



Forging Ahead to Improve Population Health

Presentation by Susan Dentzer
President and CEO, the Network for Excellence in Health Innovation (NEHI)
To the Nevada Population Health Conference
November 17, 2016

This Presentation at a Glance

- The **poor health status of many Americans** underscores the importance of addressing population health via the social determinants
- Need for **collective action** across health care system, public health, education, housing, community development, and public policy writ large
- Need for **marshaling evidence** about successful interventions and assembling more
- **Evolving models and specific threats** stemming from probable repeal of Affordable Care Act



This Presentation at a Glance

- Focus on several categories of issues and interventions:
 - One in which harms are understood, interventions exist, but uncertainty around effectiveness in screening/treatment: **Adverse Childhood Experiences**
 - One in which link is clear and there is clear evidence of effective intervention: **early childhood education**
 - One in which harm (unhealthy diet) is generally understood, but evidence on solutions is evolving - addressing **food deserts** and obesity
 - One in which general link apparent (higher income = better health), growing evidence, but maybe not enough to differentiate solutions: **Incomes/Earned Income Tax Credit**

This Presentation at a Glance

- Central questions for policy and research:
 - **Why aren't we doing more** of what we're pretty sure will work?
 - Why aren't we **funding more experiments** to learn more about what will work?
 - **What do we do in meantime** about some of the complex health challenges we now face, where evidence of multiple interventions is lacking - and where arguably action should leapfrog the evidence?

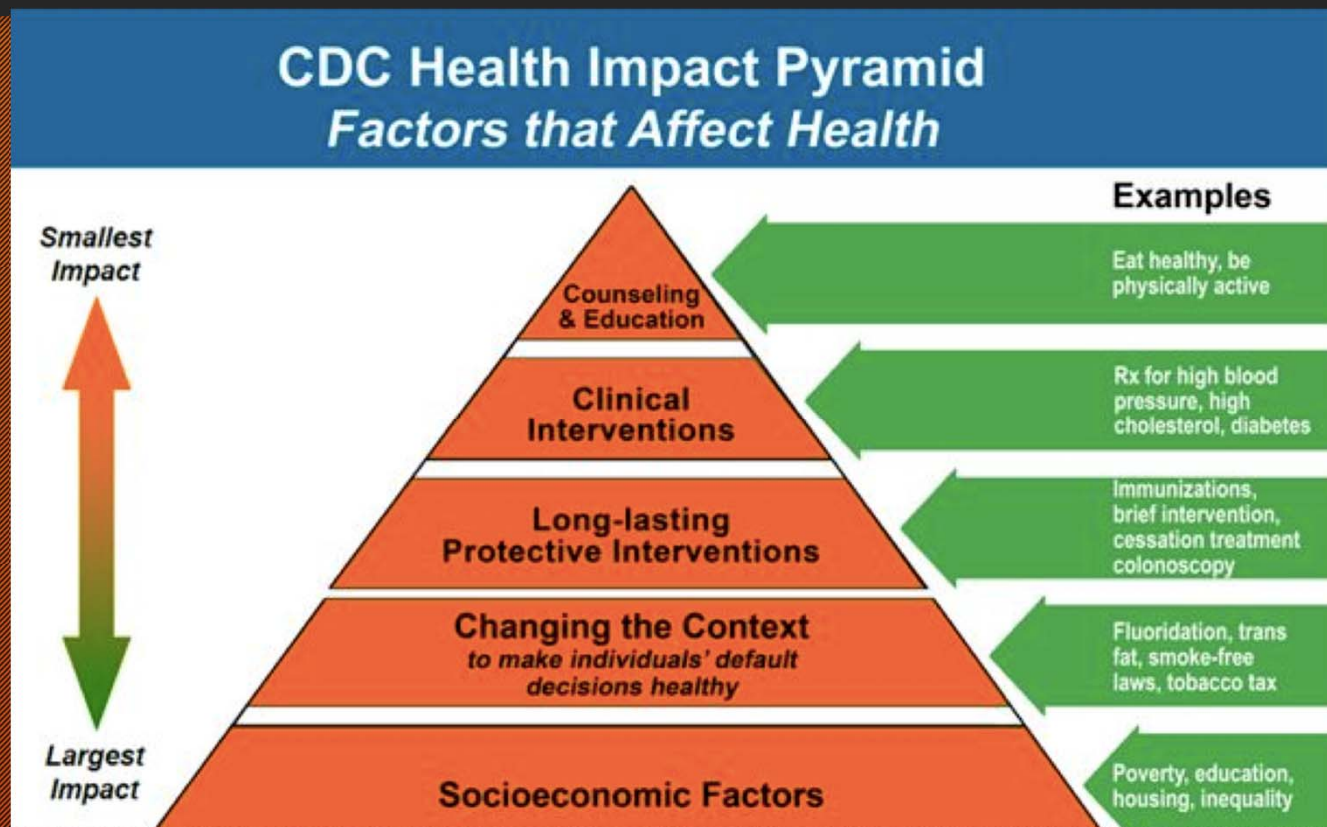


What is Population Health?

- Distinguish from **population medicine**
- More than 40 different definitions of population health
- One, by University of Wisconsin's David Kindig:
 - *Population health = the health outcomes of a group of individuals, including the distribution of such outcomes within the group.*
- Groups can be geographic populations such as nations or communities, but can also be other groups such as employees, ethnic groups, disabled persons, prisoners, or any other defined group.



Influencing Health



Social determinants of health

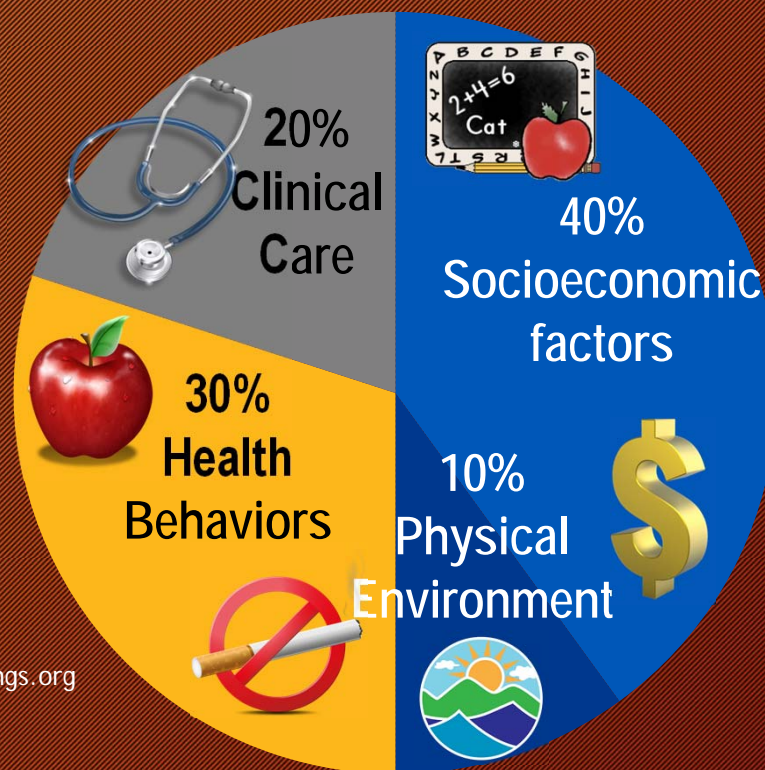
- Income and Income Distribution
- Education
- Employment or unemployment; job security; working conditions
- Early Childhood Development
- Food Insecurity
- Housing
- Social Exclusion; Social Safety Network
- Access to Health Services; Disability
- Gender, Race, Aboriginal (Native American/Indian) Status



Ten Tips for Better Health - The Social Determinants Version

- 1. Don't be poor. If you can, stop. If you can't try not to be poor for too long.
- 2. Don't have poor parents.
- 3. Own a car - it will mean that you have money, and you can drive out of the poor neighborhood where you live.
- 4. Also use that car if you live in a food desert and want to leave the neighborhood to get acquainted with fruits and vegetables.
- 5. Don't live in damp, low quality housing.
- 6. Don't work in a stressful, low-paid job.
- 7. Practice not losing your job and becoming unemployed.
- 8. Be able to travel, relax, distress.
- 9. If you're unemployed, sick, or disabled, claim all the benefits to which you're entitled.
- 10. Don't live next to a busy major road or polluting factory, or have lead in your water as in Flint, Michigan.

