

Adapting Business Models to Address Social Determinants of Health

R. Lawrence Moss, MD

President and Chief Executive Officer

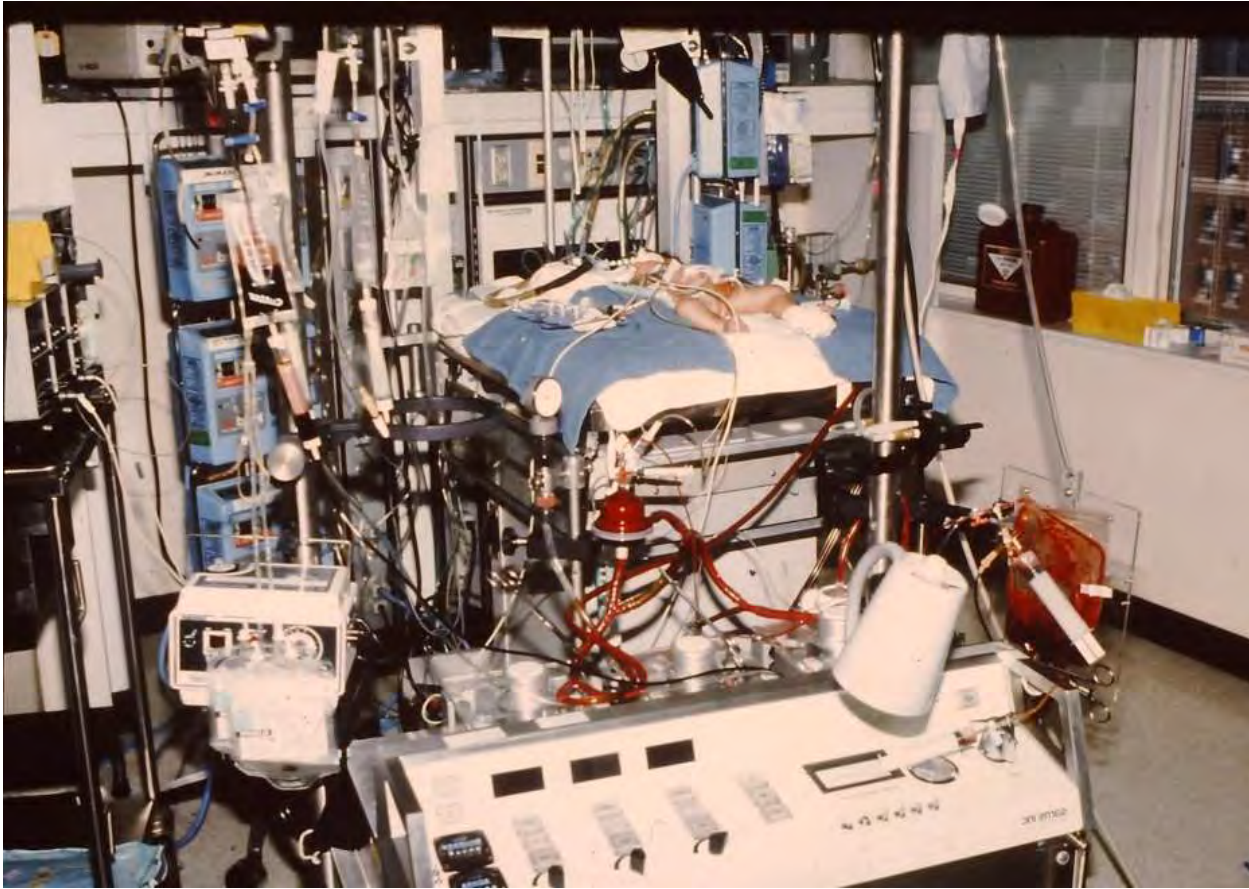
Becker's 10th Annual Meeting, April 4, 2019

Nemours Children's Health System



Kayla's Story

The best health care system in the world?



Jamal's Story

The worst health care system in the world?



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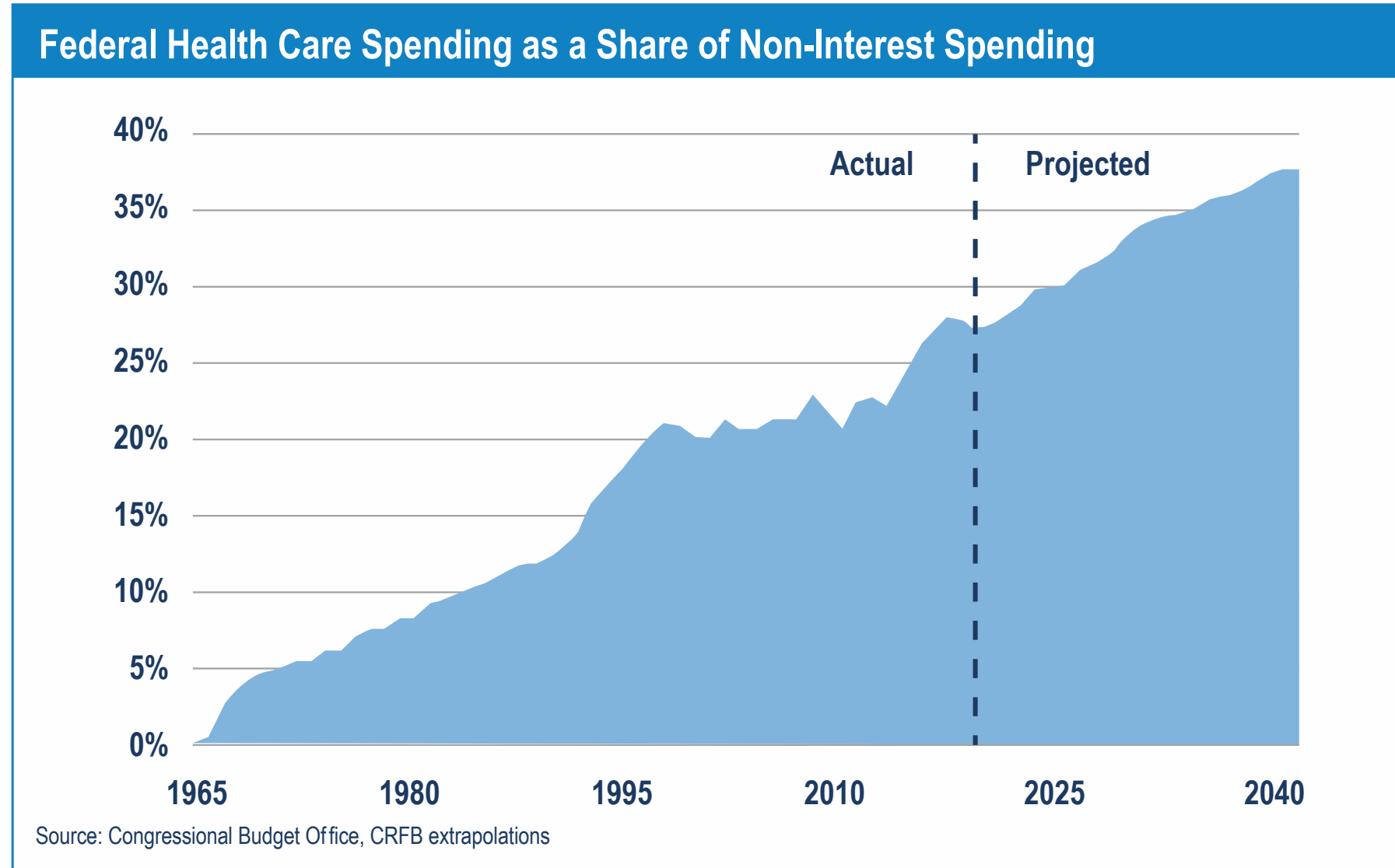
We are directing **18% of America's GDP (over \$3 trillion)** to buy the opposite of what we want.

We are getting **exactly** what we
are paying for.

