From Pounds to Pollution: The Role of Income in UK's CO2 Emissions

Income inequality and carbon emissions—two seemingly distinct issues—are actually deeply intertwined, shaping the way we live and the future of our planet. Before diving into the details, let's quickly define a few key terms. Mean is simply the average of a set of numbers, while median is the middle value when those numbers are arranged in order, giving us a better sense of what's "typical" without the extremes. A confidence interval gives us a range of possible values where the researched value might lie, providing a bit of wiggle room for uncertainty.

Now, let's talk about income in the UK. The following graphs break down income by region from 2010 to 2020, showing how it shifts every two years. The box plots display the median income and confidence intervals. What stands out is that the South East and London consistently show the highest average incomes, while regions like the North East, West Midlands, Yorkshire and the Humber are on the lower end. However, focusing on just the mean can be misleading—especially in a place like London. A few extremely wealthy individuals can pull the average way up, even if the majority of people are earning far less.

This is why the median is also important. Over the 10 years, we see that regions like the South East, South West and East of England have the highest estimated median incomes. But here's where it gets interesting: despite having one of the highest average incomes, London has a median closer to the poorest regions. This huge gap between the mean and median tells us something crucial—London has massive income inequality. While a few high earners are bringing the average up, most people in London earn much less. This is a clear sign of economic disparity and it's a reminder that many Londoners are likely struggling with the high cost of living, despite the city's reputation for wealth.

Let's take a closer look at how economic inequality drives disparities in CO2 emissions. For this article, we've classified the UK into affluent and poorer regions. The affluent regions include the South East, London, East of England, and South West, while the poor regions are represented by the North East, North West, Yorkshire and the Humber, West Midlands, East Midlands, Scotland, and Northern Ireland. Although there are nearly twice as many poor regions, the affluent areas are responsible for around 20% more of the UK's total emissions. This difference points to how wealth and economic structures affect carbon output. But wait, there's more to uncover if we dig a little deeper beyond just the total emissions.

Breaking down the sources of these emissions provides more insight. In both affluent and poorer regions, domestic emissions (related to household energy use) make up the largest portion. However, affluent regions show much higher commercial emissions, while poorer regions see greater emissions from industrial activities. Commercial CO2 emissions are largely driven by the energy needs of service-based businesses, such as offices, retail stores, and

restaurants. These emissions are particularly high in affluent areas like London and the South East, where service economies dominate. The large energy demand for heating, cooling, and operating business centers pushes emissions upward, even though these regions may have fewer residents. On the flip side, industrial CO2 emissions are more prominent in poorer regions like Yorkshire and the Humber or the West Midlands. These areas are home to heavy industries like manufacturing and production, which require significant energy to operate. This reliance on energy-intensive industries means that these regions produce higher industrial emissions, contributing to their overall carbon footprint. Ultimately, this distinction between commercial and industrial emissions highlights the impact of economic inequality on the nature of emissions. Wealthier regions emit more CO2 through service economies, while poorer regions rely on industries that are heavy emitters.

Shifting the focus to something more visually engaging, we can explore a choropleth map that illustrates the intensity of CO2 emissions across various regions of the UK. The South East stands out as the highest emitter, aligning with its economic status as one of the wealthiest areas. Looking more closely, we observe that the South East leads in emissions, followed by the North West and Scotland. What's particularly fascinating is how London, despite being geographically much smaller than regions like Scotland or the North West, emits nearly 85% of Scotland's CO2 output and 75% of the North West's. This highlights London's significant contribution to emissions despite its smaller size, emphasizing the role of dense urban areas in the climate equation.

(choropleth map: file:///Users/lixixuan/Uk%20emissions.html)

One of the most encouraging trends we see in this data is that CO2 emissions across the UK are steadily decreasing. In 2005, the gap between the highest-emitting and lowest-emitting regions was about 50,000 kilotons of CO2. By today, that disparity has nearly halved, dropping to around 27,000 kilotons. Even more heartening is the fact that emissions are declining overall every year, showing that progress is indeed possible. This reduction in emissions demonstrates that climate action can work—reducing our carbon footprint isn't an impossible task. If we continue to implement systemic changes and take collective action, as we have been, we could see remarkable improvements within the next decade.

Lastly, it's worth noting that the data used for this map differs from the previous sections. For those interested in the specific methodology or data sources, you can refer to the additional information in the references section.

In summary, the interplay between economic disparity and CO2 emissions reveals a complex but intriguing picture. Wealthier regions drive higher emissions through commercial activities, while poorer areas see more industrial output. Yet, despite these disparities, the UK's emissions are on the decline—a sign that change is possible. This raises an important question: How can we harness this momentum to address both economic inequality and environmental

impact more effectively? As we continue to push for progress, consider how your actions and choices can contribute to a more sustainable and equitable future. The Climate App is your go-to companion on the journey to keep the UK moving toward a greener future, helping you play your part in cutting down CO2 emissions! The path forward is one of collective effort and innovative thinking—let's seize the opportunity to make a difference.