STUDENT AND SCHOOL CONCENTRATED POVERTY: WHAT ARE THE LONG-TERM CONSEQUENCES FOR ACADEMIC AND CAREER OUTCOMES?

Angela K. Henneberger

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University of Maryland Baltimore County

CO-AUTHORS AND ACKNOWLEDGEMENT

- Bess Rose
- Dawnsha Mushonga
- Boyoung Nam
- Alison Preston
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COMMISSION ON INNOVATION AND EXCELLENCE IN EDUCATION

MOTIVATION AND PROCESS

- At the time, the funding formula for education in Maryland provided supplemental funds for each low-income student
- Under consideration by the Commission was providing additional supplemental funds for schools with high concentrations of poverty
- The MLDS Center was asked: *What is the role of school concentrated poverty, over and above student poverty, in long-term academic and workforce outcomes?*
- Over a 2-year period, we worked with the Commission to refine and operationalize research questions, select appropriate statistical approaches, and situate findings within the larger policy context.

BACKGROUND

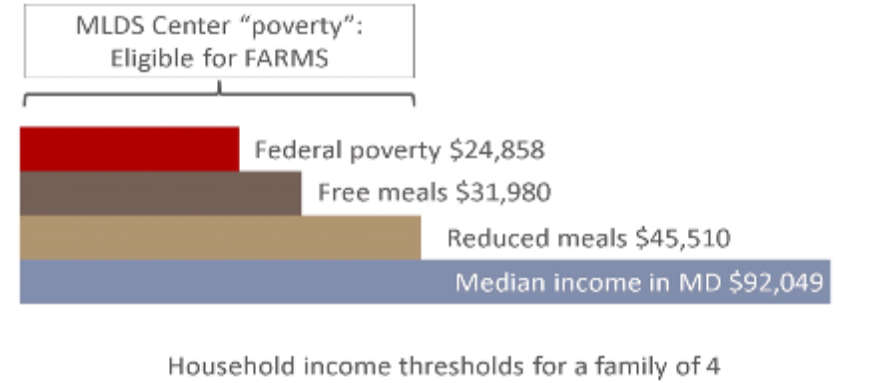
- Student poverty is consistently linked to poorer physical health, academic achievement, social, emotional, and behavioral functioning (Leventhal & Brooks-Gunn, 2000; McLoyd, 1998).
- A large body of prior research on concentrated poverty focuses on neighborhood composition
  - Observational studies indicate a link to detrimental educational outcomes (Burdick-Will et al., 2011; Sampson et al., 2008; Wodtke et al., 2011)
  - Experimental evidence from the Moving to Opportunity study indicates that moving to a lower poverty neighborhood early in life (before age 13) significantly improved college attendance rates and increased future earnings (Chetty et al., 2015)

BACKGROUND CONTINUED

- In a seminal re-analysis of data from the Coleman Report, the social class composition of a student's school was more than 1 ¾ times more important for educational outcomes than an individual student's social class (Borman & Dowling, 2010).
- School concentrated poverty is consistently linked to negative educational outcomes (Caldas & Bankston, 1997; Crosnoe, 2009; Konstantopoulos & Borman, 2011; Rumberger & Palardy, 2005).
- However, measurement issues abound and limited research focuses on post-high school outcomes.

BACKGROUND: MEASURING POVERTY

- Education researchers typically use eligibility for the National Student Lunch Program (free/reduced meals; FARMS) measured at a single point in time
  - Reduced meals = 130% of the poverty level
  - Free meals = 185% of the poverty level



BACKGROUND: MEASURING POVERTY CONTINUED

- Limitations in using FARMS at a single point in time
  - Fails to capture timing and duration of poverty (Transitory versus persistent poverty; Early versus later poverty)
  - Community Eligibility Provision (CEP)
  - Binary variable limits variation
- Domina and colleagues (2018) showed substantial variation in household income among students in the same FARMS category
- FARMS at a point in time is typically aggregated to the school level to measure school concentrated poverty (likely imprecise; see Domina et al., 2018)

BACKGROUND: MEASURING POVERTY CONTINUED

- Michelmore & Dynarski (2017) proposed a measure of poverty using the proportion of years a student was eligible for FARMS over time and validated it using data from ECLS-K
- Students with the highest number of years eligible for FARMS had the lowest scores on standardized tests.

