



Evaluating Complexity

A Chronic Disease Prevention Evaluation
Guidebook for Ontario's Public Health Units

CDP-EvaLL
Southwestern Public Health
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Evaluating Complexity

Introduction

Chronic disease prevention is complex. It involves several partners, systems and sectors collaborating to stop something from happening in the *future*. Because the work you do now may not pay off for decades, it's hard to tell if you're doing the right things and if you're doing them well. To help Ontario public health units and the professionals who work in them navigate these challenges, CDP-EvaLL was created. CDP-EvaLL is a provincial capacity-building initiative that aims to improve the knowledge and skills of public health professionals in Ontario to conduct and use evaluations of chronic disease prevention programs and interventions.

This Guidebook is just one component of CDP-EvaLL. The initiative also includes a repository of tools, templates and resources to help you apply the concepts in the Guidebook and e-learning modules that provide in-depth opportunities to explore particular concepts. You can learn more about CDP-EvaLL and find all the products at www.ophen.ca/cdp-evall.

Purpose of this Guidebook

Although this Guidebook was created to help public health professionals in Ontario evaluate chronic disease prevention programs and interventions, we have a confession to make: we can't really tell you how to evaluate something. Each evaluation is unique and there is no "one-size-fits-all" approach. Instead, this Guidebook provides an overview of the process of designing and conducting an evaluation that meets your unique needs and context. The Guidebook describes the important concepts you need to think about in chronic disease prevention evaluations. It provides suggestions for how to address complexity and ambiguity without being prescriptive. Think of it like a map, rather than a set of directions: it is not meant to be a "how-to" manual or a step-by-step guide, but it gives you a picture of what you can expect and a sense of direction.

Who Should Use this Guidebook?

This Guidebook is meant for public health professionals in Ontario interested in evaluating a chronic disease prevention program or intervention, or people who want to apply the findings of an evaluation to improve a chronic disease prevention program or intervention. Previous experience with evaluation is always helpful, but it's not necessary.

How to Use this Guidebook

This Guidebook is divided into six sections:

1. Speaking the Same Language: Key Definitions
2. Starting Off Right: Plan Robust Programs and Interventions
3. Making Sure You're Ready: Assess Evaluability
4. Choosing the Path Forward: Design a Rigorous Evaluation
5. Collecting and Analyzing the Information: Do Evaluation
6. Spreading the Word: Use Evaluation

Each section gives an overview of what you need to accomplish or consider and the unique challenges you may experience when evaluating chronic disease prevention programs and interventions. Although each evaluation is unique, to ensure evaluations conducted in Ontario public health units are rigorous, we need to know the minimum requirements for that step to be done well. These minimum standards ensure your chronic disease prevention evaluation is set up for success. Within each section, you will see Quality Standards boxes (see example below) that describe these minimum requirements. A glossary of terms is also included for all **bolded** terms found in this Guidebook.

Quality Standard

Example of a quality standard.



Speaking the Same Language: Key Definitions

To make sure we're all speaking the same language, we need to start by defining key terms that will help you understand the scope of this Guidebook. We'll continue to define terms throughout the Guidebook but these terms are ones you need to know before you can get started.

The first set of terms define evaluation concepts. **Evaluation** "is the systematic assessment of the design, implementation or results of an initiative for the purposes of learning or decision-



making."¹ There are different types of evaluation, each with a different focus. This Guidebook will focus on three broad categories of evaluation: formative, process and summative. **Formative evaluations** focus on the design or re-design of an initiative.² **Process evaluations** assess how an initiative is implemented.³ **Summative evaluations** assess

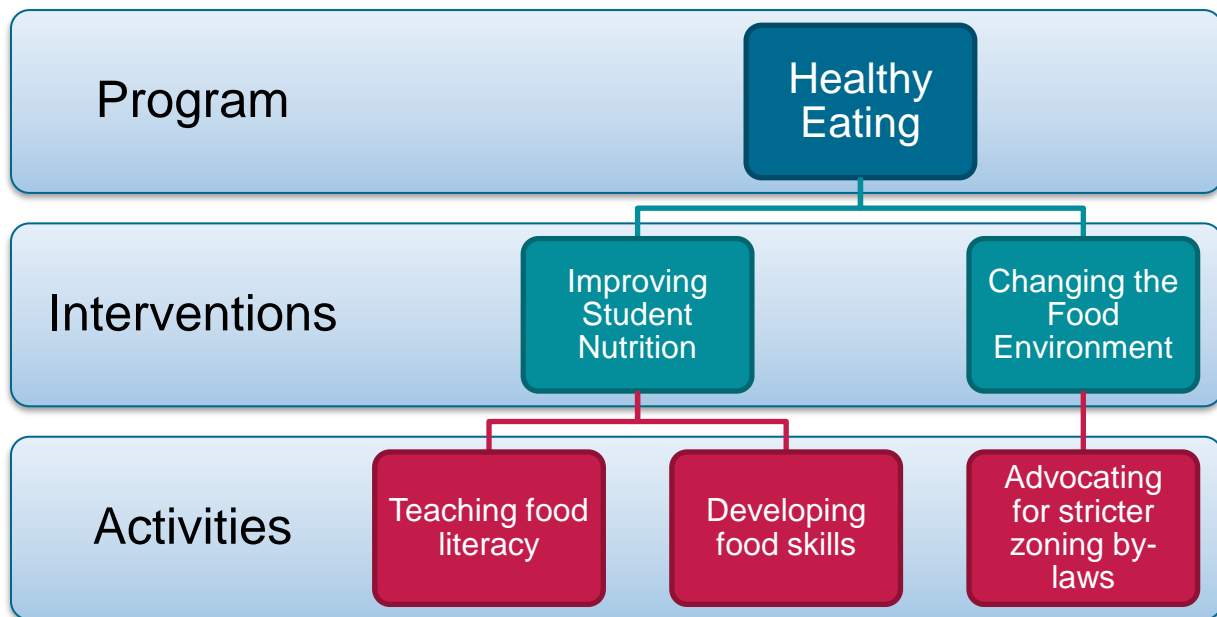
whether the initiative achieved its intended outcomes and the initiative's value.⁴ Summative evaluations are often the hardest to employ for chronic disease prevention programs and interventions.

The next set of terms define the work of public health units in Ontario. In the definition of evaluation, we used the term "initiative" to broadly describe work being evaluated. In public health and chronic disease prevention, the terms programs, services, interventions and activities are often used interchangeably to describe the different types of initiatives. In fact, they are different concepts that are arranged in a hierarchy (Figure 1).

- **Activities** are at the bottom of the hierarchy. They are specific applications of health promotion strategies, such as education, supplementation, community mobilization and environmental redesign. Activities can change as milestones are achieved or new groups are targeted.

- **Interventions** are groups of planned activities linked together by theory⁵ and supported by evidence to produce individual- and community-level changes in a target population. In contrast to activities, interventions are consistent for years because they require a long duration to be successful.
- A **program** is a group of interventions linked together through theory and supported by evidence to produce a population-level change in a population health or public health issue. Programs only change when population and public health concerns change (e.g., the emergence of vaping or legislation changes making alcohol more accessible).

Figure 1. Hierarchy of Work in an Abbreviated Healthy Eating Program

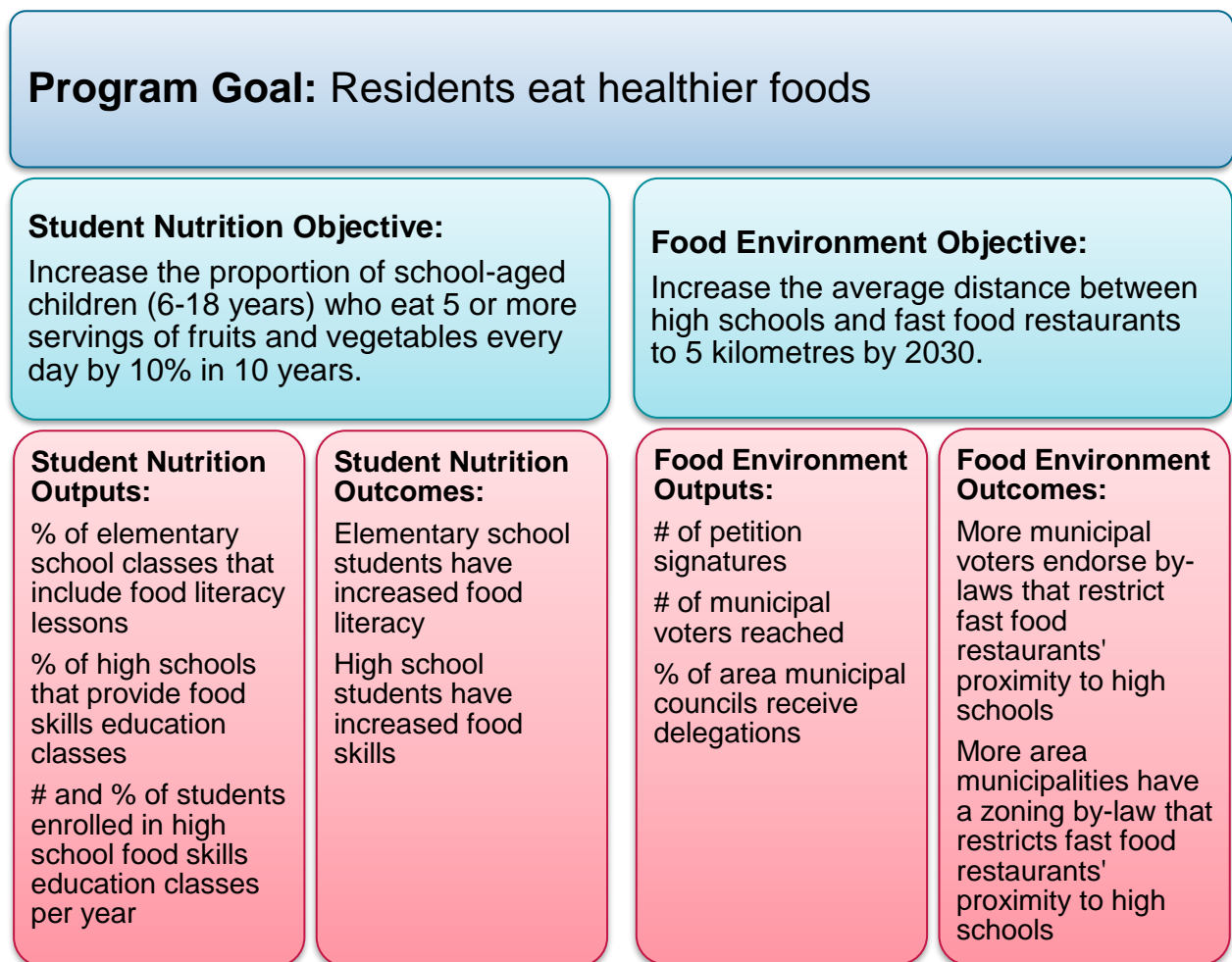


Each type of work can be evaluated, but this Guidebook will focus on evaluations of *programs* and *interventions*.

The final set of terms define the components of programs and interventions that are essential to designing an evaluation plan. Each program and its interventions need to have a goal, objectives, outputs and outcomes. The **goal** is the high-level change (or long-term outcome) that the program will achieve⁶ through the execution of its interventions. **Objectives** identify specific population or public health changes among target populations that, when taken together, will lead to the achievement of the program’s goal.⁵ Each intervention has at least one

objective and all interventions in a program have a common goal. **Outputs** are tangible things produced by your activities.⁷ Outputs, such as the number of people reached by your intervention and the percent of activities completed, tell you if you have done the work you set out to do. Because activities can change throughout the course of an intervention, outputs can be updated as milestones are achieved. **Outcomes** are the incremental changes in attitudes, knowledge, skills, behaviours, environments and policies⁸ that lead to the achievement of your objectives. Short-, medium- and long-term outcomes should be outlined at the beginning of a program and stay relatively constant throughout the life of the intervention. Figure 2 illustrates how these concepts fit within the Healthy Eating example from Figure 1.

Figure 2. Goal, Objectives, Outputs and Outcomes for an Abbreviated Healthy Eating Program



In the following sections, we'll use these terms as we discuss important concepts in chronic disease prevention evaluations.

