

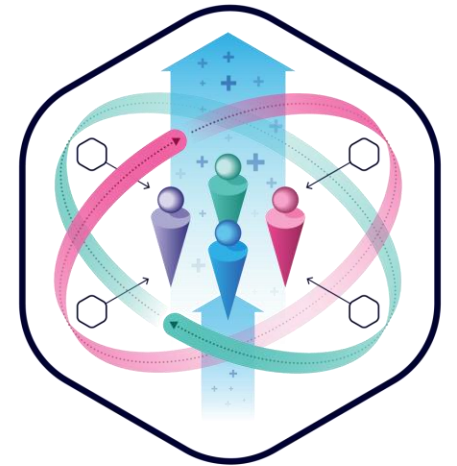
HEROES

HHealth care Rewards to Achieve Improved OutcomES

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Approved for Public Release: Distribution Unlimited



ARPA 

What if... we moved from a sick care system to a system that truly rewards better health?



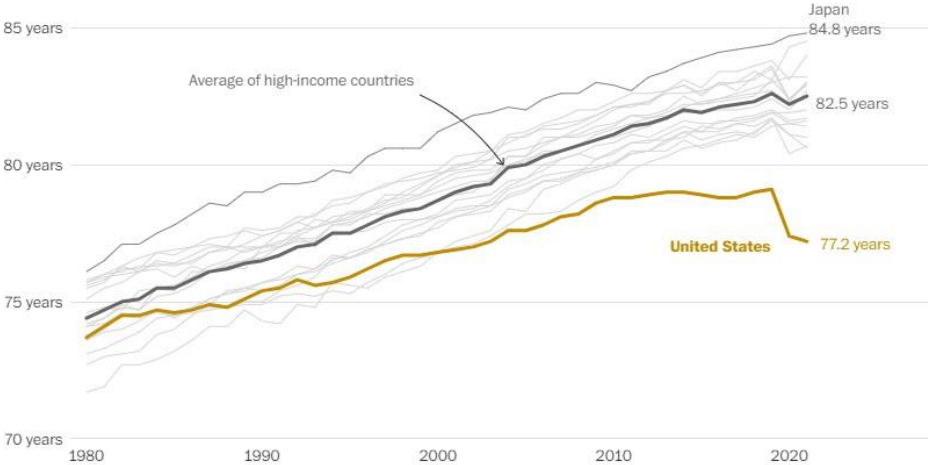
HEROES Draft Program Solicitation (PS)

- **Concise description of the program:** Under the HEROES program, public health entities and collaborators will have the opportunity to improve the health status of their communities for specific patient populations through the use of a payment model that incentivizes community-based interventions to improve health outcomes across a fixed geographic area. These solutions will investigate a new, regionally focused, outcomes-based financing approach for the healthcare industry, which rewards only positive health outcomes and reduces the healthcare burden on patients, providers, and the economy.
- **Health Outcomes include:**
 1. Maternal Health: Reduction in the rate of intrapartum and postpartum severe obstetric complications.
 2. Heart Attack and Stroke Risk: Reduction in aggregate 10-year risk of heart attack and stroke for people aged 40-70 years.
 3. Opioid Overdose: Reduction in the number of emergency medical service calls for fatal and non-fatal opioid overdoses.
 4. Alcohol-Related Health Harms: Reduction in the number of emergency medical service calls for alcohol-related emergencies.

Refer to the HEROES PS, ARPA-H-SOL-24-01 posted to <https://sam.gov> for full HEROES Program details to include key dates.

Preventive Health Care is Not Working for Many Americans

American life expectancy has been flat for decades and is declining, trailing other nations.



Source: United Nations, Department of Economic and Social Affairs, Population Division.

Despite massive spending, a high burden of preventable morbidity and mortality drives poor outcomes.

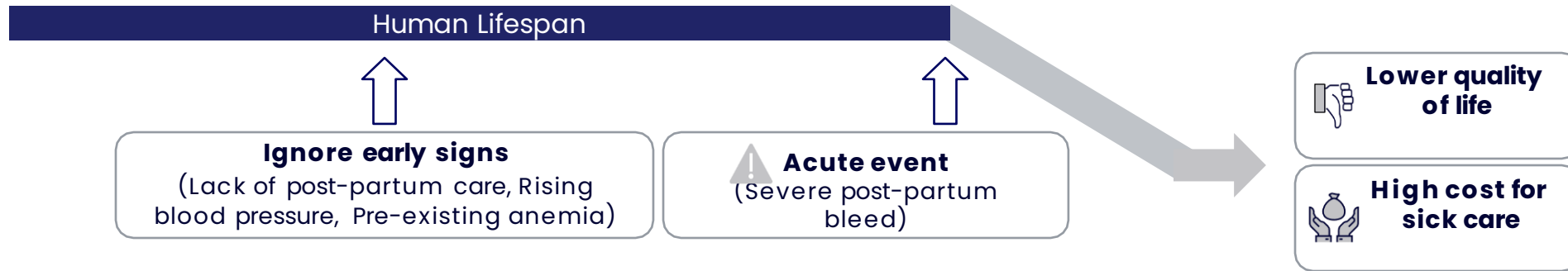
Legend: ■ Significantly lower than mean, ■ Statistically Indistinguishable from mean, ■ Significantly higher than mean

	Ischemic heart disease	Lung cancer	Road injuries	Self-harm	COPD	Cerebrovascular disease	Alzheimer disease	Drug use disorders	Diabetes	Congenital anomalies
United States	1,696.6	781.7	614.5	511.7	471.8	456.5	422.1	358.3	310.0	299.6
Comparison group average	1,181.8	645.1	317.4	420.1	299.3	555.5	300.2	131.3	151.3	232.4

Years of Life Lost Per 100,000, All Ages, Age-Adjusted, from Global Burden of Disease, <http://www.healthdata.org/united-states>

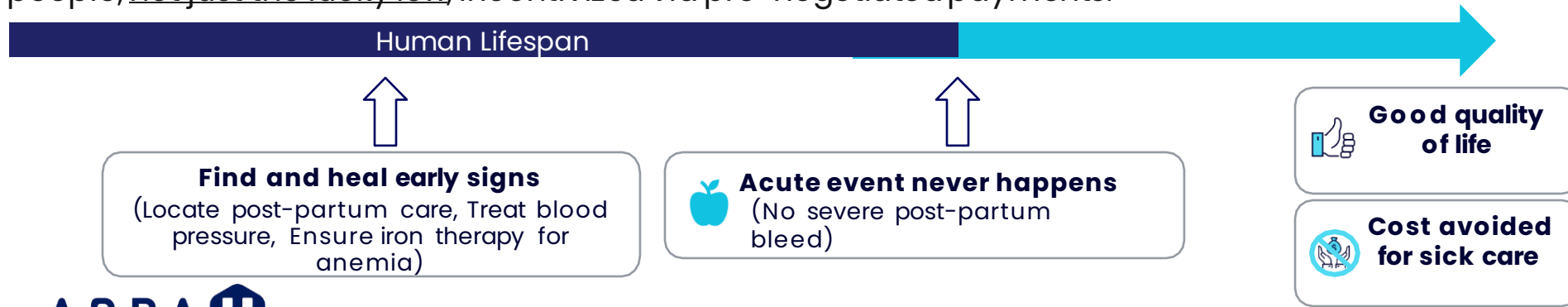
Health Care Outcomes: Current vs. Future State

Current State: Health care organizations don't have strong financial incentives to fix early signs – and most people aren't lucky enough to get the right care at the right time.



- **No Accountability:** Pay for expensive treatments, no focus on prevention.
- **Inequity:** Fragmented care, inability to make broad system investments.
- **Flying blind:** No timely data on health of the whole population.

Future State: HEROES rewards fixing early warning signs to deliver better outcomes for all people, not just the lucky few, incentivized via pre-negotiated payments.



- **Accountability:** Payment only if preventive targets achieved.
- **Equity:** Whole geographic population is included.
- **Evidence-driven interventions:** Timely data to drive rapid-cycle improvement.



