Primer on AGI and RGI indices of inequality

For full technical details see this journal article (https://doi.org/10.1016/j.socscimed.2018.01.004).

What is an AGI?

An AGI is an **Absolute Gradient Index** of inequality.

It is the modelled gap in outcomes between the most and least deprived neighbourhoods in the country. You can use any outcome that can be broken down by deprivation groups, for example, avoidable emergency admissions, GPs per population, rates of early stage cancer diagnosis, waiting times for psychological therapies, and many others.

Why a "modelled" gap rather than an "actual" gap?

Because it summarises information about everyone in the whole population, not just a few people at the two extremes. Actual gaps between extreme groups can be unstable and misleading.

Why the most and least deprived "in the country" rather than "in my local area"?

Because local inequality in your area can then be compared with local inequality in other areas on a like-for-like basis. For instance, the most deprived fifth of people in Buckinghamshire are considerably better off than the most deprived fifth in Liverpool. Inequality based on national deprivation rank can be compared between local areas, but not inequality based on local deprivation rank.

How is the modelling done?

Simple linear regression at neighbourhood level. We take all the neighbourhoods (technically "Lower Layer Super Output" areas) within your locality (e.g. clinical commissioning group or local authority). We then graph an outcome versus the national deprivation rank for each neighbourhood, and draw a straight line through those points considering the local population size (bigger neighbourhood have more influence on the direction of the line). That straight line is the "social gradient" in outcomes. The "modelled gap" is the difference between the top and bottom of the social gradient, representing the most and least deprived neighbourhoods in the country.

What is an RGI and why bother with it?

An RGI is a **Relative Gradient Index** of inequality. It is the ratio between the modelled outcome for the most deprived neighbourhood in the country and the modelled average. It tells us how much worse outcomes are for the most deprived compared with the average, in percentage terms.

The RGI should be checked when average outcomes are trending upwards or downwards. The AGI is an absolute measure of inequality, which will tend to improve when average outcomes are improving and worsen when they are worsening. The RGI is a relative measure of inequality, which is less strongly influenced by changes in average outcome levels.

What about simpler equity measures?

Useful simple equity measures for non-specialists include:

- The actual gap between best- and worst-off fifth (or tenth) based on national deprivation
- The trend in outcomes for the worst-off fifth (or tenth) based on national deprivation

When are the AGI and RGI misleading?

The AGI and RGI are unreliable for localities with a narrow deprivation range (fewer than 3 quintile groups) such as Bradford City CCG, where almost everyone is in the most deprived national quintile group. In such cases, it is more helpful to look at trends in the worst-off quintile group(s).