

# Health Behaviour Change Theories: Considerations for Planning Behaviour Change Interventions

*A Background Document*

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## 1.0 Introduction

Northern Health is committed to providing quality care for Northerners. As a part of this commitment, we will use appropriate and effective methods to encourage healthy communities in which people can live, work, learn, and play. This paper provides a basic review of evidence-based health behaviour change theories and their importance for behaviour change. A series of theories and models are presented and examples are given on how they can be combined for greater effect.

### 1.1 The Role of Theory in Health Behaviour

Using theory to guide program planning and evaluation supports evidence-based practice. In this process practitioners are assured that they are moving from intuition to a systematic way of understanding behaviour change. Variables and models are key components to theory-informed practice. Brief working definitions of these key terms are provided below.

**Theory** - an organized set of interrelated ideas, definitions, and propositions that allow for a systematic way of understanding situations. Theories explain relationships between variables. Purposefully abstract, theories apply to a wide variety of situations.

**Variables** - component (construct) of theories that are operationalized or defined. Variables allow measurement of a given situation (e.g., for evaluation).

**Model** - the application of theories to a specific situation or problem. Models identify a hypothetical set of relations. In the case of behaviour change, the model identifies those relations that can influence a specific behaviour.

When applying theories it is important to note that multiple theories can inform model development. Theories should be seen as a guide for designing models for interventions and evaluating outcomes.

Successful programs are grounded in theory.

Theories in health interventions allow for a clear understanding of the targeted health behaviour (or set of behaviours) and the environmental context in which the behaviour takes place. By using theories, factors that are causal (or otherwise relevant) to the target behaviour can be identified.

## 1.2 Factors that Influence Behaviour Change

Various factors can influence an individual's behaviour. Included in these factors are social (e.g., social support and influence) and psychological (e.g., autonomy) variables, which have been shown to have a strong influence on behaviours,<sup>1</sup> as discussed in the following sections.

### 1.2.1 Social Support and Social Influence

Social support (Box 1) is important for behaviour change because it is a buffer to stressful situations. When someone experiences stress, the ability to talk about it with others can decrease the stressful reaction.<sup>2</sup> With respect to health behaviour change, social support from different types of people can support different aspects of behaviour change. For example, a 2011 study demonstrated that social support from family and friends was important in the early stages of beginning a physical activity program and that social support from physical trainers was effective in physical activity maintenance.<sup>3</sup> Research demonstrates that interventions using social influences (i.e., social pressure, social encouragement, and social support) have higher rates in changing behaviours than other methods (Table 1)<sup>4</sup>.

#### Box 1: Defining Social Support

Social support is the perception that others are responsive and receptive to your needs.

Given that social support and social influence impact behaviour change, interventions that reach groups of people may have a greater chance of success. In group settings, individuals are influenced by the perceptions and behaviours of those around them (Box 2). Social influence can also alter individual beliefs, such as the belief that certain behaviours can lead to a specific outcome, or the belief that one can successfully perform those behaviours. Of note, the latter belief is more influential in behaviour choice.<sup>5</sup>

#### Box 2: A Group's Influence

People are highly motivated to be accepted and liked by social groups. Three factors influence conformity: strength, proximity, and number.<sup>6</sup>

Each is defined below.

- Strength – the group has to be important to the individual.
- Proximity – the group has to be close to them (space and time).
- Number – group size matters; a bigger group will have greater influence than a smaller group.

Table 1 presents results from a meta-analysis of behaviour interventions. This demonstrates that there were differences found between *intention to change* and *actual behaviour change*. The row highlighted in green in Table 1 shows that methods using social influences had the greatest effect on behaviour change and show the closest relationship between the *intention to change* and *behaviour change*.<sup>7,8</sup> This suggests that interventions including social support and social influence will increase the likelihood of short- and long-term success. In contrast, interventions that were based on monitoring, homework, and personal experiments showed less effectiveness in both intention to change and actual behaviour change than the other methods (highlighted in red in Table 1).

Of note in the method of presentation, this specific study found no significant difference in effective behaviour change between presentation methods. As seen in Table 1, one-on-one interventions ( $d = 0.38$ ) were no more effective than interventions delivered in a group ( $d = 0.31$ ) and interventions delivered in a classroom ( $d = 0.28$ ). This is encouraging for population health interventions. However, it is important to note that this finding should not undermine the value of interventions tailored to meet the specific characteristics of the population.

**Table 1: Behaviour Change Methods and Outcomes (Intended and Actual)**

Behaviour Change Methods	Intention ( $d^1$ )	Behaviour Change ( $d^1$ )
Social influences (encouragement, pressure, support)	0.64	0.54
Information regarding behaviour outcome	0.60	0.32
Goal or target specified	0.64	0.31
Persuasive communication	0.38	0.29
Modeling/demonstration by others	0.41	0.28
Environmental changes	0.77	0.27
Increasing skills	0.38	0.27
Risk awareness material	0.56	0.25
Planning, implementation	0.68	0.20
Monitoring, self-monitoring	0.36	0.13
Homework	0.23	0.11
Personal experiments	0.25	0.06
<b>Method of Presentation</b>		
One-on-One	0.66	0.38
Group	0.42	0.31
Classroom (instructor-led)	0.48	0.28

Source: Adapted from Webb and Sheeran, 2006.

### 1.2.2 Autonomy and Motivation

Self-determination theory (SDT) is also an important component of behaviour change.<sup>9</sup> SDT presents the idea that autonomy (Box 3) is impacted by both intrinsic and extrinsic motivation. Intrinsic motivation is motivation that comes from within the individual (e.g., enjoyment, satisfaction, or interest). Extrinsic motivation is motivation that is from outside of the individual (e.g., money, reward/award, or a threat).

<sup>1</sup>  $d$  refers to the effect size of the intervention when comparing groups (e.g., intervention vs. no intervention); where scores up to 0.20 mean the intervention had a small effect on intention to change or behaviour change, scores around 0.50 indicate a moderate effect, and scores of 0.80 or greater indicate a large effect.

### Box 3: Autonomy

Autonomy is acting with free will and willingness. Autonomy is a basic psychological need, regardless of gender, age, socioeconomic status, or collectivist/individualistic culture. People are more likely to have enduring behaviour change when this need is satisfied.<sup>10</sup>

Extrinsic motivation can become internalized when someone has greater autonomy (choice).<sup>11</sup> For example, viewing seatbelt or helmet use for injury prevention as a valuable component to living longer with a greater quality of life (autonomy) rather than as a way to avoid punishment (external motivation; e.g., being ticketed or fined). For health behaviour change to be effective, it is important to support autonomy in behaviour change. Some ways to ensure that interventions are supportive of autonomy include:<sup>12</sup>

1. Respect the individual's frame of reference (their implicit or expressed wishes).
2. Find ways to encourage behaviours that they can endorse and apply.
3. Provide relevant information on health risks and related behaviours.
4. Support the individual to make their own informed decisions about their behaviours.
5. Respect their ability to make decisions and their desire to be healthy.

When people are autonomously motivated, they are wholeheartedly engaged, persistent, and efficacious.<sup>13, 14</sup>

### Box 4: Building the Northern Case: Examples of Evidence in Action in Northern BC

A recent study (2010) in Prince George, BC interviewed individuals living with complex mental conditions to gain a better understanding of what a healthy lifestyle meant to this population.<sup>15</sup> The research process ensured a supportive social tone, which gave space for individuals to collectively explore a healthy lifestyle. Participants defined a healthy lifestyle as being more than healthy eating and physical activity and described unique barriers (e.g., social and structural stigma) impacting their ability to stay motivated. Within the research process, participants began to problem solve their own health solutions that were both realistic and feasible (e.g., collective purchases of Good Food boxes, peer support physical activity program).

This research highlights how social support, motivation, and autonomy all converge to stimulate the collective power, which can then inform the development of realistic and sustainable behaviour change goals. This ongoing research project will continue to empower this community through collaborative development and implementation of effective health initiatives focusing on the strengths and resources within this community.

