



Community of Practice

Introduction to Economic Evaluation: How the CHOICES Framework Can Advance Chronic Disease Prevention and Address Health Equity

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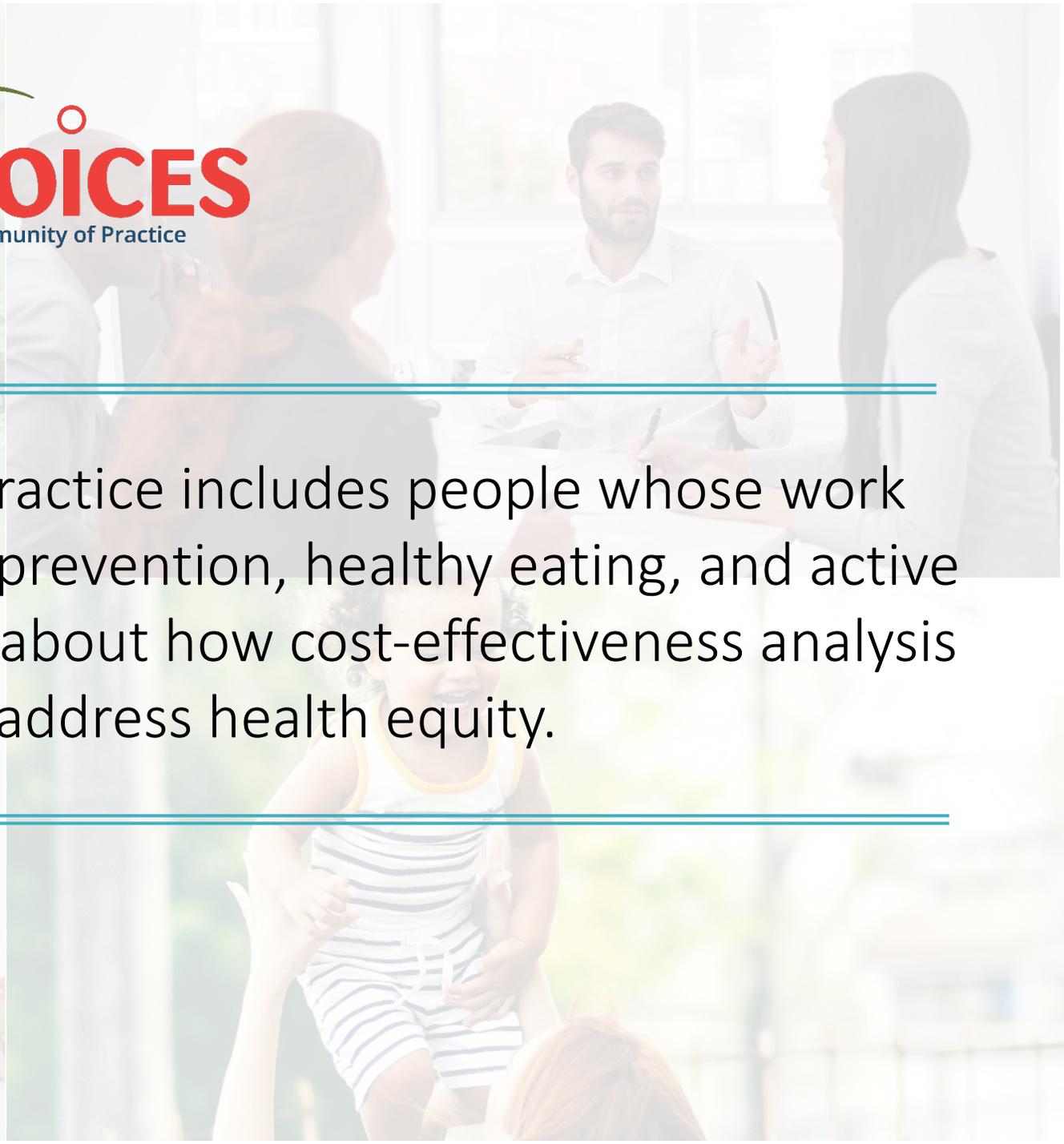
HARVARD T.H. CHAN
SCHOOL OF PUBLIC HEALTH

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» The CHOICES Community of Practice includes people whose work focuses on advancing obesity prevention, healthy eating, and active living and want to learn more about how cost-effectiveness analysis can advance their efforts and address health equity.





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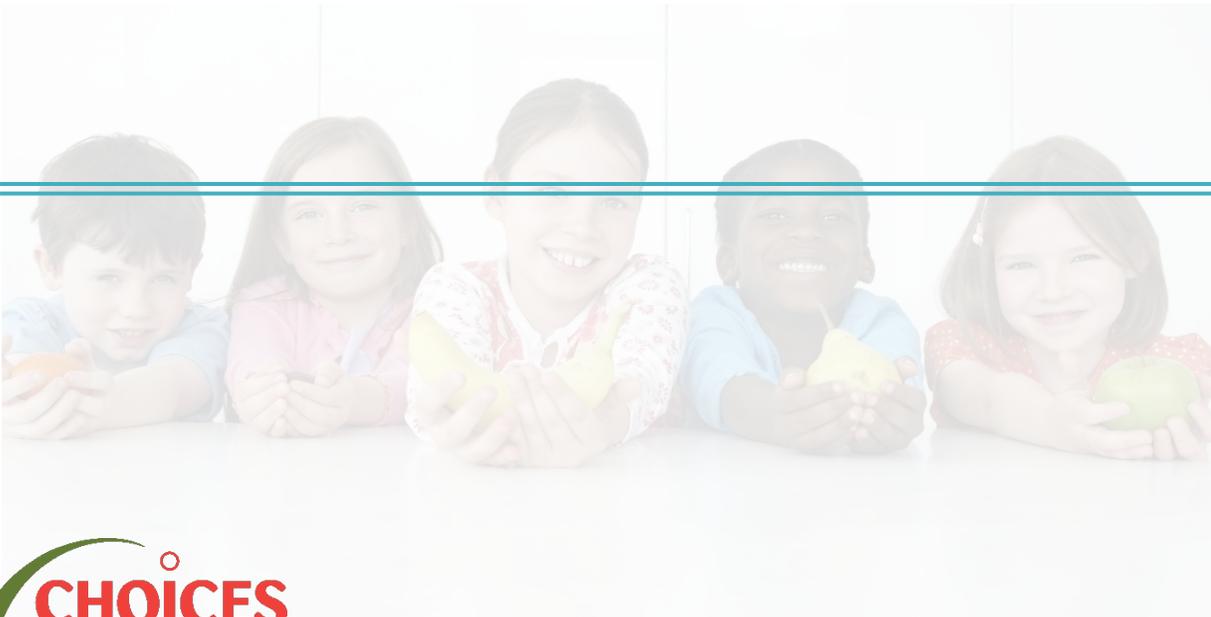
Overview of Today's Plan

