Mapping Intersectional Inequities in Mental Health Over Time: Can State EITC Policies Mitigate Disparities?

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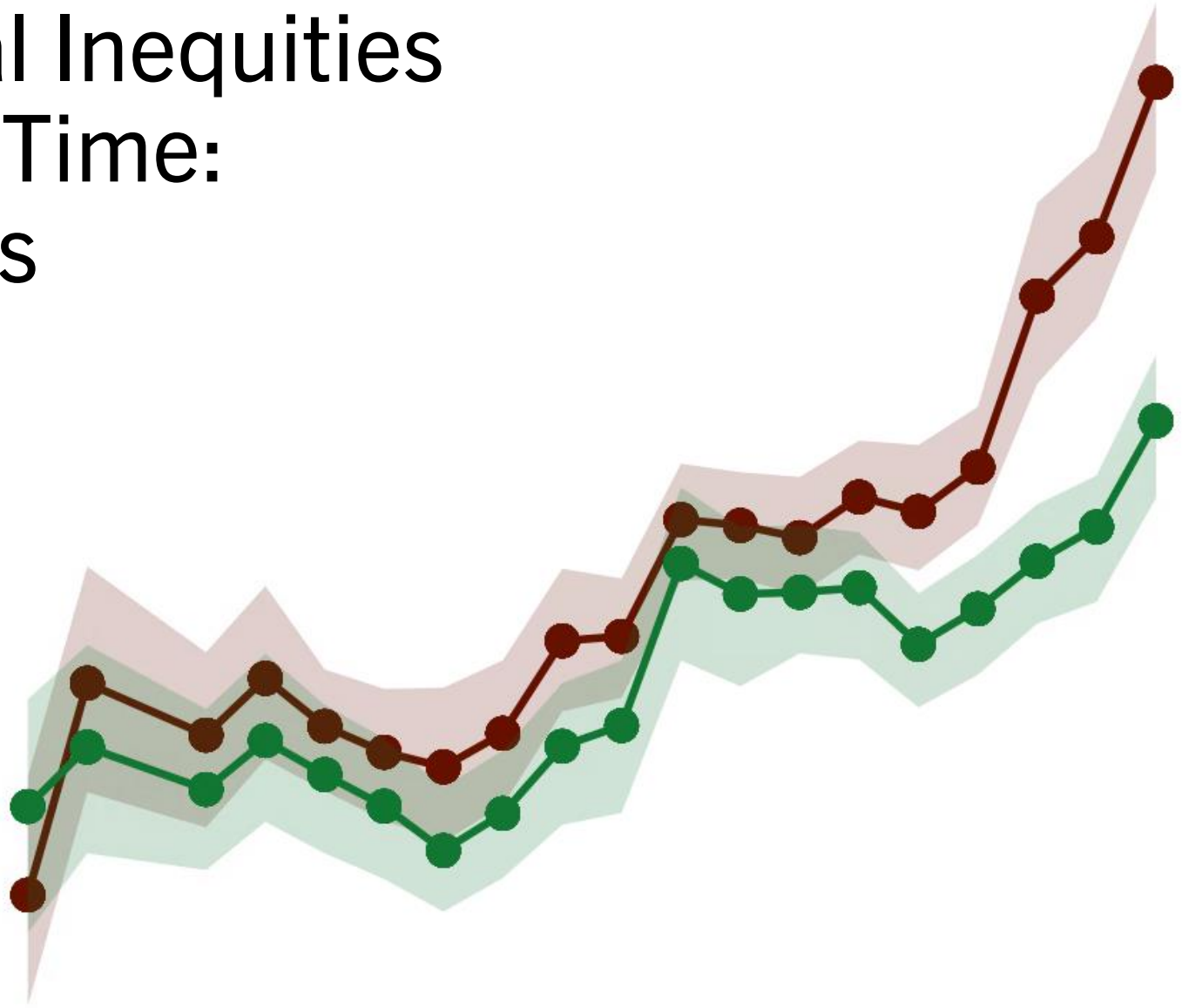


Project Aims

a) Understand how the burden of poor mental health and social inequities in the burden of poor mental health have changed over recent decades among US adults.

b) Evaluate whether State EITC policy availability and receipt have modified these trends among adults that are working-age.

Project Motivations

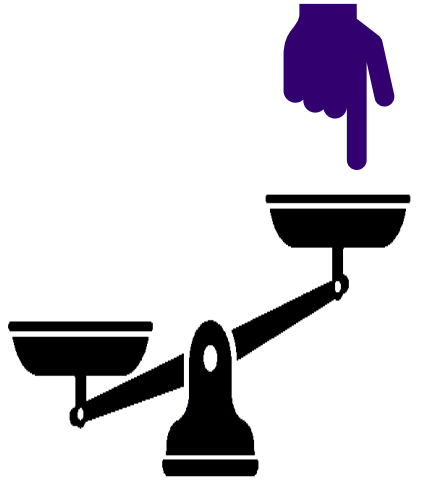
1. Social equity in mental health is a large and (possibly) growing issue
2. How we measure equity matters, and we currently do so poorly
3. Health equity requires equitable resource access, which cash transfers help towards

Mental health disorders affect:

1 in 5 at any time **&** 1 in 2 at some point

Inequality data is:

- 👎 Granular
- 👎 Actionable



Study Features

Design

Descriptive, repeated cross-sectional study with group-based inference at the national level.

Data

- 6.4 million respondents in Behavioral Risk Factor Surveillance System (BRFSS)
- State information from the University of Kentucky Center for Poverty Research, Census Bureau, and Bureau of Labor Statistics.

Analysis Period

1993-2019 for Aim 1a, restricting to 2000-2019 for Aim 1b.

Measures

Outcome

Age-standardized prevalence of Frequent Mental Distress (FMD)

- Defined as self-reporting ≥14 ‘mentally unhealthy days’ in the past 30 days.
- Standardized (via weighting) as age-based differences in FMD aren’t our focus

Exposures

Social strata defined individually and **intersectionally** by:

- Self-classified race (White, Black)
- Self-reported Hispanic ethnicity (Non-Hispanic, Hispanic)
- Perceived sex (Male, Female)
- Highest educational attainment (Less than High School, At least High School)
- Household poverty status (Not in poverty, In poverty)

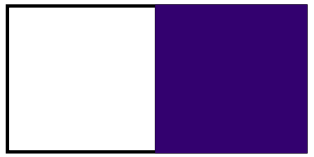
Methodology

How do we define and measure ‘social inequities’?

