



# Implementation and scale-up of two health promoting physical activity interventions

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# Land Acknowledgment

I am grateful to the Indigenous keepers of the traditional and unceded lands of the Squamish, Musqueam, \Tseil-Waututh Nations where I live, work and play.  
I acknowledge my presence on this land, with an awareness of our shared history.



# Agenda

1. Warm up
2. Let's get on the same page—defining terms
3. Let's tackle some issues in scale-up science
4. Where the rubber hits the road—evidence into action

Two real world examples of phased scale-up of health promoting interventions across 7-10 years that improved the health of i. children [Action Schools! BC, and ii. older adults [Choose to Move].

# Poll

PLEASE IDENTIFY WHICH GROUP YOU MOST CLOSELY ALIGN WITH

1. Academic
2. Health professional
3. Health practitioner
4. Implementation science researcher
5. Implementation science practitioner

# POLL

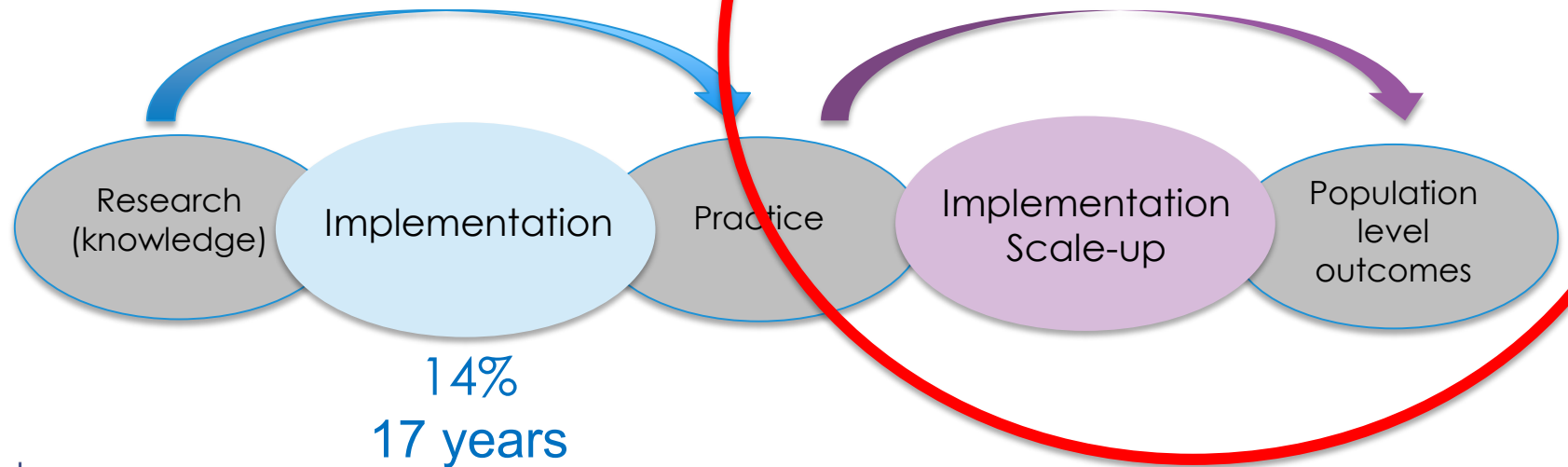
- » PLEASE CHOOSE THE PHRASE THAT MOST CLOSELY DESCRIBES YOU
- » 1. I am an implementation science **'newbie'**.
- » 2. I know **a little** about implementation science.
- » 3. I know **a fair bit** about implementation science and have evaluated implementation in a small trial.
- » 4. I know **a lot** about implementation science and have evaluated implementation in a large trial.
- » 5. I am **an expert** in implementation science and evaluated more than one evidence-based intervention.

# Why study implementation and scale-up?

## Research-to-Practice gap

What is known is  
not what is adopted

## Implementation to scale-up gap not at scale, not sustained

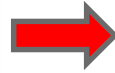


# TRANSLATION TO POPULATIONS

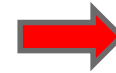
65%  
Descriptive



23%  
Efficacy



13%  
Effectiveness



3%  
Scale-up

Will it work in a  
controlled setting?

