Telling our Story: Measuring the Impact of School-based Health Centers in Maryland

RUTH AND NORMAN RALES
Rales Center for the Integration of Health and Education

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Learning Objectives

Following this presentation, participants will be able to:

1. List three high-yield health or educational outcomes for SBHC evaluation.

2. Describe the importance of examining the impact on different sub-groups of students/patients in SBHC evaluation.

3. Discuss the necessary infrastructure for large-scale SBHC impact evaluation.

Disclosures

I do not have any relevant financial relationships to disclose.

The ideas expressed today are my own and do not necessarily represent those of the Johns Hopkins University School of Medicine, the Maryland Council on the Advancement of School-based Health Centers, or the American Academy of Pediatrics Council on School Health (except where cited).

What we know

School-Based Health Centers to Advance Health Equity

A Community Guide Systematic Review

John A. Knopf, MPH,[1] Ramona K.C. Finnie, DrPH,[1] Yinan Peng, MPH, PhD,[1]
Robert A. Hahn, PhD, MPH,[1] Benedict I. Truman, MD, MPH,[2] Mary Vernon-Smiley, MD, MPH, MDiv,[3]
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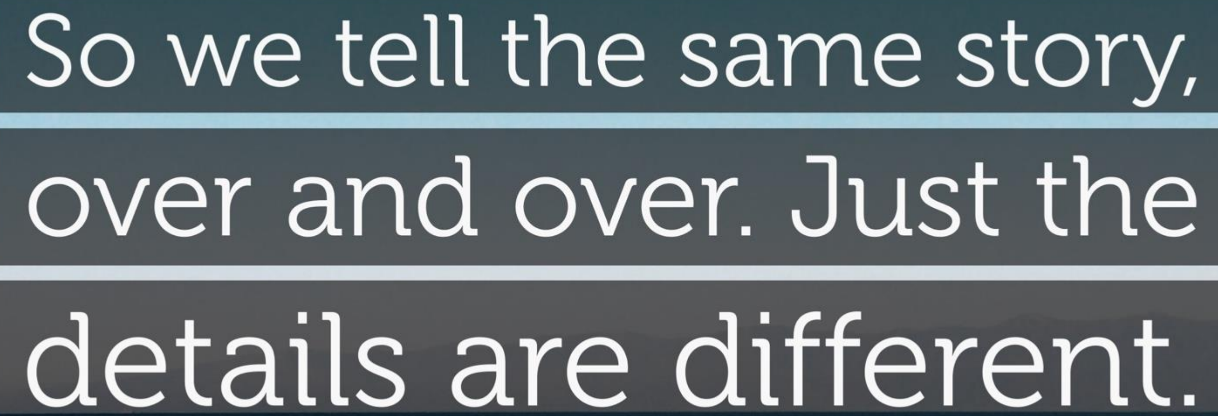
Mindy T. Fullilove, MD, MS,[9] and the Community Preventive Services Task Force

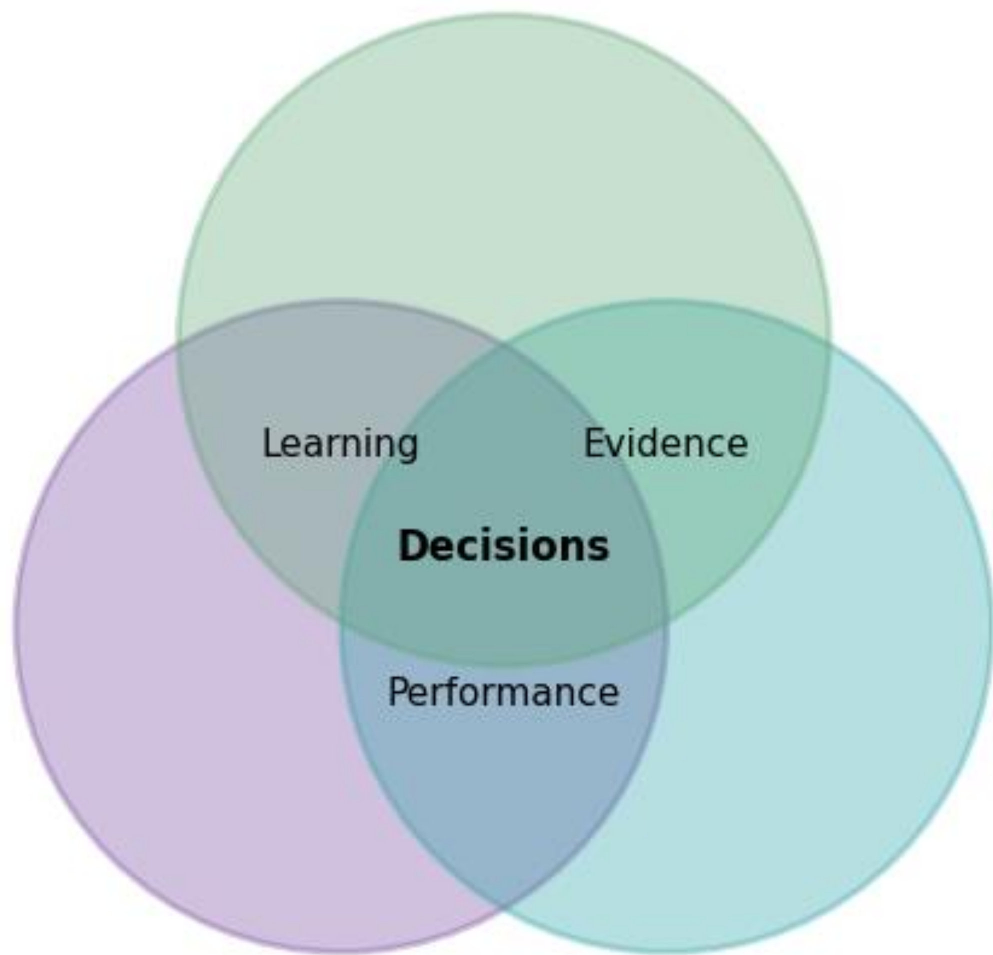
Educational Outcomes	Health Outcomes
• Higher GPA • More grade promotion • Less suspension • Less school non-completion	• More vaccination/preventive services • Less asthma morbidity • Less ED use • Fewer hospitalizations • More contraceptive use • Less substance use