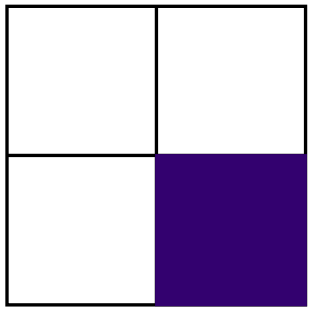
Any differences in FMD prevalence between the population presumed socially **most-privileged** and every other population **at the same level of stratification.**

For example:

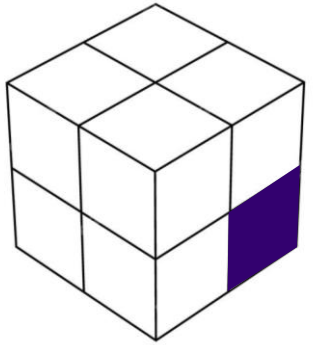
By race
(vs. white)



By race & sex
(vs. white men)



By race, sex & ethnicity
(vs. non-Hispanic white men)



… etc.

Methodology

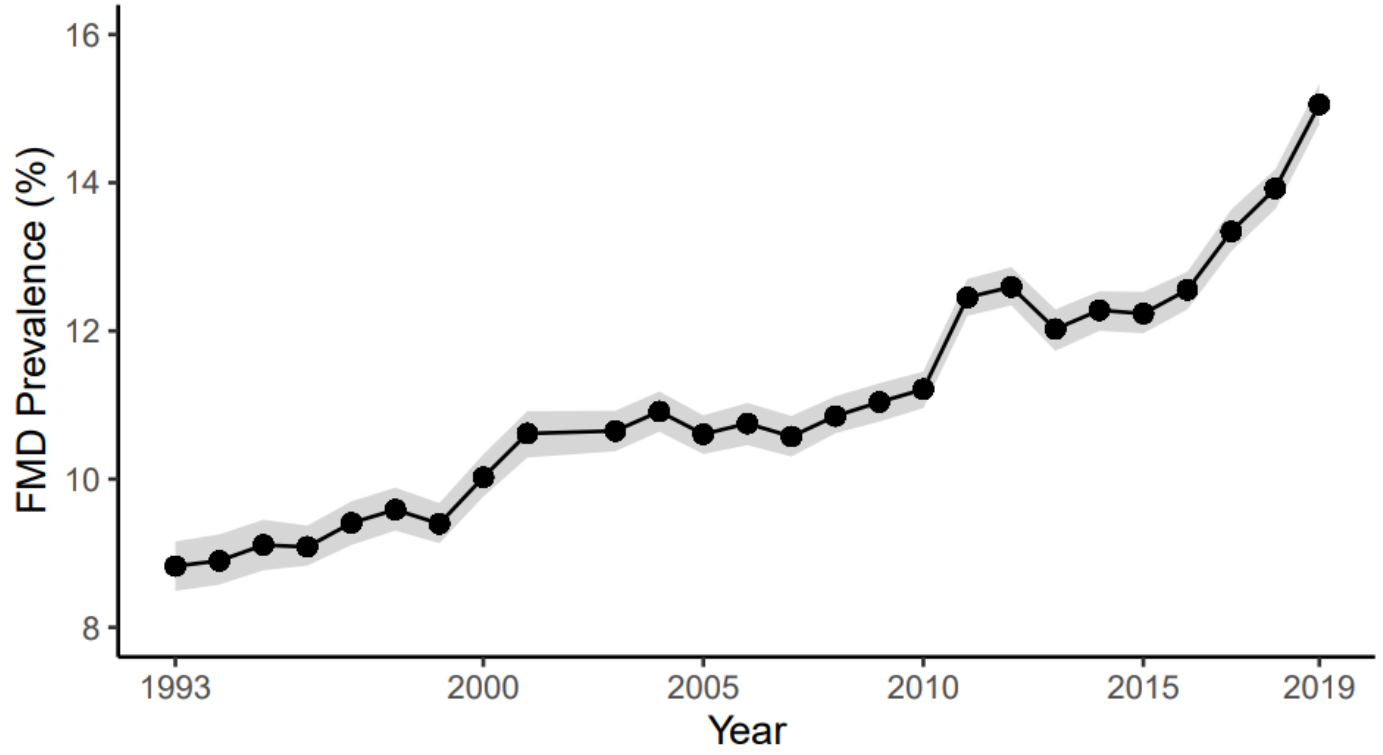
Key Analytic Steps

1. Imputing continuous income and determining poverty status
2. Determining likely Federal and State EITC credit receipt
3. Creating cross-sectional respondent weights and computing annual estimates
4. Constructing 95% confidence intervals via a stratified bootstrapping approach
5. Censoring unreliable or unstable estimates following NCHS guidelines

All discussed further in Appendix slides
(if you're interested)

Results – FMD Prevalence

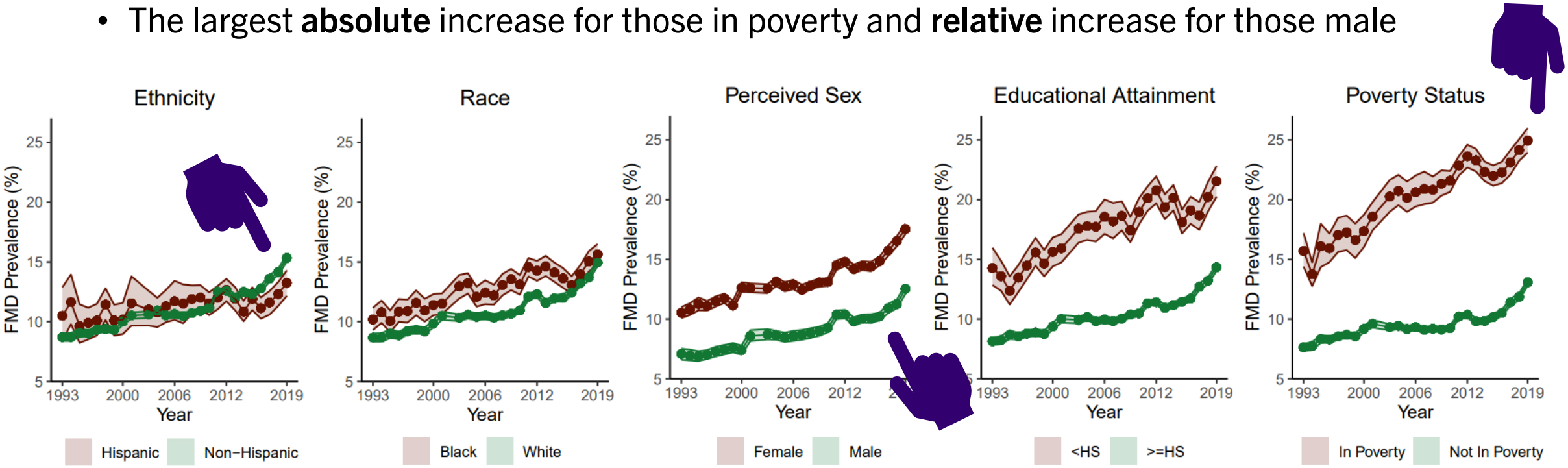
Between 1993 and 2019, age-standardized FMD prevalence across the US **increased** by 71%, from 8.8% (95% CI: 8.5%, 9.2%) to 15.1% (14.8%, 15.3%).



