CHILDREN'S HealthWatch

Housing, Child Health, and Healthy Communities:
A Stable, Decent, Affordable Home is Like a Vaccine

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Arizona Healthy Communities Conference
Mesa, Arizona
March 25, 2015

Children's HealthWatch

- Non-partisan network of pediatric & public health researchs → research & policy center
- MISSION: Improve health & development young children→ public policies → alleviate family economic hardships
  - Hunger (Food Insecurity)
  - Unstable Housing (Housing Insecurity)
  - Keeping Heat or Lights on (Energy Insecurity)
- Provide policy makers with evidence to develop policies that protect young children's health and development

Where our data come from:

Emergency Departments and Primary Care Clinics in Boston, Baltimore, Philadelphia, Little Rock and Minneapolis.

- A household survey
- Interviews - caregivers with children 0 to 4 years old
  - “invisible” group
  - critical window of time

US Housing Insecurity and the Health of Very Young Children

Diana Becker Cutts, MD, Alan F. Meyers, MD, MPH, Maureen M. Black, PhD, Patrick H. Casey, MD, Mariana Chilton, PhD, MPH, John T. Cook, PhD, Joni Geppert, MPH, RD, LN, Stephanie Ettinger de Cuba, MPH, Timothy Heeren, PhD, Sharon Coleman, MPH, MS, Ruth Rose-Jacobs, ScD, and Deborah A. Frank, MD

Objectives. We investigated the association between housing insecurity and the health of very young children.

Methods. Between 1998 and 2007, we interviewed 22 069 low-income caregivers with children younger than 3 years who were seen in 7 US urban medical centers. We assessed food insecurity, child health status, developmental risk, weight, and housing insecurity for each child's household. Our indicators for housing insecurity were crowding (>2 people/bedroom or >1 family/residence) and multiple moves (≥2 moves within the previous year).

Results. After adjusting for covariates, crowding was associated with household food insecurity compared with the securely housed (adjusted odds ratio [AOR]=1.30; 95% confidence interval [CI]=1.18, 1.43), as were multiple moves (AOR=1.91; 95% CI=1.59, 2.28). Crowding was also associated with child food insecurity (AOR=1.47; 95% CI=1.34, 1.63), and so were multiple moves (AOR=2.56; 95% CI=2.13, 3.08). Multiple moves were associated with fair or poor child health (AOR=1.48; 95% CI=1.25, 1.76), developmental risk (AOR 1.71; 95% CI=1.33, 2.21), and lower weight-for-age *z* scores (–0.082 vs –0.013; *P*=.02).

Conclusions. Housing insecurity is associated with poor health, lower weight, and developmental risk among young children. Policies that decrease housing insecurity can promote the health of young children and should be a priority. (*Am J Public Health.* 2011;101:1508–1514. doi:10.2105/AJPH.2011.300139)

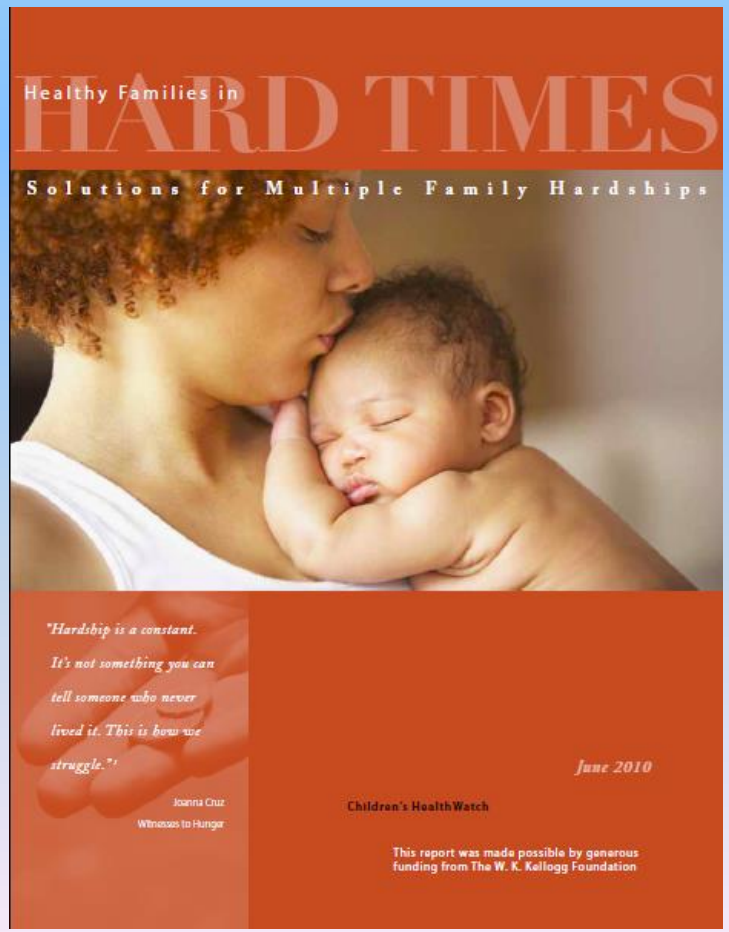
In the United States, as in other countries, housing is considered a strong social determinant of health.[1] Poor housing conditions have been linked to multiple negative health outcomes in both children and adults. The Department of Health and Human Services has defined housing insecurity as high housing costs in proportion to income, poor housing quality, unstable neighborhoods, overcrowding, or homelessness.[2] Crowding in the home and multiple moves from home to home have clear negative associations for children. Crowding is negatively associated with mental health status,[3] ability to cope with stress,[4] child and parent interaction,[5] social relationships,[3] and sleep.[3] It also increases the risk for childhood injuries,[6] elevated blood pressure,[5] respiratory conditions,[7] and exposure to infectious disease.[7] Adults[8] and children[9] living in crowded households are less likely to access health care services than are those in noncrowded households, and families with multiple moves are less likely to establish a medical home and seek out preventive health services for their children than are securely housed families.[10]

adjusted income has been used as the threshold for affordable housing costs. But affordability

HealthWatch study approached 36 618 adult caregivers of children younger than 3 years at

Use evidence from empirical research results to:

- Inform actionable policy decisions
- Support policy recommendations



How Does Housing Influence Child Health?

