



Strategies to Achieve Alignment, Collaboration, and Synergy Across Delivery and Financing Systems

Linking Education and Health Data to Improve Adolescent Health in Los Angeles

*Research In Progress Webinar
Wednesday, July 17th, 2019
12:00-1:00 pm ET/9:00-10:00am PT*

Agenda

Welcome:

Glen Mays

Presenters:

Rebecca Dudovitz, MD, MSHS

Sheryl Kataoka, MD, MSHS

Eryn Piper Block, MPP

Commentary:

Eryn Piper Block, MPP

Q&A:

Moderated by Glen Mays

Rebecca Dudovitz, MD, MSHS

Rebecca Dudovitz, MD, MSHS is an Associate Professor and Associate Chief for Research in General Pediatrics, Vice-Chair of the Primary Care College in the David Geffen School of Medicine, and Associate Program Director of the National Clinicians Scholars Program and NRSA-funded health services research fellowships. Dr. Dudovitz graduated from the David Geffen School of Medicine at UCLA before completing her residency training in the UCLA Pediatric Community Health and Advocacy Training (CHAT) program. She then completed fellowship through the Robert Wood Johnson Clinical Scholars program and received a Master's degree in health services from the Fielding School of Public Health. Her research focuses on how schools impact health, both through facilitating the delivery of health services and by changing the social determinants of health. Dr. Dudovitz has been collaborating with the Los Angeles Unified School District since 2009, as a researcher, consultant, and program evaluator.



Eryn Piper Block, MPP

Eryn Piper Block, MPP is a rising fourth-year PhD student in Health Policy and Management in UCLA's Fielding School of Public Health and a graduate researcher at the UCLA Center for Healthier Children, Families and Communities. Her research focuses on education and health policies that impact child well-being. She graduated from the University of Oregon in 2012 and worked as a middle school science teacher in Baton Rouge, LA through Teach for America for two years. She then completed a Master's in Public Policy at Vanderbilt's Peabody School of Education and worked as a summer policy researcher at Voices for Georgia's Children focusing on opportunities for expanding mental health programs for youth from disadvantaged backgrounds. Eryn is also the President of the Palms Neighborhood Council, where she takes part in policymaking at the hyper-local level. Outside of work, Eryn loves creative writing, interior decorating and training her dog, Shorty.



Sheryl Kataoka, MD, MSHS

Dr. Sheryl Kataoka is a Professor in the UCLA Division of Child and Adolescent Psychiatry, where she serves as the Training Director of the Child and Adolescent Psychiatry Fellowship. She has been collaborating with schools and districts in Los Angeles and across the country for almost 20 years. As a child psychiatrist and health services researcher, Dr. Kataoka has been evaluating evidence-based mental health services in schools. Her research has led to a greater understanding of the role of schools in decreasing disparities in mental health care for ethnic minority children and their families, and she has examined the effect of mental health services on academic outcomes. Her research has led to a greater understanding of the effects of traumatic stress on children and how school-based mental health services can improve students' well-being and ability to learn.



Our Community-Partnered Team

UCLA David Geffen School of Medicine

- Sheryl Kataoka (Dept of Psychiatry, Population Behavioral Health)
- Rebecca Dudovitz (Dept of Pediatrics)

UCLA Fielding School of Public Health

- Eryn Block (Health Policy & Mgmt)

Los Angeles Unified School District

- Pia Escudero, MSW, Director of Health and Human Services
- Maryjane Puffer, Executive Director, LA Trust for Children
- Joshua Kaufman, MSW, School Mental Health

- **Background:** The relationship between behavioral health and academic outcomes
- **Part 1. Development of a risk-indicator tool** to identify students at high risk for behavioral health concerns
 - The National Longitudinal Study of Adolescents to Adult Health (ADD Health)
- **Part 2. Application** to Los Angeles Unified School District:
 - Posttraumatic stress
- **Next steps**