Results – FMD Prevalence

Prevalence likewise **increased** for all singly-defined social groups, with:

- The smallest increases for those Hispanic
- The largest **absolute** increase for those in poverty and **relative** increase for those male

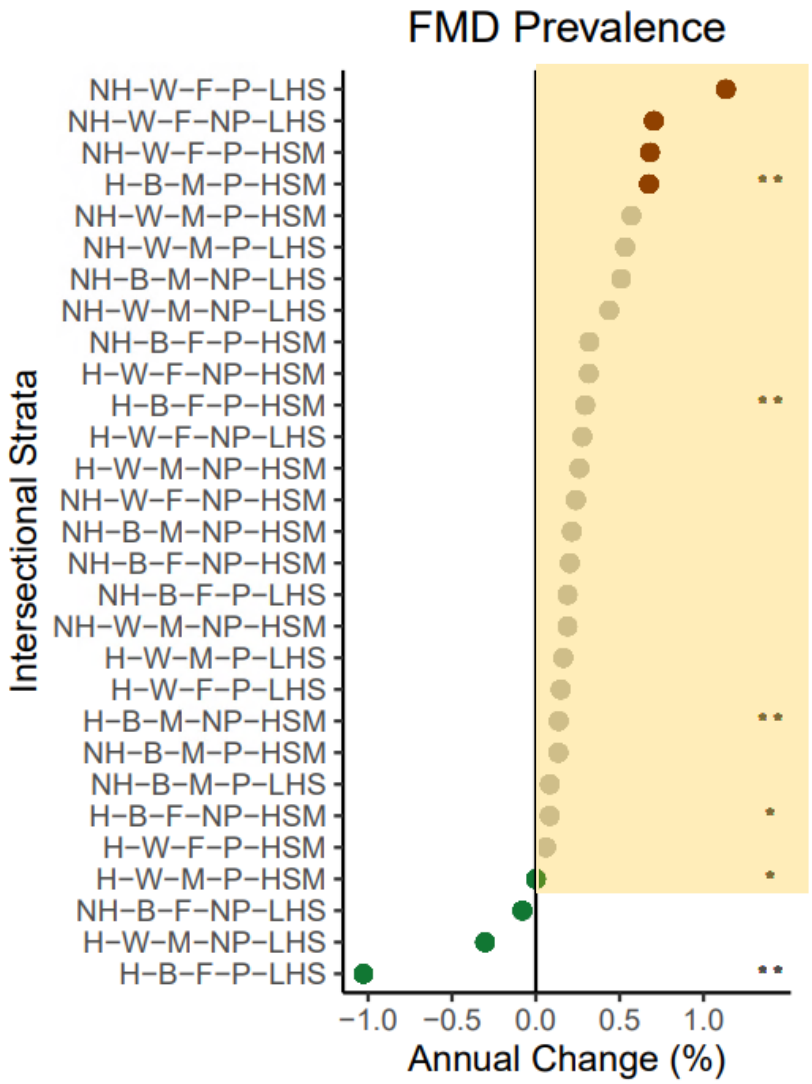


Results – FMD Prevalence

And increased for **90%** of intersectional groups defined by all social axes (26 of 29, 3 NA), with:

- **Decreases** for (some) less educated Hispanic groups
- The largest **increases** for non-Hispanic white women

Focusing on the overall **distribution** of groups vs. 0 instead of comparing groups

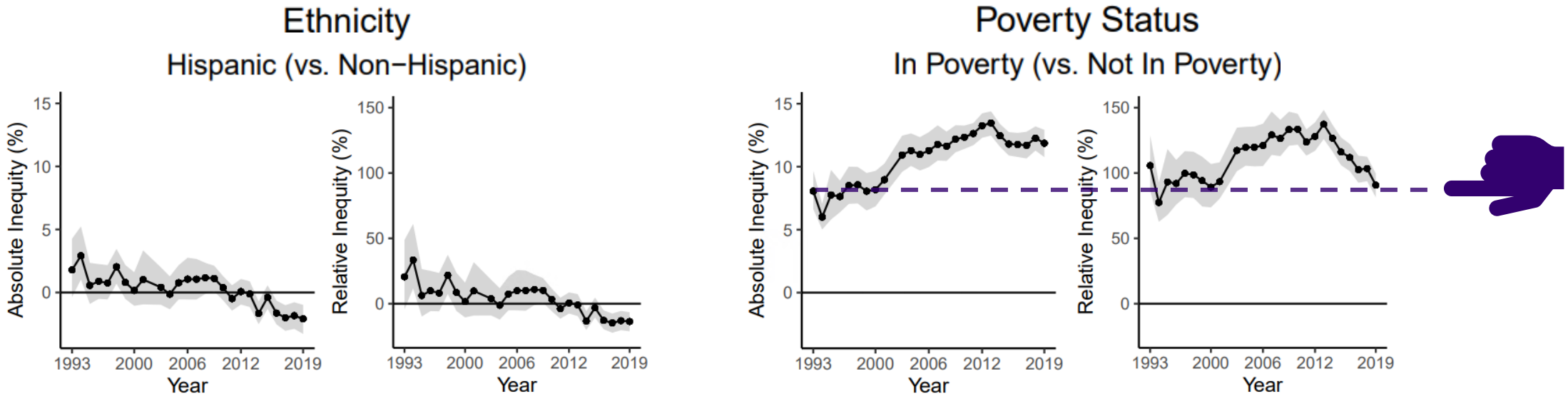


Note: Censoring precluded creating annual change estimates for less educated Hispanic Black women not in poverty and all less educated Hispanic Black men.
Estimates are based on: * < 80% of annual estimates. ** < 50% of annual estimates.
Legend: H/NH: Hispanic/Non-Hispanic. B/W: Black/White. F/M: Female/Male. P/NP: In Poverty/Not In Poverty. LHS/HSM: Less than HS/HS or More

Results – Absolute and Relative Inequities

Compared to those presumed socially most privileged across each social axis, inequities in age-standardized FMD prevalence have:

- Remained **broadly constant** by race, sex, and educational attainment (so not shown)
- **Disappeared** by Hispanic ethnicity
- **Widened** by household poverty status (but only in **absolute** terms)



