

Overall measure of accessibility of services

This measure of accessibility of services is determined by looking at average minimum travel times to key services, when travelling by either public transport and walking, or by car.

To get an assessment of service accessibility the average minimum travel time to the following nine types of service have been used:

- medium and large centres of employment (locations where over 500 people are employed across the businesses and services there, such that a range jobs are likely to be available)
- primary school
- secondary school
- further education
- doctors' surgery
- hospital
- food store
- town centre
- post office (recent post office data is currently unavailable so these calculations are using 2016 data for post offices rather than 2017)

For each area an overall accessibility index has been calculated by indexing and weighting the minimum travel times to key services. Travel times were indexed and weighted in an attempt to take account of the frequency of use of each service. This means that infrequently used but distant services (such as a hospital) do not disproportionately affect the rating of an area (see notes for more details).

Accessibility to services (derived from minimum travel times) has been presented on maps based on this overall index for travelling by public transport and walking, and for travelling by car. Rural areas are shown in green and urban areas are shown in blue, the darker the area, the poorer the accessibility of services.

- When using public transport and walking rural areas generally have poorer accessibility to services based on minimum travel times than urban areas.
- Unsurprisingly, travelling by car generally reduces travel times to key services, but overall differences in relative travel times are similar to those experienced when using public transport and walking, and rural areas still tend to have poorer accessibility (in terms of minimum travel times), compared with urban areas.

Public Transport/Walking

- When using public transport and walking rural areas generally have poorer accessibility to services based on minimum travel times than urban areas.

