Measuring health inequalities – absolute and relative inequality

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Introduction

It is common for health inequalities between populations to be monitored in two separate ways, looking at relative and absolute differences.

Both measures are used in tools and dashboards produced by the Office for Health Improvement and Disparities.

This short paper describes absolute and relative inequality and explains why it is generally important to look at both measures when considering trends over time.
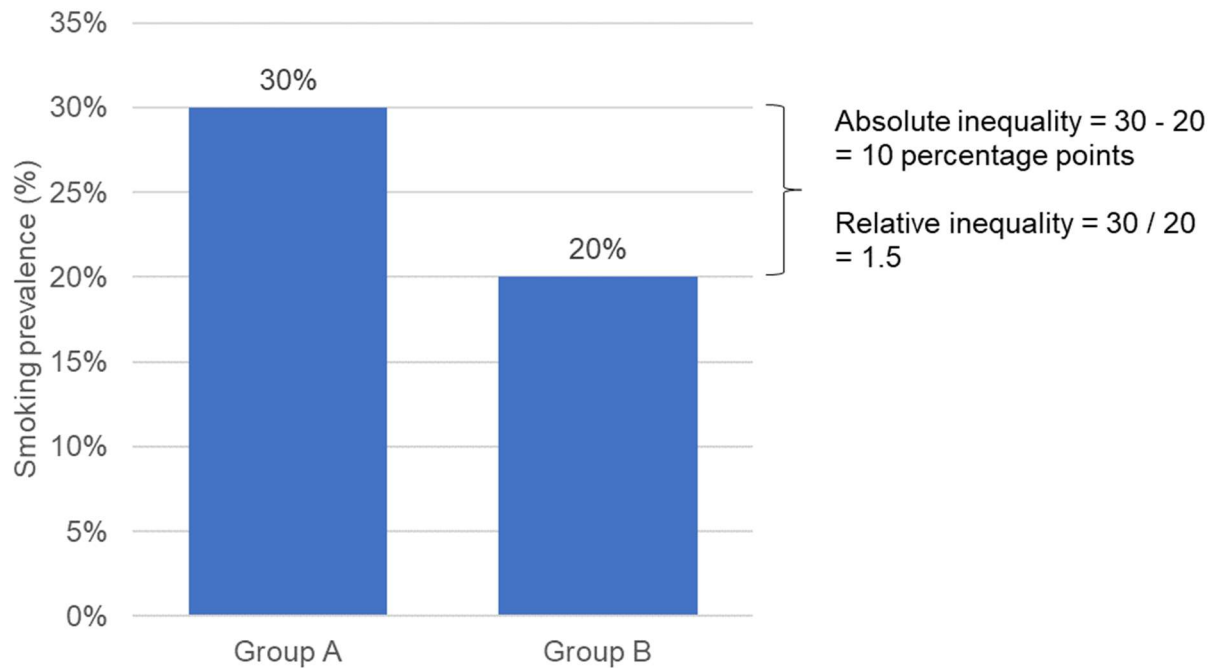
What are absolute and relative inequality?

When looking at indicators such as disease prevalence or life expectancy, absolute inequality shows the magnitude of difference between subgroups of the population. It is most simply calculated by subtracting the value for one group from another.

Relative inequality shows the proportional difference between subgroups. It is most simply calculated by dividing the value for one group by another.

For example, if 30% of people in Group A smoke, and 20% of people in Group B smoke then the absolute inequality between the groups is 10 percentage points and the relative inequality is 1.5, ie smoking prevalence is 1.5 times higher in Group A than Group B.

Example 1: Absolute and relative inequality in smoking prevalence between group A and group B (theoretical data)

Absolute inequality = 30 - 20 = 10 percentage points

Relative inequality = 30 / 20 = 1.5

Trends in absolute and relative inequality

Monitoring absolute and relative inequality measures can lead to differing conclusions about the direction of change in inequality over time.

For example, if 30% of people in Group A smoke, and 20% of people in Group B smoke in time period 1, then the absolute inequality between the groups is 10 percentage points and the relative inequality is 1.5.

If smoking prevalence in Group A reduces to 24% and in Group B it reduces to 15% in time period 2, then the absolute inequality between them has decreased to nine percentage points. However, the relative inequality between them has increased to 1.6.