Am J Prev Med 2016: 15(1): 114-126

The research to practice gap

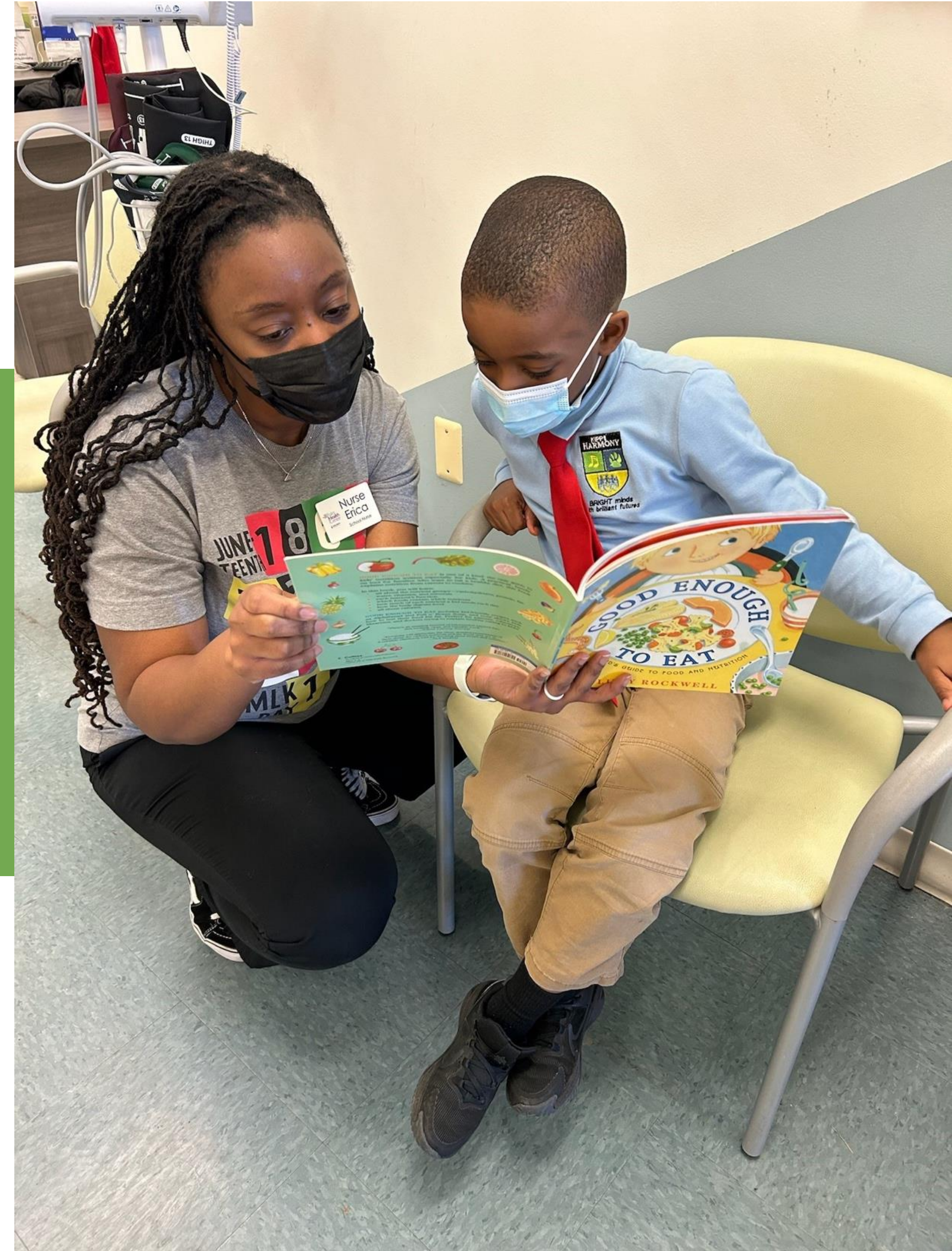
- Less than 5% of U.S. public school students have access to an SBHC.
- Infrastructure, funding, and other supports for SBHCs vary widely from state to state and LEA to LEA.
- SBHC impact evaluation can be difficult.
- Large-scale implementation and evaluation is limited.
- Peer-reviewed publications about school-based healthcare have declined in number in recent years.
- **In the age of value-based care, funders want context specific evidence of SBHC impact.**


