# **Understanding and Using the English Indices - Smruti Bulsari**

## Transcript

Video: https://youtu.be/8zmV-InxaCg

Hello everyone, today I’m going to talk about understanding English Indices of Multiple Deprivation and then making use of these indices, which I will demonstrate with the help of my ongoing research on poverty, deprivation and dementia.

I plan my talk like this: I will begin with a brief overview of the concepts of poverty and deprivation, measures of deprivation, and then I will move on to discussing the English Indices of Deprivation in detail and then my ongoing research. So coming to the concept of poverty and deprivation, different economic philosophers have tried to define poverty or the state of deprivation in using different terms. While I’m not reading out this slide, but it is very clear if you read this slide that poverty is complex; it is not really easy to define poverty, and there have been differences in explaining it, both conceptually as well as from the measurement perspective.

Poverty line or consumption norms would be soon actually distinguish poor from non-poor and also give the proportion of poor to non-poor, or to be more precise, proportion of poor in the total population. Well, Nobel has tried to define deprivation as not enough financial resources to meet the needs, and to… Amartya Sen says that absence of entitlement is deprivation. It’s a very quick round of understanding on what he means by entitlement. So Amartya Sen explains that entitlement could be of five types: one could be through trade, that is you go to the market and buy the things, maybe a loaf of bread or something, maybe you produce it on your own, or you work in a factory which produces loaf of bread, where you give your labour and get some wages or a loaf of bread in return. It could be through inheritance or transfer, or it could…any disruption in either of these could cause deprivation.

Again, deprivation could be for a short period of time, or it could be a prolonged one. So coming to the measurements of poverty and deprivation, the two most commonly used measures and the traditional measures of poverty or deprivation is the headcount measure. The headcount measure is based on income and the shortfall from what is defined as the poverty line is the number of persons below the poverty line is the headcount of the number of poors. Somehow this measurement suffers from the limitation that it is not sensitive to the distribution of income, and even those even living below the poverty line for the extent of deprivation that cannot be gauged from the headcount measure.

The second measure – minimum nutritional and food requirement also is somewhat similar to defining the poverty line, that if somebody does not get specified intake of calories per day, then they are classified as poor or deprived. But again, this measure also has limitations that (inaudible 00:03:48) of communities and habits, everything varies significantly across regions and cultures, and if you try to link these calorie norms or minimum nutritional or food requirement with income, then again, it would be based on the income-based poverty line and the nutritional requirements would in turn determine the income requirements.

And therefore, the third measure of deprivation is the relative deprivation, and that is what we are going to discuss in detail in terms of English Indices of Multiple Deprivation. It is, I mean, how much a particular group of people or how much a particular geographical area or an individual is deprived in comparison with the comparable groups, that is what the concept of relative deprivation is. Now if you go to the background and history of English Indices of Multiple Deprivation, it is a successor of the Index of Local Deprivation, so prior to the Indices of Multiple Deprivation, there used to be a local deprivation index. And the Index of Multiple Deprivation was developed and commissioned in 1998 by the then Department of Environment, Transport and Regions, and it was published in the year 2000.

Since then, the Index of Multiple Deprivation has been published in 2004, 2007, 2010, 2015 and the latest one is 2019. But mark one thing, it is reported in the Indices of Multiple Deprivation, it is not an index, it is Indices because it has seven sub-components, it has seven components or seven domains and each domain has its own index.

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Now, it’s important to talk something about LSOA, which is the Lower Layer Super Output Area, because the indices are estimated for Lower Layer Super Output Area, and these are basically neighbourhoods, which are of similar or uniform population size, ranging somewhere between 1000-1500 or approximately 650 households. So indices are basically estimated for LSOA, and then they are aggregated and made available for the higher administration levels, like local authority districts and so on.

Now as I mentioned, there are seven domains of the indices of multiple deprivation. The three domains are seen on this slide: One is income domain, second is employment domain, and third is the education domain – education, skills and training domain. The other four domains are health deprivation and disability, crime, barriers to housing and services, and living environment. Each of these domains has been assigned grades. So income domain and employment domain has been assigned 25.5% each, education, skills and training and health deprivation and disability is assigned 13.5% each, and crime, barriers to housing and services, and living environment is assigned 9.3% each.

