

## 1991 DoE, Jarman, Carstairs and Townsend scores for Wards in England and Wales

As part of an ESRC funded project examining limiting long-term illness and its associations with other measures of health status and indicators of deprivation in England & Wales, deprivation scores were calculated for wards using the following four composite measures of deprivation:-

(i) The Carstairs Index (Carstairs & Morris 1989, Carstairs & Morris 1991) (ii) The Department of Environment Index (DoE 1983) (iii) The Jarman Underprivileged Area (UPA) Index (Jarman 1984) (iv) The Townsend Material Deprivation Index (Townsend et al 1988).

### Getting the data

This data is only available to staff and students from UK higher and further education institutions from: <http://census.ukdataservice.ac.uk/>

The data is arranged in the following fields:

Field name	Data	Width (*.txt files)
<b>WARDC</b>	Wardcode (without countycode prefix)	1-4
<b>DOE</b>	DoE index	6-13
<b>CAR</b>	Carstairs index	15-21
<b>JAR</b>	Jarman index	23-30
<b>TOWN</b>	Townsend index	32-38
<b>WARDN</b>	Ward name	42-71
<b>DISTRICT</b>	District in which ward lies	72-

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### Definition and Source of Data for Calculating the Indices

All data is taken from the 1991 Census of Population Local Base Statistics (LBS). For each of the variables used, [Casweb](#) cell references are given. Data was extracted for the 9,527 wards in England and Wales (Shipping Wards were excluded) and so the data set includes 164 suppressed wards which appear as zero or missing values. The data for these wards are combined with adjacent 'importing wards'. Whilst there are scores for 9,363 wards on the Carstairs and Jarman Indices, there are scores for just 9,032 wards on the DoE Index and 9,320 wards on the Townsend Index due to the absence of either overcrowded households and/or households lacking basic amenities in certain wards as measured by these indices.

## 1. The Carstairs Index

This is a composite score based on four variables:-

- i. Unemployment - unemployed male residents over 16 (LBS 09 var0109) as a proportion of all economically active male residents aged over 16 (LBS 09 var0025).
- ii. Overcrowding - persons in households with 1 and more persons per room (LBS 23 var0054 + LBS 23 var0055) as a proportion of all residents in households (LBS 23 var0051).
- iii. Non car ownership - residents in households with no car (LBS20 var0420) as a proportion of all residents in households (LBS 20 var0411 + LBS20 var0419).
- iv. Low social class - residents in households with an economically active head of household in social class IV or V (LBS 90 var0027 + LBS 90 var0032) as a proportion of all residents in households (LBS 90 var0002).

## 2. The Department of Environment Index

This is a composite score based on six variables:-

- i. Unemployment - unemployed residents aged 16+ (L090109 + L090301) as a percentage of all economically active residents aged 16+ (LBS 09 var0025 + LBS 09 var0217).
- ii. Overcrowding - households with 1 and more persons per room (LBS 23 var0004 + LBS 23 var0005) as a percentage of all households (LBS 23 var0001).
- iii. Lone pensioners - lone pensioner households (LBS 47 var0015 + LBS 47 var0029 + LBS 47 var0043 + LBS 47 var0057 + LBS 47 var0071 + LBS 47 var0085) as a percentage of all households (LBS 23 var0001).
- iv. Single parents - lone parent households (LBS 40 var0001) as a percentage of all residents in households (LBS 01 var0065).
- v. Born in New Commonwealth - residents born in the New Commonwealth (LBS 07 var0055) as a percentage of all residents (LBS 07 var0001).
- vi. Households lacking basic amenities - households lacking exclusive use of bath or shower and inside toilet (LBS 23 var0001 - (LBS 20 var0021 + LBS 20 var0029)) as a percentage of all households (LBS 23 var0001).