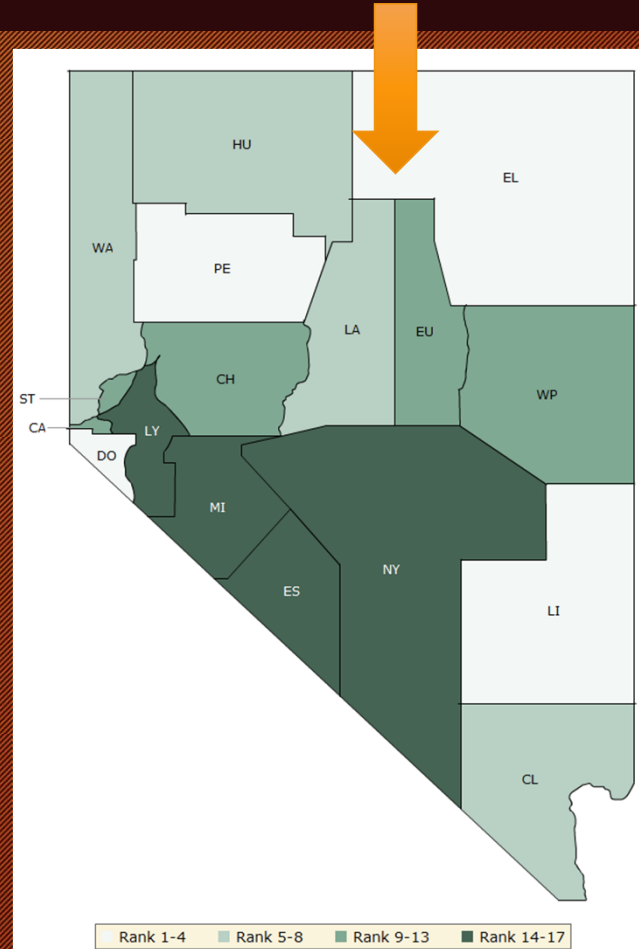
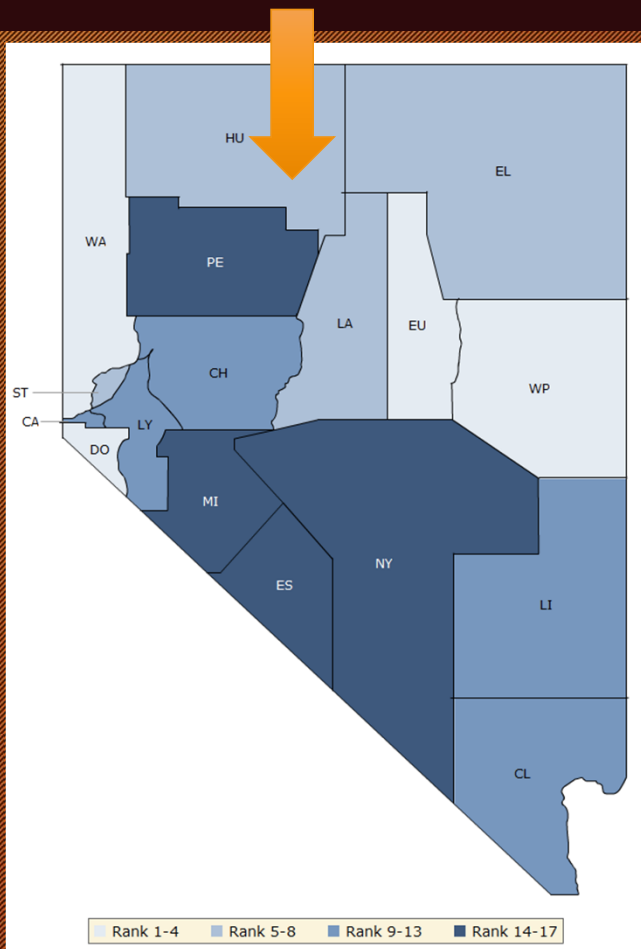
What drives overall health status?



Source: www.countyhealthrankings.org

Poor Health of Growing Numbers of Americans

How health factors influence health outcomes: Nevada



Health factors:

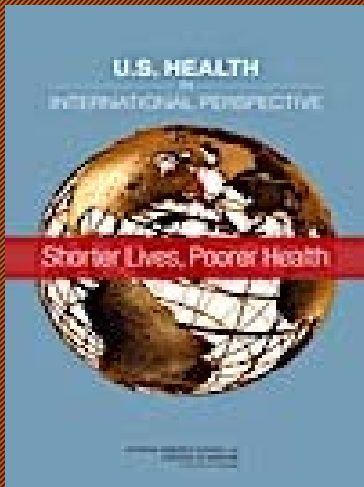
- Health behaviors
- Clinical care
- Social and economic factors
- Physical environment

Health outcomes:

- Length of life
- Quality of life

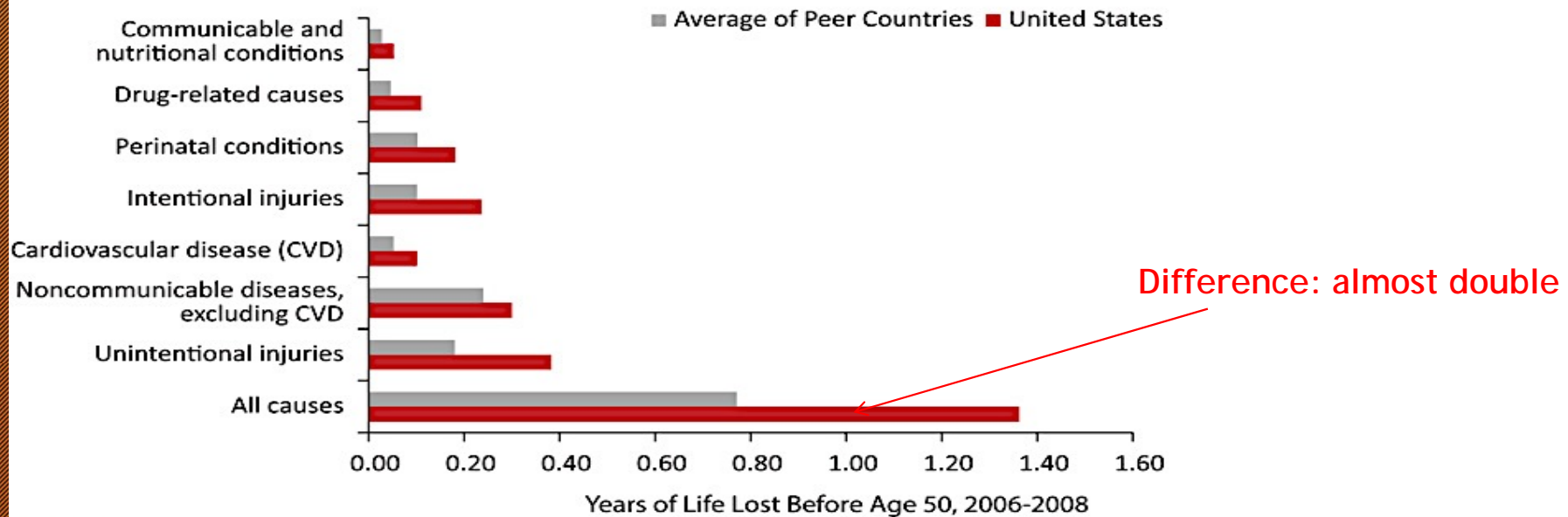
Source: www.countyhealthrankings.org

Institute of Medicine study, January 2013



- “For many years, Americans have been **dying at younger ages** than people in almost all other high-income countries.”
- “Not only are their lives shorter, but Americans also have **a longstanding pattern of poorer health that is strikingly consistent and pervasive over the life course** - at birth, during childhood and adolescence, for young and middle-aged adults, and for older adults.”

FIGURE: Causes of Death for U.S. Men Before Age 50, Compared with Average of Peer Countries, 2006-2008