So we tell the same story, over and over. Just the details are different.
Rohinton Mistry
quotefancy


Research
Learning
Evidence
Decisions
Performance
Operations
Evaluation

	Operations	Program Evaluation	Research
Purpose	Utilization, billing, quality improvement	Impact assessment	Generation of new, generalizable knowledge
Audience	SBHC staff, sponsor, partners, funding and regulatory agencies.	SBHC staff, sponsor, partners, funding and regulatory agencies, policy-makers.	Researchers, policy-makers, clinicians.
Timeframe	Monthly	Annually	Multi-year
Data requirements	Aggregated, generally visit level data. Can be de-identified. No separate database required.	Individual-level is helpful. Generally identifiable. Link health and educational information. May require separate database.	Individual-level. Identifiable. May link across multiple sources/systems. Research database needed.
Dissemination method	Internal communications and publications.	Internal and external communications, publications, reports.	Peer-reviewed publications.

The Rales Model of Coordinated School Health



Mission

The mission of the Rales Health Center is to support health and educational success for students at KIPP Baltimore, in partnership with the school and community, through the design and delivery of integrated, compassionate, evidence-informed school health services, school-based healthcare, and school wellness programs. Through our work we strive to empower students, staff, and families to lead their healthiest, most joy-filled lives, and to remove health issues as barriers to learning. We share best practices and advocate for innovative approaches like ours to promote health and educational equity at KIPP Baltimore, throughout Baltimore City, and nationwide.

Whole School, Whole Community, Whole Child (WSCC)

Source: https://www.cdc.gov/healthyschools/wscc/

KIPP:Baltimore

- 2 public charter schools
- Elementary/middle (PK-8)
- 1,420 students
- Enrolled by lottery from around the city

Geographic distribution of KIPP families

Families
> 400 - 408
> 300 - 400
> 200 - 300
> 100 - 200
12 - 100

Student Health and Wellbeing: Disparities

Chronic Conditions

65% had a chronic condition compared to 51% of children nationwide.

Asthma

36% had asthma compared to 14% nationwide.

Overweight/Obesity

39% had overweight or obesity compared to 35% nationwide.

Vision

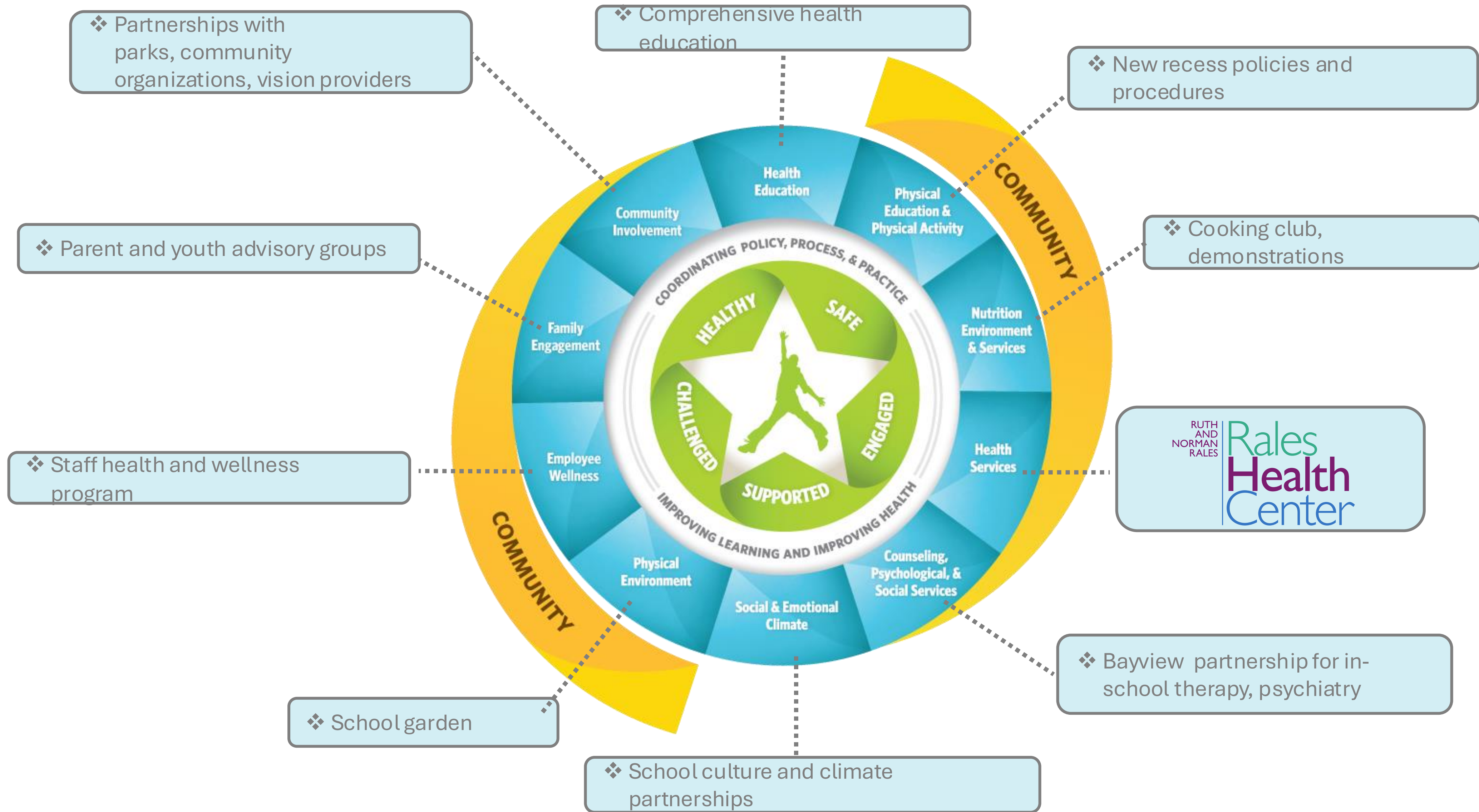
47% did not pass screening.