- » Economic Evaluation Overview
- » Key Principles in Economic Evaluation
 - How economic evaluation can support program planning
 - How economic evaluation can promote health equity
- » Examples from the CHOICES Project
- » Available Resources & Tools





Economic Evaluation Overview



What is economic evaluation?

Economic Evaluation: Analysis to support decision-making that considers both health/social impact of programs and their costs.

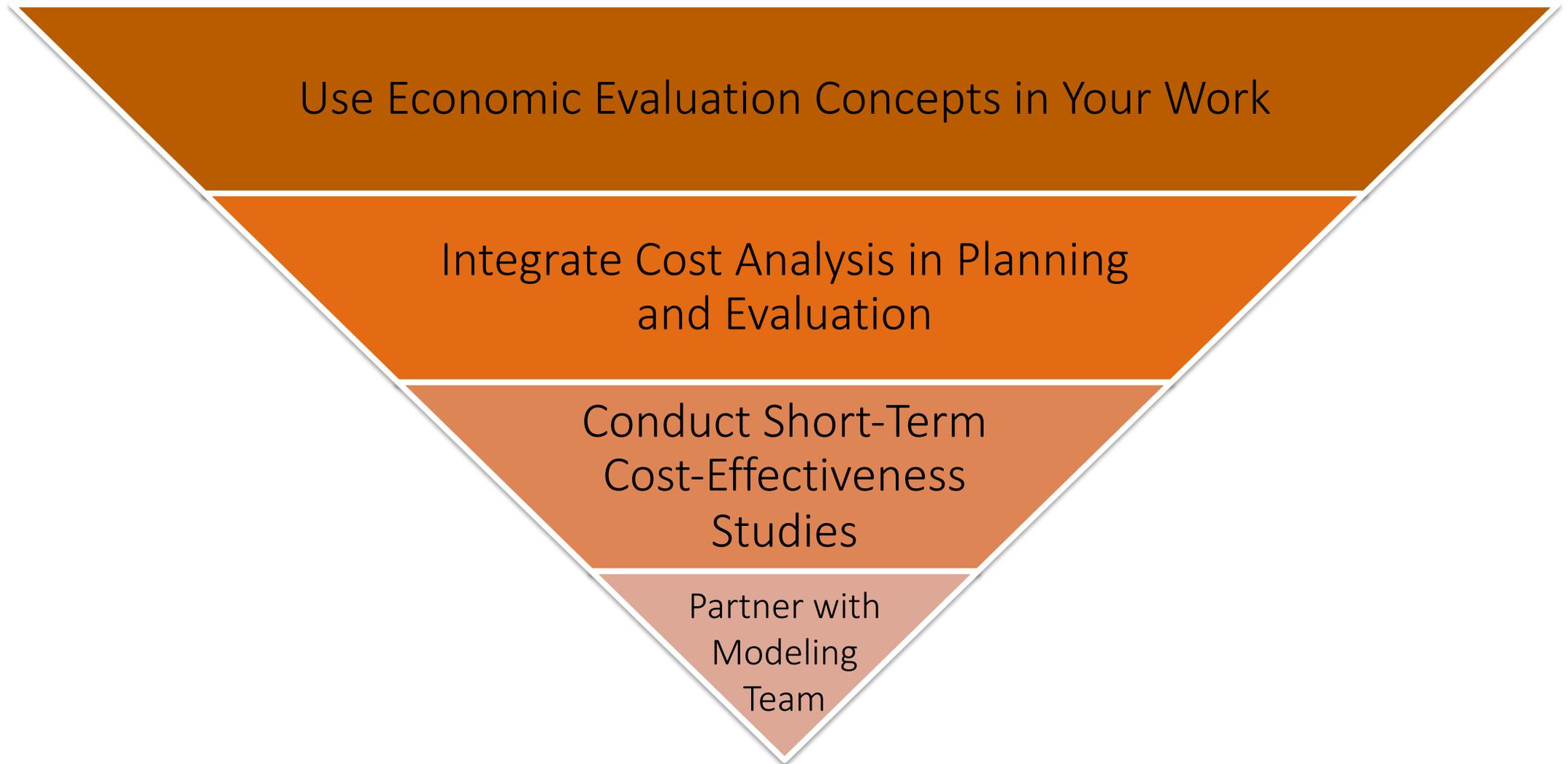
Rationale

- Limited resources force choices
- The costs and effects of choices can be hard to estimate
- A systematic approach can help us get the most “*Bang for the buck*”

Ways to Use Economic Evaluation of Public Health Programs

- (1) **Choose** the right programs to implement
- (2) **Refine** a particular program to improve efficiency
- (3) **Integrate health equity** considerations explicitly into planning and evaluation
- (4) **Communicate** value to key partners

Is Using Economic Evaluation in Public Health Practice Feasible?

