Published in final edited form as:

AIDS. 2017 March 13; 31(5): 742–743. doi:10.1097/QAD.0000000000001407.

Authors' Reply

Katerina Christopoulos

Associate Professor of Medicine, UCSF School of Medicine, Division of HIV, ID and Global Medicine, 995 Potrero Ave, SAN FRANCISCO, 94114, UNITED STATES

To the Editor

We appreciate the interest shown by Dr. Tsai in our recently published research letter, in which we applied the Lorenz curve to the distribution of HIV viremia in a safety-net clinic over a calendar year, demonstrating extreme concentration of virus among a small group of individuals.¹ As Dr. Tsai remarks, the Gini coefficient (i.e., the area between the Lorenz curve and the 45-degree line of perfect equality, divided by the total area under the 45-degree line) and other measures such as the decile ratio and Robin Hood index offer intriguing ways to summarize inequality in a single statistic and may have particular relevance in an era when global HIV strategy is increasingly based on “hotspots.” In our study, the Gini coefficient for the Lorenz curve is 0.94 (here 0 = perfect equality and 1 = complete inequality). The decile ratio (ratio of total viremia copy months held by the top 10th percentile divided by the total viremia copy months held by the bottom 10th percentile) is 9,785. The Robin Hood index (the maximal vertical distance from the Lorenz curve to the line of perfect equality) has also been described as the proportion of virus that would have to be redistributed to achieve a state of perfect equality; in our analysis it is 84%. However, we would like to point out that we would neither expect nor want virus to be perfectly equally distributed among patients established in care – the hope is that most of the population is suppressed and only a small portion remains viremic over time. Moreover, as Dr. Tsai notes, the Gini coefficient has the intrinsic limitations of being sensitive to variations in the shape of the curve and also to small sample bias. In addition to depicting extreme concentrations of virus, the Lorenz curve in one figure also has the advantage of visually representing the proportion of the population that is never viremic. Focusing on this portion on the curve is another way to monitor the success of treatment. We believe that the Lorenz curve offers the most telling picture and that numerical summaries, which have the advantage of pithiness, invariably lose information.

References

1. Christopoulos K, Hartogensis W, Glidden DV, Pilcher CD, Gandhi M, Geng EH. The lorenz curve: a novel method for understanding viral load distribution at the population level. *AIDS*. Epub 7 Nov 2016.