ADHD

7% of KIPP students had documented ADHD.

Depressive Symptoms

21% of 7th graders screened positive for depressive symptoms.


Partnerships with parks, community organizations, vision providers
Comprehensive health education
New recess policies and procedures
Parent and youth advisory groups
Cooking club, demonstrations
Staff health and wellness program
School garden
School culture and climate partnerships
Bayview partnership for in-school therapy, psychiatry
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COMMUNITY
Health Education
Physical Education & Physical Activity
Nutrition Environment & Services
Health Services
Counseling, Psychological, & Social Services
Social & Emotional Climate
Physical Environment
Employee Wellness
Family Engagement
Community Involvement
COORDINATING POLICY, PROCESS, & PRACTICE
IMPROVING LEARNING AND IMPROVING HEALTH
HEALTHY
SAFE
ENGAGED
SUPPORTED
CHALLENGED
COMMUNITY

Wellness

- CDC's School Health Index and school priorities determined areas of wellness focus in WSCC model:

1. Social-Emotional Environment
2. Physical Activity
3. Health Education

SHI SCHOOL HEALTH INDEX
A Self-Assessment and Planning Guide

The Rales Health Center

School Health Services + School Based Health Center

RUTH AND NORMAN RALES Rales Health Center

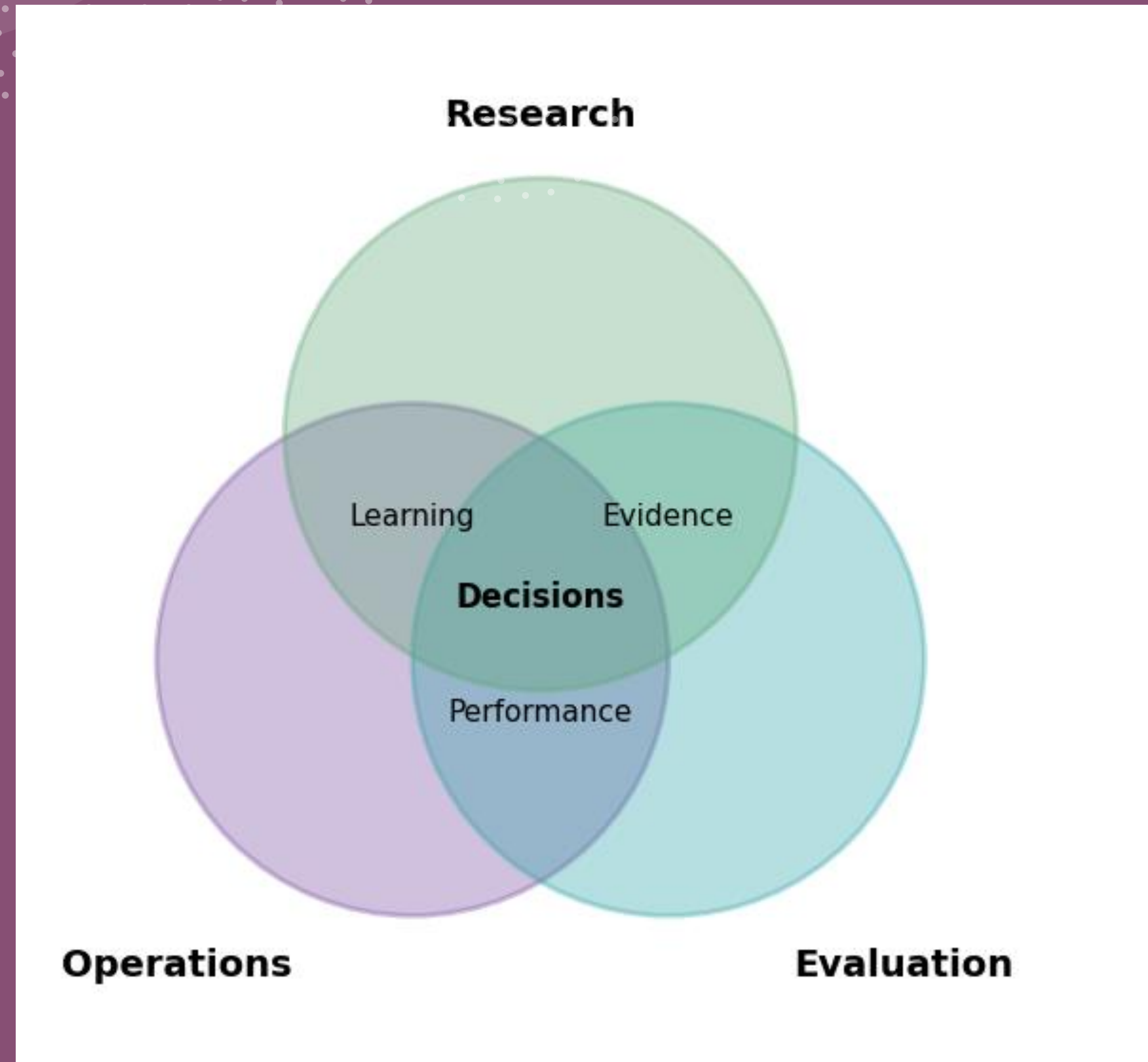
Rales Health Center

- Robust, expanded school health services
- Full-service SBHC
  - Acute, preventive, chronic disease management
  - Onsite lab, prescription delivery
- Case management and resource linkage

Rales Model Evaluation Goals

1. Characterize student health status at KIPP
2. Document the process of implementing fully-integrated school health, including lessons learned
3. Evaluate impacts on health and educational outcomes

Evaluation Approach



Evaluation Approach

- Prioritize operations, partner priorities, high-yield outcomes
  - Needs Assessment
  - Reporting Requirements
  - Performance Improvement/Continuous Quality Improvement
  - Research
- Real-world implementation – avoid research only infrastructure
- Leverage institutional resources
- Philanthropy
- Trainees
- Integrated electronic health record and IT support

Key Outcomes:

Important to kids, families, communities.

Disparities exist.

Important for multiple sectors.

Follow the money.

Health Outcomes

Healthy habits: physical activity

Preventive care: WCC, immunizations, depression screening