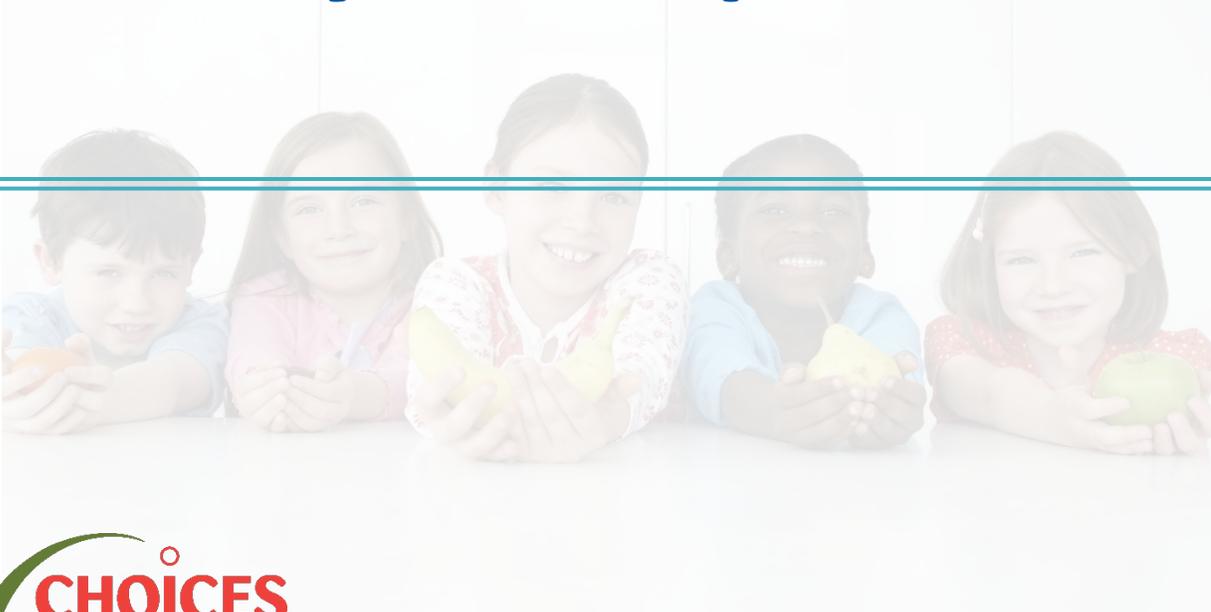


Economic Evaluations: What (types)?

Study Type	Measurement of Costs	Identification of Consequences	Measurement of consequences
Cost Analysis	Monetary Units	None	None
Cost-Effectiveness Analysis	Monetary Units	Single effect of interest	Natural units (e.g. cases of obesity prevented)
Cost-Utility Analysis	Monetary Units	Single or multiple effects, not necessarily common to alternatives	Healthy Years (QALYs most common)
Cost-Benefit Analysis	Monetary Units	Single or multiple effects, not necessarily common to alternatives	Monetary Units



Key Principles of Economic Evaluation



» Core purpose of economic evaluation is to measure value

Is the juice worth the squeeze?

Assessing Value

» Main Measure in Cost-Effectiveness Analysis: **Incremental Cost-effectiveness Ratio (ICER)**

Indicators of Value

- » The primary outcome of a CEA comparing Program A to Program B is the **incremental cost effectiveness ratio (ICER)**

$$\text{ICER} = \frac{\text{Cost}_A - \text{Cost}_B}{\text{Effect}_A - \text{Effect}_B}$$