Now these individual domains, income domain comprises seven components, employment comprises six components, education, skills and training comprises seven components, health deprivation and disability four components, crime four components, barriers to housing and services four components, and living environment two components. Now, each of these indices are estimated using different methods. These methods are described in detail on the slide and I’m not reading out considering the time constraints. We can always have a discussion in the question and answer session.

So moving on to then the measures of the indices of deprivation. So on what different forms are these numbers estimated and made available to us? So one is the average rank and another is average score. So these two measures basically provide the summary of the average level of deprivation. Second is the proportion of LSOA in the topmost deprived decile across the country, it’s the degree to which higher level areas, that is for example, local authority district, is highly deprived. And the third one is the local concentration summary, which identifies, again, the higher level areas which have extreme levels of deprivation. Now, for my research, I will largely make use of the average scores and the proportion of LSOAs in the topmost deprived decile.

Okay, so aggregation is done at this level, so as you can see on the slide, they are made available to us, this data is available in the public domain. So as I mentioned earlier that these indices are estimated at the LSOA level. There are 32,844 LSOAs across England. There are 38 local enterprise partnerships, 317 local authority districts, 191 clinical commissioning groups. So the indices are the scores calculated for LSOAs that are then aggregated to local enterprise partnerships, local authority districts and clinical commissioning groups. And then once it’s been computed for local authority districts and further aggregated to get the estimates for the upper tier local authorities.

So how is the aggregation done? So we have the average score for the LSOA. It is converted into a weighted average score by multiplying it with the LSOA population and they all are then summed up and divided by the total population for the high level administration units, that could be local enterprise partnership or local authority or clinical commissioning group, so the (inaudible 00:11:21) levels.

Now, fi we look into the characteristics, shrinkage method, I did not read out on the slide, but shrinkage method is used to derive the…so the shrinkage method basically enhances the reliability of the measurement of the index of multiple deprivation score, even the individual indexes of multiple deprivation. Then most of the domains also employ factor analysis to identity one single common factor and arrange the possibility of a more meaningful factor. Exponential transformation is also undertaken, so that a lack of deprivation in one domain could compensate for the deprivation in the other domains. And this transformation, the exponential transformation is scale independent, and therefore it is not affected by the size of the lower layer super output area population area. So these are basically the characteristics of the indexes of multiple deprivation. To ensure that they give us a robust estimate of deprivation.

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However, just like any other measure for anything, including deprivation or poverty, even the indices of multiple deprivation have some limitations. And factor analysis, which is used to identify the single most important factor also suffers from the limitation of replicability over time. That analysis is based on correlation, and correlations change over time, and therefore it has the issue of replicability over time.

On another issue, or the limitation is that there is no robust method to validate deprivation measures for small areas. Again, the weights that are assigned to each of the domains, the reasons for assigning particular weights is not clearly explained, and there could be possible issues of double counting. Something that came to my mind was the universal credit payments, which is introduced in the Index of Multiple Deprivation for 2019. Universal Credit payments in no-work requirements is included both in income and employment domains, so it could be it might result in double counting.

Now I move on to my ongoing research on dementia and deprivation. So dementia is measured as the diagnosis rate of dementia or call it dementia prevalence, and that is particularly for the age group of 65 years and above. Now, if we look at the statistics of the diagnosis rates of dementia across England, the data are for the month ending January 2023, so the diagnosis rate ranges somewhere between 20 to slightly more than 80. The average score for Index of Multiple Deprivations, the combined index of multiple deprivation ranges from slightly less than 10 to slightly more than 40. The diagnosis rate is a percentage and therefore it is a fixed range from 0-100, whereas a rate score of Index of Multiple Deprivation, it’s a weighted average of composite score of subcomponents. So they do not have any fixed range. But if you look at the maps on the left hand side of het slide, in the upper panel, you will see that a large proportion of the…okay, this, the boundaries in the maps represent the local authority districts, they are not LSOA level. The reason is the diagnosis rate of dementia, the data for that is available at local authority district level, and therefore I made use of the average score of Index of Multiple Deprivation also at the local authority district level, aggregated at local authority district level.

