Student Success Teams and On-Track to Graduation Status in Oregon: An Interrupted Time Series Analysis

Keith Zvoch

Christopher Loan

Kathleen Scalise

Anwesha Guha

University of Oregon

Presentation Outline

- Policy context and intervention

- Outcome variable: 9th grade on-track to graduation

- Study design and analysis: Interrupted time series models

- Results and interpretation

- Limitations and future directions

Policy Context

- High school success/dropout prevention in Oregon

- Oregon has had high dropout rates historically

- In AY 2013-14, the Oregon Department of Education (ODE) started collecting a ninth grade on track to graduate metric (9G-OTG): completion of 25% of coursework

- Why?
  - Ninth grade is a critical transition point for students: those who stay on track with their coursework are more likely to graduate high school on time
  - On-track metrics serve as an early warning indicator to identify students at risk of not completing high school (Allensworth, 2013; Allensworth & Easton, 2005)

Policy Context

- In November 2016, Oregon voters passed ballot Measure 98, initiating the state's High School Success (HSS) fund

- ODE allocated > $150 million across approximately 200 districts for high school success efforts

- Districts applied for funding to establish and/or expand programs in three areas:
  - Dropout prevention — *of most relevance here*
  - Career & technical education
  - College-level education opportunities

HIGH SCHOOL SUCCESS

# Oregon's Student Success Teams

- Across the state, most districts utilized HSS funding to develop and implement 9th grade student success teams for dropout prevention

- Success teams:
  - Hired and trained school-based coaches
  - School-level data system utilization
  - Weekly meetings to review data
    - Student course-taking patterns, absences, grades, and earned credits towards graduation
  - Provided ongoing counseling and support to at-risk students
    - Offered tutoring support
    - Provided mechanisms for credit recovery
    - Directed students to school sanctioned academic and health resources

Implementation (2017-18)

- Ninth grade success teams were classified as full, partial, or not implemented by ODE, based on fidelity checks and ongoing operational metric review

- Full implementation
  - Data usage plan was approved and implemented
  - 9th grade coaches (i.e., student success teams) were funded and trained
  - Data systems for monitoring 9G-OTG were utilized
  - Awareness raised of the importance of 9G-OTG to teachers, students, parents, and other stakeholders

- Partial implementation
  - Funds were allocated for tracking metrics and raising awareness
  - Coaching funds were reserved for other innovations at later high school grades

- No implementation:
  - Some schools did not use funding for 9th grade success team programming

On Track to Graduation

- In AY 2013-14, Oregon added 9th Grade on Track to Graduation status (9G-OTG) to its SLDS

- 9G-OTG is a binary indicator that captures the number of core courses students pass in 9th grade