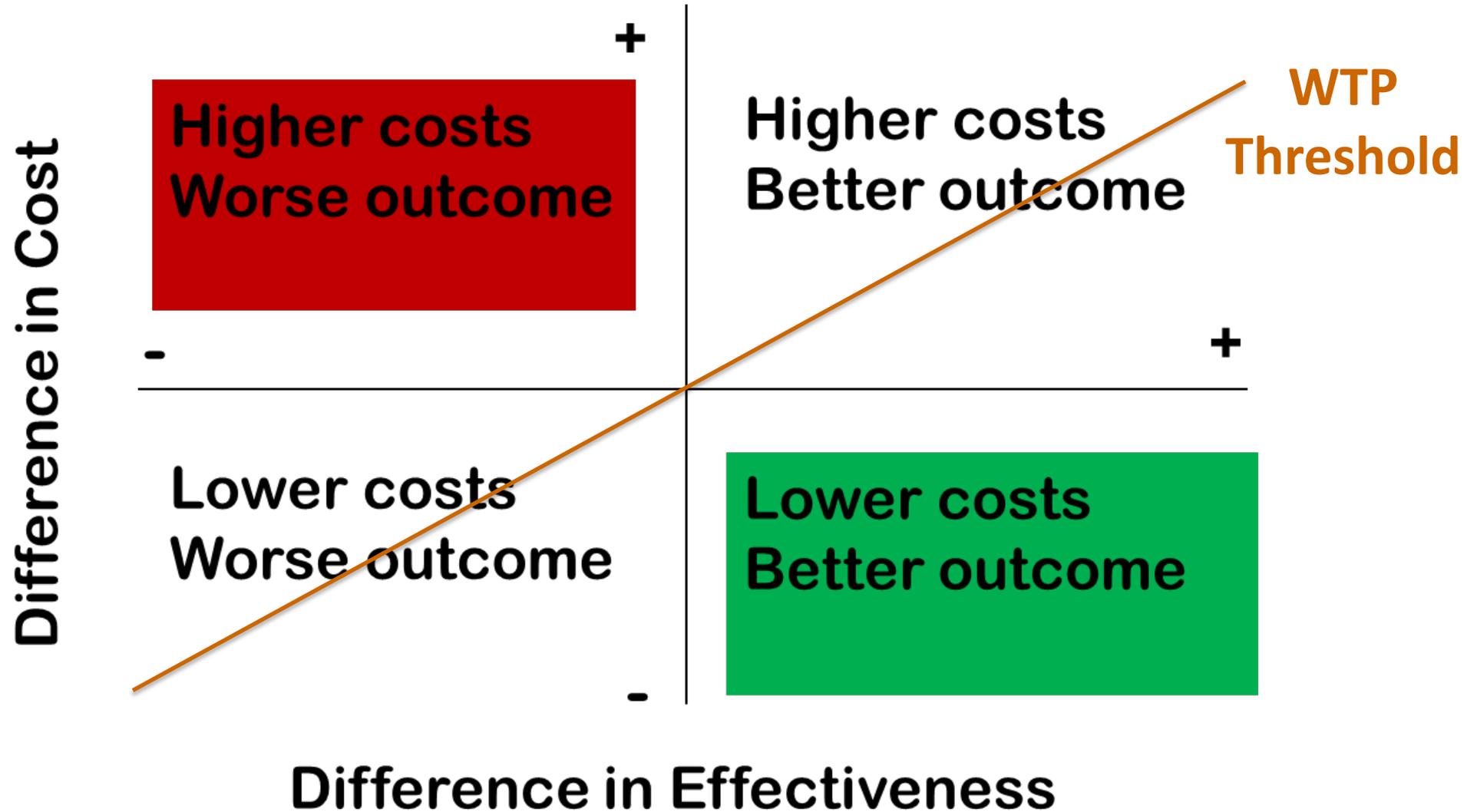
ICER Calculation Example

Alternative	Expected Cost	Expected Benefit
Program A	\$1000	15 Obesity Cases
Program B	\$100	18 Obesity Cases

$$\frac{\text{Cost}_A - \text{Cost}_B}{\text{Effect}_A - \text{Effect}_B} = \frac{\$1000 - \$100}{15 - 18} = \frac{\$900}{-3} =$$

\$300 per obesity case averted

Interpreting ICERs



Incremental Cost Example

» *Replace white bread with whole grain bread*



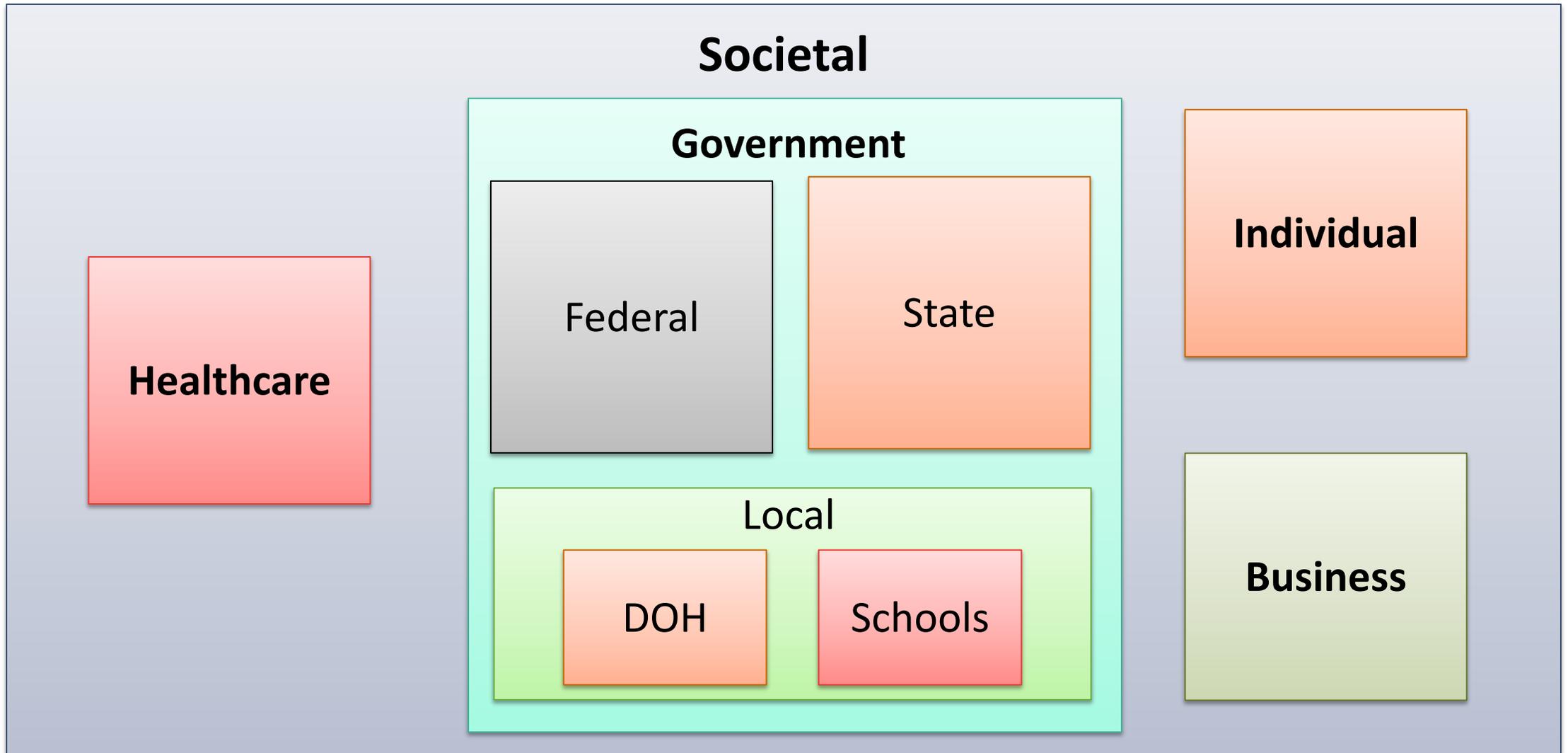
\$1.50



\$3.50

- Incremental cost: difference between the old and new cost
 - $\$3.50 - \$1.50 = \mathbf{\$2.00}$

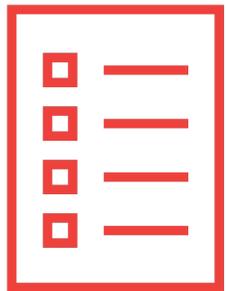
Perspective



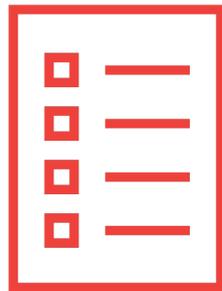
Opportunity Cost

- » In economic evaluations, we are interested in resource use regardless of whether there is a financial transaction

