A Systems Approach to Impacting Pediatric Asthma Disparities

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Michael M. Davis Lecture Series

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When a flower doesn’t bloom you fix the environment in which it grows, not the flower.
Alexander Den Heijer
Inequality
Unequal access to opportunities

Equality?
Evenly distributed tools and assistance

Equity
Custom tools that identify and address inequality

Justice
Fixing the system to offer equal access to both tools and opportunities
Asthma
“Of all the forms of inequality, injustice in health care is the most shocking and inhumane.”

~Dr. Martin Luther King Jr
Asthma Prevalence in the United States

6.9% Female
9.9% Male
4.7% 0-4yrs
9.6% 5-11yrs
10.3% 12-14yrs
9.8% 15-17yrs

7.4% White-NH
13.4% Black-NH
8.4% Other NH
8.0% Hispanic

11.1% <100% FPL
8.4% 100 to <250% FPL
6.3% 250 to <450% FPL
6.9% >450% FPL

CDC, Most Recent Data, 2017.
Asthma in Chicago


Asthma in the South Side Community

1 in 5

Each Year:

• 23% are hospitalized for asthma

• 51% miss at least 1 day of school due to asthma

• 55% have an emergency department or urgent care visit for asthma
I was very sick and I started to cough so then I started to have trouble breathing so I went to the hospital and they gave me an asthma pump.

Once upon a time I sounded like a seal and I couldn’t breath and I had to stay home.
Reasons for asthma disparities
A Model for Disparities
How can we impact asthma disparities?


Processes of care
Outcomes
<table>
<thead>
<tr>
<th>Level</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>Change knowledge and/or behaviors of patients</td>
</tr>
<tr>
<td>Provider</td>
<td>Change knowledge and/or behavior of health professionals</td>
</tr>
<tr>
<td>Microsystem</td>
<td>Change team structure or function</td>
</tr>
<tr>
<td>Organization</td>
<td>Change operations</td>
</tr>
<tr>
<td>Community Work</td>
<td>Work with people and organizations outside health settings</td>
</tr>
<tr>
<td>Policy</td>
<td>Influence laws, regulations, and/or policies</td>
</tr>
</tbody>
</table>

“A bad system will beat a good person every time.”
~W. Edwards Deming

Impacting Asthma Disparities
Community-based Participatory Research

“**collaborative** approach to research that **equitably** involves all partners in the research process and recognizes the unique strengths that each brings.”

“**begins with a research topic of importance to the community,** has the aim of combining **knowledge with action** and achieving **social change** to improve health outcomes and eliminate health disparities.”

-WK Kellogg Foundation Community Health Scholars Program
<table>
<thead>
<tr>
<th></th>
<th>Traditional Research</th>
<th>Community-based Participatory Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Objective</td>
<td>Issues based on epidemiologic data and funding opportunities</td>
<td>Full participation of community in identifying issues of highest importance</td>
</tr>
<tr>
<td>Study Design</td>
<td>Based on scientific rigor / feasibility</td>
<td>Community representative involved</td>
</tr>
<tr>
<td>Recruitment &amp; Retention</td>
<td>Based on scientific issues and “best guesses” re community members</td>
<td>Community representatives provide guidance on strategies and aid efforts</td>
</tr>
<tr>
<td>Instrument Design</td>
<td>Adopted/adapted from other studies; tested with psychometrics</td>
<td>Developed with community input; tested in similar populations</td>
</tr>
<tr>
<td>Intervention Design</td>
<td>Researchers determine based on literature and theory</td>
<td>Community members help guide development</td>
</tr>
<tr>
<td>Analysis &amp; Interpretation</td>
<td>Researchers own data, conduct analysis and interpret findings</td>
<td>Data shared; community members and researchers work together to interpret results</td>
</tr>
<tr>
<td>Dissemination</td>
<td>Results published in peer-reviewed academic journals</td>
<td>Community assists to identify appropriate venues to disseminate; results also in peer-reviewed journals</td>
</tr>
</tbody>
</table>
• 1,900 students in preK-12th grade
• 97% Black or African-American
• 82% eligible for free or reduced lunch
• 100% graduates accepted to college

Coalition with mission to improve quality of life for people with asthma
Controlling Asthma at School Takes a Team Effort

Establish an asthma management team

Promote partnerships

Identify students who have asthma

Educate students, staff, and families

Provide care, support, and resources

Enable full participation

Ensure access to medications

Provide a healthy school environment

Maintain a school-wide plan for emergencies

– Administration & self-administration of medications
– Identification of children with asthma
– 504 Plan
– Emergency response
– Training
– Bullying
Identification of children with asthma