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- Overview of how housing influences child health
  - Stability
  - Quality**
  - Affordability
- How is housing like a vaccine?
  - Provide multiple benefits
  - Long-lasting benefits, differential benefits
  - Benefits to individual and society
- Discuss how Housing and Healthcare can be bridged to provide the Housing Vaccine

Unstable Housing, Hunger, Health Linked

Children in housing-insecure families more likely to be

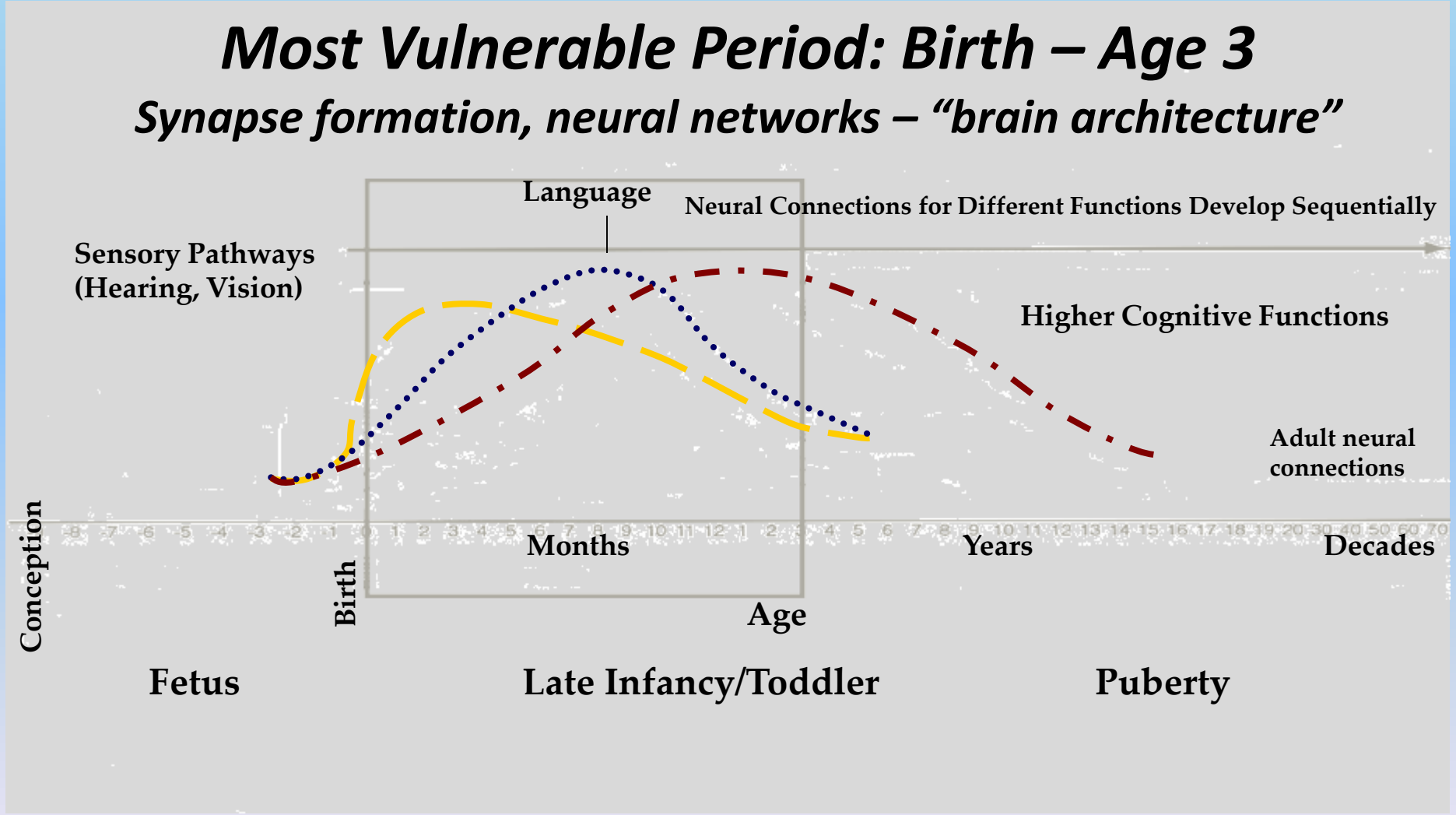
- Food insecure
- In fair/poor health
- At risk for developmental delays
- Seriously underweight

compared to children in housing-secure families

Human Brain Development

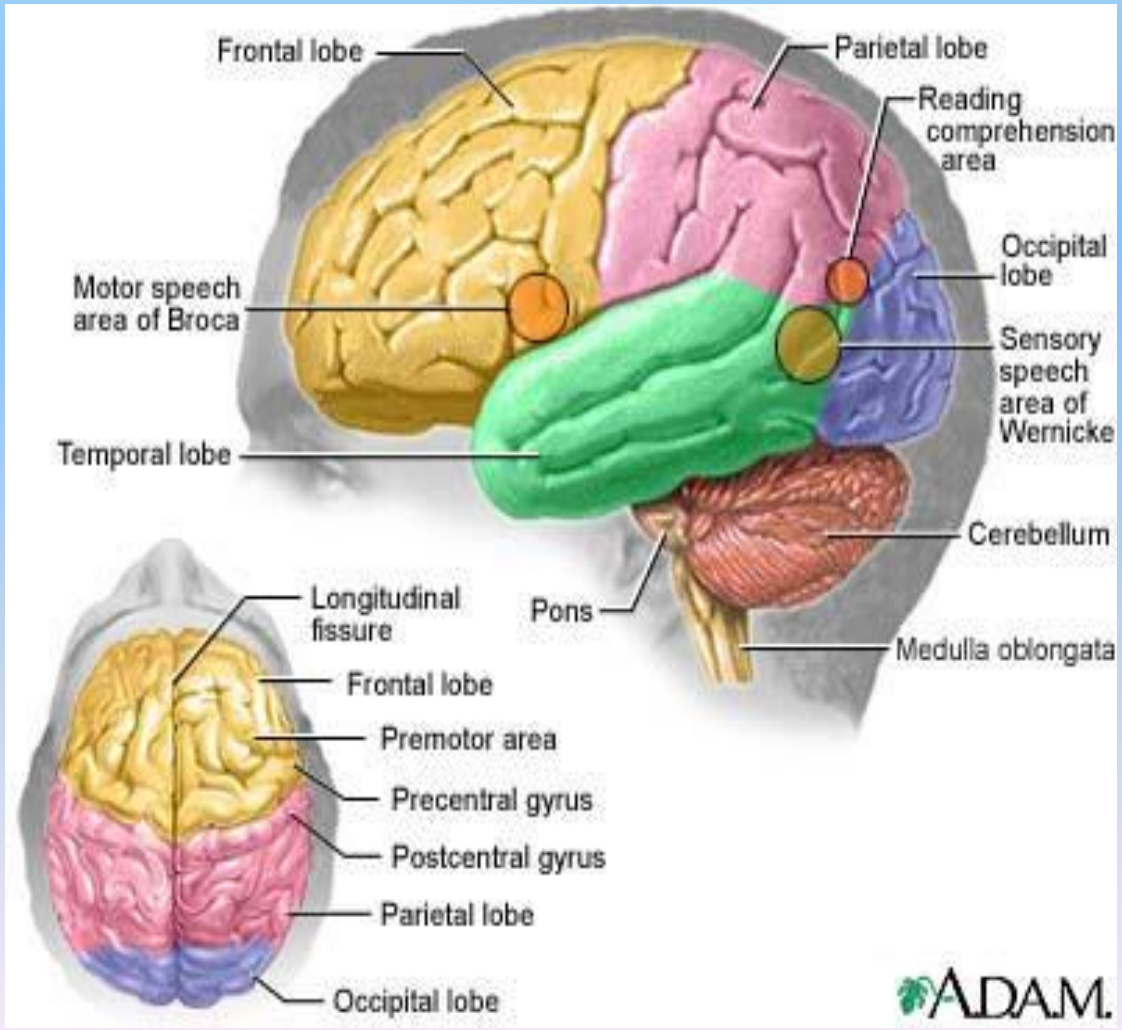
Most Vulnerable Period: Birth – Age 3

Synapse formation, neural networks – "brain architecture"