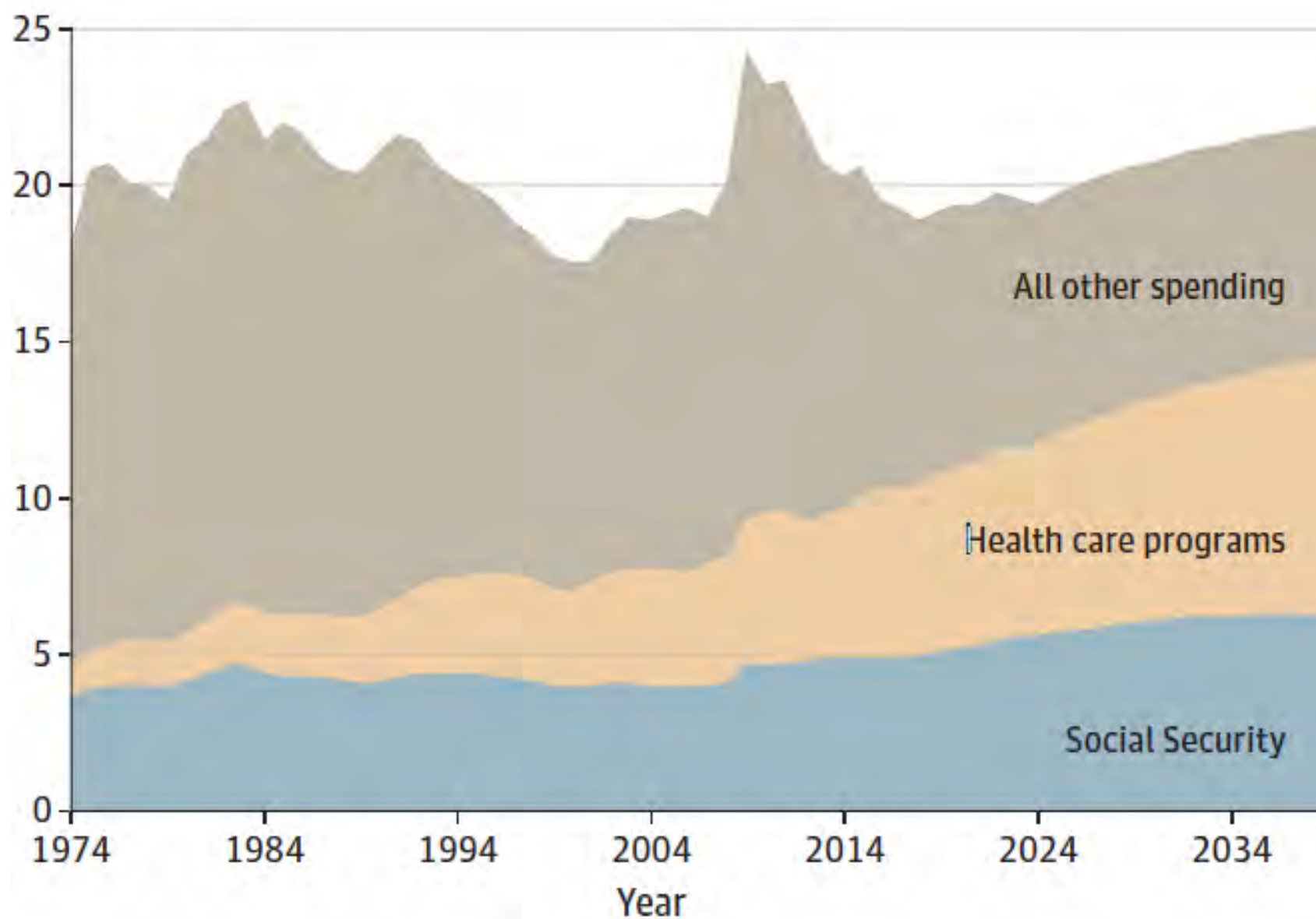
**Investing in the health of children
is the most powerful lever to align the
financial incentives
to create a healthier society, a
stronger economy, and a better
future for our country.**

Amount Trending in the Wrong Direction

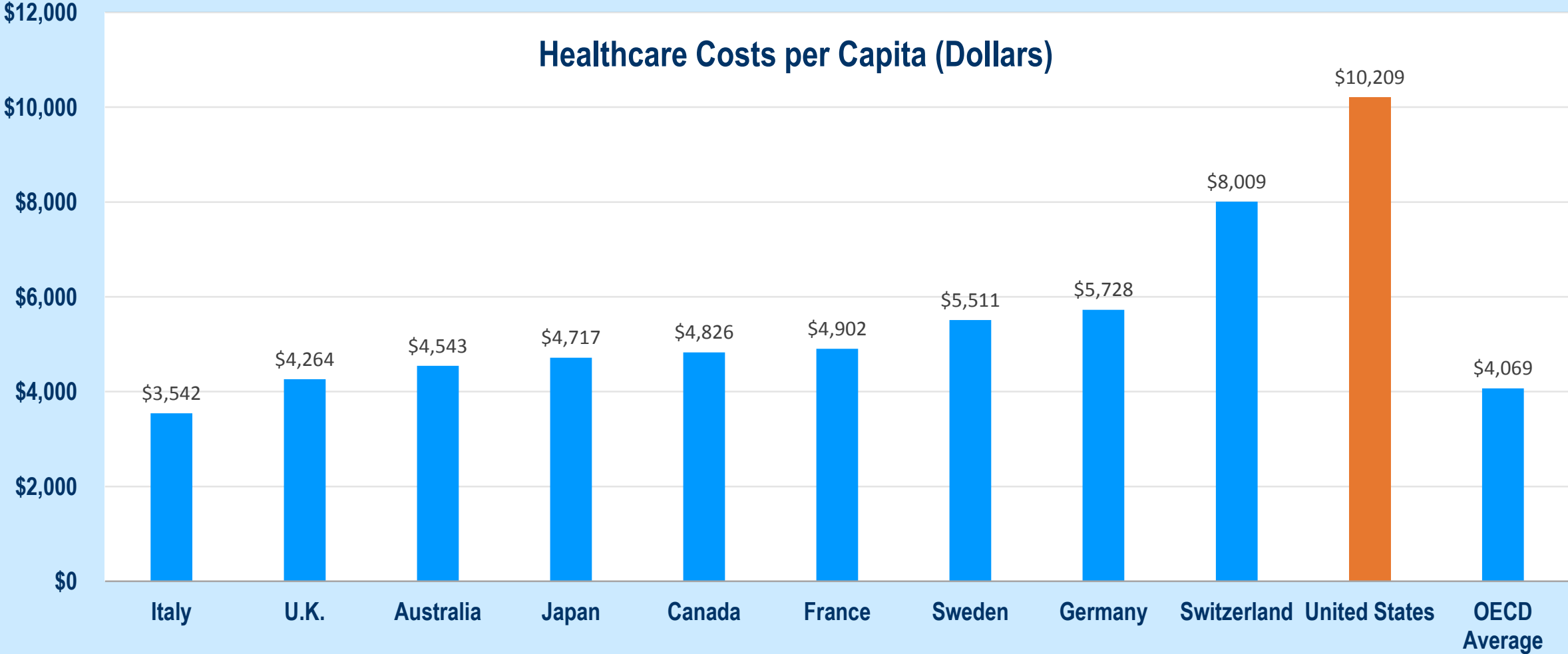
- Unchecked healthcare costs will grow faster than GDP by **.8%** over the next decade.
- Projected annual growth of **5.5%**, reaching **\$6 trillion** and nearly **20% of GDP**



Proportion Trending in the Wrong Direction



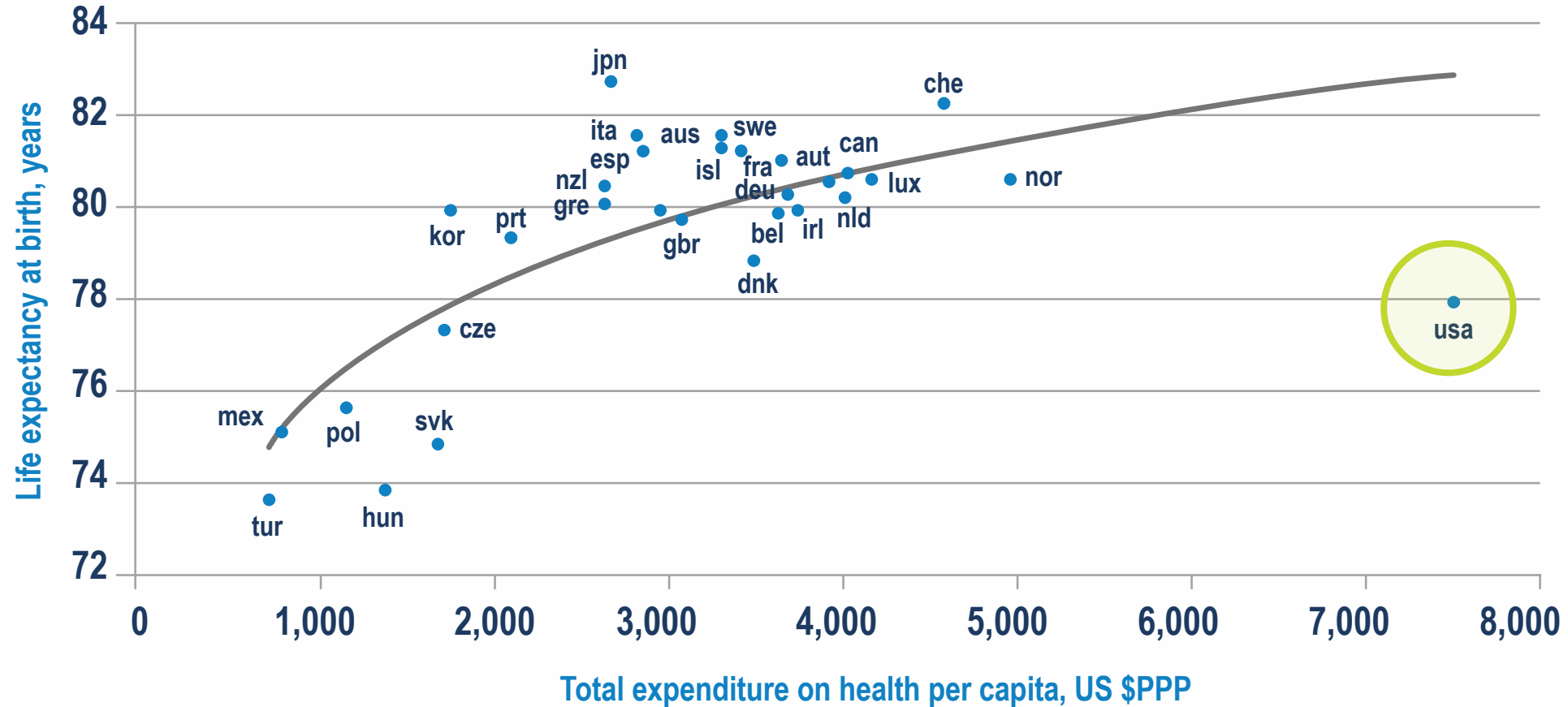
United States per Capita Healthcare Spending is more than twice the average of other developed countries



Source: Organization for Economic Cooperation and Development, OECD Health Statistics 2018, June 2018. Completed by PGPF. Note: Data are 2017 or latest available. Chart uses purchasing power parities to convert data into U.S. dollars. © 2018 Peter G. Peterson Foundation

Our Nation's Health — Where is the Value?