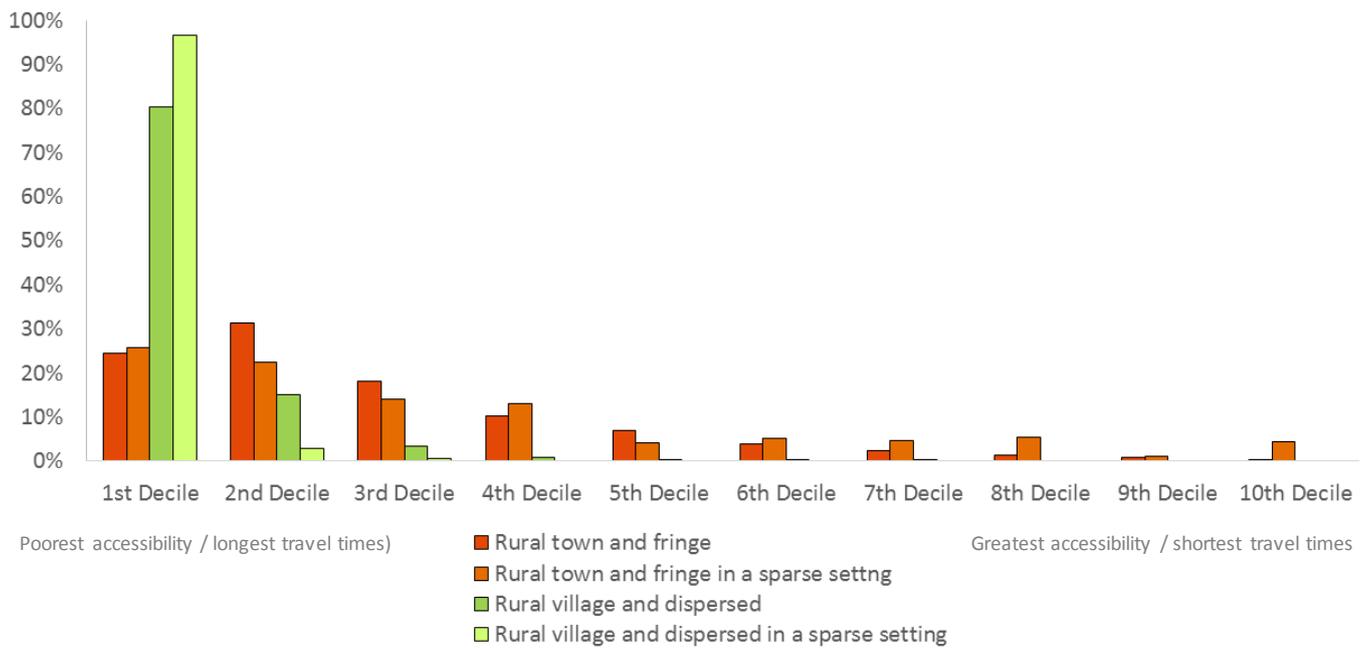
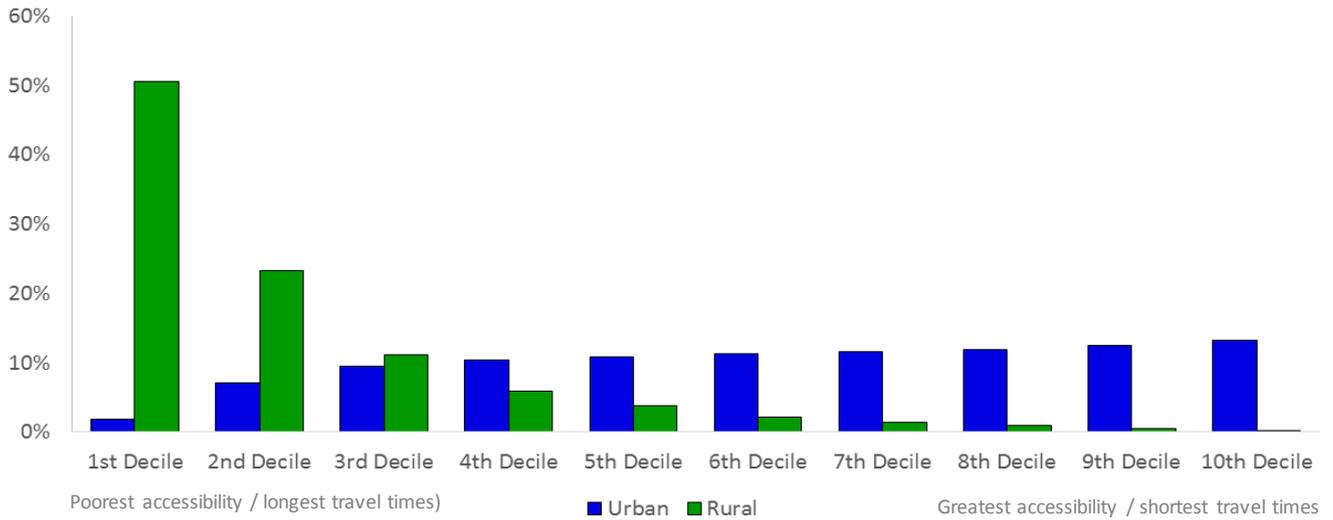
- Rural areas tend to have poorer accessibility to services based on minimum travel times than urban areas when using public transport or walking.
 - 51 per cent of the rural population are living in areas that have the poorest accessibility to services (lowest 10 per cent decile) based on minimum travel times, compared with 2 per cent of the urban population).
 - 0.2 per cent of the rural population are living in areas that have the greatest accessibility to services (highest 10 per cent decile) based on minimum travel times, compared with 13 per cent of the urban population.
- As might be expected, sparsely populated areas tend to have poorer accessibility of services based on minimum travel times when using public transport or walking:
 - 9 per cent of the population living in *urban city and town areas in a sparse setting* have the poorest accessibility to services (lowest 10 per cent decile) services based on minimum travel times, compared with 3 per cent of the population living in *urban city and town areas not in a sparse setting*.
 - 26 per cent of the population living in *rural town and fringe areas in a sparse setting* have the poorest accessibility to services (lowest 10 per cent decile) based on minimum travel times compared with 24 per cent of the population living in *rural town and fringe areas not in a sparse setting*.
 - 96 per cent of the population living in *rural village and dispersed areas in a sparse setting* have the poorest accessibility to services (lowest 10 per cent decile) based on minimum travel times compared with 80 per cent of the population living in *rural village and dispersed areas not in a sparse setting*.