Starting Off Right: Plan Robust Programs and Interventions

This section is the longest in the Guidebook – and that’s for good reason: good evaluation starts with good planning. If it’s not clear what your program is trying to achieve and how it will achieve it, you will have difficulty determining if the program is doing what it’s supposed to do. In this section, we introduce a way of thinking to support evaluation, describe program and intervention theory, and identify key groups in which your programs or interventions may produce outcomes.

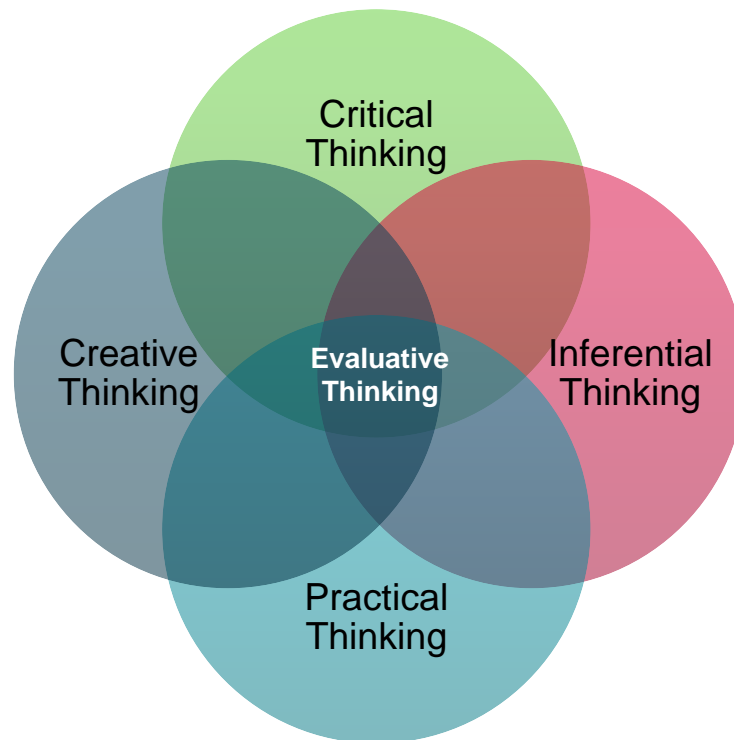
Evaluative Thinking from the Start

Evaluative thinking is “critical thinking applied in the context of evaluation, motivated by an attitude of inquisitiveness and a belief in the value of evidence, that involves identifying assumptions, posing thoughtful questions, pursuing deeper understanding through reflection and perspective taking, and informing decisions in preparation for action.”⁹ Engaging in evaluative thinking enables you to plan more robust programs and interventions because it helps you think through: why you are implementing a program or intervention, why you are doing what you plan to do and what the likely effects of your actions are.

Evaluative thinking throughout the lifecycle of a program or intervention also improves the rigor and utility of your formal evaluation activities. To think evaluatively, you need to combine four types of thinking into your decision-making processes: critical thinking, creative thinking, inferential thinking and practical thinking (Figure 3).^{10(p.21)} As you work through the rest of this Guidebook, employ evaluative thinking in these four ways to help you complete each section or step.

When you think critically, you figure out what is behind your understanding, why you have that understanding and how it impacts your decisions.¹⁰ In these ways, critical thinking is similar to applying a health equity lens or developing cultural humility.¹¹ You also seek out people who think differently and situations that don’t align with your understanding when you think critically.¹⁰ Critical thinking applied to planning chronic disease prevention programs and interventions means examining and confronting your assumptions and predispositions¹⁰ about

Figure 3. Components of Evaluative Thinking



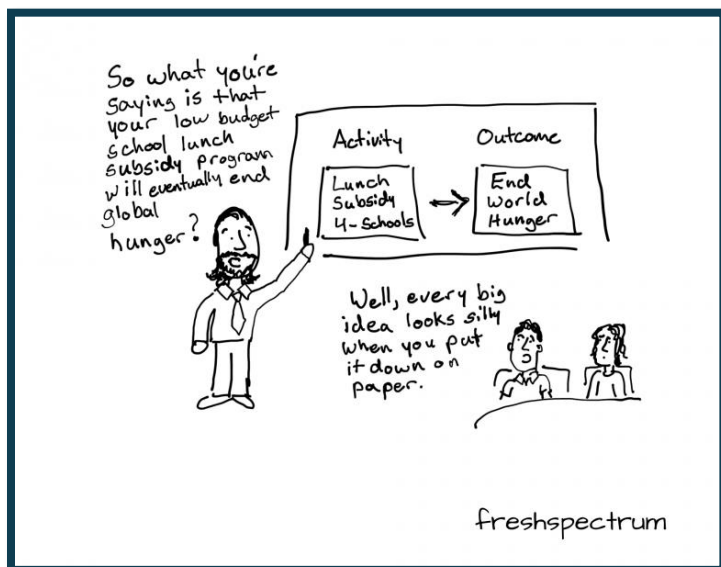
primary prevention, behaviour change, chronic disease development and risk, among other things. For example, if you were to think critically about obesity, you might ask:

- What are the different causes of obesity?
- Can a person with obesity also be healthy?
- How are obesity and chronic diseases related?
- By designing a program that targets people with obesity, are you perpetuating weight bias or stigma?¹²

Creative thinking means you approach problems from different angles, become more comfortable with ambiguity and try to find links between seemingly disparate things.¹⁰ In chronic disease prevention, creative thinking is essential to: design programs and interventions that stand out among the multiple demands for your target audience's attention; change the complex and established social, cultural, economic and political systems that affect the success of interventions; and help your target populations make sense of competing pressures to be healthy and socially engaged. For example, your target population may wonder why public health tells them to go outside on their lunch breaks and be active, while also telling them to prevent exposure to the sun's ultraviolet radiation in the middle of the day. They may also feel

pressure from media messages that promote tanned bodies as “beautiful.” How can you help them reconcile these competing messages? Creative thinking will help you design effective strategies to overcome these competing pressures and ideals.

Inferential thinking requires “fierce examination of and allegiance to wherever the evidence leads.”^{10(p.23)} This evidence comes from many sources¹³ and its validity or trustworthiness must be considered in its examination.¹⁰ Inferential thinking can be both technically and emotionally difficult. On the technical side, research evidence about chronic disease prevention interventions can be ambiguous, limited and/or of low quality. As a public health practitioner, you need to critically appraise the best available evidence and use your professional judgment



to make sound decisions. You also need to acknowledge that as you learn more, you will likely need to revise or change the strategies you initially thought would work.

Emotional attachment to a program, intervention, audience or population can make it hard for you to accept that what you plan to do or are currently doing may not be the best way to achieve your objectives.

Truly inferential thinkers examine, accept and cope with emotional

discomfort while following the evidence. As the practice of vaping has emerged in the last 10 years, our understanding of its relative risks compared to smoking tobacco has changed. We need to be ready and willing to admit that the programs and interventions we planned then might not be what we need today.

Practical thinking ensures you stay in touch with the “real” world. When you think practically about chronic disease prevention programs and interventions, you ask your target populations and audiences what they know about the issues we’re trying to address, explore the potential consequences of applying evidence and make decisions based on the resources available – now and in the future.¹⁰ Because chronic disease prevention objectives can take a long time to be achieved, practical thinking in this context means you must consider how long you are willing and able to support an intervention before choosing one to implement. You also use practical

thinking to help you scope your evaluation plans and choose appropriate methods. For example, if you have a short timeframe within which to complete an evaluation, you will likely have to limit the scope of your evaluation questions and the amount of data you collect.

Program and Intervention Theory

To reduce the burden of chronic diseases within a population, public health professionals must consider the economic, environmental, social, and behavioural determinants of chronic disease and intervene on multiple levels: individual, interpersonal, community, organizational, and societal. Planning and evaluating a robust program with this level of complexity can be challenging, but it is extremely important. Without strong program and intervention plans, both implementation and evaluation become very difficult. This section provides an overview of why it's important to link your activities and interventions together in meaningful, logical and evidence-based ways.

Program and intervention theories are different than behavioural or social change theories, but both types of theory are important for planning robust programs and interventions. Behavioural and social change theories, like the Theory of Planned Behaviour and Diffusion of Innovations, are explanations, proposed and studied by experts, that describe behaviour or social practices and how they can be changed.¹⁴ **Intervention theory** is a description of how your *particular set of activities* will lead to the intended or actual outcomes needed to achieve your intervention objective(s). **Program theory** is an explanation of how your *intervention objectives* will achieve your goal.^{15,16} A program or intervention theory can be described in words, depicted visually or a combination of the two.

Population health data, research evidence, evaluation findings and behavioural and social theories are important to developing strong program and intervention theories. Together, these become the building blocks of the program or intervention, helping you better understand:

- what health outcomes and determinants of health require intervention
- what determinants of health are affecting population health and in what ways
- what interventions will likely be effective
- how to link interventions together into a program
- how to deliver programs and interventions effectively and efficiently

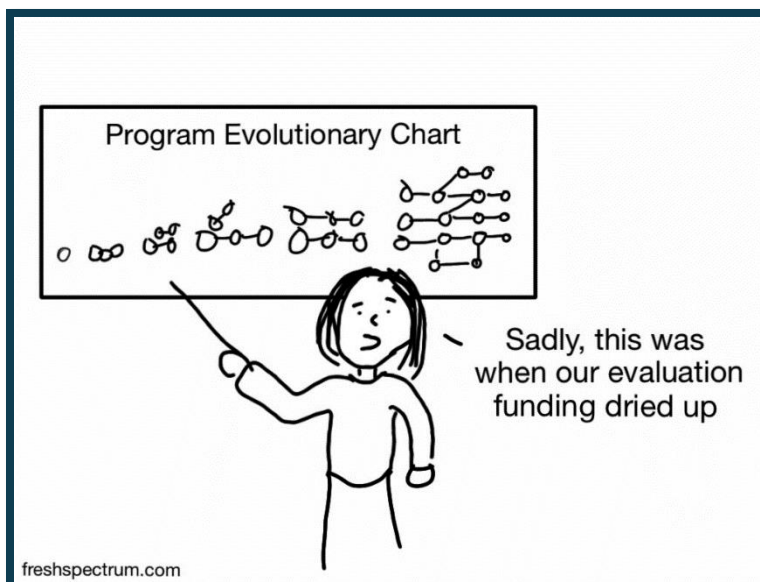
If your program or intervention theory is described before you start implementing, it can help you develop your evaluation plan.¹⁶ A well-articulated program or intervention theory is important because in chronic disease prevention, you are more likely to evaluate the program and intervention theories than conduct a summative evaluation of long-term outcomes or program goals.

Because chronic disease prevention programs and interventions are complex and take a long time to achieve their program goals or long-term outcomes, a robust, evidence-based program theory gives you confidence that the interventions you are currently doing – or will do – will achieve the program goal. You

can then evaluate the effectiveness of the component interventions in producing shorter-term outcomes; if they are effective, then you can be reasonably sure that your long-term outcomes will be realized without having to conduct another evaluation. For example, let's say your program theory says that, in order to

reduce the proportion of youth and adults who experience poor mental health, you have to ensure they develop coping skills as children. You can evaluate your intervention to determine if it effectively improves coping skills among children. If it is effective, then you can feel confident that these children are at lower risk of experiencing poor mental health as youth and adults. If it is not effective, then you need to determine why and adjust the intervention accordingly.

A robust, evidence-based intervention theory will show you the potential consequences – positive and negative – that could result from any changes you make to the intervention delivery. Using the example of an intervention aiming to improve the coping skills of children, your intervention theory would tell you which activities are necessary to achieve the objective. If you eliminate or change one of those activities, you may no longer see the outcomes you expect. If you do need to change the activities (e.g., because you no longer have the resources



to deliver them in the same way), you can evaluate if the changes you make to activities affect your outcomes and refine your intervention theory.