HEROES: Changing the System to Create a Market for Prevention

In the Right Regions:
Population-level accountability in areas hardest hit by preventable health burden



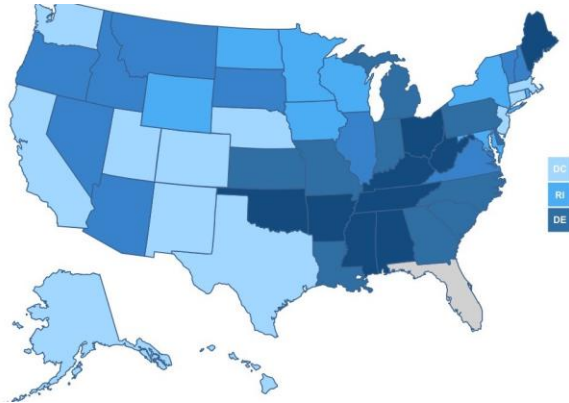
The Right Incentives:
Sustainable financing that rewards outcomes



With the Right Interventions:
Create the right Technology, Engagement, & Clinical Interventions



How HEROES Aligns Incentives with Geographies



Health Accelerators will propose a high-need geographic region in **one of four** possible health outcomes.

Each Health Accelerator will need to meet a population-specific goal that has been projected to generate at least \$60M value to society (across health care, productivity, and social service costs) over 3 years.

Maternal Health Outcomes

Significance: The U.S. experiences higher rates of Severe Obstetric Complications (SOC) than most other developed countries, and rates continue to rise.

Goal: Within a population of 5M (or an entire state if less than 5M), reduce the rate of SOC during delivery hospitalization and 60 days after delivery by 20%.

Heart Attack and Stroke

Significance: Heart disease (#1) and Stroke (#5) are among the leading causes of death in the U.S. Annually, there are about 805,000 Heart Attacks and 795,000 Strokes.

Goal: Within a population of 700,000 (or an entire state if less than 700,000), reduce 10-year aggregate risk of Heart Attack and Stroke for people aged 40-70 years by 1% point.

Opioid Overdose

Significance: Opioid Use Disorder (OUD) affects over 2.1 million individuals and causes over 100,000 deaths annually in the U.S. Fewer than 10% of patients with diagnosed OUD receive medication-assisted treatment (MAT).

Goal: Within a population of 500,000, reduce the number of emergency medical service calls for opioid overdoses by 10%.

Alcohol-Related Health Harms

Significance: An estimated 1 in 5 deaths of people ages 20 - 49 result from excessive alcohol use. There are more than 140,000 alcohol-related deaths per year in the U.S.; excessive drinking, including binge drinking, costs the U.S. \$249B annually.

Goal: Within a population of 500,000, reduce the number of emergency medical service calls for alcohol-related emergencies by 10%. Approved for Public Release: Distribution Unlimited

HEROES Outcome Toolkit

OUTCOME SELECTION:
Chosen for maximum impact on health disparities

GEOGRAPHIC INCLUSION:
Health Accelerators must choose an entire geographic region and must serve every person in the area

SITE AND PERFORMER SELECTION:
Performers are encouraged to choose a geographic area with performance worse than the national average and must have a plan to reach all people

1 What is the outcome you want to investigate?

Maternal Health

Opioid Overdose

Heart Attack and Stroke Risk

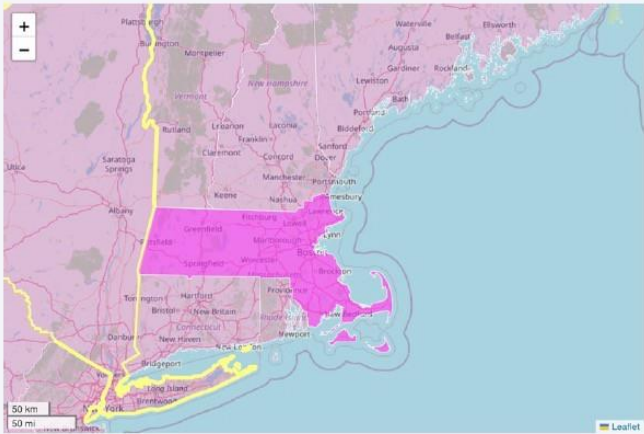
Alcohol-related Health Harms

Severe Obstetric Complications (SOC) can occur during or after labor and delivery and can result in major disability and even death of a parent or child after pregnancy. The use of technology and improved clinical coordination have been shown to improve maternal health outcomes. Estimated total maternal morbidity costs for all U.S. births in 2019 to be \$32.3 billion from conception through the child's fifth birthday. This amounts to \$8,624 in additional costs to society for each

[Learn More](#)

2 What is the geographic area you want to study?

Search for a city or state Search



Rate of SOC per 100,000 during delivery hospitalization and 60 days postpartum per month.

1 Selected Outcome: Maternal Health

Maternal Health

PROBLEM
Although maternal mortality and severe maternal morbidity (SMM) rates continue to rise, root causes of poor maternal health outcomes are difficult to discern and compare nationally.

METRICS
The rate of SOC per 100,000 people in a rolling 28-day period.

SELECTION CONSTRAINTS
The selected population must be at least 5 million with a rate of SOC higher than the national average.

« Collapse Section

2 Select the Geographic Areas For Intervention

Each county on the map is listed by its "zip3," which is the first three numbers of the county's zip code. The information provided also includes the county's population size.

Zip3s By State 21 Selected

- Alabama (21 of 21) Remove all
- Alaska (0 of 5) Add all
- Arizona (0 of 14) Add all
- Arkansas (0 of 17) Add all
- California (0 of 60) Add all
- Colorado (0 of 19) Add all
- Connecticut (0 of 10) Add all
- District of Columbia (0 of 5) Add all
- Florida (0 of 25) Add all
- Georgia (2 of 21) Add all
- Hawaii (0 of 2) Add all
- Idaho (0 of 13) Add all
- Illinois (0 of 30) Add all
- Indiana (0 of 20) Add all

ZCTA3 378xx
Anderson County, Blount County, Campbell County, Claiborne County and 19 more
Total Population: 547948

3 Evaluate Area Suitability

To qualify for the HEROES program, the selected area(s) must meet the minimum requirements below. Continue to select counties until you meet the minimum requirement. The selected areas may extend across state lines, but all counties must be connected.