School performance and behavioral health

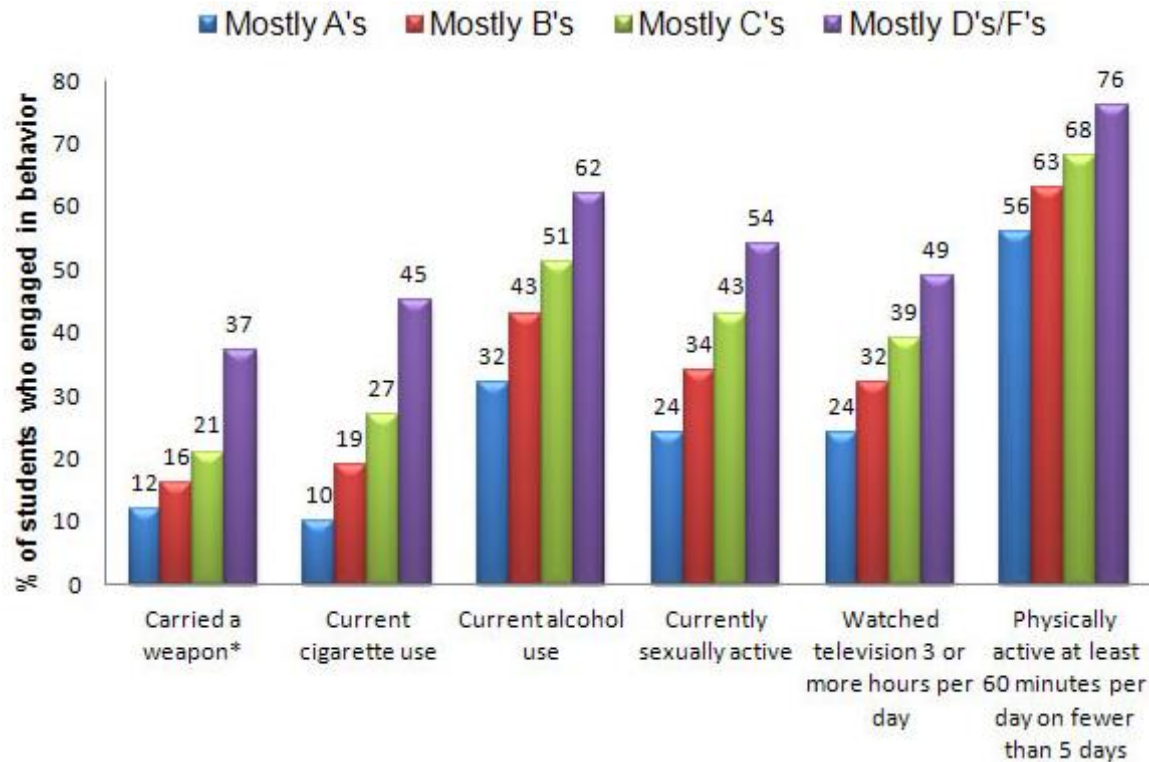
- Poor academic performance is associated with behavioral health disorders.
 - Grades, test scores, high school completion, grade retention, and educational attainment are all associated with substance use.
 - Association is incredibly robust– noted nearly 100% of the time

Grade Point Average (B– or Above vs C+ or Below)

Substance use				
Cigarette use in past 30 days	0.42 (0.27–0.65)†	0.47 (0.30–0.75)†	0.52 (0.33–0.83)†	0.52 (0.32–0.85)†
Alcohol use in past 30 days	0.65 (0.48–0.86)†	0.65 (0.48–0.88)†	0.68 (0.50–0.92)†	0.70 (0.51–0.96)†
Marijuana use in past 30 days	0.39 (0.28–0.54)†	0.42 (0.30–0.60)†	0.44 (0.31–0.62)†	0.43 (0.30–0.62)†
Binge drinking in past 30 days	0.47 (0.29–0.76)†	0.49 (0.30–0.80)†	0.49 (0.30–0.81)†	0.52 (0.31–0.86)†
Substance use at school in past 30 days	0.47 (0.29–0.74)†	0.52 (0.32–0.84)†	0.54 (0.33–0.88)†	0.55 (0.34–0.91)†

Bryant et al. *Journal of Research on Adolescence*. 2003;13(3):361-397; Bradley et al. *Journal of Adolescent Health*. 2013;52(5):523-532; Wong et al. *Academic Pediatrics*. 2017; 17:633-641.

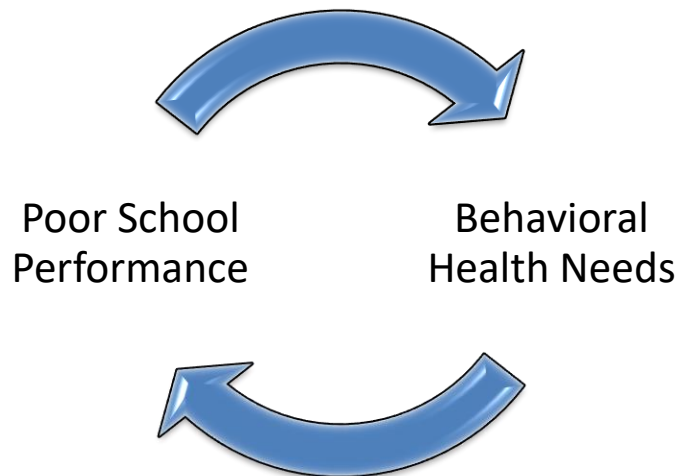
School performance and behavioral health



US 2009 YRBS results, CDC

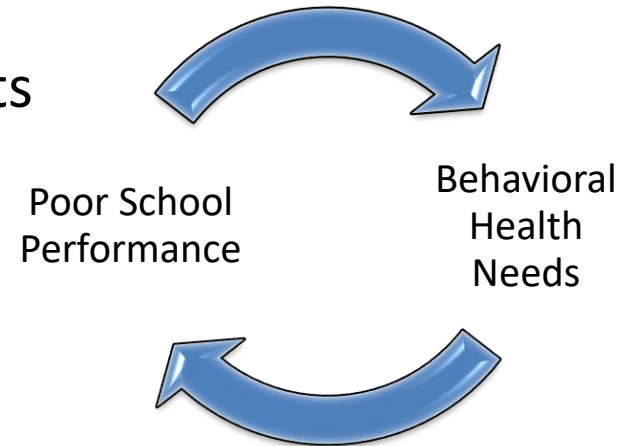
Can we harness this relationship?