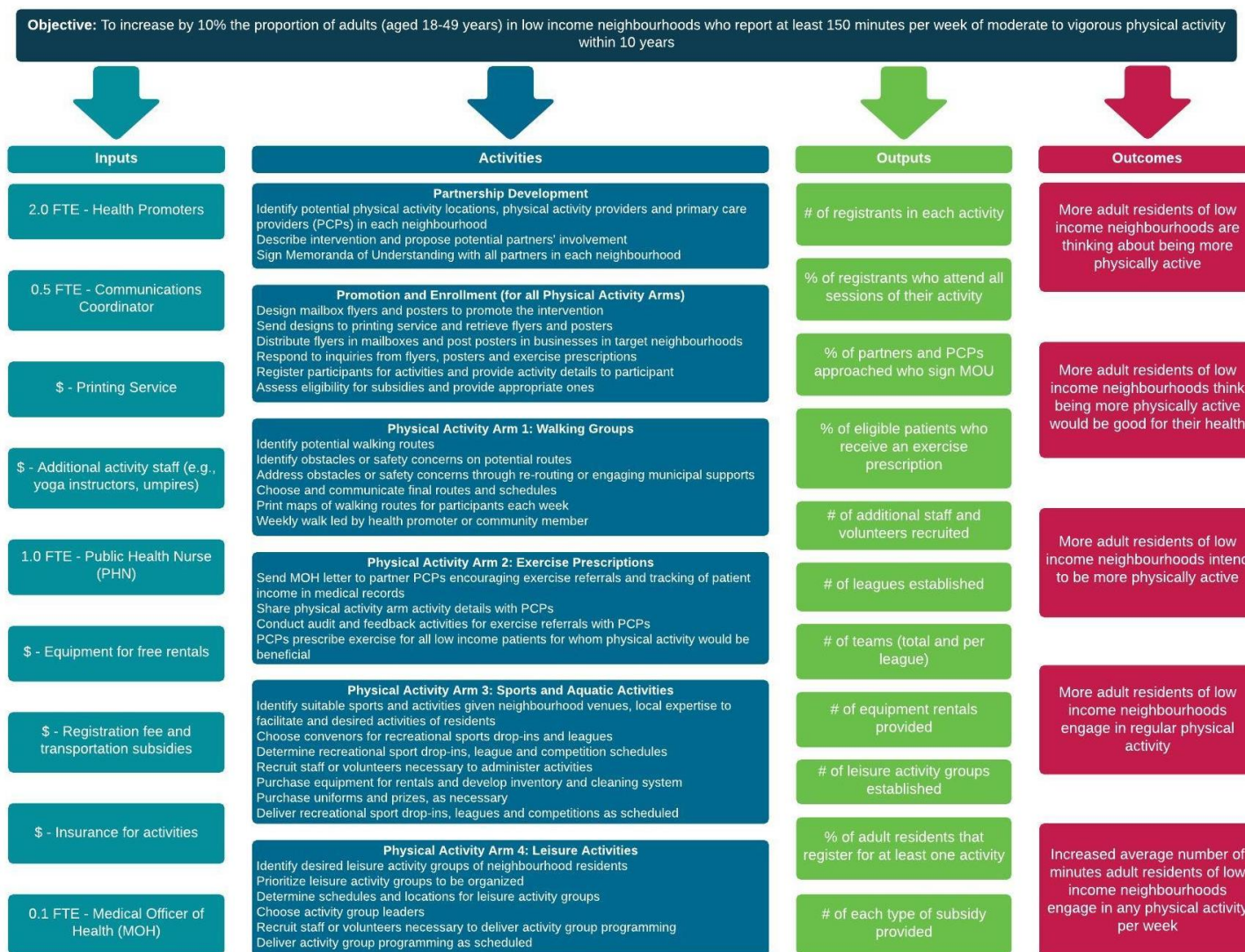
Two common ways of describing program and intervention theories are logic models and theories of change (ToCs). Although often used interchangeably, they are two different concepts. The differences between logic models and ToCs are in their complexity and depth: logic models provide a simple (often linear) overview of the program's components and the relationships among them; ToCs provide a complex, causal picture of how and why your activities will lead to your ultimate goal.^{17,18} The best one to use depends on your needs and the complexity of your program or intervention.

A **logic model** is “a picture of how your organization does its work – the theory and assumptions underlying the program”^{19(p.iii)} or intervention. It is a way to “share your understanding of the relationships among the resources you have to operate your program, the activities you plan, and the changes or results you hope to achieve.”^{19(p.1)} There are different types of logic models, including theory-, outcomes- and activities-based; the type you choose to create should be determined by what you want to use it for.¹⁹ For example, if you want to conduct a process evaluation to determine if an intervention is being implemented the way it is intended, an activities-based logic model would be most appropriate. Figure 4 provides an example of an activities-based logic model.

Although there is no agreed upon definition of a **Theory of Change**,^{17,20,21} it is often thought of as both a product and a process.²² As a product, it is a causal framework that articulates how and why a complex change process will occur over time in a particular context. Theories of change are like roadmaps for a complex change initiative. As a process, a ToC brings together key stakeholders and engages them in an outcomes-focused, rigorous, and participatory process to plan the design, implementation, and evaluation of a complex change initiative.^{17,21,22}

The ToC approach can be used for a single intervention, but it's most useful for planning and evaluation of systems change initiatives or complex programs comprised of several interventions and involving multiple actors.²² The ability of ToCs to manage complexity makes them valuable tools for chronic disease prevention planning and evaluation. Given that the ultimate outcome for chronic disease prevention programs – reduction in the rates of chronic diseases – is a goal that is not able to be realized for many years, ToCs enable public health professionals to create a roadmap of how the work they do today will impact the health of their

Figure 4. Activities-Based Logic Model Example for a Chronic Disease Prevention Intervention



Note: This logic model was adapted from the intervention described in Cochrane T, Davey RC. Increasing uptake of physical activity: a social ecological approach. J R Soc Promot Health. 2008;128(1):31-40.

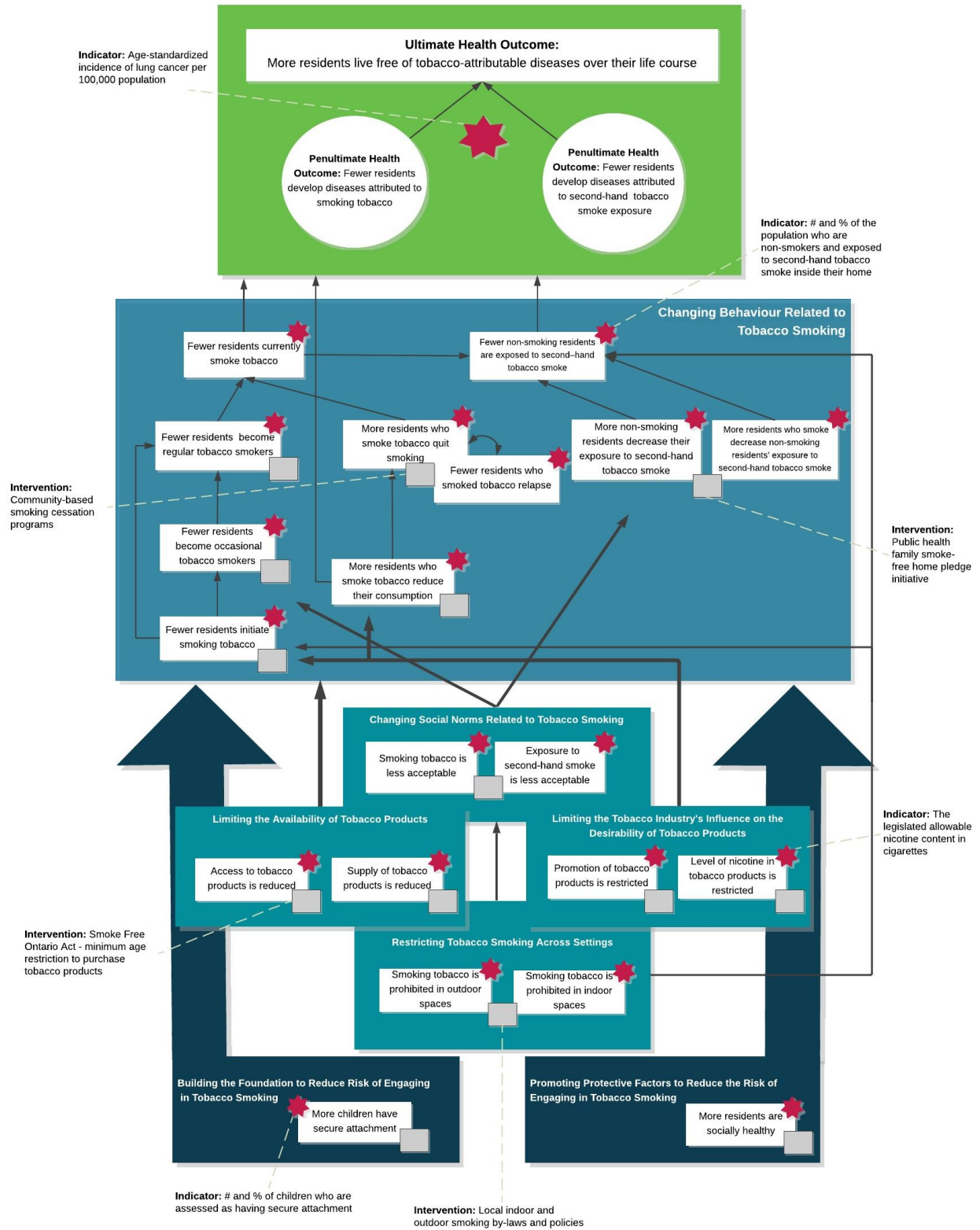
local communities in the future. They also enable them to focus their evaluation efforts on the shorter-term outcomes of their programs and interventions, confident that if they are successful in achieving these outcomes, they will be making an impact on population health in the years to come. Figure 5 provides an example of a ToC for a chronic disease prevention program.

Quality Standard



Each program and intervention should have a theory that is described in a way that allows implementers and evaluators to understand how and why it is expected to work and what it is intending to achieve. The theory should incorporate evidence from research, evaluation, public health expertise and experiences of the people who will be involved in the program or intervention.

Figure 5. Theory of Change Example for a Tobacco-Attributable Diseases Program



Note: Adapted from the Region of Peel – Public Health's Theory of Change for Tobacco Attributable Diseases

Chronic disease prevention programs should employ the frameworks and approaches outlined in the Ontario Public Health Standards Chronic Disease Prevention Guideline²³ through its interventions. To produce changes in population health, the interventions should target populations within and across all life course stages (e.g., childhood, adolescence, etc.).²⁴ Similarly, the interventions should target multiple ecological levels of influence (e.g., individual, community, interpersonal, etc.) with greater emphasis on interventions creating supportive physical and social environments and addressing the social determinants of health.²³ Finally, the interventions in a program should employ multiple health promotion strategies from the Ottawa Charter for Health Promotion (e.g., building healthy public policy, developing personal skills, reorienting health services, etc.).^{23,25} In practice, this means that chronic disease prevention programs require significant resource investment to have the potential to be effective. Table 1 shows an example of how an alcohol-attributable diseases program can be comprehensive.

Target Population, Target Audience and Priority

Population

In chronic disease prevention work, you need to define three key groups of people: target populations, target audiences and priority populations. Each group has an important role in successfully achieving your objectives and goals, but their role in your interventions varies. Each program and intervention must have a defined **target population** (sometimes called the target group): the group of people in which you are trying to produce a change in behaviour or health status.²⁶ Your target population can be as broad or specific as you need it to be, but your activities should address their needs, preferences and lifestyles.