## 3. The Jarman Index

This is a composite score based on eight variables:-

- i. Unemployment - unemployed residents aged 16+ (L09 var0109 + L09 var0301) as a proportion of all economically active residents aged 16+ (LBS 09 var0025 + LBS 09 var0217).
- ii. Overcrowding - persons in households with 1 and more persons per room (LBS 23 var0054 + LBS 23 var0055) as a proportion of all residents in households (LBS 23 var0051).
- iii. Lone pensioners - lone pensioner households (LBS 47 var0015 + LBS 47 var0029 + LBS 47 var0043 + LBS 47 var0057 + LBS 47 var0071 + LBS 47 var0085) as a proportion of all residents in households (LBS 01 var0065).

- iv. Single parents - lone 'parents' (LBS 40 var0001) as a proportion of all residents in households (LBS 01 var0065).
- v. Born in New Commonwealth - residents born in the New Commonwealth (LBS 07 var0055) as a proportion of all residents (LBS 07 var0001).
- vi. Children aged under 5 - children aged 0-4 years of age (LBS 02 var0012) as a proportion of all residents (LBS 02 var0001).
- vii. Low social class - persons in households with economically active head of household in socio-economic group 11 (unskilled manual workers) (LBS 86 var0177) as a proportion of all persons in households (LBS 86 var0009).
- viii. One year migrants - residents with a different address one year before the Census (L15 var0001) as a proportion of all residents (L02 var0001).

#### 4. The Townsend Index

This is a composite score based on four variables:-

- i. Unemployment - unemployed residents over 16 (LBS 0 var0109 + LBS 09 var0301) as a percentage of all economically active residents aged over 16 (LBS 09 var0025 + LBS 09 var0217).
- ii. Overcrowding - households with 1 person per room and over (LBS 23 var0004 + LBS 23 var0005) as a percentage of all households (LBS 23 var0001).
- iii. Non car ownership - households with no car (LBS 21 var0003) as a percentage of all households (LBS 21 var0002).
- iv. Non home ownership - households not owning their own home ((LBS 20 var0001 + LBS 20 var0009) - (LBS 20 var0002 + LBS 20 var0003)) as a percentage of all households ((LBS 20 var0001 + LBS 20 var0009).

#### Methodology

Each of the indices uses Z scores to standardise the component variables. The Z score is simply the 'observation' (percentage or proportion for the ward on a given measure) minus the mean observation divided by the standard deviation (for England & Wales). Prior to standardisation by Z scores, variables may or may not be transformed according to which index is being calculated. Furthermore, the DoE and Jarman apply different weightings to the variables (shown in Table 1), whereas the Carstairs and Townsend indices use the sum of the unweighted Z scores.

##### 1. The Carstairs Index

All four variables are standardised using Z scores and the overall score for each ward is simply the unweighted combination of the scores.

##### 2. The Department of Environment Index

The natural log of each variable is taken, except for the lone pensioner variable. The Index is the sum of the weighted Z scores of each variable, with the weights used indicated in Table 1.

### 3. The Jarman Index

The arcsine of the square root of each variable is used and Z scores are summed according to the weights outlined in Table 1.

### 4. The Townsend Index

The unemployment and overcrowding variables are transformed using the natural log transformation and Z scores are summed without weighting.

<b>Social Variable</b>	<b>Carstairs</b>	<b>DoE</b>	<b>Jarman</b>	<b>Townsend</b>
<b>Unemployment</b>	1	2	3.34	1
<b>Overcrowding</b>	1	1	2.88	1
<b>No Car</b>	1	-	-	1
<b>Not Own Occ</b>	-	-	-	1
<b>Lone Pensioners</b>	-	2	6.62	-
<b>Single Parents</b>	-	2	3.01	-
<b>New Commonwealth</b>	-	1	2.5	-
<b>Lack Amenities</b>	-	1	-	-
<b>Children &lt; 5</b>	-	-	4.64	-
<b>Low Social Class</b>	1		3.74-	-
<b>One Year Migrants</b>	-	-	2.68	-

Note : Definitions of the variables may vary between indices