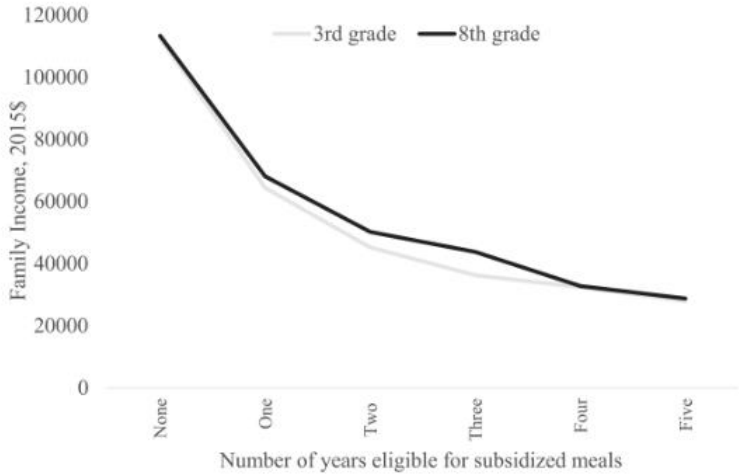


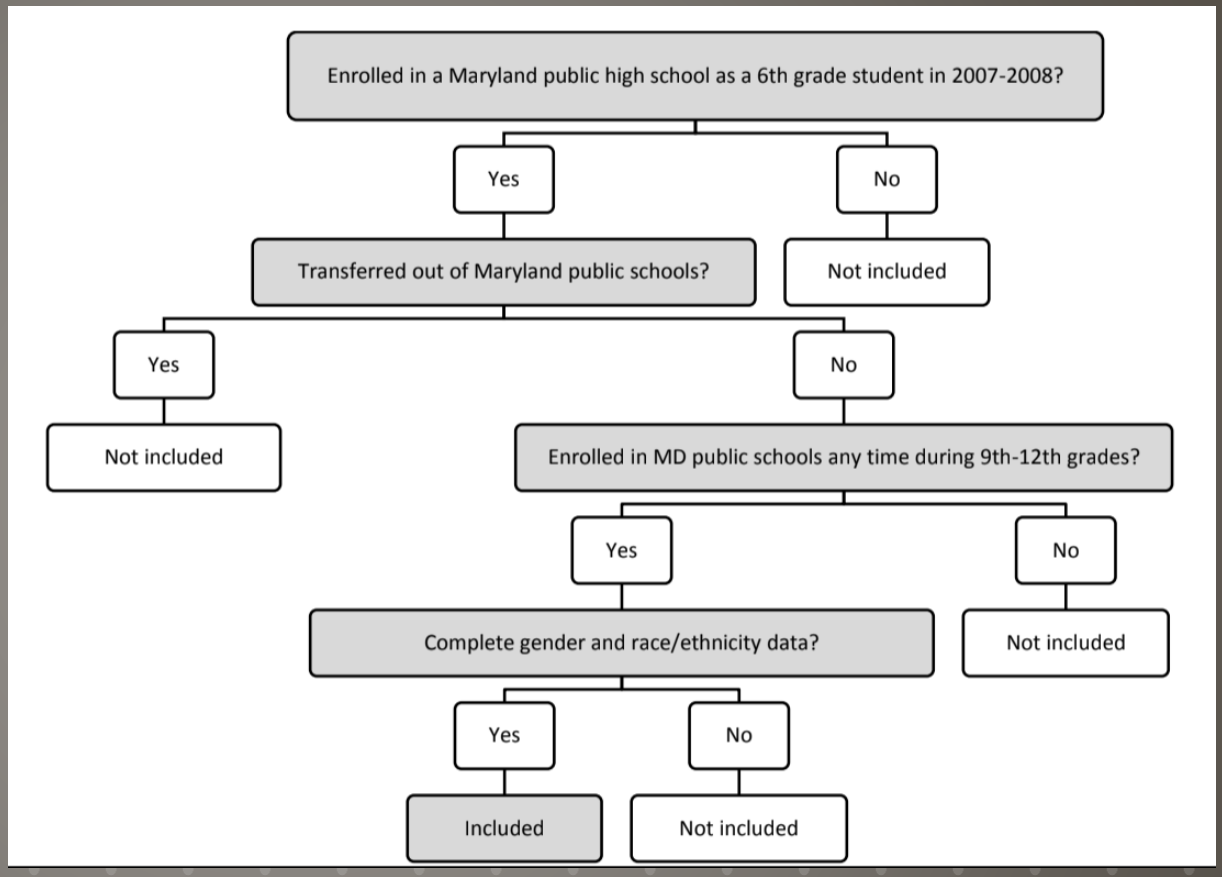
FIGURE 5. *How does income vary over time by number of years eligible for subsidized meals?*
Source. Early Childhood Longitudinal Study–Kindergarten Class of 1998–1999 (ECLS-K).
Note. Income measured by assigning the median value within each income category in the ECLS-K, by number of years eligible for subsidized meals. All dollars measured in 2015 dollars using the Consumer Price Index.

THE CURRENT STUDY

- We aim to build on Michelmore & Dynarksi (2017) to examine the long-run impacts of school concentrated poverty on academic and career outcomes.
  - We aggregate the proportion of years a student was eligible for FARMS to the school-level to create a measure of school concentrated poverty
  - We use linked longitudinal administrative data from the Maryland Longitudinal Data System (MLDS) to examine college and early labor market outcomes