Contiguity Selected areas are contiguous

Population In Selection Must be above 5.0m Selected: 6.6m

SOC Rate Must be above 1.2m Selected: 0.5m

Age Race/Ethnicity Income

Age 0 to 5 years Selected % Affected %

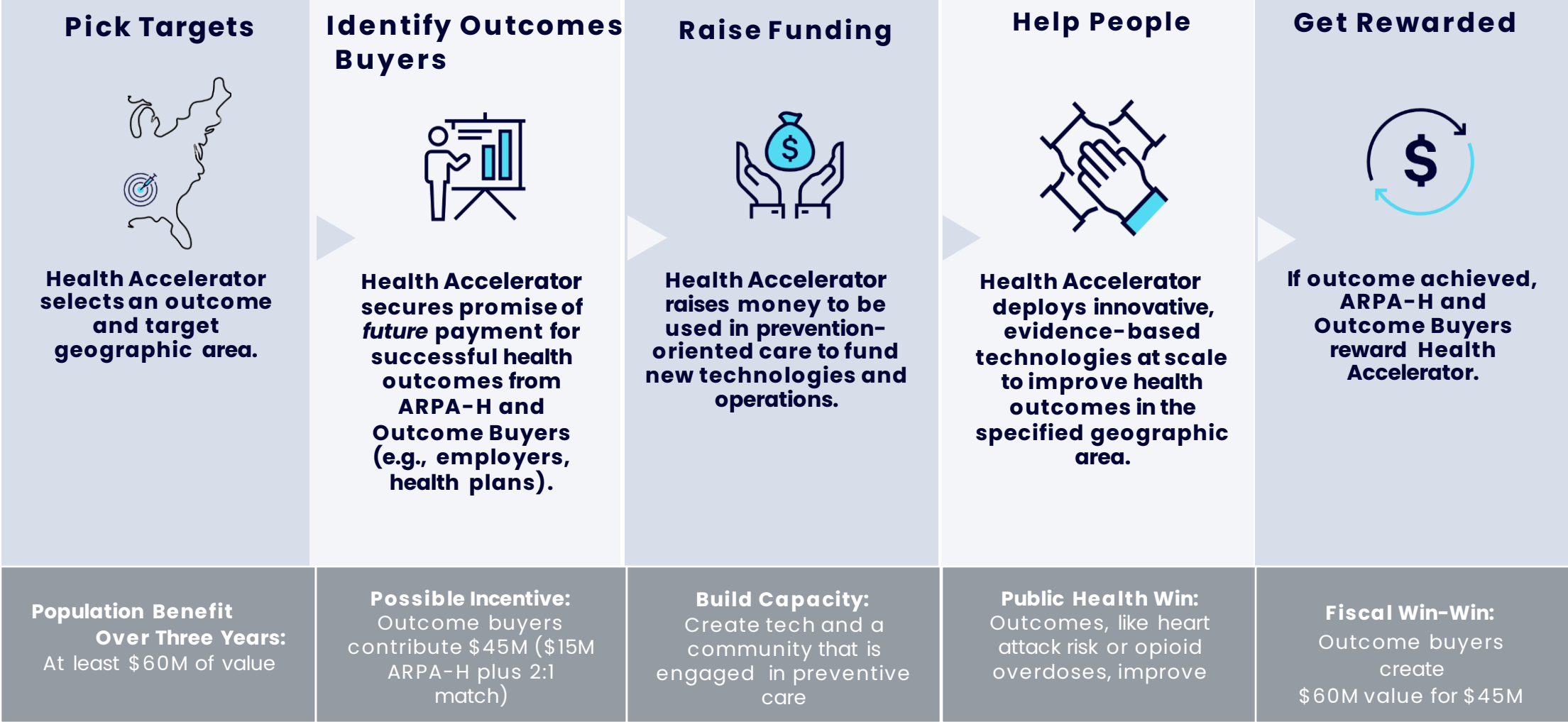
5 to 9 years

10 to 14 years

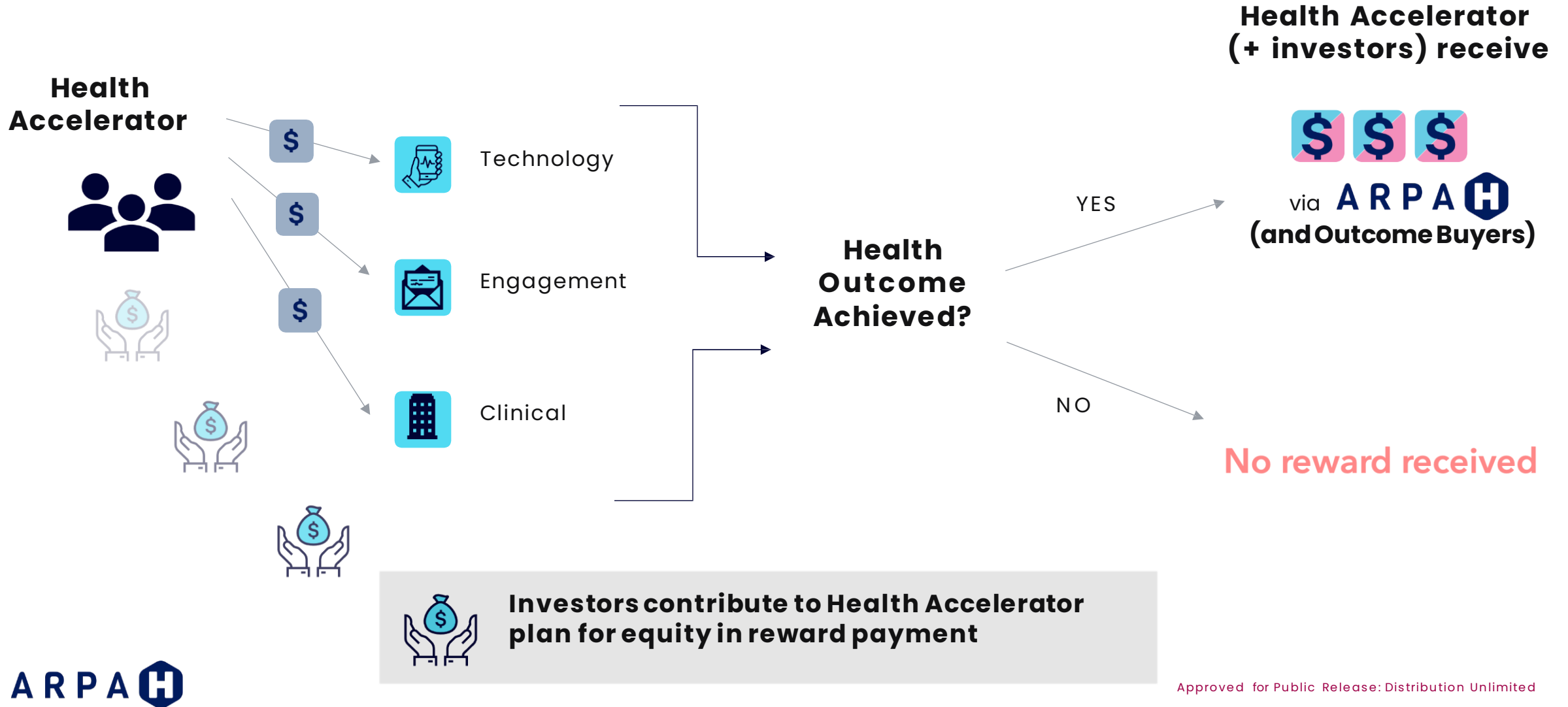
15 to 19 years



How HEROES Creates Incentives



HEROES: How the rewards flow



Hypothetical Reward Example for Maternal Health

Step 1:

Agree to "rate card" at the start

Example at 24 months:

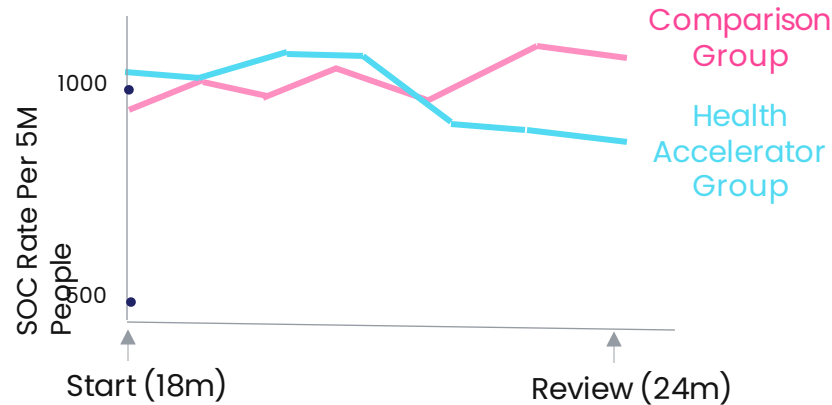
Change Relative to Comparison Group	Outcome Payment
0% or worse	None
5%	\$1.875M
10%	\$3.75M
15%	\$5.6M
20% or better	\$7.5M

Calculation going into contract:

- Performance period 36 months, paid every 6 months.
- Total Outcome Buyer Commitment = \$45M (\$15M from ARPA-H + \$30M from partners).
- Target Outcome = 20 percentage point improvement proportioned over 3y based on incremental improvement targets.

Step 2:

Every 6 months, review metrics



- ▶ In **Comparison Group**, rate worsens from start time by 5% (from its baseline).
- ▶ In **Health Accelerator Group**, rate improves from start time by 10% (from its baseline).
- ▶ Thus, **Health Accelerator** showed 15% improvement relative to **Comparison**.

Step 3:

Pay Health Accelerator per rate card

Change Relative to Comparison Group	Outcome Payment (\$375K per 1% change)
0% or worse	None
5%	\$1.875M
10%	\$3.75M
15%	\$5.6M
20% or better	\$7.5M



- ▶ ARPA-H / Outcome Buyers disburse \$5.6M reward payment to **Health Accelerator**.
- ▶ 6-month cycle restarts.

Hypothetical Reward Example (more details)

	6 months	12 months	18 months	24 Months*	30 months	36 months	Total payout (\$) and average outcome reduction (%) over entire 3-year program*
Hypothetical maximum outcome-based payout (assuming \$45M total reward pool)	\$3.75M	\$3.75M	\$7.5M	\$7.5M	\$11.25M	\$11.25M	\$45M
Expected reduction of severe obstetric complications (% relative to comparator)	10%	10%	20%	20%	30%	30%	20%
Scenario 1: Slow start with moderate sustained progress but does not achieve the expected 3-year average outcome reduction.							
Relative reduction achieved by the Health Accelerator	0%	0%	17%	15%	24%	30%	14.3%
Reward earned by Health Accelerator	\$2M	\$0M	\$6.38M	\$5.63M	\$9M	\$11.25M	\$34.25M
Scenario 2: Strong performance but does not hit all milestones during the program. At end of the program, the 3-year average outcome reduction exceeds the expected amount. The HA is eligible to receive the balance of the reward pool via a post-program "true-up."							
Health Accelerator's relative reduction	6.7%	10%	15%	20%	30%	38.3%	20%
Health Accelerator Reward Payment	\$2.5M	\$3.75M	\$5.63	\$7.5M	\$11.25	\$11.25M	\$41.8M earned and true-up to \$45M

*The actual value of the outcome-based reward pool is dependent on additional advanced commitments from Outcomes Buyers secured by the AHA.

