- Students are classified as on track to graduate if they have completed 25% of the coursework needed to graduate by the end of their freshman year
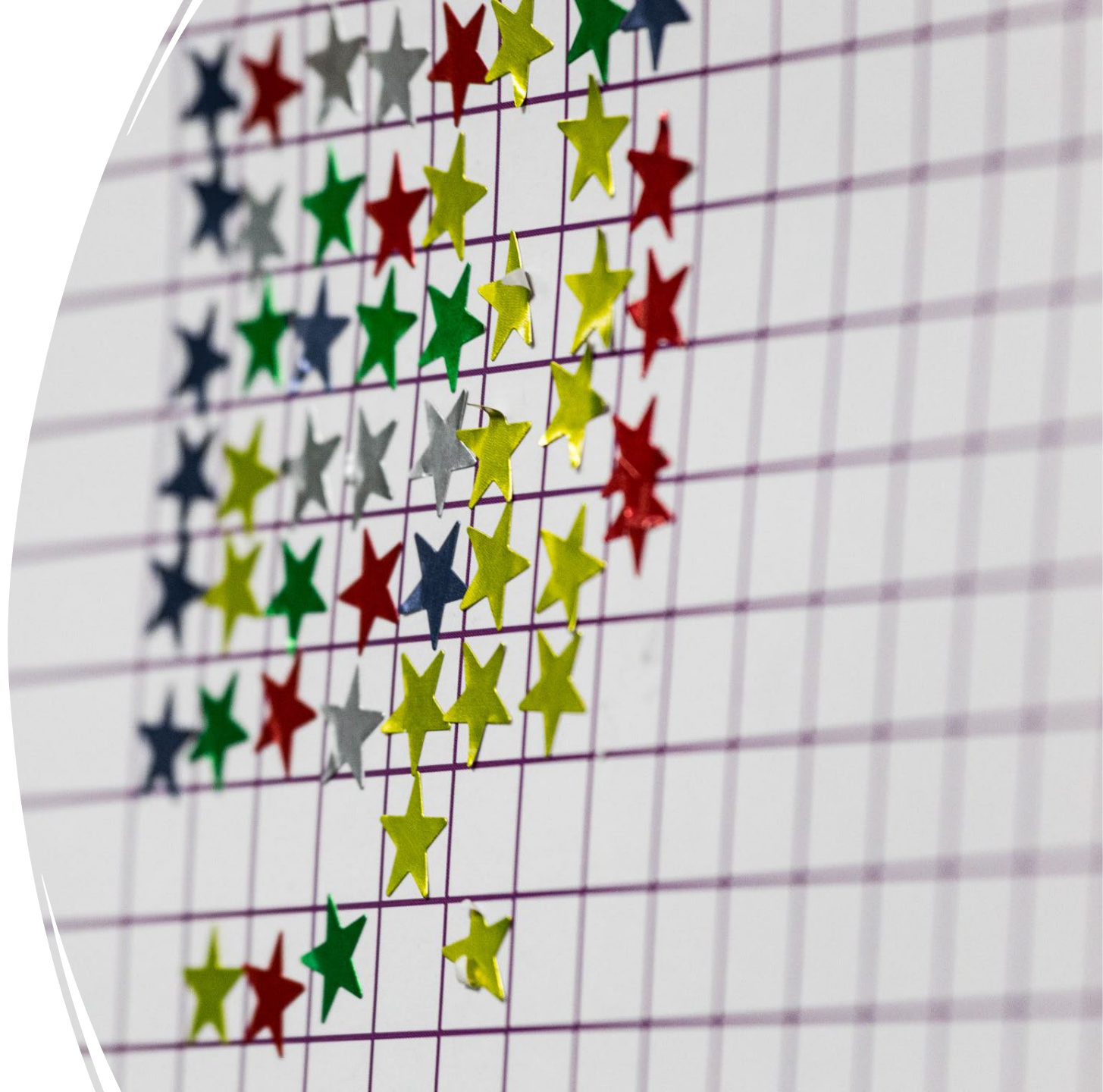
A Study in Equity: Oregon's 9th Grade Transition

In 2021, IES funded a collaboration between the Oregon Department of Education (ODE) and the University of Oregon (UO) to evaluate the efficacy of HSS funding on on-track to graduation rates

The primary goal was to determine if the high school success team initiative had a positive impact on Oregon's 9G-OTG trajectory, and whether outcomes varied by the strength of implementation

With the SLDS's longitudinal tracking of 9G-OTG (2013-14) and with the start of the HSS initiative in 2017-18, we leveraged interrupted time series (ITS) models to investigate short- and longer-term program outcomes

Design and Analytic Procedures

- Use of data from Oregon's SLDS and ODE primary data on implementation fidelity

- A multilevel comparative interrupted time series (CITS) design (districts > schools > observations)
  - Fit piecewise growth models to estimate 9G-OTG trajectories:
    - Baseline (2013-14 to 2016-17)
    - Dummy variables for each year after onset of intervention (2017-18, 2018-19, 2020-21, 2021-22)
    - No data for COVID year

- Analyses estimate heterogeneity in 9G-OTG trajectories by:
  - Level of implementation (full, partial, none)
  - Time-varying demographics (e.g., %FRL, %minority)
  - School type (traditional, charter, alternative)

Sample Characteristics

- Students and schools (*N* = 277) from all of Oregon's 197 districts, gathered from Oregon's SLDS
    - Student N ~350,000

- Analyses were weighted by freshman class size to prevent undue influence from small schools and K-12 schools

- Data from eight 9th grade cohorts (2013-14 to 2018-19, 2020-21, 2021-22)

