

Reach

Reach refers to how many individuals will benefit from an intervention and who these people are (i.e. how old they are or whether they are participants in certain programs). The CHOICES team uses published estimates for adoption, participation, and enrollment or other supporting documents to collect data about the population being reached. The CHOICES team follows the steps below:

- Define the geographic area of interest where the intervention is going to be implemented (i.e. a particular state or city)
- Start with the entire population the geographic area of interest
- Apply inclusion and exclusion criteria to narrow to who will be impacted by the intervention. Data on settings and programs can often be found in published reports or by contacting state and local agencies that work within those settings:
 - If the intervention is going to be carried out within a particular setting like public schools or participants in a nutrition assistance program, focus on estimating the number of people who participate in that setting. There may be further inclusion/exclusion criteria to apply from the relevant published studies, like the intervention has only been studied and found to be effective for a particular age group (e.g. children in elementary school)
 - Published data may also provide data on how many people will likely receive the full intervention activities. For instance, only a certain percentage of trained teachers end up delivering a curriculum.

The final reach estimate you will end up with is the number of individuals who are likely to actually receive the health benefits of the intervention.

Effect

When estimating effect, we have to ask the key question: how can we estimate the impact of a strategy to reduce childhood obesity? We also need to ask: what is being impacted?

For the CHOICES model, using estimates of strategy effect from published literature, we look for effects of strategies on change in BMI. If that's not available we look at change in dietary intake and/or change in physical activity and change in screen time.

The CHOICES team has figured out which of the many potential strategies have good evidence for impact on health after conducting systematic reviews. A systematic review or search of the literature may provide us with multiple studies and references. There are key components that should be abstracted, or pulled from the paper, and organized in a table:

- Strategy (e.g., activities, implementation personnel)
- Population & Setting (e.g., who is receiving strategy and where)
- Outcome (e.g., dietary intake, weight status, BMI), which includes pre-strategy outcomes, post-strategy outcomes, and change estimates

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- Measurement (e.g., self-reported survey, accelerometer, direct observation), which includes duration of measurement (24 hour accelerometer where during one school week; kcal consumption at lunch, five times per week)
- Costs

In addition, study design quality helps determine whether an effect estimate from the literature is valid. The CHOICES team prioritizes effect estimates that are from strong designs providing the opportunity for strong causal inference: RCTs, quasi or natural experiments and in some cases, change-in-change longitudinal studies. We prioritize a number of components when trying to find high quality studies from which we pull effect estimates.

Some change takes time to happen. For example, individuals may gain or lose weight more easily than they will actually shift their BMI. Moreover, we try to use studies that measure changes after a reasonable amount of time has passed.

Intervention Implementation Cost

The intervention implementation costs of an intervention are the monetary value of activities and resources necessary to achieve the expected health impact. The CHOICES team takes a modified societal perspective in costing the implementation of interventions. This perspective:

- Accounts for all costs regardless of payer (e.g. healthcare system, school, parents)
- Places a value on incremental cost- the difference in costs between existing resources and resources necessary for implementation of strategy (both addition and elimination of resources)
- Places a value on opportunity costs- includes resources that could be devoted to alternative activities; should be included in the cost analysis even if they do not result in a change in budgetary cost from any payer perspective
- May include potential cost offsets- implementation results in a change in downstream resource use elsewhere that could be negative
- Called modified because it excludes the cost of a participant's (intended beneficiary's) time

The following resources and activities are not included in the costing of intervention implementation:

- Resources used in the original design and development of interventions, to research intervention options, or advocate for a policy, regulation, or guideline
- Resources used to evaluate the effectiveness of an intervention (e.g., collecting height and weight data)

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