Scenario 1:

- The AHA does not earn the full reward amount available every 6 months except for the last where it performed at the target improvement rate.
- In each 6-month payout period, the AHA earns a reward value proportional to the improvement, except in the first 6-month payout period in which it earned the minimum floor payout of \$2M despite showing no improvement.




Scenario 2:

- The AHA receives the full reward amount of \$45M.
- Every 6 months, the AHA earns a payout proportional to its improvement performance (e.g., in the first 6-month payout period, a 6.7% reduction relative to a 10% target rate reduction earns two-thirds of the maximum payout of \$3.75M, or \$2.5M).
- Towards the end of the 3-year performance period, the AHA starts to perform better than the targets. However, the reward pools are capped regardless of the AHA over-performing.
- As a result, at the end of the implementation period, ARPA-H reviews the overall improvement and determines that the AHA met its overall improvement target of 20%.
- Therefore, the AHA will be true-up to earn the full \$45M reward to encourage the catch-up improvements that were made.

Today's Financing Models

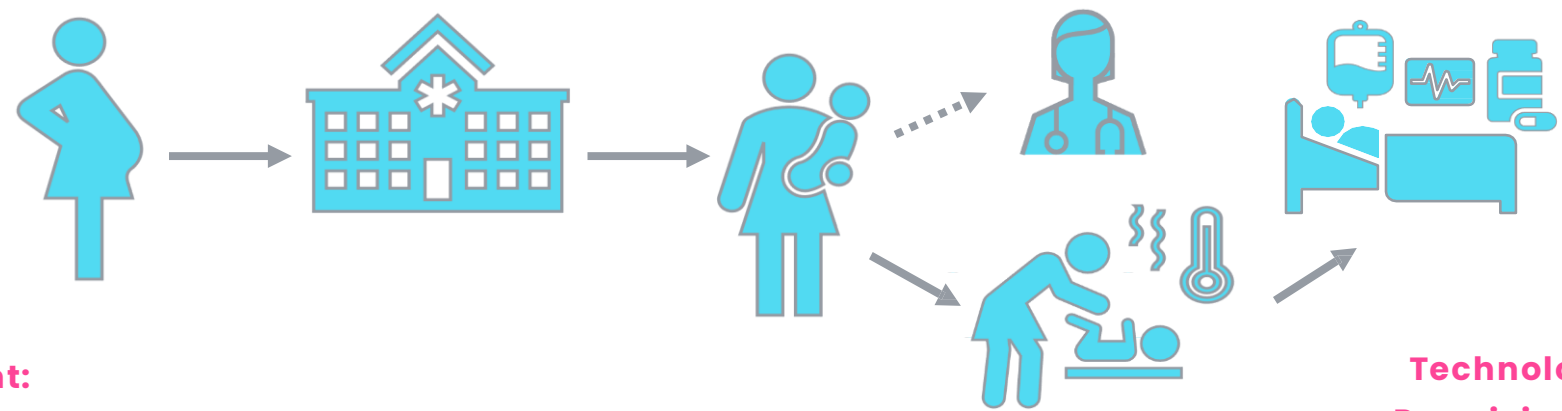
Key organizational attributes	Traditional Payers (Medicare, Medicaid, Commercial)	Public Health Departments and Agencies	Venture Capital and Private Equity-Backed Companies	HEROES
Payment for prevention	 <i>Limitations:</i> Churn, provider focus	 <i>Strengths:</i> Prevention focus	 <i>Limitations:</i> Focused on high acuity patients	 <i>Strengths:</i> Upstream outcomes
Geographic accountability	 <i>Limitations:</i> Small fraction of the population	 <i>Limitations:</i> Geographic scope, but no accountability	 <i>Limitations:</i> Narrow population focus	 <i>Strengths:</i> Population-wide accountability
Population-level outcomes measurement	 <i>Limitations:</i> Primarily hospital-based	 <i>Limitations:</i> Long lags in surveillance data	 <i>Limitations:</i> Primarily hospital-based	 <i>Strengths:</i> Near real-time population measurement
Sustainable business model that integrates private capital	 <i>Strengths:</i> Established contracting approaches	 <i>Limitations:</i> Largely grant-funded, unstable	 <i>Limitations:</i> Unproven	 <i>Strengths:</i> Meaningful business case

Key

-  Minimal alignment with program requirement
-  Moderate alignment with program requirement
-  Complete alignment with program requirement



How HEROES Could Transform Care in Communities: Current State Example Maternal Health Patient Journey



Engagement:
Disparities are invisible until it's too late

Natalia lives in a community with limited access to care and doesn't have her first prenatal care visit until her 7th month of pregnancy.

Clinical Interventions: Mothers with newborns suffer through intense and reactive treatment plans only after experiencing a poor outcome

Natalia experiences significant blood loss and develops an infection, both of which are preventable with improved hospital protocols.

Technology Advancements: Promising technologies go to select few

Natalia develops dangerously high blood pressure after returning home with her infant, resulting in a rehospitalization that could have been prevented with home blood pressure monitoring technology.

Evaluating Effectiveness of Interventions and Progress Towards Financial Sustainability

<h3>Health Outcomes</h3> <p>HEROES will evaluate if Health Accelerators achieve health outcome milestones.</p>	<h3>Interventions</h3> <p>HEROES learns and shares what works and what doesn't to drive impact.</p>	<h3>Sustainability</h3> <p>HEROES supports a path to sustainability for the program performers.</p>
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Tools to Monitor Success and Estimate Payout



HEROES will use metrics to:

- **Track progress toward health outcome goals at 6-month intervals** for ARPA-H funded Health Accelerators.
- **Determine the expected payout** based on changes in the outcome relative to the adjusted national average.

Evaluation to Understand Intervention Effectiveness



HEROES will work with Health Accelerators to:

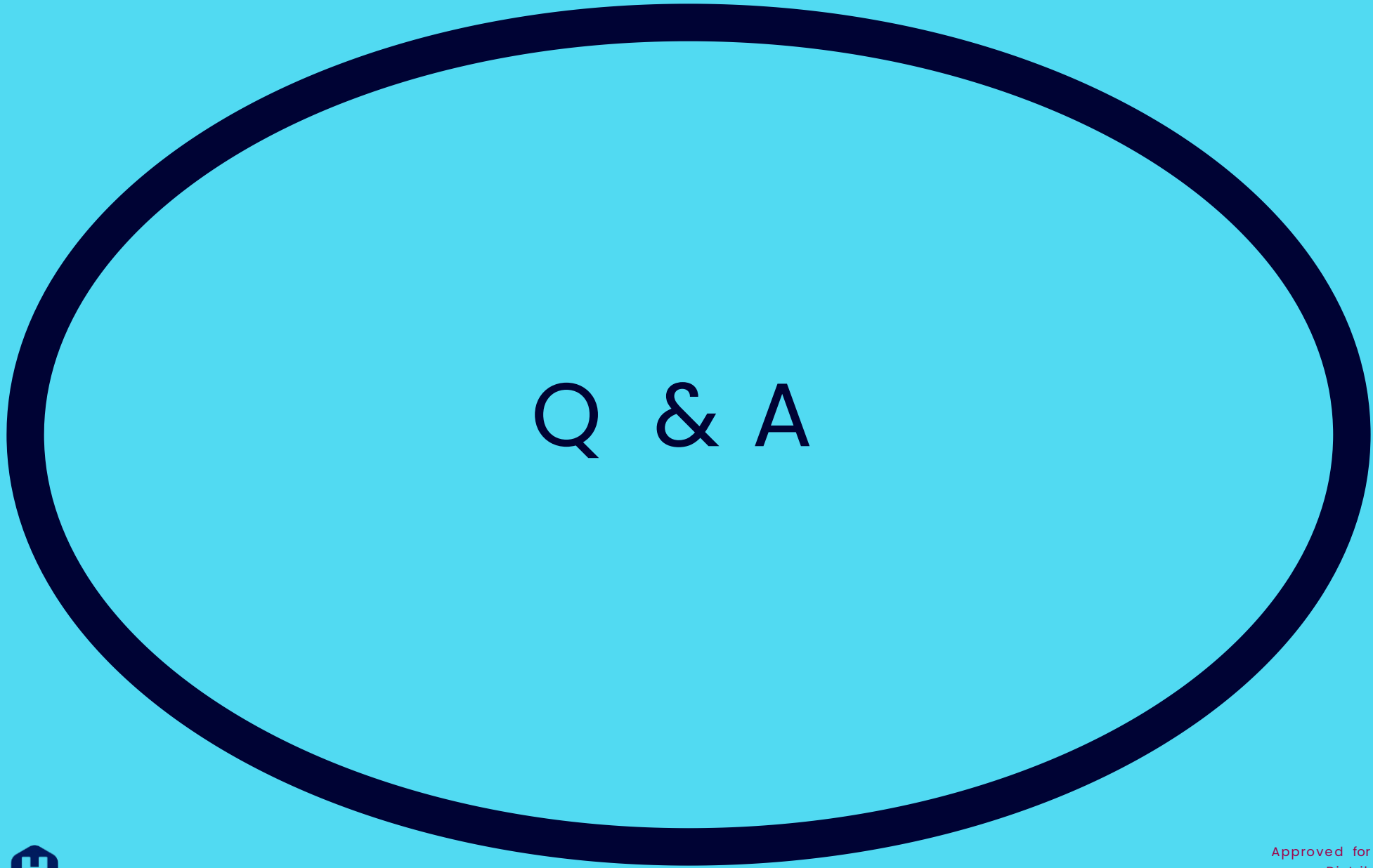
- **Understand which interventions were delivered to whom** to understand how population-level improvements were achieved, or why they weren't achieved.
- **Evaluate the impact of interventions on subgroups** to learn what strategies were (and weren't) effective in different demographic groups, and which strategies were effective in closing equity gaps.
- **Convene workshops for learning and diffusion among Health Accelerators** to build infrastructure for collaboration and trust.