Grade	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
9	X	X	X	X	X	X		X	X

|	School Year	Mean Proportion FRL (SD)	Mean Proportion Non-White (SD)	Mean 9th Grade Class Size (SD)
None (n = 33)				
	2013 - 2014	0.59 (0.27)	0.08 (0.09)	84.84 (114.1)
	2014 - 2015	0.59 (0.27)	0.08 (0.1)	82.53 (108.48)
	2015 - 2016	0.6 (0.28)	0.09 (0.08)	87.09 (114.33)
	2016 - 2017	0.6 (0.29)	0.09 (0.08)	86.33 (114.33)
	2017 - 2018	0.57 (0.29)	0.09 (0.06)	84.27 (105.8)
	2018 - 2019	0.53 (0.28)	0.07 (0.05)	88.09 (113.35)
	2020 - 2021	0.72 (0.32)	0.05 (0.04)	90.42 (116.8)
	2021 - 2022	0.77 (0.31)	0.05 (0.04)	88.61 (117.75)
Partial (n = 98)				
	2013 - 2014	0.55 (0.2)	0.1 (0.11)	142.42 (159.2)
	2014 - 2015	0.55 (0.23)	0.11 (0.11)	143.06 (163.88)
	2015 - 2016	0.56 (0.26)	0.11 (0.11)	139.85 (158.44)
	2016 - 2017	0.56 (0.26)	0.1 (0.09)	139.17 (161.08)
	2017 - 2018	0.56 (0.28)	0.1 (0.1)	141.38 (164.01)
	2018 - 2019	0.56 (0.28)	0.1 (0.09)	141.66 (164.43)
	2020 - 2021	0.66 (0.34)	0.09 (0.09)	143.73 (167.32)
	2021 - 2022	0.76 (0.34)	0.09 (0.08)	136.22 (155.11)
Full (n = 146)				
	2013 - 2014	0.53 (0.19)	0.16 (0.18)	173.73 (172.87)
	2014 - 2015	0.5 (0.19)	0.16 (0.15)	176.27 (177.95)
	2015 - 2016	0.51 (0.22)	0.15 (0.15)	180.25 (181.76)
	2016 - 2017	0.49 (0.22)	0.15 (0.14)	178.14 (176.29)
	2017 - 2018	0.49 (0.22)	0.15 (0.14)	176.99 (174.84)
	2018 - 2019	0.49 (0.23)	0.15 (0.14)	179.25 (174.83)
	2020 - 2021	0.61 (0.33)	0.14 (0.14)	182.53 (176.19)
	2021 - 2022	0.69 (0.34)	0.14 (0.14)	179.32 (168.99)

Modeling Framework: ITS and CITS models with yearly post-test effects

- We used this (C)ITS model due to the COVID-19 disruption:
 - 2016-17 intercept coded as zero (i.e., wave = -3,-2,-1,0,1,2,4,5)

$$Y_{ti} = \pi_{0i} + \pi_{1i}(Pre\ TxSlope)_{ti} + \pi_{2i}(TxDosage)_{ti} + \pi_{3i}(TxLevel:\ year\ 1)_{ti} + \pi_{4i}(TxLevel:\ year\ 2)_{ti} + \ldots + \pi_{5i}(TxDosage * TxLevel:\ year\ 1)_{ti} + \pi_{6i}(TxDosage * TxLevel:\ year\ 2)_{ti} + \ldots + \pi_{ti}(Time\ Varying\ Covariates)_{ti} + e_{ti}$$

- Benefits:
  - Makes fewer assumptions regarding functional form
  - Can test for immediate and delayed effects (relative to pre-intervention intercept)
  - Controls for the pre-intervention slope

