## Revising Statistical Evidence Required for Establishing Disparate Impact Claims

Equal opportunity in employment and housing is a core right in the United States. This right is enforced through anti-discrimination cases brought under Title VI/VII of the Civil Rights Act and the Fair Housing Act. Recently, there has been a surge in Fair Housing and Equal Opportunity complaints while concurrently, less than 1% of employment cases brought to courts have established discrimination.[[1]](#footnote-1)Increasingly, these cases stem from ostensibly neutral actions that disproportionately affect protected classes. For example, landlords use former-incarceration status to screen out tenants, which may cause racial disparities in housing access.[[2]](#footnote-2) Additionally, some justice programs use algorithmic decision-making, potentially leading to discriminatory harms by perpetuating existing biases found in historical data.[[3]](#footnote-3)

These cases may be challenged through disparate impact claims, which are resolved by courts using a three-part test.[[4]](#footnote-4) The first step requires demonstrating a disparity using statistical evidence. This requires showing a protected class is adversely affected at a four-fifths rate relative to a comparator population (the four-fifths rule) and showing the effect is statistically significant (the significance rule). [[5]](#footnote-5) The intent of these rules is to standardize the identification of disparities by providing clear guidelines.

While initially these rules appear to apply neutrally to cases, meeting the bar set by the four-fifths rule and significance rule can vary depending on statistical factors unrelated to the case. For instance, finding a 20% effect size depends on the baseline occurrence of an event and the measure considered, and statistical significance depends on statistical power, sample size, and the size of an effect.[[6]](#footnote-6) These factors can make determining disparities highly variable under seemingly static rules and place an undue burden on plaintiffs. To better align with the intent of disparate impact cases, courts may need to adjust rules to account for additional measurement factors. This is particularly important to investigate since more policies are now based on algorithmic data mining techniques, which present unique challenges for disparate impact cases.[[7]](#footnote-7)

In this study, we propose to explore how measurement factors like baseline event rates, sample sizes, and effect sizes influence our ability to robustly detect disparate impacts. The aim is to identify and propose new statistical rules for courts that would improve detection. We propose to do these explorations using a series of simulations that will 1) demonstrate how obvious disparate impacts may not be captured by the current set of rules; & 2) identify a range of functional relationships between effect sizes and significance levels that courts may wish to use to determine disparities, incorporating additional relevant statistical measures.

1. [*State of Fair Housing – Annual Report to Congress,* 2022](https://www.hud.gov/sites/dfiles/FHEO/documents/FHEO%20Annual%20Report%20FY%202022.pdf); [Jameel, Shapiro, and Yerardi, 2019](https://www.washingtonpost.com/graphics/2019/business/discrimination-complaint-outcomes/) [↑](#footnote-ref-1)
2. [Griswold et al., 2023](https://www.rand.org/pubs/research_reports/RRA2689-1.html) [↑](#footnote-ref-2)
3. [Osoba & Welser, 2017](https://www.rand.org/pubs/research_reports/RR1744.html). [↑](#footnote-ref-3)
4. [Title VI Legal Manual, Section VII, Sec. C](https://www.justice.gov/crt/fcs/T6Manual7#C) [↑](#footnote-ref-4)
5. [Title VI Legal Manual, Section VII, 1 (C) ii - iv](https://www.justice.gov/crt/fcs/T6Manual7#G) [↑](#footnote-ref-5)
6. [Cohen, 2013](https://www.jstor.org/stable/pdf/24758720.pdf?refreqid=fastly-default%3A24937b1ae04c24243be4456ee301795d&ab_segments=&origin=&initiator=&acceptTC=1); [Kim & Choi, 2019](https://onlinelibrary.wiley.com/doi/full/10.1111/abac.12172); [Spanos, 2017](https://onlinelibrary.wiley.com/doi/full/10.1111/joes.12200); [Grossman, Nyarko, & Goel, 2023](https://5harad.com/papers/disparate-impact.pdf) [↑](#footnote-ref-6)
7. [Barocas & Selbst, 2016](https://www.jstor.org/stable/pdf/24758720.pdf?refreqid=fastly-default%3A24937b1ae04c24243be4456ee301795d&ab_segments=&origin=&initiator=&acceptTC=1) [↑](#footnote-ref-7)