### Brief Pediatric Asthma Screen

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Has your child ever been diagnosed by a doctor as having asthma?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2. Has your child ever had episodes of wheezing (whistling in the chest) in the last 12 months?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3. In the last 12 months, have you heard your child wheeze or cough during or after active play?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4. Other than a cold, in the last 12 months, has your child had a dry cough at night?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5. In the last 12 months, has your child been to a doctor, an emergency room, or a hospital for wheezing?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Establishing asthma prevalence

<table>
<thead>
<tr>
<th>School (grade)</th>
<th>Total students</th>
<th>Students screened</th>
<th>Asthma diagnosis or symptoms</th>
<th>Asthma diagnosis of asthma</th>
<th>Symptoms suggestive of asthma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary (prekindergarten to fifth)</td>
<td>942</td>
<td>429 (45.5)</td>
<td>173 (40.3)</td>
<td>94 (21.9)</td>
<td>79 (18.4)</td>
</tr>
<tr>
<td>Middle school (sixth to eighth)</td>
<td>637</td>
<td>235 (37.3)</td>
<td>89 (37.9)</td>
<td>73 (31.1)</td>
<td>16 (6.8)</td>
</tr>
<tr>
<td>Total</td>
<td>1,579</td>
<td>664 (42.1)</td>
<td>262 (39.5)</td>
<td>167 (25.2)</td>
<td>95 (14.3)</td>
</tr>
</tbody>
</table>

*P value: .009, <.001

Diagnosis - 25.2%
Symptoms - 14.3%

Stakeholder input

- **Interviews / Focus groups n=80**
- **Other children with asthma**
- **Peers without asthma**
- **Teachers / staff**
- **Surveys n=184**
- **Focus groups n=22**
- **Parents**
- **Office clerks**
- **Interviews n=13**
- **Administrators**
- **Nurses**
- **Meetings**

- **Child with asthma**

**Chicago Public Schools Policy Manual**

Title: ASTHMA MANAGEMENT POLICY
Section: 704.10
Board Report: 12-6125-P03
Date Adopted: January 25, 2012
Themes

- Awareness
- Communication
- Knowledge and training
- Variation in care
- Empowerment
Awareness

Teachers / Staff:

I know all of the children who have asthma in my class(es):

- Agree: 51.2%
- Neutral: 11.9%
- Disagree: 36.9%

“I bet if I go to my son classroom, each class, [the teachers] wouldn’t know he’s asthmatic. I bet you all on that.”

~Parent

“If we're outside and I'm not able to go to the teacher… my friends help me get my inhaler.”

~Child
Communication

“On parent-teacher conference days I sat down with them and explained my child’s condition to them as well as made it my business to meet with any other teachers they interact with.” ~Parent

“The teachers that I tell about my asthma, they trust me, so it feels good.

~Child

“Typically, when a kid comes in, I have them call parent and then we call the nurse.” ~Office clerk
Knowledge and training

Teachers / Staff:

When did you last receive education or training about asthma with a school:

- 56.1% 12.8% 31.1%
  - < 2 years > 2 years No prior education / training

I am adequately trained to provide asthma care to students at my school:

- 33.2% 25% 41.9%
  - Agree Neutral Disagree

“The nurse trains me. She gives me a pamphlet, we go through it, we read it, she’ll demonstrate.” ~Office clerk

“At this point, [my child is] very educated on when she needs [her inhaler], how much she needs it, how to take it, and she always let everyone know, I’m a asthmatic.” ~Parent
Variation in care

“Times when I don’t want him to miss that many days I will bring his nebulizer to the school myself and at lunchtime I sit in the office and give him a treatment.”

~Parent

“Sometimes I can go get [my inhaler] and sometimes I can’t. So if my teachers gives me the signal….that means just wait for a little.”

~Child

“We really don’t get a lot of students that come down before the nurse…they normally come when she’s here.” ~Office clerk
Empowerment

Teachers / Staff:
I feel ready to respond to an asthma emergency:

- **Agree**: 50.3%
- **Neutral**: 23.1%
- **Disagree**: 26.6%

Office clerks:
I feel ready to respond to an asthma emergency:

- **Agree**: 84.6%
- **Disagree**: 15.4%

“If [the nurse is] off campus, then of course we’re the first responders so we have to make sure that we’re making the right decisions.”

~Office clerk
Themes: Stakeholders

- Awareness
- Communication
- Knowledge and training
- Variation in care
- Empowerment

Children's artwork and handwriting:

When I had asthma, my chest was hurting and I wasn't breathing correctly. I also took my asthma pump in the office.

