

Disentangling the Root Causes of Racial Disparities in Asthma: The Role of Structural Racism in a 5-Year-Old Black Boy with Uncontrolled Asthma



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Overall Purpose/Goal: To provide excellent case-based reviews on key aspects of allergic disease to those who research, treat, or manage allergic disease.

Target Audience: Physicians and researchers within the field of allergic disease.

Accreditation/Provider Statements and Credit Designation: The American Academy of Allergy, Asthma & Immunology (AAAAI) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. The AAAAI designates this journal-based CME activity for 1.00 AMA PRA Category 1 Credit™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

List of Design Committee Members: Margee Louisias, MD, MPH, and Elizabeth Matsui, MD, MHS (authors); Robert S. Zeiger, MD, PhD (editor)

Learning objectives:

1. To recognize the importance of social context in the management of asthma in minority pediatric patients.
2. To differentiate between individual-level discrimination and structural discrimination.
3. To recognize the health impacts of racial residential segregation in regard to housing quality and environmental allergen and pollutant exposures.
4. To conclude that race is a social construct, but it may be associated with differential biological consequences due to historical and social injustices.

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CASE

A 5-year-old black boy was seen at the Allergy Clinic with a history of “frequent wheezing.” He has had several wheezing episodes per year since infancy and has never been hospitalized. He has been treated at the emergency room with nebulized albuterol and prednisone at each visit. He has never been on a controller medication. He has daily symptoms and cough with activity, and uses an inhaled short-acting beta-agonist at least 2 times per week. He had 2 episodes of nighttime symptoms last month. He does not have a primary care provider and receives medical care through the emergency room. He had a lapse in Medicaid coverage last year, after he and his family were evicted from their apartment, because their landlord did not pay the mortgage. He now lives in a shelter apartment with his mother and older brother, located near a major expressway. There is no second-hand tobacco smoke exposure. He is unable to do spirometry and his serum specific-IgE testing shows cat, cockroach, mouse, oak, and *Alternaria* sensitization. His mother reports seeing mouse droppings and cockroaches in the shelter hallway.

DISCUSSION: INCORPORATING SOCIAL CONTEXT IN ASTHMA MANAGEMENT

Our patient’s struggle with asthma is a manifestation of the marked racial and ethnic disparities that have been recognized for decades, but sadly have persisted.^{1,2} Understanding the contribution of historical and social influences in the United States and the opportunities for advocacy, health care reform, and medical research will help not only address this patient’s needs but also shrink racial and ethnic asthma disparities.^{3,4}

Racism has shaped our medical evaluation and scientific analysis of differences between racial and ethnic groups,⁵ leading to the incorrect view of race as a biologic construct while excluding race as a social construct conceived out of a hierarchy of systematic oppression of blacks.⁶⁻⁸ In fact, structural racism, which is the integration of historically rooted and culturally enforced discriminatory practices and policies into social, economic, health care, criminal justice, and political systems,⁹ is a major force behind health disparities.^{5,10,11} Racial residential segregation is an example of structural discrimination⁹ and stems from explicit discriminatory policies of mortgage lenders and governmental agencies starting in the 1930s that promoted segregation, often referred to as redlining.^{9,12} This physical separation has led to a concentration of resources and wealth in white communities and concentration of poverty in black communities.¹² There is a growing literature examining health consequences of racial residential segregation.^{9,13-15} This economic and social disadvantage results in reduced access to primary and specialty care, particularly high-quality care, and disinvestment in community health resources.⁹ There is a higher concentration of dilapidated housing, which is conducive to mice, cockroaches, and fungi (“mold”), and minority communities also have higher outdoor air pollution exposure and a greater likelihood of hazardous waste exposure.¹⁶ Together these downstream effects on health care access and quality and environment harm the health of our minority patients.