- Evidence for causality in both directions
- Other factors may influence both behavioral health needs and school performance
- **Either way, school performance may be a useful marker for behavioral health needs**



Advantages of academic data

- Near-universal, passive, automatic longitudinal data collection
- May address disparities in access and utilization of mental health services
- Early intervention improves outcomes
 - May yield academic and health benefits



- Determine which aspects of school performance are the most sensitive and specific indicators of behavioral health needs
- Ensure tool is feasible and useful in diverse communities.

Part 1. Development of a risk-indicator tool:

Predicting risk of behavioral health concerns using ADD Health

- Developed separate models for predicting depression, substance use, and comorbid outcomes using logistic regression and survey weights.
- The sample was split for cross-validation.
- Identified candidate academic variables based on the literature and those routinely available from school district administrative records.
- Built models separately in each of the two randomly selected subsamples.

- Pseudo R-squared in weighted models were used to select significant interactions and squared terms for inclusion.
- Area Under the ROC Curve (AUC), Brier Score and Calibration Slope were used to validate and calibrate. We calculated these statistics for each of the two subsamples using the model built in the other subsample, and took the average of the two.
- Table 1 describes the variables that were included in the final models using survey weights to correct for oversampling of small subpopulations. Table 2 presents the results of the validation and calibration process

- Nationally representative school-based sample
 - 80 high schools and 52 feeder school
 - Wave I: 20,745 participants, grades 7-12, collected 1994-1995
 - Wave II: 14,738 participants, grades 8-12, collected 1996
 - High school transcripts from approximately 10,000 students
 - Self-report attendance, truancy, suspensions and expulsions
 - Self-report substance alcohol, marijuana, other drug use, problem substance use and depression (CES-D)
 - Free/Reduced lunch status, race/ethnicity, gender, age
- Analytic sample = participants in grades 9-12 during waves I or II, with valid survey weight, data on at least one outcome, and academic transcript data

ADD Health Sample

Variable Name	%
Female	49.81
Primary Race	
White	71.85
African American	16.73
American Indian	1.0
Asian	4.54
Other	5.88
Latino Ethnicity	10.59
Free-or-Reduced-Lunch Status	
None	54.58
Reduced	7.93
Free	14.68
Missing Data	22.81
Grade in School	
9	1.7
10	27.68
11	27.02
12	43.19
Using alcohol more than once a month	24.23
Alcohol Misuse	20.58
Using Marijuana more than once a month	13.40
Using other drugs more than once a month	4.84
Any risky substance use	36.22
Any risk (Substance use, depression or both)	44.72
Comorbidity (Both substance us and depression)	7.56
Depressed	16.07
Ever received out-of-school suspension	14.15
Ever expelled from school	1.88
	Mean
GPA – Current Year	2.62
Proportion of Courses with GPA Decrease from Prior Year	0.36
GPA Change from Prior to Current Year	.003

Table 2 presents the average model characteristics from the cross-validation process

Outcome	Avg Reduced LROC	Avg Full LROC	Avg Cal Slope	Avg Brier Score
Depression	0.58	0.63	0.63	0.14
Alcohol misuse	0.56	0.66	0.82	0.16
Alcohol frequency	0.59	0.66	0.79	0.18
MJ Frequency	0.52	0.68	0.65	0.11
Other drug frequency	0.56	0.72	0.58	0.05
Any risky substance use	0.57	0.67	0.80	0.21
Any risk Comorbid Depression & Substance Use	0.52	0.66	0.74	0.23
	0.55	0.67	0.64	0.07

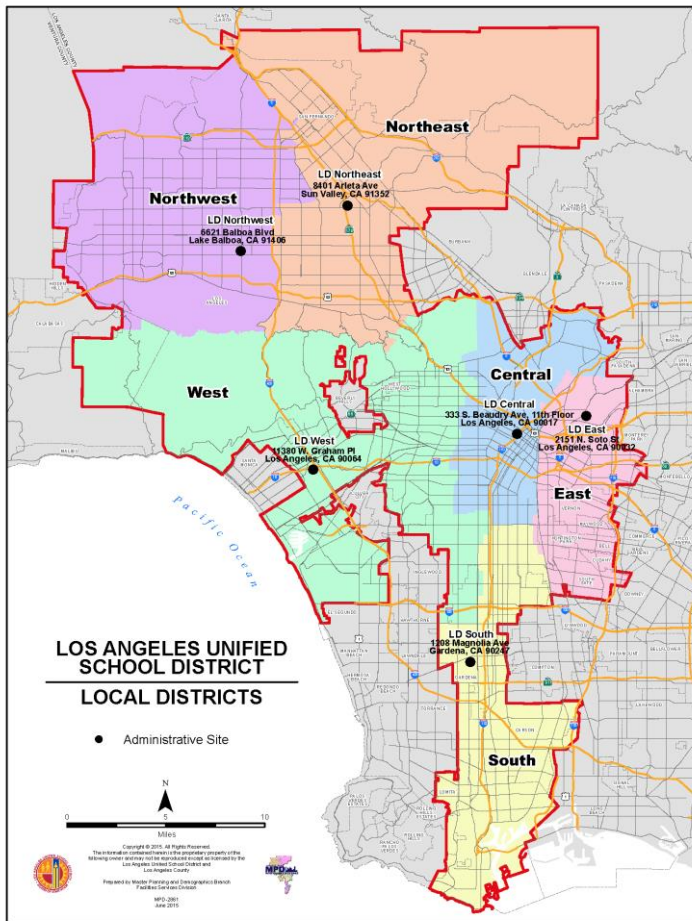
- Prediction tool strategy using academic data can improve the performance of a prediction model for identifying which students are at risk for behavioral health conditions.
- Performance of these current models are likely not powerful enough to be used alone for population health management.