Will it work in a  
'real world' setting?


How will benefits reach  
the whole population?

Institutionalization

Adapted from Milat AJ et. al.  
BMC Public Health 2011

4%  
scaled-up

# Physical activity is good for older adults—but is programme implementation being overlooked? A systematic review of intervention studies that reported frameworks or measures of implementation

Samantha M Gray,<sup>1</sup> Heather A McKay ,<sup>1,2</sup> Lindsay Nettlefold,<sup>1</sup> Douglas Race,<sup>1</sup> Heather M Macdonald,<sup>1,2</sup> Patti-Jean Naylor,<sup>3</sup> Joanie Sims-Gould<sup>1,2</sup>

<sup>1</sup>Active Aging Research Team,  
The University of British  
Columbia, Vancouver, British  
Columbia, Canada

## ABSTRACT

**Objective** To examine older adult physical activity (PA) intervention studies that evaluated implementation and/

widespread or routinely used.<sup>4</sup> Effectiveness trials shed light on the ‘what’—they identify evidence-based practices or interventions that work in real-



# SCALING UP

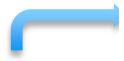
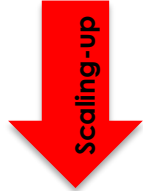


“The effort to magnify the impact of health... innovations successfully tested in pilot or experimental projects so as to benefit more people and to foster policy and program development on a lasting basis.

*(Simons and Shiffman 2007; WHO 2010- ExpandNet:  
<http://expandnet.net/>)*

» WHERE DOES SCALE-UP BEGIN?

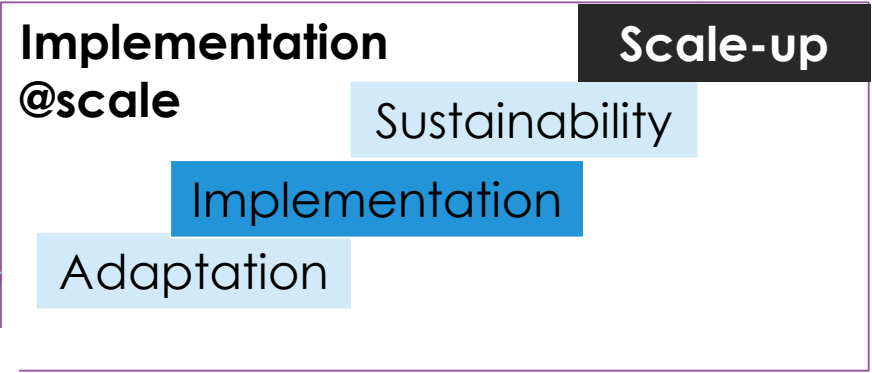




Preintervention  
(pilot trials)

Efficacy  
(RCT)

Effectiveness  
(quasi-exp.  
trials)



**A process –  
NOT an endpoint**



# Polling question

1. I will never scale-up an intervention
2. I would scale-up an intervention if I knew how
3. I have already scaled up at least one intervention
4. I am a scale-up 'afficianado' and have already scaled up more than 1 intervention
5. Scale-up – what's that?

# Taking scale-up out of the too hard basket

A vast array of  
implementation  
theories, models,  
frameworks and  
indicators.



# METHODS



A modified 5-round Delphi methodology with an international group in PA and nutrition with 1 to 10 (n=13), 11 to 20 (n=3), or >20 (n=3) years experience as ‘implementation scientists’.

**McKay HA**, Naylor PJ, Lau E, Gray SM, Wolfenden L, Milat A, Bauman A, Race D, Nettlefold L, Sims-Gould J. *Implementation and scale-up of physical activity and behavioural nutrition interventions: an evaluation roadmap*. International Journal of Behavioral Nutrition and Physical Activity. 16:102. November 2019.