This research is not alone (even within northern BC) in providing additional support for the need to work in collaboration with each target community in planning and implementing appropriate and effective programs. For example, seniors' needs studies in the Northeast HSDA (Peace River Regional District), Northwest HSDA (Terrace and area), and Northern Interior HSDA (Mackenzie) collect and make relevant community knowledge for planning place-based, appropriate health interventions.<sup>16</sup>

## 2.0 Connecting Theory and Practice

Theory informs and guides intervention development; yet, it remains a challenge to determine what individual theory (or theories) is best suited for a target population. Therefore, it is important to develop a working knowledge of a range of theories and their potential application(s) to support theory-informed practice. With this knowledge a health care practitioner can confidently develop and evaluate an intervention. Drawing from more than one theory is often more effective for planning a comprehensive intervention. This provides the ability to target multiple levels of health behaviour and allows the practitioner to consider individual and environmental influences.<sup>17, 18, 19</sup>

Comprehensive interventions draw from multiple theories.

It is important that the approach is appropriate and flexible, regardless of which theory or theories are used to inform intervention planning. An intervention is most appropriate when it is planned for a specific community or population and is designed to meet their needs. Flexible interventions are suited to respond to the needs of the target population either through evaluation and adaptation or recognizing changing needs. As such, key considerations in planning a community health intervention, include:

- Getting community involvement in defining their needs, beliefs, barriers, resources, and potential solutions.
- Selecting an appropriate theoretical framework.
- Designing an intervention to suit the target population.
- Evaluating the intervention (before, during, and after implementation).

The following sections discuss the first two key considerations, knowing your population and selecting appropriate theoretical framework(s).

### 2.1 Knowing your Population

It is important to assess the health situation in the context of your target population.<sup>2</sup> Interventions need to incorporate the unique strengths and challenges of the target community to effectively promote behaviour change. One must consider the target population, the environmental context, the health behaviours that support (adaptive behaviours) or do not support (maladaptive behaviours) a healthy lifestyle, and how these variables interact. Understanding the population's characteristics allows interventions to be planned and developed that are more attainable and realistic for the intended audience.

<sup>2</sup> A quick and easy starting point for Northern Health area statistics is at the Healthy Community's webpage: <http://www.northernhealth.ca/YourHealth/HealthyLivingCommunities/HealthyCommunitiesToolkit.aspx>

While data can give us population characteristics, it cannot tell us the whole story. Qualitative characteristics of the community, such as how they view or perceive health and health behaviours, are also important. Qualitative information can be unique to different groups. It is important to understand and include how the target population defines health issues as community-specific knowledge can lead to community-specific solutions (Box 4). This information will support developing new or adapting previous interventions that are realistic and effective for the given population. Obtaining community involvement throughout planning and implementation is often overlooked in health programs.



Equally important is that it cannot be assumed that the findings in one population can be directly transferred to another population and have the same level of effectiveness. Each population will have unique circumstances that will be barriers and promoters of healthy lifestyles (e.g., living in a rural area or an urban community, being male or female, and how such factors interact with one another) that need to be explored and addressed.<sup>20</sup>

## 2.2 Behaviour Change Theories

Research demonstrates that successful interventions draw on several theories and strategies in the planning and implementation phases. Organized into two categories (explanatory theories and change theories), this paper presents examples of some of the theories that are commonly and successfully used in behaviour change interventions.

**Explanatory Theories** - as the name implies, explanatory theories offer an explanation for why certain behaviours exist. Explanatory theories allow planners to determine what factors need to be considered to address a given problem.

**Change Theories** - change theories are used to guide the development of intervention programs. Change theories help to identify what factors need to be addressed and in what order for a program or intervention to be effective.

The Canadian Best Practices Portal provides empirically supported health interventions for various behaviours across a variety of communities (<http://cbpp-pcpe.phac-aspc.gc.ca>).

Table 2 lists some of the most commonly used health behaviour theories and their demonstrated effectiveness in either explaining individual behaviours or changing behaviours. This table provides a snapshot of each theory’s characteristics and can be used as an aid to understanding how various theories have been used in research. It is important to be aware of a range of theories to inform your practice. However, due to variability in how theories can be used, the intervention designs, methodologies, and target populations must be considered in conjunction with understanding what theory informs practice.<sup>21</sup>

**Table 2: Common Health Behaviour Theories and Demonstrated Effectiveness for Specific Behaviours**

Theory	Notable Characteristics	Has Been Used to Understand or Influence The Following Behaviours	Detailed Information Describing the Theory can be Found in Appendix:
<b>Explanatory Theories</b>			
Health Belief Model	Applied most often for asymptomatic, prevention-based health concerns where beliefs are the most important factor for health behaviours. <sup>22</sup>	<ul style="list-style-type: none"> <li>Physical activity</li> <li>HIV prevention</li> <li>Medication adherence</li> <li>Injury prevention</li> <li>Cancer screening<sup>23, 24</sup></li> </ul>	A
Theory of Planned Behaviour	Useful to identify beliefs relevant to individuals and groups; allows understanding reasons/motivations for behaviour. Key constructs applicable across cultures. <sup>25</sup>	<ul style="list-style-type: none"> <li>Physical activity</li> <li>Substance use</li> <li>Tobacco use</li> <li>HIV/STD prevention</li> <li>Mammography screening</li> <li>Following clinician recommendations</li> <li>Oral hygiene<sup>26, 27</sup></li> </ul>	B
Social Cognitive Theory	Key constructs for changing behaviour: goal setting, self-monitoring, and self-efficacy are useful for behaviour change interventions. Bidirectional influence (reciprocal determinism) between the individual and the environment is a core construct for integrating environmental changes in behaviour change interventions. <sup>28</sup>	<ul style="list-style-type: none"> <li>Eating habits</li> <li>HIV risk</li> <li>Cancer screening</li> <li>Contraception</li> <li>Physical activity</li> <li>Substance use<sup>29, 30, 31</sup></li> </ul>	C
<b>Change Theories</b>			
Positive Deviance Approach	Behaviour change should be affordable, sustainable, and culturally appropriate as it is already practiced by members in the community. <sup>32</sup>	<ul style="list-style-type: none"> <li>Child nutrition in disadvantaged communities</li> <li>Reducing spread of clinical infections in hospitals</li> <li>HIV prevention<sup>33, 34</sup></li> </ul>	D
Transtheoretical Model/Stages of Change	The most common application is to match appropriate messages to individuals across stages. <sup>35</sup>	<ul style="list-style-type: none"> <li>Tobacco use (extensive)</li> <li>Medication adherence</li> <li>Bullying prevention</li> <li>Substance use</li> <li>Domestic violence</li> <li>Cancer Screening</li> <li>Combined health behaviours<sup>36, 37</sup></li> </ul>	E

Theory	Notable Characteristics	Has Been Used to Understand or Influence The Following Behaviours	Detailed Information Describing the Theory can be Found in Appendix:
RE-AIM	Useful in planning and evaluating interventions to ensure they meet RE-AIM objectives (reach, efficacy, adoption, implementation, and maintenance) and improve external validity and sustainability. <sup>38</sup>	<ul style="list-style-type: none"> <li>Typically used in program evaluation</li> <li>Physical activity</li> <li>Nutrition education</li> <li>Obesity prevention</li> <li>HIV prevention</li> <li>Tobacco use<sup>39</sup></li> </ul>	F
Diffusion of Innovations	Designed to assist practitioners in bridging the knowledge to action gap. <sup>40</sup>	<ul style="list-style-type: none"> <li>Sun screen promotion<sup>41</sup></li> </ul>	G
Precede-Proceed Model	Offers a planning process that prioritizes targets by selecting factors most important and most changeable. Objectives are revisited throughout the process (e.g., who does what by when? Or, what conditions or circumstances will be changed according to what timeline?) <sup>42</sup>	<ul style="list-style-type: none"> <li>Injury prevention</li> <li>Improving diabetic outcomes</li> <li>Mammography promotion</li> <li>Community-level cancer prevention<sup>43,44</sup></li> </ul>	H
Barrier Analysis	Designed to help look for key messages to be used in program planning as well as to find out what is or is not working with the program. <sup>45</sup>	<ul style="list-style-type: none"> <li>Many different applications as this is an integrated model that incorporates other change theories<sup>46</sup></li> </ul>	I
Community Level Models	Useful information for promoting community level behaviour change.		J

### 2.3 Combining Theories

When used together, explanatory theories can explain the “why” of a situation and the change theories can support “how” the problem can be changed. Theories listed in Table 2 can be (and often are) used in combination with each other to maximize the benefits of the intervention and address the community’s needs. Two examples are provided below to demonstrate how different theories can be combined to provide a more complete picture of behaviour change.