Drivers of Financial Sustainability



Through data collected from Health Accelerators and key stakeholders, HEROES will:

- **Track Outcome Buyer and Investor activity** to determine whether the financial incentives are operating as intended.
- **Monitor financial outcomes** for all stakeholders to determine whether each Outcome Buyer and Investor met financial goals.
- **Identify which Health Accelerators successfully scaled to long-term contracts or new geographies** through renewed or expanded contracts (with Outcome Buyers and Investors) by the end of the HEROES period.



Q & A



APPENDIX:
OUTCOMES

Severe Obstetric Complications

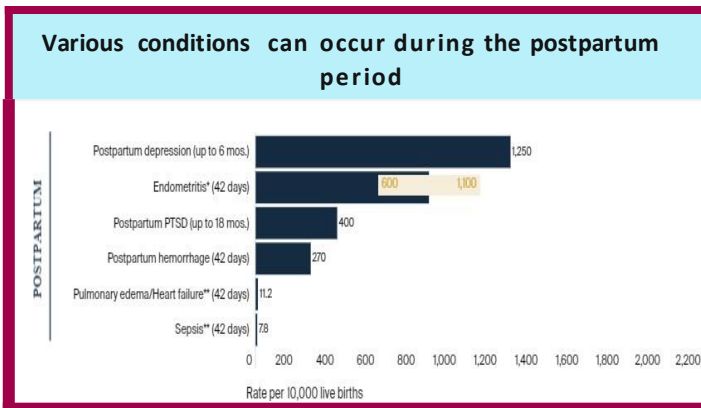
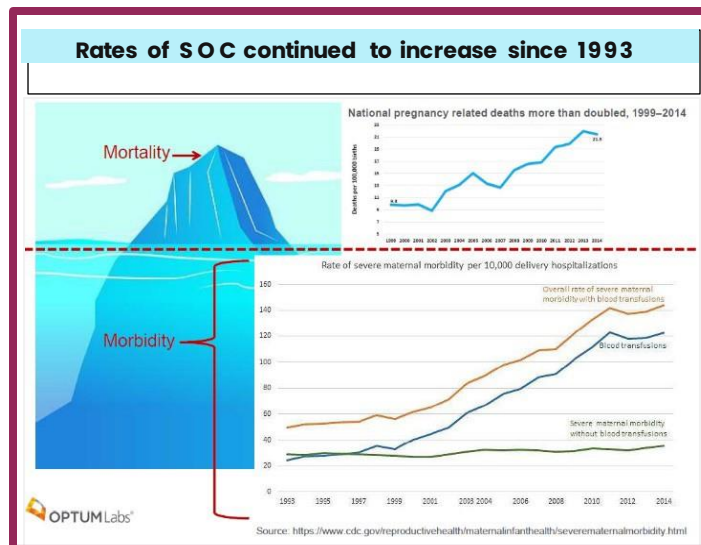
Goal: Improve Care During the Postpartum Period to Reduce Rates of Severe Obstetric Complications (SOC)

Severe Obstetric Complications (SOC)

- **Has been increasing** due to changes in the overall health of the population of women giving birth (e.g., increases in maternal age, pre-pregnancy obesity, preexisting chronic medical conditions, cesarean delivery).
- **Research and prevention efforts historically have been focused on the delivery hospitalization**; less is known about SOC diagnosed after delivery discharge.

Scope of the Problem

- **Affects approximately 65,000 women each year** (or 1.8 percent of women giving birth in 2021).
- **Up to 17% of cases first developed a SOC after the delivery discharge** (e.g., one in seven among commercially insured women, and almost one in six among Medicaid-insured women).
- **Predominantly occurs within the first two weeks after delivery** (75% of SOC cases) and could be avoided with timely, appropriate care in most instances.
- **Estimated total maternal morbidity costs for all US births in 2019 were \$32.3 billion from conception through the child's fifth birthday**, amounting to \$8,624 in additional costs to society for each maternal-child pair and \$500,000 for each SOC case.



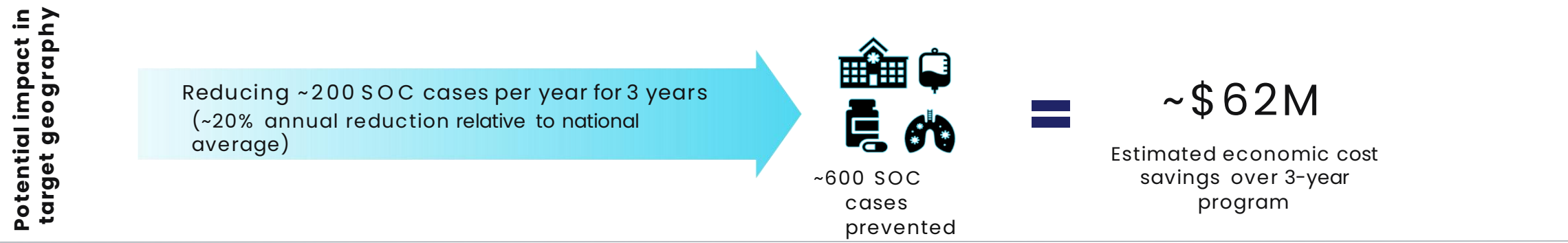
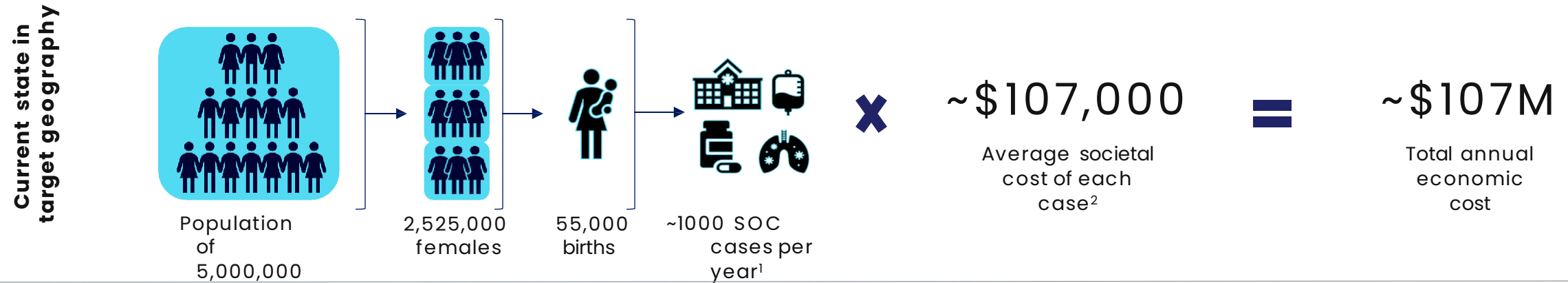
Timely identification of at-risk postpartum women can improve outcomes.

- If more at-risk women are identified early enough, appropriate care can be initiated, improving outcomes.
- The CDC has identified 21 indicators (16 diagnoses and five procedures) for measuring SOC. Monitoring for precursors can help identify women at risk.

Key Outcome Metric

- **Severe Obstetric Complications** measure was developed by The Joint Commission, CMS, and Yale New Haven Health Service Corporation/ Center for Outcomes Research and Evaluation.
- It identifies patients with severe obstetric complications that occur during the inpatient delivery hospitalization.
- The measure may be modified to capture SOC during the delivery hospitalization and 60 days after discharge using claims data.