Proportion of the population within each decile for accessibility of services based on minimum travel times by public transport and walking, by rural-urban classification, England, 2017

Decile	Poorest accessibility of services					Greatest accessibility of services				
	1	2	3	4	5	6	7	8	9	10
Urban major conurbation	<1%	2%	4%	7%	9%	11%	12%	14%	17%	22%
Urban minor conurbation	<1%	6%	13%	14%	13%	12%	14%	11%	9%	8%
Urban city and town	3%	11%	13%	12%	12%	11%	11%	10%	9%	6%
Urban city and town in a sparse setting	9%	7%	10%	6%	4%	6%	16%	5%	7%	28%
Rural town and fringe	24%	31%	18%	10%	7%	4%	2%	1%	1%	<1%
Rural town and fringe in a sparse setting	26%	22%	14%	13%	4%	5%	5%	5%	1%	4%
Rural village and dispersed	80%	15%	3%	1%	<1%	<1%	<1%	<1%	<1%	<1%
Rural village and dispersed in a sparse setting	96%	3%	1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Urban	2%	7%	9%	10%	11%	11%	12%	12%	12%	13%
Rural	51%	23%	11%	6%	4%	2%	1%	1%	1%	<1%

Source: Department for Transport (DfT)² and Defra analysis, ONS mid-year population estimates 2017³

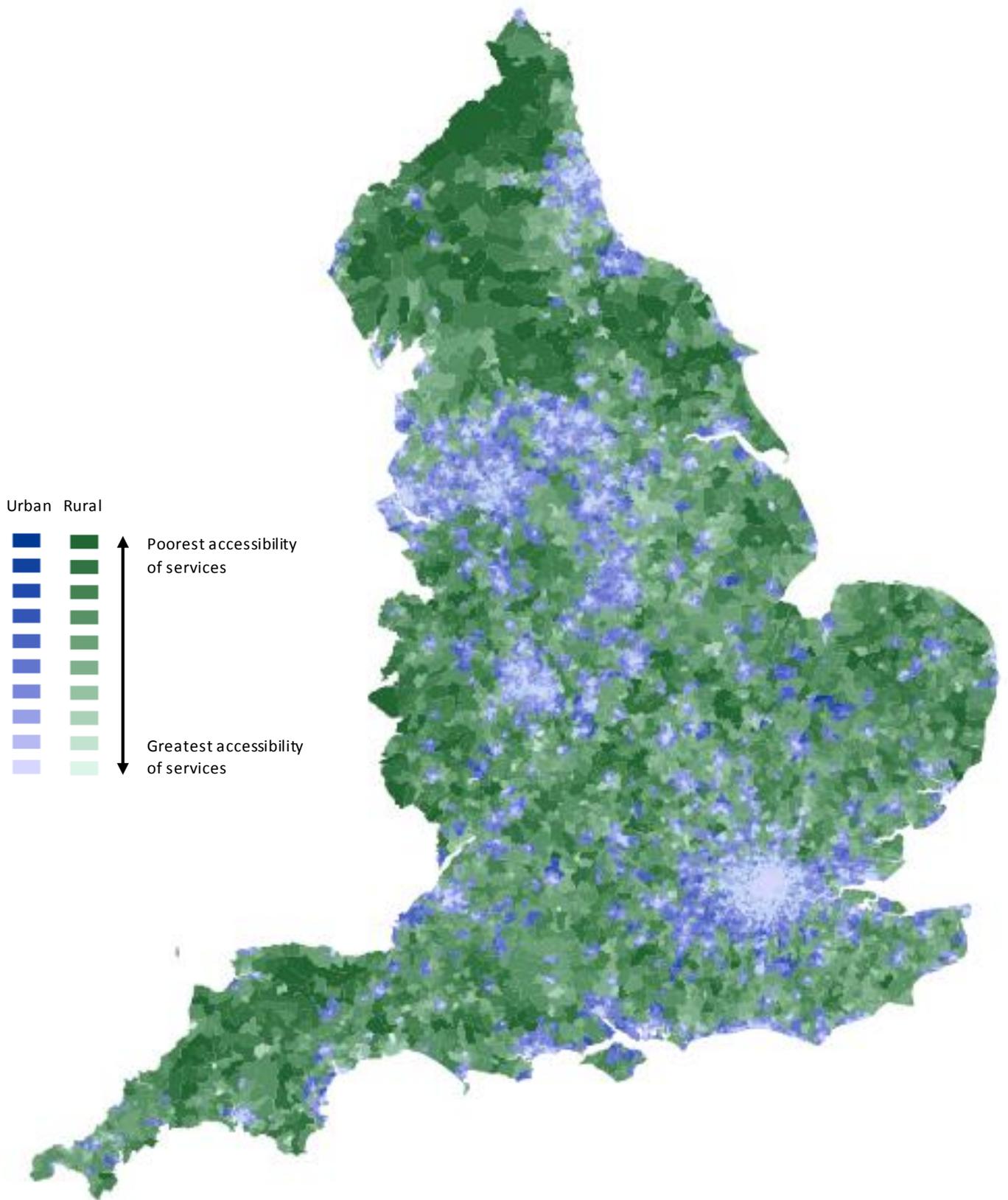
Proportion of population within each decile of accessibility of services based on minimum travel times by public transport and walking, by rural-urban classification and detailed rural classification, England, 2017