METHOD: MLDS SAMPLE SELECTION

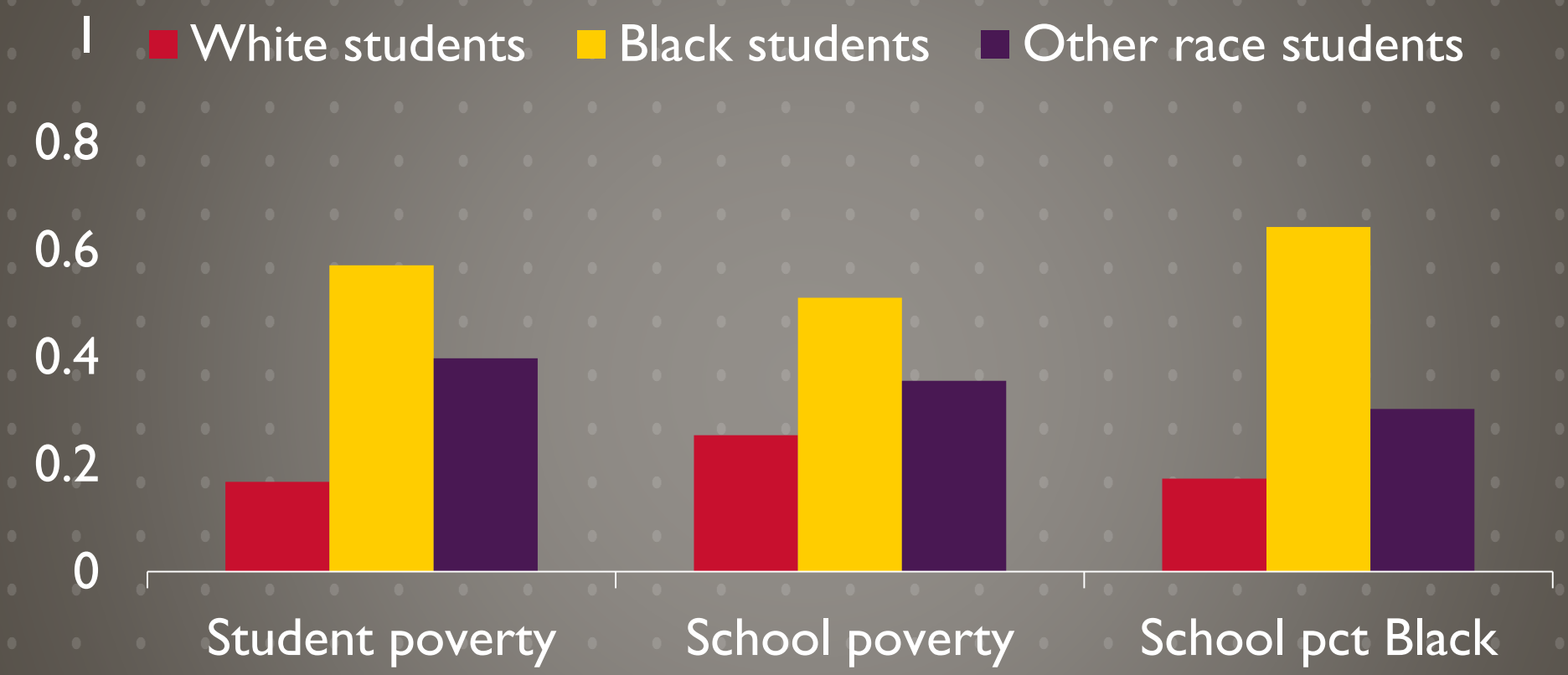
- All MD public school 6th graders in 2007-2008 who did not transfer out of MD public schools (*N* = 52,610)



METHOD: DESCRIPTIVE STATISTICS

Student Characteristic (*N* = 52,610)	%
Male	50
Asian	5
Black	35
Hispanic	10
Other	4
White	45
Ever eligible for FARMS (6^{th}-12^{th})	49
Ever English Learner (6^{th}-12^{th})	3
Ever Special Education (6^{th} – 12^{th})	14
Ever Homeless (6^{th} – 12^{th})	4

POVERTY AND RACE



(*N* = 52,610)

METHOD: MEASURING PREDICTORS

- Poverty – the duration of time eligible for FARMS between 6th and 12th grades (*R* = 0-1; *M* = 0.36; *SD* = 0.42); multiplied by 10
  - Aggregated to school level to measure school poverty (*M* = 0.49; *SD* = 0.25); multiplied by 10
- Race/ethnicity– non-Hispanic White; non-Hispanic Black/African American; Other
  - Aggregated to school level to measure school racial composition; multiplied by 10
- Baseline academic performance– Maryland State Assessment (MSA) scores in reading and math; scale scores in 6th grade
  - Aggregated to school level and averaged (high multi-collinearity)

METHOD: MEASURING OUTCOMES

- Enrollment in college (1 year post on-time high school grad)
  - MD and out-of-state
  - 2-year and 4-year, public and private colleges
- Employment and wages (1 year post on-time high school grad; separate analyses for college enrollees and non-college)
  - MD employers subject to MD Unemployment Insurance (UI)
  - Excludes federal and military, self-employment, out-of-state

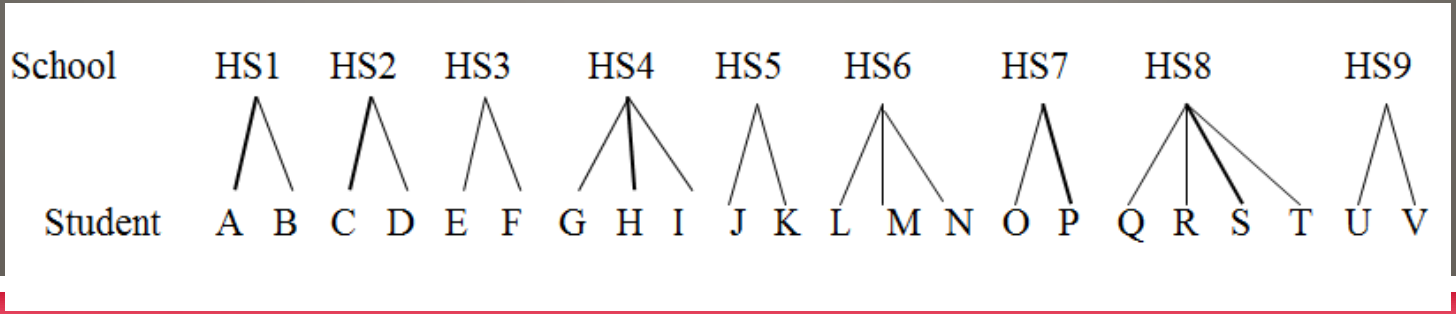
METHOD: ANALYTIC APPROACH

- Hierarchical Linear Modeling (HLM; Raudenbush & Bryk, 2002) is the traditional statistical approach for correctly adjusting for nesting in educational data

$$\text{Student level: } Y_{ij} = \beta_{0j} + e_{ij}$$

$$\text{School level: } \beta_{0j} = \gamma_{00} + u_{0j}$$

- However, HLM is appropriate when students are nested within only 1 school over time.