# RESULTS 'roadmap'



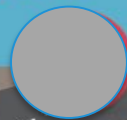
3 Frameworks

5 Outcomes

10 Determinants

Tools and  
measures

Strategies



## Frameworks

### Implementation frameworks

1. Framework for Effective Implementation (Durlak and DuPre. 2008 Am J Community Psychol.)
2. Consolidated Framework for Implementation Research (CFIR) (Damschroder et. al. 2009 Implement Sci.)
3. Dynamic Sustainability Framework (Chambers et al. 2013 Implement Sci. )

### Scale-up frameworks

1. Scaling Up Health Service Innovations - A Framework for Action (Simmons et al. 2007 WHO)
2. Interactive Systems Framework for Dissemination and Implementation (Wandersman et al. 2008 Am J Community Psych.)
3. Scaling-Up: A Framework for Success (Yamey. 2011 PLoS Med)

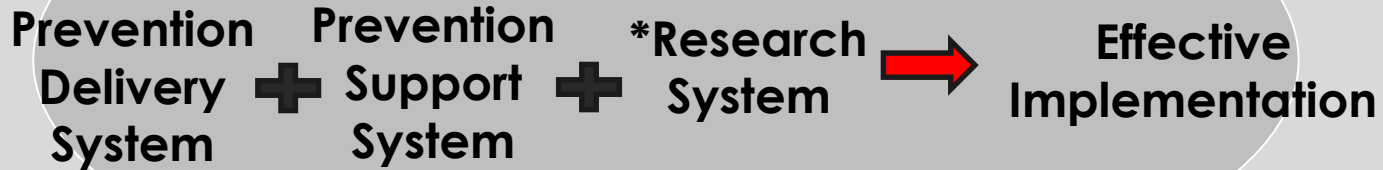


# Framework for effective implementation

**Community Factors**

**Provider characteristics**

**Innovation characteristics  
(interactive System Framework)**



- Also called Knowledge synthesis and translation system Wandersman et. al 2008  
Adapted from Durlak and DuPre. Am J Community Psychol, 2008, 41 (3-4):327-50

# Indicators

## Implementation outcomes

Adoption

Dose delivered

Reach

Fidelity

(adherence)

Sustainability

(maintenance)

## Implementation determinants

Context

Acceptability

Adaptability

Feasibility

Compatibility

(appropriateness)

Cost

Culture

(Dose) Satisfaction

Complexity

Self-efficacy

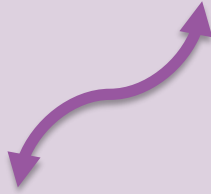
# Level of operations

Determinants	Delivery of the intervention	Delivery of implementation strategies
<b>Acceptability</b>	Perceptions among the <b>delivery team</b> that a given intervention is agreeable, palatable, or satisfactory. (Proctor et al. Adm Policy Ment Health. 2011.)	Perceptions among <b>the support system</b> that implementation strategies are agreeable, palatable, or satisfactory.

## Challenges



Terms are defined differently across sectors



Mismatch between frameworks and evaluation indicators



Lack of standardized and valid measures

# LET'S TALK SCALE UP

## 10 minutes

- » WHERE IS YOUR WORK ON THE SCALE-UP CONTINUUM?
  
- » AT WHAT LEVEL ARE YOU EVALUATING?
  - e.g. Delivery of *an intervention* by an instructor/teacher/coach to participants?
  - Delivery of *implementation strategies* by delivery partner organizations?