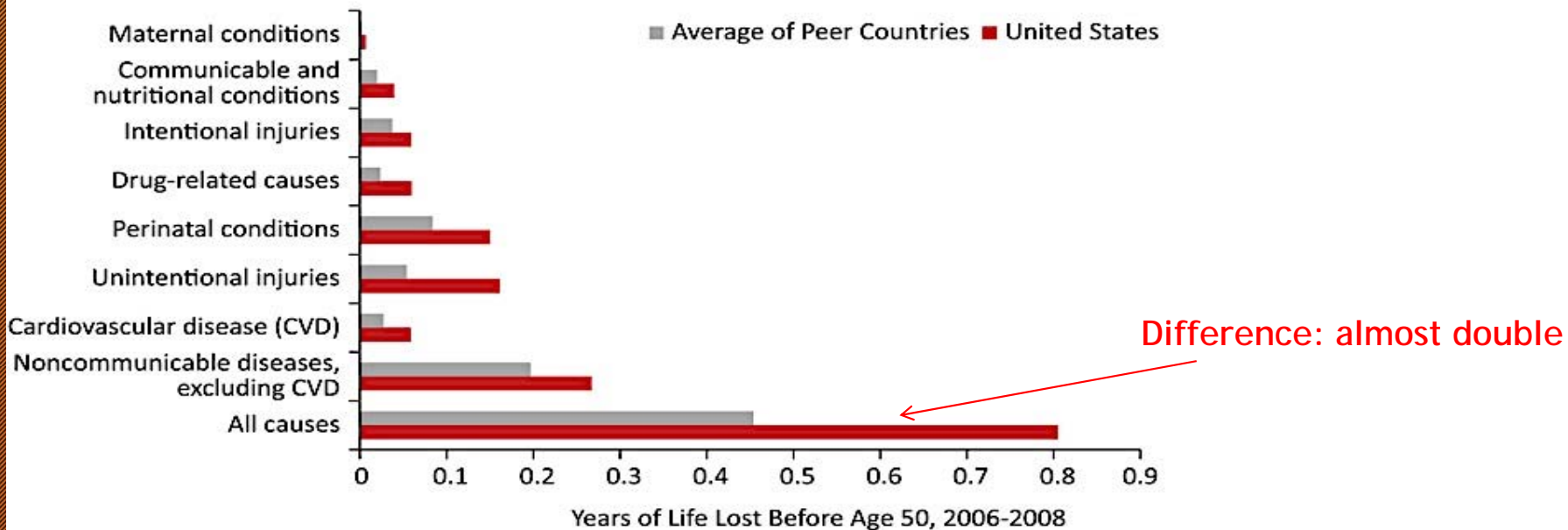


NOTE: CVD is cardiovascular disease

SOURCE: Data from the Human Mortality Database, the World Health Organization Mortality Database, and Statistics Canada, as reported in Ho, J. Y. and S.H. Preston (2011). *International Comparisons of U.S. Mortality*. Data analyses prepared for the National Academy of Sciences/ Institute of Medicine Panel on Understanding Cross-National Health Differences Among High-Income Countries. Population Studies Center, University of Pennsylvania. *U.S. Health in International Perspective: Shorter Lives, Poorer Health*, January 2013

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FIGURE: Causes of Death for U.S. Women Before Age 50, Compared with Average of Peer Countries, 2006-2008



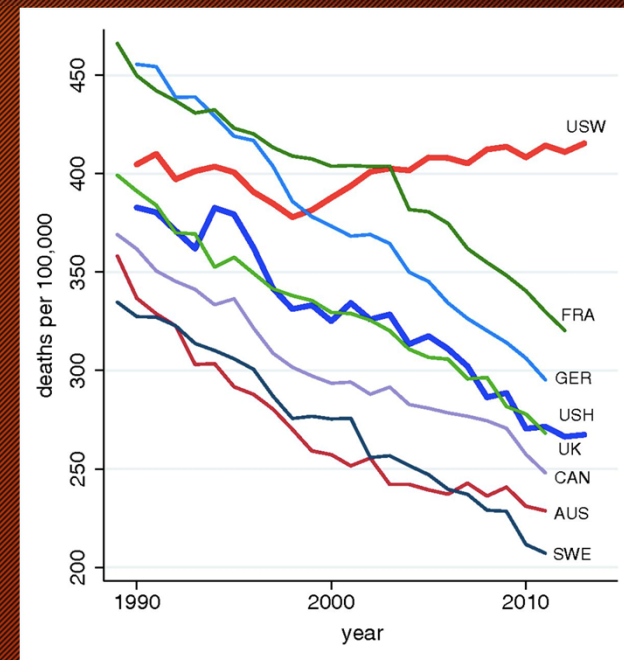
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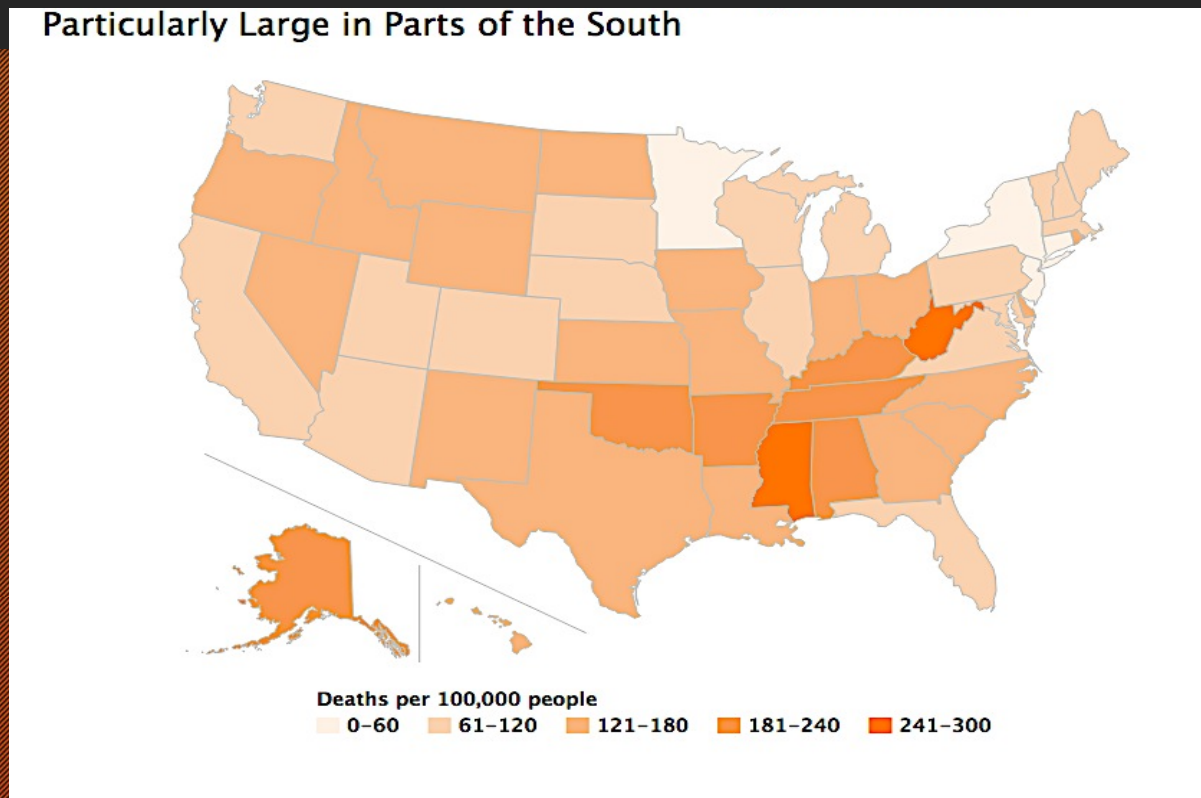
Rising morbidity and mortality in midlife

- Estimated 500,000 lives lost 1999-2013 in U.S. due to rise in all-cause mortality of middle-aged, white, non Hispanic men and women
- Increasing death rates from drug and alcohol poisonings, suicide, chronic liver diseases, cirrhosis
- Biggest mortality increases among those with least education
- Morbidity: self-reported declines in health, mental health, ability to conduct activities of daily living
- Increases in chronic pain and ability to work



Source: Anne Case and Angus Deaton, "Rising morbidity and mortality in midlife among white non-Hispanic Americans in the 21st century," Proceedings of the National Academy of Sciences, vol. 112 no. 49, 15078-15083

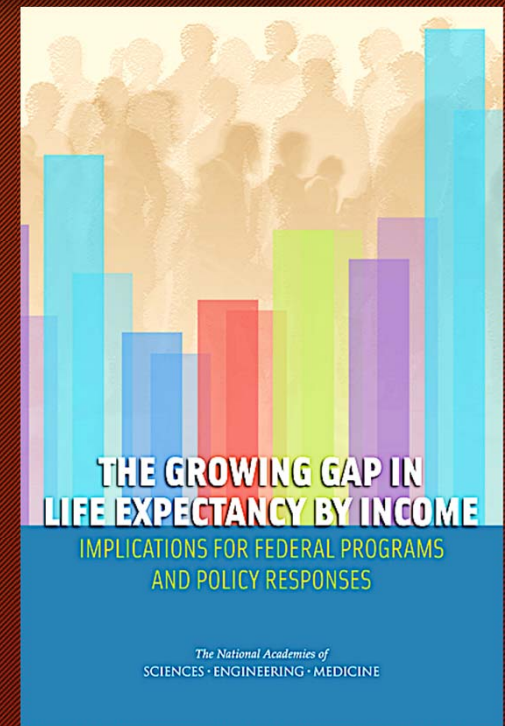
The Map of the “Mortality Gap” for Middle-Aged Whites



Source: D Squires and D. Blumenthal, *Mortality Trends Among Working-Age Whites: The Untold Story*, The Commonwealth Fund, January 2016