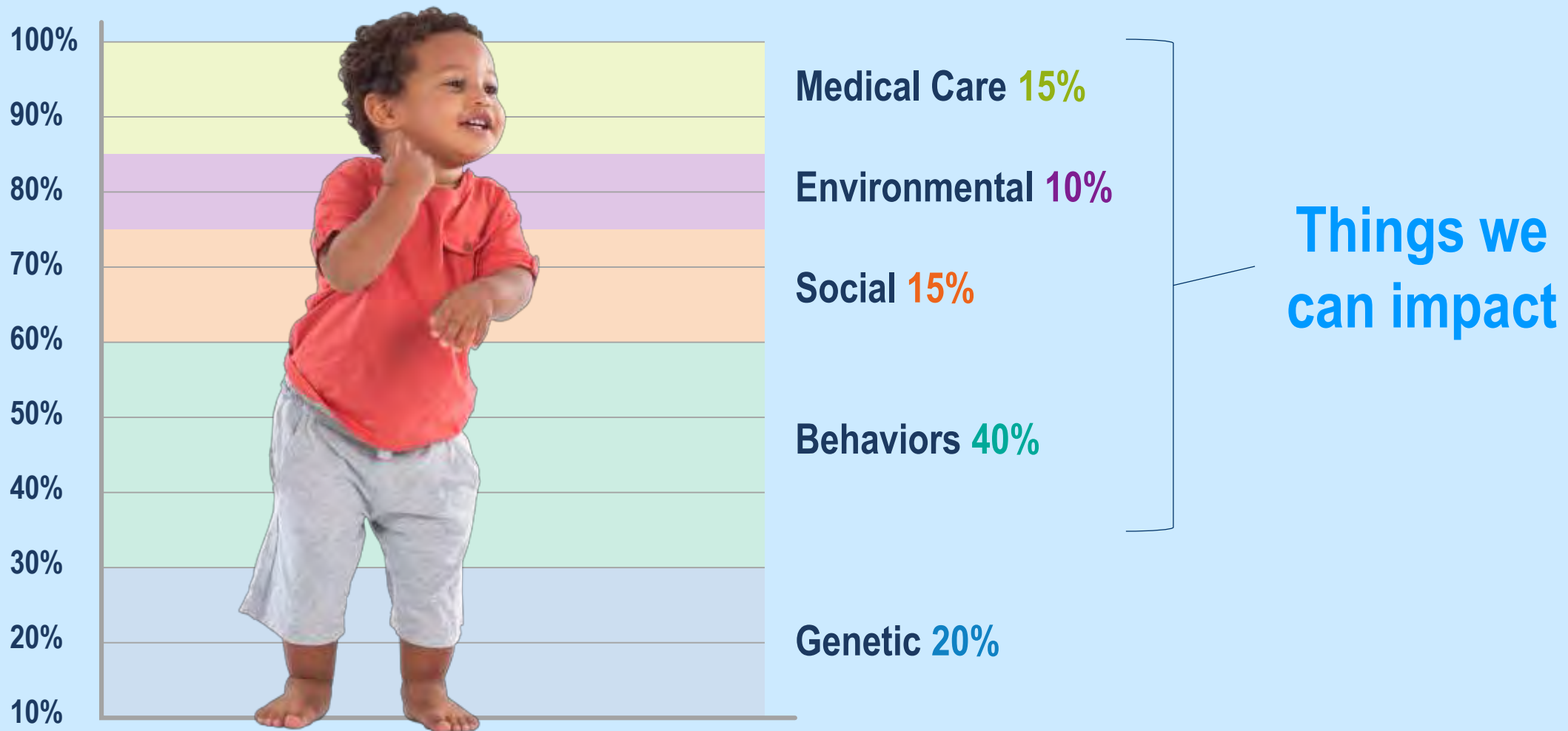
Life Expectancy and Health Care Spending, 2008



Degree of Influence in Shaping the Health of Populations

What Determines the Health of an Individual?

Degree of Influence in Shaping the Health of Populations



We Want: Health

We Are Paying for: Medical Care

Determinants of
Health

Spending on
Medical Care

15%
Medical Care
85%
Health Behaviors
& Other Factors



97%
Medical Care
3%
Health Behaviors
& Other Factors

Core Concepts of Social Determinants of Health

World Health Organization

- The social determinants of health are the conditions in which people are born, grow, live, work and age
- These circumstances are shaped by the distribution of money, power and resources at global, national and local levels
- The social determinants of health are mostly responsible for health inequities

What are the primary social determinants of health?

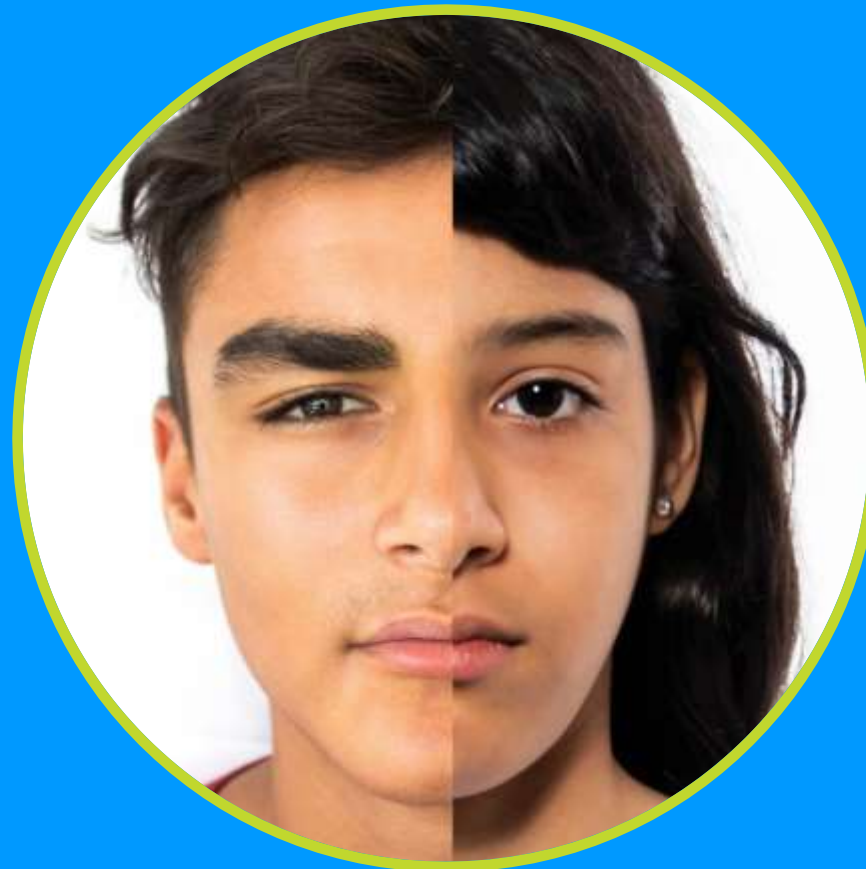
- Education and literacy
- Nutrition and Food Security
- Childhood experiences
- Healthy behaviors
- Income and social status
- Employment and work conditions
- Social supports and coping skills
- Physical environments
- Biology and genetic endowment
- Culture

Among the Largest Health Disparities on the Planet

Your ZIP CODE shouldn't predict how long you live, BUT IT DOES.