Existing Program



New Program



Resources allocated to new program

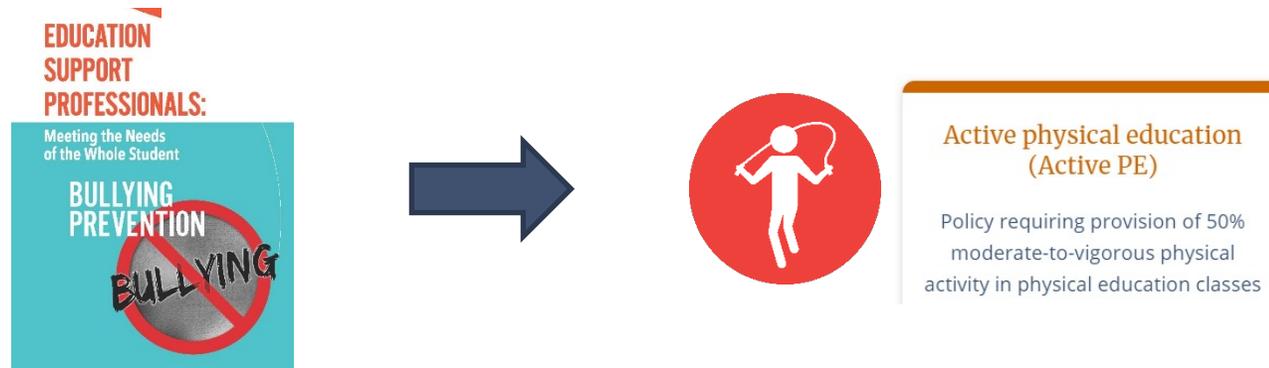


Even though the budget is not affected, the cost of this resource should be included in the costing of the program.

- » The opportunity to use it for some other purpose is gone

Opportunity Cost Example

- » Annual professional development training for Bullying Prevention is replaced with a training for Active PE



- » This is an **opportunity cost**

Resources (time, labor) are now used for something else that society also values

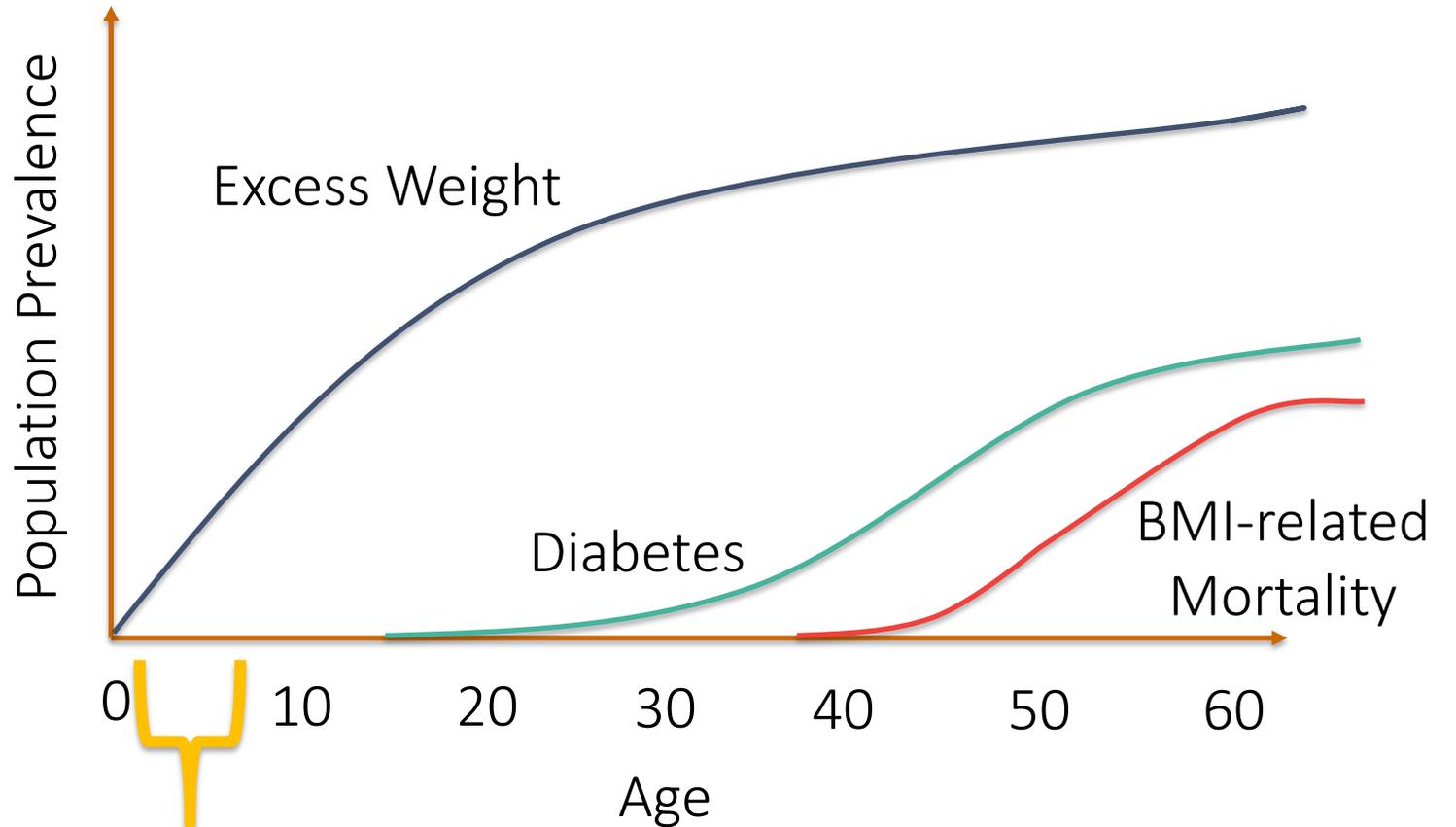
Time Horizon

Intervention time frame:

Period of time required for implementing program and achieving stable change in health outcome of interest

Analytic time frame:

Period of time required for full accrual of all relevant costs and health benefits that could be attributed to the intervention