Inequality: Growing disparities In life expectancy by income

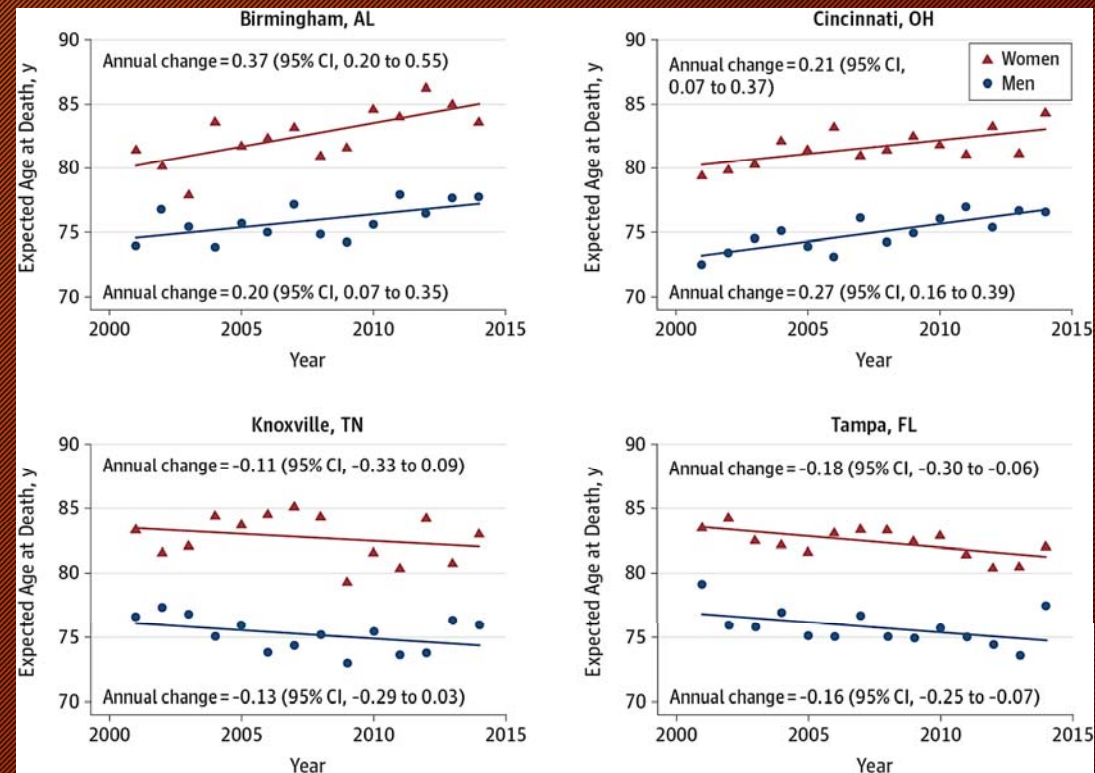
- Comparing men who turned 50 in 1980 or 2010:
 - Those in **top fifth of income gained 7 years of life expectancy**; those in bottom fifth of income gained nothing
- Comparing women who turned 50 in 1980 or 2010:
 - Those in top fifth of income gained nearly 6 years of life expectancy
 - Those in **bottom fifth of income lost 4 years** of life expectancy
 - Those in next lowest fifth of income lost nearly 2 years of life expectancy



The link between income and life expectancy

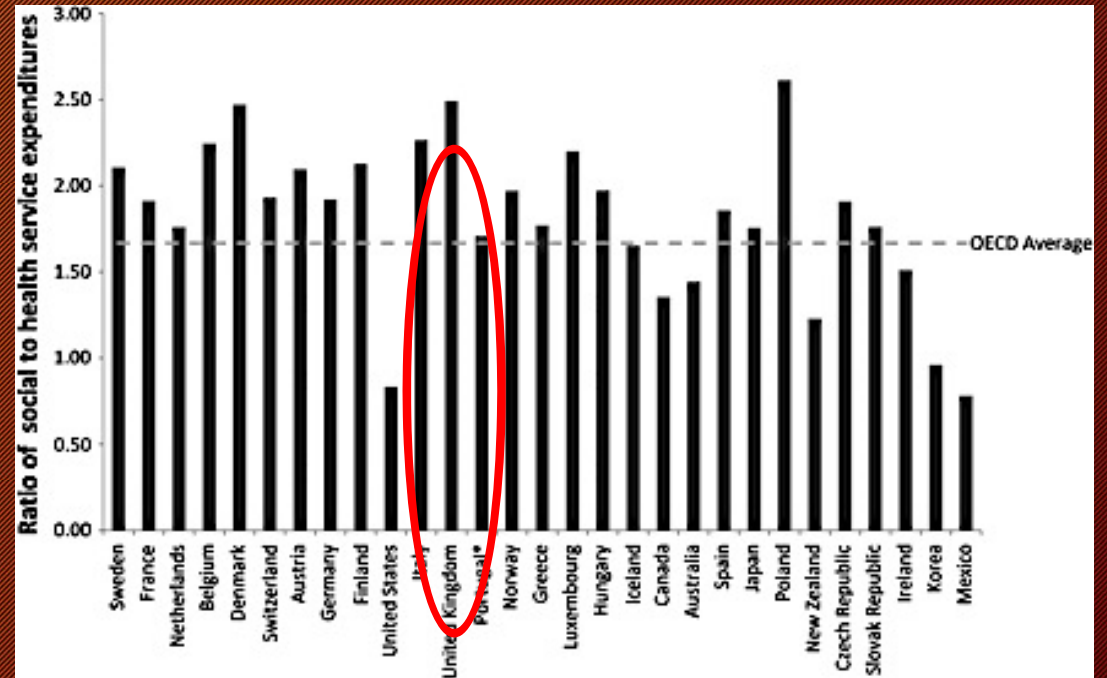
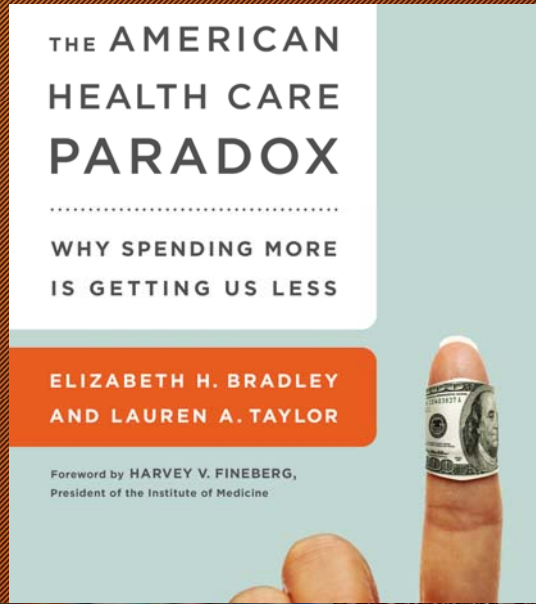
- Study by Chetty et al linking 1.4 billion tax records and mortality data from 2000-2014
- Higher income associated with greater longevity
- Life expectancy gap increased over time
- Associations and effects differed across areas; **do local policies matter? Which ones?**

Source: R Chetty et al, "The Association Between Income and Life Expectancy in the United States, 2001-2014," JAMA 2016; 315(16):1750-1766



What Can We Do?

Clues: US Imbalance In Health Care Vs. Social Services Spending



Paucity of evidence?

- "Leveraging the Social Determinants of Health: What Works?"
- Article by Taylor et al, PLOS One (August 17, 2016)
- Review of recently published literature
- 39 articles met review criteria; 32 (82%) reported "some significant positive effects on either health outcomes (N=20), health care costs (N=5), or both (N=7)
- Analysis indicates that "several interventions in the areas of housing, income support, nutrition support, and care coordination and community outreach have had a positive impact in terms of health improvements or health care spending reductions."
- Underwhelming evidence?