STOCKTON
95202
Life Expectancy

73

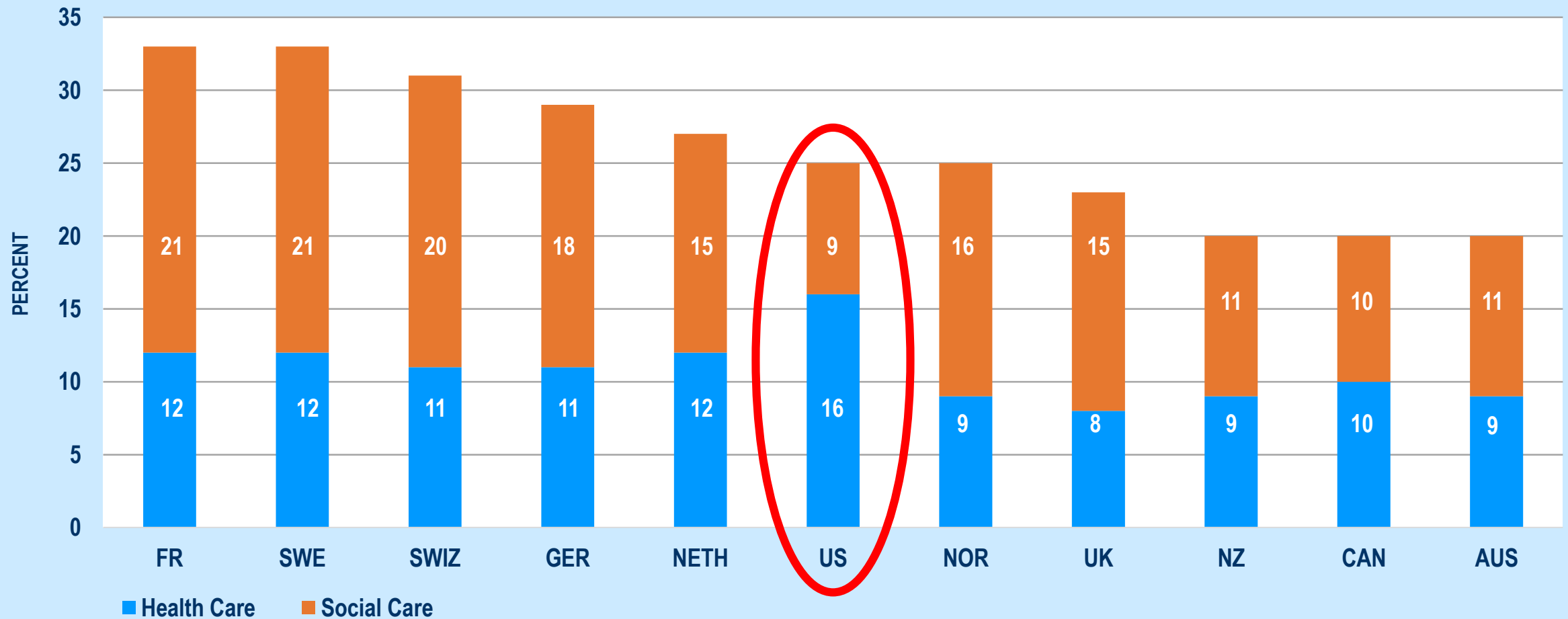


IRVINE
92606
Life Expectancy

88

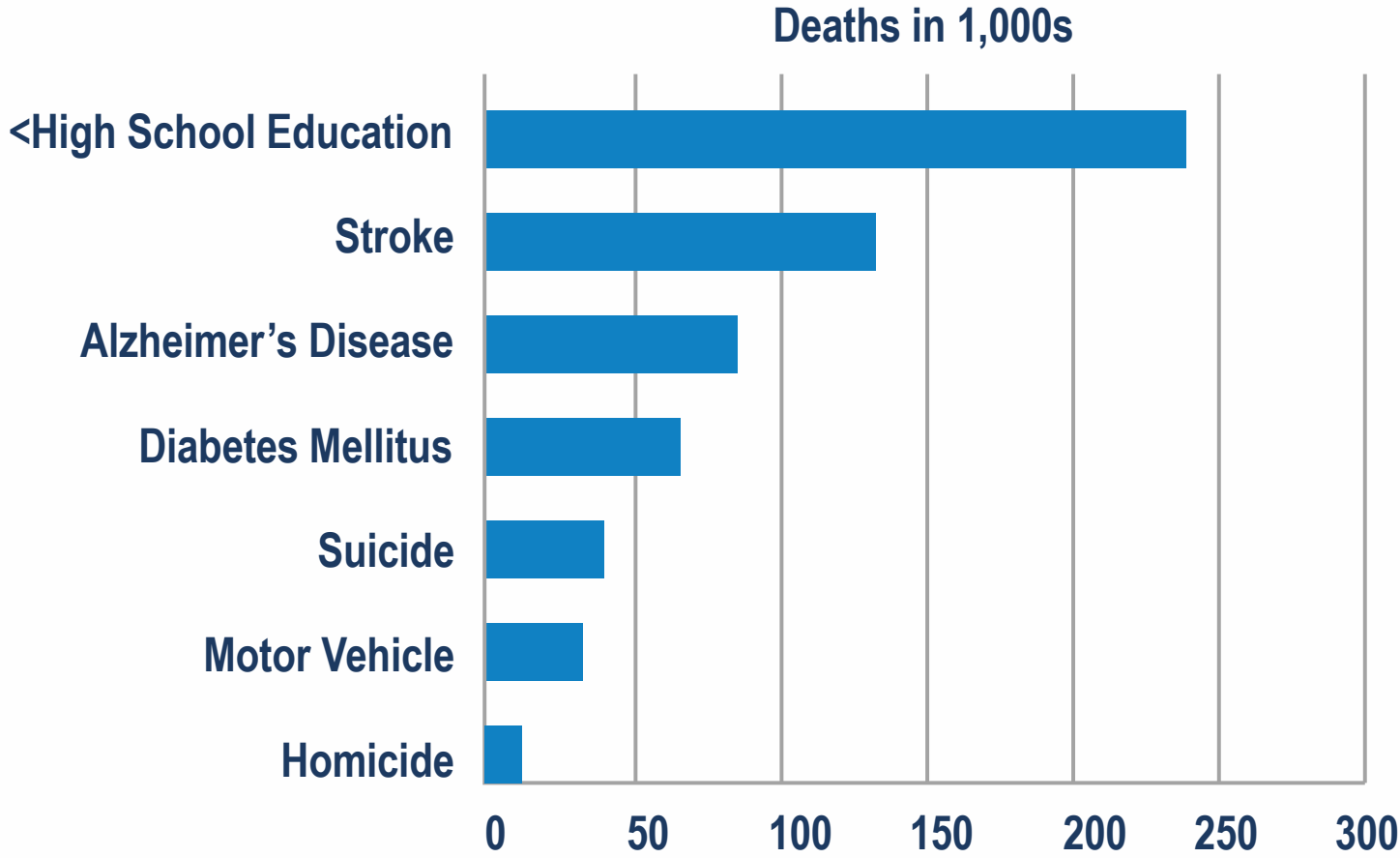
How Do We Spend Our “Health” Dollars?

Health and Social Care Spending as a Percentage of GDP



Lack of Education Links Directly to High Risk of Death

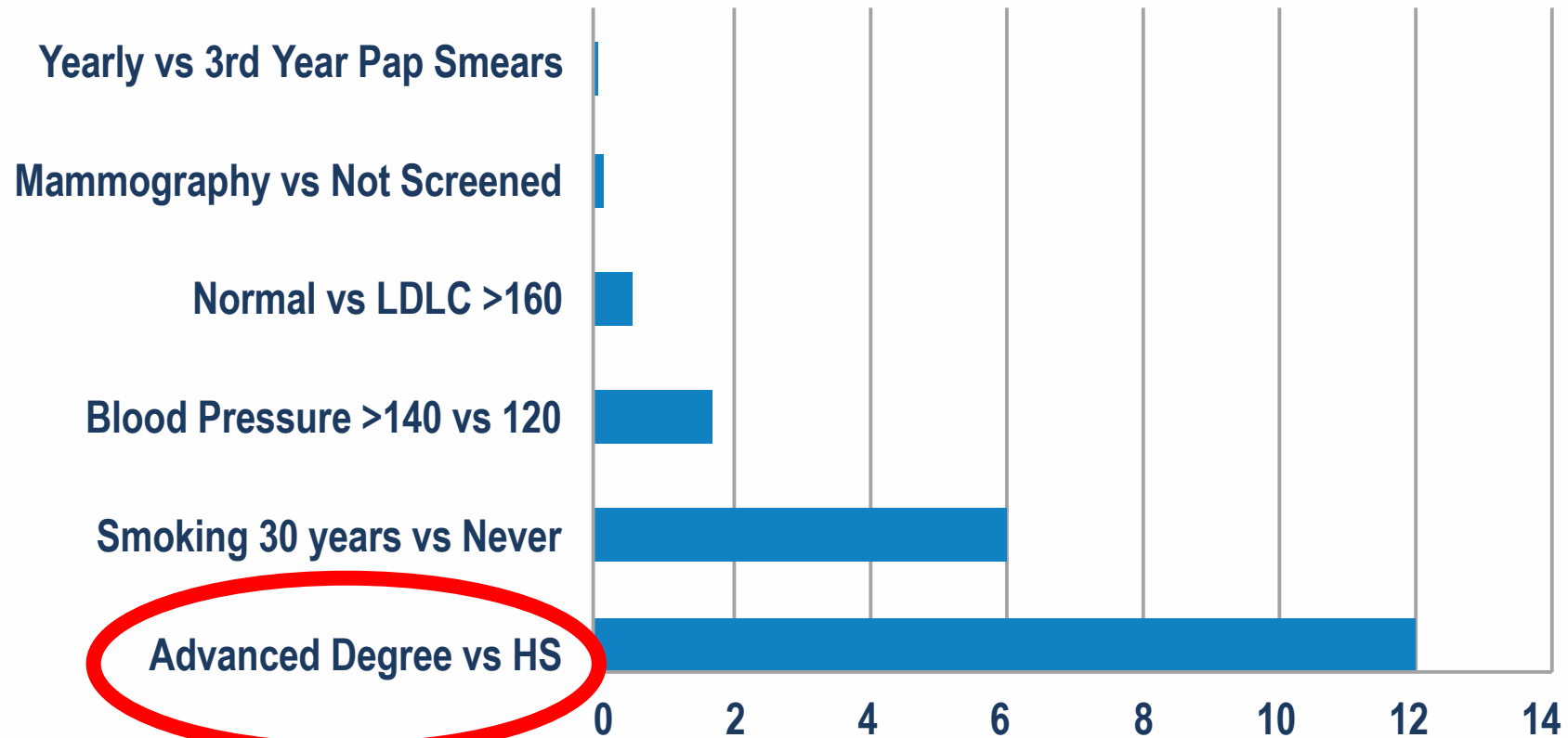
Deaths Associated With Low Education



Death data from National Vital Statistics Report, 61 (4), May 8, 2013. Education estimate from Galea et al AJPH, 2011