- Limitations:
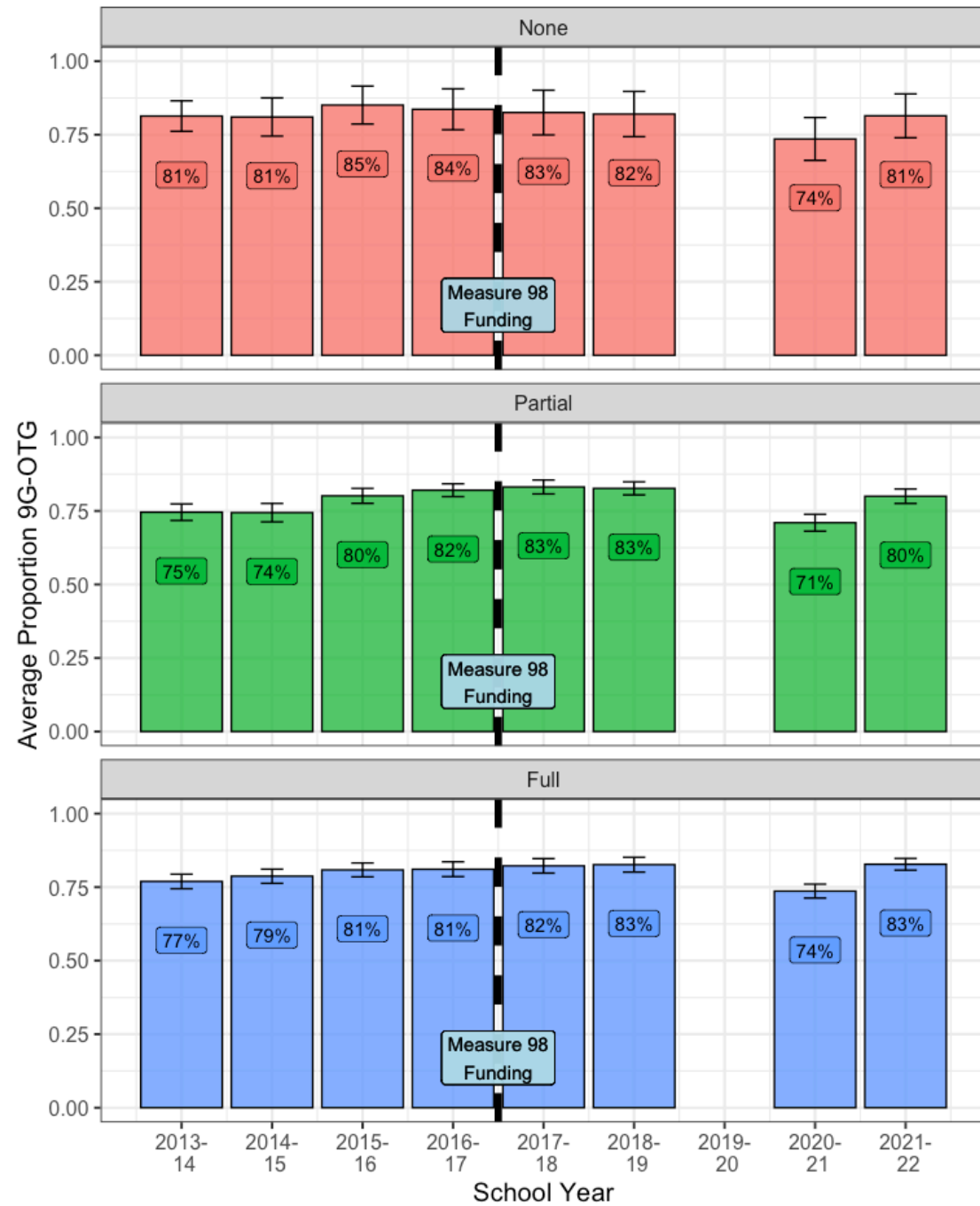 - Post-intervention slope not specified or tested