Early Childhood Education
Physical Activity &
Nutrition Intervention

Time Horizon and the Use of Modeling

- » Estimating **full benefits and costs** of an intervention
- » Estimating **health impacts** (Cases of Cases of disease prevented, deaths prevented, Gains in QALYS)

Time Horizon & Modeling Considerations

- ✓ Longer analytic time horizon than the intervention timeframe or near-term follow-up studies
- ✓ Often requires use of simulation model



CHOICES Approach to Addressing Time Horizon

- » Near-term changes in behaviors based on the evidence time frame
 - **Example**: *Reduction in sugar-sweetened beverages consumed per day based on the 18-month trial.*
- » Measures 10-year impact on:
 - Health care costs
 - Cases of obesity
 - Quality-Adjusted Life Years
- » Interest in longer time horizons



How Economic Evaluation Can Support Program Planning

- » Many health programs rely on other institutional partners (e.g., schools), families, and individuals
 - Their contributions are often non-budgeted opportunity costs
- » Quantifying value of budgeted and opportunity costs using a range of perspectives during planning → may lead to:
 - Enhanced support for implementation partners
 - Increased incentives for participants

Perspective and opportunity costs can inform planning for:

- ✓ Setting-level adoption and sustainability
- ✓ Implementation fidelity
- ✓ Target population enrollment and adherence

How Economic Evaluation Can Promote Health Equity

Health Equity: Attainment of the highest level of health for all people. Achieving health equity requires valuing everyone equally with focused and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and the elimination of health and health care disparities ¹

- » Economic evaluation methods can be used to promote health equity through:
 - Identification of cost-effective interventions that also promote health equity
 - Use of explicit decision-making process and recognition of a diverse set of perspectives enhances procedural justice

¹ Centers for Disease Control and Prevention, 2013

How Economic Evaluation Can Promote Health Equity

- » Health equity should be built into all phases of the economic evaluation project
 - Problem definition
 - Selection of potential solutions (alternatives)
 - Perspectives and time horizon
 - Data sources/quality and analytic plan
 - Interpretation and Dissemination

How Economic Evaluation Can Promote Health Equity

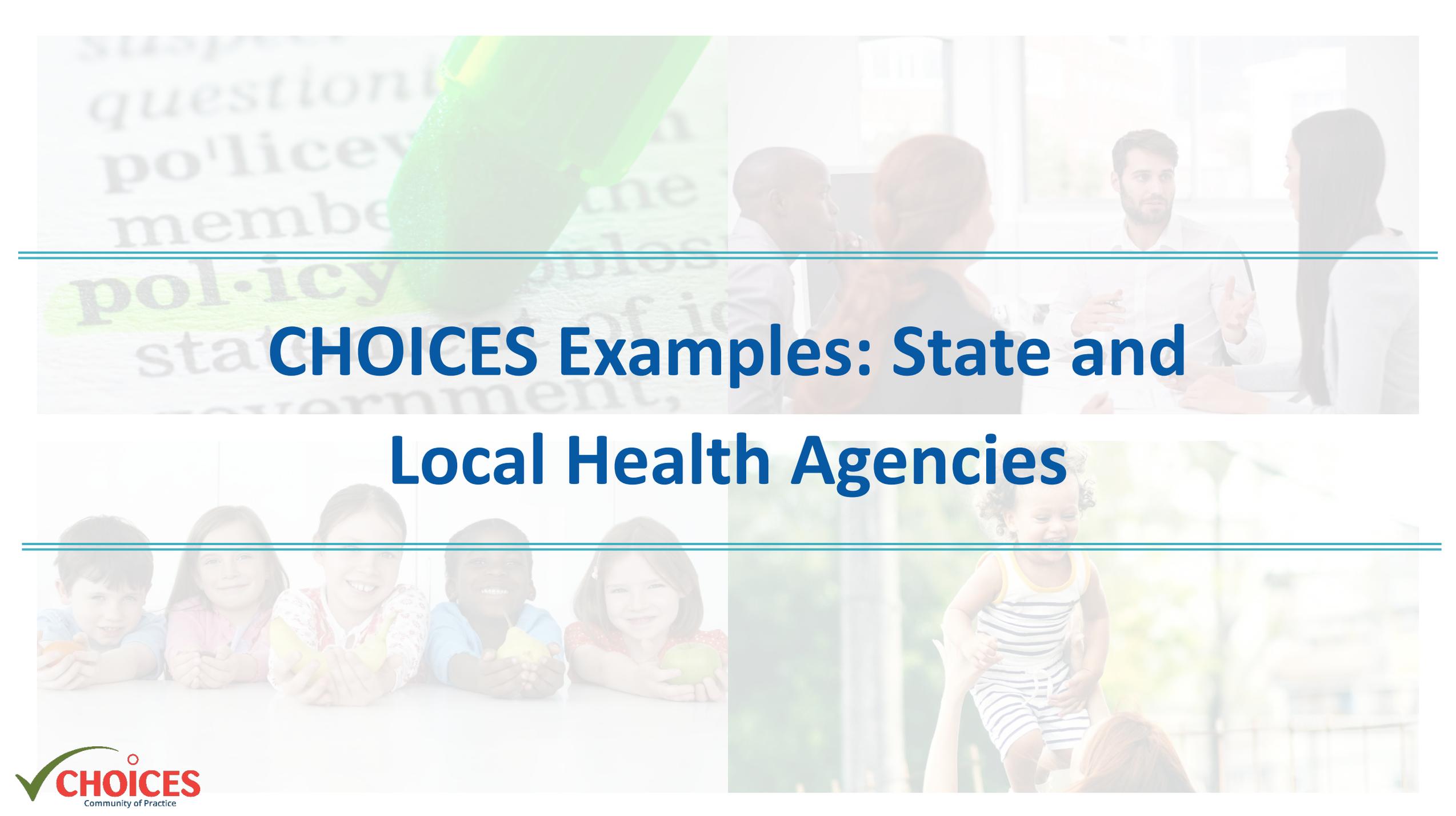
- » CHOICES uses both **absolute** and **relative** measures of the equity effect of a given intervention for two or more groups estimated over 10 years
 - **Absolute:** Difference in number of cases of obesity
 - **Relative:** Ratio of obesity prevalence

