in which the geo_code area sits. E=32,843 (Scilly Isles excluded); S=6,976; W=1,909; NI=890.
combined	INT	None	Rank of geo_code area within country against the combined priority places index.

Priority Places for Food Index - User Guide

Peter Baudains, Francesca Pontin, Emily Ennis and Michelle Morris

Consumer Data Research Centre, University of Leeds

The CDRC Priority Places for Food Index is a composite index formed of data compiled across seven different dimensions relating to food insecurity for England, Scotland, Wales and Northern Ireland. Its goal is to identify neighbourhoods that are most vulnerable to increases in the cost of living and which have a lack of accessibility to cheap, healthy, and sustainable sources of food.

It is developed at the geographic level of Lower Super Output Areas in England and Wales, Data Zones in Scotland, and Super Output Areas in Northern Ireland (2011 boundaries).

This user guide describes the construction of the indicators and domains that form the index.

Domain	Indicator	Source data	Description/Method
Proximity to supermarket retail facilities	Average distance to nearest large grocery store	EFDI, Geolytix Retail Points v15.	A large grocery store is defined with a floor space greater than 1,400m^2. The distance from each postcode centroid to the nearest large retail store is calculated. The mean distance within each LSOA is then used as the indicator.
Proximity to supermarket retail facilities	Average count of stores within 1km	EFDI, Geolytix Retail Points v15	For each postcode in the UK, the number of supermarket stores of any size within 1km is calculated. The mean number for each LSOA is then used.
Accessibility to supermarket retail facilities	Average travel distance	England, Scotland and Wales: EFDI, from a custom-built spatial interaction model	A spatial interaction model was developed to capture interactions between residential neighbourhoods and physical grocery retail facilities. This indicator captures the average travel time for modelled individuals to carry out a food shop (including effects for store size, brand, and proximity). No equivalent data were available for Northern Ireland.
Accessibility to supermarket retail facilities	Accessibility to nearest supermarket via public transport	EFDI (England: Journey Time Statistics 2017, Table JTS0507; Wales: Welsh IMD 2019 Physical Access Domain; Scotland: Scottish IMD 2020, Geographic Access to Services)	This indicator is formed from journey travel time via public transport statistics sourced for England, Wales and Scotland. No equivalent statistics for Northern Ireland could be identified. In each case, the average time to a supermarket or other facility is given in minutes, providing an indicator of accessibility.
Access to online deliveries	Online groceries availability	England, Scotland and Wales: EFDI, Newing et al (2020).	Newing et al. (2020) describe a web-scraping method to gather data on e-commerce availability for different grocery retailers. This analysis was conducted in 2019. The number of grocery retailers delivering to each LSOA was enumerated and used as the indicator. No equivalent data was available for Northern Ireland.
Access to online deliveries	Propensity to shop online	England, Scotland and Wales: 2018 Internet User Classification (Alexiou and Singleton, 2018)	The Internet User Classification links each LSOA to a derived classification of internet use for that area, using data from the British Population Survey, transactional datasets from the CDRC, and infrastructure information, supplied by Ofcom. The indicator is derived by using