#### Example #1 - Figure 1

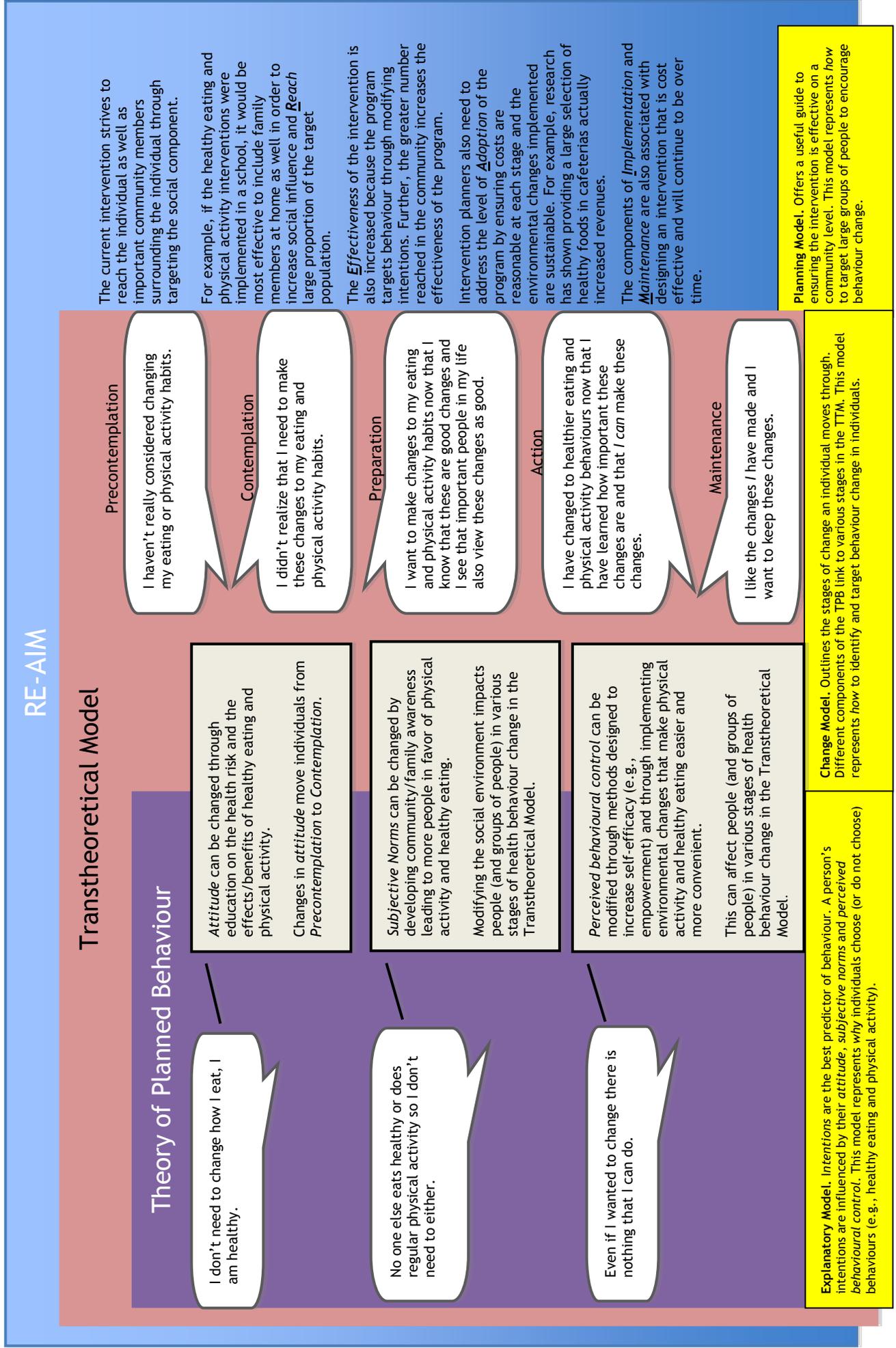
**Sample population:** This population has a high proportion of individuals with self-perceived very good/excellent health.<sup>47</sup> However, data suggest that many people in this region consume less than five servings of fruit and vegetables per day and there are high rates of obesity and overweight individuals.<sup>48</sup>

**Health Promotion Assumption:** Increasing healthy eating and physical activity would most likely lead to improved health of this population.

**Proposed Course of Action for Community Involvement:** Community presentations, focus groups, and individual interviews will provide insight into the attitudes, needs, barriers, strengths, and resources of the community members that will be vital in designing community appropriate interventions, while also providing education to community members. With community input and support interventions can then be developed to look at changing healthy eating and physical activity behaviours in the community.

**Theory Selection:** Research demonstrates that interventions based on the Theory of Planned Behaviour (TPB), the Transtheoretical Model (TTM), and RE-AIM would be useful in this first example (Figure 1). TPB allows for exploration of the why individuals choose to or not to adopt behaviours. TTM supports planning interventions to meet the individuals where they are at in terms of behaviour change. As is highlighted in Figure 1, certain aspects of TPB are related to aspects of TTM. RE-AIM is a change theory that can be used as a planning model and is appropriate for both program planning and evaluations. RE-AIM allows for assessing whether the intervention will be (or is) appropriate at the community level. By combining these three theories we can create a comprehensive intervention that is more effective in promoting behaviour change.

Figure 1: Combining Theory of Planned Behaviour, Transtheoretical Model, and RE-AIM



## Example #2 - Figure 2

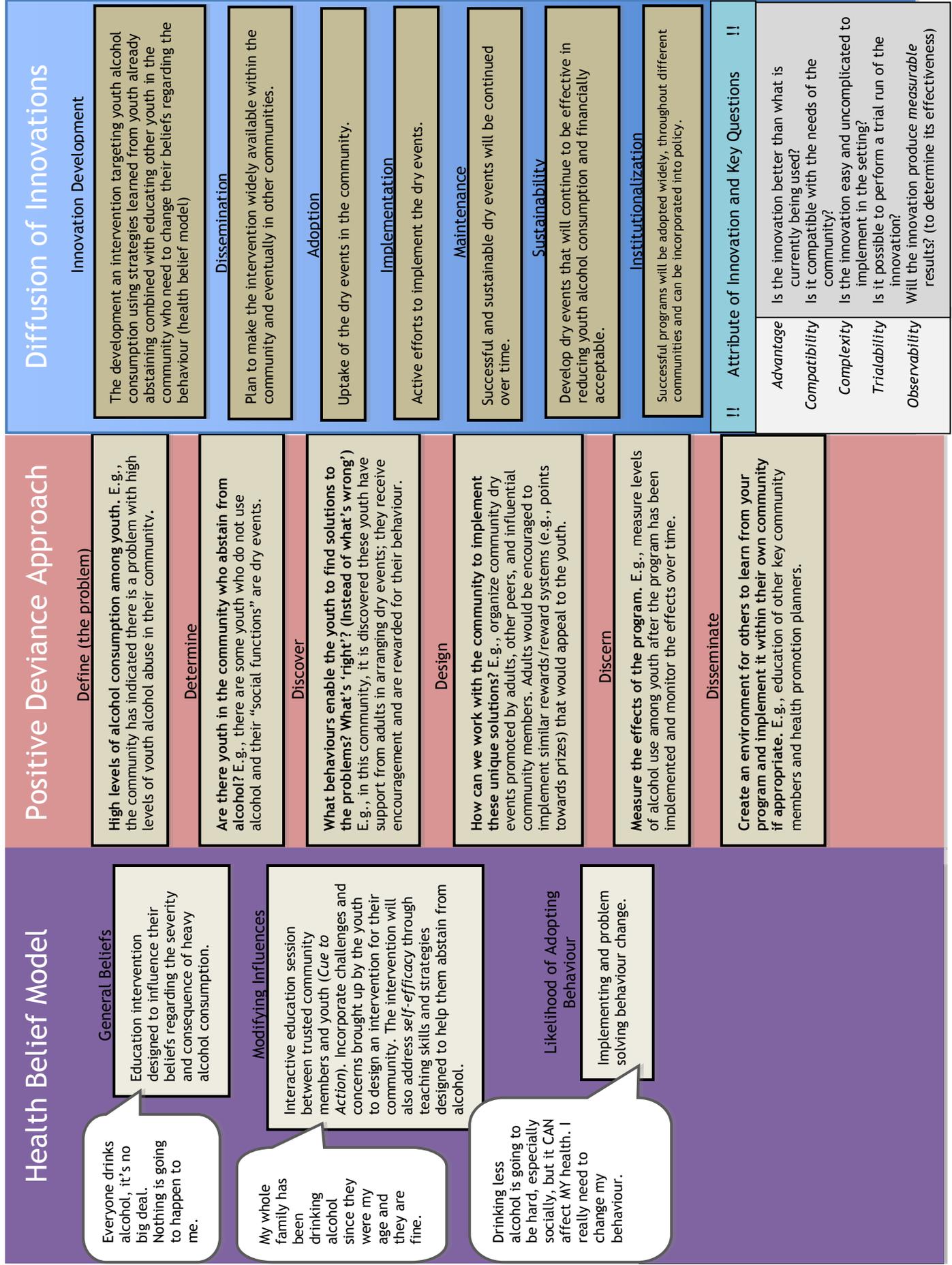
**Sample population:** This population has high alcohol consumption rates.<sup>49</sup> Heavy alcohol consumption is a significant threat to health and well-being for youth due to various negative physical (e.g., injury, alcohol-related health risks, and death), social (e.g., relationship problems), and psychological (e.g., depression) outcomes related to alcohol consumption. In this case the target community for behaviour change would be youth and their families from specific cities, towns, or villages (or other appropriate and specific sub-groupings) within the region.