As the poorest decile of accessibility of services is predominantly made up of rural LSOAs we were unable to map the data by decile. This is because the map was almost entirely coloured in with the darkest green (denoting poorest accessibility) and therefore showed little information that was not already presented in the graphs above. Because of this we instead mapped the data using Jenks; a method which aims to group data in a way that minimises the variability within each group whilst maximising the variability between groups. **A drawback of this method is that the maps cannot be compared to previous years because the thresholds for the 10 groups will not be the same. However, this method does allow the areas with the poorest accessibility to be differentiated from those which are slightly better, and also shows which areas have similar levels of accessibility of services to each other.**

Accessibility of services based on minimum travel times using public transport and walking

Accessibility of services based on minimum travel times using public transport and walking, by rural-urban classification (Lower Super Output Areas¹), in England (2017)



Source: Department for Transport (DfT)² and Defra analysis

Car

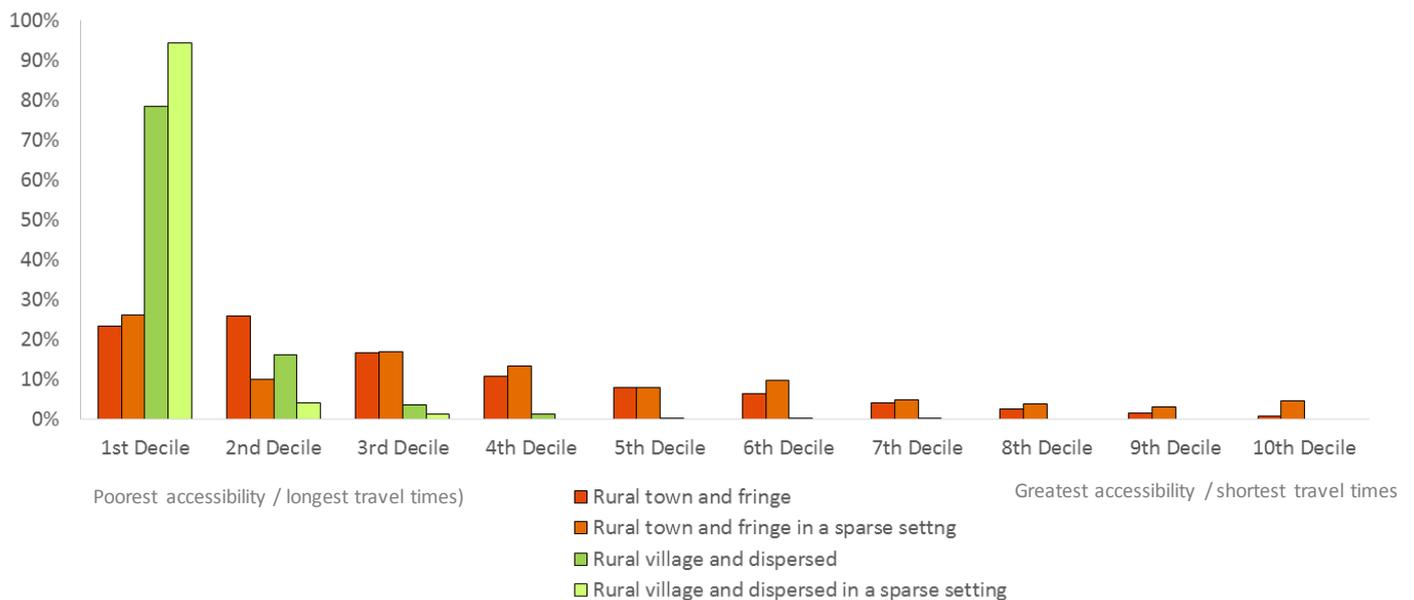
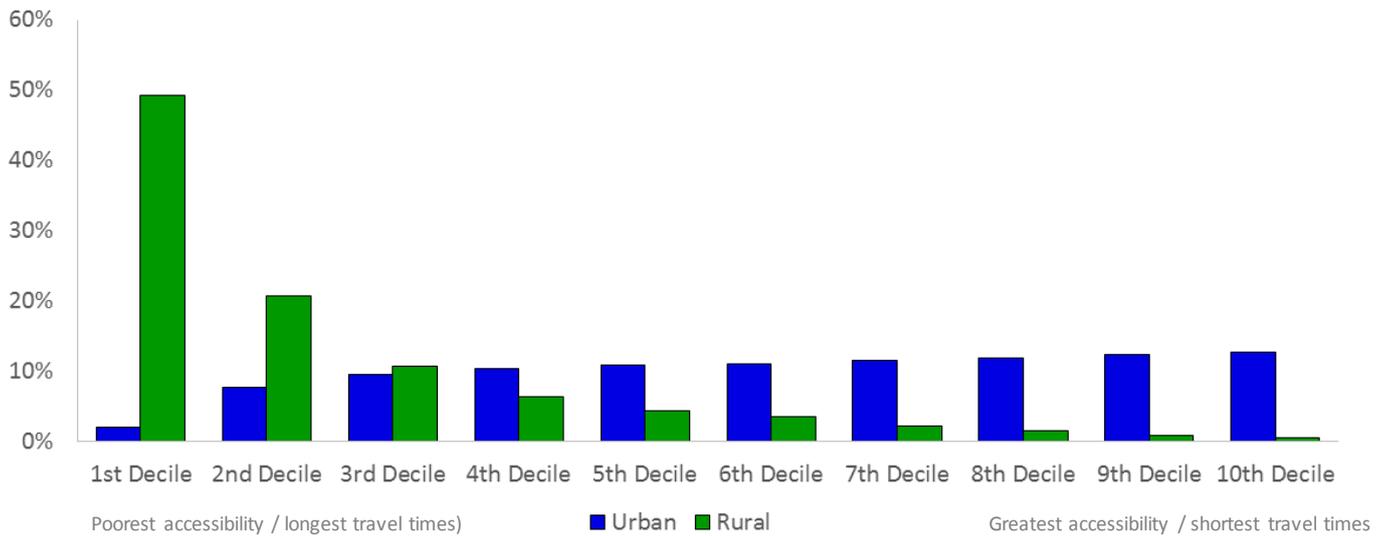
- Unsurprisingly travelling by car generally reduces travel times to key services compared with public transport and walking, but overall relative differences in travel times are similar, and rural areas still tend to have poorer accessibility (in terms of minimum travel times), compared with urban areas.