The pharmacologic management of this patient’s asthma is straightforward, but addressing his environmental, health care access, and housing needs is complicated, but paramount, because these social challenges are root causes of his uncontrolled asthma. Although our patient needs guidelines-based asthma

management, pharmacologic management should be paired with tools to address his family’s social circumstances to address the root causes of his uncontrolled asthma. Because the resources to address our patient’s social needs are inadequate and fragmented, ultimately systems-level change is required to ensure all such patients have access to high-quality health care, appropriate medications, and healthy housing.

In today’s health care landscape, clinicians can serve a critical role in advocating for necessary change while delivering high-quality asthma care to their patients.¹⁷ Specific recommendations for the management of patients such as the one discussed here include the following:

1. Patient level
 - Be aware—asking about a patient’s social challenges in a culturally competent and sensitive manner.
 - Offer health recommendations appropriate to patients’ social contexts—for example, selection of medications to minimize costs.¹⁸
 - Refer to a social worker, connect to social services, particularly those providing housing support and related services.
2. Practice level¹⁹
 - Partner with local health department programs that offer asthma home visits.^{20,21}
 - Institute social needs screening to identify and link patients to social services, for example, community health workers and social workers.

In addition, there are opportunities for clinicians to advocate and support system-level change, including the following¹⁷:

- Advocate for expansion of state Medicaid managed care programs to screen for social needs and provide social services referrals (CMS Health Accountable Communities Model)—presently only in 31 states.²²
- Encourage medical center and community partnerships using existing resources; for example, medical legal partnership formed with 2 Cincinnati Children’s Hospital Medical Center primary care clinics led to the identification of a substandard housing cluster.^{23,24}
- Advocate for health care reform that guarantees access to essential asthma medicines. For example, an American Thoracic Society’s policy statement calls for the creation of an independent, national entity to allow restructuring of the pharmaceutical supply chain, with guaranteed availability of essential asthma medicines on tier 1 formularies of all insurance plans.¹⁸

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Severe Asthma

AAAAI/NAIA

Difficult Cases

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Case: Patient LJ

- 5 year old boy presented to the Allergy clinic with history of “frequent wheezing.” Mom wants to know what she can do treat and prevent his wheezing.
- **Asthma history**
 - Several wheezing episodes per year since infancy treated at EDs with nebulizers. Mom thinks he was given prednisone given each time.
 - About 2 months prior to presentation, LJ had cough x 2 days that then progressed to wheezing, and his mom did not have albuterol.
 - Never been on controller medication
 - No admissions

Patient LJ: Asthma Control Assessment

- Daily symptoms
- Cough with running/playing
- Albuterol 2-3x/week, when it is available
- Woke with symptoms 2x past month
- Last exacerbation 2 months ago (ED visit + oral CS)
- Never been on ICS or montelukast

Case: Patient LJ: PMHx

- Past Medical History
 - Eczema
 - Allergic rhinitis
- Family History: environmental allergies, asthma
- Surgical History: none
- Medications: none
- Allergies: NKDA

Patient LJ: Social/Environmental History

- No PCP, receives medical care mainly in ED
- Undomiciled in shelter apartment with mom and 8 yo brother
- No exposures to cigarette smoke in apartment
- Mouse droppings & roaches seen in hallway of shelter
- Shelter located 1 block from major expressway

Patient LJ: PE

- Gen: active, African-American little boy, coughing
- HEENT: normal TMs/pharynx, Allergic shiners, large inferior turbinates
- Pulm: scattered mild expiratory wheezes, no retractions, no tachypnea
- Skin: no eczema
- Unable to do spirometry

What should you do for LJ?

