



A Stable Affordable Home is A Prescription for Good Health

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September 30 2019

Roadmap

1. Dimensions how Homes affect Health
 - Quality, Stability, Affordability, Location
 - How a Home can it be like a Vaccine
2. Homes and People (Population Health)
3. How Can Healthcare and Housing Work Together
4. Homes as a route to Health Equity

Social Factors Can Drive Health



SDOH are the structural factors and conditions in which people are born, grow, live, work and age.

Evidence on Home Quality

- Accidents/Injuries – exposed wiring, needed repairs
- Development and worsening asthma, allergies tied to home
 - Pests (cockroaches and mice)
 - Molds/Chronic Dampness
 - Tobacco smoke
- Lead exposure tied to long term effects
 - Developmental delay, Attention deficit
- Heat or eat

Skinner et al, 2014

Home Quality and Mental Health

MacArthur Foundation
HOW HOUSING MATTERS

macfound.org/HousingMatters

POLICY RESEARCH BRIEF

Poor Quality Housing Is Tied to Children's Emotional and Behavioral Problems

Parents' stress from
takes a

by REBEKAH LEVINE COLEY, TAMA LEVINE,
ALICIA DOYLE LYNCH, AND MELISSA F.

SEPTEMBER 2013

A family's home is their haven, but for families living with leaking roofs and mold, it's not always a safe place. For those who have to choose between staying in their homes or finding a new one, the stress of finding a place to live can be overwhelming. For those who are repeatedly move in search of a more affordable housing, one's place of refuge is not always very homey.

This brief examines how housing characteristics affect children and families' well-being.¹ Among the variables tested, poor housing quality was the most and strongest predictor of emotional and behavioral problems in low-income children and youth. It also had a strong association with school performance among children. Poor housing affected children because the stress of living in unhealthy and unsafe conditions affected parents' ability to care for their children.

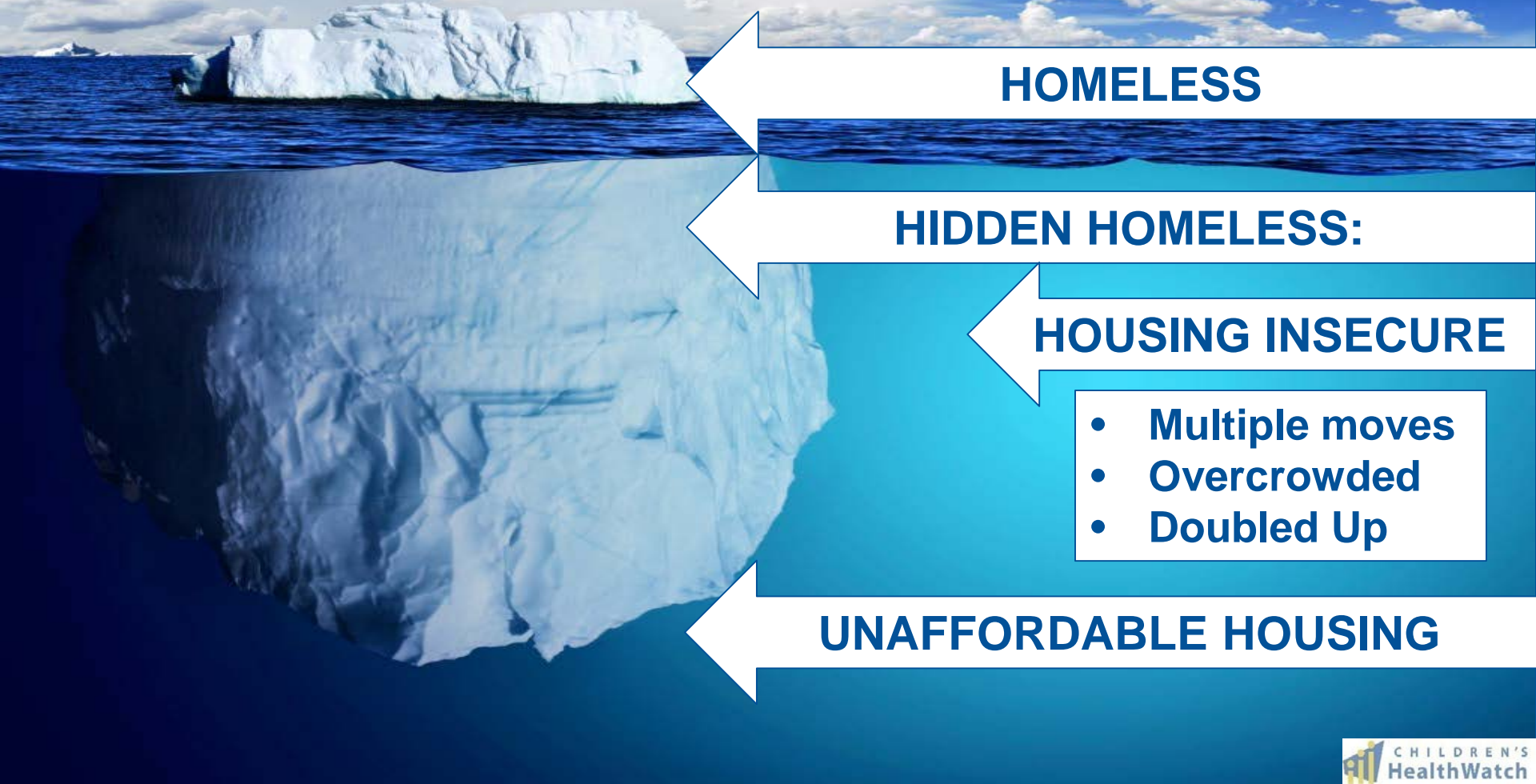
Advantages of the Current Study

Past research has identified several aspects of housing that are thought to be associated with children's mental health.² Researchers, for example, have found that poor housing—exposed wiring, peeling lead paint, mold, and the like—may contribute to parental stress in children, inhibiting their emotional and behavioral learning. Similarly, residential instability may in-

- Poor housing quality strongest predictor of emotional and behavioral problems in low-income children
- Much of association between poor housing quality and children's wellbeing operates through parental stress, parenting behaviors and mental health