- Rural areas tend to have poorer accessibility to services based on minimum travel times than urban ones based on minimum travel times when using a car:
 - 49 per cent of the rural population are living in areas that have the poorest accessibility to services (lowest 10 per cent decile) based on minimum travel times compared with 2 per cent of the urban population.
 - 0.5 per cent of the rural population are living in areas that have the greatest accessibility to services (highest 10 per cent decile) based on minimum travel times compared with 13 per cent of the urban population.
- As might be expected, sparsely populated areas tend to have poorer accessibility of services based on minimum travel times when using a car:
 - 12 per cent of the population living in *urban city and town areas in a sparse setting* have the poorest accessibility to services (lowest 10 per cent decile) based on minimum travel times compared with 4 per cent of the population living in *urban city and town areas not in a sparse setting*.
 - 26 per cent of the population living in *rural town and fringe areas in a sparse setting* have the poorest accessibility to services (lowest 10 per cent decile) based on minimum travel times compared with 23 per cent of the population living in *rural town and fringe areas not in a sparse setting*.
 - 94 per cent of the population living in *rural village and dispersed areas in a sparse setting* have the poorest accessibility to services (lowest 10 per cent decile) based on minimum travel times compared with 79 per cent of the population living in *rural village and dispersed areas not in a sparse setting*.