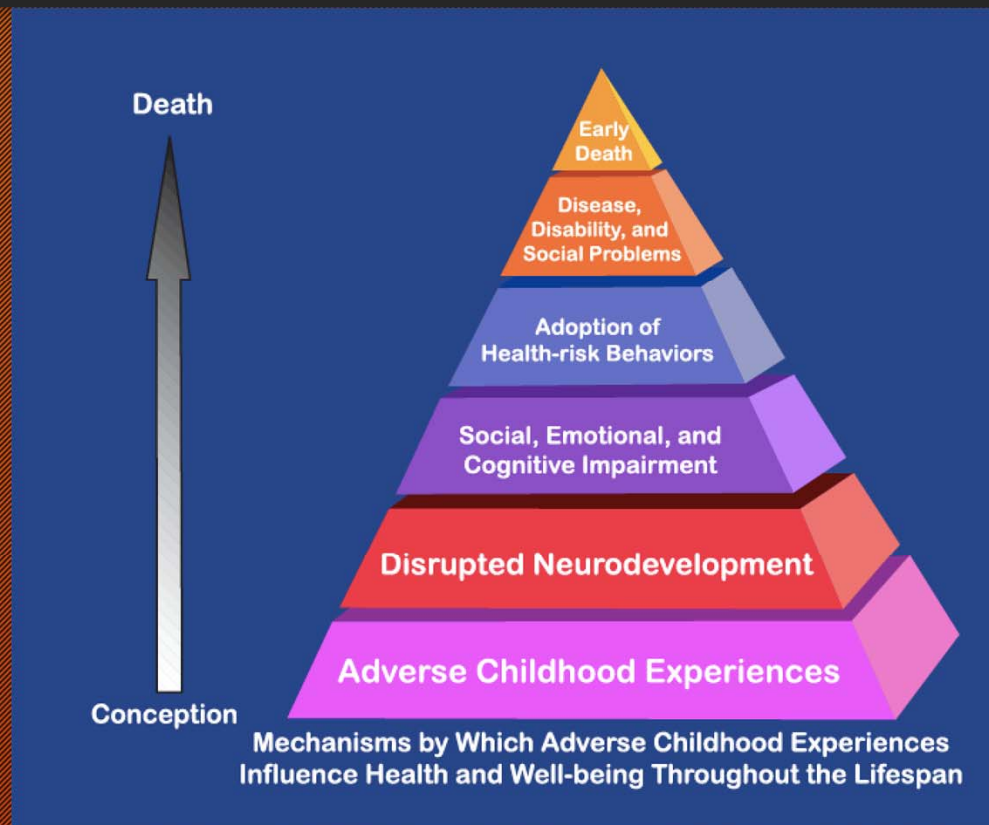
Importance of early childhood



Adverse Childhood Experiences Study

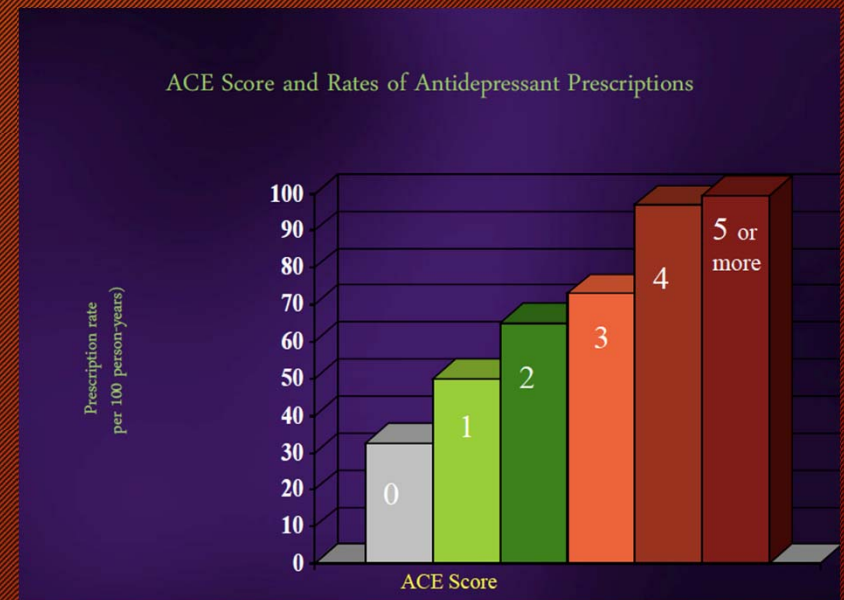
- Collaboration between the U.S. Centers for Disease control and Prevention and Kaiser Permanente
- Has followed 17,000 members of Kaiser's HMO plans since 1995
- Has yielded more than 50 scientific articles linking childhood abuse, neglect, and other "toxic" stressors to such conditions as depression, heart disease, chronic lung disease, liver disease, and cancer.
- More than two-thirds of study participants reported at least one such adverse childhood experience, including psychological, sexual, or physical abuses.
- Source: <http://www.cdc.gov/ace/>

Theoretical biological mechanism



ACEs screening: Harms identified

- Recurrent physical or emotional abuse or neglect
- Contact sexual abuse
- Alcohol or drug abuser in household
- Incarcerated household member
- Household member who is chronically depressed, mentally ill, or suicidal
- Mother treated violently
- Parents separated or divorced





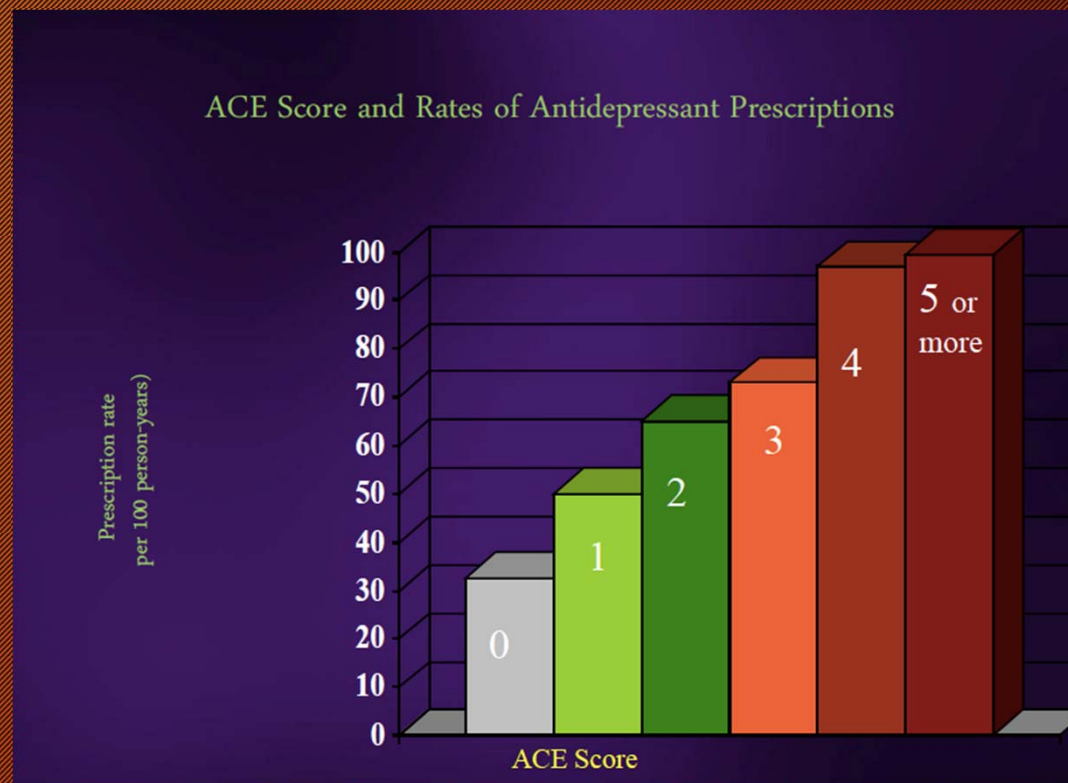
**STANFORD
COORDINATED
CARE**

Care with the Patient at the Center

How do ACE's play out later in life (assuming survival past childhood)?

- **Increased smoking:**
 - The higher the ACE score, the greater the likelihood of current smoking
- **COPD:**
 - A person with an ACE score of 4 is 2.6 x more likely to have COPD than a person with an ACE score of 0
- **Depression:**
 - A person with an ACE score of 4 was 4.6 x more likely to be suffering from depression than a person with an ACE score of 0
- **Suicide:**
 - There was a 12.2 x increase in attempted suicide between ACE 4 vs. 0; at higher ACE scores, the prevalence of attempted suicide increases 30-51 fold!
 - Between 66-80% of all attempted suicides could be attributed to ACE.