How Economic Evaluation Can Promote Health Equity

» Many programs that are cost-effective can also improve equity

Potential mechanisms for a why given program would have a positive equity impact

- » Focused interventions (SNAP, WIC)
- » Underlying behaviors/risk exposure variation



**CHOICES Examples: State and
Local Health Agencies**

CHOICES Learning Collaborative Partnership (LCP) Examples

Oklahoma WIC

Choose the right programs to implement

Denver STAR

Refine a program to improve efficiency

California Sugary Drink Tax

Integrate health equity considerations explicitly into planning and evaluation



Oklahoma WIC: Choose the right program

Identifying priorities in Oklahoma

- Governor Fallin called for more evidence-based decision-making and focus on cost in public health
- Health leaders identified obesity prevention as a priority
- Identified the **Special Supplemental Program for Women, Infants, and Children (WIC)** as a key opportunity

Gathering Information for Action

- Partnered with the CHOICES Learning Collaborative Partnership
- Selected best value for money strategy
- Determined key activities and collected data to estimate costs

Helping Change Happen

- Used cost-effectiveness analysis findings as evidence for action
- Feasible strategy that could be implemented easily and have positive impact on health and health equity



2014

2015

2016

2017

Oklahoma WIC: Choose the right program

"We learned two key things: the very positive result of reducing screen time, and that this strategy was something we could not only model but implement, and we could do it fairly quickly."

– Terry Bryce, State WIC Director

Since 2017:



**NEARLY 30,000 FAMILIES
RECEIVED SCREENTIME GUIDANCE**



**75% ARE TAKING STEPS TO
REDUCE SCREENTIME**

Denver STAR: Refine a program to improve efficiency and promote health equity

- » Focused intervention strategy within Denver Health
- » Replaced mailings with text messages



→ Lower cost, feasible strategy to reach more children and improve health equity



**DENVER
PUBLIC HEALTH™**

Denver STAR: Refine a program to improve efficiency and promote health equity

“With the STAR clinical strategy, it was so feasible compared to other strategies, and when looking at our entire budget, it is a drop in the overall bucket of funding.”

– *Jennifer Moreland, Chronic Disease Manager, Denver Public Health*



**11 DENVER HEALTH CLINICS
IMPLEMENTING THE STRATEGY**



**8 DENVER HEALTH TRAINING
MATERIALS CREATED**

(EPIC TIP SHEETS, FAQs, PRESENTATIONS)

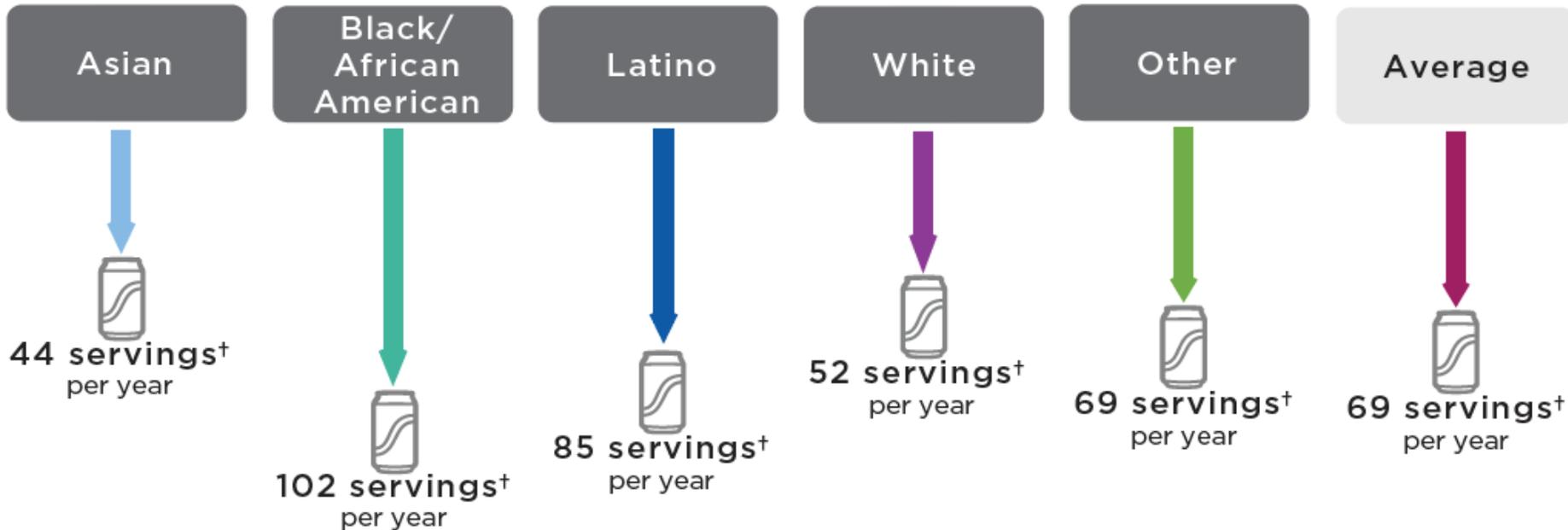
California SSB Tax: Integrate Health Equity

- » Partnered with the California Department of Public Health and the County of Santa Clara Public Health Department to evaluate the potential effect and cost-effectiveness of a \$0.02/oz excise tax on sugar-sweetened beverages



California SSB Tax: Integrate Health Equity

Post-Tax Decrease in Sugary Drink Consumption Per Person in California by Race/Ethnicity*