**Health Promotion Assumption:** Working with the youth and their community to explore, develop, and implement ways to decrease alcohol consumption would most likely help improve the physical and psychological health of youth and increase life expectancy.

**Proposed Course of Action for Community Involvement:** Consult members of the community in order to learn about the community's attitudes, needs, strengths, and barriers with respect to problematic substance use among youth. With community input and support interventions can be developed.

**Theory Selection:** Using the strategy of encouraging changes in beliefs and behaviours, concepts in the Health Belief Model (HBM), the Positive Deviance Approach (PDA), and the Diffusion of Innovations (DOI) model can be combined. HBM helps to find out why an individual is or is not adopting health behaviour in terms of perceived threat. PDA looks at individuals within a community that are successfully using healthy behaviours and how their behaviours can be transferred to other community members. DOI is used to assist in the sharing of ideas throughout the process of the intervention for the purposes of greater collaborative development and adoption of the ideas.

Figure 2: Combining the Health Belief Model, Positive Deviance Approach, and Diffusion of Innovations.



## 2.4 Selecting Theories

Each theory has unique strengths or foci (e.g., beliefs, social influence, etc.). The theory may lend itself to be used in some areas more than others, but to help you select and feel confident about your choice of theories, there are a series of questions you can ask yourself. These questions will help you to pre-plan an intervention regardless of the theory you choose. It is best to be as specific and detailed when answering the following:

In order to maximize results, it is important to find the best match for the:

- target community/group (e.g., their beliefs, resources, barriers, etc.)
- target behaviours [e.g., behaviour(s) to be changed and the ideal behaviour(s)]
- theoretical framework (e.g., individual theory or combination of two or more theories)

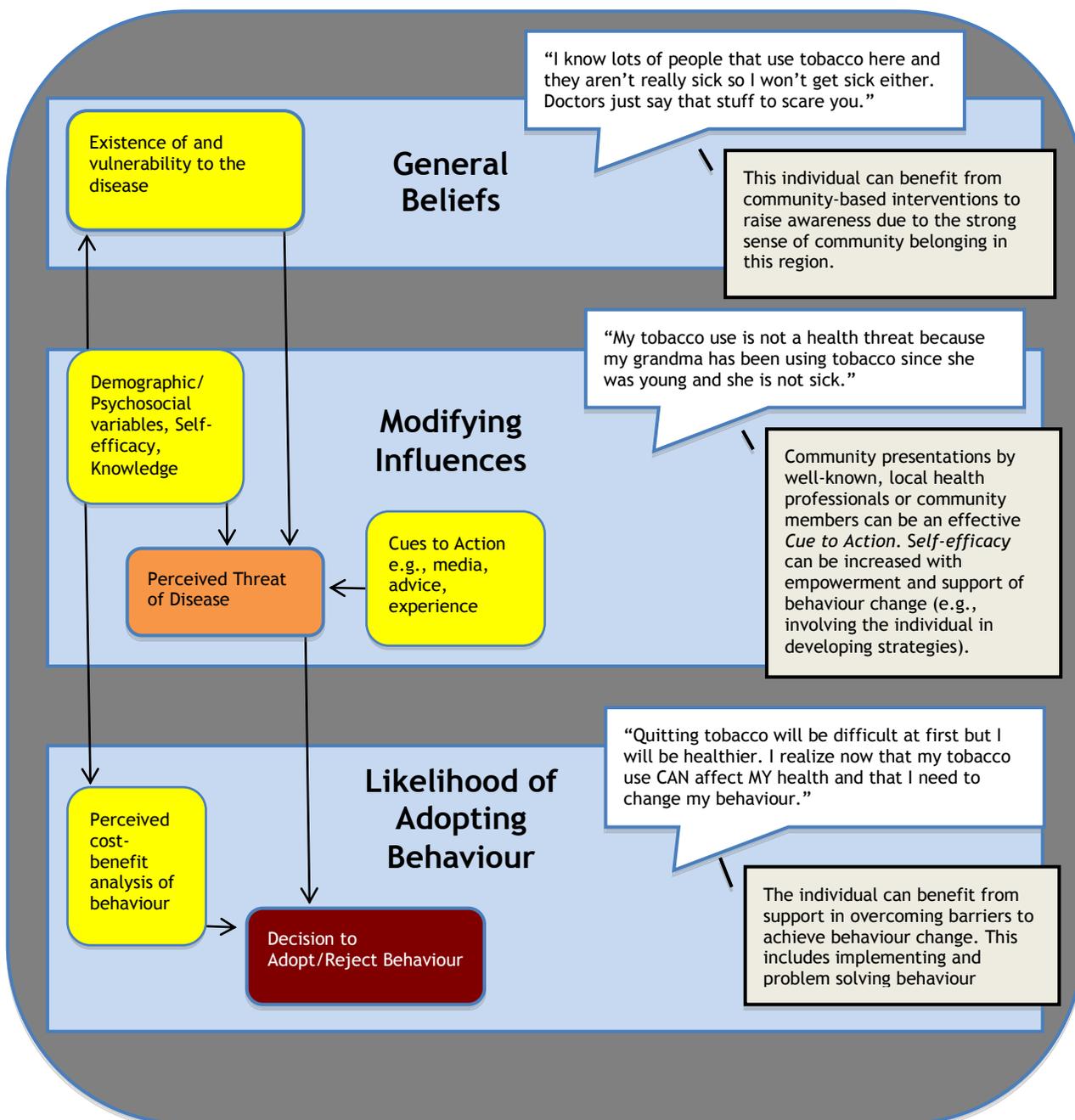
1. **What is the community's (including target population's) perspective on their health behaviour? How do they view this health concern?**
  - For example, talk to individuals and/or groups from the community to find out their perspectives on the matter, what works for them, what doesn't work for them, what are their resources, who are the people that influence their decisions (family, friends, community leaders), etc.
2. **What is the behaviour the community (and target population) would like to change?**
3. **What is the outcome/goal the community is hoping for?**
  - For example, describe the specifics (qualitative and quantitative) of their goal.
4. **Who is the intended target population of the intervention?**
  - For example, specify (or provide ranges) of location, gender, age, and other relevant characteristics of the target population that will be included in the intervention.
5. **What does the ideal behaviour look like (relative to your target population)?**
  - For example, describe the specifics (quality and quantity) of the ideal/goal health behaviour as identified with the target population, include measurable details. Relate to regional, national, international health recommendations, if available.
6. **How do you plan on measuring the change in behaviour?**
  - For example, repeatable questionnaires with specific, measurable questions.
7. **How can you use the information from questions above to create an effective theory-based intervention? What theoretical framework(s) will be your best fit? One theory? Combination of two or more theories? What does the evidence suggest might work best, or has worked in similar situations in the past?**
8. **How and when will you evaluate your program? What is your timeline?**
9. **How will you share the findings of your program? How will others use the program?**
  - For example, describe how you will provide the specific information about the program design and target population used in your intervention thus making it easier for others to adapt the program to suit their unique needs.

### 3.0 Conclusion

Behaviour change theories inform the development of effective health promotion interventions. By understanding these theories and how they can be applied to practice is an important step in supporting a population health approach. This paper provides a basic overview of some behaviour change theories and how they can be combined and applied for specific interventions or programs. This review will support Northern Health to strategically use behaviour change theories to inform the development and implementation of health interventions to support the population health approach. Theories guide us to know that we are ensuring best practices and supporting quality improvement.