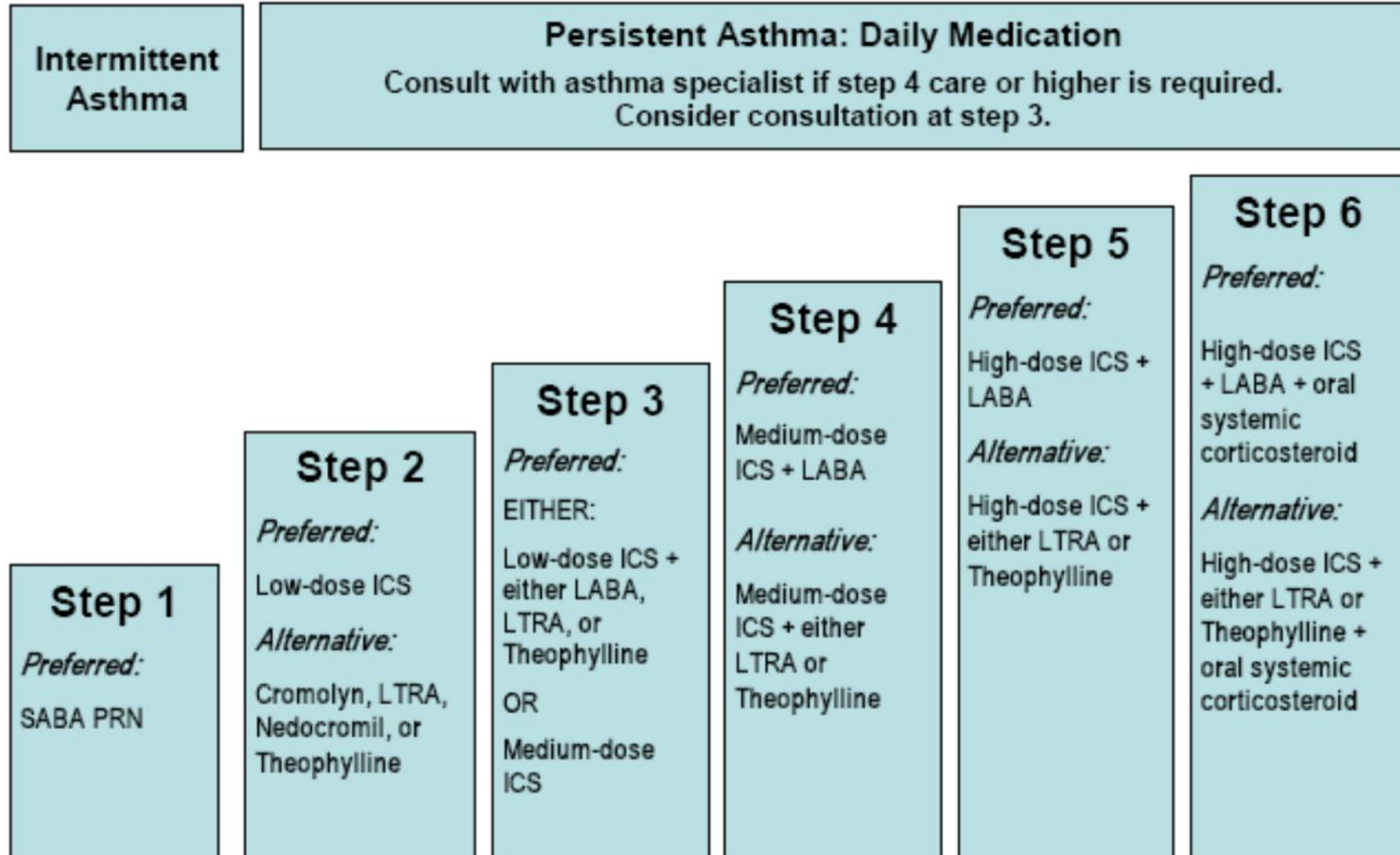
Components of Severity		Classification of Asthma Severity (5–11 years of age)			
		Intermittent	Persistent		
			Mild	Moderate	Severe
Airway	Symptoms	≤2 days/week	>2 days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	≤2x/month	3–4x/month	>1x/week but not nightly	Often 7x/week
	Short-acting beta ₂ -agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week but not daily	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
	Lung function	• Normal FEV₁ between exacerbations • FEV₁ >80% predicted • FEV₁/FVC >85%	• FEV₁ = >80% predicted • FEV₁/FVC >80%	• FEV₁ = 60–80% predicted • FEV₁/FVC = 75–80%	• FEV₁ <60% predicted • FEV₁/FVC <75%
Risk	Exacerbations requiring oral systemic corticosteroids	0–1/year (see note)	≥2/year (see note)		
		Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time for patients in any severity category.			
		Relative annual risk of exacerbations may be related to FEV ₁ .			
Recommended Step for Initiating Therapy (See figure 4–1b for treatment steps.)		Step 1	Step 2	Step 3, medium-dose ICS option and consider short course of oral systemic corticosteroids	Step 3, medium-dose ICS option, or step 4
		In 2–6 weeks, evaluate level of asthma control that is achieved, and adjust therapy accordingly.			