Proportion of the population within each decile of accessibility of services based on minimum travel times by car, by rural-urban classification, England, 2017

Decile	Poorest accessibility of services					Greatest accessibility of services				
	1	2	3	4	5	6	7	8	9	10
Urban major conurbation	<1%	3%	6%	8%	10%	11%	13%	15%	16%	18%
Urban minor conurbation	1%	6%	10%	12%	12%	12%	13%	12%	12%	11%
Urban city and town	4%	11%	13%	12%	12%	11%	10%	10%	9%	8%
Urban city and town in a sparse setting	12%	18%	<1%	5%	8%	5%	11%	9%	9%	24%
Rural town and fringe	23%	26%	17%	11%	8%	6%	4%	3%	2%	1%
Rural town and fringe in a sparse setting	26%	10%	17%	13%	8%	10%	5%	4%	3%	4%
Rural village and dispersed	79%	16%	4%	1%	<1%	<1%	<1%	<1%	<1%	<1%
Rural village and dispersed in a sparse setting	94%	4%	1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Urban	2%	8%	10%	10%	11%	11%	12%	12%	12%	13%
Rural	49%	21%	11%	6%	4%	4%	2%	1%	1%	<1%

Source: Department for Transport (DfT),² and Defra analysis, ONS mid-year population estimates 2017³

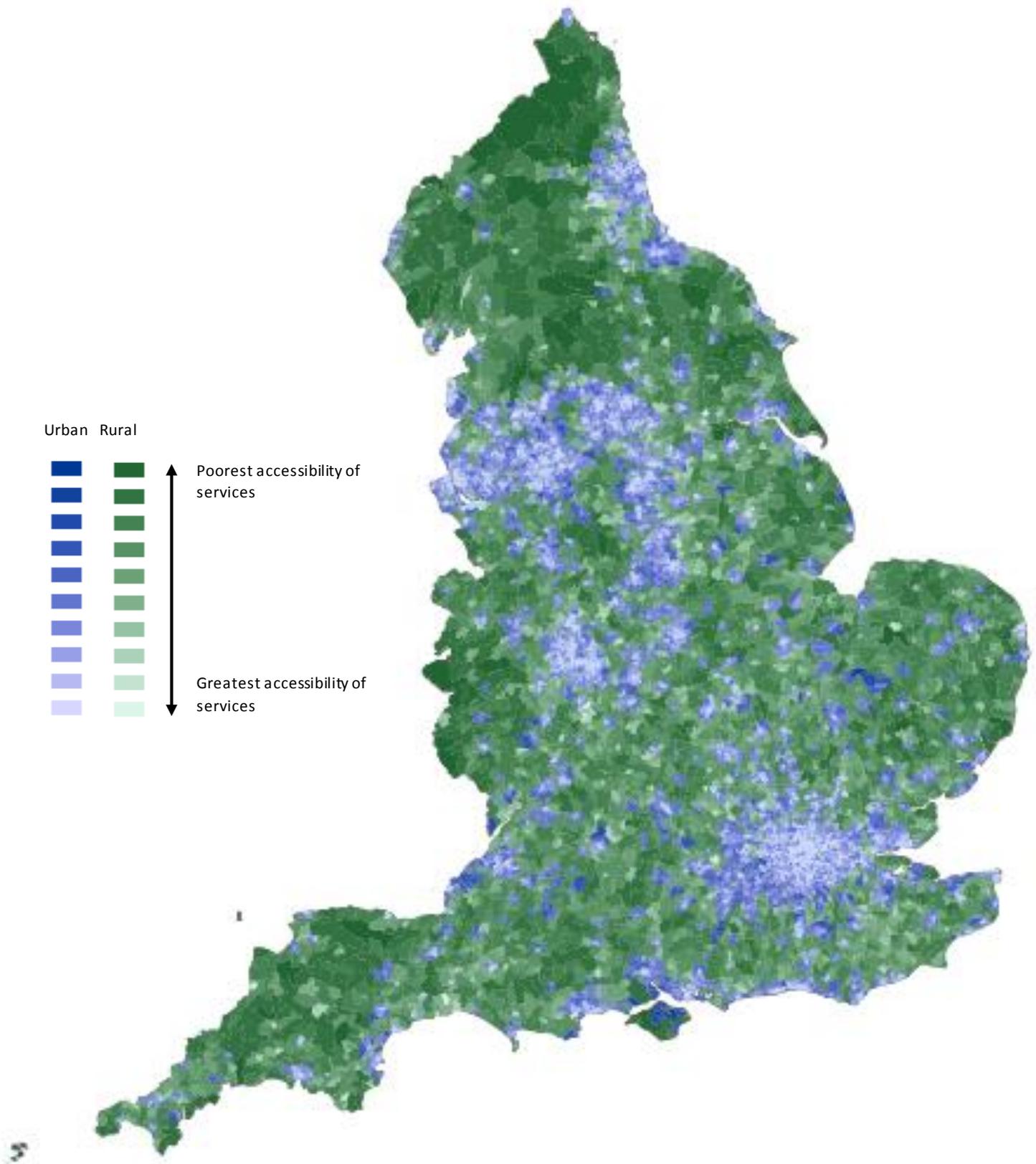
Proportion of population within each decile of accessibility of services based on minimum travel times by car, by rural-urban classification and detailed rural classification, England, 2017