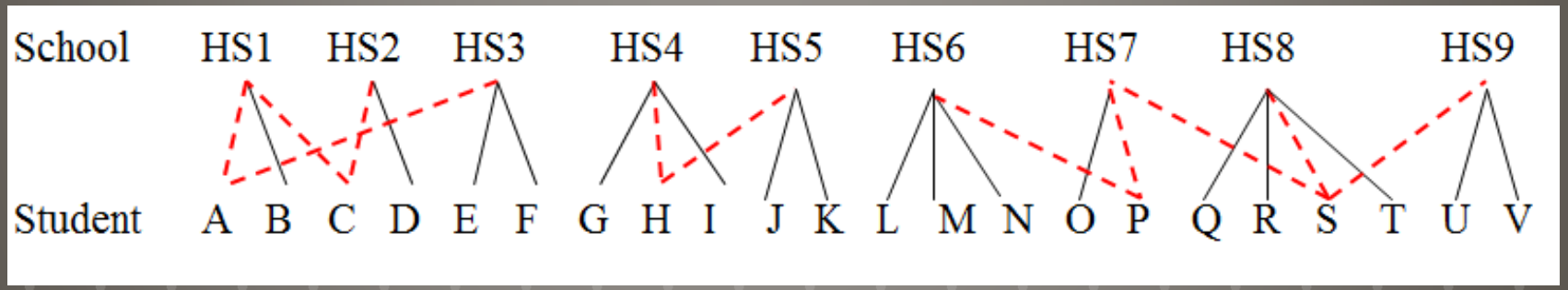


METHOD: ANALYTIC APPROACH

- Multiple Membership Multilevel Modeling (MM MLM; Chung & Beretvas, 2012) helps to account for all school attended by each student.

Student level: $Y_{i\{j\}} = \beta_{0\{j\}} + e_{i\{j\}}$

School level: $\beta_{0\{j\}} = \gamma_{00} + \sum_{h \in \{j\}} w_{ih} u_{0hj}$



METHOD: ANALYTIC APPROACH

Multiple Membership Multilevel Modeling (MM MLM; Chung & Beretvas, 2012)

Level 1 (Students):

$$Outcome_{i\{j\}} = \beta_{0j} + \beta_{1j} StPov_{i\{j\}} + \beta_{2j} Black_{i\{j\}} + \beta_{3j} Other_{i\{j\}} + \beta_{4j} MSA_{i\{j\}} + e_{i\{j\}}$$

Level 2 (Schools):

$$\beta_{0j} = \gamma_{00} + \gamma_{01} SchPov_{0\{j\}} + \gamma_{02} Black_{0\{j\}} + \gamma_{03} Other_{0\{j\}} + \gamma_{04} MSA_{0\{j\}} + \sum_{h \in \{j\}} w_{ih} u_{0h}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

- Group-mean centering at Level 1
- Grand-mean centering at Level 2
- Fixed coefficients; Random intercepts

(Bell et al., 2018; Enders & Tofighi, 2007)

RESULTS: COLLEGE ENROLLMENT

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Intercept	0.68***	0.06						
Student poverty								
School poverty								
Black								
Other								
Sch pct Black								
Sch pct Other								
6th grade reading								
6th grade math								
Sch 6th grade mean								

RESULTS: COLLEGE ENROLLMENT

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Intercept	0.68***	0.06	0.94***	0.05	0.99***	0.04	1.05***	0.03
Student poverty			-0.10***	0.00	-0.11***	0.00	-0.18***	0.00
School poverty			-0.32***	0.02	-0.40***	0.02	-0.32***	0.02
Black					0.27***	0.04	0.62***	0.04
Other					0.33***	0.04	0.44***	0.04
Sch pct Black					0.10***	0.02	0.12***	0.02
Sch pct Other					0.23***	0.03	0.22***	0.03
6th grade reading							0.01***	0.00
6th grade math							0.01***	0.00
Sch 6th grade mean							0.02***	0.00

Predicted probability of enrolling in postsecondary within 1 year of on-time high school graduation