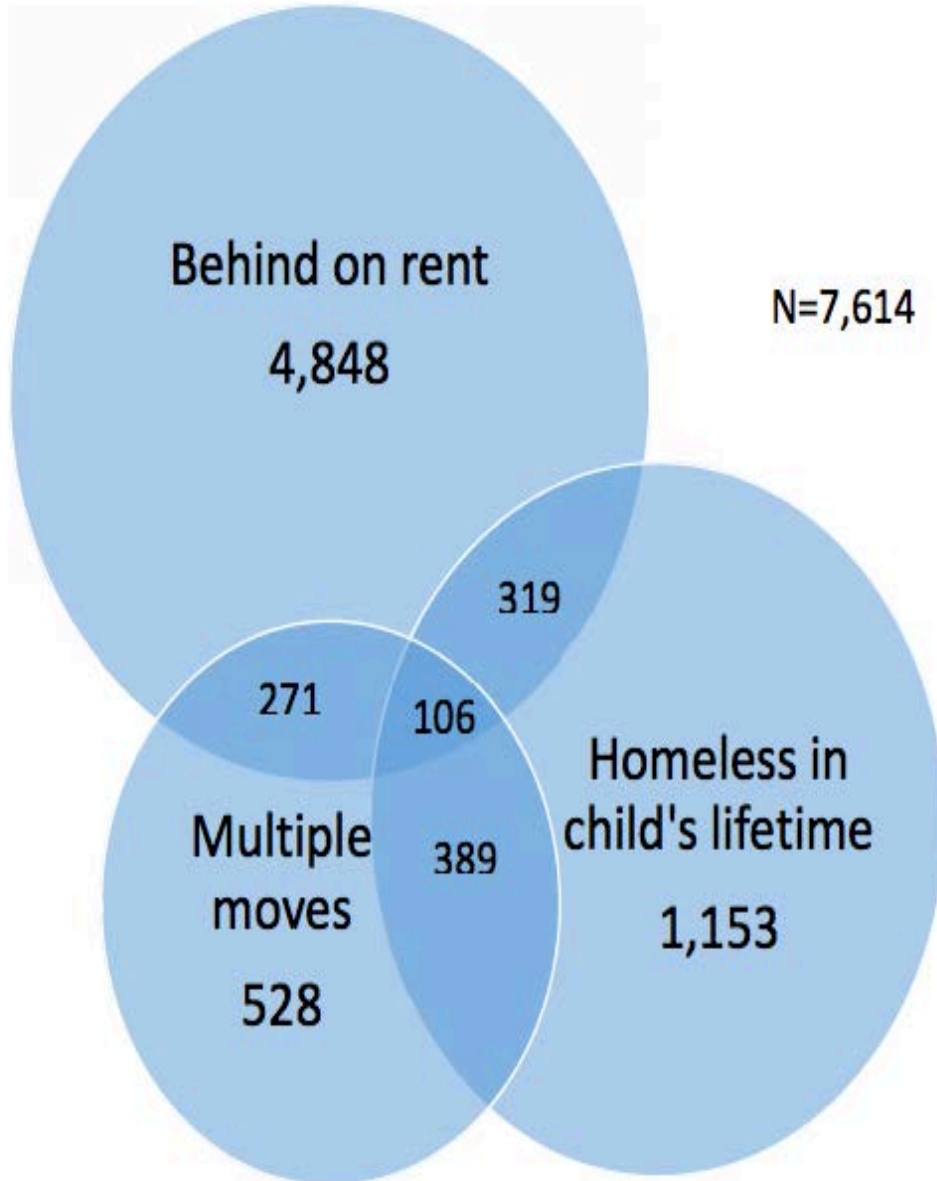
Stability: The Home Iceberg



Exploring three forms of unstable housing with caregiver and child health

- Among 22,234 families, 34% had at least one adverse housing circumstance:
 - 27% behind on rent
 - 8% multiple moves
 - 12% history of homelessness
- Each circumstance individually associated with adverse health and material hardship compared to stable housing