In chronic disease prevention work you often need to influence other people to produce positive changes in your target population's behaviours or health status; for example, to change children's physical activity levels, you need to influence their parents' behaviours and attitudes. The group of people you are trying to engage in your intervention activities is called the **target audience**.²⁷ Some interventions will have more than one target audience. Sometimes your target audience and target population are the same, but because of the future-oriented and intersectoral nature of chronic disease prevention, you will often try to engage groups that differ from your target population. For example, you may want to reduce the amount of time children

Table 1. Example of a Comprehensive Chronic Disease Prevention Program

Intervention	Target population	Activities	Life course stages	Levels of influence	Strategies
Increasing access to early treatment for problem drinking	People 15-74 years old visiting a health care provider	<ul style="list-style-type: none"> Promotion of screening, brief intervention and referral by healthcare providers Advocacy for the delivery of problem drinking treatment services in the community Advocacy for increased coverage for problem drinking treatment under provincial health insurance 	<input type="checkbox"/> Pre-birth <input type="checkbox"/> Childhood <input checked="" type="checkbox"/> Adolescence <input checked="" type="checkbox"/> Adulthood <input checked="" type="checkbox"/> Older adulthood	<input checked="" type="checkbox"/> Individual <input type="checkbox"/> Interpersonal <input checked="" type="checkbox"/> Community/Organizational <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Policy	<input checked="" type="checkbox"/> DPS <input type="checkbox"/> SCA <input checked="" type="checkbox"/> RHS <input type="checkbox"/> CSE <input checked="" type="checkbox"/> HPP
Promoting abstinence until reaching legal drinking age and harm reduction behaviours	Students aged 12-29 years old	<ul style="list-style-type: none"> In-class lessons about the Low Risk Alcohol Drinking Guidelines (LRADG) Social and traditional media campaign Alcohol-free on-campus events 	<input type="checkbox"/> Pre-birth <input type="checkbox"/> Childhood <input checked="" type="checkbox"/> Adolescence <input checked="" type="checkbox"/> Adulthood <input type="checkbox"/> Older adulthood	<input checked="" type="checkbox"/> Individual <input checked="" type="checkbox"/> Interpersonal <input type="checkbox"/> Community/Organizational <input checked="" type="checkbox"/> Environmental <input type="checkbox"/> Policy	<input checked="" type="checkbox"/> DPS <input type="checkbox"/> SCA <input type="checkbox"/> RHS <input checked="" type="checkbox"/> CSE <input type="checkbox"/> HPP
Promoting and supporting abstinence during pregnancy	Women who are pregnant	<ul style="list-style-type: none"> Education on LRADG by obstetrician-gynecologists during each appointment Promotion of abstinence among partners of pregnant women Support groups for pregnant women who try to abstain 	<input checked="" type="checkbox"/> Pre-birth <input type="checkbox"/> Childhood <input type="checkbox"/> Adolescence <input type="checkbox"/> Adulthood <input type="checkbox"/> Older adulthood	<input checked="" type="checkbox"/> Individual <input checked="" type="checkbox"/> Interpersonal <input type="checkbox"/> Community/Organizational <input type="checkbox"/> Environmental <input type="checkbox"/> Policy	<input checked="" type="checkbox"/> DPS <input type="checkbox"/> SCA <input type="checkbox"/> RHS <input checked="" type="checkbox"/> CSE <input type="checkbox"/> HPP
Reducing access to alcohol	All residents	<ul style="list-style-type: none"> Community mobilization for raising the drinking age Advocacy for municipal alcohol policies, including placing or increasing restrictions on the location of alcohol outlets 	<input type="checkbox"/> Pre-birth <input checked="" type="checkbox"/> Childhood <input checked="" type="checkbox"/> Adolescence <input checked="" type="checkbox"/> Adulthood <input checked="" type="checkbox"/> Older adulthood	<input type="checkbox"/> Individual <input type="checkbox"/> Interpersonal <input checked="" type="checkbox"/> Community/Organizational <input checked="" type="checkbox"/> Environmental <input checked="" type="checkbox"/> Policy	<input type="checkbox"/> DPS <input checked="" type="checkbox"/> SCA <input type="checkbox"/> RHS <input checked="" type="checkbox"/> CSE <input checked="" type="checkbox"/> HPP

Legend: DPS = develop personal skills; SCA = strengthen community action; RHS = reorient health services; CSE = create supportive environments; HPP = build healthy public policy

(target population) spend engaging in sedentary behaviours, but to do so you need to influence their parents’ and teachers’ attitudes and behaviours (target audiences). Your intervention should have defined outcomes for both your target audience(s) and your target population. It’s important to describe both your target population and your target audience(s) so that you know which outcomes you need to see in each group. Table 2 provides examples of two interventions for which the target population and target audiences differ.

Table 2. Examples of Target Populations and Target Audiences

Intervention Description	Target population	Target audience(s)
A tobacco cessation intervention that aims to get men to quit smoking by appealing to their sense of duty to their families	Men, aged 30-54, who smoke daily or occasionally	Partners of men who smoke
A physical activity intervention that aims to increase engagement in active modes of transportation by influencing municipal policies	Residents aged 12 and older	Municipal staff and councillors

The final group of people you need to define is the **priority population**: a group of people “experiencing and/or at increased risk of poor health outcomes due to the burden of disease and/or factors for disease; the determinants of health, including the social determinants of health; and/or the intersection between them.”¹¹ Epidemiological analyses can determine which subgroups of people within your target population are experiencing higher rates of morbidity and mortality due to chronic diseases or are at higher risk of developing chronic diseases in the future. Priority populations should be specific to the health outcomes you are trying to impact; that is, they should not be generalized to all chronic disease prevention work. Defining your priority population(s) is important for applying a **proportionate universalism** approach to

resource allocation whereby everyone receives some degree of intervention, but the degree of intervention is dependent upon their need or the inequities they are experiencing.²⁸

Quality Standard



Each program must have a defined target population for the program goal. If priority populations have been identified for a program, you must provide evidence to justify their identification. Each intervention must have a defined target population. If your intervention's target audience is different from its target population, you must describe it in the intervention plan.

Indicators of Success

If you want to know if your program or intervention has been or is successful, you need to first define what success *looks like* by choosing indicators. An **indicator** is “a specific, observable and measurable accomplishment or change that shows the progress made toward achieving a specific output or outcome.”²⁹ Indicators are used to monitor your programs and interventions – they tell you if there is something you should evaluate. For example, an indicator of success for your intervention may be participation rates. If you suddenly notice a drop-off or surge in participation, you can conduct an evaluation to understand why participation rates have changed. Where possible, you should choose established indicators: ones that have been developed, tested and validated and are known to be relevant to your outputs and outcomes.³⁰ You should also ensure that your indicators are sensitive enough to show meaningful changes in your outputs and outcomes. For example, the rate of deaths due to lung cancer is one indicator of the impact of the disease on population health; however, because people can live with lung cancer for a long time before dying and may die of unrelated causes, by itself it is not a good indicator of whether you are influencing the prevalence of lung cancer. Instead, the proportion of people exposed to your intervention who intend to quit smoking in the next six months or have made a quit attempt in the past year may be more sensitive to changes produced by your programs and interventions.

Both outputs and outcomes need indicators, and you can use more than one indicator for an output or outcome. For example, to understand the burden of cardiovascular diseases you might choose to monitor the rates of emergency department visits, hospitalizations and deaths due to cardiovascular diseases. You should define and describe the key indicators of success for your programs and interventions before you start implementing them, but new indicators can be developed as you learn how the program is unfolding. Be careful, though – too many indicators can make it hard to interpret what’s going on with your program or intervention and in your target population.

Because data sources and resource availability change over time, you should regularly revisit your indicators to ensure they are still relevant, feasible and appropriate. Population-level indicators for protective and risk factors for developing chronic diseases may be limited and/or your desired program- or intervention-level indicators may not yet exist. If your indicator is truly important, then you will need to invest resources in creating the systems and structures needed to collect data for that indicator.

Making Sure You're Ready: Assess Evaluability

Evaluation is an important tool in chronic disease prevention, but just like most tools, it has a time and place when it's most useful. Deciding whether to evaluate a chronic disease prevention program or intervention can be a challenge. Before you start evaluating your program or intervention you should assess the readiness of the program and its stakeholders for evaluation.³¹ Doing so in advance can save you money – either by avoiding an unnecessary evaluation or focusing the scope of your evaluation.³² **Evaluability assessments** examine whether or not your program or intervention can feasibly and usefully be evaluated; they are ongoing, iterative processes that can be done informally or formally. You should start assessing evaluability when the idea of evaluation first arises and should continue to assess it until you start implementing an evaluation plan. In this section, we discuss two key questions an evaluability assessment of chronic disease prevention programs and interventions should answer: Should you evaluate? and Can you evaluate?

Should You Evaluate?

The purpose of evaluation is to inform a decision about or acquire a deeper understanding of the program or intervention.¹ Unless you are mandated to conduct an evaluation, there is no point to evaluating your program or intervention if you don't have a question that needs to be asked or a decision that needs to be made. When you start assessing whether you should evaluate, start with the potential evaluation users. Talk to them to understand what their evaluation needs are and what evaluation questions they might want to prioritize; this information can help to determine the scope or type of evaluation you will do.³² If they want to redesign the intervention so that it incorporates more recent technology, a formative evaluation might be useful. If they want to know which groups of people are benefitting most from a program, a summative evaluation is needed.

The outcomes produced by chronic disease prevention programs and interventions don't always lend themselves well to evaluation. If your stakeholders are only interested in assessing outcomes, you may not be able to meet their learning needs. In these situations, you should try to find a more feasible scope (see the Can You Evaluate? section below) or seek out additional evaluation support (e.g., external consultants or researchers) to meet their needs. Another thing to consider here is whether your stakeholders' evaluation questions can be addressed through

other means. For example, if your stakeholders are interested in learning about the participants' satisfaction with the intervention, a quality improvement project might answer their question. Similarly, if your chronic disease prevention intervention that has demonstrated that it works in controlled conditions as well as in "real world," and has been implemented with fidelity, then it's reasonable to assume that your intervention is effective and does not require additional evaluation to determine its effectiveness.

Chronic disease prevention programs and interventions require significant resource investment from multiple sectors and stakeholders, which can be both a facilitator and barrier to the utility of evaluations. When many hands are in

the pot, making decisions about what to evaluate and how to act on evaluation findings is harder. When the enthusiasm is high, each person may want to know something different, expanding the scope of the evaluation beyond what your resources and skills can support, which might mean reduced buy-in for what your evaluation eventually becomes. Alternatively, the prospect that an evaluation may



produce negative or undesired findings may be a deterrent for some stakeholders who do not want to risk losing funding for staff and other resources attached to the program or intervention being evaluated.

It is also important to determine what the intended users can and will do with the evaluation results. Resource availability, political will and organizational culture all impact the ability of evaluation users to address and/or apply evaluation findings. During an evaluability assessment, you should explore if they are willing and able to make changes to the program or intervention. If there are limitations to their willingness or ability to act on the evaluation findings, what are they? To promote the utility of the potential evaluation, all your stakeholders should agree on the reason for the evaluation, its scope, the evaluation questions and the intended use of the findings.³¹⁻³³ Without this agreement from the outset, your evaluation could be a waste of resources. Once you have agreement, you can focus your evaluation on those things that will be acted upon.

Can You Evaluate?

Just as important as whether you *should* evaluate your chronic disease prevention program or intervention is whether you *can* evaluate it. There are two important concepts to assess when determining your ability to evaluate: plausibility and feasibility.³¹ Plausibility helps you understand if your program or intervention is ready for evaluation; feasibility helps you understand if your organization is capable of evaluating the program or intervention.

Plausibility refers to the likelihood that your evaluation questions can be answered. To assess plausibility, you have to review your program or intervention theory and the evidence used to create it, as well as the extent to which your program or intervention has been implemented.^{30,31} If your program or intervention theory is underdeveloped or is based on inappropriate or inadequate evidence, it is unlikely to produce the outcomes that you think it will³¹ and your ability to evaluate those outcomes will be limited. Theory-based evaluation approaches are particularly helpful in this situation to support evaluation of chronic disease prevention programs and interventions. These approaches are used to understand *how* programs and interventions create change.³⁴ For example, a comprehensive sleep program may employ evidence-based interventions to improve people's sleep habits. However, most of the evidence for those interventions may be based on data from people who work "9-to-5" jobs and you want to know how those interventions work for people who work varied hours or shift work. A theory-based evaluation approach such as realist evaluation can help you understand "What works, for whom, in what respects, to what extent, in what contexts, and how?".³⁵ After evaluating and further refining the theory, you may be able to evaluate whether your short-term outcomes have been achieved.