ACE: "Dose-response" effect



Effect on children

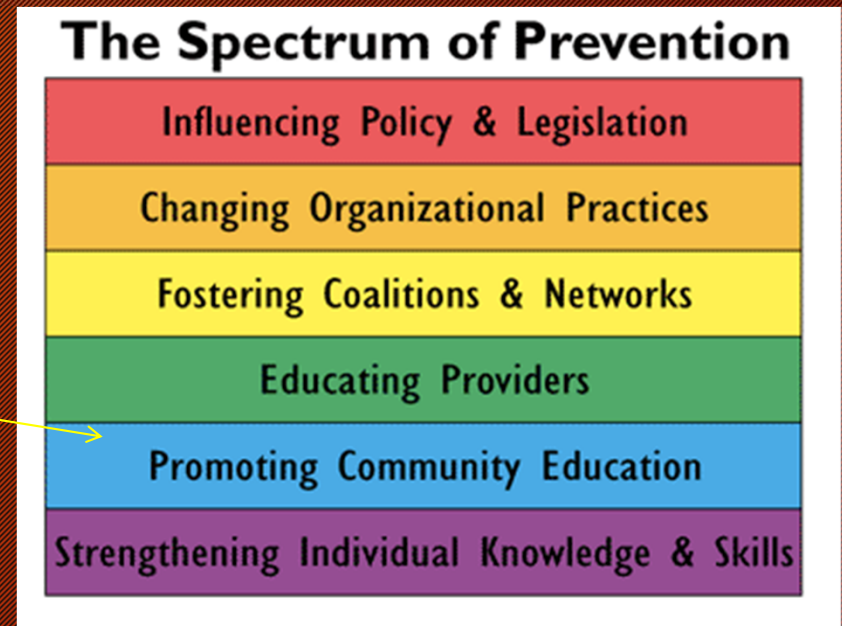
- Use of ACEs screening at Bayview Child Health Center, San Francisco
- 2011 study found 2/3 of children experienced at least one type of trauma
- 1 in 8 children had experienced 4 or more
- Average age 7 years
- Children with no ACEs: almost all had no learning problems
- ½ of children with ACE score of 4 or higher had learning problems
- Higher rates of obesity with ACE score of 4 or higher
- Source: Burke Harris N et al, Journal of Child Abuse and Neglect, 2011)



Nadine Burke Harris, MD (left)
Founder of Bayview clinic

Preventing ACE's?

- Some evidence that building "community capacity" - government, public and private agencies, citizens, resources, and support - can reduce ACE's



Sources: Prevention Institute; Judy Hall et al, [J Prev Interv Community](#). 2012 Oct; 40(4): 325-334.

American Academy of Pediatrics Recommendations

- ACEs screening tool designed for adults, not children
- Uncertainty around whether role of pediatrician is to surface ACEs in children or their parents
- Some new approaches being tested for children
- Hypothesis: Identifying ACEs in parents can be preventive measure with respect to health of children
- Estimates: Fewer than ½ of pediatric practices doing any screening at all

American Academy of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN™

Addressing Adverse
Childhood Experiences
and Other Types of Trauma
in the Primary Care Setting

Unintended consequences?

- ACE's screening in other settings possibly problematic
- If ACEs screening leads to reports about trauma, mandatory reporting could require referrals to criminal justice system
- Most schools don't have ability to respond
- More evidence needed - not just on screening but on interventions and link to health

Early childhood education



Early Childhood Interventions: the “Heckman Equation”

- Policies that shape early life environments, such as early childhood education, are effective for promoting health (Conti and Heckman, 2014)
- Early childhood interventions targeted to disadvantaged children may promote adult health (Blackson and Hurley 2014; Campbell et al, 2014)

+ Invest

Invest in educational and developmental resources for disadvantaged families to provide equal access to successful early human development.

+ Develop

Nurture early development of cognitive and social skills in children from birth to age five.

+ Sustain

Sustain early development with effective education through to adulthood.

= Gain

Gain a more capable, productive and valuable workforce that pays dividends to America for generations to come.

Looking back at 2 major studies: Perry Preschool

- Enhanced preschool program (3 and 4 year-olds) in Ypsilanti, MI in 1960s
- Evaluation via randomized controlled trial of 123 children (58 received program; 65 children in control group did not).
- Educational and life outcomes for children receiving program much superior
- Age 40 follow-up: 42 percent higher median monthly income (\$1,856 vs. \$1,308)
- 26 percent less likely to have received government assistance (e.g. welfare, food stamps) in past ten years (59% vs. 80%)

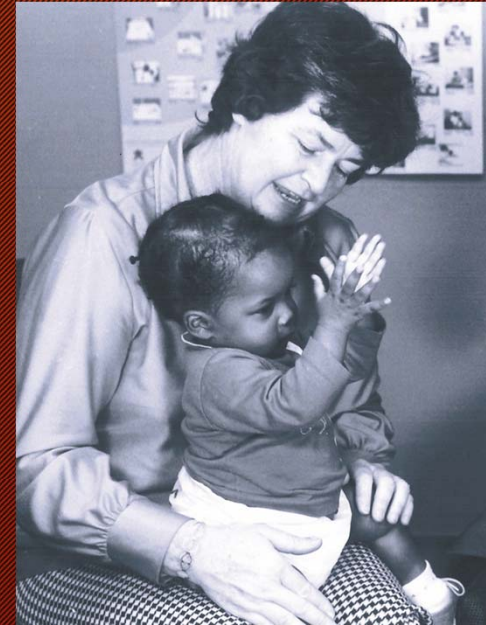


Looking back at 2 major projects: Carolina Abecedarian

- Controlled experiment conducted in 1972 to study potential benefits of early childhood education for poor children
- 111 infants born 1972-1977; 57 given high-quality intervention, 54 control group
- 98 percent of children African American
- Statistically significant outcomes at age 30:
 - Four times more likely to have graduated from a four-year college (23 percent vs. 6 percent)
 - More likely to have been employed consistently over the previous two years (74 percent vs. 53 percent)
 - Five times less likely to have used public assistance in the previous seven years (4 percent vs. 20 percent)
 - Delayed becoming parents by average of almost two years

Early Childhood Interventions

- Both the Perry Preschool and North Carolina Abecedarian Projects “have statistically and substantively significant effects on the health and healthy behaviors of their participants.”
- Stronger effects for boys than for girls - why not well understood
- Significant role played by “improved childhood traits above and beyond the effects of...adult socioeconomic status.”
- E.g., improvements in childhood self-regulation and cognition lead to less smoking, more physical activity later in life
- Source: Conti, Heckman, and Pinto, NBER working paper 21454, August 2015)



Early Childhood Education

- Conclusion: By whatever pathway - improved socioeconomic status or other - early childhood education works to improve health and gains can be durable
- Of 41 states with state-funded pre-K programs in 2014, only nine served more than half of all 4-year-olds in the state
- 11 served less than 10 percent
- Only three states - Florida, Georgia, and Oklahoma - had truly universal pre-K programs
- "At the recent rate of progress it will take decades to serve even 50% of 4-year-olds in state pre-K."
- Source: *The State of Preschool 2015*, National Institute for Early Education Research



Abecedarian Then and Now?

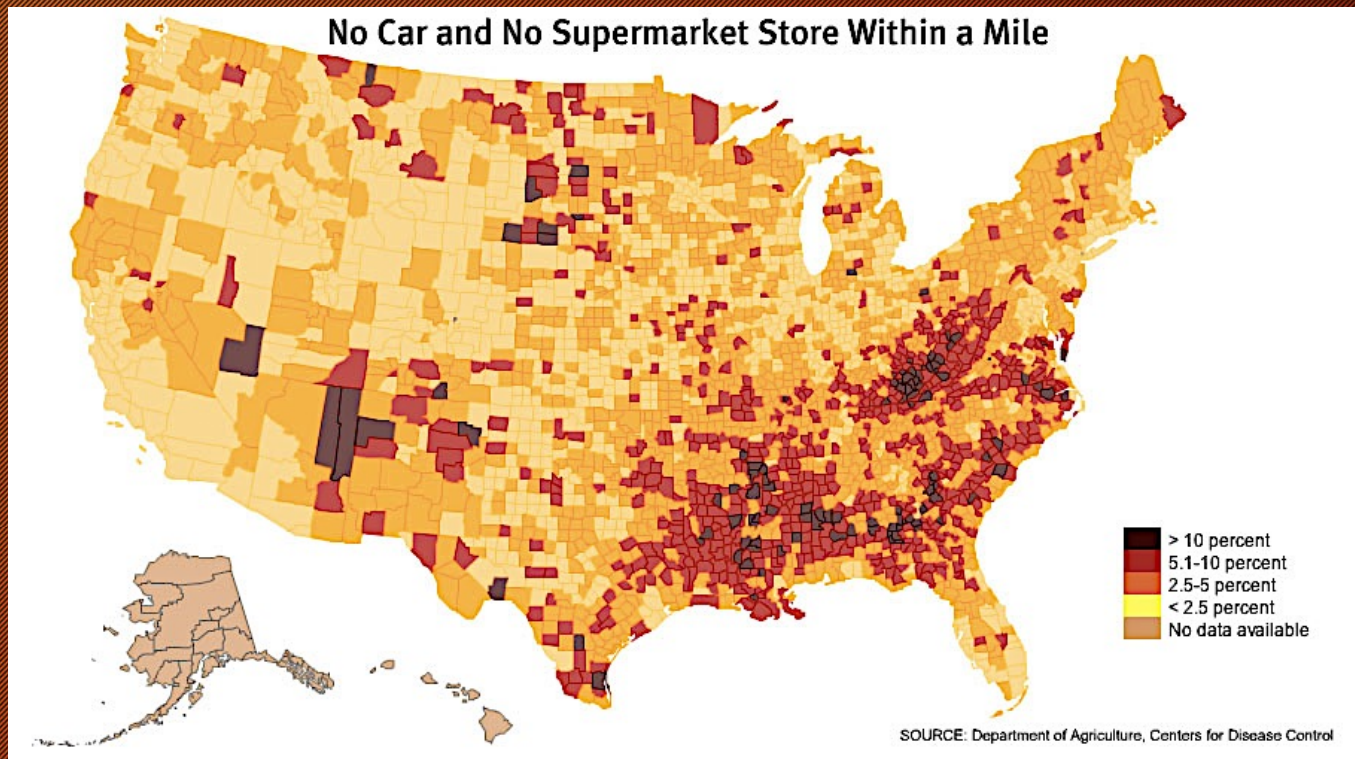
- Total per-child cost of the project was ~\$67,225, or ~\$13,900 for each of the five years (2002 dollars)
- Masse & Barnett (2002) estimated that the total annual cost of a comparable program for all poor children in 2002 would have been ~\$53 billion
- What price today?
- What value/cost effectiveness/ROI based on health impact alone?