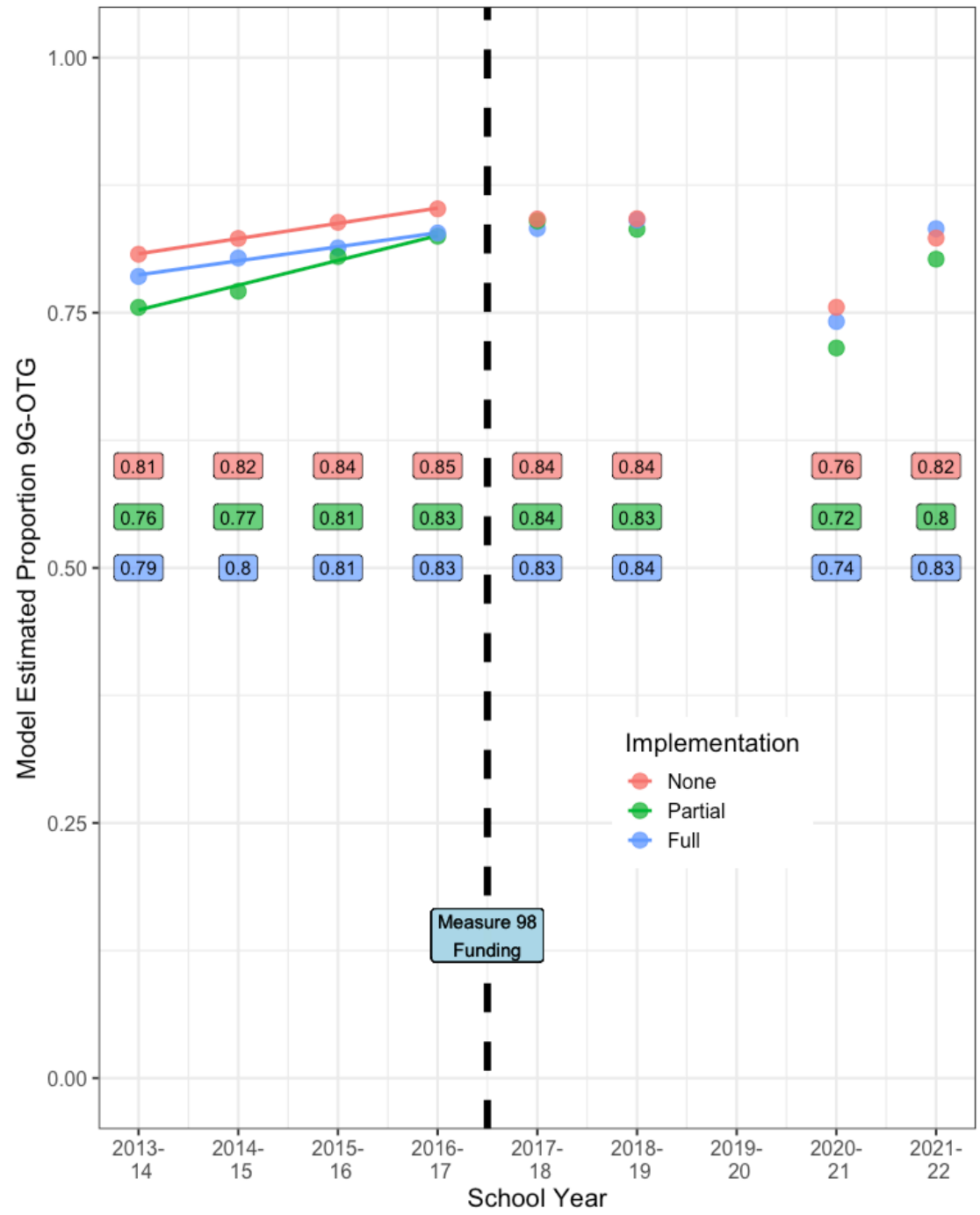
9G-OTG Rate by Year
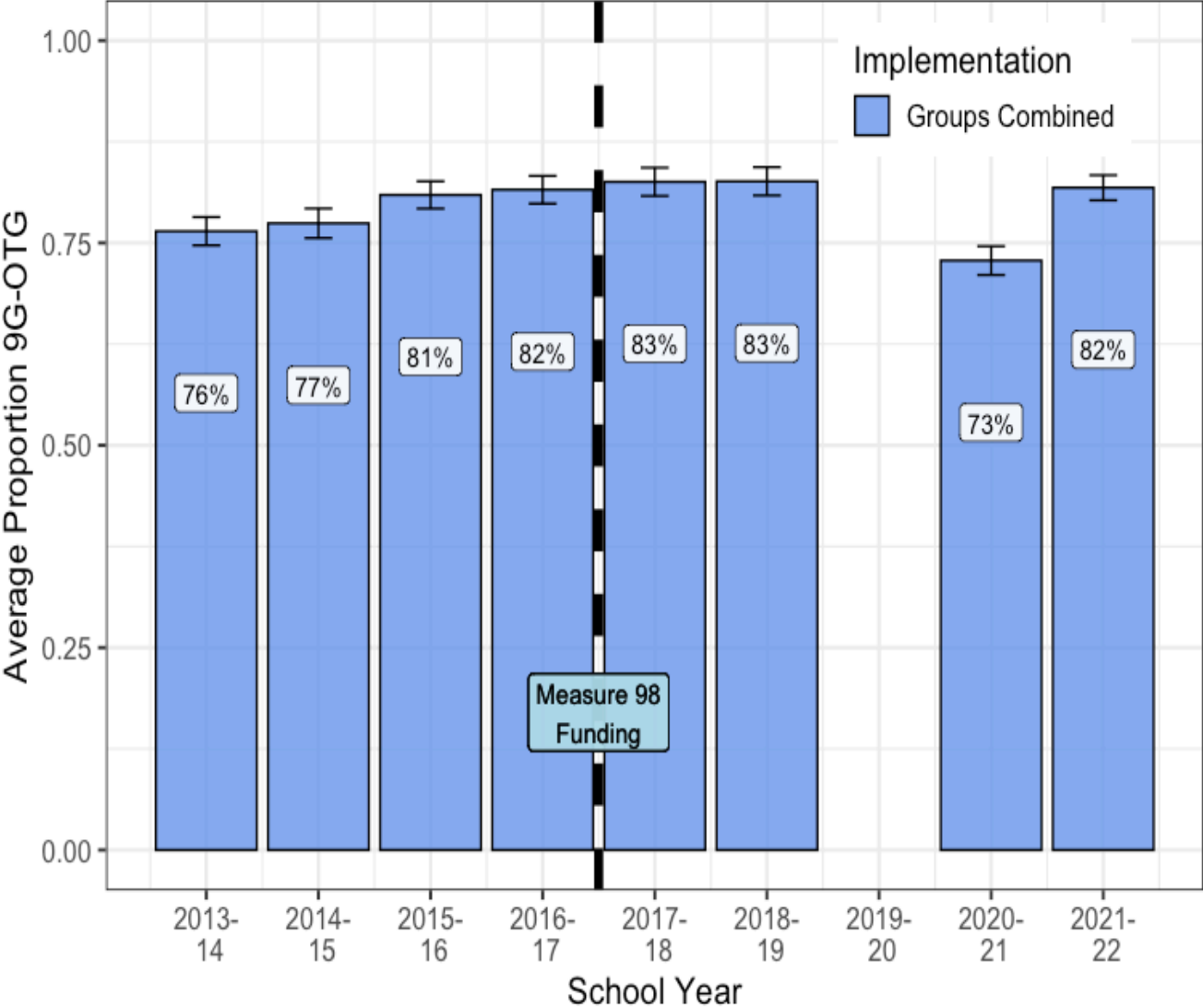