Control of chronic conditions (e.g. asthma control test)

Healthcare utilization: ED visits, hospitalizations

Healthcare costs

Educational Outcomes

Attendance, esp. chronic absenteeism

Academic growth

Behavior

Data Sources:

Use what exists.

Focus on high-quality, objective measures.

- **School health services data:**
  - Student health background forms (self-report)
  - School physicals
  - School health services records
- **School-based health center records**
- **City Schools**:
  - Demographic data
  - Attendance
  - Standardized assessment scores
  - IEP and 504 status
- **Maryland Medicaid/Hilltop Institute ($$$):**
  - Medicaid claims data for SBHC enrollees
  - Medicaid claims data for propensity-matched controls

Process

State and local regulatory approval for SHS and SBHC

Memoranda of Understanding

- KIPP Baltimore
- City Schools
- Baltimore City Health Department

Data Use Agreement: Hilltop Institute Institutional Review Board

- Johns Hopkins Medicine
- City Schools
- Maryland Department of health

Set-up for success

Focus on data already collected in the course of care.

Avoid double documentation.

Create templates and flowsheets to capture key data.

Create reports to allow straight-forward data pulls.

Clinical QI infrastructure.

Database to link health and educational data and facilitate analysis.

RALES Flowsheet

Responsible | Create Note | Macro Manager | Show All Choices

Rales Health Center Visit Flowsheet

Well child visit in the last 12 months?

1-Yes | 0-No

What would parent/patient have done if SBHC not available?

0-Would not hav… | 1-PCP now | 2-PCP later | 3-Urgent care now | 4-Urgent care later | 5-ED now | 6-ED later | 7-Other

Time in health center

Time OUT health center

Disposition

0-Class | 1-Home | 2-Urgent care | 3-ED/self transport | 4-ED/ambulance… | 5-Other

Averted absence?

1-Yes | 0-No

Averted ED visit?

1-Yes | 0-No

Mental health referral?

0-No | 1-Yes/Bayview | 2-Yes/other | 3-Already in services/Ba… | 4-Already in services/other

Environmental tobacco smoke exposure screening

Yes | No

Pediatric Social History

Routine immunizations up to date

Yes | No

Referral to Community Asthma Program

Yes | No

Depression Screening

PHQ-Adolescent Hyperlink

Yes | No

Jump to PHQ-A

Asthma Control Test 4-11 years

Asthma Control Test (4y to 11y)

Yes | No

Ped ACT

Counseling for Patients with BMI >= 85%

Nutrition Counseling?