- Preferred: Initiate ICS
- Alternative
 - LTM
 - Intermittent ICS

Components of Control		Classification of Asthma Control (5–11 years of age)		
		Well Controlled	Not Well Controlled	Very Poorly Controlled
Asthma Control	Symptoms	≤2 days/week but not more than once on each day	>2 days/week or multiple times on ≤2 days/week	Throughout the day
	Nighttime awakenings	≤1x/month	≥2x/month	≥2x/week
	Interference with normal activity	None	Some limitation	Extremely limited
	Short-acting beta ₂ -agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week	Several times per day
	Lung function • FEV₁ or peak flow • FEV₁/FVC	>80% predicted/ personal best >80%	60–80% predicted/ personal best 75–80%	<60% predicted/ personal best <75%
Risk	Exacerbations requiring oral systemic corticosteroids	0–1/year	≥2/year (see note)	
		Consider severity and interval since last exacerbation		
	Reduction in lung growth	Evaluation requires long-term followup.		
	Treatment-related adverse effects	Medication side effects can vary in intensity from none to very troublesome and worrisome. The level of intensity does not correlate to specific levels of control but should be considered in the overall assessment of risk.		
Recommended Action for Treatment		• Maintain current step. • Regular followup every 1–6 months. • Consider step down if well controlled for at least 3 months.	• Step up at least 1 step and • Reevaluate in 2–6 weeks. • For side effects: consider alternative treatment options.	• Consider short course of oral systemic corticosteroids, • Step up 1–2 steps, and • Reevaluate in 2 weeks. • For side effects, consider alternative treatment options.