Results: Simple ITS
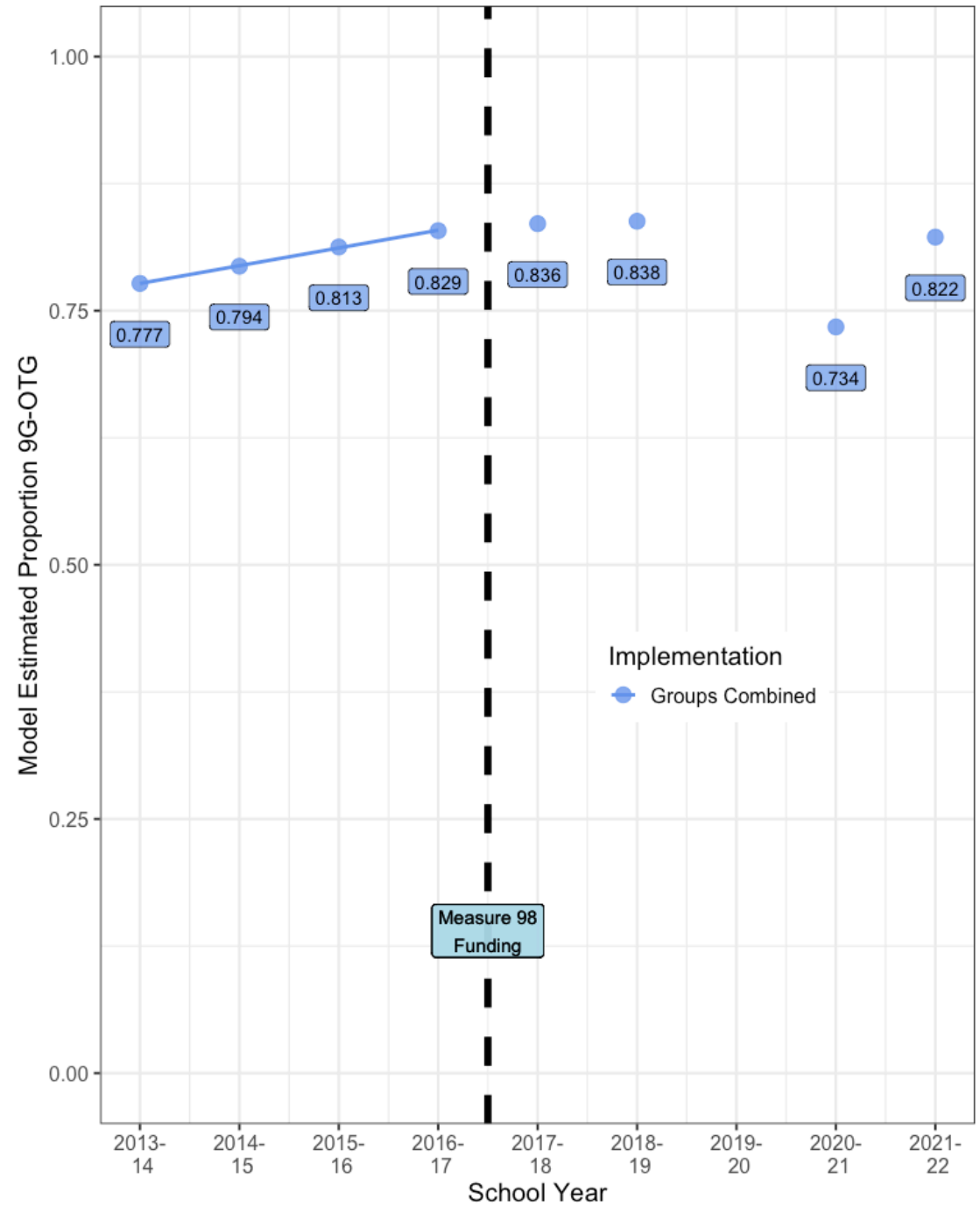
9G-OTG Rate by Implementation Status and Year