So if we look at the diagnosis rate of dementia for people aged 65 and above, the rate is really very high and it’s very high across the country, you will see very less regions which are actually green or slightly darker than green. Most of the regions you will find it in the brown and red area, brown and moving gradually to…on the colour scale towards red. Whereas if you look at the average score of Index of Multiple Deprivation overall, most of the areas appear to be in green. Of course, you might notice that there is a small grey region in the map, and that indicates unavailability of data for those regions. But again, a large proportion of the local authority districts are green in colour, which means that the average score for Index of Multiple Deprivation is very, very low, which means most of the areas across England are relatively lesser deprived. Now, if we compare specifically the health deprivation and disability domain, there the deprivation seems to be very high, the scores range from slightly less than -2 to slightly more than 1, that is the scale on which the health deprivation and disability index is measured. It is also some kind of weighted average, but as with each, (inaudible 00:17:20) is applied and then factor analysis is applied and exponential estimation is applied.

And finally you come at the values which may even range from…may even have a negative number. So higher the number, more is the deprivation. So here you will see that, again, a large proportion of the local authority districts show high levels of health deprivation and disability across England. And if you see, there is a pattern which matches more or less in the panel…the upper panel and the lower panel, that is mapped for dementia diagnosis rate and the map for the average score for health deprivation and disability. However, we even see that the correlation is not very strong between the two.

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Okay, so now if we compare the average score of overall IMD and health deprivation, you will see that while overall deprivation seems to be low, health deprivation seems to be high, from the colour that you can see in the maps that health deprivation index is more brown and red whereas overall IMD is relatively greener.

Coming to the correlations: So the first column shows the correlation of different domains of deprivation, overall index of deprivation with the factor of the dementia diagnosis rate, and we can see that there is a weak correlation or a mild correlation, or medium correlation across different domains of deprivation. As I mentioned there, the dementia diagnosis rate is for the people who are 65 years and above, and therefore another index which is specially estimated for old age people, who are also 65 years and above, income deprivation for old age people, this index is also calculated, estimated and made available, by the Government of the UK. So that also I have taken into consideration for my research and the correlation is, again, very weak. But if you see the correlation between the dementia diagnosis rate, living environment and barriers to housing and services, there is a negative correlation, which means that higher the barriers to housing and services, lower is the dementia diagnosis rate, and higher or better the living environment, lower is the dementia diagnosis rate.

Now, if we take into consideration the proportion of LSOAs which are highly deprived in the top 10% or the top decile, then you will see that…you see the map, which is absolutely green in the bottom panel of the left hand side of the slide. So across England, there are very few, I mean, very few local authority districts which have slightly higher levels or higher proportion of LSOAs which fall into the top 10 deciles of deprivation.

Same is the case when we come to health deprivation and disability domain. When we talk about the proportion of LSOAs which are highly deprived, the proportion is really very less. So this is in contrast with the average score, where we saw that the average score showed that there is a high level of health deprivation across the local authority districts. Here it shows that the proportion of LSOAs which are highly deprived in the local authority districts for the health deprivation and disability is again, very, very low. Therefore this requires further research, further exploration, and unlike the average scores, well, also this is all I have to (inaudible 00:21:50) today, and the major takeaways I can think of from today’s session is there are many methods of measuring poverty, however, the most recent method of estimating IMD has the least limitations, and recovers a wide range of domains of deprivation. There are some limitations which I already discussed in detail and I’m not repeating it over here, but the Indices of Multiple Deprivation are available in the form of average scores for LSOAs and they are made available at higher administrative levels also. And the research that I mentioned which I am currently…which is an ongoing research, that examines the patterns and associations in dementia and deprivation at local authority district level, the reasons there will be association, there is a negative correlation as I mentioned between the dementia diagnosis rate and deprivation for housing and services and living environment, and there is a very high level of correlation among the domains of deprivation with the (inaudible 00:22:57).

Now, the way forward is we are planning to examine the pattern in correlation over time, and we also plan to undertake the impact, to examine the impact of dementia while honing for demographic characteristics. Thank you very much for patient listening and begin the question and answer session. Thank you.

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