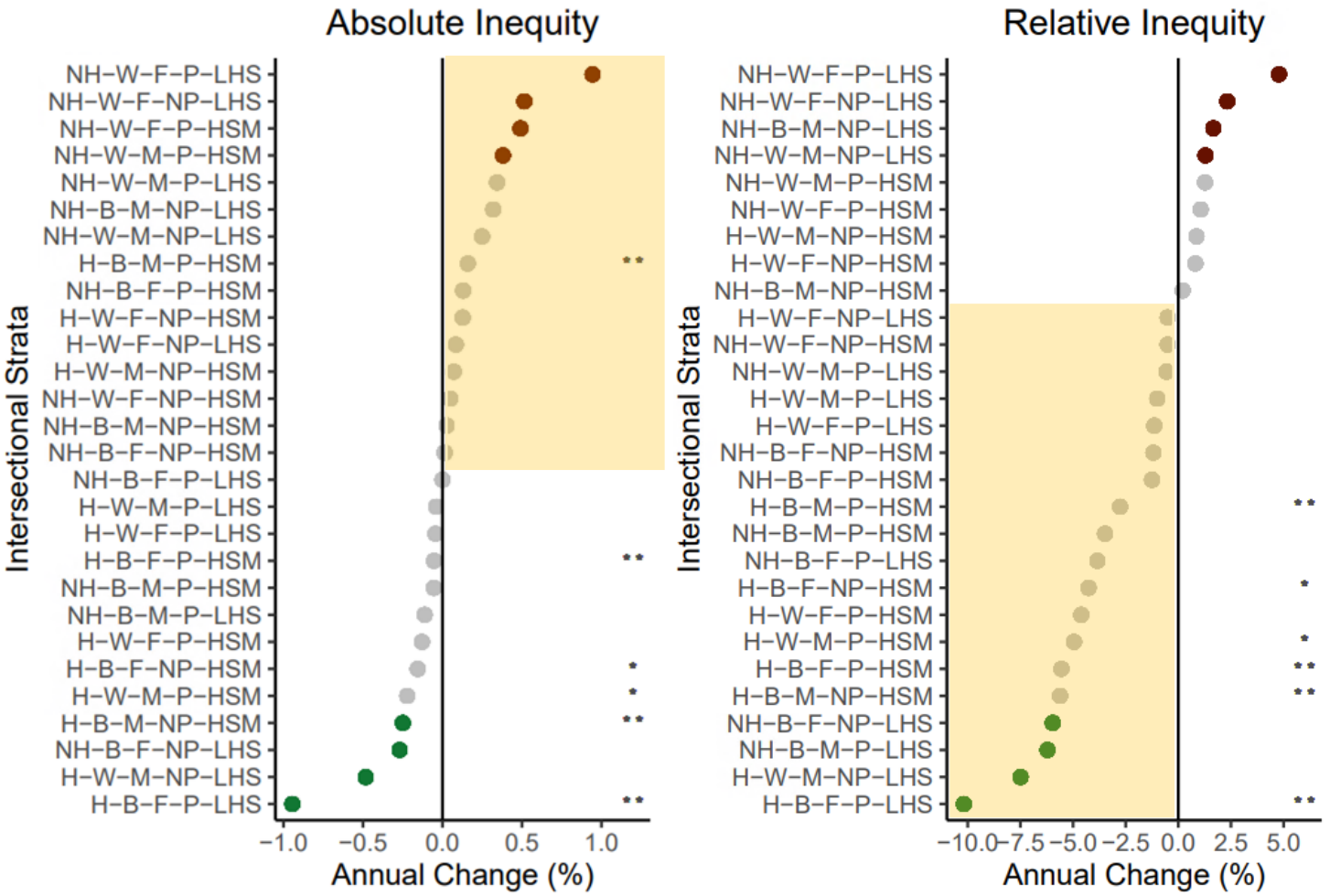
Results – Absolute and Relative Inequities

How **intersectional** inequities appear to have changed depends on the **scale.**

Most groups saw inequities:

- **Widening** absolutely (57%)
- **Narrowing** relatively (68%)

Most groups with narrowing inequities are less privileged

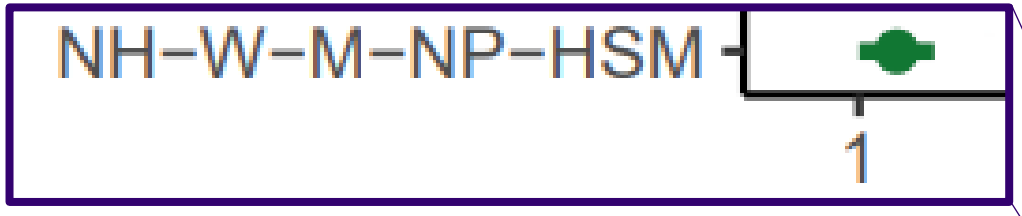


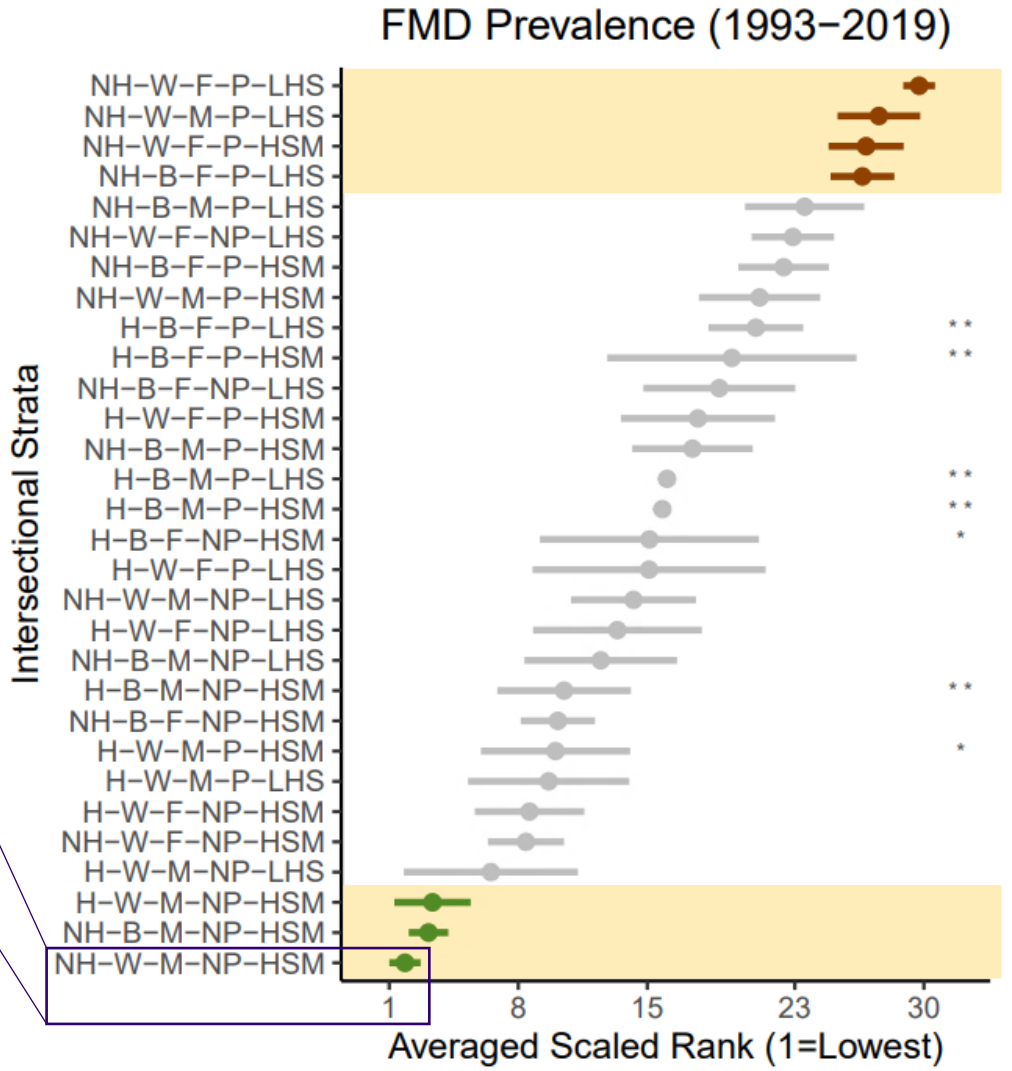
Estimates are based on: * < 80%, ** < 50% of annual estimates.
Legend: H/NH: Hispanic/Non-Hispanic. B/W: Black/White.
F/M: Female/Male. P/NP: In Poverty/Not In Poverty.
LHS/HSM: Less than HS/HS or More