Another aspect of plausibility is the implementation of your program or intervention. If your program or intervention theory is well-developed, it should tell you how much work you need to do and how to do it. A plausibility assessment includes determining if enough work has been done and if it has been done the way it was intended.³³ As we've said before, chronic disease prevention requires significant resource investment and reach to produce measurable changes in your target population. If your theory says that it takes 30 or more quit attempts to successfully quit smoking for one year,³⁶ you will need to engage smokers in your smoking cessation intervention for a significant duration (possibly more than 30 years!)³⁷ and see multiple quit attempts among them to observe your behavioural outcome (quitting smoking for

one year). That means if you are only engaging participants for one year or less, then you aren't likely to see many successful quit attempts – especially if those participants haven't tried to quit smoking before. In this case, it would not be appropriate to conduct an evaluation to see if your intervention is helping people quit smoking because it's unlikely your program could produce the outcome, even if your theory is plausible. Instead, it might be more plausible to see a change in your participants' motivations and attitudes towards quitting smoking.

Feasibility refers to the ability of your organization to do the evaluation in the way that you are proposing. Before proceeding, your evaluability assessment should determine that you have the data, money, time, people, infrastructure, knowledge and skills needed to credibly answer your evaluation questions.³⁰ Evaluation requires significant resource investment to be done well, particularly when you have several outcomes and processes to assess. In chronic disease prevention, long-term outcomes take years – or even decades – to achieve (see the tobacco example above), but short-term outcomes may be more feasible to evaluate because they won't require the same amount of time and money to be invested in the evaluation.

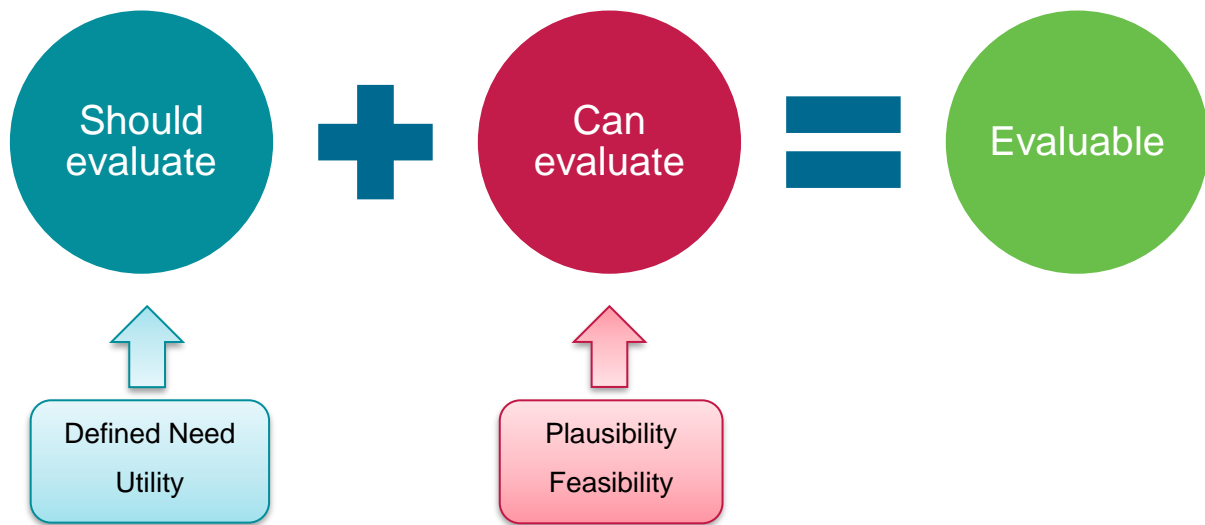
When assessing the feasibility of any evaluation, you should also assess the knowledge and skills of the people who will need to conduct it by asking questions like:

- Do you need to train people to collect and analyze data?
- Do you have the methodological expertise available to design a rigorous evaluation?
- If your existing staff do not have the knowledge and skills needed, do you have the money to hire someone to conduct the evaluation for you?

Due to the collaborative nature of chronic disease prevention programs and interventions, participatory evaluation approaches are useful to engage stakeholders throughout the process of designing, conducting and using evaluation.^{38,39} If you are planning to use a participatory approach, you need to also consider the availability of skilled facilitators who can balance the experiences and expertise of your collaborators with the methodological rigor needed to answer your evaluation questions.⁴⁰ If you have limited resources in any of these areas, consider reframing your evaluation or narrowing its scope.

Figure 6 summarizes evaluability assessments into a simple equation: if you *should* evaluate and you *can* evaluate, then your program or intervention is *evaluable*. If your assessment reveals it's not the right time to evaluate, that's OK. You can change your proposed evaluation,

Figure 6. Evaluability Equation



change the program or intervention, end the program or intervention or continue to implement it without evaluating right now. Remember: if your context changes, you can always conduct another evaluability assessment to see if your program or intervention is evaluable.

Quality Standard



The evaluability of your program or intervention must be assessed – formally or informally – prior to conducting an evaluation.

Choosing the Path Forward: Design a Rigorous Evaluation

Designing an evaluation requires evaluative thinking, research skills and collaboration. In this section, we'll discuss what you need to consider when choosing your evaluation questions, approach and methods. We also examine ethical issues that can arise during chronic disease prevention evaluations.

Components of an Evaluation Plan

An evaluation plan is a written document that describes your intended actions and the reasoning behind them. It helps you and your stakeholders understand the purpose, scope and methods of the evaluation so that everyone knows from the outset what you can and can't accomplish in the evaluation.⁴¹ Although there are common components of an evaluation plan, the way they come together in a plan may be more complicated for chronic disease prevention evaluations than for other public health topic areas. In general, your evaluation plan should include:

- a description of the program or intervention being evaluated, including the program or intervention theory
- the purpose of the evaluation and the specific questions you will try to answer
- your evaluation approach and the methods you will use
- roles and responsibilities of the project team
- the financial, human and other resources you will need to execute the plan
- the intended users of the evaluation findings and the knowledge exchange and dissemination activities to engage them
- an action plan to describe how you will act on the recommendations⁴¹

The following sections describe how you should approach completing an evaluation plan for chronic disease prevention evaluations. Evaluative thinking is a necessary skill and process for developing a rigorous evaluation plan. As you continue to think critically, creatively, inferentially and practically, you will adjust the plan to meet your stakeholders' needs and suit the context.⁴¹ The objective is to create a plan that will produce an evaluation that is useful, feasible, grounded in evidence and conducted with integrity.⁴²

Quality Standard



Each evaluation must have a documented evaluation plan completed prior to undertaking any evaluation activities.

Engaging Stakeholders

Involving stakeholders in developing an evaluation plan helps ensure the evaluation addresses the information and learning needs of the intended users and is utilized for its intended purpose.⁴³ Stakeholders are particularly important to engage in chronic disease prevention evaluations because the complexity of the programs and interventions warrants seeking out and considering multiple perspectives on the activities.³⁰ By engaging stakeholders early in the evaluation planning process, you ensure that you have support for your activities and the reasoning behind your decisions is well-developed.⁴¹

Chronic disease prevention programs and interventions can have dozens of stakeholders – but having too many stakeholders involved in the work of designing an evaluation can make the process difficult to manage. For this reason, it is important to identify not only who your stakeholders are, but *why* they are interested in your evaluation. Their interest in the evaluation will also dictate what role they might play in your evaluation design.^{30,41} Being clear about stakeholder roles makes the feedback and design process smoother. Table 3 provides examples of stakeholders who might be interested in your evaluation and how they might be involved in the evaluation design.

Articulating the Evaluation Purpose and Questions

Your **evaluation purpose** is the overarching reason you decided to evaluate your program or intervention⁴¹ and it is linked to the type of evaluation – formative, process or summative – you will pursue.⁴⁴ You might want to determine the effectiveness of your program (summative),

Table 3. Sample Stakeholder Analysis in Chronic Disease Prevention Evaluation Design

Stakeholders	Evaluator’s Interest in their Perspective	Potential Role(s) in Design
<ul style="list-style-type: none"> • Program or intervention funders 	<ul style="list-style-type: none"> • Ensure it meets their decision-making needs about future or ongoing funding 	<ul style="list-style-type: none"> • Approval of final evaluation plan
<ul style="list-style-type: none"> • Partner agencies 	<ul style="list-style-type: none"> • May be asked to help recruit their clients or employees to be participants for the evaluation • May want to implement the program or intervention being evaluated 	<ul style="list-style-type: none"> • Provide feedback about feasibility and appropriateness of participant recruitment strategies and data collection methods
<ul style="list-style-type: none"> • Target population and/or audience members • Program or intervention staff members 	<ul style="list-style-type: none"> • May become evaluation participants • Ensure the findings include their perspectives • May be affected by the recommendations 	<ul style="list-style-type: none"> • Provide feedback about feasibility and appropriateness of participant recruitment strategies and data collection methods • Provide feedback about potential consequences of achieving the evaluation purpose or answering the evaluation questions
<ul style="list-style-type: none"> • Program or intervention delivery and content decision-makers • Evaluation funders 	<ul style="list-style-type: none"> • Ensure it meets their decision-making needs regarding program and intervention activities • Ensure it meets their expectations for resource investments 	<ul style="list-style-type: none"> • Approval of final evaluation plan • Provide feedback on the scope and purpose of the evaluation, including its evaluation questions • Provide feedback on the potential participants and the type of data collected • Provide feedback about knowledge exchange products and activities

understand how an intervention is being implemented at different sites (process) or what your target audience’s communication preferences are (formative). As discussed above, it’s hard to show that chronic disease prevention programs and interventions have direct impact on the health of a population; therefore, a common purpose for chronic disease prevention evaluations is to better understand or refine the program or intervention theory. Having a reason to do the evaluation is part of the evaluability equation described above, so doing an evaluability assessment should refine your evaluation’s purpose.

Evaluation questions are what you need to answer to achieve your evaluation purpose; they are *not* the questions you ask of participants or instruments to collect data.³⁰ Let's explore the evaluation questions you might ask if you need to decide how to resource the interventions within a healthy eating program going forward (a formative evaluation) because your program budget has been reduced. To achieve that purpose, you will need to know:

- What are the potential consequences to the program's effectiveness if you stop one or more interventions?
- What – if any – alternative interventions could be implemented using reduced resources, while achieving similar effectiveness?
- What – if any – ways can the existing interventions be delivered using reduced resources, while maintaining effectiveness?

To fulfill the second half of the evaluability equation, your evaluation must be feasible: you should have the resources available to gather, collect and analyze data to answer all your evaluation questions. The complexity of chronic disease prevention programs and interventions means you will likely have

several evaluation questions to answer that require a lot of data or hard-to-collect data. If you are unable to secure the needed resources, you will need to reduce the number of questions or refine them to narrow the scope of the evaluation. In the above example, if you don't have enough time or money to assess the contribution of all



interventions in the healthy eating program, you could revise the first question to include only a subset of interventions: "To what extent are the interventions targeting adolescents contributing to the program's goal?" As you move through the rest of the design process, you should review and revise your evaluation questions to ensure they are still feasible and are helping you achieve your purpose.

Quality Standard



Each evaluation must have its purpose and evaluation questions defined *before* choosing the evaluation approach, selecting the methods and conducting the evaluation.

Choosing an Evaluation Approach

An **evaluation approach** is “an integrated package of options (methods or processes)”⁴⁵ that help you achieve your evaluation purpose and answer your evaluation questions. It directs your design choices, implementation practices and knowledge exchange activities.⁴⁴ Each approach has its strengths and limitations which need to be considered before you settle on one or more to employ in your evaluation. Again, evaluative thinking is important here. You need to think critically about whether your evaluation team’s values align with the approach; creatively to design strategies to mitigate the limitations of the approach; inferentially to understand if the approach can offer evidence you are willing and able to act on; and practically to determine if you have the capacity to employ the approach well.

Evaluation approaches can be described in terms of their “orientation” or what they prioritize.⁴⁶ For example, Appreciative Inquiry is a strengths-based approach and Utilization-Focused Evaluation is a user- or consumer-oriented approach.^{47,48} The orientation helps you understand the underlying philosophy of the approach and what types of evaluation questions it can help you answer. An Appreciative Inquiry approach is not going to help you answer questions about what is missing from a program or intervention or where it is falling short; however, it can help you understand what lessons can be learned from what is going well, how to build upon them and/or how to apply them elsewhere.⁴⁷ The orientation also tells you if the approach aligns with your stakeholders’ values. If your stakeholders value objectivity, then an approach that prioritizes narratives of participants’ experiences and values over direct measurement, like Most Significant Change,⁴⁹ would be inappropriate. In chronic disease prevention, evaluation questions can be diverse and complex, so you might need more than one evaluation approach to answer them all. In these cases, you need to make clear how you will combine the approaches – including how you will deal with any incompatible philosophies. For example, you

should describe how you will use the data from each approach to make conclusions: do the findings from the first approach inform what data are collected using the second approach, or are the different approaches used to increase your confidence in the findings?