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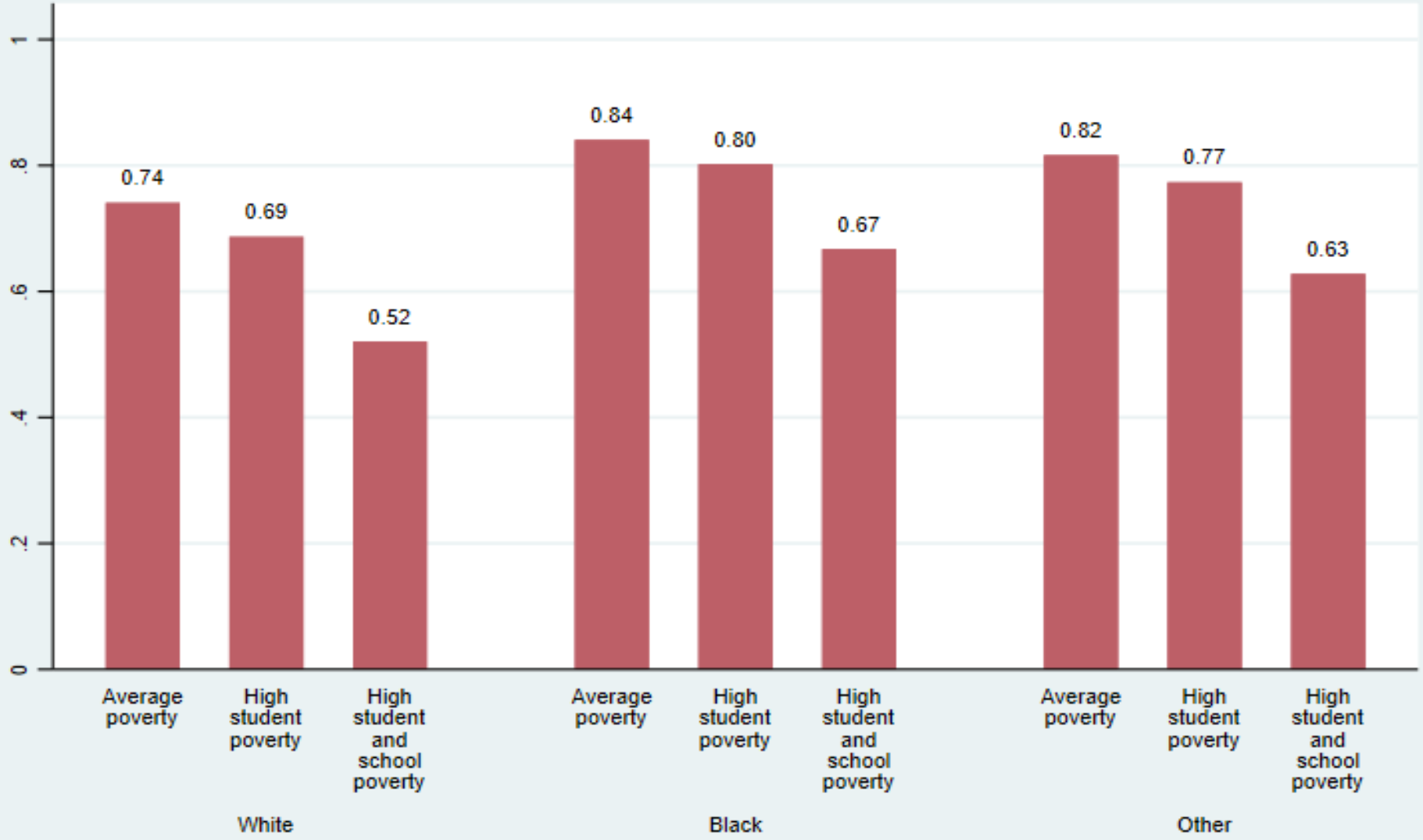

Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 who graduated from high school on time, n=45,580.

RESULTS: LOG WAGES – NOT IN COLLEGE

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Intercept	8.45***	0.02	8.49***	0.02	8.49***	0.02	8.49***	0.02
Student poverty			-0.01***	0.00	-0.01*	0.00	-0.01*	0.00
School poverty			-0.04***	0.01	0.01	0.01	-0.01	0.01
Black					-0.27***	0.04	-0.27***	0.04
Other					0.03	0.05	0.02	0.05
Sch pct Black					-0.05***	0.01	-0.06***	0.01
Sch pct Other					-0.02	0.01	-0.02	0.01
6th grade reading							-0.00*	0.00
6th grade math							0.00*	0.00
Sch 6th grade mean							-0.00**	0.00

Predicted MD wages - not enrolled in postsecondary within 1 year of on-time high school graduation

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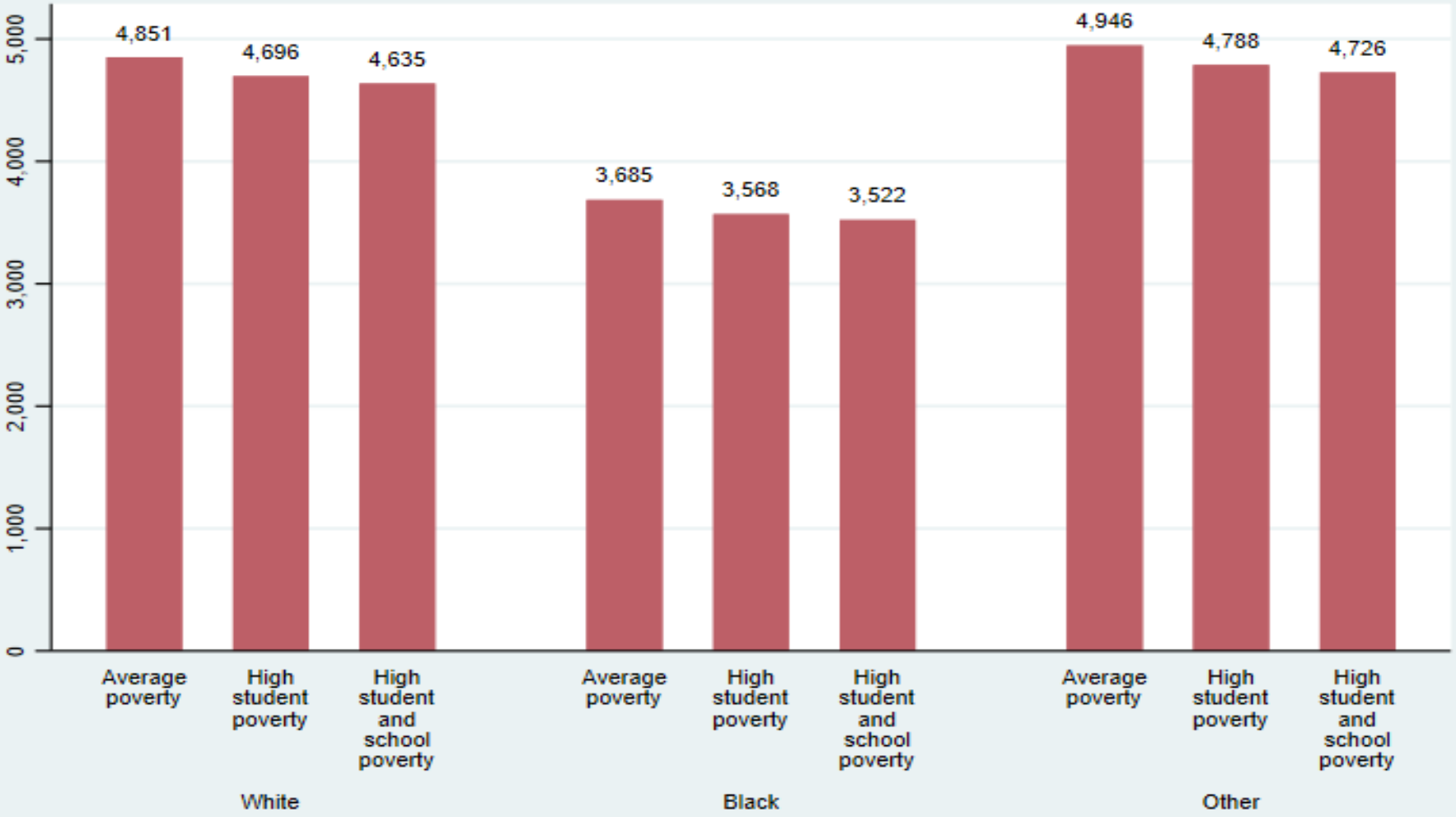

Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 who graduated from high school on time and were not enrolled in postsecondary, n=8,529.

RESULTS: LOG WAGES – IN MD COLLEGE

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Intercept	7.90***	0.02	7.91***	0.02	7.90***	0.01	7.94***	0.01
Student poverty			0.03***	0.00	0.03***	0.00	0.02***	0.00
School poverty			0.05***	0.01	0.13***	0.01	0.10***	0.01
Black					-0.22***	0.03	-0.32***	0.03
Other					0.04	0.03	0.00	0.03
Sch pct Black					-0.08***	0.01	-0.09***	0.01
Sch pct Other					-0.08***	0.01	-0.08***	0.01
6th grade reading							-0.00***	0.00
6th grade math							-0.00***	0.00
Sch 6th grade mean							-0.01***	0.00

Predicted MD wages - enrolled in MD postsecondary within 1 year of on-time high school graduation

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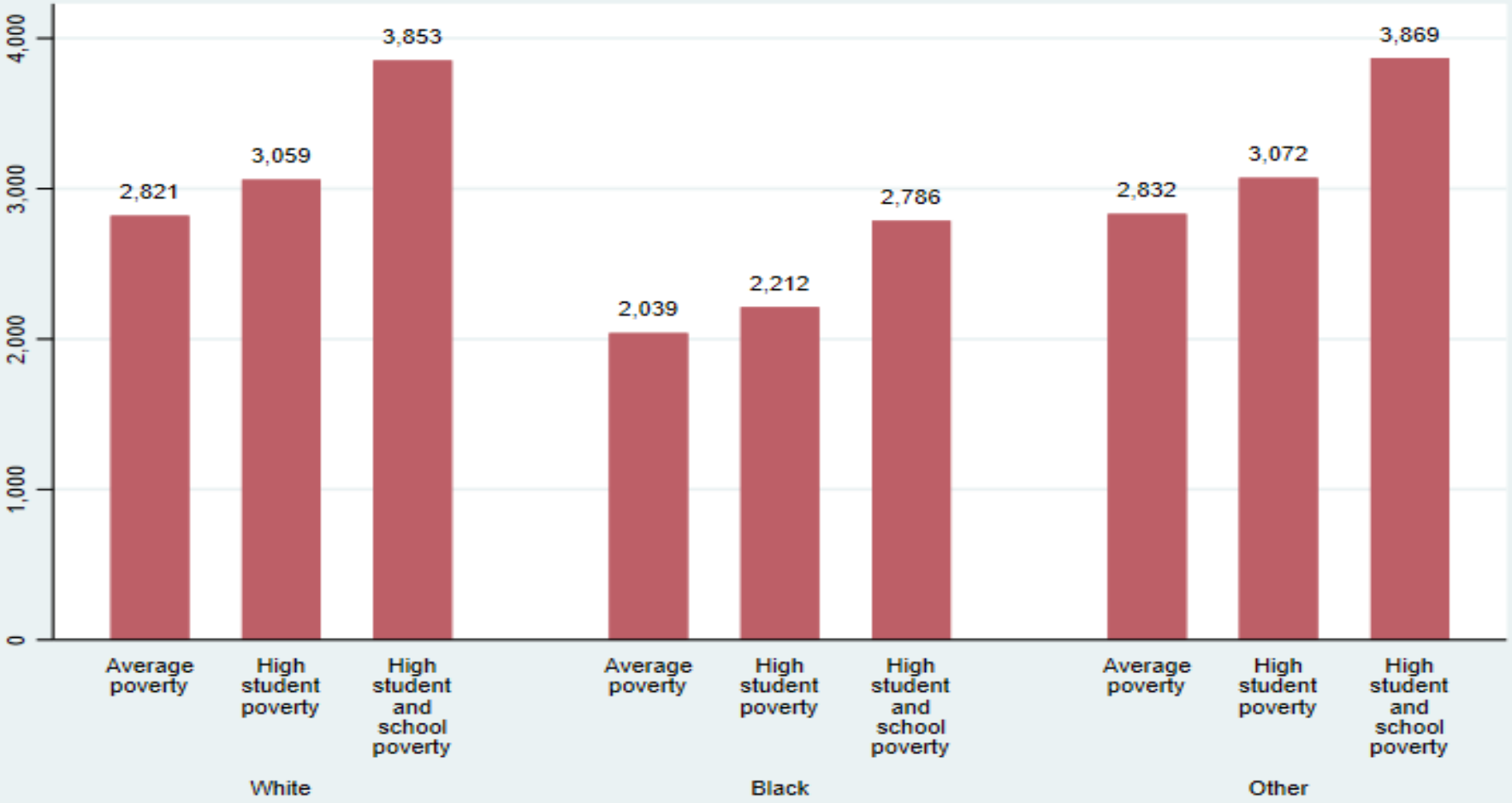


Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 who graduated from high school on time and were enrolled in postsecondary in MD, n=22,550.