Food/nutrition and health



"Food Deserts"



Attacking food deserts

- US government has spent more than \$500 million building supermarkets in urban food deserts since 2011
- Implicit notion: access to healthier foods = reduced obesity
- Evidence of effects scarce
- No studies pre-PHRESH showed a direct link between a new supermarket and residents' diet or improved health



If you build a supermarket in a “food desert,” what happens?



Pittsburgh Hill/Homewood Research on Eating, Shopping and Health

Results: Mixed Picture

The New Supermarket Led to Some Improvements

	Changes for Hill District Residents After Opening of Supermarket*	Hill District Resident Changes Compared with Changes Among Homewood (Comparison Neighborhood) Residents
Caloric intake	Decreased	Improved
Added sugars	Decreased	Improved
Consumption of "empty calories" (solid fats, alcohol, and added sugar)	Decreased	Improved
Consumption of whole grain foods, fruits, and vegetables	Decreased	No difference
Body mass index (average)	No change	No difference
Perceived access to healthy food	Increased	Improved
Neighborhood satisfaction	Increased	Improved

* This table only indicates a decrease or improvement that was shown to be statistically significant at the $p < 0.05$ level.

Results not linked to actual use of supermarket as both frequent and infrequent shoppers experienced Gains (!)

Analysis and interpretation

- Nearly all dietary improvements were related to reduced food intake
- May lead to improvements in obesity over time
- Critical to document and examine forces that influence neighborhood health and nutrition to inform policies for combatting obesity



Analysis and interpretation

- Neighborhood satisfaction rates rose sharply (66% to 80%)
- Opening of supermarket stimulated other neighborhood investments
- Potential benefit to health and well-being?
- Community development/incomes route?



Incomes and health



Incomes and health

- In general, large body of research shows higher incomes associated with better health
- Theoretically, benefits of employment and good working conditions positively influence health outcomes
- Role of enhanced financial security, social status, personal development, social relations, self-esteem
- Protection from physical and psychosocial hazards

The case of the earned income tax credit

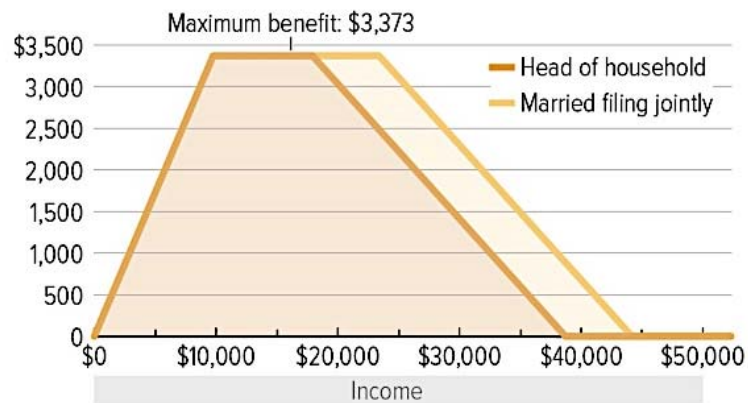
- EITC = broad-based income support program shown to increase employment and income among working families
- Established in 1975; expanded in 1990s; today the largest federal antipoverty program
- Refundable tax credit designed to offset impact of federal taxes on low-income families

The case of the earned income tax credit

- EITC gives a minimum wage worker with two children the equivalent of a 40 percent increase in annual earnings; big boost to female-headed households in particular
- 26 states and District of Columbia have supplemental EITC programs at state level
-
- Expansions and policy changes at state level = opportunities for research

EITC effect

Earned Income Tax Credit for Households with One Child, 2016



Note: Assumes all income is from earnings (as opposed to investments, for example).
Source: Internal Revenue Service

State of evidence

- Small but body of evidence shows links between EITC and health, especially maternal and child health
- E.g., Kevin Baker (2008) showed EITC led to increase in average birth weight and reduced incidence of low birth weight (also Wicks-Lim and Arno, 2015)
- Other studies (e.g., Boyd-Swan et al, 2013) have found reduced depression symptoms in low-skilled mothers receiving EITC; decreased biomarkers of physical and mental stress

State of evidence

- Arno et al (J Public Health Policy, 2009) examined associations between state-level EITC penetration and the infant mortality rate
- Each 10 percent increase in EITC penetration associated with a decline of 23.2 percent per 100,000 in infant mortality rate

EITC and Health: Remaining Issues

- Issues: Are benefits from increased employment or combination of employment plus increased income?
- “From a policy perspective, does it matter?” -- Peter Arno, PhD, UMass-Amherst

Income gains at last, six years post recession

- Real median household income increased 5.2 percent 2014-2015 to \$56,516
- First annual increase in median household income since 2007
- The official poverty rate decreased by 1.2 percentage points 2014-2015
- The number of people in poverty fell by 3.5 million; incomes statistically higher for all demographic groups

Source: Income and Poverty in the United States, 2015: Current Population Reports, U.S. Census Bureau

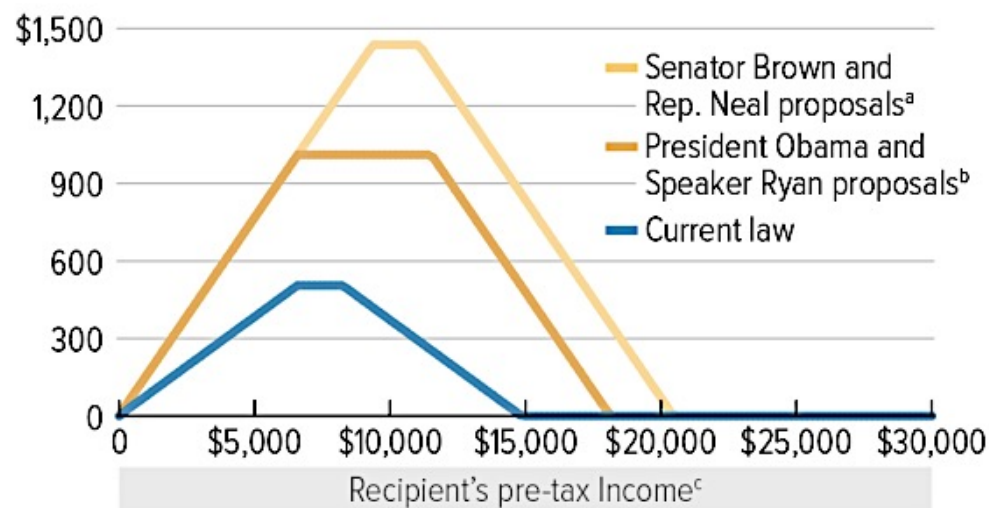
Income gains and health effects?

- What have been the health effects of most recent gains in income?
- What are health effects of increased levels of minimum wage?
- What are health effects of joint impact: EITC, minimum wage increases, overall income gains from improving economy?
- Who's most affected?