Again, as the poorest decile of accessibility of services is predominantly made up of rural LSOAs we were unable to map the data by decile. This is because the map was almost entirely coloured in with the darkest green (denoting poorest accessibility) and therefore showed little information that was not already presented in the graphs above. Because of this we instead mapped the data using Jenks; a method which aims to group data in a way that minimises the variability within each group whilst maximising the variability between groups. **A drawback of this method is that the maps cannot be compared to previous years because the thresholds for the 10 groups will not be the same. However, this method does allow the areas with the poorest accessibility to be differentiated from those which are slightly better, and also shows which areas have similar levels of accessibility of services to each other.**

Accessibility of services based on minimum travel times using a car

Accessibility of services based on minimum travel times using a car, by rural-urban classification (Lower Super Output Areas¹), in England (2017)



Source: Department for Transport (DfT)² and Defra analysis

Notes:

The table below shows the weightings used for the nine services and the reasons these were chosen. Assumptions have had to be made that will not hold true for every individual. These weightings are simply an attempt at ensuring that services that are typically visited very infrequently although an important service (such as a hospital) do not have undue influence over the final measure if the travel times are much greater than for other services.

Service	Weighting	Reason
Medium and Large Employment Centre	0.22	Under the assumption of 240 working days per year, one journey per day
Primary School	0.18	Under the assumption of 190 school days per year, one journey per day
Secondary School	0.18	Under the assumption of 190 school days per year, one journey per day
Further Education	0.18	Under the assumption of 190 school days per year, one journey per day
Doctors' Surgery	0.01	Under the assumption of 6 visits per year ⁴
Hospital	0.002	Under the assumption of 2.4 visits per year ⁵
Food Store	0.10	Under the assumption of a weekly visit
Town Centre	0.10	Under the assumption of a weekly visit
Post Office	0.05	Under the assumption of bi-weekly visits

In most cases the weightings are broadly of the same magnitude and hence their use does not result in significant adjustments. Where possible the weightings have been determined using statistical evidence but are otherwise based on best judgements, for example an average person will travel more frequently to their place of work or school than they would to some other services.

The weighted minimum travel times were indexed and then summed to give a single value which was then indexed again. This indexing process was used to ensure that infrequently used services did not disproportionately influence overall accessibility if travel times are large.

As an index an actual travel time has not been determined, the index is a relative measure.

Footnotes:

1. A Lower Super Output Area (LSOA) is a geographic area built up from groups of census output areas. LSOAs were developed (along with Middle Super Output Areas) to help improve the reporting of small area statistics, allowing for greater precision than reporting at Local Authority level. Each Local Authority will be built up of many LSOAs, therefore just because one LSOA scores poorly on accessibility of services it does not mean that this is an issue for the whole Local Authority.
2. <https://www.gov.uk/government/statistics/journey-time-statistics-2017>
<https://www.gov.uk/government/publications/journey-time-statistics-guidance>
3. <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/lowersuperoutputareamidyearpopulationestimates>
4. <https://www.bma.org.uk/-/media/files/pdfs/news%20views%20analysis/press%20briefings/general-practice.pdf>
5. <http://www.nhsconfed.org/resources/key-statistics-on-the-nhs>