Allergies affected my life when I was playing outside with my friends at school. And I was running in the cold and really badly. So I had to go take my inhaler.
Inhaler access

69% children had quick-relief inhaler at school

54% self-carry inhaler

40% parents familiar with school asthma policy

32% had documentation on file at school
### Inhaler self-carry and use

#### Facilitators
- Child’s asthma knowledge
- Inhaler characteristics
- Need for easy inhaler access
- Responsibility of child
- Social support from peers and teachers

#### Barriers
- Child’s limited understanding about asthma and inhalers
- Perception that inhaler not needed
- Limited inhaler access
- Inconsistent policy implementation
- Embarrassment within social groups

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“*If I am running, I can take a break and use it instead of going back to the office.*”
~10yo female

“*He doesn’t think he needs the inhalers until he has a difficult time breathing.*”
~parent of 14yo male
Inhaler technique: Assessment

97% children misused inhaler

71% of children were confident that they can properly use properly

92% of parents were confident in their child’s ability to use inhaler properly
Inhaler technique: Teach to Goal

Misuse (less than 10 steps correct)

Mastery (all 12 steps correct)

1 - Removes cap of inhaler and spacer
2 - Shakes inhaler up and down
3 - Attaches inhaler to spacer
4 - Breaths out fully
5 - Breaths out away from spacer/inhaler
6 - Closes lips around spacer mouthpiece
7 - Presses down on canister one time
8 - Breaths in slowly (no whistle sound)
9 - Holds breath for at least five seconds
10 - Removes spacer from mouth before breathing normally
11 - Breaths normally for at least 30-60 seconds
12 - Repeats steps 2-11 for second puff

Proportion Correct (%)

Baseline  Post-TTG
“The leaf does not turn yellow without the silent consent of the tree.”

~Khalil Gibran

Systems for Asthma Care
Chicago Public Schools Policy Manual

Title: ASTHMA MANAGEMENT POLICY
Section: 704.10
Board Report: 12-0125-PO3
Date Adopted: January 25, 2012

- Administration & self-administration of medications
- Identification of children with asthma
- 504 Plan
- Emergency response
- Training
- Bullying

Education

- Child with asthma
- Other children with asthma
- Teachers/staff
- Peers without asthma
- Parents
- Nurses
- Administrators
- Office clerks
- Lunch n’ Learns
- Interviews/Focus groups
- Surveys
- Professional development
- Interviews
- Workshops & Calls
- Focus groups
- Physical Education & Wellness classes
- Meetings
Susie has asthma. Every time she is near dogs, her asthma starts to give her trouble. Her friend at school just got a puppy and invites her over to meet the puppy. Should Susie go over to her friend’s house to see the new puppy? What does she need to do if she does go?

During gym class, Joe was running laps and began to have difficulty breathing. As a classmate, what can you do to help Joe?
Outcomes

- 360 approach to asthma education
  - Teachers and staff about asthma
    - 184 teachers/staff
  - Children with asthma
    - 113 students
  - All students (4th-6th grade)
    - 150 children

- Care management
  - Phone outreach
    - 307 parents/caregivers
  - In person
    - 65 child/parent pairs
  - 30% decrease in ED visits over 6 months
    - 57 children

- Referrals
  - 25 children
Identification

- Screening integrated into registration
- 1304 students reached (71.6%)
- Students with asthma diagnosis

22.2%
Improving identification

USE THESE CHECKLISTS TO MAKE SURE YOU COMPLETE THE REQUIRED FORMS!

Asthma Forms Checklist

☐ Student Medical Information Form
☐ Consent to Exchange Information and Medical Records
☐ Physician Verification of Asthma
☐ Physician Request for Medication Administration
☐ Parent Request for Medication Administration
☐ Asthma Action Plan
Improving identification

16,856 students with asthma currently identified

54,505 students with asthma based on city prevalence

37,649 students with asthma NOT currently identified
Guideline-based components

- Identification process
- In-depth staff training
- Technology based tracking system
- Communication strategies
- Protocol for routine care and emergencies
- All-student education
Community-based Participatory Research

“collaborative approach to research that equitably involves all partners in the research process and recognizes the unique strengths that each brings.”

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Implementation Science

“Implementation research is the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and hence, to improve the quality and effectiveness of health services and care.”

-Martin Eccles and Brian Mittman
Evidence-based guidelines on components of school asthma management program

- Establish an asthma management team
- Identify students who have asthma
- Provide care, support, and resources
- Ensure access to medications
- Maintain a school-wide plan for emergencies
- Provide a healthy school environment
- Enable full participation
- Educate students, staff, and families
- Promote partnerships

School

Guideline-based intervention components:
- In-depth staff training
- Identification process
- Technology based tracking system
- Communication strategy
- Protocol for routine care and emergencies
- All-student education

School-directed child-centered program
- Evidence-based
- Comprehensive
- Integrated
- Longitudinal
- Sustainable

Reimagining systems
Processes of care
Outcomes
“We can't educate children who are not healthy, and we can't keep them healthy if they're not educated.”

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