ADD Health Limitations

- Self-report for excused and unexcused absences
- Surveyed at different times during the school year
- More accurate attendance data might improve model performance.

Part 2. Application of predictive tool method:

Relationship between Posttraumatic Stress and school outcomes in LAUSD



694,096 Students

82% Living in poverty

94 Languages spoken

21% English language learners

More than 7000 students in foster care

74%

- Latino

9.8%

- Caucasian

8.4%

- African American

6%

- Asian





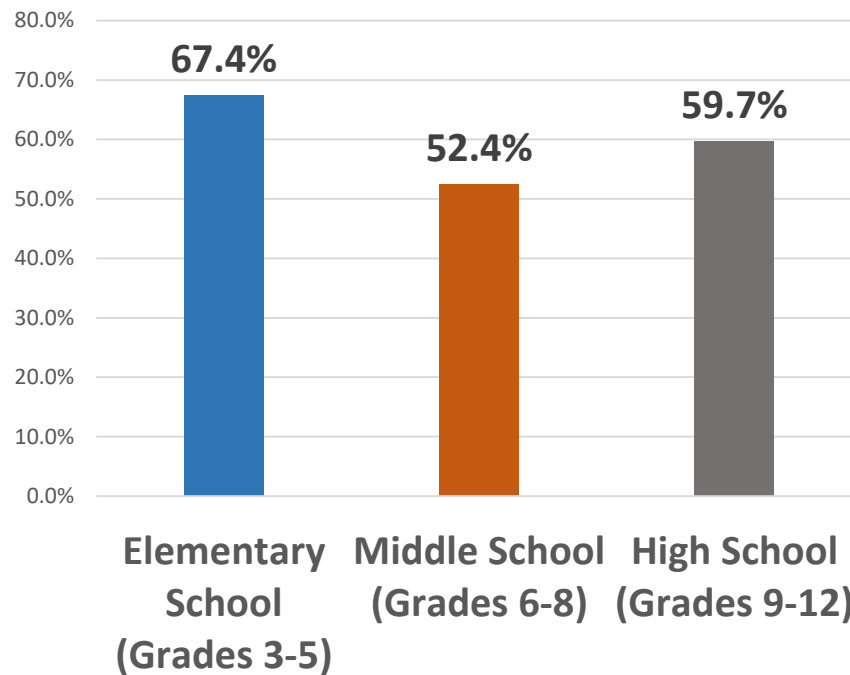
Proficient in Math: 33%

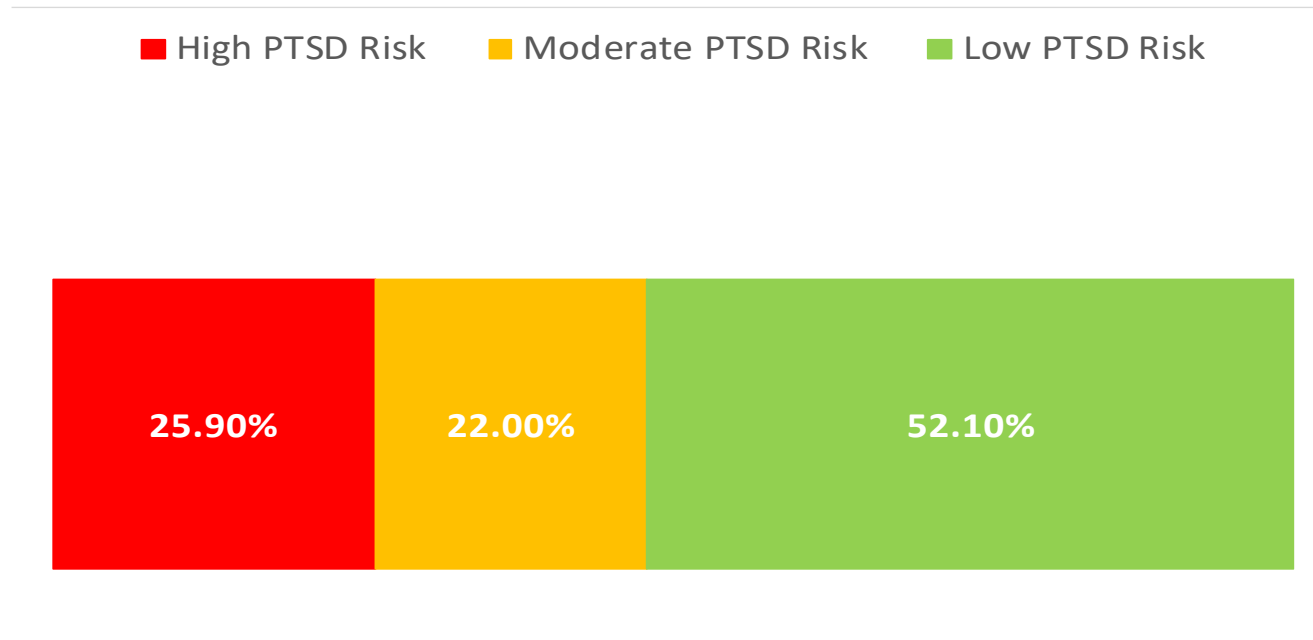
Proficient in English: 43%

Meets Attendance
Standard: 73%

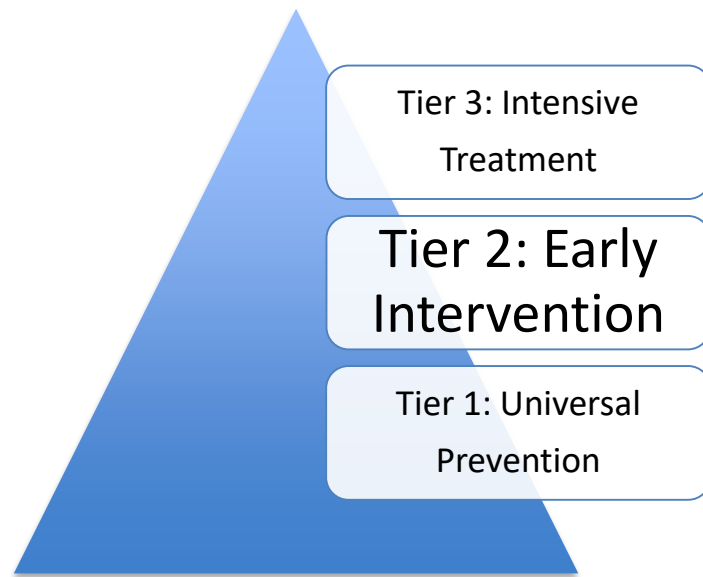
Graduation Rate: 75%

Feeling Safe at School by School Type (N=1944)





Multi-tiered Systems of Support



Trauma and Resilience Informed Schools

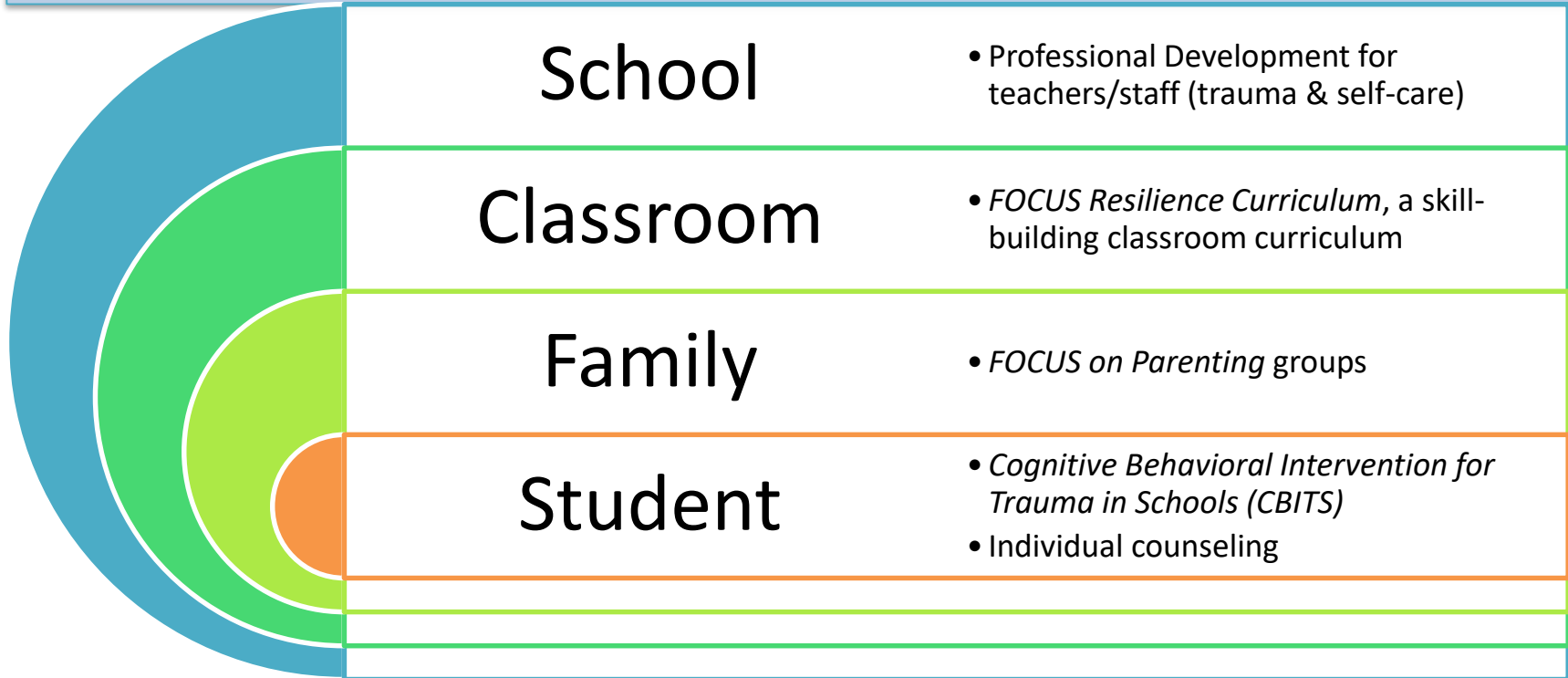
Universal: FOCUS Resilience Curriculum, Teacher Professional Development, FOCUS on Parenting, Stigma Reduction Campaigns, Suicide Prevention