Results – Social Rankings

Looking at the average annual FMD prevalence rank of groups over time (1 = Lowest Burden):

- The most- and least-burdened groups are **stable**
- Those presumed 'most-privileged' **actually are**

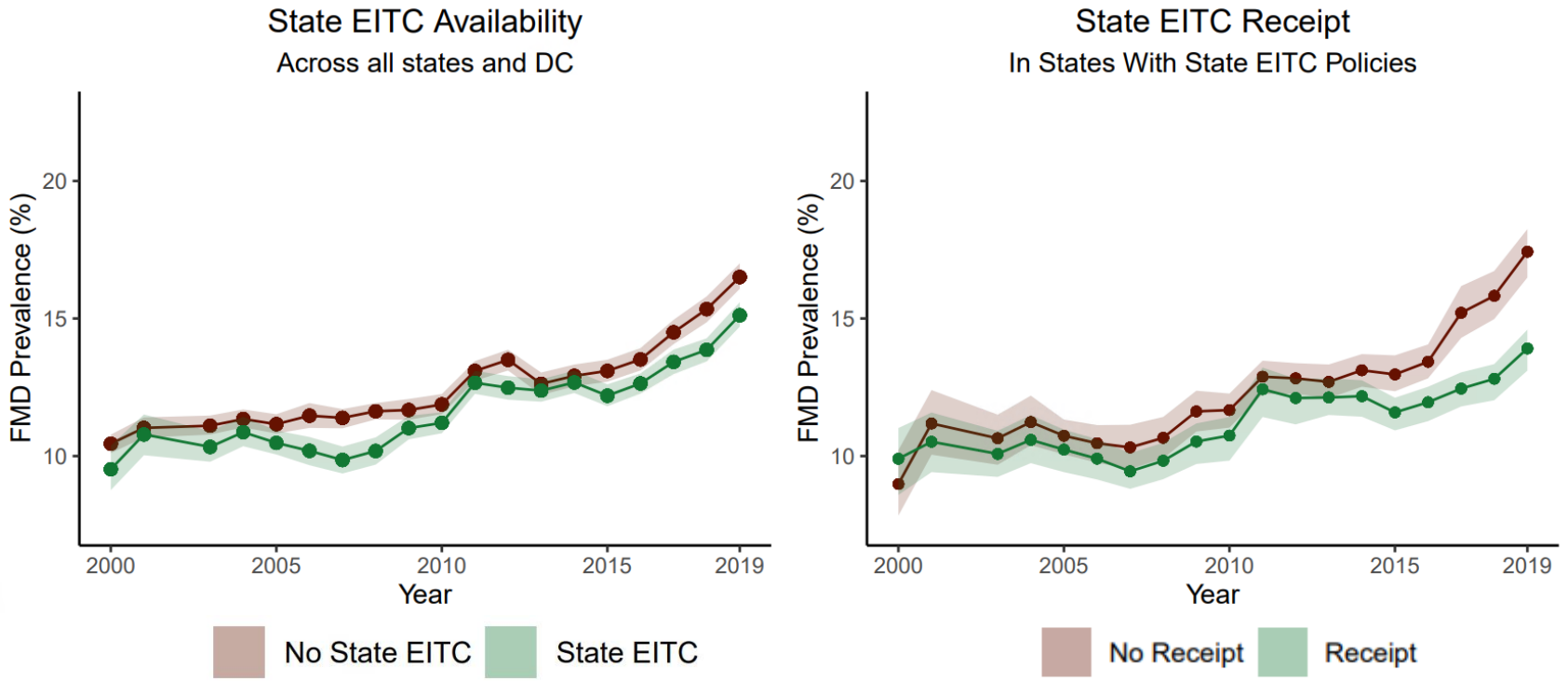




Estimates are based on: * < 80%, ** < 50% of annual estimates.
Note: Error bars reflect ± 1SD of strata-specific ranks over study years.
Annual ranks are scaled according to the number of contributing uncensored strata.
Legend: H/NH: Hispanic/Non-Hispanic. B/W: Black/White. F/M: Female/Male.
P/NP: In Poverty/Not In Poverty. LHS/HSM: Less than HS/HS or More