Policy proposal: EITC expansion For childless workers

Proposals Would Substantially Expand Childless Workers' EITC

Earned Income Tax Credit amount, 2016



Health System Interventions

Shifting the System Upstream



Rishi Manchanda, Physician and Author, "The Upstream Doctors"

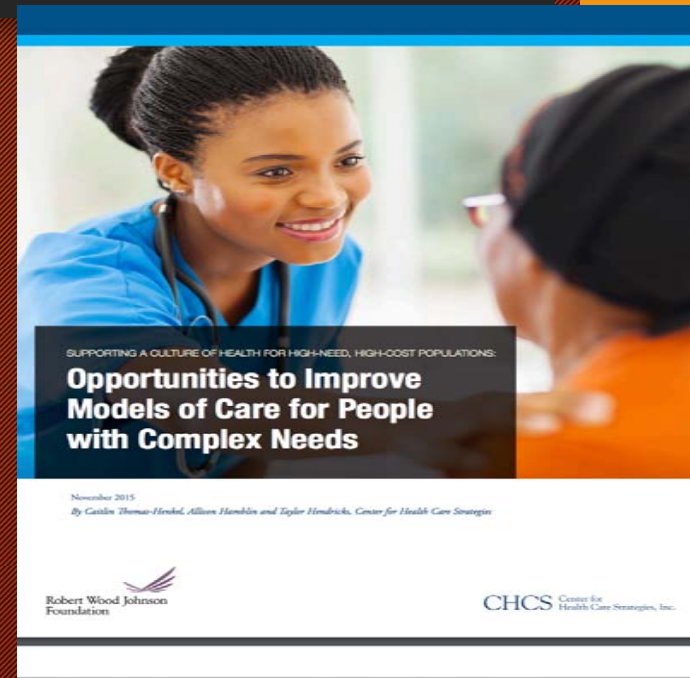
- Story of patient, Veronica , in mid-30s, from S. Central Los Angeles
- Chronic severe headaches for three years; presented at ER's in 3 hospitals; multiple head CT's and blood tests ordered; nothing found told to come back if symptoms didn't resolve
- At Manchanda's clinic was queried by medical assistant with 7 questions derived from American Housing Survey designed to surface issues such as slum-type housing
- Home was positive for roaches; clinic concluded she had allergic rhinitis and sinus headache due to roach infestation
- Referred to a tenant's rights worker and a lawyer.

Rishi Manchanda, Physician and Author, "The Upstream Doctors"

- "Treating patients without tackling the conditions that make them sick is ...a losing proposition and is substandard care."
- "If you want to increase the focus on social determinants, you have to engage the elephant that is taking up the room - the health care system."

“High-Touch” Interventions Needed

- Vastly more attention to social, non-health care needs, including
- Transportation to/from medical appointments
- Advocacy/legal support
- Linkages to mental health and substance abuse treatment
- Home visits
- Connections to social services and supports
- **What's optimal “dosing” of these services?**



Kaiser Permanente Southern California Region: Starting by Asking People About Social Needs

- At Kaiser Permanente, 1 percent of patients account for 20 percent or more of resources
- Average annual cost \$98,000-plus
- KP has begun cold calling 5,000 members in Southern California region to ask them about 12 domains of social determinants
- Each has average of 3.5 unmet needs
- High prevalence issues include financial needs, food, caregiver support



Nirav Shah, MD, Senior Vice President and Chief of Clinical Operations for Kaiser Permanente Southern California region

Accountable Health Communities

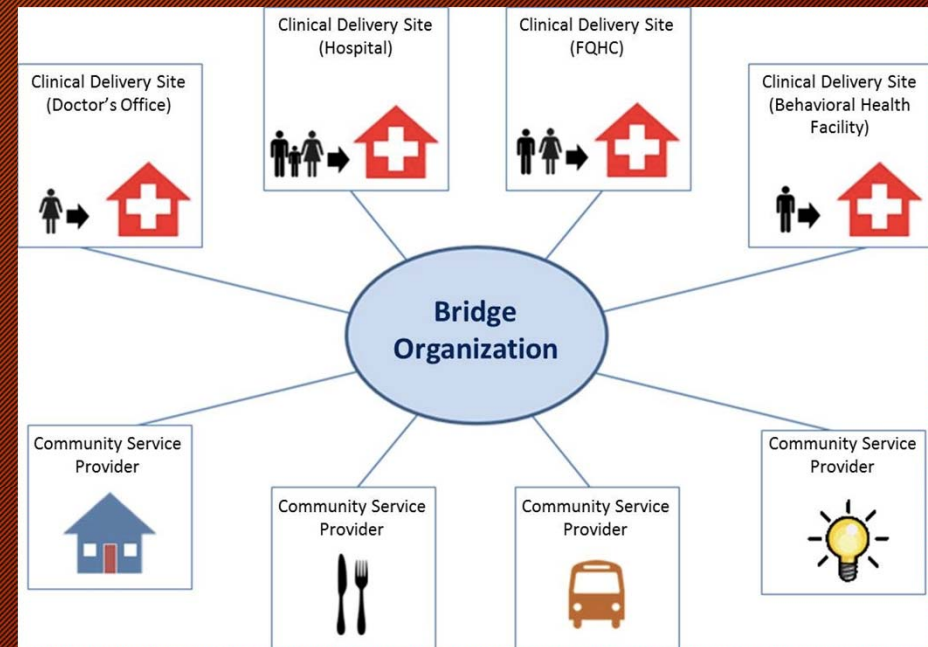
- Center for Medicare and Medicaid Innovation released proposal Jan. 5, 2016
- \$157 million over five years to address “critical gap between clinical care and community services in the current delivery system”
- Universal, comprehensive screening for health related social needs of community-dwelling Medicare and Medicaid beneficiaries
- Needs included housing instability or quality, utilities, food insecurity, transportation beyond medical transportation, interpersonal violence



Source: CMS Fact Sheet at <https://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-sheets/2016-Fact-sheets-items/2016-01-05.html>

Accountable Health Communities

- 44 cooperative agreements to be signed in 3 tracks:
- Track 1 - Awareness: Increase beneficiary *awareness* of available community services through information dissemination and referral
- Track 2 - Assistance: Provide community service navigation services to *assist* high-risk beneficiaries with accessing services
- Track 3 - Alignment: Encourage partner *alignment* to ensure that community services are available and responsive to the needs of beneficiaries



Hennepin Health

- Medicaid demonstration project serving more than 10,500 in Minneapolis
- Capitated model
- Integrates safety net health care providers, behavioral health, social services and public health - all at risk in shared savings arrangement
- Links patients with vocational training and housing support; **avoiding one day of hospitalization = one month's housing cost**
- Early results show decreased ED utilization, inpatient admissions, higher rates of optimal care



Hennepin Health
County Health Care Reform



Above: Behavioral health nurse care Coordinator Amber Morgan works with a patient at Hennepin County Mental Health Center

Source: R Tiperni et al, "Accountable Communities for Health: Moving from Providing Accountable Care To Creating Health," *Annals of Family Medicine*, vol. 13, no. 4, 367-369.

Implications for patient population and care patterns

- Lots of chronically ill and disabled people ages 55 and older
- Tens of millions whose care will be managed outside of hospitals and nursing homes for cost and convenience reasons -- and probably by teams of care providers
- Opportunity - and obligation - for larger role of health system in prevention and focus on community/population health
- What types of health care organizations are best suited to deliver on these goals?
- What is the optimal financing, management structure, and work force composition?

ACA Uncertainties: Hospitals' New Roles in Population Health

- New requirements under ACA on tax-exempt hospitals and health systems
- To retain 501(c)(3) [tax exempt] status, organization must conduct a "community health needs assessment" (CHNA) at least every three years
- Must adopt implementation strategy to meet the community health needs identified through the assessment
- Penalty: \$50,000 excise tax for each year that a tax-exempt hospital subject to these provisions fails to satisfy requirement
- Increasing number of hospitals conducting joint CHNA's and health improvement plans
- Will provision survive ACA repeal and replace effort?

Key Questions For Hospitals and Health Systems

- How do you have an impact on the population of people who aren't currently your patients?
- What strategies and tactics do you pursue that are outside your normal wheelhouse?
- What resources do you use until payment supports population health?
- Whom in the community do you partner with?

Big Questions Remain



Action and Evidence: Implications For Policy and Research

- Why aren't we doing more of what we're pretty sure will work?
 - Pre-K education, e.g.
 - Incomes policy - e.g. raising minimum wage
- Why aren't we funding more research and experiments to learn more about what will work?
 - ACEs screening & intervention, e.g.
 - Fresh food access and obesity



ACA Uncertainties: Prevention and Public Health Fund

- \$24 billion, 10-year fund created under ACA
- Some diverted to set up exchanges; other amount has backfilled some of CDC budget
- Health Subcommittee Chairman Joe Pitts: it's "a slush fund that the Health and Human Services [HHS] Secretary can spend from without any Congressional oversight or approval."
- Since 2014, Congress has exercised detailed control over the fund
- About \$900 million spent in 2016 in such areas as diabetes prevention, Alzheimers prevention, falls prevention, lead poisoning awareness, youth suicide prevention, promoting physical activity and nutrition in early childhood education centers
- Proposed for elimination under House GOP "repeal and replace" plans on ACA

Action and Evidence

- What do we do in meantime about some of the complex health challenges we now face, where evidence of multiple interventions is lacking - and where arguably action should leapfrog the evidence?
- What will we be able to accomplish in current political environment?
- Can more happen on state and local level, and/or at health system level, than federal level in the meantime?





The End