Targeted: Wellness Checkup, Cognitive Behavioral Intervention for Trauma in Schools (CBITS), Targeted Case Mgt

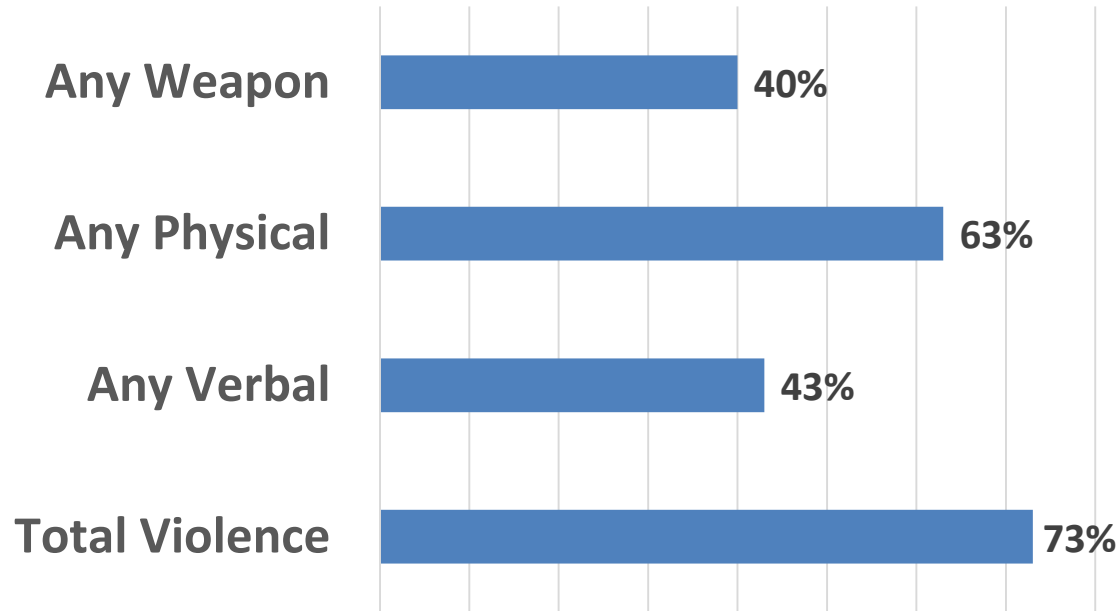
Intensive: Triage, Linkage & Referral, Individual & Family Therapy

Crisis Response

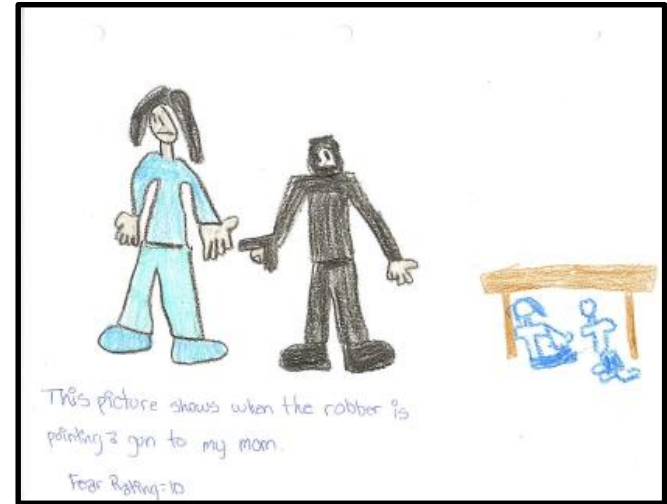
Trauma- & Resilience-Informed School Community



Violence Exposure in the Past Year



N=28,882 (Ramirez et al, 2012)



Violence and Absenteeism

Table III. Associations between violence exposures and absenteeism for sixth grade students (N = 27 110)