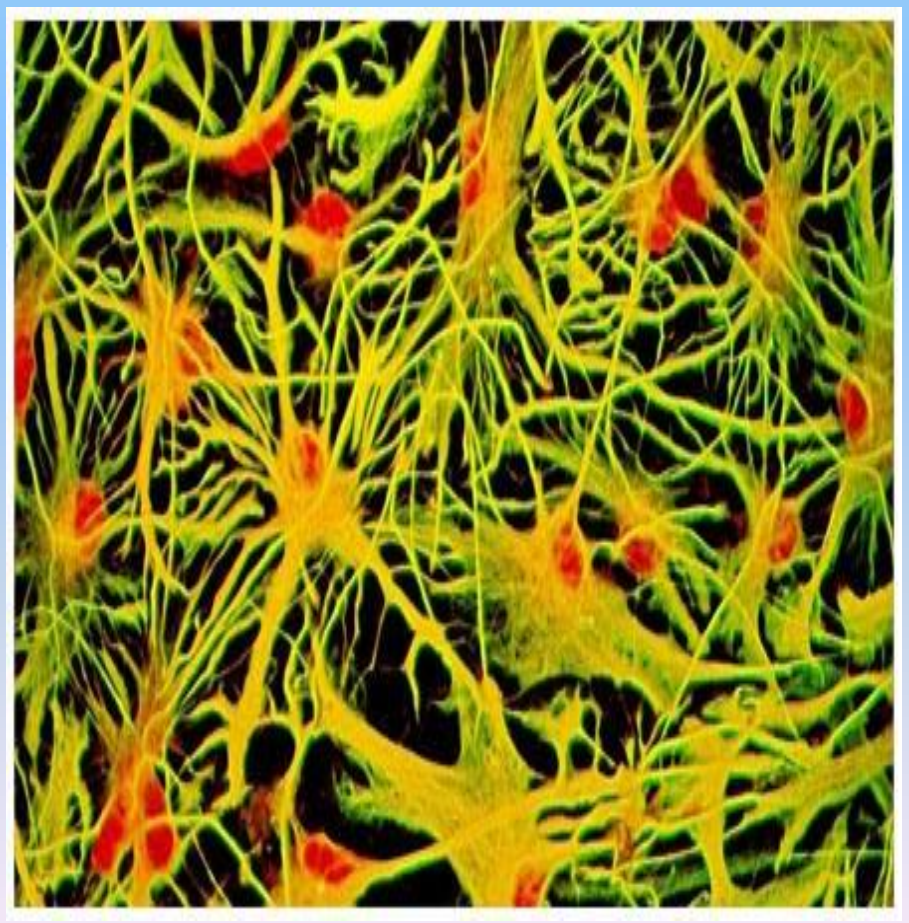


Source: Thompson & Nelson, 2000

Brain architecture is laid down during the first three years of life



Brain architecture is physical structure, interconnections, & neural networks



Brain “architecture” is physical structure, and interconnections. There are about 100 billion cells in the brain.

It is influenced by many factors, including those associated with stress related to poverty, and food insecurity.

The first 3 years of life largely set the trajectory of cognitive development, school readiness, academic achievement, and educational attainment .

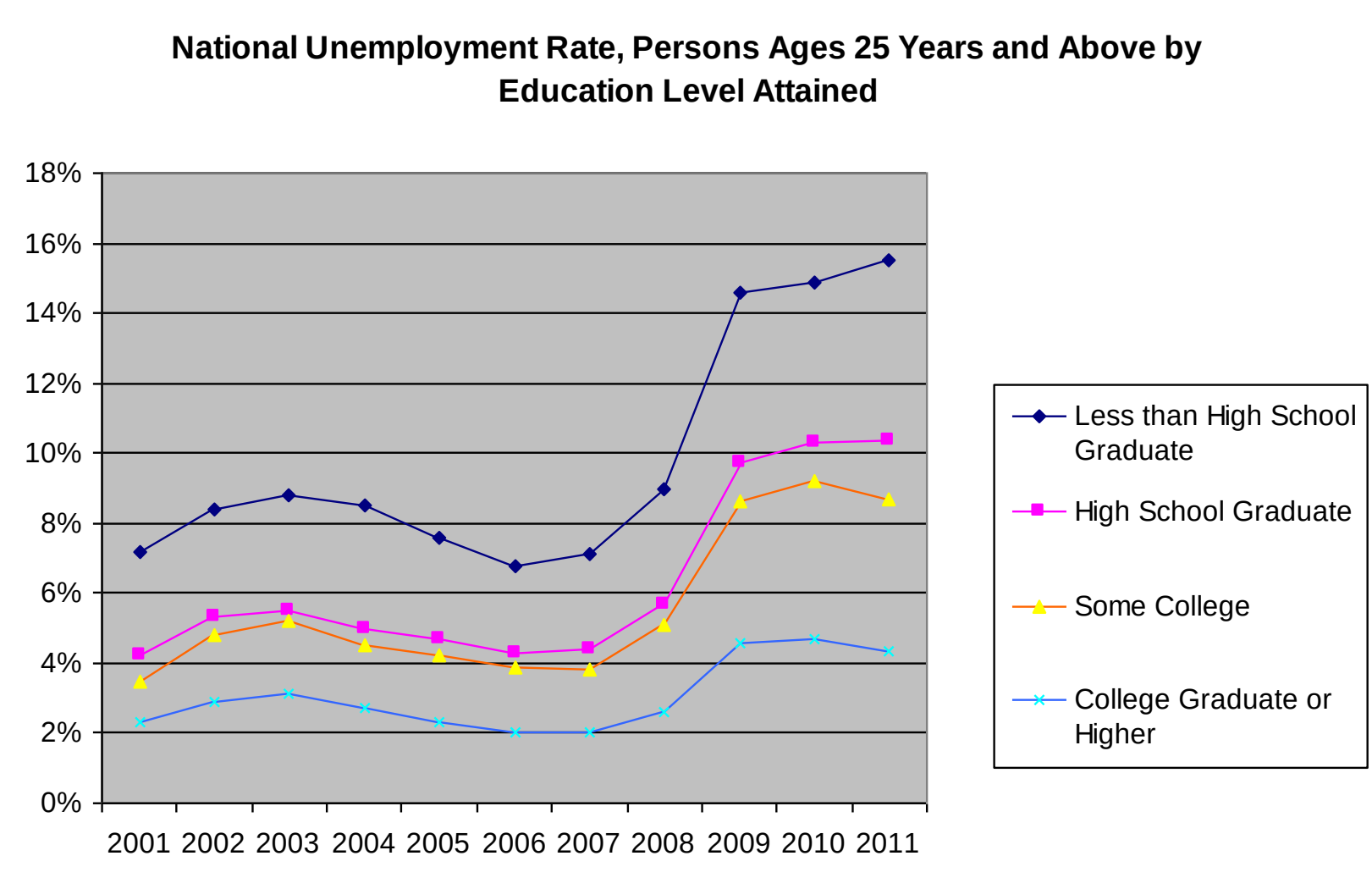
Toxic stress damages the brain architecture!