- Preferred: Initiate ICS
- Alternative
 - LTM
 - Intermittent

Treatment Steps: 5-11 years



Allergy Assessment

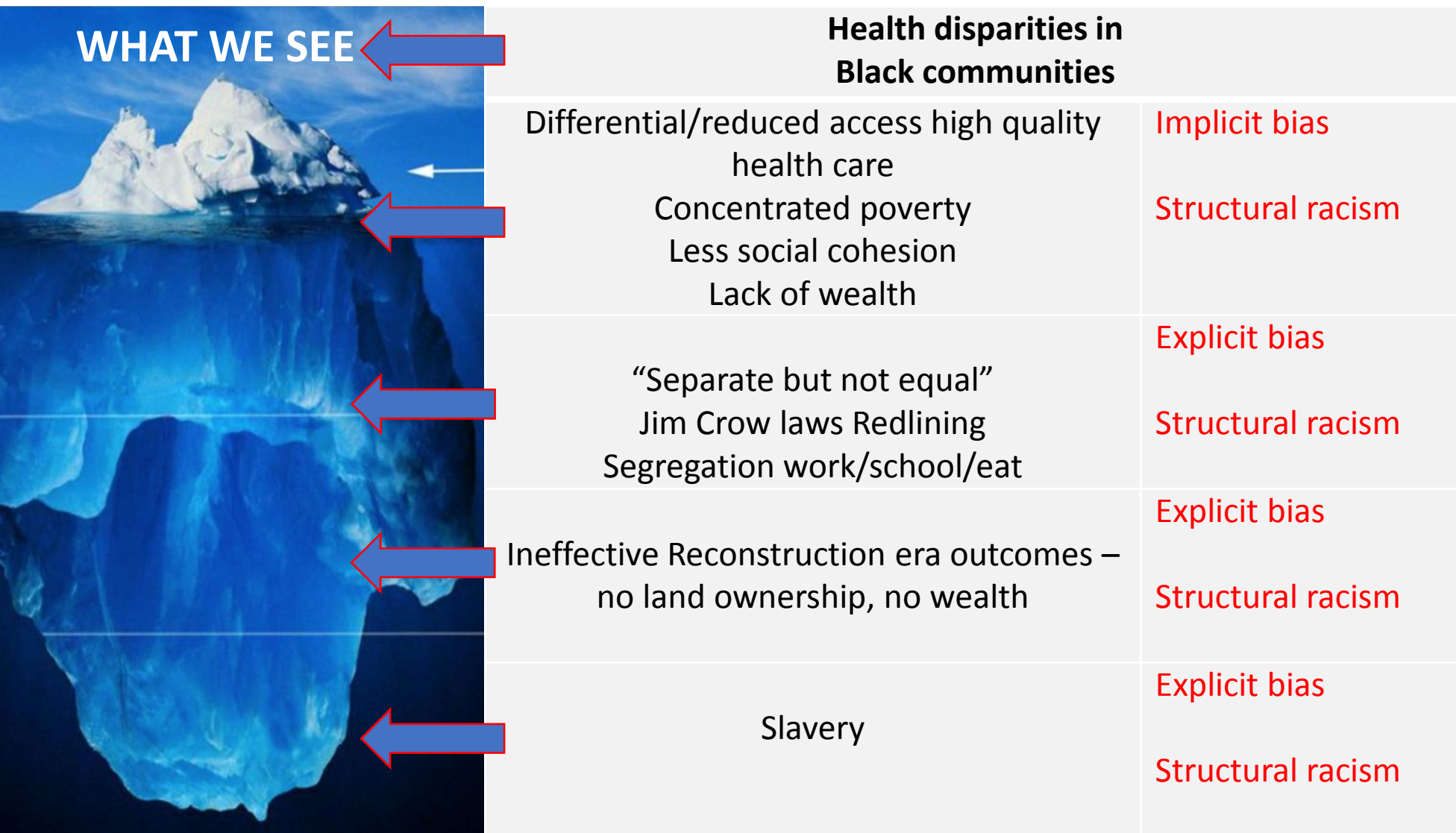
Allergen	Specific IgE (kU/L)
Cat	10.5
Dog	0.5
Dust mite (Der f)	<0.35
Cockroach	18.9
Mouse	78.7
Oak pollen	1.2
Grass pollen	<0.35
Ragweed	<0.35
Alternaria	5.1