Violence	Boys			Girls		
	Total	Yes	Adjusted*	Total	Yes	Adjusted*
		n (%)	OR [95% CI]		n (%)	OR [95% CI]
Total						
Victim-perpetrator	2568	1231 (47.9)	1.53 [1.38, 1.70]	1138	494 (43.4)	1.65 [1.44, 1.88]
Perpetrator	1427	690 (48.4)	1.51 [1.34, 1.71]	1237	500 (40.4)	1.46 [1.28, 1.66]
Victim	2606	1053 (40.4)	1.18 [1.07, 1.29]	1522	592 (38.9)	1.40 [1.23, 1.58]
Witness	3898	1446 (37.1)	1.03 [0.93, 1.15]	5262	1806 (34.3)	1.16 [1.06, 1.28]
None	2889	1017 (35.2)	Ref	4563	1334 (29.2)	Ref
Weapon						
Victim-perpetrator	218	121 (55.5)	1.70 [1.24, 2.33]	68	35 (51.5)	1.68 [1.04, 2.69]
Perpetrator	117	58 (49.6)	1.39 [1.01, 1.92]	44	17 (38.6)	1.17 [0.72, 1.91]
Victim	1707	827 (48.5)	1.45 [1.32, 1.59]	715	310 (43.4)	1.38 [1.18, 1.62]
Witness	3898	1726 (44.3)	1.25 [1.17, 1.33]	4023	1513 (37.6)	1.12 [1.03, 1.22]
None	7448	2705 (36.3)	Ref	8872	2851 (32.1)	Ref
Physical						
Victim-perpetrator	1820	859 (47.2)	1.25 [1.12, 1.39]	756	296 (39.2)	1.14 [0.98, 1.32]
Perpetrator	1927	951 (49.4)	1.31 [1.18, 1.46]	1473	644 (43.7)	1.37 [1.23, 1.53]
Victim	1918	761 (39.7)	0.98 [0.87, 1.10]	978	381 (39.0)	1.20 [1.04, 1.38]
Witness	3665	1397 (38.1)	0.94 [0.85, 1.05]	4471	1564 (35.0)	1.03 [0.94, 1.13]
None	4058	1469 (36.2)	Ref	6044	1841 (30.5)	Ref
Verbal						
Victim-perpetrator	402	196 (48.8)	1.31 [1.10, 1.55]	160	83 (51.9)	1.76 [1.27, 2.44]
Perpetrator	593	304 (51.3)	1.42 [1.21, 1.67]	382	156 (40.8)	1.23 [1.02, 1.50]
Victim	1726	766 (44.4)	1.14 [1.04, 1.26]	846	358 (42.3)	1.35 [1.17, 1.55]
Witness	3803	1586 (41.7)	1.04 [0.96, 1.14]	3728	1405 (37.7)	1.12 [1.02, 1.23]
None	6864	2585 (37.7)	Ref	8606	2724 (31.7)	Ref
Total	13 388	5437 (40.6)		13 722	4726 (34.4)	

*Generalized estimating equation with a link function, clustered on school of enrollment, adjusted for disability, SES, Latino, ethnicity and school type, and mutually adjusted for weapons, physical, and verbal violence.

Violence and Suspensions

Table IV. Associations between violence exposures and suspension for sixth grade students (N = 24 764)

Violence	Boys			Girls		
	Total	Yes	Adjusted*	Total	Yes	Adjusted*
		n (%)	OR [95% CI]		n (%)	OR [95% CI]
Total						
Victim-perpetrator	2413	514 (21.3)	2.53 [2.19, 2.92]	1069	118 (11.0)	2.43 [2.03, 2.92]
Perpetrator	1338	222 (16.6)	1.96 [1.69, 2.26]	1146	92 (8.0)	1.85 [1.55, 2.21]
Victim	2427	306 (12.6)	1.55 [1.40, 1.72]	1379	94 (6.8)	1.72 [1.48, 2.00]
Witness	3576	336 (9.4)	1.28 [1.14, 1.43]	4676	178 (3.8)	1.17 [1.07, 1.29]
None	2648	181 (6.8)	Ref	4092	99 (2.4)	Ref
Weapon						
Victim-perpetrator	210	60 (28.6)	2.35 [1.85, 2.99]	72	10 (13.9)	1.84 [0.86, 3.91]
Perpetrator	115	30 (26.1)	2.39 [1.64, 3.48]	41	3 (7.3)	†
Victim	1626	311 (19.1)	1.63 [1.44, 1.85]	657	67 (10.2)	1.84 [1.54, 2.22]
Witness	3659	532 (14.5)	1.34 [1.21, 1.49]	3653	237 (6.5)	1.28 [1.15, 1.44]
None	6792	626 (9.2)	Ref	7939	264 (3.3)	Ref
Physical						
Victim-perpetrator	1699	355 (20.9)	1.70 [1.48, 1.94]	703	71 (10.1)	1.70 [1.42, 2.04]
Perpetrator	1820	337 (18.5)	1.53 [1.35, 1.73]	1380	128 (9.3)	1.65 [1.37, 1.99]
Victim	1783	230 (12.9)	1.14 [1.00, 1.29]	893	71 (8.0)	1.57 [1.33, 1.87]
Witness	3368	326 (9.7)	0.98 [0.89, 1.08]	3986	164 (4.1)	1.06 [0.96, 1.16]
None	3732	311 (8.3)	Ref	5400	147 (2.7)	Ref
Verbal						
Victim-perpetrator	383	97 (25.3)	1.90 [1.53, 2.36]	155	23 (14.8)	2.12 [1.49, 3.02]
Perpetrator	568	130 (22.9)	1.70 [1.38, 2.09]	355	47 (13.2)	1.97 [1.51, 2.57]
Victim	1595	257 (16.1)	1.28 [1.11, 1.48]	774	58 (7.5)	1.28 [1.09, 1.52]
Witness	3528	462 (13.1)	1.09 [1.00, 1.18]	3333	194 (5.8)	1.10 [1.01, 1.20]
None	6328	613 (9.7)	Ref	7745	259 (3.3)	Ref
Total	12 402	1559 (12.6)		12 362	581 (4.7)	