## Appendix A: Health Belief Model

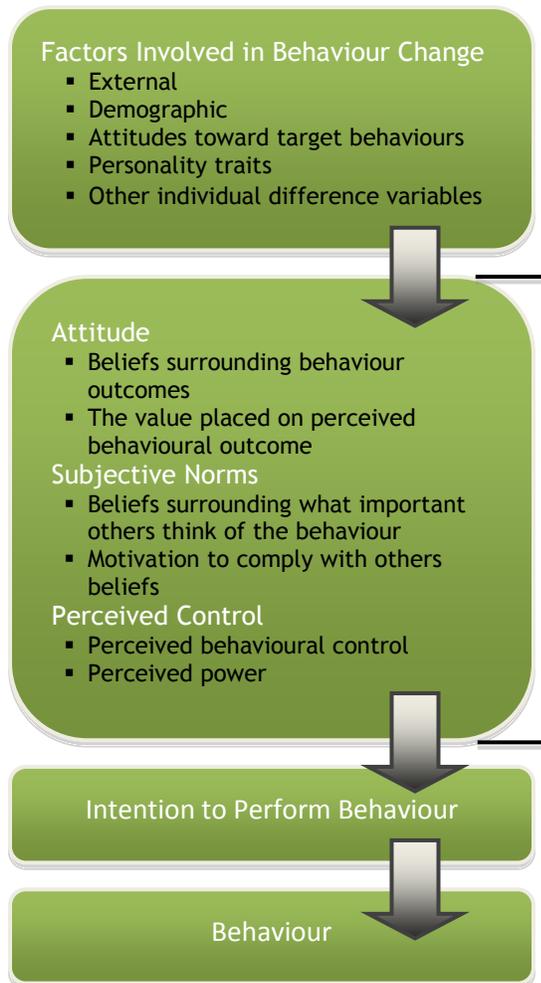
According to the Health Belief Model, the probability a person will adopt a recommended health behaviour depends on several beliefs. Before behaviour change is considered, the person must believe that a health threat exists and they are vulnerable to the threat. Additionally, the consequences of the health threat must be serious enough for the person to consider taking action for prevention. Finally, the perceived benefits of the protective health behaviour must outweigh the perceived barriers and costs of the behaviour. It is important to note these beliefs do not exist in isolation, as there are other factors that influence behaviour change. Specifically, self-efficacy plays an important role in influencing whether a person will adopt a new behaviour or not. If the person does not believe they can perform the recommended behaviour it is unlikely to be tried even if the appropriate beliefs are held towards the behaviour.<sup>50</sup> The Health Belief Model also includes “cues to action” or events that motivate a person to attempt behaviour change. A cue to action can occur within the individual, such as the experience of pain or external from the individual such as exposure to a media campaign, or discovering a family member or friend has an illness. The Health Belief Model has demonstrated effectiveness when used with interventions designed to modify health risk behaviours such as participation in screening, physical activity and medication adherence.<sup>51</sup>



## Appendix B: Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) has also demonstrated usefulness in predicting and explaining health behaviour. The TPB proposes that intentions are the central factor in determining behaviour.<sup>52</sup> Recognizing how intentions are formed is important for understanding behaviour. According to the TPB, a person's intentions are influenced by their attitudes, social norms, and their perceived behavioural control. In this context, the attitude towards the behaviour is determined by the perception of the outcome of adopting the behaviour and the perceived value of that outcome. Subjective norms represent beliefs about what other important people hold concerning the behaviour in question and their motivation to comply. In this way, subjective norms can be viewed as a type of social pressure,

which motivates an individual to behave in a way that is in line with the opinions of others. Perceived behavioural control is similar to self-efficacy as it refers to an individual's belief in their ability to perform the new behaviour.



It is important to understand the attitudes, subjective norms, and perceived control that can impact the behaviour change. This can be done by asking specific questions on how bad/good pleasant/unpleasant behaviours would be, how approving important others would be of the behaviour, how others like them behave, their confidence in their confidence and ability to control their behaviour, as well as their current level of intention. For example questions see: <http://people.umass.edu/aizen/pdf/tpb.measurement.pdf>.

Targeting the accuracy or level of their responses to the previous questions can influence individual's intentions. For example, if an individual reported that they believe that healthy eating won't affect their health (accuracy) and physical activity might only help a bit (level), they can be presented with information on various ways that healthier eating and physical activity can affect their health (e.g., digestive concerns, headaches, etc.). Targeting an individual's specific beliefs will not guarantee that they will choose to change their attitude or intentions towards a behaviour or even to change their behaviour. Therefore, it is important to target more than one belief and ensure that any changes in beliefs are not offset by unanticipated changes in other beliefs to maximize the potential for behaviour change.

## Appendix C: Social Cognitive Theory

Social Cognitive Theory (SCT) has been applied to health behaviour programs as it offers an explanation for human behaviour. SCT focuses on the social environment and individual cognitions.<sup>53</sup> According to SCT, human behaviour is the result of learning, perceptions of the environment, and physical and intellectual capacities. Therefore behaviour can be modified through new learning, guidance of perceptions of the environment, and the provision of support to increase capacities.<sup>54</sup> Social Cognitive Theory explains behaviour through five constructs: psychological determinants (PD), observational learning (OL), environmental determinants (ED), self-regulation (SR), and moral disengagement (MD).<sup>55</sup>

*Cognitions* are defined as mental processes through which knowledge is acquired, including reasoning, judgment, and perception.

Outcome Expectations (PD)	<ul style="list-style-type: none"> <li>Beliefs about consequences and the value of behaviour choices</li> </ul>	Change expectations (e.g., promoting condom use as increasing pleasure and safety)
Self-Control and Self-Efficacy (PD)	<ul style="list-style-type: none"> <li>Beliefs about personal ability to perform behaviours that achieve positive outcomes</li> </ul>	Use behaviour contract to set small achievable goals and rewards that utilize self-monitoring reinforcement (e.g., improving beliefs about ability to convince partners to use condoms)
Collective or Group Efficacy (PD)	<ul style="list-style-type: none"> <li>Beliefs about the group's ability to perform behaviours that achieve positive outcomes</li> </ul>	Organize group activities (e.g., safe parties to reduce youth alcohol consumption)
Observational Learning (OL)	<ul style="list-style-type: none"> <li>Learning to perform healthy behaviours through exposure (e.g., peer modeling or media campaigns)</li> </ul>	Peer modeling is particularly effective in promoting behaviour change (e.g., behavioural journalism promoting condom use)
Reciprocal Determinism (ED)	<ul style="list-style-type: none"> <li>People respond to and influence their environment</li> </ul>	Change environmental factors that influence health behaviour (e.g., through planned protection and promotion of public health)
Facilitation (ED)	<ul style="list-style-type: none"> <li>Providing tools, resources, and environmental change to support behaviour change</li> </ul>	Same as description (e.g., provide condoms free of charge or employment opportunities for vulnerable populations)
Incentive Motivation or Reinforcement (ED)	<ul style="list-style-type: none"> <li>Use of rewards and punishment</li> </ul>	Change laws designed to modify behaviour, increased costs of unhealthy behaviour (e.g., tobacco laws can have negative effects whereas taxes can deter the onset of tobacco use)
Self-Regulation (SR)	<ul style="list-style-type: none"> <li>Behaviour self-control through self-monitoring, goal-setting, self-reward, eliciting feedback, self-instruction, and enlisting social support</li> </ul>	Same as description (e.g., telephone counseling for tobacco cessation, computerized self-management programs)
Moral Disengagement (MD)	<ul style="list-style-type: none"> <li>Thinking about harmful behaviours in ways that 'justify' the action to make the infliction of suffering on others acceptable</li> </ul>	Dehumanization, diffusion of responsibility (e.g., in the context of public health organizations may undertake practices that harm public health)

Social Cognitive Theory, Constructs, and Examples (adapted from McAlister et al., 2008).