1-Yes | 0-No

Physical Activity Counseling?

1-Yes | 0-No

Screen Time Counseling?

1-Yes | 0-No

Restore | Close | Cancel | Previous | Next

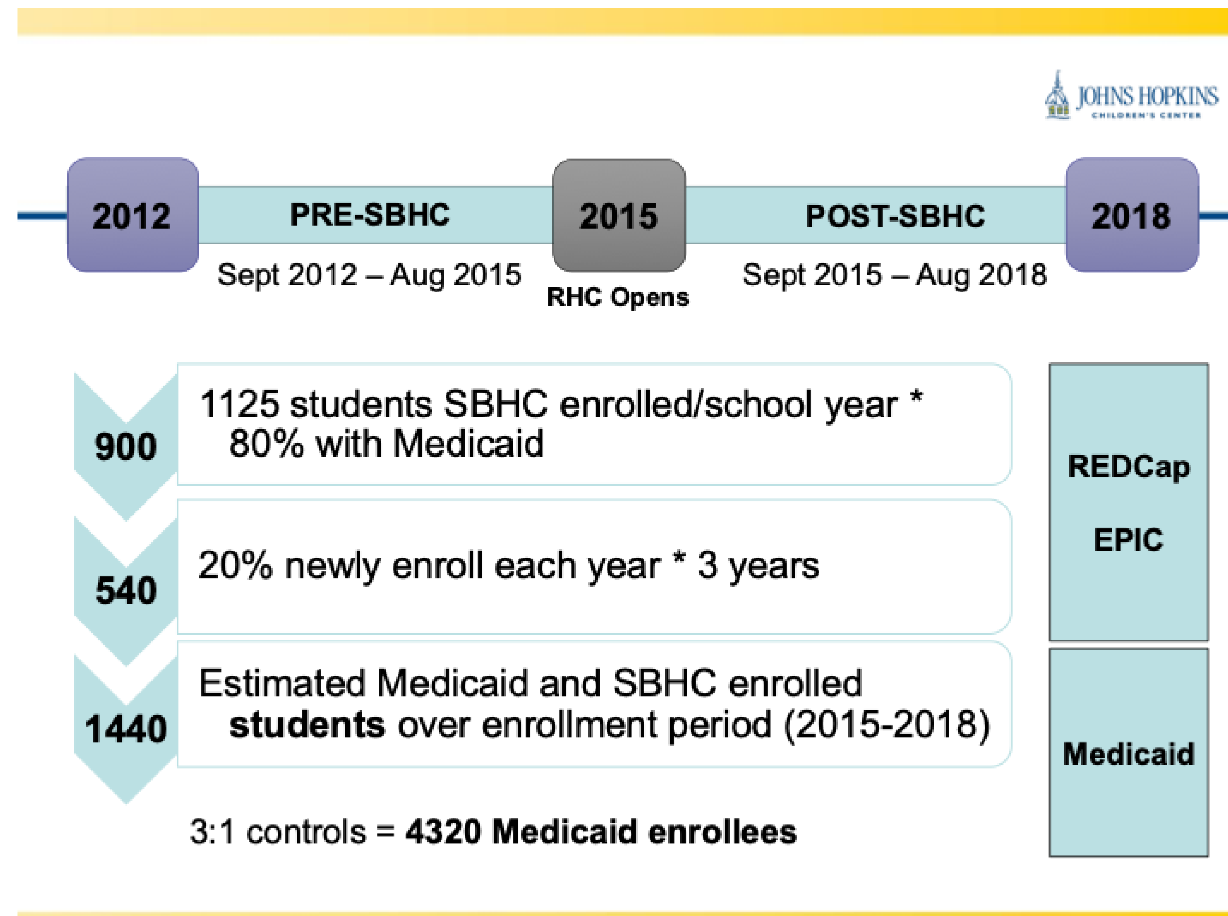
RHC Health Impact

- Operations:
  - **Improved asthma control**
    - 70% decrease in unscheduled albuterol use for students in DOT
    - Decline in acute asthma SBHC visits
  - **Increased physical activity:** 250,000 minutes of classroom physical activity added in year 1
- Program Evaluation:
  - **Decreased healthcare cost**: $420,800 in cost savings in the first four years due to averted ED visits
- Research:
  - **Decreased emergency department utilization:** analysis of Maryland Medicaid data showed fewer ED visits for students enrolled in the RHC SBHC compared to propensity matched controls.