Quality Standard



Each evaluation must have a defined approach that is stated and/or described in the evaluation plan. If more than one approach is used, how the approaches will be combined to answer the evaluation questions must also be described.

The Evaluation Matrix

An **evaluation matrix** is a tool to document how you will answer your evaluation questions. Each evaluation question is matched to the measures and data sources that will generate evidence related to the question.⁵⁰ All evaluation data should be collected for a specific reason and the evaluation matrix helps you demonstrate that reasoning. It also makes it easier to see how you are planning to integrate multiple evaluation approaches.⁵⁰ The complexity of chronic disease prevention evaluations means that they may require significant amounts of data be collected over multiple years. When it's time to analyze all the data, an evaluation matrix will help you keep track of why you collected each dataset, how it relates to other datasets and what you expect it to reveal about your program or intervention. The matrix also makes it easier for your stakeholders to understand your choice of measures and data sources and provide input to them. An evaluation matrix can also assign data collection and analysis methods, timelines and staff to each measure or data source.⁵⁰

Measures

As we defined in the planning section above, indicators let you know if your program or intervention is successful or if something has changed. **Measures** are the quantitative and qualitative pieces of information you are collecting to learn about your program or intervention. It's a subtle – but important – difference. Just as you can have multiple indicators to describe an

outcome, you can choose from multiple measures to feed into an indicator. Table 4 provides examples of measures for relevant chronic disease prevention indicators. The measures you will employ in an evaluation should be considered as part of your evaluability assessment: they should be feasible to collect and analyze and be plausible representations of your indicators.

Table 4. Examples of Quantitative and Qualitative Measures

Indicator	Potential Measures	Quantitative or Qualitative
Proportion of the population who engages in hazardous or harmful drinking	Alcohol Use Disorder Identification Test (AUDIT) scores ⁵¹	Quantitative
	Self-reported prevalence of exceeding the low-risk alcohol drinking guidelines (LRADG) ⁵² in the last year	Quantitative
	Self-reported high-risk behaviours engaged in while drinking (e.g., driving, jumping from high places)	Qualitative
Proportion of users that engaged with social media content	Number of unique users that commented on a page or post	Quantitative
	Number of unique users that click through a link	Quantitative
	Number of unique users who liked a page or post ⁵³	Quantitative
Quality of municipal by-laws that promote active transportation	Number of references to academic literature ⁵⁴	Quantitative
	Consistency of content with the most recent evidence ⁵⁴	Qualitative
	Consistency of content with other policies that have demonstrated effectiveness ⁵⁴	Qualitative

Because evaluation involves comparisons, you should think about what those comparisons will be when selecting your measures. If you think you will want to evaluate your program or intervention’s progress over time, you should collect data for your measures *before* implementation to establish a baseline. If you think you will want to evaluate your ability to meet a standard, you should set a target or benchmark in advance.²⁷ If you are comparing your program or intervention’s performance to a benchmark, you need to use the same measures and data collection procedures as your benchmark. For output measures, you should choose

targets that ensure you have done enough work to potentially achieve your outcomes. For example, if your program aims to see a change in 5% of your population, you will need to reach much more than 5% of your population through your interventions. The comparison could also be between groups, such as those who received the intervention and those who did not. As with benchmarks, the same measures and procedures should be used when comparing between groups.

Data Sources

After you have determined the measures you will use, you will identify the best sources from which to obtain data. Sources are where you get the information from – not how you collect it. You can have primary or secondary sources of information. **Primary sources** reflect data and datasets collected for your specific evaluation; **secondary sources** reflect existing datasets collected for a different purpose. Because of this distinction, secondary sources are often less expensive to tap into, but they may also be less relevant to or appropriate for your evaluation questions and context.⁴⁶ For chronic disease prevention evaluations that require long-term follow-up, primary sources of data may not be feasible to collect. However, data collection tools and procedures can change over time or be discontinued, so secondary sources that were appropriate at the outset of an evaluation may be inappropriate before the end of the follow-up. Secondary data relevant to chronic disease prevention can come from healthcare and social services organizations, public health databases, internal databases, research, media, national or provincial surveys and municipalities.

Primary and secondary data can come from people, observations, physical measurements or documents and files.⁵⁵ Each source has its benefits and limitations. Although direct observations or physical measurements might be ideal for some measures, you often have to rely on self-reported data for chronic disease prevention evaluations. For example, physical activity and sedentary behaviours can be captured with the use of accelerometers but public health units don't often have the money, time and equipment needed to use them appropriately. Instead, you can ask evaluation participants to keep diaries or answer recall questions on surveys. Chronic disease prevention evaluations can use data from each of these sources. For example, evaluation of a built environment intervention may use any and all of the following sources of information:

- people's opinions about the proposed locations of bike lanes posted in an online forum
- observations of the number of cyclists at an intersection during rush hour

- physical measurements of the total kilometres of bike lanes in a municipality
- documented political discussions from municipal council meeting minutes

Your evaluation matrix should identify the specific source for each of your measures. You may have multiple sources for a measure available to you at any given moment. In the example of hazardous and harmful drinking from Table 4, you could get AUDIT scores from a questionnaire administered by your evaluation team (a primary source) or you could get AUDIT scores from secondary sources like the CAMH Monitor⁵⁶ or the Ontario Student Drug Use and Health Survey.⁵⁷ The sources you choose should align with the evaluation approach you selected. For example, if your approach values the participants' or target populations' experiences then you should use sources that have data from people directly affected by or involved in your program or intervention.

Quality Standard



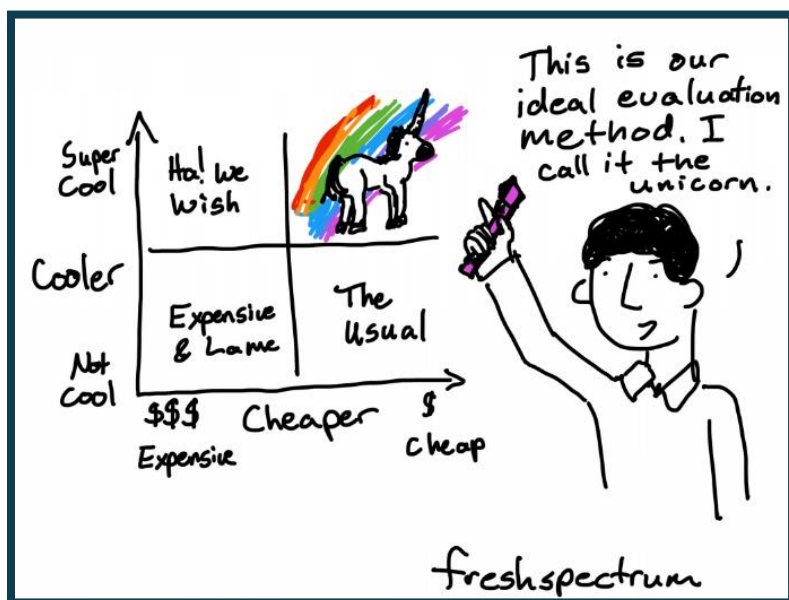
Each evaluation must document (e.g., in an evaluation matrix) the measures and data sources that will be used to answer each evaluation question. The measures you choose should be feasible and plausible, and the data sources you use should align with the evaluation approach.

Data Collection and Analysis Protocols

Once you have described the measures and data sources you will need to answer your questions, you have to plan for collecting and analyzing it. Your evaluation approach(es) will tell you which data collection and analysis procedures are appropriate to answer your evaluation questions.⁴⁵ The amount of detail in these protocols will depend on the approach you choose. For some approaches, it's important to decide and describe exactly how you will collect and analyze the data in advance. For others, data collection and analysis are more flexible and iterative. In the latter cases, you will describe the basic principles that will guide your methods in the evaluation plan and document your exact methods in your final report.

Data collection protocols describe what data are relevant to your evaluation; where you will get the data from; how you will recruit participants; who will collect the data and how they will be recorded, validated and stored. Data collection protocols help ensure that you will collect useful data that will answer your evaluation questions. They should describe the methods (e.g., interviews, surveys, focus groups, document reviews, etc.), tools (e.g., questionnaires, interview guides, checklists, etc.) and people involved in this stage of the evaluation. If more than one person is collecting data, you should describe how you will ensure they are collecting it in the same way. Data quality standards and methods for assessing those standards are also described in these protocols.^{30,41}

Chronic disease prevention programs and interventions are complex, so you will likely have to employ multiple methods and tools to collect all the data needed to answer your evaluation



questions. Use the questions from the evaluability assessment to help you determine which methods to employ: do you have the resources needed to do them well and are they likely to tell you what you need to know? When choosing methods for chronic disease prevention evaluations, you also have to consider if your potential sources of data can provide

the information you are seeking. For example, if you want to collect data about young children, asking them to read and respond to a survey might be challenging; however, you could read the questions to them and have them respond verbally or draw a picture, or you could ask their parents to respond to the survey on their child's behalf. Similarly, health equity concerns may limit the effectiveness of some data collection methods. Transportation, language, cultural practices, educational attainment, literacy levels, social isolation and stigma can be barriers to participation in primary data collection or could be characteristics of people whose voices are excluded from secondary data sources.⁴⁴ Consider how you can employ multiple collection

methods to maximize the range of experiences and backgrounds that are included in your evaluation, as appropriate.

Data analysis protocols describe how you will treat the data once they are collected. They should include how you will deal with missing, incomplete or ambiguous data; the analytical methods you will use; which subgroup analyses and comparisons you will make; any hypotheses you have made; and how you will validate your analyses.⁵⁸ Your approach(es) will dictate which analytical methods are appropriate for your evaluation.⁵⁹ For example, randomized controlled trials will employ inferential statistical analyses,⁴⁶ but grounded theory studies will employ constant comparative analysis and qualitative coding.⁶⁰ If more than one person is analyzing data, you should describe how you will ensure that they are making the same analytical decisions and following the same methods. Because the prevalence of chronic diseases and their risk factors vary by age, sex, socioeconomic status, racial identity and Indigenous identity,⁶¹ you should consider subgroup and equity analyses where possible and those subgroups should be informed by research and local surveillance data.

Sampling

For some evaluation approaches, it is impractical and/or unnecessary to collect data from every person or place that might have been affected by your program or intervention. In those cases, you need to identify the subset – or **sample** – you will collect data from. Sometimes, the population is small enough and easy enough to access that you can collect data from each of its members; this method is called a census.⁶² The approach you choose for your evaluation will tell you what is important to consider when choosing your sample.

Once you have figured out all the people, organizations, or things that could be sampled, you need to decide who/what will be part of your sample and who/what will not be part of it; these characteristics are known as inclusion and exclusion criteria.⁶³ Your evaluation approach will guide you in making these decisions. If your approach requires direct knowledge of and experience with the program or intervention, your sample will exclude people and places that were not directly involved in the activities. In chronic disease prevention evaluations, you need to consider inclusion and exclusion criteria such as: exposure to the intervention, prevalence of protective and risk factors for the outcome and the presence of comorbidities.

You also have to determine how big your sample should be, which can be complicated. Your evaluation questions, approach, methodology and methods will help you determine what sample

size you need. The way you determine sample size will be different for quantitative and qualitative methodologies. In quantitative methodologies, you need to consider the **effect size**: the magnitude of change the intervention can produce. Health promotion interventions can successfully produce behavioural changes, but the effect size is generally small to moderate.⁶⁴

⁶⁷ Interventions with smaller effect sizes need bigger samples because it's harder to detect differences when effect sizes are small. If you want to be able to show that your intervention had an effect that wasn't due to chance, you should do a sample size calculation to make sure your sample is large enough to be able to show that difference if it exists.^{41,68}

In qualitative methodologies, your sample size will need to consider:

- the diversity of experiences you need to capture
- the contexts in which those experiences can occur
- how experiences can change over time
- your underlying philosophy about the nature of “truth” and how we can know it⁶²


Some qualitative methodologies require the evaluator to continue sampling people, places, times, contexts and experiences until **theoretical saturation** is reached. Theoretical saturation is the point at which your data collection returns no new information and you can define and describe the properties and variations of the phenomenon you are studying, as well as the relationships it has with other phenomena.⁶²

Sometimes, getting the sample size you need might not be feasible. In those cases, you will need to reconsider your evaluation approach or questions. Evaluation approaches and methodologies (like case studies⁶⁹) that aim to understand the context and specificities of a particular experience with the program or intervention will require smaller sample sizes because the purpose isn't to generalize or determine statistical significance. Research evidence and past evaluations can help you determine the likely effect size of your intervention.