SUMMARY OF RESULTS

- Student poverty and school concentrated poverty were associated with worse college and early labor market outcomes
- Black students had more positive outcomes for college enrollment after controlling for student and school poverty
- Poverty was related to lower wages for students not enrolled in college
- Poverty was related to higher wages for students enrolled in college
- Black students had lower wages after controlling for other variables

POLICY IMPLICATIONS

- Additional resources for students in schools with high concentrations of poverty.

- We need a better measure of student poverty!

SENATE BILL 1030

F1 9lr2562
CF HB 1413

By: **The President (By Request – Commission on Innovation and Excellence in Education) and Senators King, Pinsky, Ferguson, and Young**
Introduced and read first time: March 4, 2019
Assigned to: Education, Health, and Environmental Affairs and Budget and Taxation

A BILL ENTITLED

AN ACT concerning

The Blueprint for Maryland's Future

FOR the purpose of stating findings and declarations of the General Assembly; establishing the public policy of the State; establishing principles of The Blueprint for Maryland's Future that are intended to transform Maryland's early childhood, primary, and secondary education system to the levels of high–performing systems around the world; stating certain actions necessary to achieve certain principles; stating certain requirements necessary to establish a world–class education system in Maryland under The Blueprint for Maryland's Future; altering a certain Consumer Price Index used for calculating the target per pupil foundation amount and the student transportation amount for education; requiring the State to provide a certain supplemental grant to certain county boards of education through a certain fiscal year; establishing a Concentration of Poverty School Grant Program; stating the purpose of the Program; requiring the State to distribute certain grants to each county board and the State Department of Education in certain fiscal years; requiring each county board to distribute a certain amount to each eligible school; requiring each eligible school to employ certain staff using certain grant funds; requiring certain eligible schools to use certain funds to provide wraparound services

LIMITATIONS AND FUTURE RESEARCH

- Limitations of the current study
  - Unmeasured confounders may bias results
  - Missing data were handled using list wise deletion; attrition may bias results
  - Workforce data exclude large proportion of Maryland employees
  - No data on school expenditures or on household income
- Future research
  - Longer-run outcomes
  - Wage trajectory analyses examining the benefit of degree attainment for subgroups of students
  - Analyses examining homelessness as the most severe form of poverty
  - Peer effects research examining the role of peers' academic and behavioral characteristics