## Appendix D: Positive Deviance

Positive deviance is uncommon behaviour practiced by a few members in a community that is advantageous to the individuals practicing it compared with the behaviours of the surrounding members of the community. Uncommon behaviours practiced by a few community members are likely to be affordable, sustainable, and acceptable because they are practiced by members of the community who face the same hardships as their neighbors. The PD approach facilitates the process of social mobilization, information gathering, and behaviour change. Social mobilization occurs wherein community members have responded with enthusiasm as they are encouraged to learn they are enacting a successful solution available to their community. As well as information gathering, where in-depth community enquiries occur to identify transferable behaviours and enabling factors, which account for the desirable outcome. Finally, behaviour changes that are accessible, affordable, and available for immediate adoption into the community.<sup>56</sup> The six D's of positive deviance have been termed to outline a positive deviance approach to health behaviour change.<sup>57</sup>



The First Positive Deviant

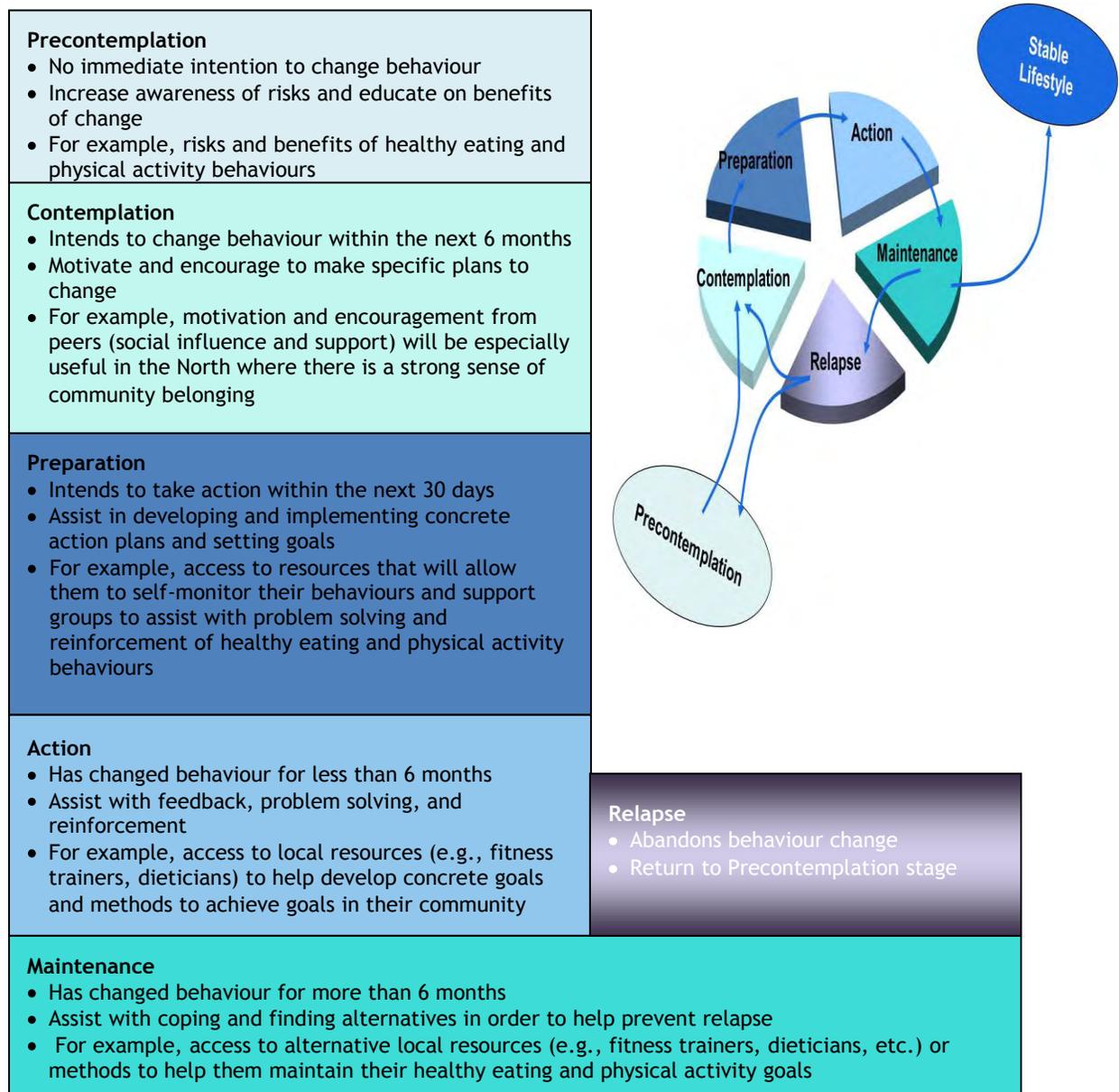
The Six D's	Definition	Strategy
Define	Define the problem, causes, and current practices	<ul style="list-style-type: none"> <li>Define the behavioural solution to the problem</li> <li>For example, decrease tobacco use rates by 25% over the next two years</li> </ul>
Determine	Determine if individuals exist in the community who already perform the desired behaviour	<ul style="list-style-type: none"> <li>Identification of the positive deviants in the community</li> <li>For example, individuals that have successfully stopped using tobacco</li> </ul>
Discover	Discover behaviours/practices that enable the positive deviants to find solutions to the problem - look at what works rather than what doesn't work	<ul style="list-style-type: none"> <li>What strategies enable positive deviants to carry out the desired behaviour</li> <li>For example, peer support, observing own health improvements, etc.</li> </ul>
Design	Design and implement interventions/activities that will assist others in the community to practice the new behaviour	<ul style="list-style-type: none"> <li>Focus on doing rather than increasing knowledge. The emphasis is on acting rather than knowledge transfer</li> <li>For example, implement the approaches of the positive deviants (e.g., peer support programs, self-health monitoring)</li> </ul>
Discern	Discern the effectiveness of the project through ongoing evaluation and monitoring	<ul style="list-style-type: none"> <li>Measure the effects of the desired behaviour of individuals participating in the program</li> <li>For example, how often and how much they are using tobacco</li> </ul>
Disseminate	Disseminate the process of the successful program to appropriate others	<ul style="list-style-type: none"> <li>Create an environment where others can experience hands-on-participation in the program</li> <li>For example, presentation by positive deviants or participants to other community members</li> </ul>

The six D's of Positive Deviance (modified from Website of the Canadian Positive Deviance PD Project)

## Appendix E: Transtheoretical Model of Change (TTM)

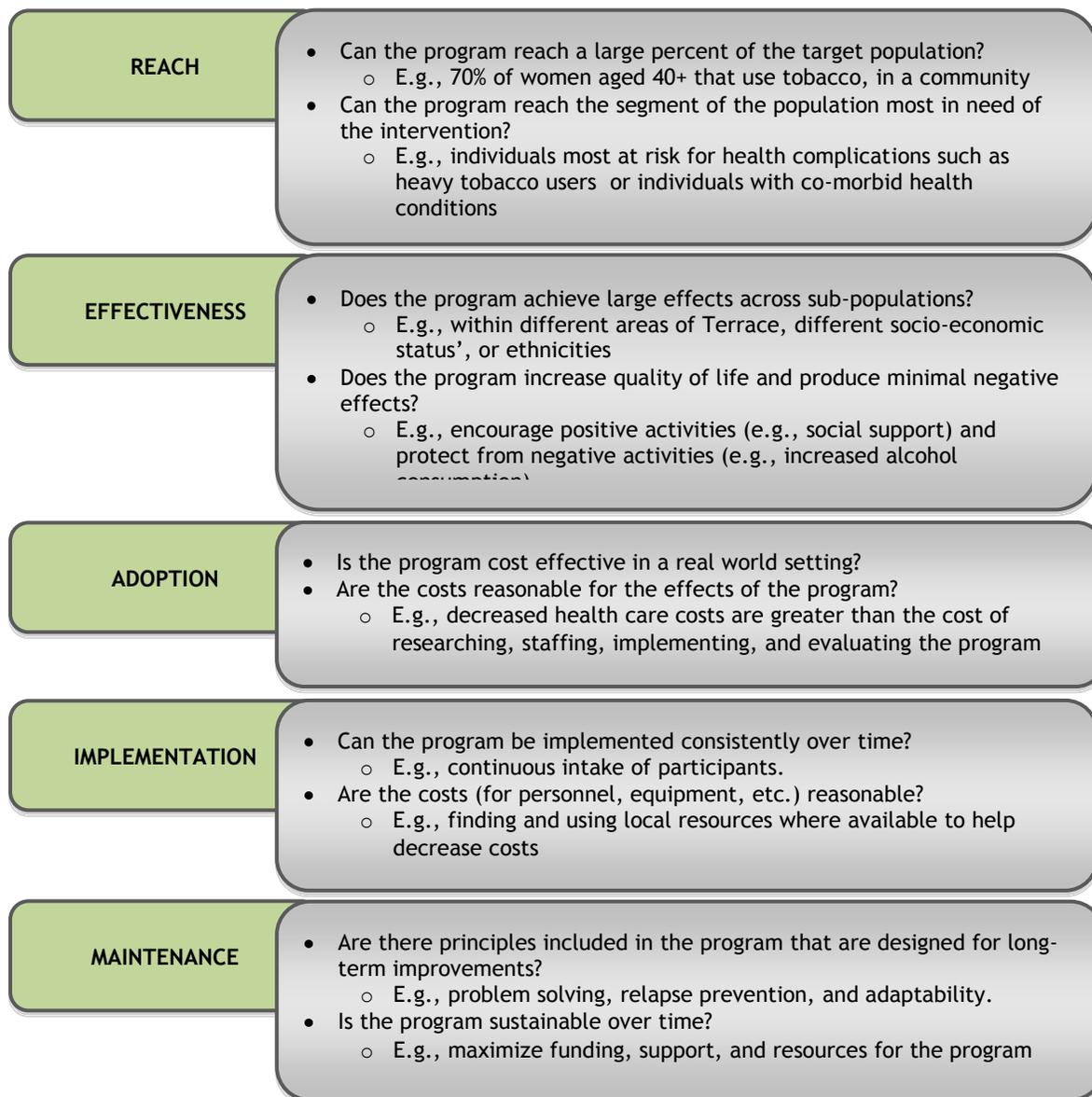
The transtheoretical model purposes there are 5 stages an individual moves through when adopting behaviour change. The first is *pre-contemplation* where the person has no intention of changing their behaviour. The second is *contemplation* where consideration of behaviour change occurs. The third stage is *preparation* where plans are made to change in the near future. The fourth stage happens when the individual takes *action* and changes their behaviour. The fifth stage is the *maintenance* phase where the new behaviour is consistent. Some theorists also include a stage for *relapse* in the model and indicate that relapse is a stage rather than a failure and individuals can move back into the maintenance stage again. In this way the model is circular rather than linear as people achieve change, relapse, and then change again.