Stress is a natural response to changes and challenges in our environment

- Stress can be mild, and lead to important learning – we can learn from stress
- Moderate stress – can go either way, can learn from it, or it can be harmful
- **Toxic stress** – chronic mild-to-moderate stress, or acute short term stress

Toxic stress damages the brain architecture of young, developing children!

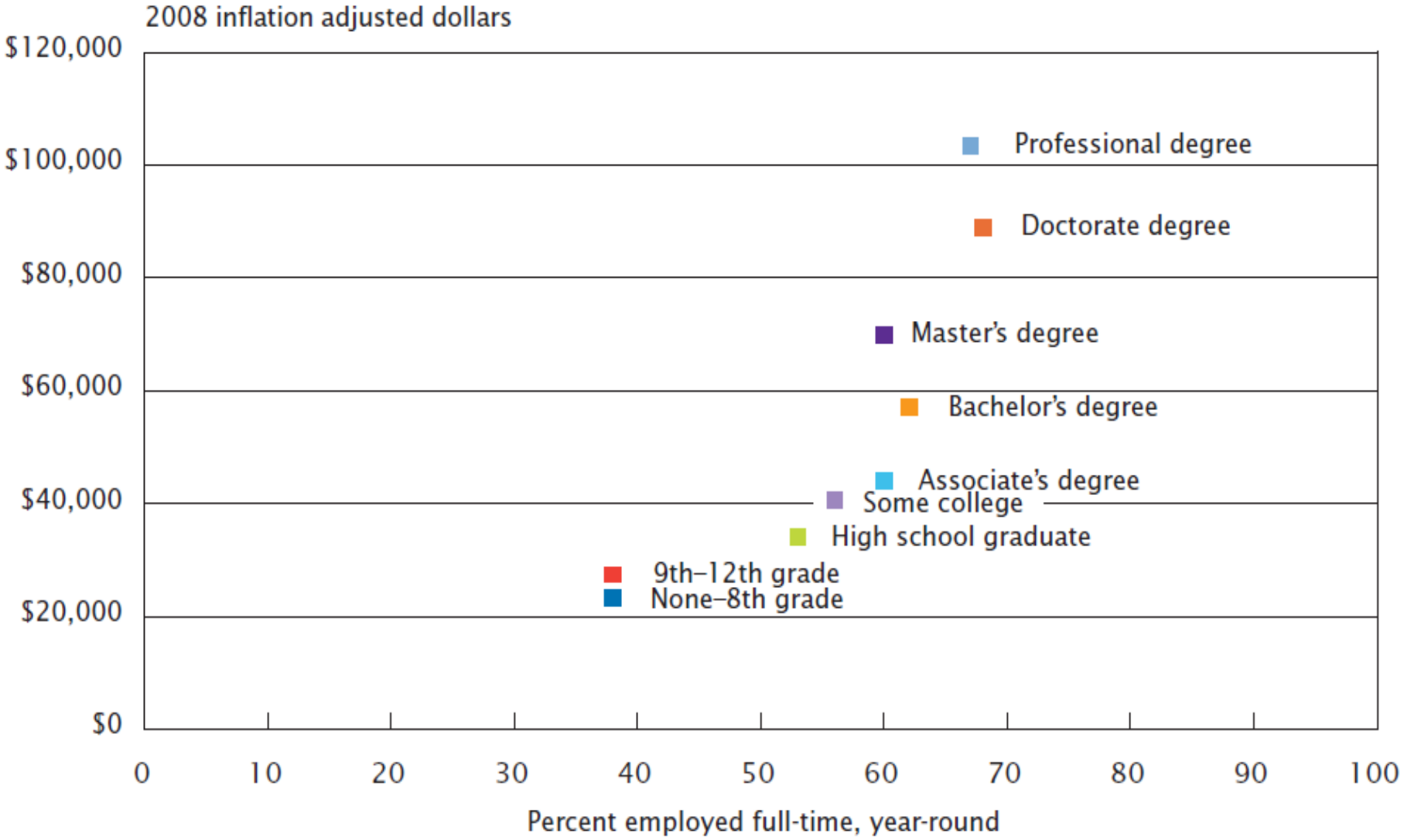
Why Impacts of Housing Insecurity on Child Health and Development and Health Matter



Source: U.S. Bureau of Labor Statistics, CPS unemployment data.

Figure 2.

Education, Work Status, and Median Annual Earnings



Source: U.S. Census Bureau, American Community Survey, 2006–2008.

Homelessness; does timing matter?

- Yes!
- Comparison - birth outcomes
  - Consistently housed
  - Homeless prenatally
  - Homeless postnatally

- Mothers' characteristics or homelessness itself?
- Prenatal homeless – increased risk of
  - Low birthweight
  - Preterm delivery
  - Lower weight at birth

Cutts et al. MCH, 2014.