The Most Powerful Behavior to Promote Health: School

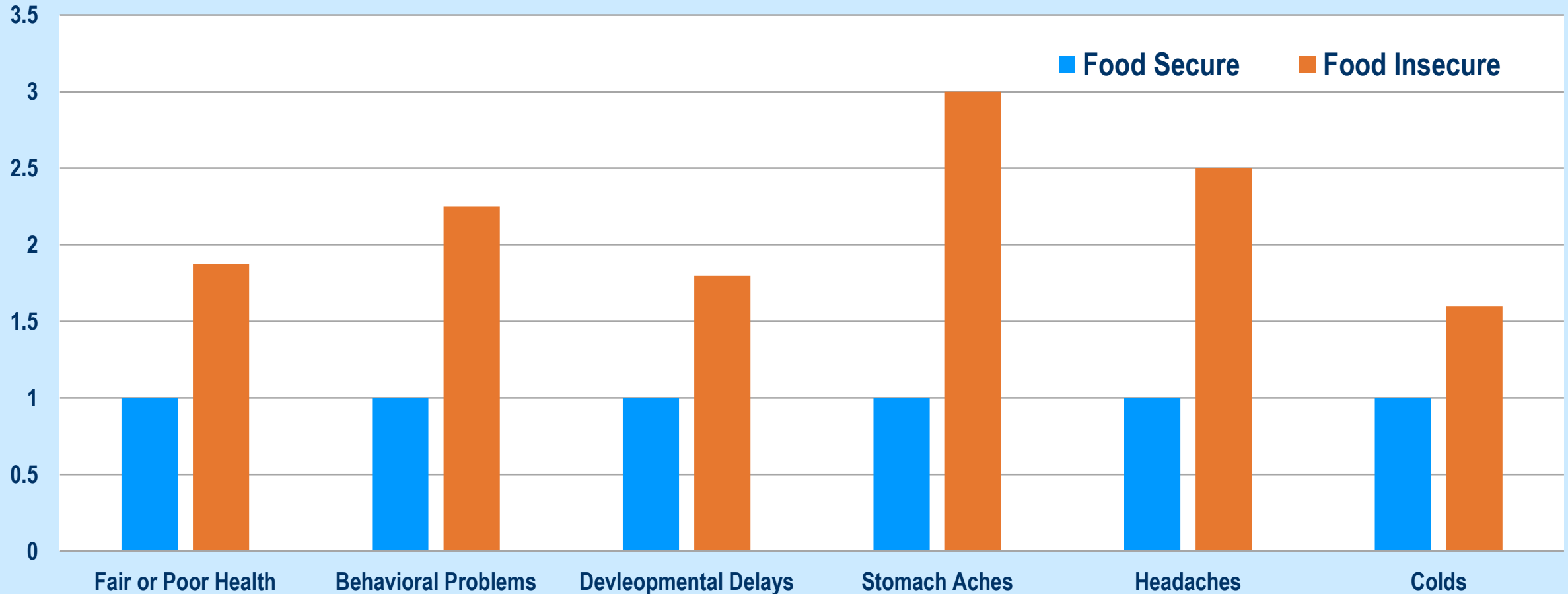
Quality Adjusted Life Years by Risk



Data estimated from Whitehall 39 year follow-up: Clarke BMJ 2009;339:b3513

Impact of Food Insecurity on Health Outcomes

Food Insecure Young Children Face Increased Chances of Various Health Risks



Adverse Childhood Experiences

- Emotional or physical neglect
- Physical, emotional or sexual abuse
- Growing up with family members with mental illness, alcoholism or drug problems
- Family violence
- Incarcerated family member
- One or no parents

The Adverse Childhood Experience ACE Study

- Center for Disease Control and Kaiser Permanente Collaboration
- Ten-year study involving 17,000 people
- Looked at effects of adverse childhood experiences (trauma) over the lifespan
- Largest study ever done on the subject

Findings

- 67% of respondents had at least one ACE
- 1 in 4 exposed to 2 categories of ACEs
- 1 in 16 was exposed to 4 categories.
- 22% were sexually abused as children.
- 66% of the women experienced abuse, violence or family strife in childhood.

Impact of Trauma Over the Lifespan

Neurological, biological, psychological and social. They include:

- Changes in brain neurobiology;
- Social, emotional & cognitive impairment;
- Adoption of health risk behaviors as coping mechanisms (eating disorders, smoking, substance abuse, self-harm, sexual promiscuity, violence); and
- Severe and persistent behavioral health, health and social problems, early death. (Felitti et al, 1998)

ACE Study Findings

Compared with people with no ACEs, those with four or more ACEs were:

- Twice as likely to smoke
- Seven times as likely to be alcoholics
- Six times as likely to have had sex before age 15
- Twice as likely to have cancer or heart disease
- Twelve times more likely to have attempted suicide
- Men with six or more ACEs were 46 times more likely to have injected drugs than men with no history of adverse childhood experiences

Is the impact of these childhood experiences really that large into adulthood? Don't they just get over it?

An untreated high ACE score in a child predicts a

20 years decrease

in life expectancy

Health Costs of Adverse Childhood Experiences



41%
of Medicaid
enrollment
in Alaska can be
linked back to ACEs.

↓
22,000 Alaskans
rely on Medicaid
due to ACEs at an
estimated cost of

↓
\$360 million



32%
of Alaskan
smokers
likely smoke
due to ACEs.

↓
Each year,
37,000 Alaskans
with ACEs smoke
at an estimated
cost of

↓
\$190 million



24%
non-gestational
diabetes
cases are linked
with ACEs.

↓
10,000 Alaskans
with ACEs have
diabetes and
annually cost

↓
\$110 million



14%
of obesity
in Alaska is linked
with ACEs.

↓
Each year,
22,000 Alaskans
with obesity health
issues related to
ACEs cost more
than

↓
\$31 million



11%
of binge drinking
is linked with
ACEs.

↓
Each year,
11,000 Alaskans
likely binge drink
due to ACEs at a
cost of

↓
\$70 million

Nemours[®] Children's Health System



Investing in the Social Determinants in Children Increases ROI By on Order of Magnitude

- Longitudinal studies (i.e. James Heckman) show direct health benefits
- Longitudinal studies confirm economic benefits to age 35, which translate to lifelong health benefits
- These benefits stand up to rigorous (onerous) statistical correction

Abecedarian Preschool and Early School Age Project: Heckman et al North Carolina

- Social experiment based upon intellectual stimulation in early childhood
- Preschool (Birth – 5) and School age (6-8)
- Two meals and a snack daily
- Periodic medical checkups
- Health behaviors and lifestyle

Results on Health Outcomes

All Changes Statistically Significant at Age 35

- Lower systolic and diastolic blood pressure
- Less likely to be stage one hypertensive or pre hypertensive
- None exhibited metabolic syndrome versus 25% of a control group
- Higher levels of HDL “good cholesterol”
- Lower incidence of abdominal obesity

Results on Health Behaviors

All Changes Statistically Significant at Age 35

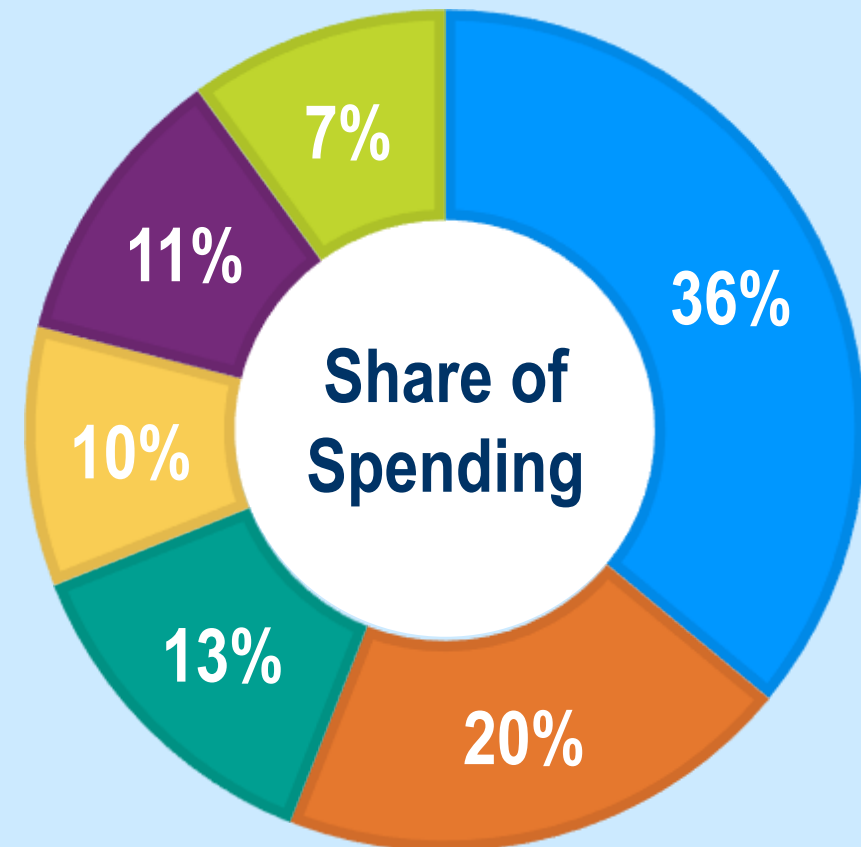
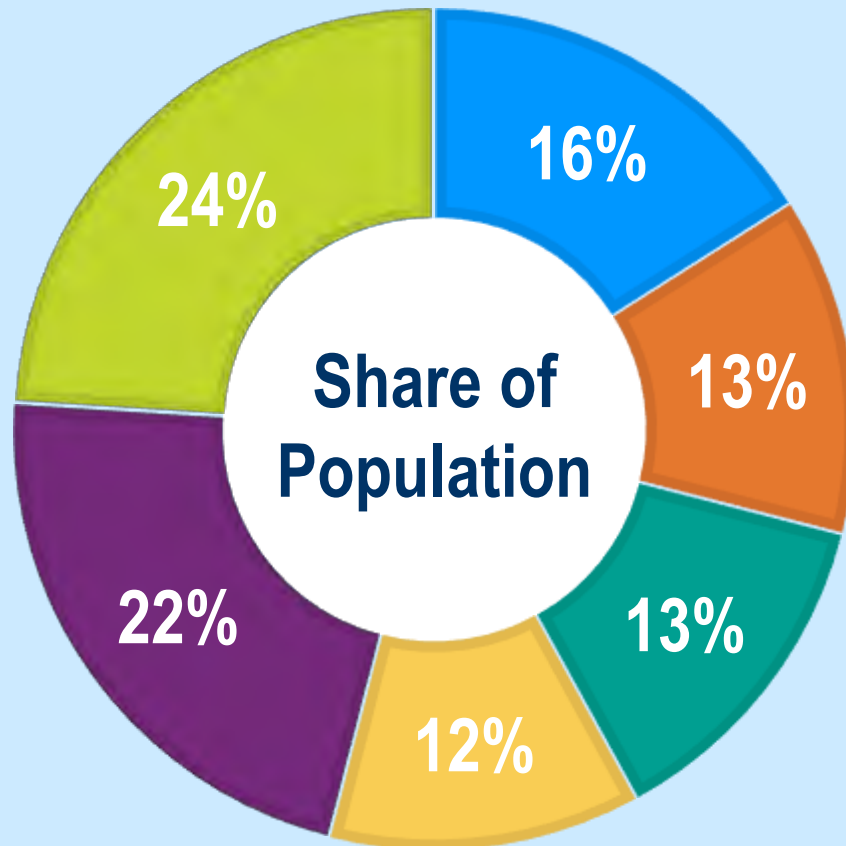
- More likely to engage in regular physical exercise
- Less likely to smoke at early age
- More likely to eat nutritious food at age 21
- Less likely to be overweight in childhood
- Less likely to start drinking alcohol before age 17