			the cluster centroid for each LSOA corresponding to the propensity for a household to shop online for their groceries. No equivalent data were found for Northern Ireland.
Proximity to non-supermarket food provision	Distance to nearest non-supermarket retail food store	Food Standards Agency UK Food Hygiene Rating Data API, accessed 23rd August 2022.	To incorporate food provision from non-supermarkets, we used the Food Standards Agency UK Food Hygiene Rating Data API to identify food shops other than supermarkets (and which are therefore subject to a Food Standards rating). The nearest distance of each postcode to the non-supermarket food retailer is calculated and then averaged to LSOA level.
Proximity to non-supermarket food provision	Count of non-supermarket retail food stores within 1km	Food Standards Agency UK Food Hygiene Rating Data API, accessed 23rd August 2022.	Using the same dataset as above, the number of non-supermarket food shops within 1km of each postcode was counted. This was then averaged to LSOA level.
Proximity to non-supermarket food provision	Average distance to nearest market	England and Wales: National Market Traders Federation, available via the CDRC.	The National Market Traders Federation collect data for registered markets in the UK via field visits to each market site by NMTF field officers. For each market listed, we calculate the distance to the nearest market for each postcode and then average that distance to each LSOA level. Coverage of the data did not extend to Scotland and Northern Ireland, for which this indicator has been omitted.
Proximity to non-supermarket food provision	Average count of markets within 1km	England and Wales: National Market Traders Federation, available via the CDRC.	Using the same dataset as above, the number of markets within 1km of each postcode was counted which was then averaged to LSOA level. Coverage of the data did not extend to Scotland and Northern Ireland, for which this indicator has been omitted.
Socio-economic barriers	Proportion of population experiencing income deprivation	England: English Indices of Multiple Deprivation 2019, income deprivation domain; Wales: Welsh Index of Multiple Deprivation 2019, Income domain; Scotland: Scottish Index of Multiple Deprivation 2020 Income domain; Northern Ireland: Northern Ireland Multiple Deprivation Measure 2017, Income Deprivation Domain.	Each of the four nations in the UK product an index of multiple deprivation with an Income domain measure capturing the proportion of the population in each geographic area in a form of income deprivation. The score data was used directly in each case.
Socio-economic barriers	Proportion of population with no car access	UK Census 2011	The proportion of households with no car access was calculated from UK Census 2011 data.
Family food support	Free school meal eligibility	England: Free School Meals data from explore-education-statistics.service.gov.uk, accessed August 2022; Scotland: Pupil census: supplementary statistics, 2021. Wales: Free school meal eligibility from StatsWales. Northern Ireland: NISRA	Provided at the Local Authority Level across the four nations of the UK, the number of students eligible for free school meals is converted into eligibility percentage by dividing by the total number of students.

		School Leavers Free School Meal Entitlement 2020.	
Family food support	Healthy start voucher usage	Data on uptake % at the Local Authority Level https://www.healthystart.nhs.uk for England and Wales	For England and Wales, data on Healthy Start Voucher uptake at the Local Authority level was used to provide an estimate at the LSOA level. Northern Ireland data was only available at the level of NHS area, which was regarded too large to create accurate local estimates. No equivalent data could be found for Scotland's Best Start scheme at a suitable level of geography.
Family food support	Distance to nearest foodbank	https://www.givefood.org.uk/	Using foodbank location data from givefood.org.uk, the distance between each postcode centroid and its nearest foodbank was calculated. This was then averaged up to LSOA level by taking the mean distance over postcodes within each LSOA.
Fuel Poverty	Proportion of households in fuel poverty	England: Fuel Poverty Statistics, 2020. Scotland: Scottish House Condition Survey, 2019. Wales: Fuel poverty modelled estimates for Wales as at October 2021.	For each of the three nations, the data sources provide a measure of the number of households in fuel poverty. In the case of England, these are provided as modelled data at LSOA level, using a regression model of sample survey data. For Scotland and Wales, the data is provided at Local Authority level, which is mapped to LSOA level according to the Local Authority value. No equivalent data for Northern Ireland could be identified.
Fuel Poverty	Prepayment meter prevalence	Electric Prepayment Meter Statistics from the UK Department for BEIS.	Using data published by UK Dept for BEIS, the proportion of households that have an Electric Prepayment Meter at the LSOA level is calculated for England, Scotland and Wales. No equivalent data for Northern Ireland could be identified.

Table 1: Indicator data sources and methods

To construct the domain level ranks for each LSOA from the indicator values, the following procedure is applied:

1. The raw indicator values are oriented so that the highest values in each indicator represent those higher priority places.
2. The indicators are grouped by country and then ranked.
3. Each indicator is transformed using the Rankit method to normalise the data (Green et al., 2018)
4. Domains are constructed by averaging over each indicator within each domain
5. A ranking is then constructed for each domain by grouping on each country.
6. To create the combined Priority Places index, the domain ranks are transformed to an exponential distribution to minimise cancellation effects (Noble et al., 2006).
7. The domains are then combined using the domain weights shown in Table 2.

Domain	Weight
Proximity to supermarket retail facilities	12.5%
Accessibility to supermarket retail facilities	12.5%

Access to online deliveries	12.5%
Proximity to non-supermarket food provision	12.5%
Socio-economic barriers	16.7%
Family food support	16.7%
Fuel Poverty	16.7%

Table 2: Domain weights are applied to equally weigh the accessibility/proximity domains with the deprivation-focused domains.

References

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Acknowledgements