Prospective approach to generate >\$60M economic value (>30% ROI) from the Severe Obstetric Complications (SOC) program



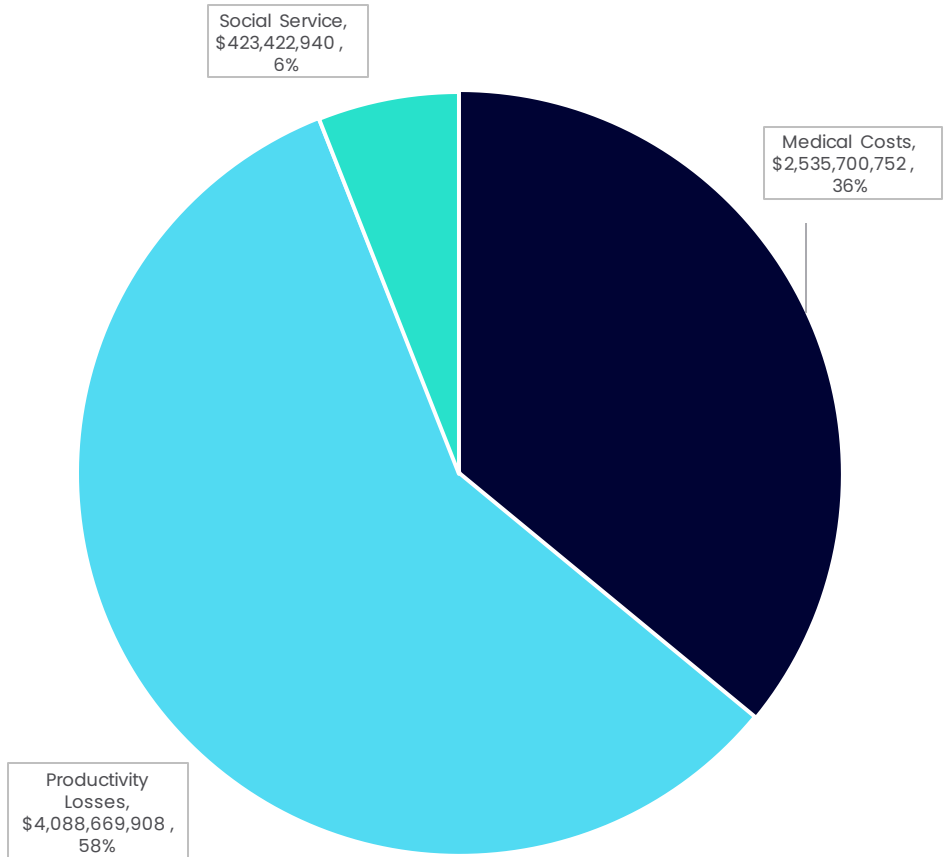
Potential annual economic value if successfully rolled out across the US = **~\$1.4B**

Total annual economic savings

1) Claims-based prevalence of severe obstetric complications based on US-wide averages
 2) Excludes costs associated with reduced quality of life and therefore represents a minimum societal cost estimate

Severe Obstetric Complications: US-wide Economic Costs

- **Total Estimated US-wide Economic Costs = \$7B**
 - **\$2.5B in Acute Healthcare Costs (36%)**
 - Extended intrapartum hospitalization.
 - Readmissions for Severe Maternal Morbidity as identified by the Centers for Disease Control and Prevention through a list of 21 indicators and corresponding ICD codes.
 - **\$4.1B in Productivity Losses (58%)**
 - Presenteeism (reduced productivity and accuracy at work)
 - Absenteeism (regularly missing work)
 - Unemployment
 - **\$423M in Social Service Use (6%)**
 - Mental health support services and other assistance, such as the Supplemental Nutrition Assistance Program (SNAP), Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), Medicaid, Temporary Assistance for Needy Families (TANF).



Heart Attack and Stroke Risk

Goal: Reduce the Rates of Heart Attack and Stroke, the Leading Causes of Death and Disability

Scope of the Problem

Nationally, heart disease is the leading cause of death. **About 695,000 people in the United States died from heart disease in 2021** (this equates to **1 in every 5 deaths**).

In 2021, **1 in 6 deaths** from cardiovascular disease was due to stroke.

1.6M annual total heart attack and strokes deaths and 1.2M first time heart attack and strokes per year.

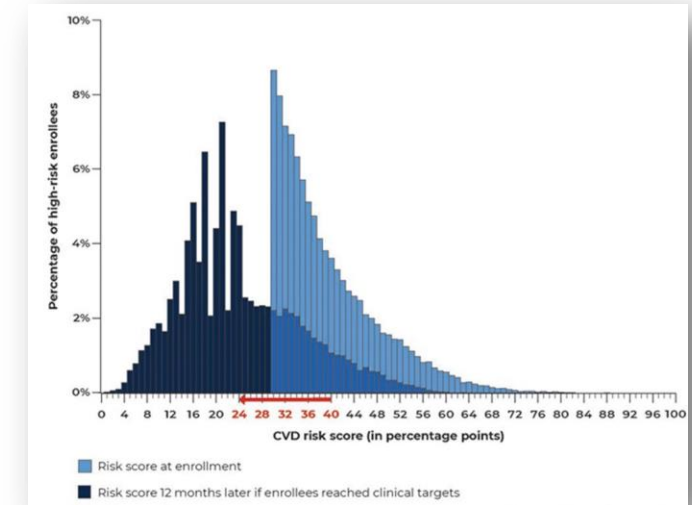
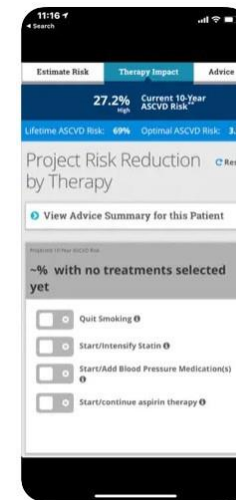
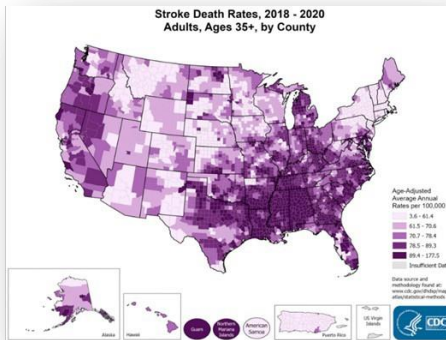
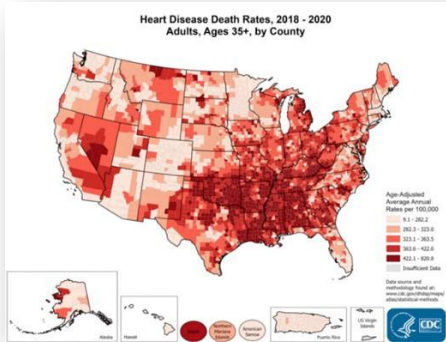
Health Outcomes & Costs

- Heart disease and stroke totals **\$254.2B** in annual direct and indirect costs.
- With 123 million adults between the ages 40-70 living in the United States, the **approximate cost per case in this age group is \$101,000.**
- A 1%-point reduction in 10-year Heart Attack and Stroke risk would result in a total cost savings of **\$20.3M per year, or \$61M over 3 years.**

[Heart Disease Facts |cdc.gov](https://www.cdc.gov/heartdisease/facts/)
[Know Your Risk for Heart Disease |cdc.gov](https://www.cdc.gov/heartdisease/knownyourrisk/)
[Stats of the States - Stroke Mortality \(cdc.gov\)](https://www.cdc.gov/stroke/mortality/)
[Evaluation of the Million Hearts® Cardiovascular Disease Risk Reduction Model: Third Annual Report \(cms.gov\)](https://www.cms.gov/medicare/coverage/coverage-summaries/evaluation-of-the-million-hearts-cardiovascular-disease-risk-reduction-model-third-annual-report)
[Heart Disease and Stroke Statistics—2018 Update: A Report From the American Heart Association](https://www.heart.org/en/health-topics/heart-disease/heart-disease-statistics)

Opportunity for Change

- Patients are unaware of their Heart Attack and Stroke risk (as there is no requirement for screening in the clinical setting).
- The Million Hearts Cardiovascular Risk Reduction Model resulted in several hundred thousand Medicare age members having significant improvement in Heart Attack and Stroke risk, use of preventive medications, and 6% relative reduction in death, in a randomized design.