Results on Economic Outcomes

- 13% return on investment per annum
- Increased high school graduation rate
- Less likely to be convicted of a crime and be incarcerated
- Higher median annual income compared to controls
- Two generation effect

Share of Medical Care Spending by Age Group

■ 65 and over ■ 55 to 64 ■ 45 to 54 ■ 35 to 44 ■ 19 to 34 ■ Under 18

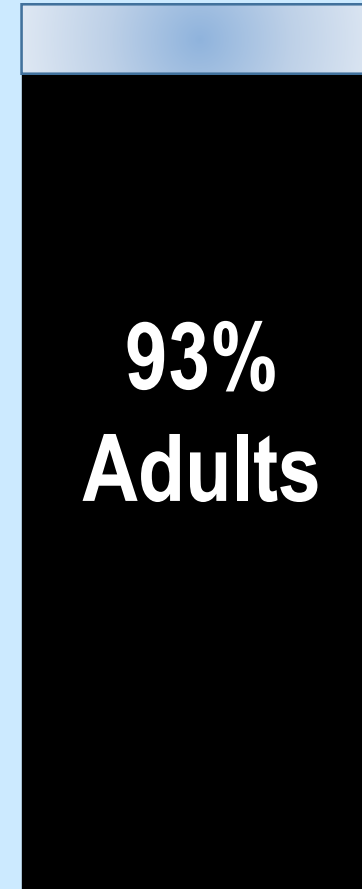


Total Health Care Spending

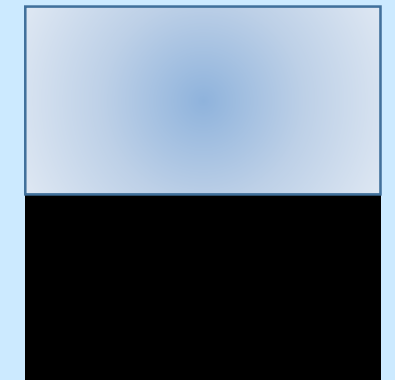
Spending on **CHILD HEALTH** provides the largest lever to impact **future generations**



7%
Children



TODAY



10-20 YEARS

Nemours at a Glance

- The only multi-state, multi-region, multi-hospital pediatric care system in the U.S.
- Commitment to all aspects of children's health including medical care
- Enduring legacy of Alfred I. duPont



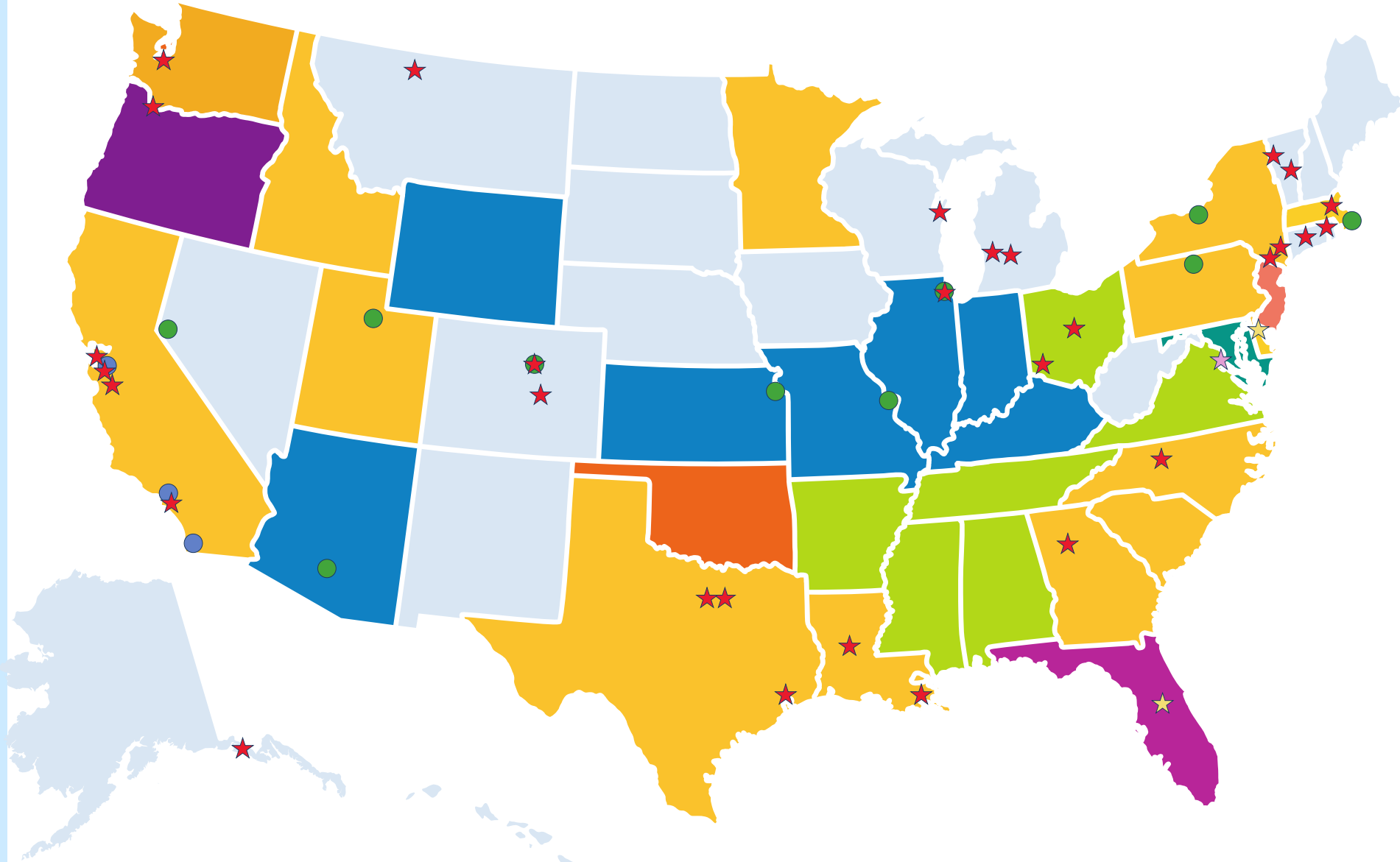
Nemours at a Glance

- 1.8 million visits
- 470,000 unique patients
- 3,800 trainees (residents and fellows)
- 847 employed physicians
- 218 researchers
- 42 specialties and subspecialties
- 8,000 employees
- 80 pediatric care locations
 - Delaware
 - New Jersey
 - Maryland
 - Pennsylvania
 - Florida



Nemours Prevention and Population Health

Spreading and Scaling Impact in the Early Years



Three Anecdotal Examples of Leveraging SDOH to Improve Children's Health

- Broad based community wide approach to childhood asthma
- Development of a social determinants of health screening tool to be used for all children at the primary care doctors office
- Implementation of healthy lifestyle training in preschool

Nemours CMMI Asthma Award

Value Based Care in a Fee-for-Service World

- Award Parameters:
 - 3-year award beginning July 1, 2012
 - \$3.7 million
 - Cooperative Agreement
- Self Monitoring and Evaluation:
 - Nemours in collaboration with Thomas Jefferson U and U of Delaware
 - NORC at the University of Chicago: External Evaluation

Changes in Our Practice Model--Asthma

- Pediatric Primary Care Practices: NCQA accredited PCMHs
- Behavioral Health Integration
- Patient level influencers (Community Health Workers)
- Community level influencers (Community Health Liaisons)
- Optimize Use of Technology

Behavioral Health Integration

- Psychologists and social workers hired and integrated into the practice team
- Role
 - Behavioral health management
 - Adherence promotion
 - Team building/integration
 - Population-based interventions – education/groups
 - Consultations