Results – Overall Moderation by EITCs

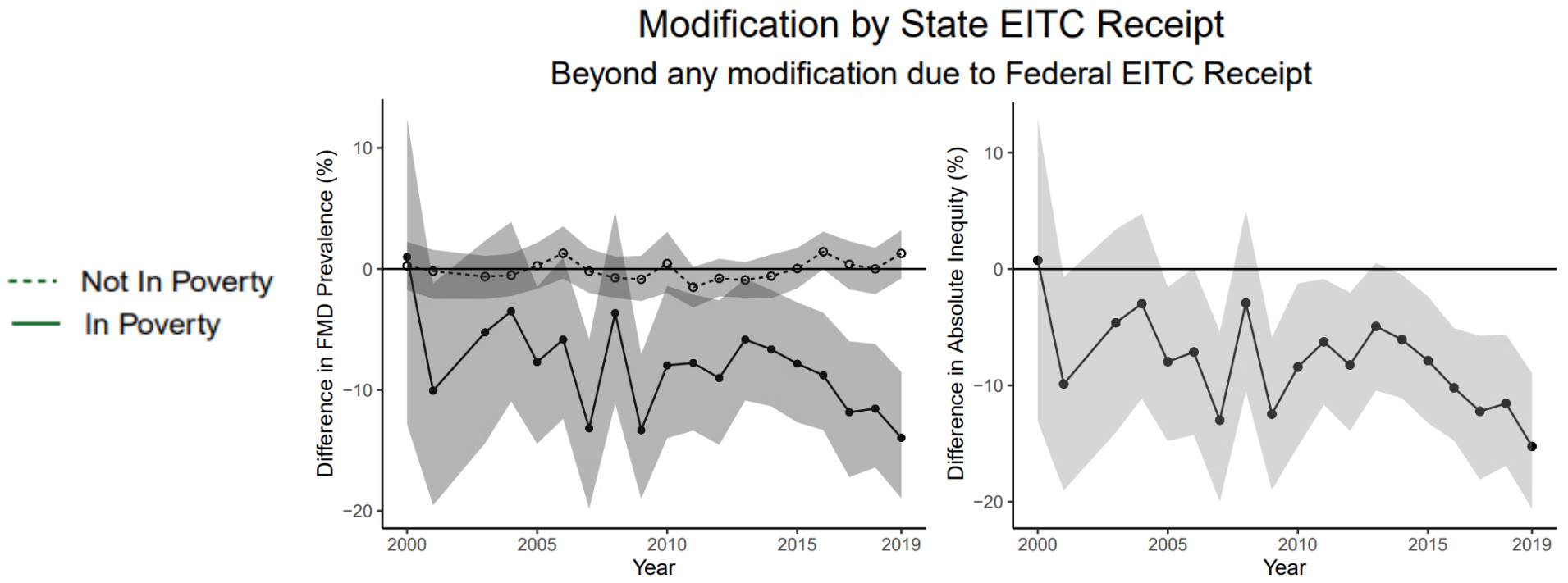
Among working-age adults, age-standardized FMD prevalence is **lower** in states with State EITC policies and in populations receiving State EITC credits.



Note: EITC: Earned Income Tax Credit. Shaded bars reflect 95% Confidence Intervals. Shaded bars reflect 95% CI.

Results – Poverty-based Moderation by EITCs

State EITC receipt (on top of moderation by Federal EITC receipt) is associated with **lower** FMD prevalence for those in poverty and **smaller** poverty-based inequities.

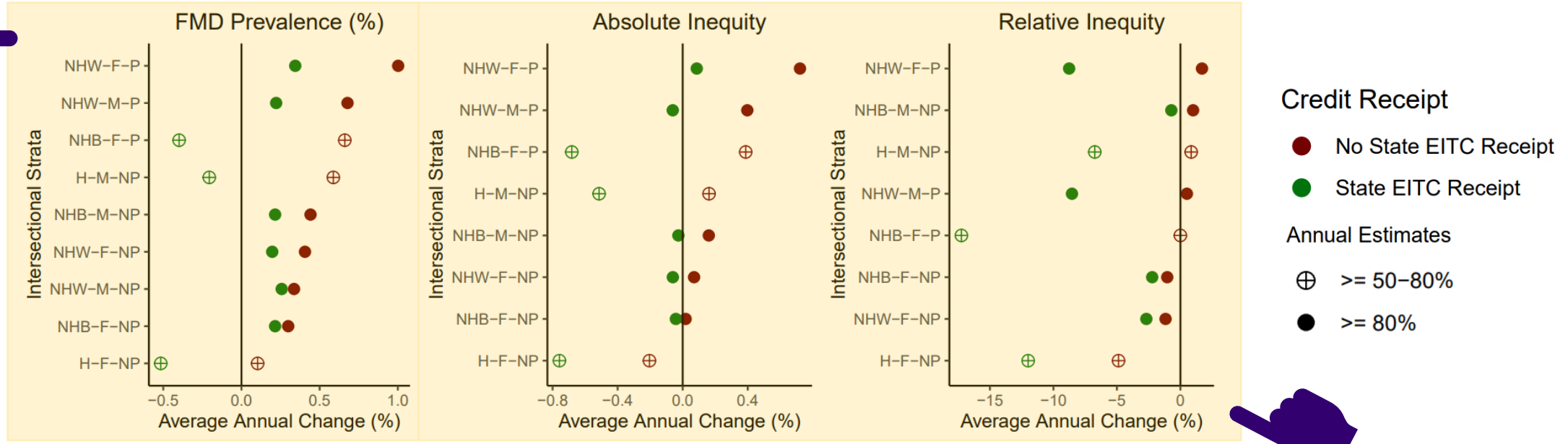


Note: EITC: Earned Income Tax Credit. Shaded bars reflect 95% CI.

Results – Intersectional Moderation by EITCs

Comparing FMD prevalence and inequity trends across State EITC contexts:

- Prevalence has increased at a **slower rate** for intersectional strata receiving State EITCs
- Inequities have mostly **narrowed** for those receiving State EITCs but **widened** for those not



Note: EITC: Earned Income Tax Credit. Strata with fewer than 25% of estimates are excluded.
Legend: NHW/NHB/H: Non-Hispanic White/Non-Hispanic Black/Hispanic. F/M: Female/Male. P/NP: In Poverty/Not in poverty.

Results Summary

Aim 1a

- Age-standardized FMD prevalence has **worsened** over time
- Intersectional inequities have mostly **widened** absolutely but **narrowed** relatively
- Groups historically burdened the most and least by FMD **remain unchanged**

Aim 1b

State EITC receipt (vs. non-receipt) is associated with:

- **Lower** FMD prevalence overall and for those in poverty
- **Smaller** inequities by household poverty status
- **Slower** increases in FMD prevalence over time across intersectional groups
- **Narrowing** intersectional inequities over time (vs. widening for non-recipients)

Thanks for listening!
Any Questions?