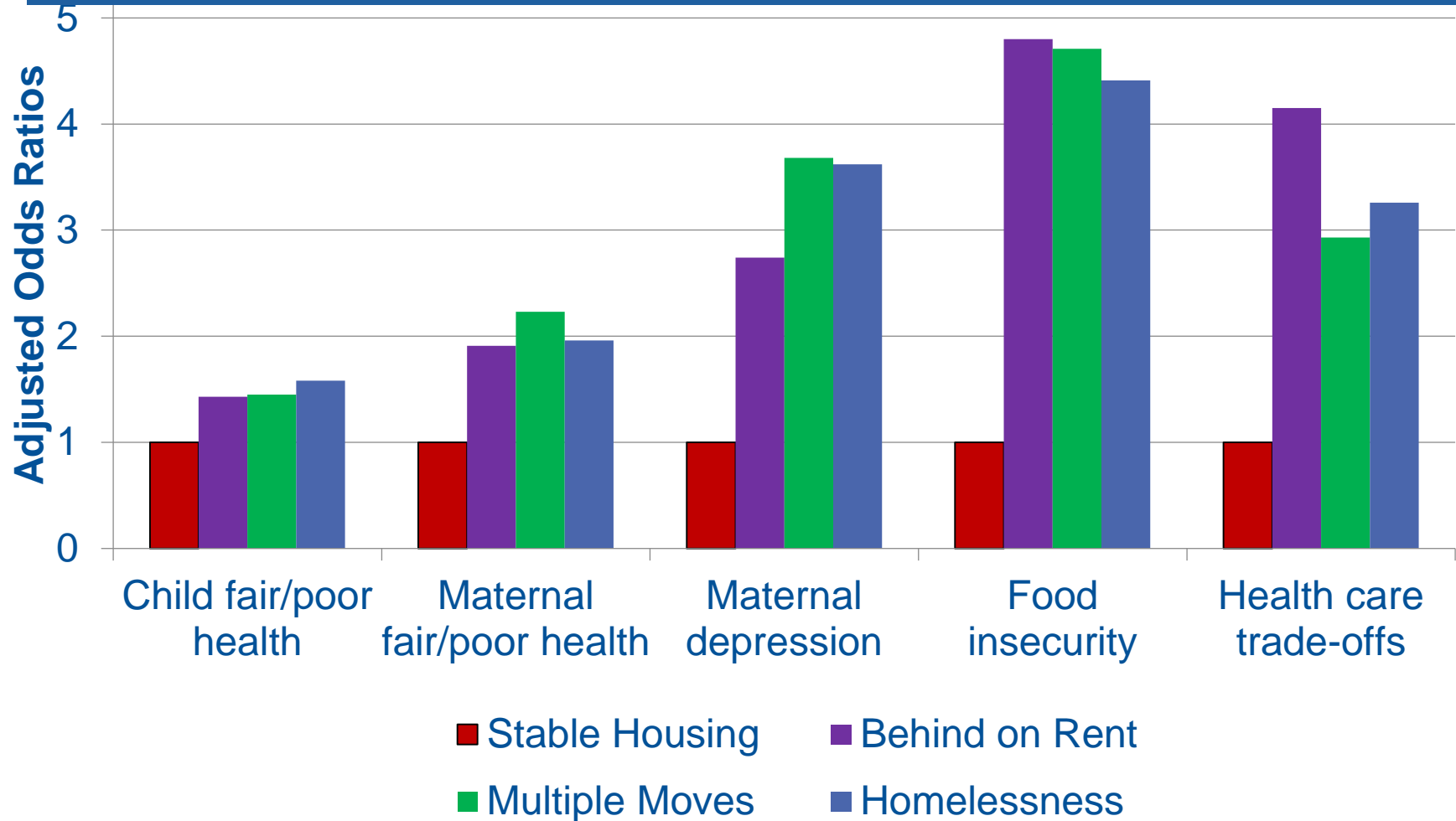
Number of adverse housing conditions



**Little overlap
among three
adverse housing
conditions**

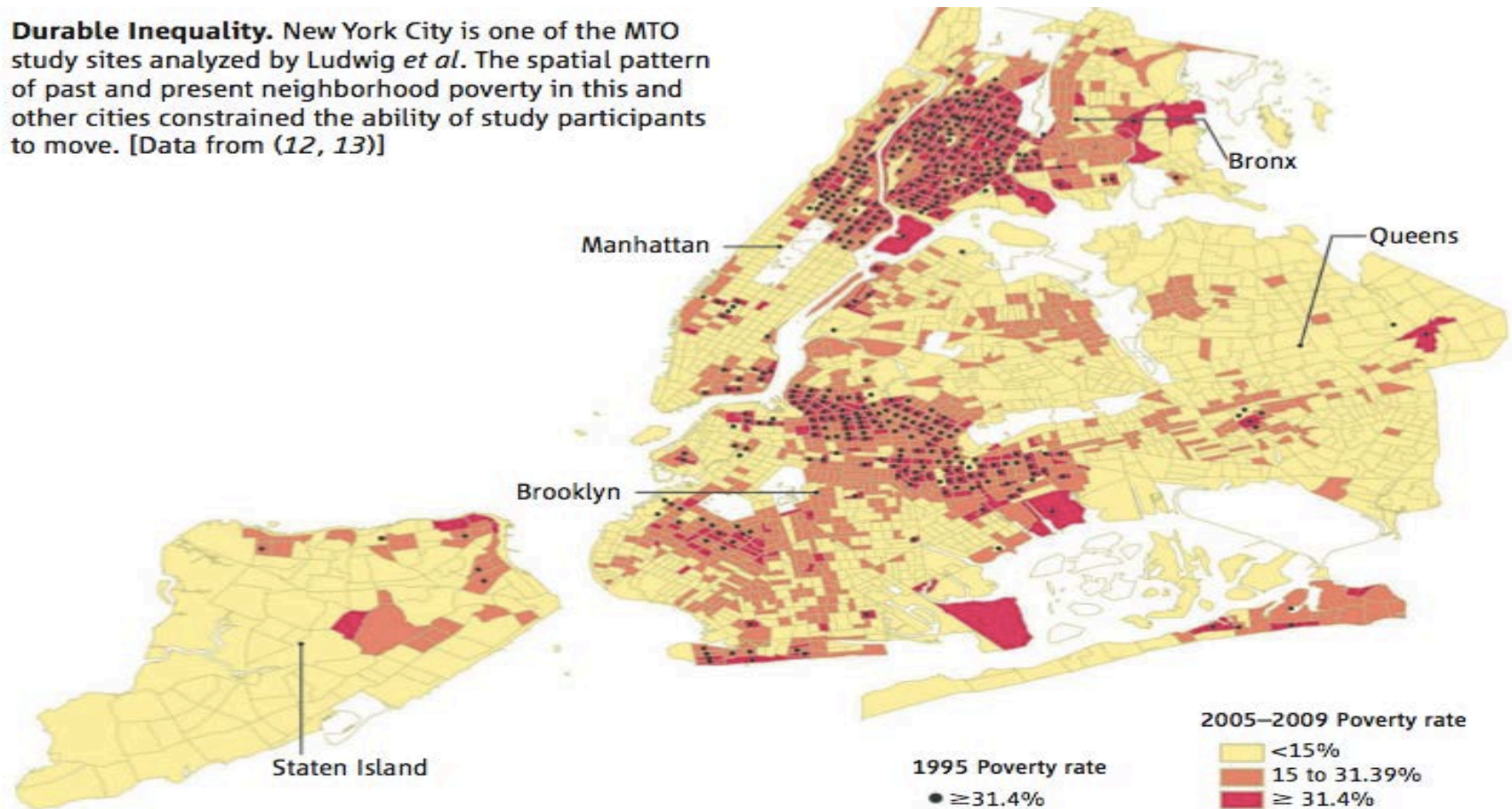
**Most families
were renters
and behind on
rent and
impacted health**