The assumption underlying this model is that people go through the same stages of change whether they engage in self-management or use a professional program to achieve behaviour change. The TTM points to specific strategies for assisting in behaviour change at each level of change. The TTM has demonstrated success in several interventions, including tobacco cessation, dietary change, and addiction.



## Appendix F: RE-AIM

RE-AIM is a planning and evaluation framework that was designed to help professionals develop interventions and evaluations that are focused on several key factors considered to be essential for success in the real world.<sup>58</sup> Specifically, RE-AIM is an acronym representing the key elements **R**each, the target population; **E**ffectively lead to positive changes in quality of life through self-management across groups, be **A**dopted across diverse settings, target staff, or institutions to lead to consistent **I**mplementation of strategies that are cost-effective, and lead to **M**aintained self-management and sustained delivery in primary care settings. RE-AIM was also designed to evaluate issues.<sup>59</sup>



RE-AIM Guidelines for Developing Programs (adapted from Vinson, 2012)

## Appendix G: Diffusion of Innovations

In the past, researchers and practitioners have been reluctant to implement “new” interventions, as their effectiveness has not yet been demonstrated within their specific context. The current emphasis on diffusion, dissemination, and translation has begun to change practitioner’s views on implementing new knowledge. The diffusion of innovations model has been used widely to outline the process of dissemination and diffusion of innovations, or put simply, the sharing of ideas. Rogers described the diffusion of innovation process as a bell curve with five categories of adopters (innovators, early adopters/opinion leaders, early majority, late majority, and laggards). In addition to individuals and their process of adopting a new innovation, the characteristics of the community or organization also influence innovation adoption. Further, it is crucial to ensure a good fit between the qualities of the innovation and the organization or community. In order to maximize fit, it is necessary to consider the means of communication and collaboration, as success is more likely if the communication of the innovation is a process of *exchange* rather than a focus on persuasion only.<sup>60</sup>

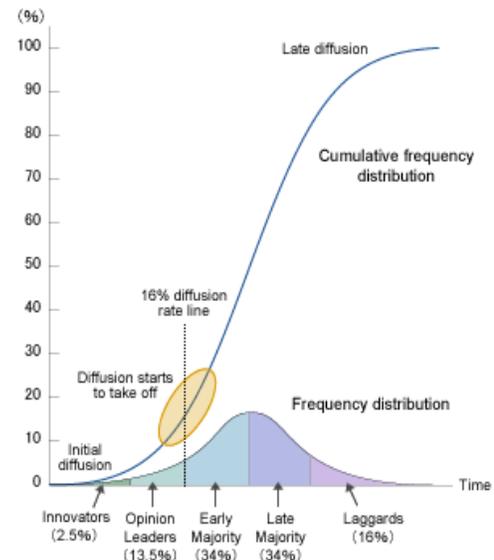
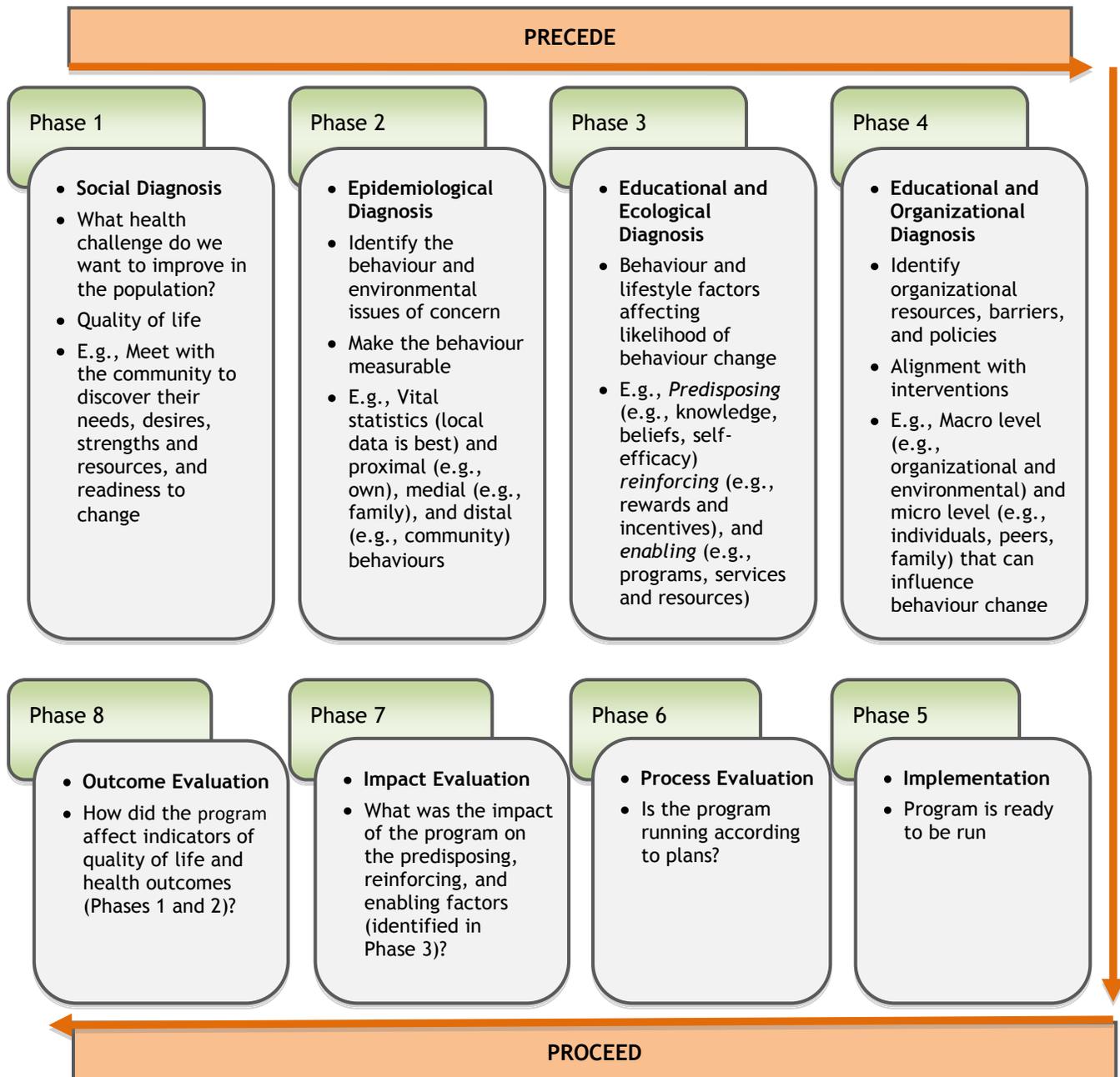