Deployment of a Navigator Workforce

Patient Level

- Hired, trained and deployed Community Health Workers – unlicensed
- Link between clinic and home
- Home environmental assessments
- Case management of non-medical issues/concerns
- Reinforcement of asthma education

Deployment of Integrators Workforce

Community Level

- Community liaisons
- Community engagement and mobilization
- Link between clinic and community—increase in connections to community resources
- Focus on upstream determinants of health
- Facilitated partnerships with key stakeholders (HUD, ALA, DPH, etc.)
- Facilitated practice team members engagement with community
- Developed and implemented community action plans

Optimize Use of Technology

- Establish Asthma Registry
- QI measures and tracking
- Individualized Asthma Action Plan
- Standardized evidence-based approach—Control stops in EMR
- Student Health Collaborative
- Asthma Education:
 - Electronic newsletter
 - Texting Program
 - Provider Training Modules in Nemours University

Patient Based Results

Internal Data

- 40% - 60% reduction in ER visits from baseline
- Reduced population based asthma admission rates from 0.7/100,000 to 0.1/100,000
- Inpatient CHW intervention lowered readmissions by half from 2.8% to 1.4%
- Risk-stratification tool worked
- Reduced Overall cost of care <\$500 per patient per quarter
- Considerable reduction in cost of care,
BUT without a payment model aligned to support outcomes, overall costs to health system were high and unsustainable

Community Based Results

- Change to DE Medicaid drug formulary allowing metered dose inhalers
- Smoke-Free Wilmington Ordinance—Impacts smoking in public spaces
- Reduced school bus idling
- 100% of Head Start childcare centers are asthma-friendly
- School Health Collaborative—school nurses have access to EMR
- Healthy Homes and Integrated Pest Management

Scope of Impact of Community Based Results

In a very small state

- Changes to drug formulary –metered dose inhaler. **11,805 children impacted.**
- Smoke-Free Wilmington Ordinance –**19,224 children** impacted
- Reducing school bus idling in Wilmington - **14,029 children** impacted.
- 100% of Telamon Head Start childcare centers in Delaware are asthma-friendly, impacting 852 children annually.
- School Health Collaborative: 1302 patients enrolled in 2015-2016 school year
- Healthy Homes and Integrated Pest Management >20,000 children est.

Lessons Learned from a “Pay for Health” Project in a “Pay for Sickness” World

- These interventions work. When we invest in health we get health
 - Not a single new drug or innovative medical intervention
 - The acuity level and complexity of care markedly decreased
- Broad partnerships with communities, social service agencies, government, schools etc. are critical to success
- These efforts will only be sustainable when financial incentives are aligned
 - The infrastructure and implementation costs are very high – will likely decrease with experience and economies of scale
 - The costs to the health system of considerable improvements in health is LARGE

Nemours Social Determinant of Health Screener

- Recognition that the health of the children we serve lives predominantly outside of medical care
- Recognition that we can provide more efficient and targeted care if we are cognizant of the social circumstances in which our patients live
- PILOT – for use in visits to primary care provider
- Will evolve with experience

Piloting Our SDOH Screener

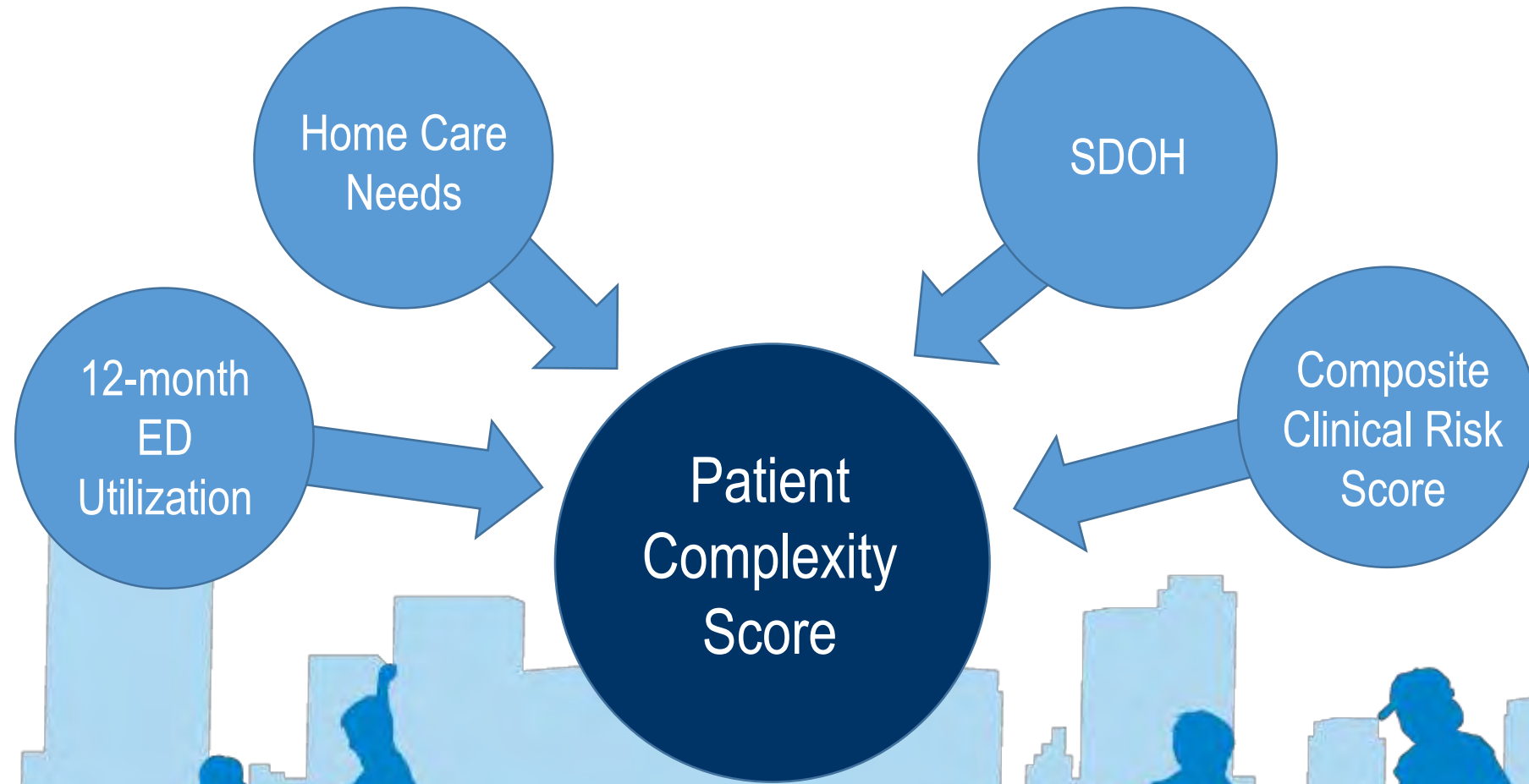
Real Data but Not Validated

In the past 12 months, were there times the food you bought didn't last and you didn't have money to buy more?

Yes No

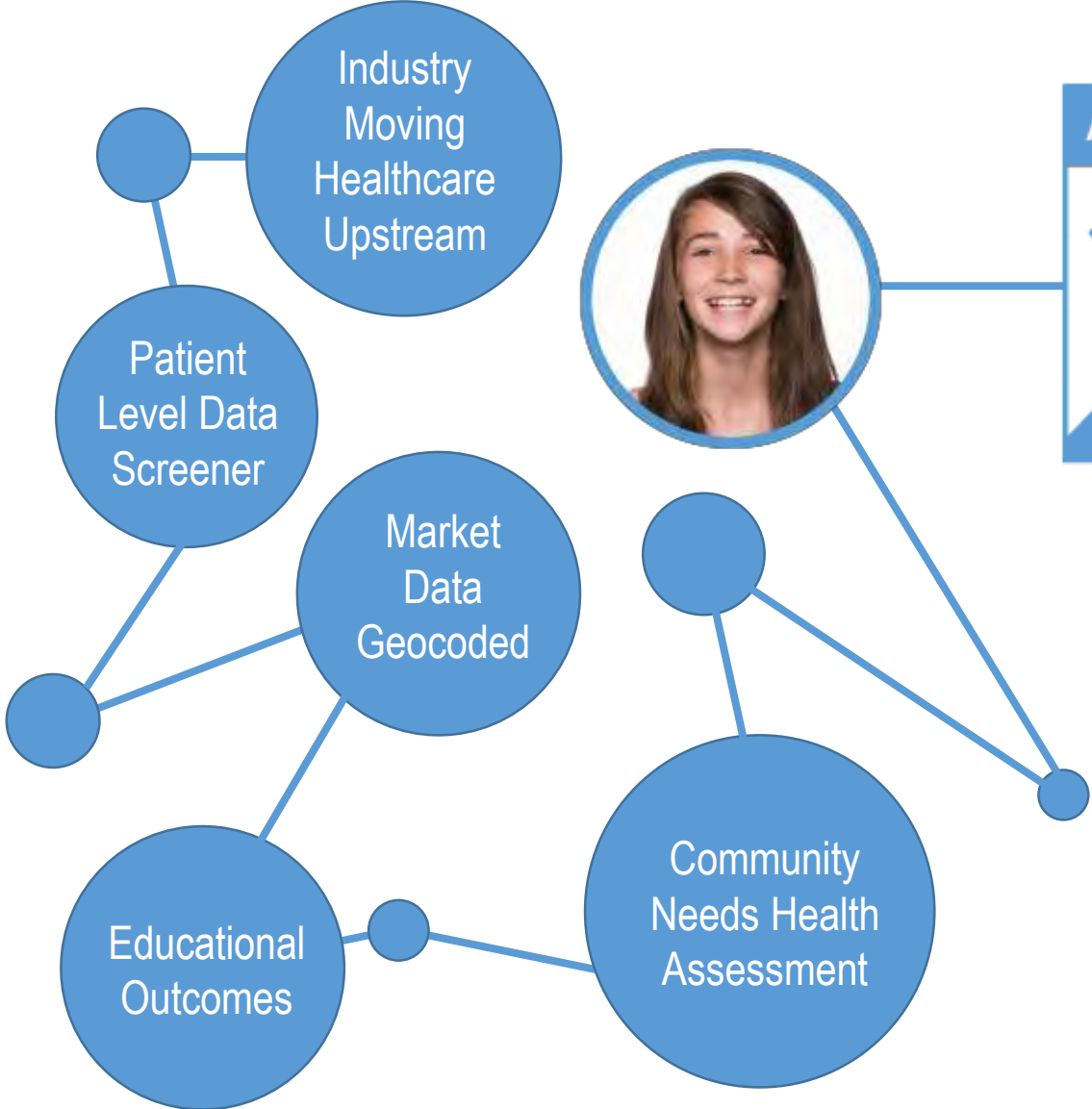
Response	Overall	Hospital ICU and ED Setting	Suburban Care Setting, Mixed Income	Specialty Clinic	Rural Primary Care Clinic	Urban Primary Care Clinic, High Spanish speaking
No	341	73	47	54	53	51
Yes	88	21	10	10	20	26
% with need	20.5%	22%	17.5%	15.6%	27.3%	33.7%