Outcomes of unstable housing with health and material hardship outcomes

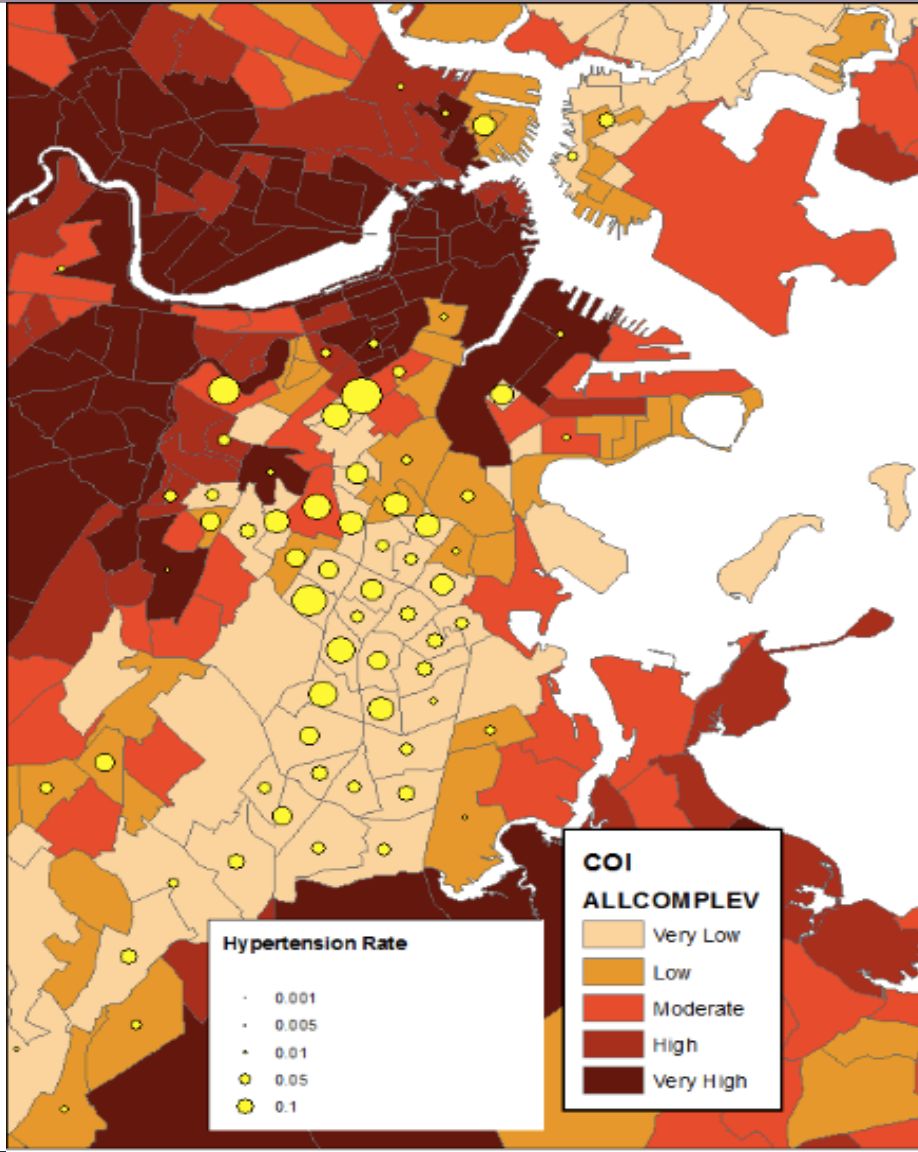


Location: Poverty and Zip code remain linked

Durable Inequality. New York City is one of the MTO study sites analyzed by Ludwig *et al.* The spatial pattern of past and present neighborhood poverty in this and other cities constrained the ability of study participants to move. [Data from (12, 13)]



Place, Opportunity, and Health



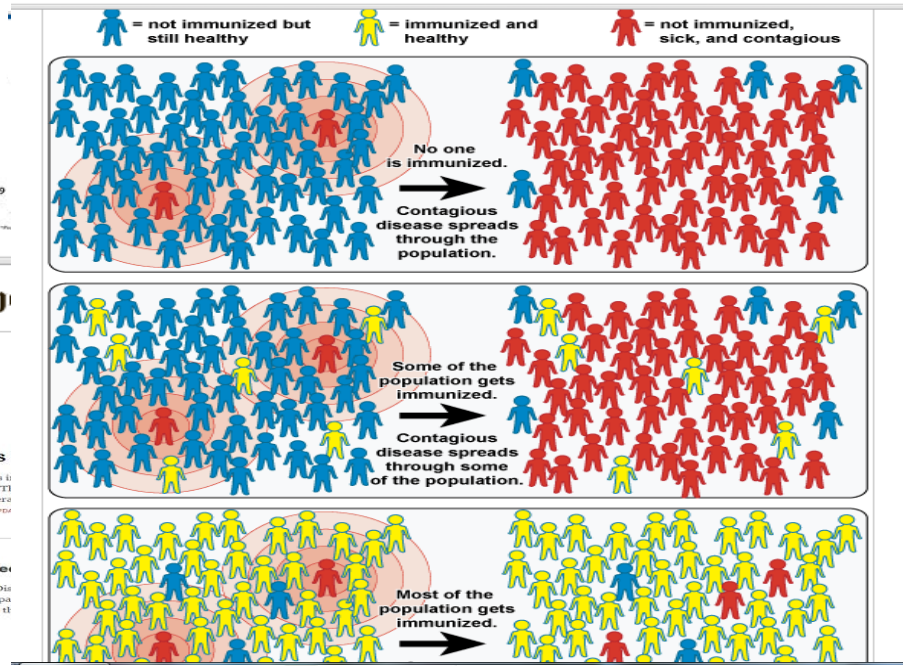
- Mapping elevations in the blood pressure of 3 years olds by Child Opportunity Index from diversitydatakids.org
- Vital Village Network at Boston Medical Center maps relationship between opportunity and life course (elevated BP at age 3)

Public Health 101 – Vaccine Review

Why vaccinate?

- Personal protection
- “Herd immunity”
- Community and economic benefit

From January 1 to February 20, 2015, 154 people from 17 states and Washington DC were reported to have measles [AZ (7), CA (104), CO (1), DC (2), DE (1), GA (1), IL (14), MI (1), MN (1), NE (2), NJ (1), NY (2), NV (6), PA (1), SD (2), TX (1), UT (2), WA (5)]. Most of these cases [118 cases (77%)] are part of a large, ongoing multi-state outbreak linked to an amusement park in California.



Facts About the Measles

The United States has already had more cases of measles this year than the number that is typically diagnosed in a full year. The disease was declared eliminated in the United States.

Where Cases Have Been Reported

A majority of the cases this year have been tied to an outbreak at Disneyland in California. At least 40 people who visited or worked at the theme park disease has now spread to at least six other states. The map shows the states where cases have been reported.



Subsidized Housing and Children's Nutritional Status

Data From a Multisite Surveillance Study

Alan Meyers, MD, MPH; Diana Cutts, MD; Debra Anne Skalicky, MPH; Timothy Heeren, PhD; John Maureen Black, PhD; Patrick Casey, MD; Nieve

Background: A critical shortage of affordable housing for low-income families continues in the United States. Children in households that are food insecure are at risk for adverse nutritional and health outcomes and may be more vulnerable to the economic pressures of high housing costs. Only about one fourth of eligible children receive a federally financed housing subsidy. Studies have examined the effects of such housing subsidies on the health and nutritional status of low-income

Objective: To examine the relationship between receiving housing subsidies and nutritional and health status among young children in low-income families, especially those that are food insecure.