Sensitized to allergens at shelter

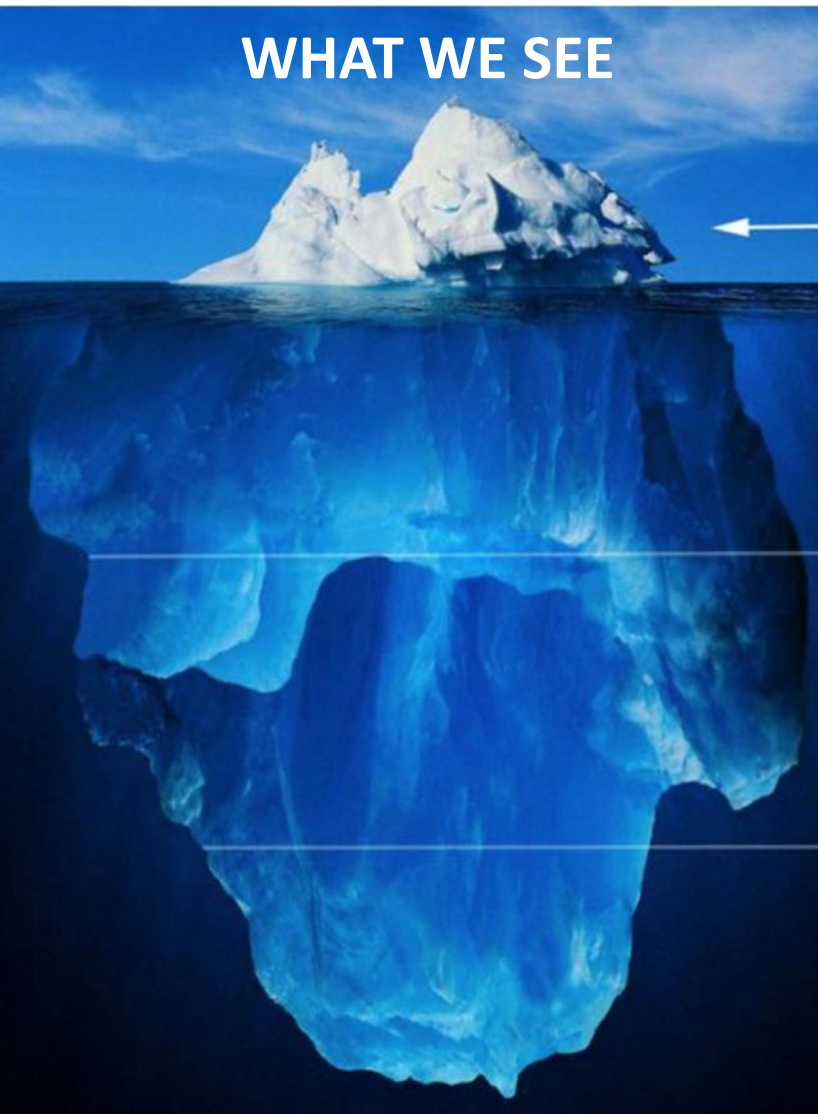
LJ has uncontrolled allergic asthma, now what?

Why are LJ and his family in this situation?

Iceberg” Framework to Understanding L

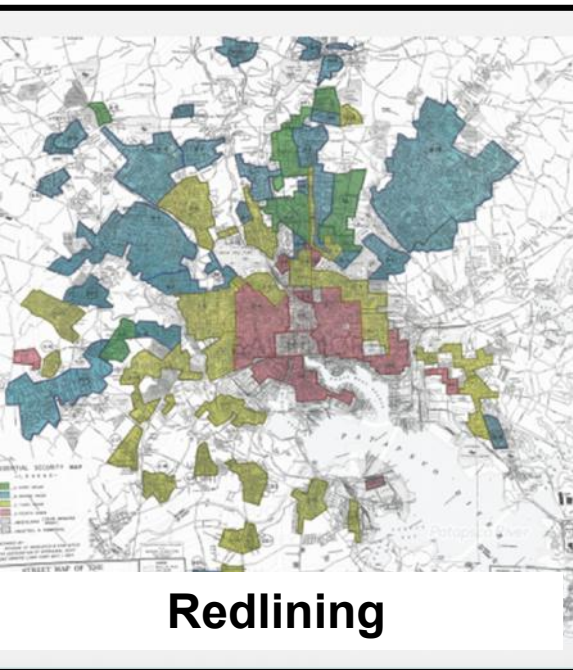


"Iceberg" Framework to Understanding L



- **What we see** clinically in our minority patients, is a physical manifestation (in form of disease) of our society's historic injustices
- Historical injustices are perpetuated by current structural factors
 - Safety-net hospitals – understaffed, less specialists
 - Schools in minority communities with less funding
 - Research efforts emphasize pursuit of biological reasons for racial differences in health outcomes

Getting at the Root Cause: Concentrated Poverty and Housing & Neighborhood Conditions



<http://thepeopleschampion.me/baltimore-citys-dirty-secret-how-politicians-and-industry-created-thousands-of-developmentally-disadvantaged-citizens-like-freddie-gray/>