Once you know what your sample should look like and how many should be in it, you need to select the members of it. There are several sampling methods that fall into two main categories: probability and non-probability.⁶² A comparison of these categories can be found in Table 5. Choose a sampling strategy that aligns with your approach(es) and your evaluation questions.

Table 5. Probability vs Non-probability Sampling⁶³

	Probability Sampling	Non-probability Sampling
Characteristics	<ul style="list-style-type: none"> • Random selection of the sample • Differences in results between your sample and the population can be estimated 	<ul style="list-style-type: none"> • Non-random selection of the sample • Differences in results between your sample and the population cannot be estimated
Potential Benefits	<ul style="list-style-type: none"> • Allows for generalizability of sample findings to the population (if done well) • All eligible members of the population have the same potential to be included 	<ul style="list-style-type: none"> • Convenient
Potential Challenges	<ul style="list-style-type: none"> • Expensive • Time-consuming 	<ul style="list-style-type: none"> • Cannot generalize sample findings to the population • Not all members of the population are eligible to be sampled, so may be inequitable
Examples	<ul style="list-style-type: none"> • Random sampling • Clustered sampling 	<ul style="list-style-type: none"> • Theoretical sampling • Snowball sampling • Convenience sampling
Most Useful Situations	<ul style="list-style-type: none"> • Evaluations that assess causation or contribution • Evaluation approaches that require control or mitigation of factors outside of the program or intervention that might contribute to the outcome 	<ul style="list-style-type: none"> • Evaluations that assess experiences • Evaluation approaches that seek out specific people, experiences and perspectives

Quality Standard 

Data collection and analysis procedures and the sampling strategy for your evaluation must align with the evaluation approach(es) and methodologies you selected.

Ethics

As a public health professional, you impact the lives of people and populations every day. Every evaluation activity has an impact on those same people and populations. For that reason, you need to make sure that you pay attention to the potential consequences of your activities and

implement risk mitigation strategies during the design phase of the evaluation. The sections below identify some key ethical considerations for evaluating chronic disease prevention programs and interventions.

Equitable Access to Participation

When you design an evaluation, you make decisions about what data and experiences are important to your evaluation questions and the decisions that are made based on your findings. As a result, you decide whose voices are heard and whose are not. The way you design your evaluation also provides benefits to and places burdens on potential participants. An inequitable distribution of benefits and burdens also affects whose voices are heard because they facilitate or hinder participation among different groups.⁷⁰ Here are some ways equitable access to participation is affected by your evaluation design:

- Your evaluation questions determine what information and experiences you pay attention to and examine in-depth.
- Your evaluation approach creates power dynamics that affect how decisions are made about and for communities, populations, and cultural groups.
- Your decisions about measures, data sources, sampling strategies and inclusion and exclusion criteria determine who has the chance to participate and how concepts are understood by different subpopulations.
- Your recruitment strategies and data collection methods impact how easy it is for people to participate if they are eligible.
- Your data analysis methods determine to what degree people's unique or dissenting voices and experiences are heard.

When making the design decisions above, you should make sure you are not directly or indirectly excluding people or experiences “for reasons unrelated to the research.”^{70(p.50)} Public health programs and interventions often have trouble reaching people who are most at risk of developing poor health outcomes. If you make decisions about your programs and interventions without including the target population's experiences in your evaluations, you will continue to have difficulty reaching them and they will continue to experience poor health outcomes.

Consent to Participate

When you want people to participate in your evaluations, you need to make sure that their consent is “free, informed and ongoing”^{70(p.27)} and that their participation options are not unjustly limited by their capacity to consent.⁷⁰ Chronic disease prevention programs and interventions often involve people who may have limited capacity to consent to participating in evaluations, such as children, people with low literacy skills or people who do not speak the language in which the evaluation is being conducted. In these cases, you need to implement strategies such as getting consent from authorized third parties and obtaining **assent** (the agreement of a potential participant who is unable to consent) or **dissent** (the refusal of a potential participant who is unable to consent)⁷⁰ or using translation services.

Participants need to be told all relevant information *throughout* the evaluation process and they need to be able to withdraw their participation and their data (where possible) without penalty. If withdrawal of participation or data is not possible, these parameters need to be explained to potential participants from the outset.⁷⁰ This ethical principle is especially relevant to chronic disease prevention evaluations that require long-term or repeated data collection because participants’ circumstances and exposure to risk can change over time.

Making Conclusions and Recommendations

Evaluation is done for the purpose of making decisions or answering a specific question about the program or intervention. So, evaluators must understand the potential implications of the conclusions and recommendations that they make on the people and organizations who implement and receive the program and intervention activities.⁴² Evaluators don’t just say what they found – they put the findings into context and offer recommendations for how to proceed. Sometimes, those recommendations are to divest from the program or intervention, target new populations or audiences or change the way the activities are delivered. If those recommendations are acted upon, people’s lives can be changed in ways they may not perceive or experience as positive. To promote transparency and credibility, evaluators need to demonstrate how they came to their conclusions and how their recommendations are relevant to the culture and context of the program or intervention.⁴² This ethical principle is particularly relevant to chronic disease prevention summative evaluations because of the complex nature of the work. By demonstrating how your data led to your conclusions, you help your evaluation’s

audience assess their credibility and make informed decisions about the program or intervention.

Disseminating Evaluation Findings

Evaluation findings and recommendations are most useful for learning and decision-making when they are shared with others. You will have to make strategic decisions about with whom and how you share the evaluation results. Evaluators have an ethical duty to communicate evaluation findings and recommendations to those who participated in the evaluation and to those who commissioned the evaluation. If these communications are not carried out with sensitivity, they may cause offence. Your findings could also be misunderstood if they are presented in a way the target audience can't understand (e.g., too high of a reading level). Evaluators should explain the limitations and scope of their findings to help the audience understand the evaluator's interpretations, conclusions and recommendations.^{42,71}

Quality Standard



Each evaluation plan must identify the potential ethical implications of the evaluator's decisions and describe the mitigation strategies that will be employed.

Collecting and Analyzing the Information: Do Evaluation

Once you have a robust program or intervention that is ready to be evaluated using the methods in your evaluation plan, it's finally time to conduct the evaluation. You'll notice that this section of the Guidebook is the shortest and that is for a good reason: rigorous evaluations have robust evaluation plans. Still, there are important considerations for conducting chronic disease prevention evaluations and they are presented below.

Following the Plan

Your evaluation plan identified the important steps you will follow and the principles that will guide you as you collect and analyze data. If followed, your plan can function as the documentation of your methods. Following the plan increases consistency in data collection and analysis, which supports the “dependability and truthfulness” of your evaluation results.⁴² It also helps address quality standards like reliability, validity and objectivity (for quantitative data)⁴⁶ or trustworthiness (for qualitative data).⁷² For chronic disease prevention evaluation plans that include multiple sites, take several years to implement and/or require multiple people to collect and analyze data, following the plan helps make it easier to manage the project because it can act as a training and operational manual or provide principles on which to make decisions.

Being Adaptable

Sometimes you encounter issues that you didn't anticipate during the evaluation design process. For example, secondary data may not be available or you may be unable to recruit enough participants. In these cases, you can adapt your plan, as long as your adaptations are aligned with the principles and philosophical underpinnings of your evaluation approach. You must document any deviations from the plan, the reason you made them and the potential

consequences (positive and negative) of the changes.⁴² If the program or intervention itself changes, the methods you described in the evaluation plan may not be feasible or appropriate anymore. You need to make sure you know what methods you can adapt and how, so that you are still able to answer your evaluation questions – particularly when evaluating long-term chronic disease prevention outcomes.



Some approaches, like developmental evaluation^{73,74} allow for flexible or emergent methods and rely on principles of action. If you are using a flexible approach, you need to document what you've done and justify your actions.⁴² Multi-year chronic disease prevention evaluations may require adaptations as contexts, resources, stakeholders, information needs and secondary data sources change. In these cases, you need to demonstrate how the deviations from the plan still align with the principles on which the approach is based.

Quality Standard



All modifications to the evaluation plan must be documented and justified. For flexible evaluation approaches, the methods employed and the reasons for choosing those methods must also be documented.

Making Conclusions and Recommendations

Data collection and analysis are not enough to answer your evaluation questions. You need to interpret the findings from your analyses, put them into context, make judgements and offer

suggestions for the future of the program or intervention.⁴⁴ All four components of evaluative thinking are important here:

- You need to think *critically* about what the data is telling you – and what it's *not* telling you.
- *Inferential thinking* is necessary to make evaluative conclusions about the program or intervention based on the evidence found.
- *Creative and practical thinking* help you formulate (ideally in collaboration with your evaluation users) appropriate recommendations based on your conclusions.¹⁰

Interpreting your findings starts with looking at the data and the reason for your evaluation. Let's say data you collected six weeks after a community mobilization intervention started revealed that 20% of the eligible voters you sampled support constructing protected bike lanes in the downtown core. Is that good or bad? The answer: it depends on the evaluation questions. If one of your questions asked about the effectiveness of your intervention at increasing eligible voters' support over time, then you would compare these results to the results from the data collected from the same sample prior to the intervention. If there is a positive and statistically significant increase from pre- to post-intervention, then the results are good. If not, then the results are bad.

If one of your evaluation questions asked whether or not your intervention generated enough support to convince decision makers to construct protected bike lanes in the downtown core, you would interpret your results in a different way. Ideally, you would have identified the required amount of support your intervention needs to generate *before* collecting data. If not, you definitely need to identify the amount of support the intervention needs to generate before you can interpret the results. If your intervention produced more than the required amount of support, you could conclude that the result is "good." On the other hand, if your intervention does not achieve the required amount of support, your results are bad. Without these comparisons, you can't justify any conclusions that your intervention was successful or recommend what changes to make (if any) to the intervention moving forward.

The evaluation matrix you created during the design phase will help you determine what data needs to be analyzed and synthesized to answer each evaluation question. You should also consult previous research and/or evaluation evidence to determine if your evaluation findings are consistent with their findings. If they are inconsistent with other evidence, you should also

use this evidence to figure out why those inconsistencies might exist. Taking all that information together, you can then make conclusions that align with your evaluation's purpose. For chronic disease prevention evaluations, you could find yourself trying to interpret a lot of seemingly ambiguous or disparate findings. Evaluative thinking helps think about what you have learned about each evaluation question separately and what each answer contributes to your understanding of the program or intervention as a whole so that you can make conclusions about it.

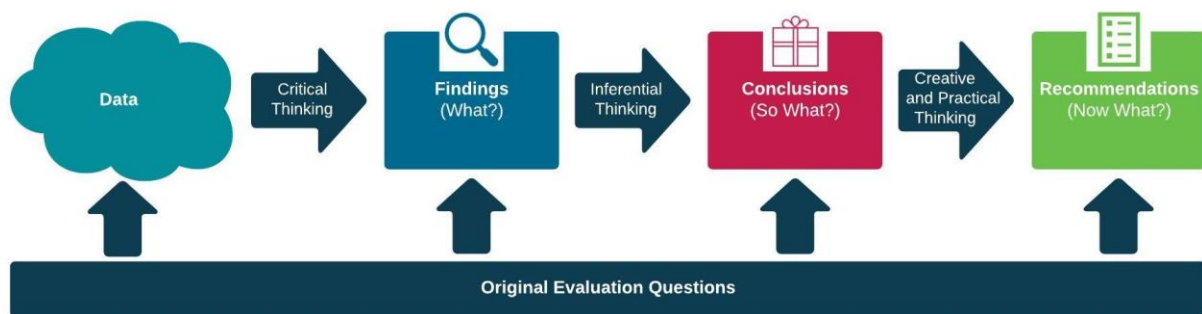
Let's say the purpose of the evaluation of the community mobilization intervention described above was to determine if the intervention should continue next year. The amount of eligible voters who support constructing protected bike lanes in the downtown core might be interpreted as "good," but it doesn't necessarily tell you if intervention is worth continuing. Findings from the data used to answer other evaluation questions may be interpreted as "bad" or "inconclusive" and you may find evidence that community mobilization interventions are only effective at increasing voter support for an issue for a short period of time. Thinking critically about how much each answer to your evaluation questions should be weighted in your conclusion and following the evidence (thinking inferentially)¹⁰ might lead you to the conclusion that, despite the good voter support, the intervention should not continue next year.