Preliminary data – differential effects of homelessness

Prenatal homelessness → poor birth outcomes, poor health

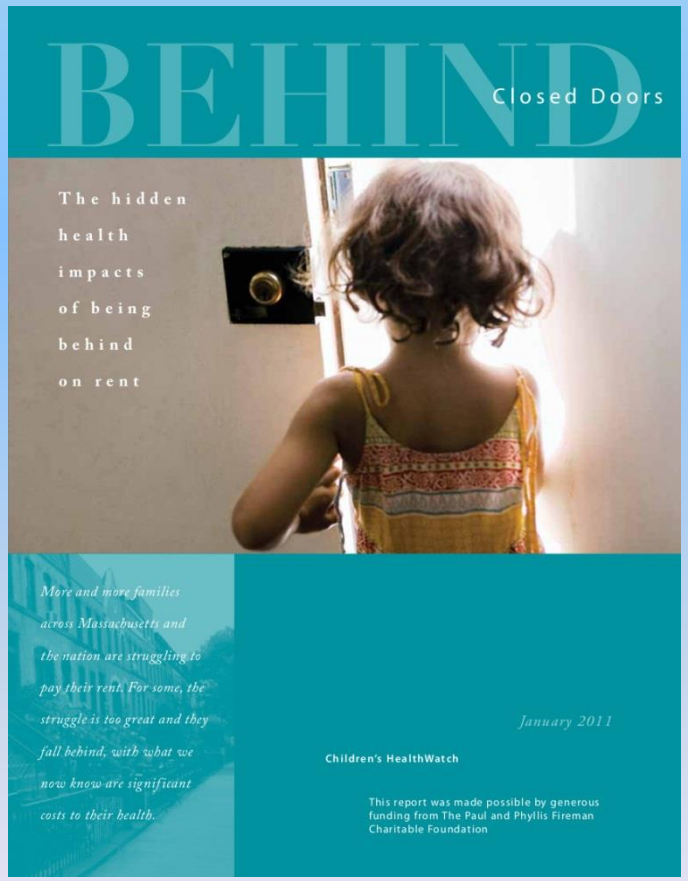
Postnatal homelessness → Poor child health and development

<u>Cumulative effect matters</u>

Prenatal + Postnatal homelessness → Poor birth outcomes, hospitalizations, poor child health, and development

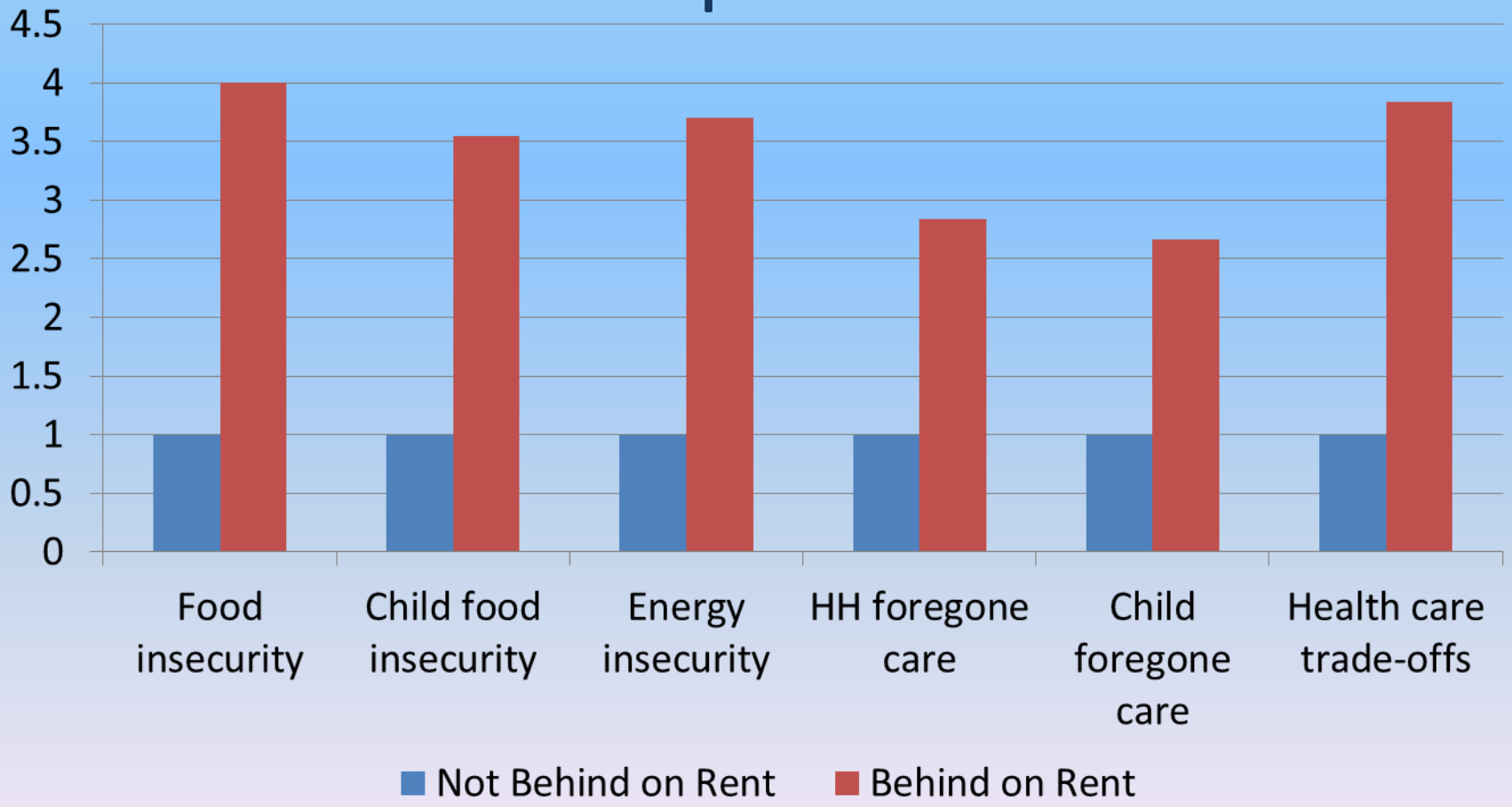
Sandel et al. In preparation.

Affordability: Behind Closed Doors



- Being <u>behind on rent</u> strongly associated with negative child and maternal health outcomes
  - Lifetime hospitalizations
  - Fair/poor health
  - Serious underweight
  - Maternal fair/poor health
  - Maternal depressive symptoms

Being behind on rent – strong indicator of other household hardship



Cutts et al. In preparation.

R_x for Hunger: Affordable Housing

- Housing subsidies free up resources for food & other necessities
- Children in subsidized housing (compared to those on waitlist)
  - More likely food secure
  - Less likely underweight
  - More likely a “well” child