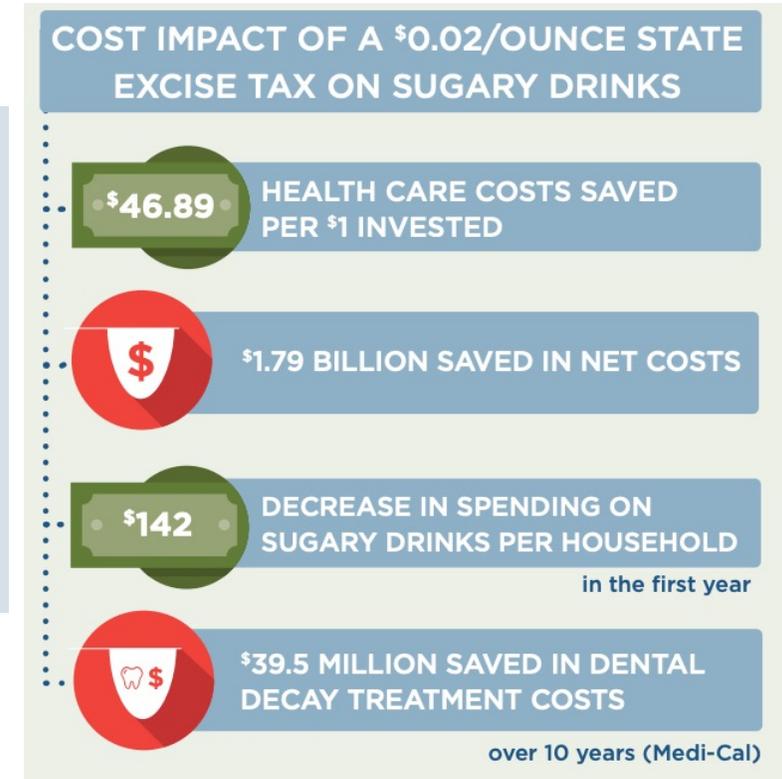


With a tax, sugary drink consumption would decrease the most among Latino and Black/African American Californians. On average, each Latino Californian would reduce consumption by 85 servings per year and each Black/African American Californian would reduce consumption by 102 servings per year.

*In the first year following an excise tax of \$0.02/ounce on sugary drinks
†Each serving is 12 ounces.

California SSB Tax: Integrate Health Equity

- » Black/African American Californians would see a 39% greater reduction in obesity prevalence than average
- » Latino Californians would see a 33% greater reduction in obesity prevalence than average.





Questions?



Tools & Resources



CHILDHOOD OBESITY NATIONAL ACTION KIT

■ SCHOOL
 ■ EARLY CARE & OUT OF SCHOOL TIME
 ■ COMMUNITIES AND GOVERNMENT
 ■ CLINICAL

METHODS GLOSSARY

NATIONAL RESULTS

	Active physical education (Active PE)	Creating healthier child care environments	Sugar-sweetened beverage (SSB) excise tax	Electronic decision support for pediatric medical providers
	MORE INFO	MORE INFO	MORE INFO	MORE INFO
POPULATION REACH <i>10-Year Reach</i>	54,000,000	5,800,000	344,000,000	2,000,000
INTERVENTION EFFECT <i>1-year BMI change kg/m²</i>	-0.011	-0.21	-0.125	-0.5
INTERVENTION COST <i>Cost per Child/Person, \$</i>	\$17.00	\$613.00	\$1.38	\$119.00
OBESITY PREVENTED (YEARS) <i>Years with Obesity Prevented (10-year totals 2015-2025)</i>	130,000	234,000	17,834,000	226,000
HEALTH CARE COSTS SAVED <i>Costs Saved per Dollar Invested (10-year totals 2015-2025)</i>	\$0.04	\$0.04	\$30.78	\$0.27

NOTES

Costs are in 2014 dollars and discounted at 3% per year.



Understanding Cost-Effectiveness Analysis



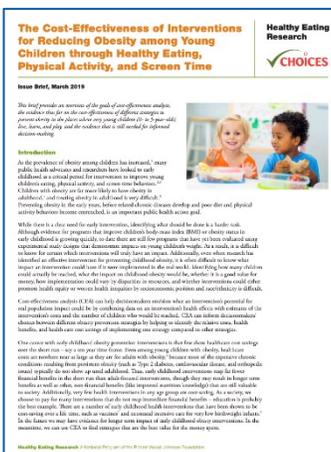
Video: Costing Perspectives, Principles, & Activities



Video: Assessing Strategy Effectiveness



Video: Assessing a Strategy's Population Reach



Research brief: Cost-Effectiveness of Interventions for Reducing Obesity among Young Children



Story from the Field: Oklahoma Takes Action to Improve Child Health

CHOICES | Childhood Obesity Prevention Effectiveness Study

Common Terms Related to Examining the Cost and Impact of Initiatives: Cost-Effectiveness Analysis, Cost-Benefit Analysis and Return on Investment
Cost-Effectiveness Analysis (CEA) Compared to Cost-Benefit Analysis (CBA)¹

Both Cost-Effectiveness Analysis (CEA) and Cost-Benefit Analysis (CBA) are types of decision analysis techniques. They both measure "value for money" and are used to help decision makers make better choices ("better" = the choice that is most aligned with the decision maker's preference, selecting the option that maximizes utility).

Cost-effectiveness analysis relates the costs of a program to its key outcomes or benefits.

Cost-benefit analysis requires assigning a dollar value to health outcomes, including life, and this is difficult to do. For this reason, the CHOICES project uses cost-effectiveness analysis as the decision analysis technique.

Method	Number of types of effects included	Effect type common to interventions compared	Measurement of Consequences	Decision Rule	Example
Cost-Effectiveness Analysis	Single	Yes	Nature (units in g, cases) or summary health measure (e.g. quality-adjusted life years)	e.g. Cost per Case Prevented Choose policy if: Cost per Case Prevented is lower than decision maker's willingness-to-pay for a prevented case.	A cost-effectiveness analysis of a company wellness program would evaluate the program in terms of its costs versus the reduction in sick days taken by employees.
Cost-Benefit Analysis	Multiple	Not necessary	All consequences monetized using "willingness-to-pay/costs"	Choose policy if: (Benefit - Cost) > 0	A cost-benefit analysis of a company wellness program could measure benefits as the money the company saved in reduced sick days.

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Fact sheet: Differences Between Decision Analysis Techniques

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