Your evaluation approaches and methods limit what you are able to conclude about your program or intervention. For example, you cannot conclude that your program or intervention *caused* a change in your target population or audience if you did not use an experimental approach like randomized controlled trials.⁴¹ The intersectoral, multifaceted and collaborative nature of chronic disease prevention work makes it hard to attribute outcomes to a particular program or intervention, so your conclusions are more likely to be about how your work *contributed* to the outcomes, rather than how they *caused* them. Similarly, the diversity and representativeness of your sample places limits on your ability to conclude that your findings are generalizable or transferable to other groups or contexts.^{46,72}

Recommendations are important for the "learning and decision-making"¹ portions of evaluation. The purpose of the evaluation tells you what your recommendations should focus on.⁴¹ For example, if the purpose of your formative evaluation is to determine how best to communicate with your target audience, making recommendations about communication channels and products is appropriate, but recommendations about re-orienting health services are likely out of scope. Recommendations from chronic disease prevention evaluations can have long-lasting

consequences. Divesting from a program or intervention may impact population health in ways and degrees that may not be seen for several years. Therefore, your recommendations should be feasible; be grounded in the evaluation findings, research evidence and theory; and mitigate against potential negative consequences of acting on them.^{30,42} Because of the collaborative nature of chronic disease prevention work, it might be beneficial to use a participatory process during this stage. This process will ensure your recommendations have incorporated the expertise and perspectives of people who may need to implement the recommendations and help promote agreement on the recommendations and support their implementation.³⁸ Figure 7 depicts the process of moving from findings to conclusions to recommendations. Good recommendations are specific, actionable and feasible. They should be easy enough for evaluation users to implement, but not insignificant enough to be dismissed. Think of recommendations as the catalyst for mobilizing actual use.

Figure 7. Moving from Findings to Conclusions



Quality Standard



All conclusions and recommendations must be grounded in the evaluation findings and the context in which the program and intervention is delivered. Conclusions must align with the philosophical underpinnings and limitations of the approach(es) and methods you employed. Recommendations should be related to the purpose of the evaluation.

Spreading the Word: Use Evaluation

Completing an evaluation marks the beginning of a critical next step – dissemination of your results to evaluation users to ensure your hard work is recognized and utilized in practice. Evaluation is not just about studying the program or intervention and answering questions about it – it’s also about using the findings and conclusions to learn and make decisions. This concept is embedded in the definition of evaluation, signifying its importance. However, getting people and organizations to use evaluation findings to improve programs and interventions can be just as hard as doing one. This section highlights how you should think about sharing your chronic disease prevention evaluation findings, conclusions and recommendations in ways that promote their use.

Engaging Evaluation Users

Evaluation users are the people who learn from and act on evaluation findings. Including stakeholders throughout the evaluation process improves evaluation use.⁷⁵ Ideally, you have engaged most of your potential evaluation users throughout the designing and doing phases of your evaluation. However, your evaluation may have produced findings that you hadn’t anticipated, and you now need to engage new people or organizations. For example, if your evaluation revealed that an intervention previously tested in only one target population is effective for another, other health units and researchers could use your evaluation results. It’s never too late to involve people and involving potential users in this communication stage also improves evaluation use.⁷⁵ Factors affecting evaluation use are described in Table 6. You should consider the impact of these factors on your specific evaluation users as you develop your key messages, choose communication channels and design communication products.

No matter when they are first engaged, it’s important that you take the time to understand the evaluation users’ information needs and communication preferences^{30,75} to ensure the right information is provided to the right audience at the right time and in the most effective ways. Chronic disease prevention evaluations include a wide range of stakeholders and, therefore, a wide range of evaluation users whose characteristics, needs and preferences could vary widely. It’s important to understand “who needs what” to move your evaluation’s recommendations

Table 6. Factors Affecting Evaluation Use⁷⁶

Category	Description
User factors	How the person thinks and feels about evaluation in general and your specific evaluation, as well as the degree of commitment they have to using the evaluation’s findings.
Evaluator factors	The degree to which the person or people responsible for designing and conducting the evaluation: is/are committed to promoting its use; is/are seen as credible by potential users; built strong relationships with potential users; and engaged potential users throughout the evaluation.
Evaluation factors	The characteristics of the evaluation and the communication about it, including: the perceived credibility and appropriateness of its methods to the users; the degree to which users’ learning and decision-making needs were met; the timeliness of communication; the degree to which the users understand the communication; and the degree to which the evaluation findings align with other sources of knowledge about the program or intervention.
Organizational and social factors	The context within which the program or intervention is being delivered, including: autonomy; inter-agency agreements; how long the program or intervention has been running; and the degree of alignment between the evaluation findings and other information sources about the program or intervention.

forward effectively. Even though the objectives you have for two users or groups may be the same, you may need to use different channels to reach them and different messages to get their attention.⁷⁷ For example, one of your recommendations may be to increase the reach of your intervention by expanding the number of recreation subsidies to additional groups of people. In this case, you may want both municipalities and private companies to provide and/or fund those subsidies. Although you can reach municipal decision-makers through presentations at committee meetings and council delegations, you will need different strategies, such as

business cases and one-on-one pitch meetings, to reach managers and administrators of private companies.

Knowledge Translation Plans

A **knowledge translation (KT) plan** (also called a knowledge exchange plan or knowledge mobilization plan) acts as a roadmap for how you will make your target audiences pay attention to and act on your evaluation findings and recommendations. Preparing a KT plan in advance of the completion of your evaluation ensures timely and intentional dissemination of your findings. Like an evaluation matrix, a KT plan matches your target audiences and communication objectives with the messages, channels and products you need to employ to get them to use your evaluation; you should also include roles, responsibilities and timelines in your KT plan to ensure the work is completed.⁷⁸ As with all public health efforts, you need to attend to cultural needs and health equity concerns when creating KT plans.

To facilitate use of your findings, think about your KT plan like a program and its components as interventions. Instead of a population health change, your KT plan's goal is to have the people



you want to use your evaluation findings use them in the ways you want them to.^{79(p.1)} Those intended uses should relate back to your evaluation purpose and conclusions. Your KT interventions should draw on evidence you gather from engaging your potential evaluation users, research and your professional experience. If the target audiences within each of your interventions require different

channels, messages and products, make sure to note it in the plan. KT plans for chronic disease prevention evaluations can be complex and labour intensive because of the number and variety of potential evaluation users. To ensure your evaluation is used in the ways you intend it to be used, you need to invest time, effort and resources in developing and implementing high-quality KT plans.

Quality Standard



All evaluation findings should be shared with relevant evaluation users in ways that are evidence-based and that promote the use of the findings.

Conclusion

Hopefully this Guidebook has helped you identify strategies for understanding how your programs and interventions work, who they work for, and how to make them work better. If you take one thing away from this Guidebook, let it be this: rigorous evaluations start from the first moment you think about a chronic disease prevention program or intervention – before it's even close to being implemented. If you start thinking evaluatively from the beginning, your programs and interventions are more likely to be evaluable, your evaluation purpose and questions are easier to define, the methods you should use are clearer, and the results are more easily interpreted and used.

As you continue to plan, implement and evaluate your chronic disease prevention programs and interventions, we hope you return to this Guidebook and the other CDP-EvaLL products to support your work. You can find all the CDP-EvaLL products here: www.ophen.ca/cdp-evall.

Glossary

Activity is a specific application of health promotion strategies (e.g., education, supplementation, community mobilization and environmental redesign) carried out as part of an intervention

Assent is the agreement of a potential participant who is unable to consent to participating in an evaluation⁷⁰

Data analysis protocol is a set of directions that describe how you will treat the data once they are collected

Data collection protocol is a set of directions that describe how you will obtain the data needed for your evaluation

Dissent is the refusal of a potential participant who is unable to consent to participating in an evaluation⁷⁰

Effect size is the magnitude of the change produced by your program or intervention

Evaluability assessment is an ongoing, iterative process that can be done informally or formally to examine whether or not your program or intervention can feasibly and usefully be evaluated

Evaluation “is the systematic assessment of the design, implementation or results of an initiative for the purposes of learning or decision-making”¹

Evaluation approach is “an integrated package of options (methods or processes)”⁴⁵ that help you achieve your evaluation purpose and answer your evaluation questions

Evaluation matrix is a tool to document how you will answer your evaluation questions

Evaluation purpose is the overarching reason you decided to evaluate your program or intervention⁴¹

Evaluation question is the thing you need to answer to achieve your evaluation purpose; it is *not* the questions you ask of people, organizations or documents to collect data³⁰

Evaluation user is a person or organization who learns from and acts on evaluation findings

Evaluative thinking is “critical thinking applied in the context of evaluation, motivated by an attitude of inquisitiveness and a belief in the value of evidence, that involves identifying assumptions, posing thoughtful questions, pursuing deeper understanding through reflection and perspective taking, and informing decisions in preparation for action”⁹

Feasibility is a judgement about the ability of your organization to do the evaluation in the way that you are proposing

Formative evaluation is the process of assessing how to design or re-design a program or intervention²

Goal is the high-level change (or long-term outcome) that the program will achieve⁶ through the execution of its interventions

Indicator is “a specific, observable and measurable accomplishment or change that shows the progress made toward achieving a specific output or outcome”²⁹

Intervention is a group of planned activities linked together by theory⁵ and supported by evidence to produce individual- and community-level changes in a target population

Intervention theory is a description of how your particular set of activities will lead to the intended or actual outcomes needed to achieve your intervention objective(s)

Knowledge translation (KT) plan is a set of directions for how you will disseminate the evaluation findings and recommendations to promote their use

Logic model is “a picture of how your organization does its work – the theory and assumptions underlying the program”^{19(p.III)} or intervention

Measure is a quantitative and qualitative piece of information you are collecting to learn about your program or intervention

Objective is a specific population or public health change among target populations that will lead to the achievement of the program’s goal⁵

Outcomes are the incremental changes in attitudes, knowledge, skills, behaviours, environments and policies⁸ that lead to the achievement of your objectives

Outputs are tangible things produced by your activities⁷

Plausibility is a judgement about the likelihood that your evaluation questions can be answered

Primary data source is a set of data collected for your specific evaluation

Priority population is a group of people “experiencing and/or at increased risk of poor health outcomes due to the burden of disease and/or factors for disease; the determinants of health, including the social determinants of health; and/or the intersection between them”¹¹

Process evaluation is an assessment of how a program or intervention is implemented³

Program is a group of interventions linked together through theory and supported by evidence to produce a population-level change in a population health or public health issue

Program theory is an explanation of how your intervention objectives will achieve your goal^{15,16}

Proportionate universalism is an approach to resource allocation whereby everyone receives some degree of intervention but the degree of intervention is dependent upon their need or disadvantage²⁸

Sample is the subset of your target population or target audience you will collect data from

Secondary data source is an existing dataset collected for a different purpose than your evaluation

Summative evaluation is the process of assessing whether a program or intervention achieved its intended results and the initiative’s value⁴

Target audience is the group of people you are trying to engage in your intervention activities²⁷

Target population is the group of people in which you are trying to produce a population or public health outcome²⁶

Theoretical saturation is the point at which your data collection returns no new information, and you can define and describe the properties variations of the phenomenon you are studying, as well as the relationships it has with other phenomena⁶²

Theory of change is a causal framework that articulates how and why a complex change process will occur over time in a particular context and/or a process that brings together key stakeholders and engages them in an outcomes-focused, rigorous, and participatory process to plan the design, implementation, and evaluation of a complex change initiative^{17,21,22}

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