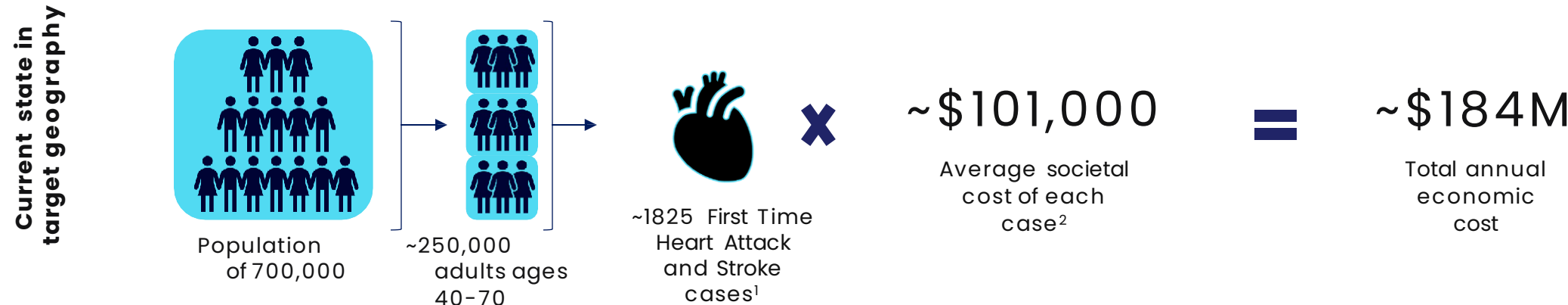


Key Outcome Metric & Reporting

- Reduce the aggregate 10-year Heart Attack and Stroke risk for intermediate-high risk people (>7.5% risk) at the population wide level in specific geographically attributed populations in people aged 40-70 years.
- Partner with hospitals and primary care providers in the identified geographies to report Heart Attack and Stroke data. Partner with Health Information Exchange Networks or Organizations within the identified geographies to obtain Heart Attack and Stroke-related data to calculate risk.



Prospective approach to generate >\$60M economic value (>30% ROI) from the Heart Attack and Stroke program



1. Based on EHR ambulatory data
2. Excludes costs associated with reduced quality of life and therefore represents a minimum societal cost estimate
3. 10-year Heart Attack and Stroke Risk correlates with absolute Heart Attack and Stroke cases and will be used to track intervention efficacy

Heart Attack and Stroke: US-wide Economic Costs

- **Total Estimated Economic Costs = \$123B**

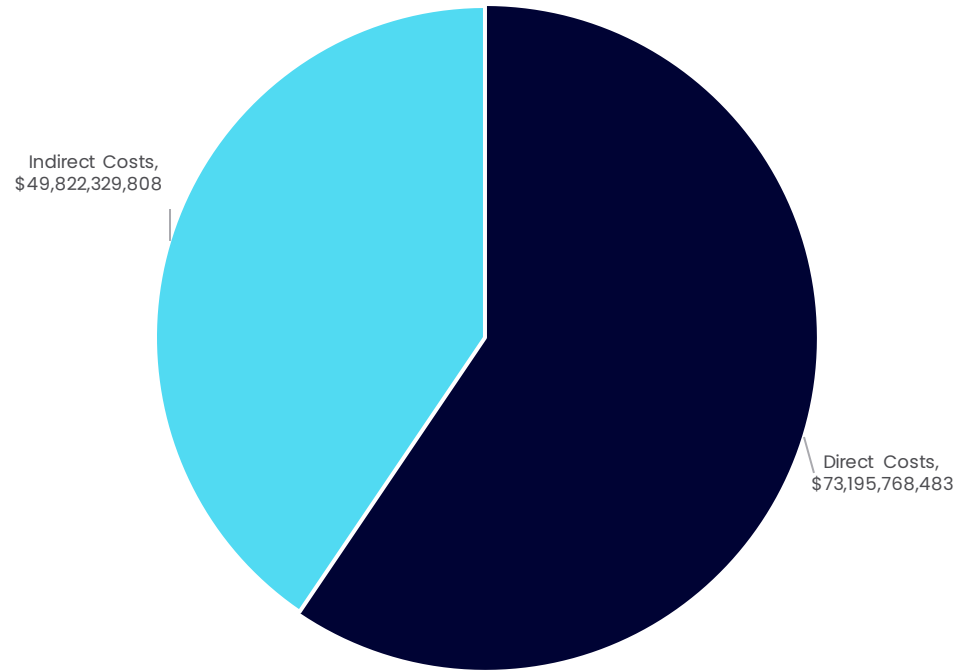
- **\$73.2B in Direct Costs (60%)**

- Physician - Office-based Visits
- Hospital
 - Inpatient
 - Outpatient
 - Emergency Room
- Prescriptions
- Home Health
- Other
 - Vision
 - Medical Supplies
 - Dental

- **\$49.8B in Indirect Costs (40%)**

- Productivity loss from morbidity and mortality.

Direct and Indirect Cost of First Time Heart Attack and Stroke in the United States



Goal: Decrease the Rate Opioid Overdoses

Scope of the Problem

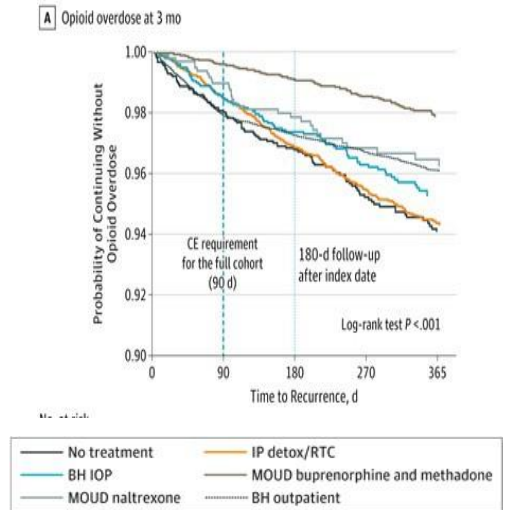
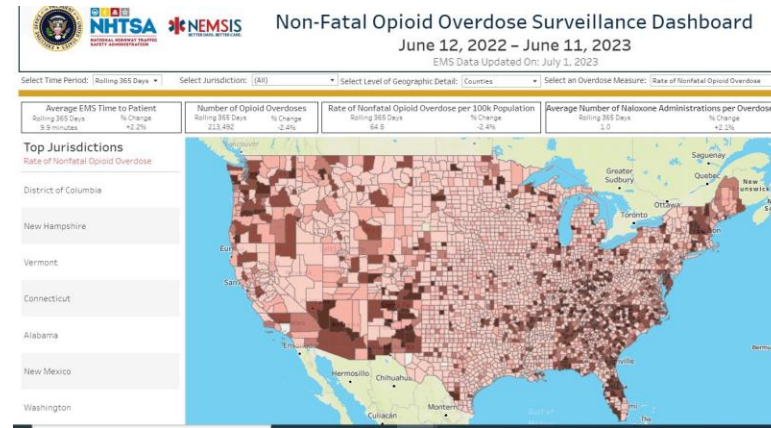
- Opioid Use Disorder (OUD) is the chronic use of opioids that causes clinically significant distress or impairment. OUD consists of an overpowering desire to use opioids, increased opioid tolerance, and withdrawal syndrome when discontinued. OUD includes dependence and addiction.

Health Outcomes & Costs

- OUD is a life-threatening condition associated with a 20-fold greater risk of early death due to overdose, infectious diseases, trauma, and suicide.

Opportunity for Change

- Fewer than 10 percent of US patients with diagnosed OUD receive medication-assisted treatment (MAT).
- Behavioral therapies, when delivered alone, have limited efficacy in addressing the complex symptomatology and physical aspects of OUD.



Ref: JAMA, 2020

Key Outcome Metric & Reporting

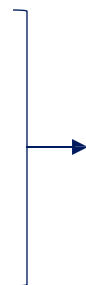
- Decrease the rate of fatal and non-fatal opioid overdoses/100,000 population/rolling 28-day period.
- National Emergency Medical Services Information System (NEMSIS) is a county-level database updated semi-monthly which includes fatal and non-fatal opioid overdoses. It is a collaboration of the Office of National Drug Control Policy, the National Highway Traffic Safety Administration, and the Department of Health and Human Services.