Design: Cross-sectional observational study.

Setting and Participants: From August 1999 to 2003, the Children's Sentinel Nutrition Assessment Program interviewed caregivers of children younger than 6 years in pediatric clinics and emergency departments at 6 sites (Arkansas, California, Maryland, Massachusetts, Minnesota, and Washington, DC). Interviews assessed demographics, perceived child health, the US Household Food Security Scale, and public assistance program participation. Children's weight at the time of the visit was documented. The study sample consisted of all renter households identified as low income by their participation in at least 1 means-tested program.

Kids in Food Insecure Families were TWO FOLD less likely to be underweight if they had a housing subsidy than similar kids who were eligible but did not receive a subsidized home

...positive indications of undernutrition than those of comparable families not receiving housing subsidies, especially if the family is not only low income but also food insecure.

Arch Pediatr Adolesc Med. 2005;159:551-556

Cost-effectiveness of a Routine Varicella Vaccination Program for US Children

Tracy A. Lieu, MD, MPH; Stephen L. Cochi, MD; Steven R. Paul, MD, MPH; Henry R. Shinefield, MD; Sandra J. Holmes, PhD; Melissa M. Thompson, MD, MPH

Objective.—To evaluate the economic consequence of a routine vaccination program that targets healthy children.

Methods.—Decision analysis was used to compare the cost-effectiveness of a routine vaccination program with no routine vaccination. Outcomes were based on a mathematical model of vaccination outcomes published and unpublished data and on expert opinion. Model costs were collected from multiple sources, including the Medical Care Program and the California Hospital Discharge Data.

Results.—A routine varicella vaccination program would prevent 94% of all potential cases of chickenpox, provide a coverage rate is 97% at school entry. It would cost approximately \$2 per child if one dose of vaccine per child were recommended at the societal perspective, which includes work-loss costs. However, from the health care payer's perspective (medical costs), the program would cost approximately \$2 per chickenpox case life-year saved. The medical cost of disease prevention was relatively insensitive to vaccination coverage rate and vaccine price but was relatively sensitive to assumptions about vaccine efficacy within plausible ranges. Catch-up vaccination of 12-year-olds would have high incremental costs. The net savings of a routine vaccination program were sensitive to vaccination coverage rate of children of preschool age were net savings at a coverage rate of 50%.

Conclusions.—A routine varicella vaccination program would result in net savings from the societal perspective as well as medical costs. Compared with other preventive programs, a routine vaccination program could also be relatively cost-effective from the health care payer's perspective.

VARICELLA virus causes an estimated 3.7 million cases of chickenpox and 9000 hospitalizations in the United States annually.¹ A routine varicella vaccination program targeting healthy children could prevent most of this morbidity

and mortality (M.E.H., S.L.C., M.W., and L. Fehrs, MD, unpublished data, 1993), but would it be worth the cost?

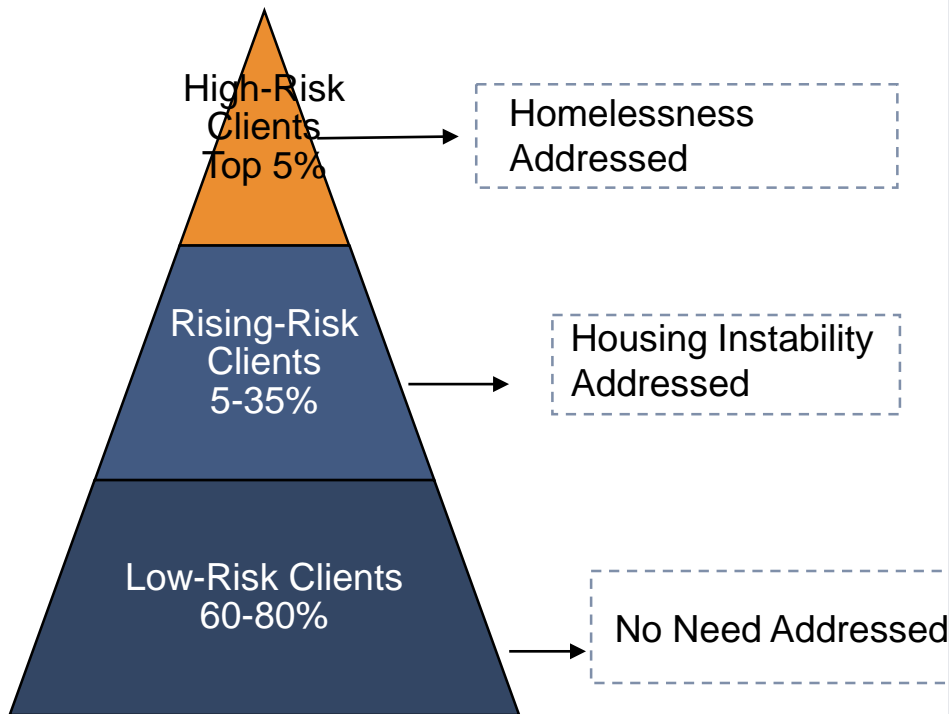
A cost-benefit analysis in 1985 suggested that a varicella vaccine that provided lifelong immunity would save \$7 in costs to society for every dollar in-

creased. Major complications were defined as those requiring hospitalization, including but not limited to pneumonia and encephalitis. Patients with major complications could go on to have no long-term sequelae, long-term disability, or death. The possibility that a vaccination program could cause changes in the