Future Plans: Calculating Overall Patient Complexity*



*Model based on Children's Hospital of Colorado Patient Complexity Scoring, August 2018

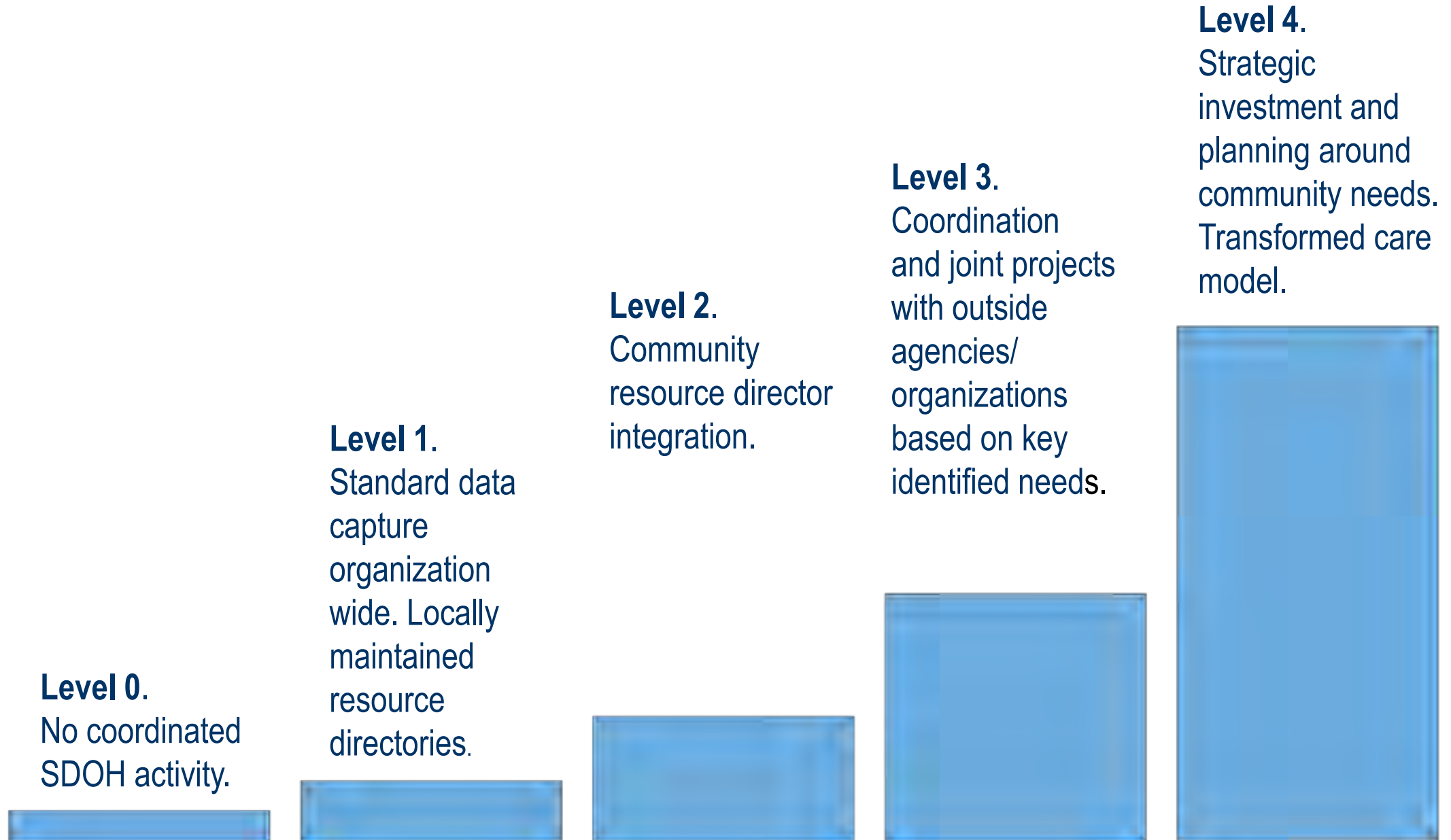
Screeners is Part of a Larger Effort



About Our Patients: Pensacola				
	68%	White	84.8%	Florida
	17.53%	Black or African American	14.4%	Alabama
	6%	Hispanic		
	55%	Male		

Amber is a 13-year-old Type 1 diabetic. She resides with her grandmother in Alabama (over a 2-hour drive). The family struggles with transportation and financial issues. These issues have caused several cancelled/no-show appointments. The patient is covered by Alabama Medicaid, which will not transport across state lines.

Levels of Adoption / Intervention for SDOH



Why Nemours Invests in Early Care and Education

- Nearly 15 million children under 6 are in child care
- 60% of children ages birth to 5 spend at least part of every day in non-parental care
- Families see their ECE providers every day - children spend more time in ECE settings than they do in health care
- ECE programs can promote healthy behaviors
- Practice and policy changes are sustainable and have reach
- A point of primary prevention

National Early Care and Education Collaboratives

The Facts

- 6 years of implementation
- 11 locations in 10 states
- 126 learning collaboratives
- More than 2,500 ECE program participated
- More than 201,500 children served by those programs

The Results

- Pre- and post-tests indicated statistically significant improvements in the number of healthy eating and physical activity best practices met
 - Environment
 - Provisions
 - Teacher Practices
- Improvements maintained at least 12 months post intervention

What if ...

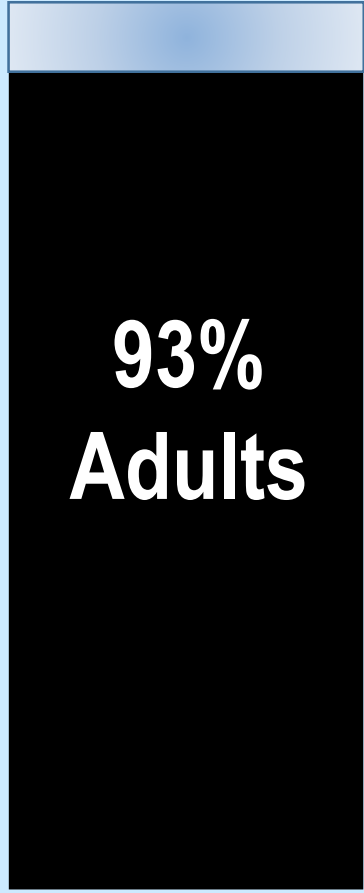
- we successfully prevent disease, reduce hospitalizations, and treat disease with less costly treatments?
- children's health systems do more than deliver superb medical care and also take responsibility for the vital factors outside of the hospital that impact a child's well-being?
- we become stewards of children's health in this country?
- we are a major force in creating a new definition of children's health and in creating the healthiest generation of children in American history?

Total Health Care Spending

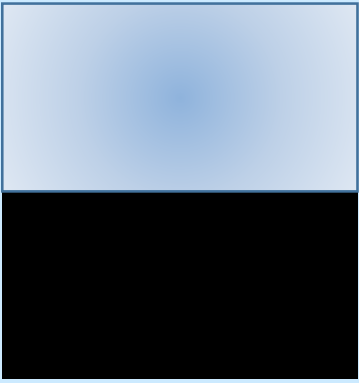
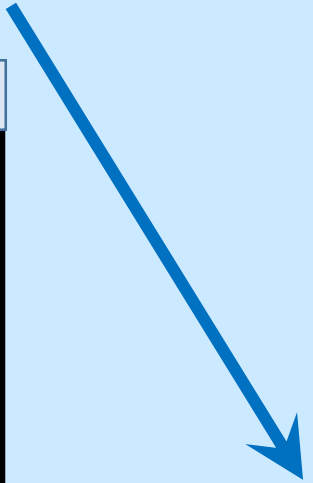
Spending on **CHILD HEALTH** provides the largest lever to impact future generations



7%
Children



TODAY



10-20 YEARS

Nemours[®] Children's Health System





“It is the duty of everyone to do what is within his power to alleviate human suffering.”

Albert S. Burdette