Prospective approach to generate >\$60M economic value (>30% ROI) from the Opioid Overdose program

Current state in target geography



Population of 500,000



~3,700 individuals with Opioid Use Disorder (OUD)



~\$73,000

Average societal cost of each case¹



~\$270M

Total annual economic cost

Potential impact in target geography

Reducing ~360 OUD cases per year for 3 years (~10% annual reduction relative to national average)²



~1080 fewer individuals with OUD



~\$79M

Estimated economic cost savings over 3-year program

Potential annual economic value if successfully rolled out across the US



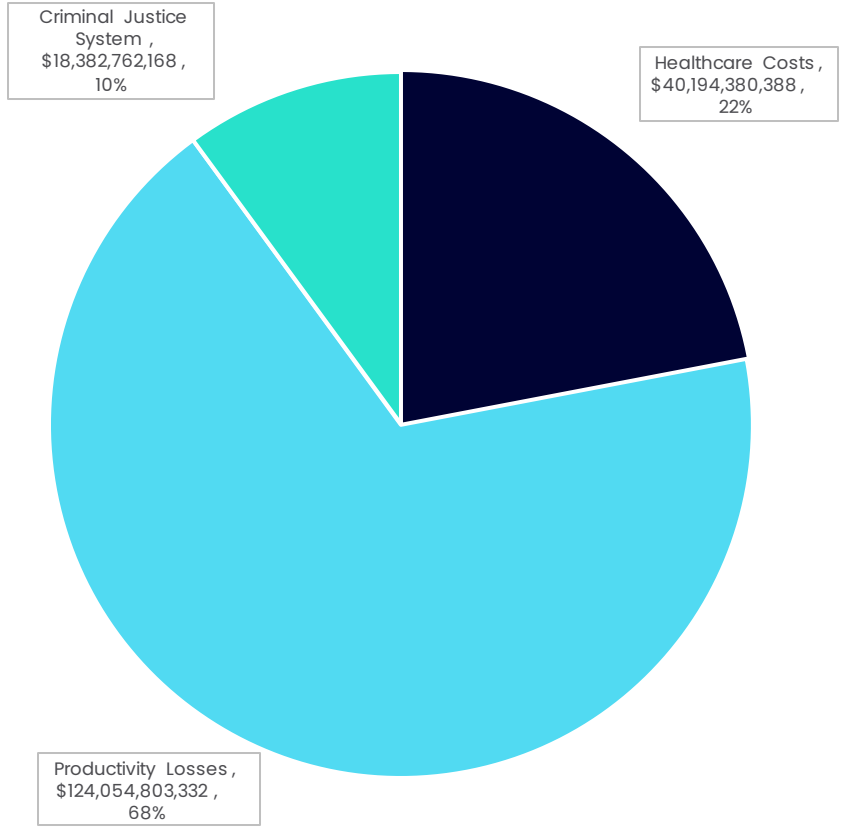
~\$17.8B

Total annual economic savings

1. Excludes costs associated with reduced quality of life and therefore represents a minimum societal cost estimate.
 2. OUD cases correlate with absolute prevalence of Fatal and Non-fatal Opioid Overdoses in the National Emergency Medical Services Information System (NEMSIS) Opioid Overdose Tracker, which will be used to track intervention efficacy.
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Opioid Overdose: US-wide Economic Costs

- **Total Estimated US-wide Economic Costs = \$182B**
 - **\$40B in Healthcare Costs (22%)**
 - Emergency Department Visits
 - Emergency Medical Services Activations
 - Hospitalizations and Rehabilitation Services
 - General Medical Care
 - **\$124B in Productivity Losses (68%)**
 - Presenteeism (reduced productivity and accuracy at work)
 - Absenteeism (regularly missing work)
 - On-the-job injuries
 - Unemployment
 - **\$18.6B in Criminal Justice System (10%)**



Alcohol-Related Health Harms (ARHH)

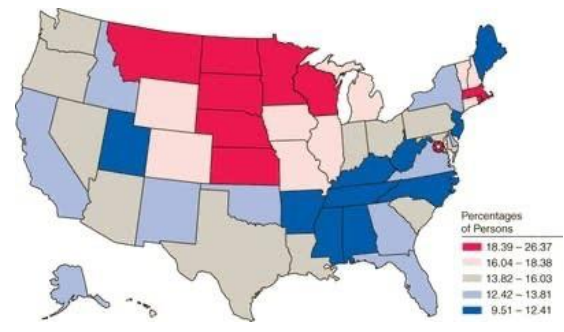
Reduce the number of alcohol-related Emergency Medical Services (EMS) activations

• **Binge Drinking**

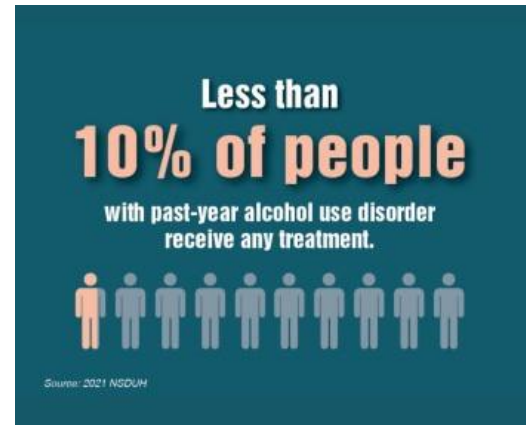
- Binge drinking is defined as consuming 5 or more drinks on an occasion for men or 4 or more drinks on an occasion for women.
- Drinking too much alcohol can cause serious health problems including stroke, cancer, and cirrhosis.
- People with alcohol use disorders, including binge drinking, are also more likely to get sick and are less able to fight off infections.

• **Scope of the Problem**

- Binge drinking is the most common and costly pattern of excessive alcohol use in the United States.
- Binge drinking is a serious but preventable public health problem.
- Every day, about 37 people in the United States die in drunk-driving crashes —that's one person every 39 minutes. In 2021, 13,384 people died in alcohol-impaired driving traffic deaths —a 14% increase from 2020. These deaths were all preventable.



% of residents with prior DUI arrest (Source: MPR, 2010)



• **Opportunity for Change**

- 18% of Americans have engaged in binge drinking in the past month.
- A 2019 government survey found less than 1 in 10 people with an alcohol use disorder received any treatment, and less than 2% of those individuals said they had been offered medication.
- In every state, it is illegal to operate a motor vehicle with a blood alcohol content of 0.08% or higher. Yet for every 88 instances of driving, someone is arrested for operating a motor vehicle above the legal limit.

• **Key Outcome Metric**

- Metric: Number of alcohol-related emergencies reported by EMS services/100,000 population.
- The National Emergency Medical Services Information System (NEMSIS) dataset is a repository for emergency medical technician provision of services nationally. It is funded primarily by the National Highway Traffic Safety Administration.

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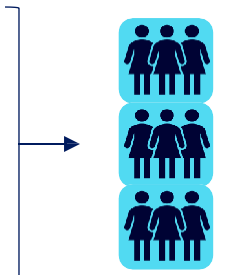


Prospective approach to generate >\$60M economic value (>30% ROI) from the Alcohol-Related Health Harms (ARHH) program

Current state in target geography



Population of 500,000



~90,500 individuals who binge drink



~\$3,900

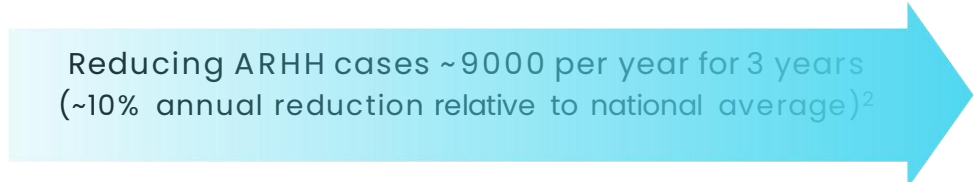
Average societal cost of each ARHH¹



~\$354M

Total annual economic cost

Potential impact in target geography



~27,000 fewer individuals with ARHH



~\$106M

Estimated economic cost savings over 3-year program

Potential annual economic value if successfully rolled out across the US



~\$23.8B

Total annual economic savings

1. Excludes costs associated with reduced quality of life and therefore represents a minimum societal cost estimate.
 2. ARHH cases correlate with the prevalence of alcohol-related EMS calls reported via National Emergency Medical Services Information System (NEMSIS), which will be used to track intervention efficacy.



Alcohol-Related Health Harms: US-wide Economic Costs

- **Total Estimated US-wide Economic Costs = \$237.6B**
 - **\$20.2B in Healthcare Costs (9%)**
 - Emergency Department Visits
 - Emergency Medical Services Activations
 - Hospitalizations and Rehabilitation Services
 - General Medical Care
 - **\$166.6B in Productivity Losses (70%)**
 - Presenteeism (reduced productivity and accuracy at work)
 - Absenteeism (regularly missing work)
 - On-the-job injuries
 - Unemployment
 - **\$50.7B in Other (21%)**
 - Criminal Justice
 - Motor Vehicle Crashes
 - Fire Losses