Public Health 101 – Vaccine Review

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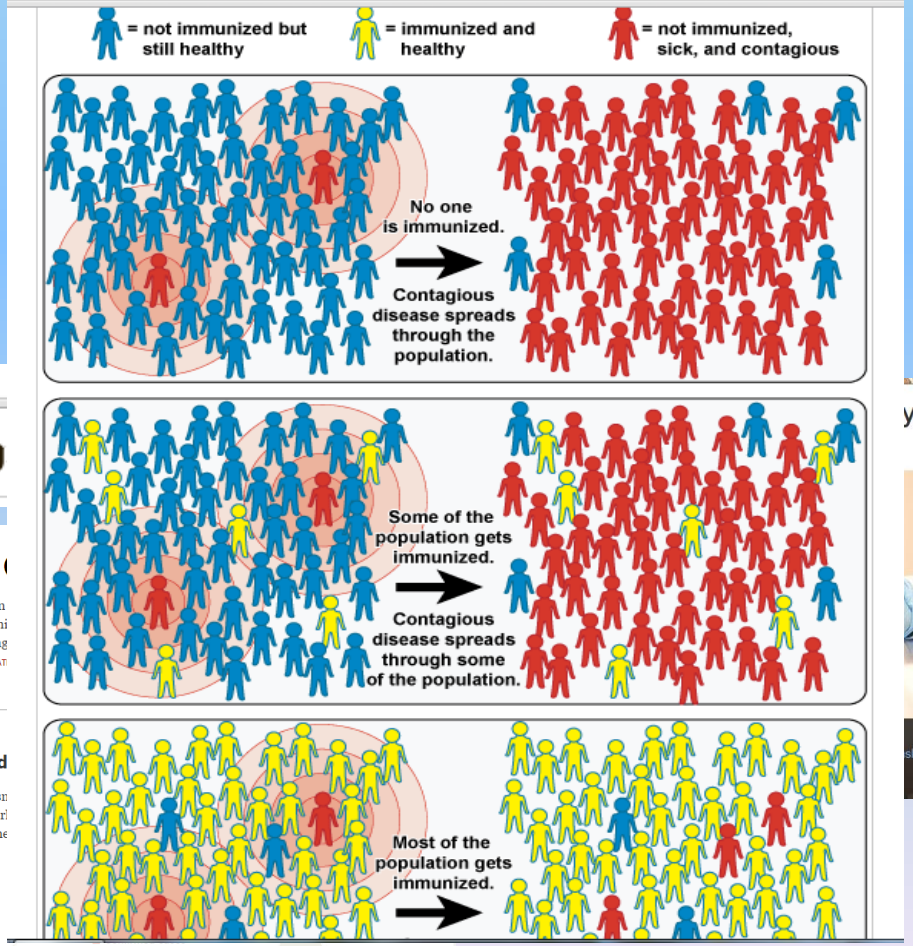
Why vaccinate?

- 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.



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Facts About the Measles (

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

Where Cases Have Been Reported

A majority of the cases this year have been tied to an outbreak at Disn December. At least 40 people who visited or worked at the theme par disease has now spread to at least six other states. The map shows the reported. DATA AS OF FEB. 6

sles In

Why would Housing be like a vaccine?

- What are the properties of vaccines?
  - Provide benefits against multiple threats
  - Builds immunity to be long lasting
  - Acknowledged to have differential benefits, can be targeted or tailored to groups
- Why do we think vaccines are good investments?
  - Benefits to individual and society

ARTICLE

Subsidized Housing and Children's Nutritional Status

Data From a Multisite Surveillance Study

Alan Meyers, MD, MPH; Diana Cutts, MD; Deborah A. Frank, MD; Suzette Levenson, MEd, MPH; Anne Skalicky, MPH; Timothy Heeren, PhD; John Cook, PhD; Carol Berkowitz, MD; Maureen Black, PhD; Patrick Casey, MD; Nieves Zaldivar, MD

Background: A critical shortage of affordable housing for low-income families continues in
dren in households that are food
for adverse nutritional and health
be more vulnerable to the econor
high housing costs. Only about or
lies receive a federally financed ho
ies have examined the effects of su
the health and nutritional status

Objective: To examine the re
ceiving housing subsidies and nu
tus among young children in lo
pecially those that are food inse

Design: Cross-sectional observ

Setting and Participants: Fro
2003, the Children's Sentinel Nu
gram interviewed caregivers of c
years in pediatric clinics and emergency departments in 6 sites (Arkansas, California, Maryland, Massachusetts, Minnesota, and Washington, DC). Interviews included 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.

Main Outcome Measures: Weight for age, self-

Even after controlling for food insecurity, children living in subsidized housing had healthier weights for their age, while those in food-insecure families without a subsidy were more likely to be seriously underweight.

Conclusions: In a large convenience sentinel sample, the children of low-income renter families who receive public housing subsidies are less likely to have anthropometric 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

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Special Communication

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

JAMA The Journal of the American Medical Association

Tracy A. Lieu, MD, MPH; Stephen L. Cochi, MD; Steven B. Black, MD; M. Elizabeth Halloran, MD, DSc; Henry R. Shinefield, MD; Sandra J. Holmes, PhD; Melinda Wharton, MD; A. Eugene Washington, MD, MSc

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

Methods.—Decision analysis was used to compare the costs, outcomes, and cost-effectiveness of a routine vaccination program with no intervention. Clinical outcomes were based on a mathematical model of vaccine efficacy that relied on published and unpublished data and on expert opinion. Medical utilization rates and costs were collected from multiple sources, including the Kaiser Permanente Medical Care Program and the California Hospital Discharge Database.

Results.—A routine varicella vaccination program for healthy children would prevent 94% of all potential cases of chickenpox, provided the vaccination coverage rate is 97% at school entry. It would cost approximately $162 million annually if one dose of vaccine per child were recommended at a cost of $35 per dose. From the societal perspective, which includes work-loss costs as well as medical costs, the program would save more than $5 for every dollar invested in vaccination. However, from the health care payer's perspective (medical costs only), the program would cost approximately $2 per chickenpox case prevented, or $2500 per life-year saved. The medical cost of disease prevention was sensitive to the vaccination coverage rate and vaccine price but was relatively insensitive to assumptions about vaccine efficacy within plausible ranges. An additional program for catch-up vaccination of 12-year-olds would have high incremental costs if the vaccination coverage rate of children of preschool age were 97%, but would result in net savings at a coverage rate of 50%.

Conclusions.—A routine varicella vaccination program for healthy children would result in net savings from the societal perspective, which includes work-loss costs as well as medical costs. Compared with other prevention programs, it would also be relatively cost-effective from the health care payer's perspective.

(*JAMA.* 1994;271:375-381)

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-

Policy decisions about new health programs today ideally should be based not only on clinical effectiveness but also on cost-effectiveness. We performed an updated cost-effectiveness analysis of a routine varicella vaccination program for preschool-age children, who are currently being considered by policymakers as the primary target group for vaccination. The present analysis is unique because it takes into account (1) current evidence about vaccine efficacy, (2) the effects of expected changes in the age distribution of disease, and (3) empirical data on the costs of medical utilization and work loss from varicella.

METHODS

Decision Analysis Model

We constructed a decision tree (Fig 1) to compare two major options for varicella. Under "No Vaccination," a person's probability of contracting chickenpox reflects the current absence of a vaccination program. Chickenpox may cause no complications, major complications, or death (Fig 2). It also may cause medical utilization including telephone advice, outpatient visits, emergency department visits, and hospitalization.