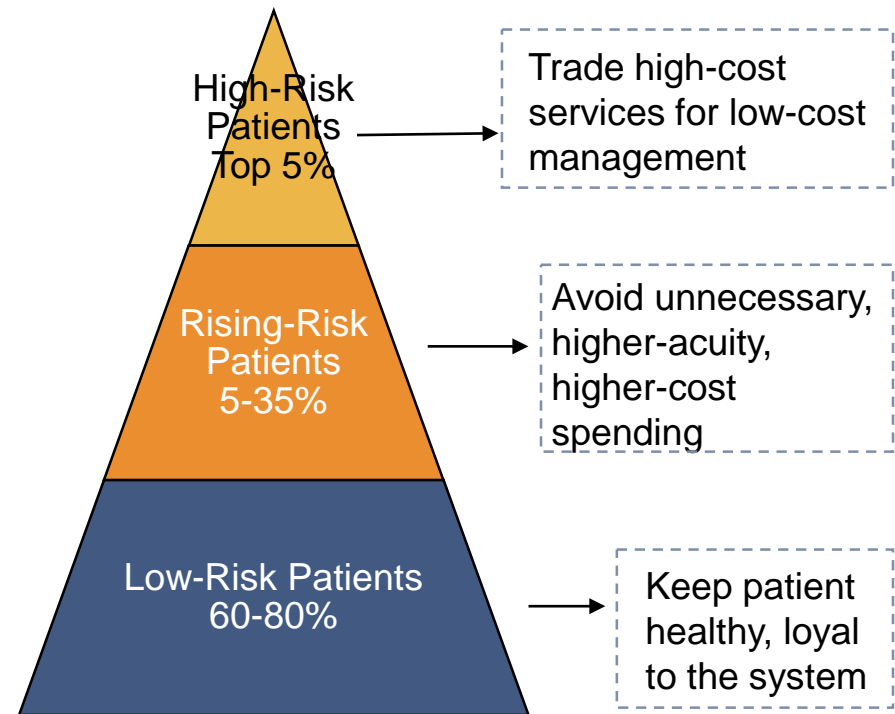
For Healthcare costs alone, it did not save money, but cost \$2 per chicken pox case prevented. But by societal costs, every \$1 invested in vaccines saved \$5 including work-loss costs

How Should Population Health be Defined?