Project Code,
Presentation Slides
& Data Summaries

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Appendix – EITC Policy Characteristics

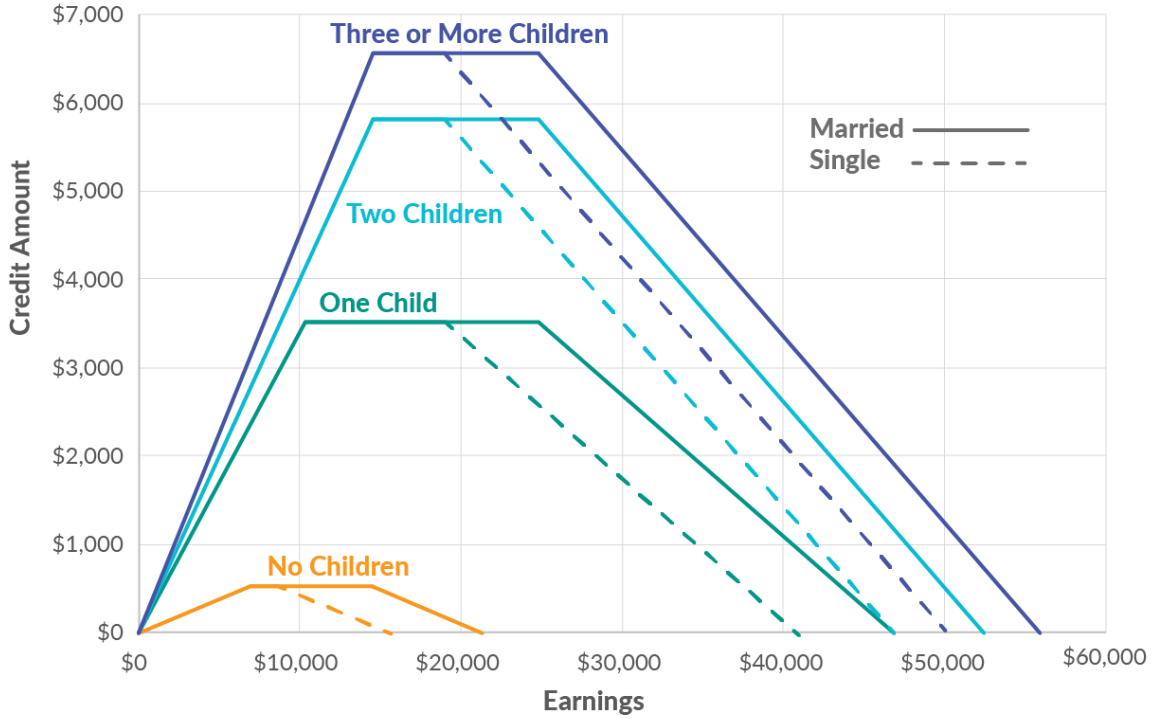
EITC policies are means-tested, refundable tax credits available to low- to moderate-income working individuals and couples.

EITC size varies based on claimant:

- Total labor income
- Marital status, and
- Number of dependent persons.

State EITC policies typically have a similar structure to the Federal EITC but can vary in multiple ways.

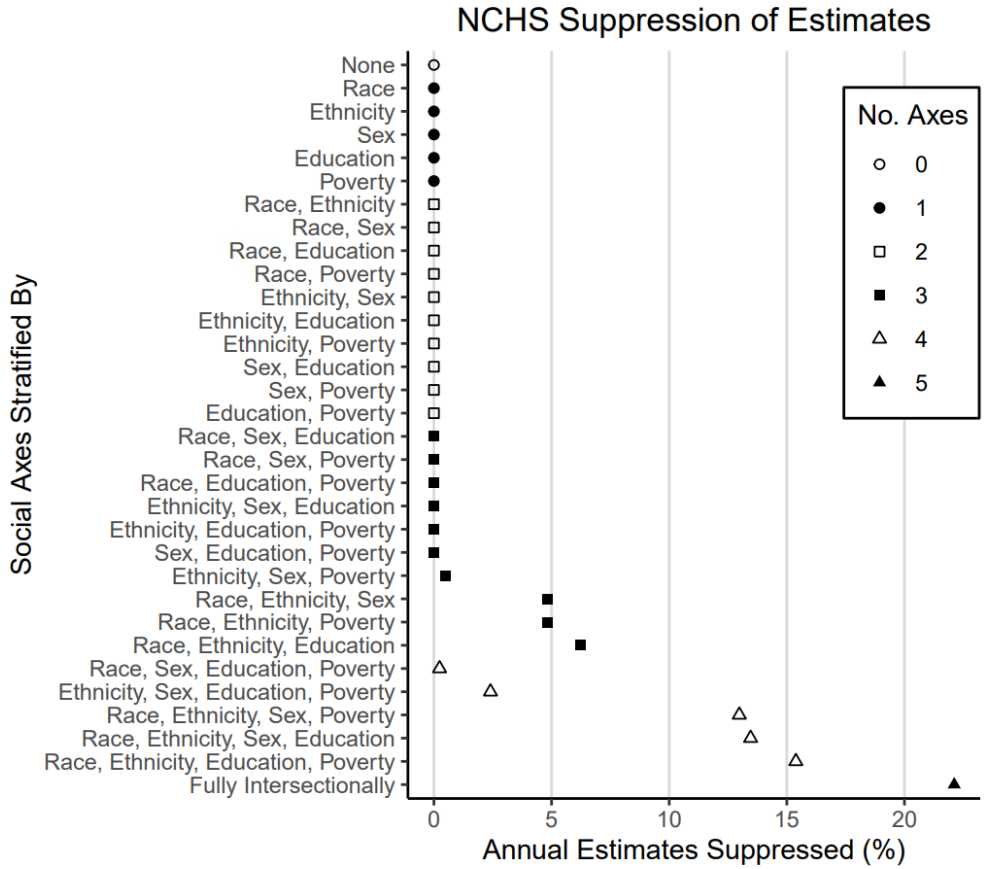
Both Federal and State EITC policies deliberately aim to incentivise work.