Results: Comparative ITS w/Covariates

Interpretation

- Large statistically significant decreases in 9G-OTG in the post-COVID year for all school types with a rebound the following year

- School implementation types not statistically different in any of the intervention years

- Statistical relationships between 9G-OTG rates and school demographics, both ~1.5% decrease in 9G-OTG with a 1 standard deviation increase in proportion FRL or proportion of non-white students

- Charter and alternative schools also had relatively lower 9G-OTG rates

Logistical Challenges and Limitations

- Data
  - Data screening has uncovered an array of coding and classification issues associated with non-traditional alternative schools, charters, and correctional schools
  - No data available during the primary COVID year (2019-20)

- Implementation
  - None, partial, and full are based on funding plans and observed resource allocations
  - Time-invariant covariate is included, but it is possible variation in implementation occurred by year (particularly during and after COVID)

Logistical Challenges and Limitations

- Possible selection effects into treatment condition at baseline

- Obvious confounding with COVID impacts

- Year-to-year sampling variation
  - Some small schools had 9th graders in some years and none in others
  - Weighting was used to account for variation in freshman class size

Conclusions

- Some evidence of a closing of the 9G-OTG gap pre-COVID with a widening akin to pre-intervention status afterward

- Still a work in progress

- More data forthcoming (22-23)

Other Work: Validation and Exploration

- Machine learning (ML) models exploring the classification of on-track status

- Logistic and ML models predicting on-time graduation

- LLM models to validate implementation coding

Acknowledgment