Population by Housing Risk



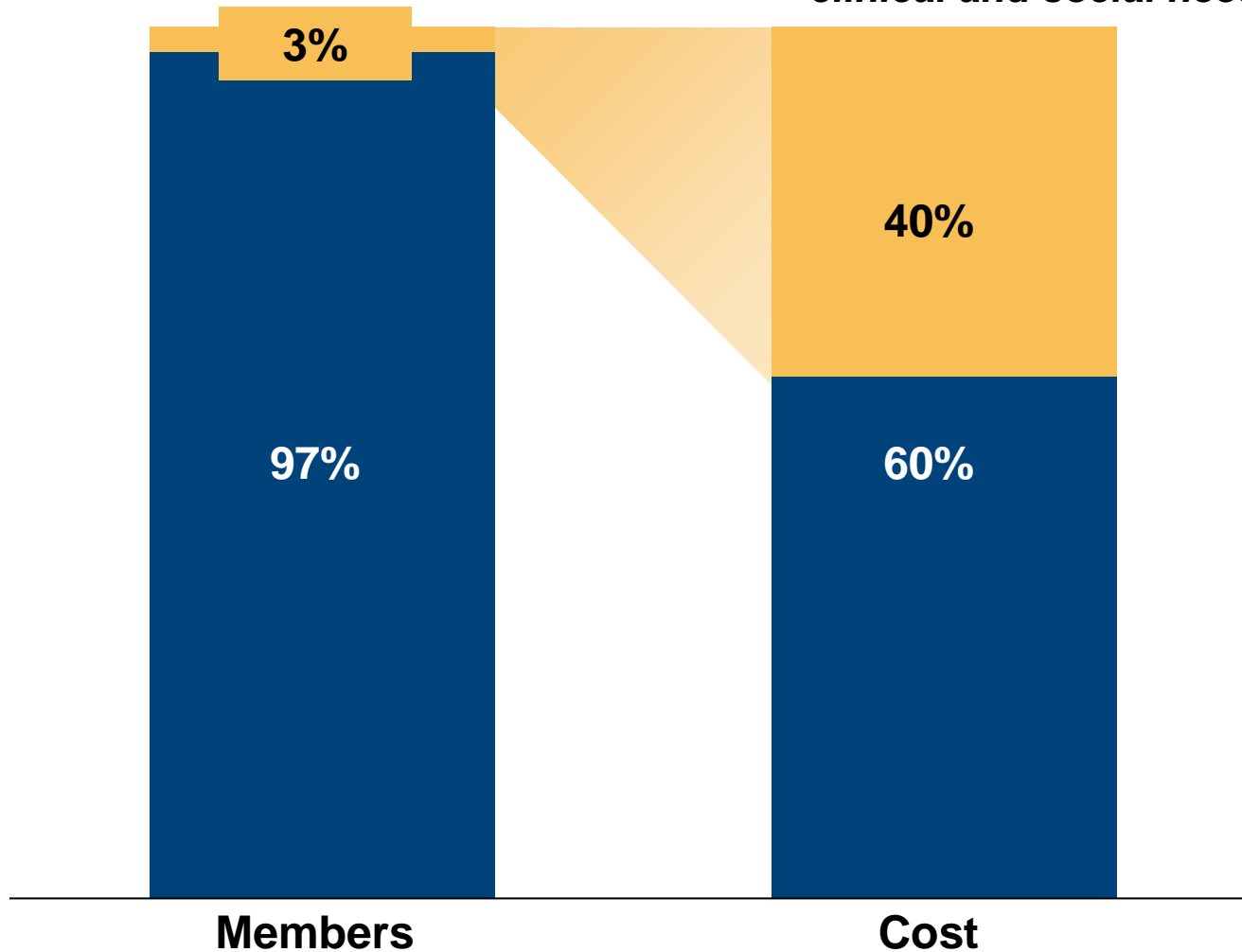
How Healthcare Alone Looks at Risk



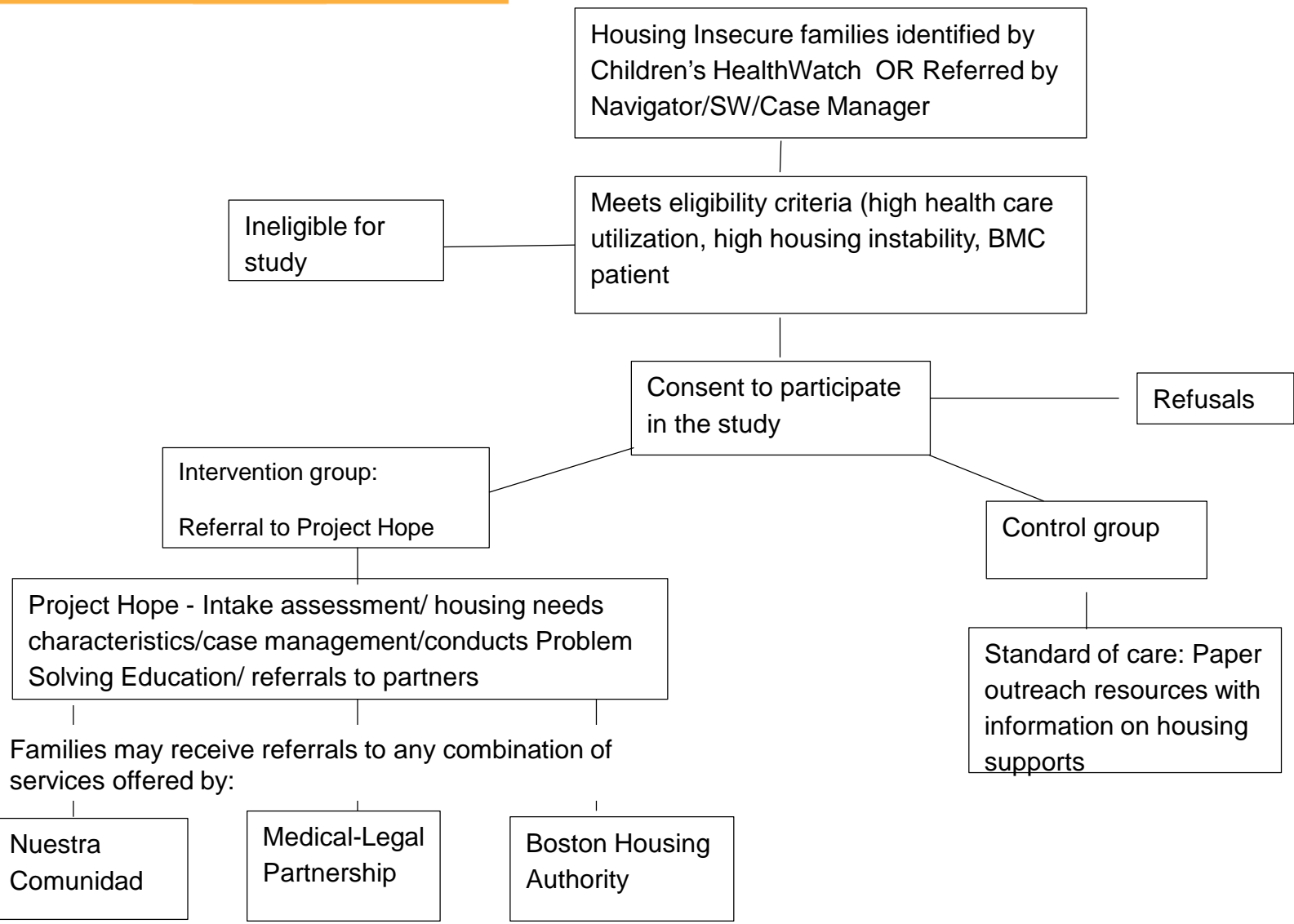
Homelessness Drives HealthCare Costs

3 percent of our patients account for 40% of our costs

Our highest risk patients have both clinical and social needs



New RCT studies in Housing



What Could This Look Like in Action

Healthy Start in Housing

- Housing insecure, high risk pregnant/ parenting families, child <5 with complex condition requiring specialty care
- Secure and retain housing to
 - improve birth outcomes
 - improve the health and well-being of women and families
- Provision of housing by public housing
- Intensive case management: housing retention, engagement in services, family development plan paid for by health sector



Boston Public Health Commission & Boston Housing Authority

Investing in Partnerships



Press Releases

Boston Medical Center to Invest \$6.5 Million in Affordable Housing to Improve Community Health and Patient Outcomes, Reduce Medical Costs

December 07, 2017

We are investing \$6.5M in housing initiatives in Boston's most underserved neighborhoods. Our first venture into housing is a key opportunity to partner with our community and impact population health