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

Subsidized Housing Index

- Focus – low-income families with young children in cities with fewer subsidized units than need → higher rates of housing insecurity
- County-level index of availability of subsidized housing
  - Total # sub. units available (occ + unocc) relative to demand, low-income households paying >30% of income for rent

Bailey et al. Housing Policy Debate. In press.

Subsidized Housing Index – if supply increases what can cities expect?

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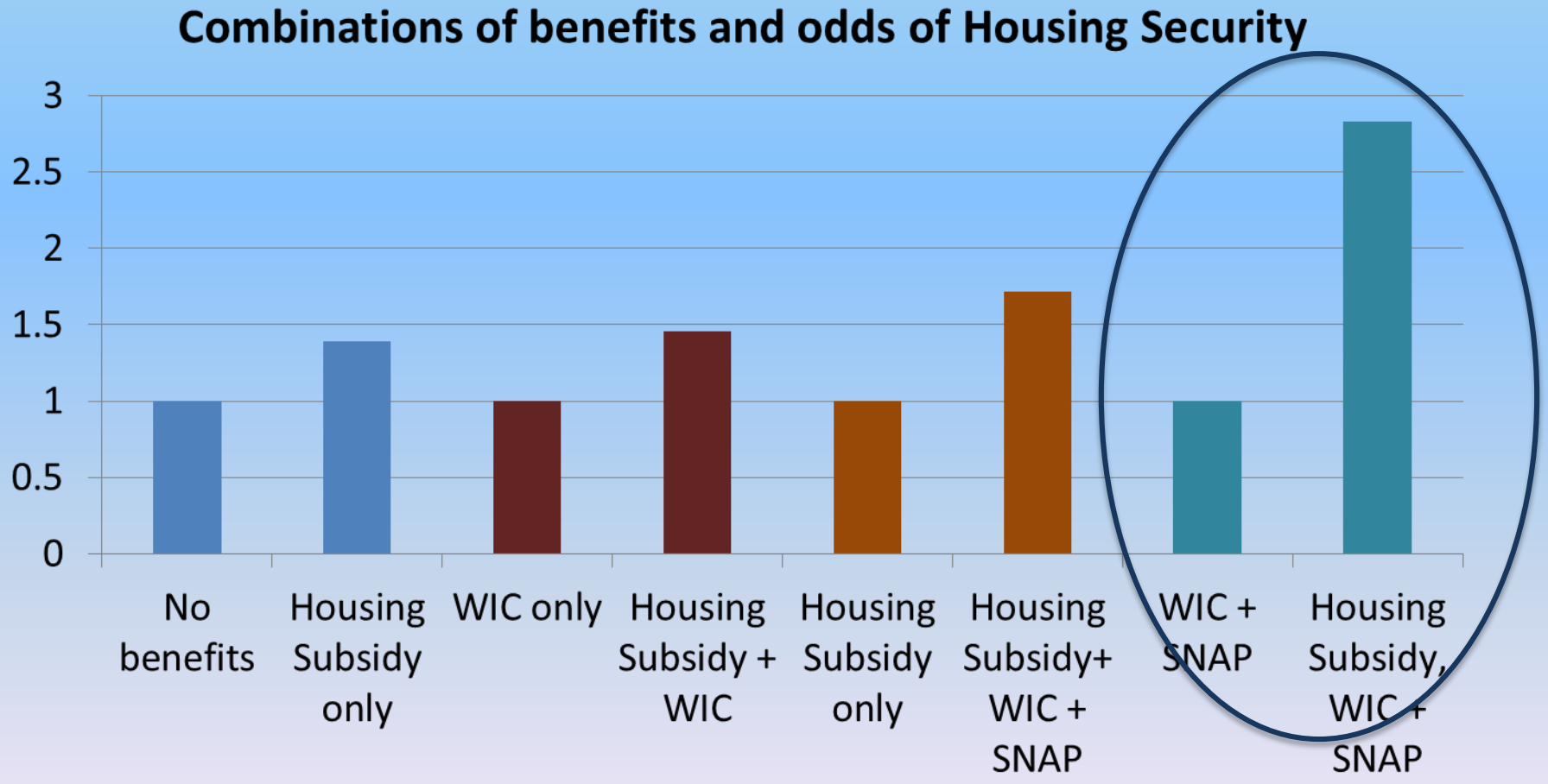
- Tested changes in supply against components of housing insecurity
  - Behind on rent
  - Overcrowding
  - Multiple moves
  - Homelessness

- **If 5% increase in supply (for every 50 additional sub housing units/1000 low-income rent-burdened HHs)⟶ approx 1/3 decrease each – overcrowding, multiple moves**

Building the evidence for change - coenrollment



Sandel et al. JARC, 2015.

Interesting… so what can I do with this information?

BlueCross BlueShield Minnesota

CENTER FOR PREVENTION

Health Equity in All Policies

Vayong Moua MPA,
Senior Advocacy and Health Equity Principal
Center for Prevention