Discrimination/Stress & Asthma Morbidity

- Black Women's Health Study, Chest 2014
 - Participants in the highest quartile vs lowest quartile of reported racism, had a higher incidence of adult onset asthma
- Thakur, Chest 2017
 - Black youth who reported any perceived discrimination had 78% increased greater odds of asthma and 97% increased odds worse asthma control
- Kopel, JACI 2017
 - High caregiver stress scores associated with more asthma symptom days in their urban school-aged children
- Zoratti, AJRCCM 1998
 - Black patients had more asthma ED visit, less ICS prescriptions, more oral steroid prescriptions, more admissions, less specialist visits compared to White patients in the same managed care health plan

Implicit Bias in Physicians & Health Outcomes

- Societal attitudes or stereotypes that unconsciously affect our individual understanding, actions and decisions
 - Cause us to have attitudes about others based on age, gender, race/ethnicity, weight, and appearance
- Under-recognized contributor to health disparities
- Few studies examining impact of bias on asthma management
- Systematic reviews show health care providers with pro-White/anti-Black bias
- Implicit bias affects: clinical decision-making, treatment recommendations, nonverbal communication

Staats. Kirwan Institute 2014.

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Public Health Programs in Boston

Breathe Easy at Home

- Clinicians refer Boston residents with asthma for a home inspection by the Boston Inspectional Services Department
- ISD inspectors identify asthma triggers in the home that are violations of the Massachusetts Sanitary Code
 - enforce the state sanitary code for housing
 - work with property owners to address these poor conditions.

Boston Home Visit Collaborative

- During a home visit, a CHW:
 - Home assessment for asthma triggers
 - Gives info, resources to reduce or eliminate them (including low cost asthma-friendly home supplies).
 - Works with family to create an asthma management plan and reviews asthma symptoms, asthma medications and the patient's AAP

Medical-Legal Partnerships (MLP)

- Collaboration between health care team and lawyers to address social determinants of health
- Lawyer is typically “in-residence” at the health care setting
 - Formal screening process of patients for health-related social and legal needs
 - Communication with healthcare partners

National Center for Medical  Legal Partnership



Resource to find MLP locations

Every parent faces different stresses that can affect their child's health. I ask every family about the issues because we may be able to help:

Are you having problems receiving WIC, food stamps, daycare vouchers, medical card, or SSI?	☐ Yes	☐
Housing problems (overcrowding, roaches, rodents, utilities, mold, lead)?	☐ Yes	☐
Threatened with eviction or losing your home?	☐ Yes	☐
Over the past 2 weeks, have you felt down, depressed, or hopeless?	☐ Yes	☐
Over the past 2 weeks, have you felt little interest or pleasure in doing things?	☐ Yes	☐
Do you feel that you and/or your children are unsafe in your relationships?	☐ Yes	☐
Would you like to speak with a social worker or legal advocate in the clinic about these issues?	☐ Yes	☐

Cincinnati MLP found a cluster of referrals from a housing complex with city code violations. Repairs were completed in 71% (10) of the homes, out of 16. 36% (16/45) of the cases had asthma

Beck. Pediatrics 2012, vol 130.

Implicit Bias: Debiasing

- All of us have some level of implicit bias
 - Take the Implicit Association Test (IAT)
 - Project Implicit, <https://implicit.harvard.edu/implicit/>
- Trainings
 - Local hospital/academic medical center – “cultural competency”
 - AAMC
<https://www.aamc.org/initiatives/diversity/322996/lablearningonunconsciousbias.html>
 - IHI
 - <http://www.ihl.org/communities/blogs/how-to-reduce-implicit-bias>

Question: Patient LJ

What factor has NOT been shown to be associated with worse health outcomes in Black patients with asthma?

- A. Reduced access to high quality medical care
- B. Self-reported racial discrimination
- C. Living in an area with concentrated poverty
- D. Genetic polymorphism causing severe asthma phenotype

Question: Patient LJ

What factor has NOT been shown to be associated with worse health outcomes in Black patients with asthma?

- A. Reduced access to high quality medical care
- B. Self-reported racial discrimination
- C. Living in an area with concentrated poverty
- D. **Genetic polymorphism causing severe asthma phenotype**

Conceptual Model: Structural Racism & Health Disparities