*Generalized estimating equation with a link function, clustered on school of enrollment, adjusted for disability, SES, Latino, ethnicity and school type, and mutually adjusted for weapons, physical, and verbal violence.

†Not estimated due to small sample size.

Part 2. Application of predictive tool method:

Predicting risk of Posttraumatic Stress in LAUSD

- Convenience sample, data collected by LAUSD School Mental Health as part of their dissemination of a universal classroom resilience program
- Surveys from 3301 9th grade students who underwent screening for PTSD (PC-PTSD) and have school data merged as part of a program evaluation

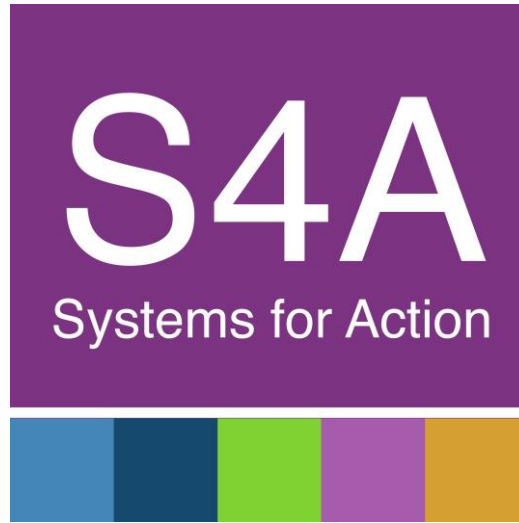
Sample Description

Variable Name	%
Female	46.62
Primary Race	
Hispanic	86.28
White	3.03
African American	5.66
Asian	4.39
Other	0.64
In poverty	72.04
English language learner	7.54
Vulnerable (homeless or foster care)	2.51
	Mean
GPA – Current Year	2.31
GPA Change from Prior to Current Year	-0.14
Attendance % - Current Year	95.53
Attendance change from Prior to Current Year	-0.84

Variables	Demographics-Only Model	Full Model
Race/Ethnicity (Hispanic/Latino is Reference Category)		
Black/African American	0.039 (0.797)	-0.102 (0.598)
White	-0.011 (0.005)	-0.085 (0.752)
Asian	0.500 (0.963)	0.692 (0.000)
Other	0.276 (0.533)	0.446 (0.362)
Gender	0.501 (0.000)	0.499 (0.000)
In poverty	-0.180 (0.043)	-0.241 (0.012)
English language learner	-0.209 (0.167)	-0.257 (0.138)
Vulnerable (homeless or foster)	0.335 (0.125)	0.411 (0.108)
GPA – Current Year		-0.193 (0.000)
GPA Change		0.059 (0.363)
Attendance % - Current Year		0.014 (0.184)
Attendance Chance		-0.013 (0.308)
LROC	0.5840	0.5953

- PTSD is less sensitive to both demographic and academic data than other outcomes
- Challenge to have a homogenous sample in race/ethnic and poverty level
- No interactions found, whereas each of the models in Add Health had at least one significant interaction

Questions?



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Upcoming Webinars

- **July 31st, 2019 12 p.m., ET**

Systems for Action Individual Research Project

[Redesigning Health and Social Systems for the Cheyenne River Sioux Tribe Using Community-Engaged Decision-Making](#)

Barbara Quiram, PhD, and David Washburn, ScD, Texas A&M University School of Public Health

- **August 7th, 2019 12 p.m., ET**

Systems for Action Individual Research Project

[Integrating Health and Social Services for Veterans by Empowering Family Caregivers](#)

Megan Shepherd-Banigan, PhD, MPH, Department of Veteran Affairs and Duke University

Acknowledgements

Systems for Action is a National Program Office of the Robert Wood Johnson Foundation and a collaborative effort of the Center for Public Health Systems and Services Research in the College of Public Health, and the Center for Poverty Research in the Gatton College of Business and Economics, administered by the Colorado School of Public Health.



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