ENGAGING WITH STAKEHOLDERS

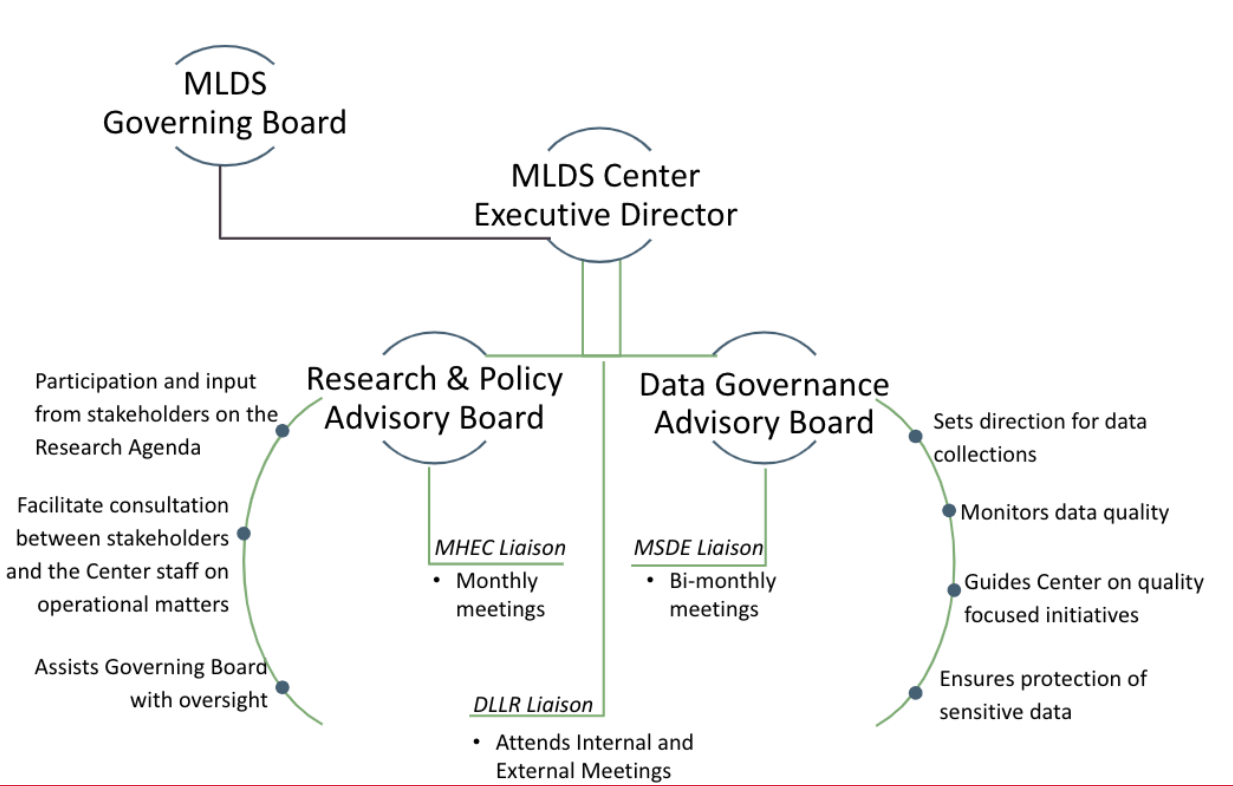
MLDS Governing Board

Established in state law for creating and managing the MLDS

12 Member Board of education and workforce leaders

Makeup of Board ensures the success of the MLDS

ENGAGING WITH STAKEHOLDERS



MARYLAND TASK FORCE ON RECONCILIATION AND EQUITY

Chapter 417

(Senate Bill 350)

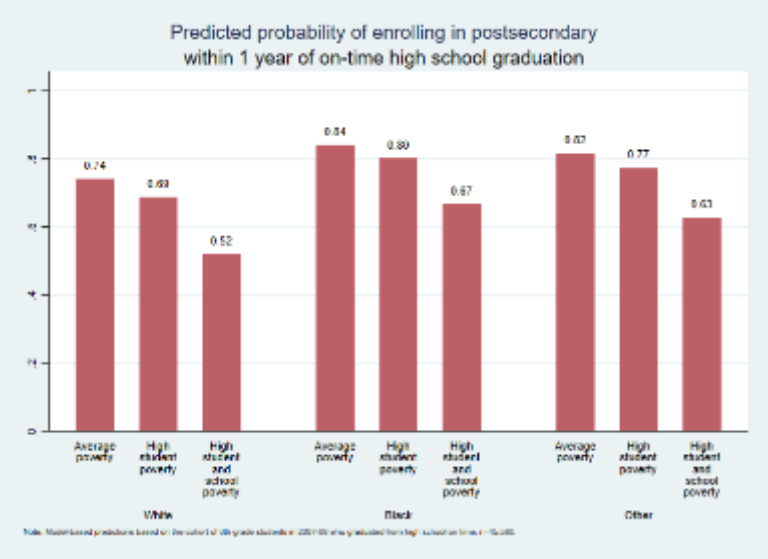
AN ACT concerning

Morgan State University – Task Force on Reconciliation and Equity

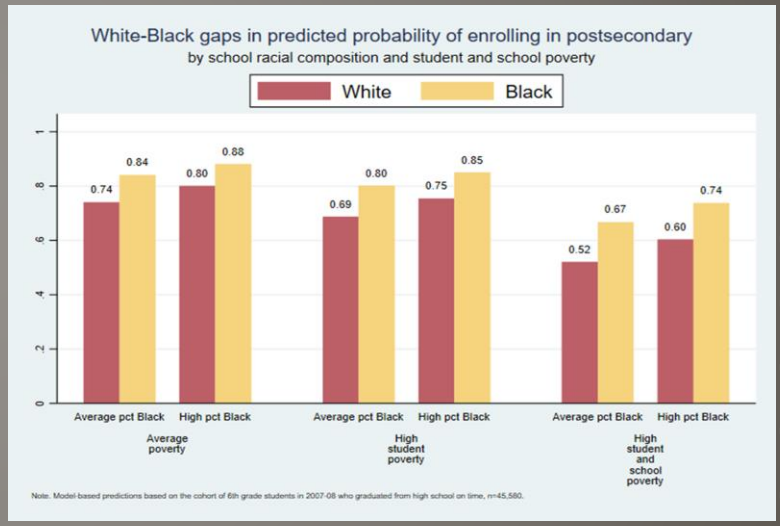
FOR the purpose of requiring the Institute for Urban Research at Morgan State Uni
to convene a task force to foster reconciliation and inclusionary justice an
toward achieving racial equity by taking certain actions; requiring the task
include certain members; requiring, to the extent practicable, the members
task force to have expertise in certain matters and reflect a certain di
prohibiting a member of the task force from receiving certain compensati
authorizing the reimbursement of certain expenses; providing for the cha
staffing of the task force; authorizing the task force to establish
subcommittees; requiring the task force to consult with certain units o
government; authorizing the task force to consult with certain units of State
government; requiring, on request of the task force, a unit of State governm
provide information or staff support in a certain manner or to desig
representative to serve as a member or attend a meeting or hearing of the tas
requiring the task force to hold certain hearings and invite certain persons to
at the hearings, to study and make recommendations regarding certain matte
to monitor and evaluate the implementation of certain recommendations
certain criteria; prohibiting a certain person from retaliating against an individual
for giving testimony at a hearing held by the task force; requiring, on or before
certain dates, the Institute for Urban Research at Morgan State University to submit
certain preliminary and full reports to the Governor and the General Assembly;
providing for the termination of this Act; and generally relating to a task force on
reconciliation and equity convened by the Institute for Urban Research at Morgan
State University.

COMMUNICATING RESULTS

Commission on Innovation and Excellence in Education



Task Force on Reconciliation and Equity



COMMUNICATING RESULTS: CHALLENGES

- Stakeholder base is large and diverse with varying levels of background in data analytics
- The modeling approach we used here enabled an "apples to apples" comparison
  - Some stakeholders still want to see the "apples to oranges" comparisons that show the actual situation
  - Predicted outcomes can misleadingly look like actual data
- Informing, but not recommending, policy
- Timeline mismatch between research and policy

QUESTIONS AND CONTACT

Dr. Angela Henneberger
University of Maryland School of Social Work
ahenneberger@ssw.umaryland.edu
MLDS Center Director of Research