Example 2: Trend in absolute and relative inequality in smoking prevalence (theoretical data)

Time period 1

Absolute inequality = 30 - 20 = 10 percentage points

Relative inequality = 30 / 20 = 1.5

Time period 2

Absolute inequality = 24 - 15 = 9 percentage points

Relative inequality = 24 / 15 = 1.6
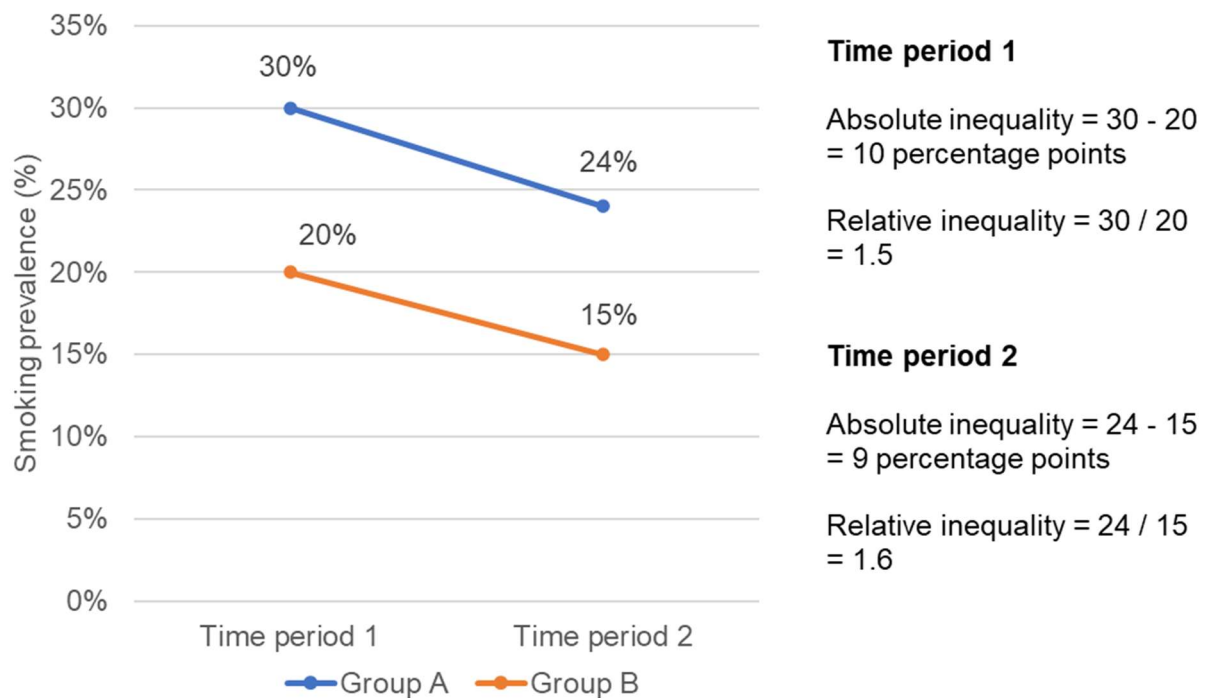
This effect is observed in several indicators included in OHID's Health Inequalities Dashboard, including premature mortality rates from cardiovascular disease and cancer, percentage of 5 year olds with visually obvious dental decay, and school readiness. All of these indicators have seen a decline in the underlying rates of the indicator over time, a decrease in absolute inequality, and an increase in relative inequality.

Advantages and disadvantages of the different approaches to inequality measurement

There are advantages and disadvantages to each approach to inequality measurement.

One of the advantages of the relative measure is that it is scale neutral, meaning inequality can be compared for outcomes measured on different scales. However, information about the overall importance or burden of the condition/indicator is lost in the relative measure. For example, a difference of between 1 and 4 deaths per 100,000 population is the same as the difference between 100 and 400 deaths per 100,000 population in relative terms.

The burden of the condition/indicator is clearer in the absolute measure. In the example above, inequality would be 3 deaths per 100,000 population and 300 deaths per 100,000 population in absolute terms.

However, absolute inequality is sensitive to the trajectory of the indicator overall. For example, if the value of an indicator halved across all groups within a population, then the absolute inequality would also halve (whilst relative inequality would remain the same). Absolute inequality would double if there is a doubling in the underlying rate of the indicator over time.

Useful references on measurement of absolute and relative inequality

Keppel K, Pamuk E, Lynch J, et al. Methodological issues in measuring health disparities. National Center for Health Statistics. Vital Health Stat 2(141). 2005. https://www.researchgate.net/publication/7712196_Methodological_Issues_in_Measuring_Health_Disparities (Section B)