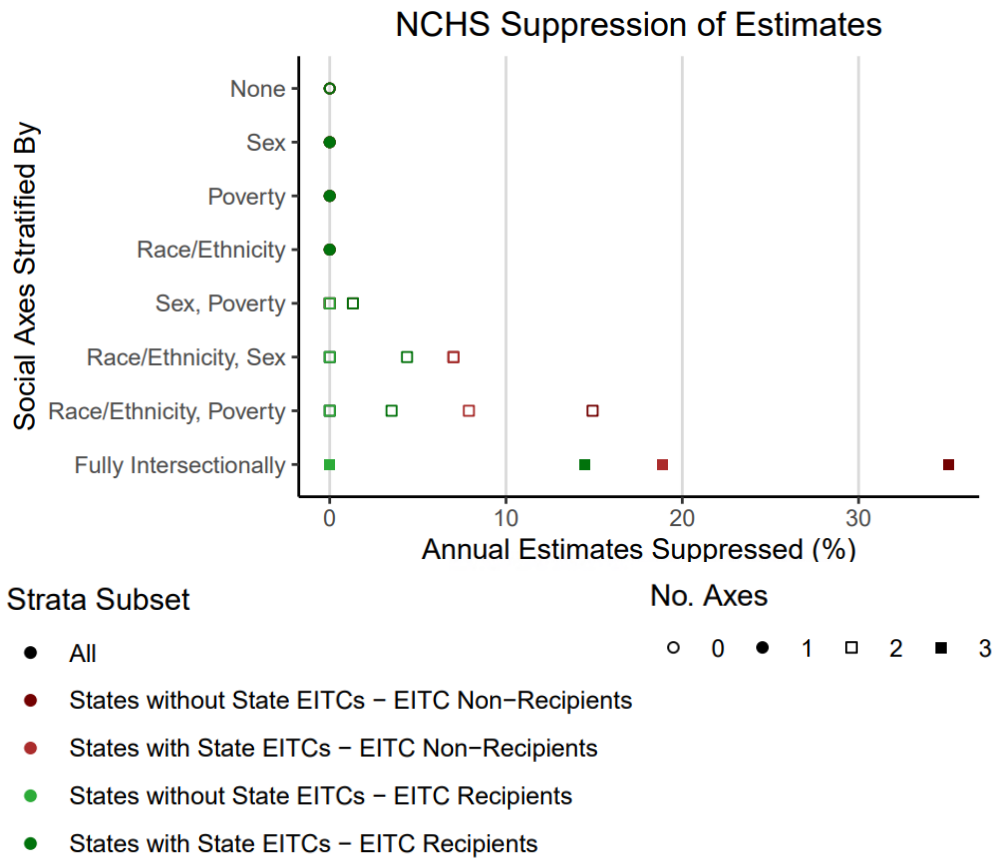


Source: Amir El-Sibaie, "2019 Tax Brackets," Tax Foundation, Nov. 28, 2018.

Appendix – Extent of Data Suppression

For Aim 1 (left) and Aim 2 (right), data suppression was typically low.





Appendix – Imputing Continuous Income & Determining Household Poverty Status

Imputing Continuous Income Information

BRFSS respondents report **categorized** annual household income, but we need **continuous** income to determine household poverty status and likely EITC receipt.

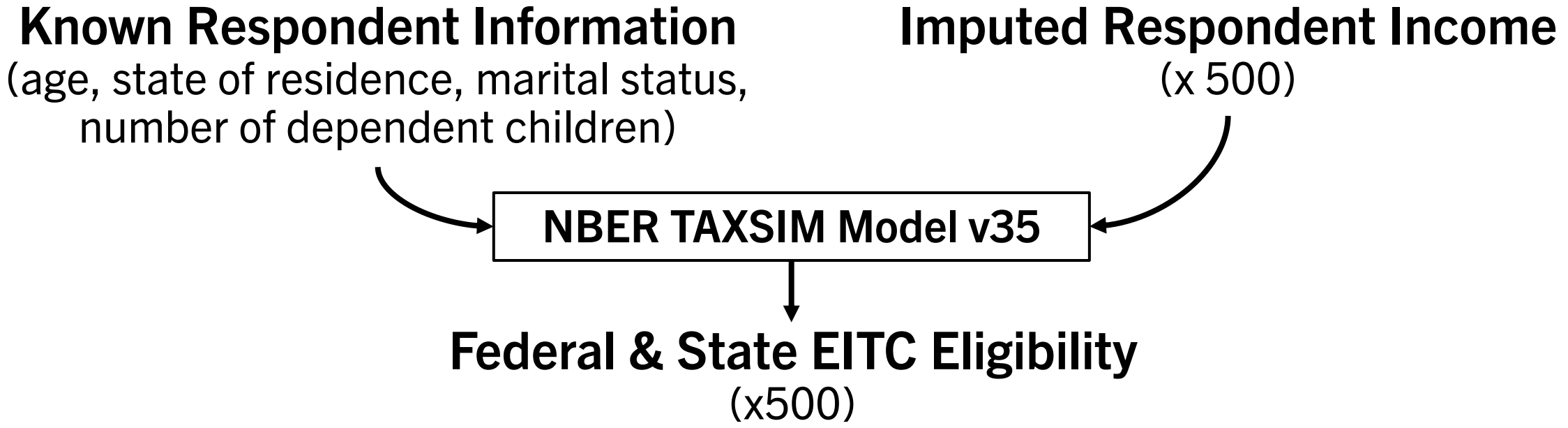
We impute continuous income for each respondent 500 times using the **within-category uniform imputation approach** recommended by SHADAC. This approach has the best performance for imputing lower-incomes, more relevant for our uses.

Determining Household Poverty Status

We compare each respondent's imputed continuous income to the Census Bureau Official Poverty Measure (OPM) after adjustment for state purchasing power using a form of Median Rent Index (Bishaw Index).

Appendix – Determining Likely Federal and State EITC Receipt

We determine likely Federal and State EITC recipiency for each respondent using the **NBER TAXSIM model** as described below:



Appendix – Creating and incorporating cross-sectional respondent weights

Creating Respondent Weights

We create composite respondent weights W_i computed as the product of:

1. Pre-existing BRFSS Weights
   - Accounting for BRFSS design effects and providing cross-sectional population representativeness
2. Weights created by Klein & Schoenborn (2001)
   - Designed for use in standardizing populations by age to equal the predicted national age-distribution in 2000

Incorporating Respondent Weights

We incorporate weights by computing each annual strata prevalence estimate as:

$$Prev_{Strata,year} = \sum_{i=1}^{n_{strata,year}} W_i * Y_i$$

Appendix – Censoring unreliable/unstable estimates following NCHS guidelines

We suppress strata-specific prevalence estimates following guidelines produced by the **National Center for Health Statistics (NCHS)**, below:

Prevalence estimates are censored unless:

- The effective strata N accounting for design effects is ≥ 30
- The strata reports at least 1 event and non-event
- The absolute 95% CI width is < 0.3 (or 30%)
- The relative 95% CI width is < 1.3 (or 130%)

We opt not follow BRFSS suppression guidelines as these rely on RSE, which can be overly conservative or liberal for small and large estimates

Appendix – Constructing 95% CI via a stratified bootstrapping approach

We construct percentile-based 95% confidence intervals using a **stratified bootstrapping approach** with **500 repetitions** in which we:

1. Assign respondents their N^{th} household poverty status and EITC recipiencies, where N is the current bootstrap repetition (of 500)
2. Determine intersectional strata memberships for each respondent given their current-repetition household poverty status
3. Re-sample respondents with replacement proportional to their intersectional strata size in each year
4. Compute all analysis variables (e.g. FMD prevalence, inequity magnitudes)
5. Calculate final point estimates as the mean estimate across repetitions and 95% CI as the 2.5^{th} and 97.5^{th} percentile estimate values across repetitions