Figure showing the process of spreading innovations through the population starting with innovators and ending with laggards. The 16% mark indicates where the majority of the population is reached by the innovation and where the greatest spread will begin. (retrieved from: <http://www.mitsue.co.jp/english/case/concept/02.html>)

Concepts and Definitions
<b>Diffusion</b> - the process of communicating innovation over time throughout a social system
<b>Dissemination</b> - systematic efforts to make innovation widely accessible. Outcome of these efforts is diffusion
<b>Innovation</b> - a new idea, practice, or object
<b>Communication Channels</b> - channels through which the message is spread (media, electronic communications, interpersonal)
<b>Social System</b> - a set of interrelationships between groups who engage in joint efforts to achieve common goals. Include norms, leadership, and structure.
<b>Innovation Development</b> - the outcome of activities and decisions from the beginnings of an idea to its full development
<b>Adoption</b> - program or innovation uptake by target groups
<b>Implementation</b> - active efforts for program implementation within a specific setting
<b>Maintenance</b> - the innovation ongoing use overtime
<b>Sustainability</b> - the degree to which the adoption and implementation is continued after initial start-up resources are expended
<b>Institutionalization</b> - the incorporation of innovation into organizations and or policy

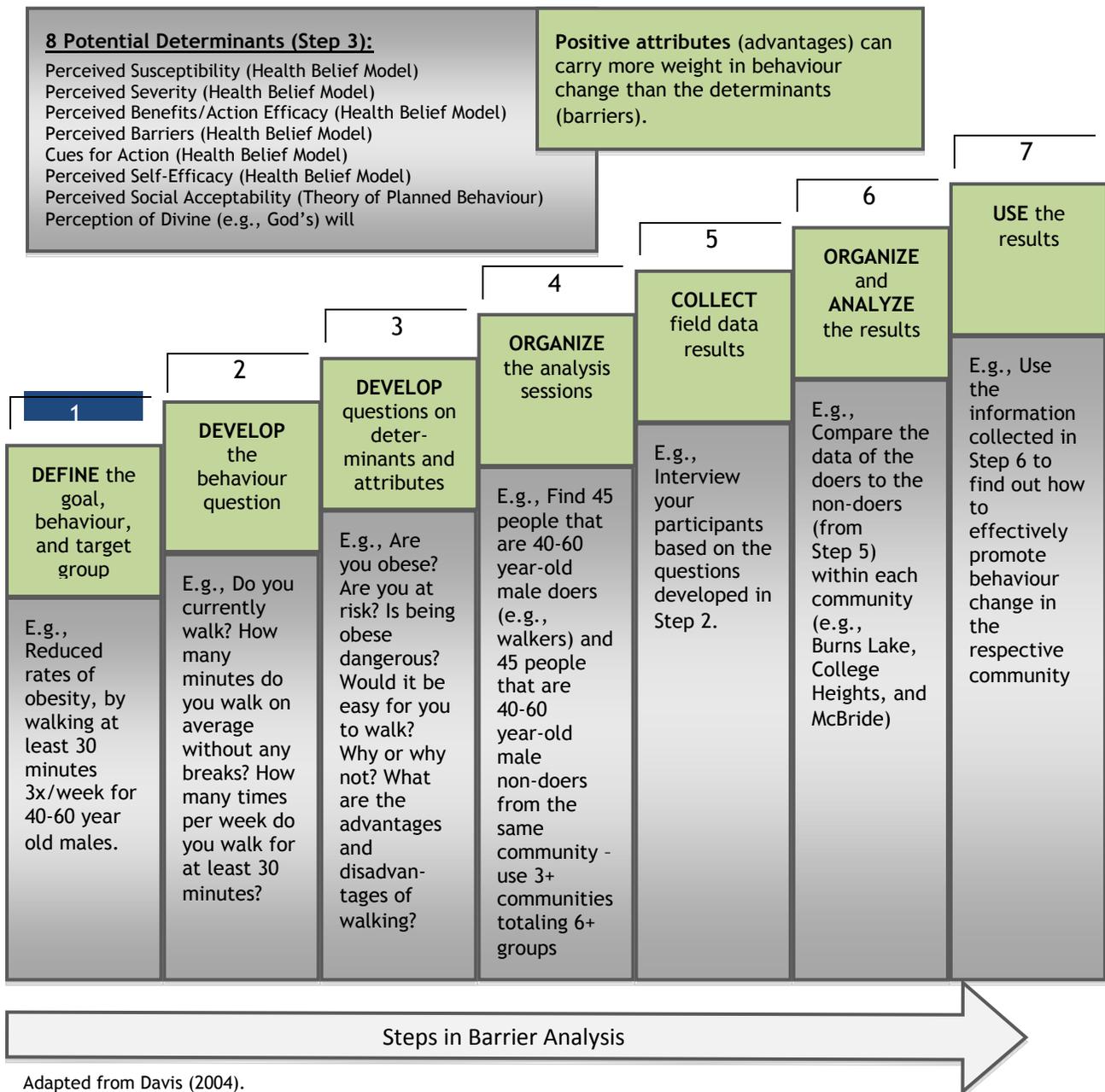
## Appendix H: Precede - Proceed Model

The precede-proceed model is designed to give health promotion planners a logical step-by-step guide beginning in the planning stages following to the implementation and analysis of the impact of the program. In this way the model provides structure and an overarching framework in which health promotion planners can apply their selected theories and concepts that are appropriate for their target population and strategy.<sup>61</sup> The model has two key elements, the *precede* portion of the model outlines the planning phase of the program and the *proceed* portion refers to the implementation and evaluation of the program. The model consists of 9 phases, beginning with an evaluation of the problem being addressed by health promotion planners and ending with evaluation of the outcome.



## Appendix I: Barrier Analysis

The Barrier Analysis Model was developed based on a combination of the Health Belief Model and the Theory of Reasoned Action (now the Theory of Planned Behaviour) with additional aspects relating to ones religiosity (Perception of Divine Will), Positive Deviance (Doers and Non-Doers), and the Transtheoretical Model (Prochaska’s Change Theory). Barrier Analysis was designed as part of the Food for the Hungry project and can be applied to various health topics.<sup>62</sup> Barrier analysis can be used to find key messages for planning a behavioural intervention or during behaviour an intervention to see what is or is not working. Barrier analysis is based on 8 potential determinants related to behaviour change. Barrier Analysis can be used in focus groups or individual interviews with benefits for each, however the facilitator’s guide recommends individual interviews in order to obtain more reliable data.



## Appendix J: Community Level Models

The promotion of health in target populations, large institutions, and communities rather than just focusing on individuals is a fundamental objective of public health systems. Establishing structures and policies that support healthy behaviours and eliminate of health hazards can increase the health and well being of entire communities. It is important to note that models designed to improve health on a community level are essentially frameworks that offer understandings of how social systems function and change.<sup>63</sup> Research has shown that community development is an effective strategy for health promotion and serves to increase community cohesion and empowerment. It is important to include community definitions of what constitutes a health issue, as attempting to engage community members in a struggle for a cause that is not a priority is extremely difficult.<sup>64</sup> Similarly, research has demonstrated top-down approaches to community health campaigns have a poor record of success. For example, if communities are struggling with poverty, housing, and unemployment, it is difficult to engage them in a program to prevent heart disease.<sup>65</sup> Therefore a focus on the social determinants of health can be warranted in some communities.

Action	Example
Implement changes that make healthy behaviours easier, cheaper, and convenient	Reduce access to unhealthy food choices (i.e. ban pop machines) while supplying inexpensive healthy food choices
Do not just disseminate knowledge, focus on changing the environment	Top-down media campaign approaches have been largely unsuccessful. Engage community members by focusing on issues prioritized by the community
Ensure environmental changes are substantial enough to have a real impact.	Providing a token healthy item in a cafeteria that sells mainly unhealthy items will not generate health change
Promote healthy urban environments through advocacy and policy within and outside the health sector.	Produce changes in the environment among various institutions both inside and outside the health sector. (i.e. schools, daycares, work, and recreational settings)
Follow evidence from best-practice research by introducing informed environmental changes that have shown effectiveness in past projects	Examine the literature to discern successful from unsuccessful strategies to guide intervention planning

Action steps to increase effectiveness of environmental interventions (adapted from Kreindler, 2009).

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