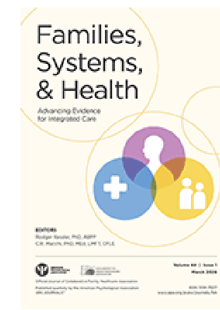
Research Example: Health Outcome

SBHC Enrollment and Healthcare Utilization

- Purchased Medicaid data from Maryland Medicaid/Hilltop Institute
  - Medical/professional fee files
  - Institutional/facility fee files
  - Pharmacy files
  - Other claims and encounter files
  - Managed care capitation files
- 3:1 propensity matched controls
- Pre and post enrollment data
- Extensive data management/cleaning, health economist analyst (consultant)



Mental/Behavioral Health Disorders



- Descriptive cross-sectional analysis of Medicaid data for SBHC enrollees (n=1173) and matched controls (n=2,594)
- Calculated the rate of ED visits for MBHD among SBHC enrollees vs. controls
  - No statistically significant difference in ED visit rates between groups
- Calculated the rate of ED visits for MBHD among SBHC users (enrolled with at least 1 visit) vs. controls
  - **ED visit rates for MBHD were significantly lower among SBHC users**
- Differences in diagnoses associated with ED use for MBHD in SBHC users compared to controls
  - **Depression was the most common visit reason for SBHC users vs. ADHD for controls**

Smith, Brandon M et al. "Emergency Department Visits for Mental and Behavioral Health Disorders by Students Enrolled in a School-Based Health Center." *Families systems & health.* 43.1 (2025): 38–48. Web.

RHC Educational Impact

- Operations:
  - **Mean return to class rate:** 95%

- Program Evaluation
  - **Improved school attendance, decreased chronic absenteeism**
    - 2,600 fewer absences per year related to the RHC
    - 49% decrease in chronic absenteeism among students with asthma
    - 50% decrease in chronic absenteeism among students with ADHD

- Research
  - **Improved classroom behavior**: vision program and glasses adherence intervention associated with improved behavior

    Haag TM, Velazquez GC, Wiggins T, Spin P, Johnson SB, Connor KA. J Sch Nurs. 2020 Oct 13.
  - ***Improved* performance on standardized assessments:** greater growth in math and reading for SBHC enrolled students

    Connor KA, et al.. Acad Pediatr. 2024 Apr 6:S1876-2859(24)00116-5.

Research Example: Educational Outcome

SBHC enrollment and MAP growth

- **Retrospective, non-randomized comparator controlled study**
- **Sample:** 2,480 students enrolled in the schools (2015-19)
- **Exposure:** SBHC enrollment
- **Outcomes:** Measures of Academic Progress (MAP) scores; school absenteeism
- **Covariates:** grade, sex, BMI category, chronic health conditions, baseline MAP scores, baseline absenteeism, individual pre-trends

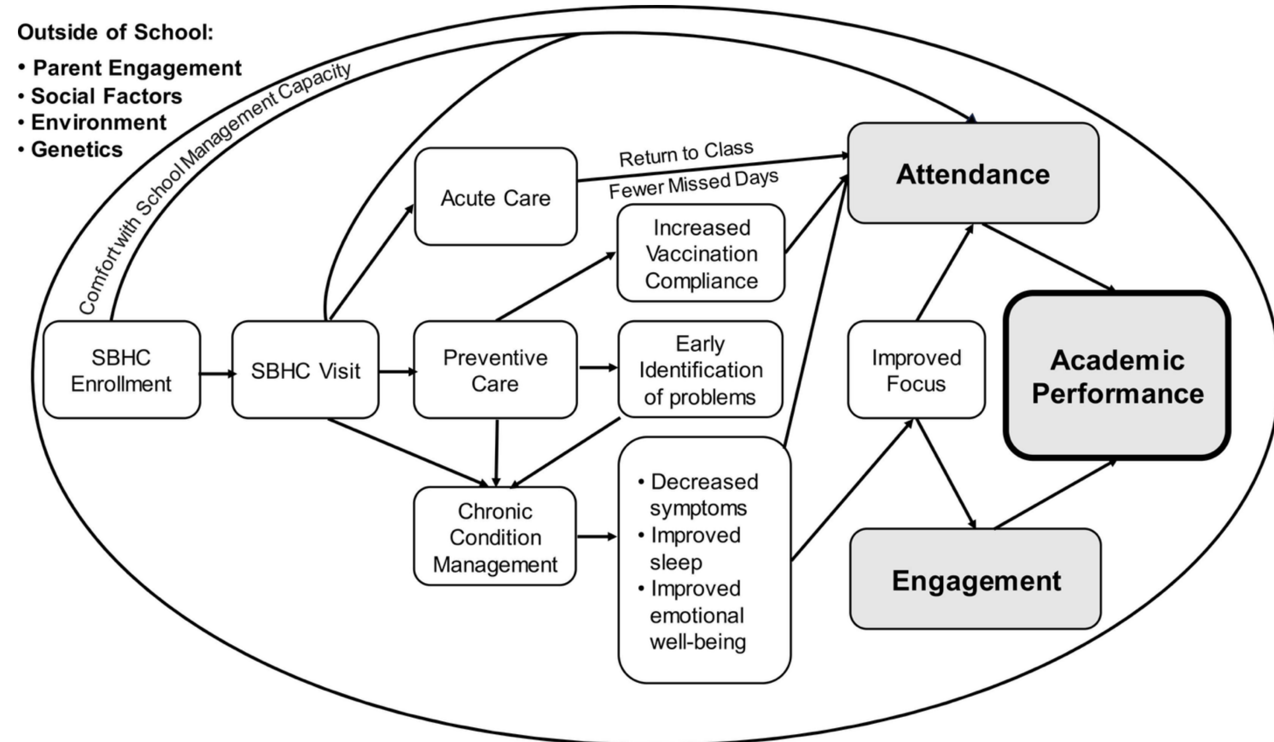


Fig. 1 **Conceptual model of the links between health and academic performance.** Adapted from: Knopf JA, Finnie RK, Peng Y, et al. School-based health centers to advance health equity: A community guide systematic review. American Journal of Preventive Medicine. 2016;51(1):114-126.