Ramona and friends

Ramona and friends

Ramona and friends

Ramona and friends

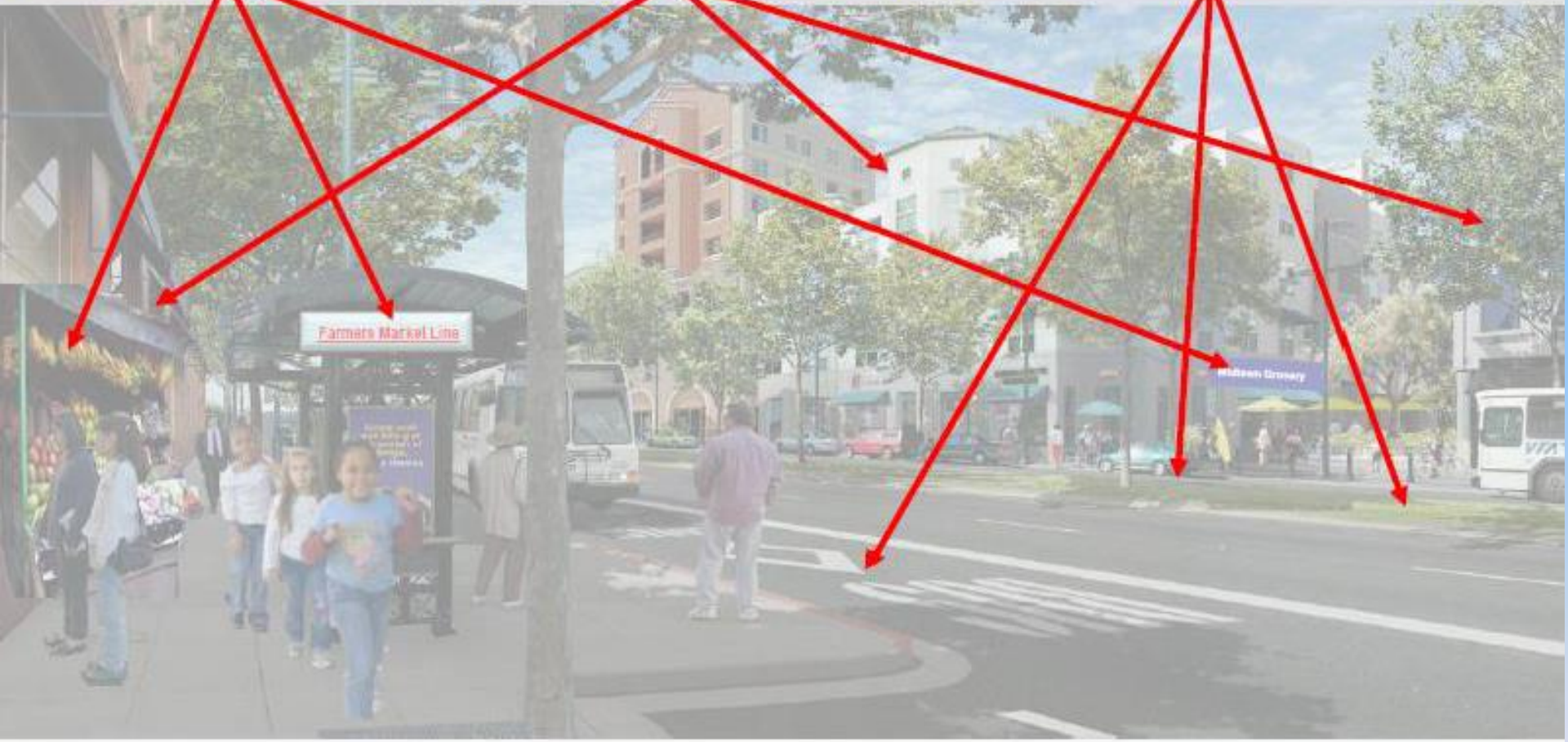
Ramona and friends

Policy Behind the Environment

Healthy Community Zoning

Comprehensive Plan

Complete Streets Ordinance



Public transit bike rack

Business incentives

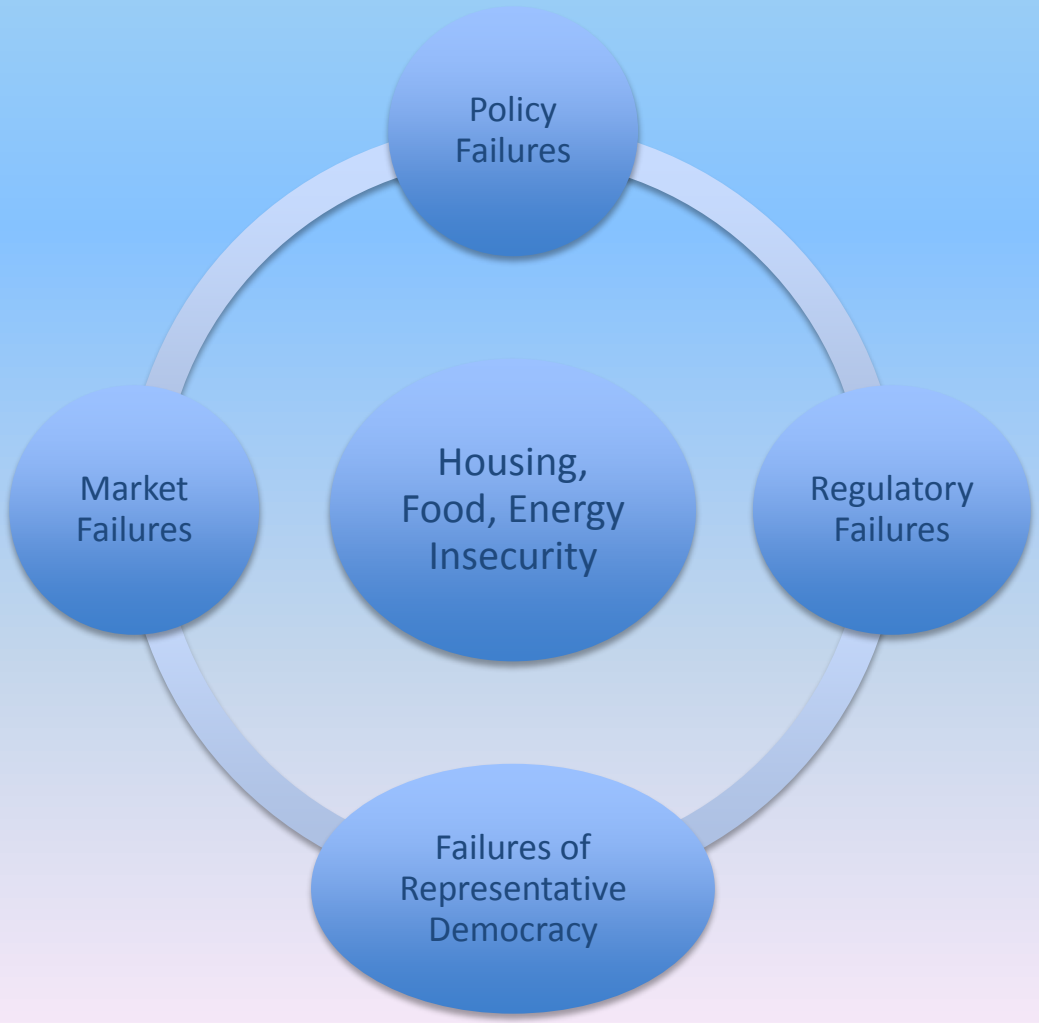
Advertising ban

Lighting

Fines for littering

Business improvement district

Housing, food and energy insecurity are results of systemic failures, not individuals' failures



Bringing housing, health together

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- Hospital systems/health care partners
  - Health insurance companies – invest in housing (e.g. United Healthcare)
  - IRS approved nutrition access as community benefit… housing access next?
- Broad, Multi-sector Coalitions
  - "Human beings aren't divided into government departments"
    - Co-enrollment for benefits, including housing
  - Healthy Food, Healthy Homes, Healthy Children – omnibus bill
  - On Solid Ground - research-based approach; increase housing stability, economic mobility
- Housing advocacy – health argument/partners help build momentum for change
  - Priority for homeless pregnant women (Healthy Start in Housing – Boston)
  - Housing Arkansas - $500,000 for state Housing Trust Fund
    - Working toward permanent $15 million source
  - Looking outside of housing – increasing federal/state EITC … prevent an eviction?

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Housing Influences Health

- New understanding of interplay of how housing influences health
  - Stability- Beyond homelessness
  - Quality- Physical and mental health
  - Affordability- Hardships are interconnected
- Housing can act like a vaccine
  - Provide Multiple, Long Lasting benefits
  - Differential Benefits to Individual and Society
- How can we pay for it requires evidence-based partnerships

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Thank you!

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