Partners

Funding

Housing Project Investments



\$2.2M

Housing Support Service



The Community Builder



\$0.9M

Hybrid Housing Project Investment



Pine Street Inn
Ending Homelessness



Boston Housing Authority

\$1.3M

Community Engagement & Housing Stability



\$1.7M

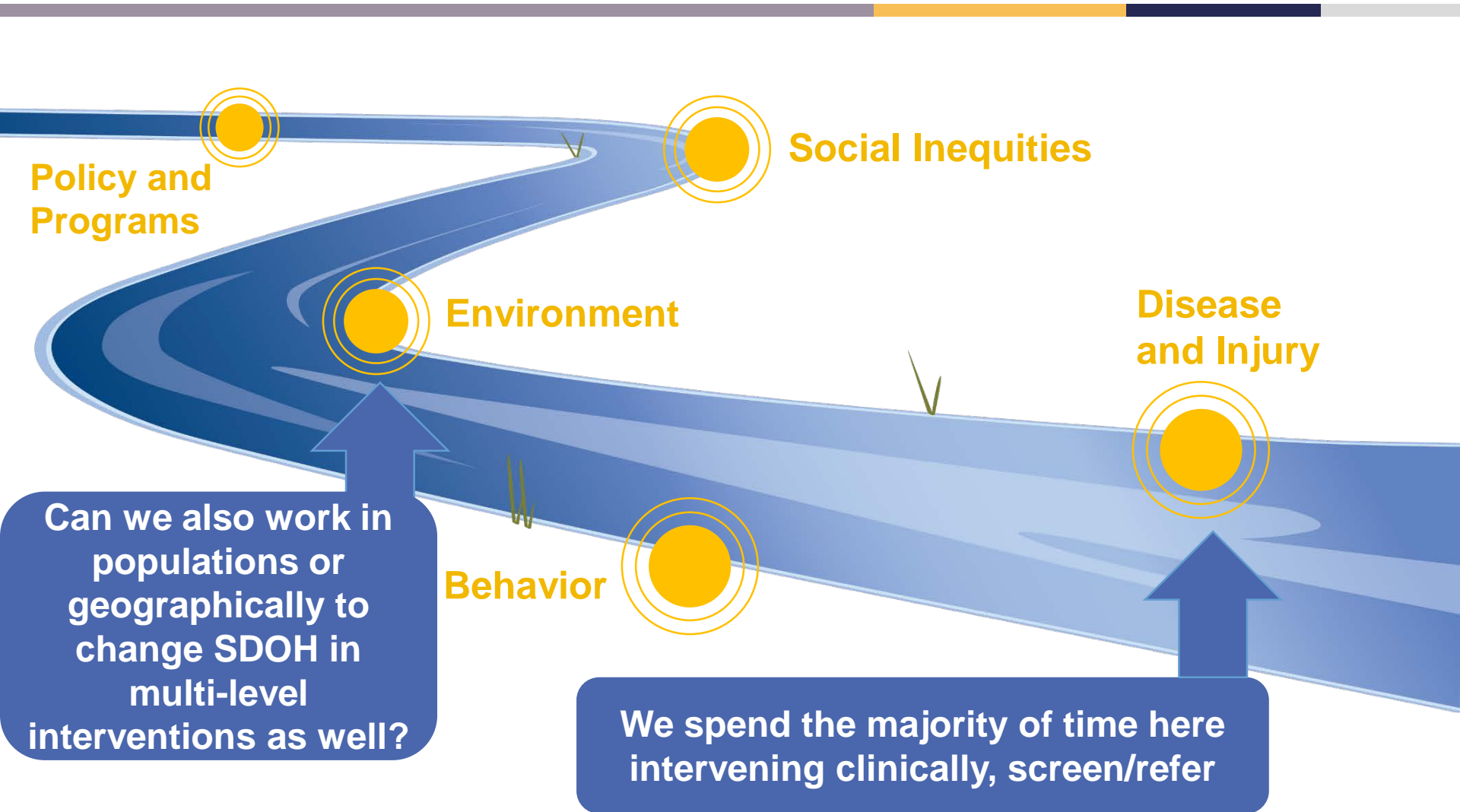
Social Impact Fund

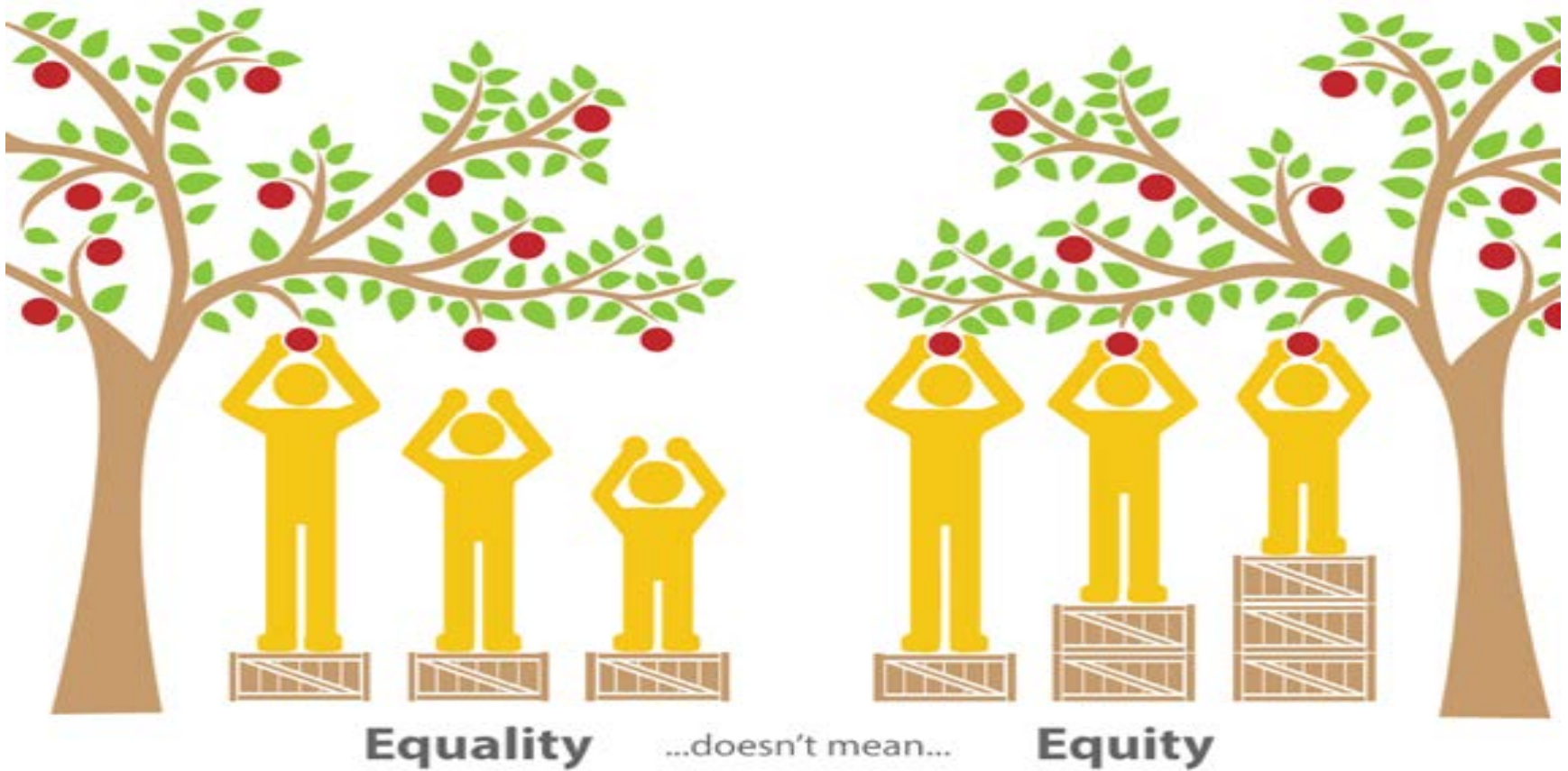
HEALTHY
NEIGHBORHOODS
EQUITY FUND I LP

\$0.5M

- This fall, we innovatively guided Determination of Need obligated funding towards housing.
- We aim to support housing and wrap-around services our patients and use **Community Investment Tax Credits** to stretch dollars.
- We plan to test multiple approaches and have devoted \$0.65M to evaluation and oversight to determine the best approach.
- We look forward to working with other Boston hospitals to make similar investments and work collaboratively to improve community health.

To achieve real change in SDOH we have to go deeper than typical clinical interventions to address root causes and test multi-level strategies





Neudorf C, Kryzanowski J, Turner H, et al. (2014). Better Health for All Series 3: Advancing Health Equity in Health Care. Saskatoon: Saskatoon Health Region. Available from: https://www.saskatoonhealthregion.ca/locations_services/Services/Health-Observatory/Pages/ReportsPublicatlions.aspx