Connor KA, et al.. Acad Pediatr. 2024 Apr 6:S1876-2859(24)00116-5.

SBHC enrollment and MAP growth

- **Analysis:**
  - Descriptives compared for enrollees and controls using standardized mean differences (SMDs)
  - Linear mixed models with random intercepts
  - Difference in Differences (DiD) to estimate the relationship between SBHC exposure and post-exposure MAP trends
- **Results:**
  - SBHC enrollees more likely to have asthma, ADHD, overweight or obesity
  - Baseline math and reading scores lower for enrollees than non-enrollees
  - **Mean change from baseline covariate adjusted math scores for enrollees exceeded non-enrollees** by 3.5 points (2.2, 4.8)
  - **Mean change from baseline covariate adjusted reading scores for enrollees exceeded non-enrollees** by 2.1 points (0.9, 3.3)

Connor KA, et al.. Acad Pediatr. 2024 Apr 6:S1876-2859(24)00116-5.

SBHC Enrollment and Attendance

- Baseline absenteeism rate was significantly lower for SBHC enrollees than for non-enrollees.

- Rate of decrease of absenteeism was greater for enrollees than non-enrollees (trend, not statistically significant).

- It's complicated!
  - Changing measures and definitions
  - No pure comparison group
  - MANY other (social) factors influencing absenteeism that are difficult to account for
  - How long does it take to impact absenteeism? Differs by reason.

Connor KA, et al.. Acad Pediatr. 2024 Apr 6:S1876-2859(24)00116-5.

Lessons Learned

- **Users of school-based healthcare services are different than non-users at baseline** – use caution when making rough comparisons.
  - Large samples/system-level data can help
  - Consider whole school vs. utilizer effects
- High quality data are important and can be hard to come by – **standardized definitions and measures** at the LEA and/or state level help.
- MOU with LEA can support data sharing at the individual program level – **unified systems for data sharing are needed for consistent, real-time evaluation and improvement.**

Telling the story of Maryland SBHCs

- Individual, local, *and* state-level impact.
- Necessary infrastructure for large-scale evaluation:
  - Common goals
  - Clearly defined key outcomes
  - Uniform data definitions
  - Streamlined data collection:
    - Electronic systems
    - Data sharing agreements, HIPAA/FERPA consents
    - Access to educational and healthcare data including Medicaid claims data
  - Support for analysts with expertise in complex methods

Progress!

- Central SBHC infrastructure with mission, vision, strategic priorities.
- Focus on equity.
- Increased funding for SBHCs, including infrastructure.
  - IT support, CRISP integration, technical assistance, consultation
- Focus on streamlined data collection with clearly defined elements.
  - Timely data reports available to the public.
- Focus on SBHC standardized performance measures.
- Collaboration with Medicaid, CRISP, MASBHC, CASBHC
- Data exemplars: St. Mary's County, many more

Next Steps

- Alignment of outcomes to policy-maker focus areas.
- State-level discussions about value-based care opportunities with Medicaid MCOs and commercial payors.
  - What are the key outcomes of interest for these groups?
- Data collection infrastructure (e.g. CRISP).
- QI collaborative infrastructure.
- Academic partnerships for state-level impact evaluation.
- Critical focus on impacts for immigrant, refugee, newly-arrived students.

Community Impact

"I can't even put into words how much [the RHC] is appreciated and loved. As a single mom, having a child with multiple diagnoses can be very trying. Prior to enrolling J at KIPP, I had to leave multiple jobs that had set hours and miss a lot of time from my employer .... I applied to the lottery at KIPP so he could be closer to my job so I could care for him. I literally smiled and cried tears of joy when I heard about the clinic being inside of the school"

Parent of J, a student with diabetes

"Baltimore is well-known as a center of healthcare from economic and academic perspectives, but historical and structural inequities specifically in the healthcare community have strained trust between leading healthcare organizations and community members of color. Having health care professionals and public health experts as part of KIPP's team increased our confidence in returning our highest needs students to school early in the winter of 2020. Our school's health, safety, and operations protocols were subsequently used as a guide when the school district developed their universal standard operating procedures for re-opening."

Natalia Adamson, Chief Academic Officer, KIPP Baltimore

Rales Team

Wellness

Administration & Evaluation

Rales Center

@raleshealthcenter

Partners and Funders

THE KAHLERT FOUNDATION

KIPP Baltimore

JOHNS HOPKINS
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Questions?