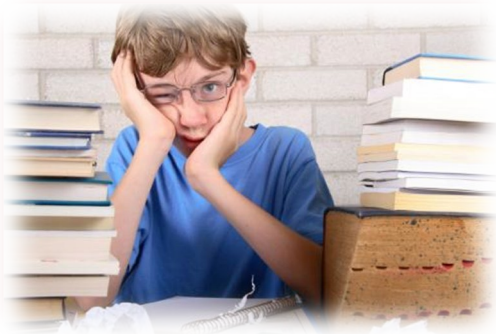
# TWO CASE STUDIES



TM

Action Schools! BC

**CHOOSE**  
to **MOVE**





TM

# Action Schools! BC



SCHOOL ENVIRONMENT



PHYSICAL EDUCATION



CLASSROOM ACTION



EXTRA-CURRICULAR

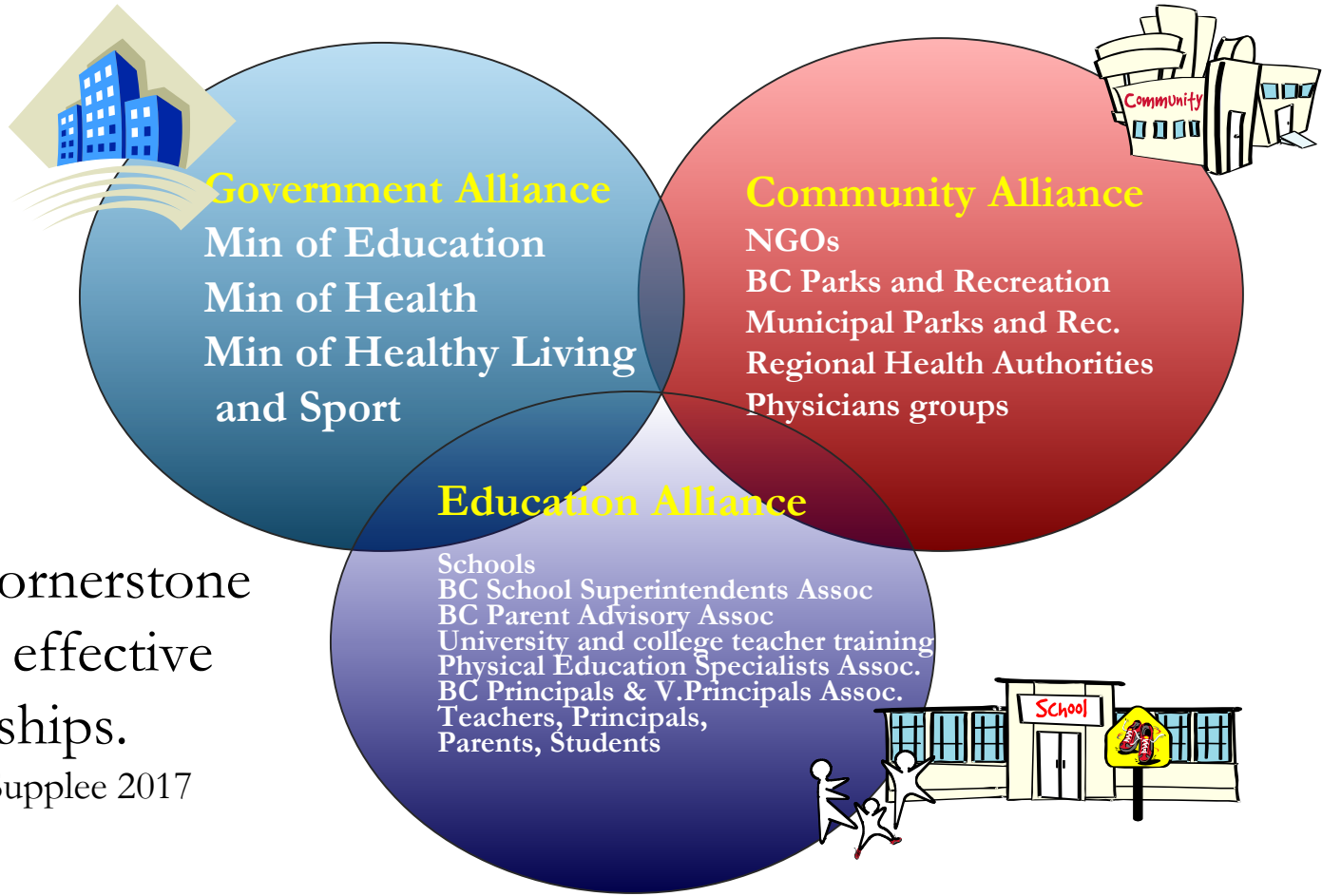


FAMILY AND COMMUNITY



SCHOOL SPIRIT

To integrate physical activity into the fabric of elementary schools and maintain them through partnerships with family and community.

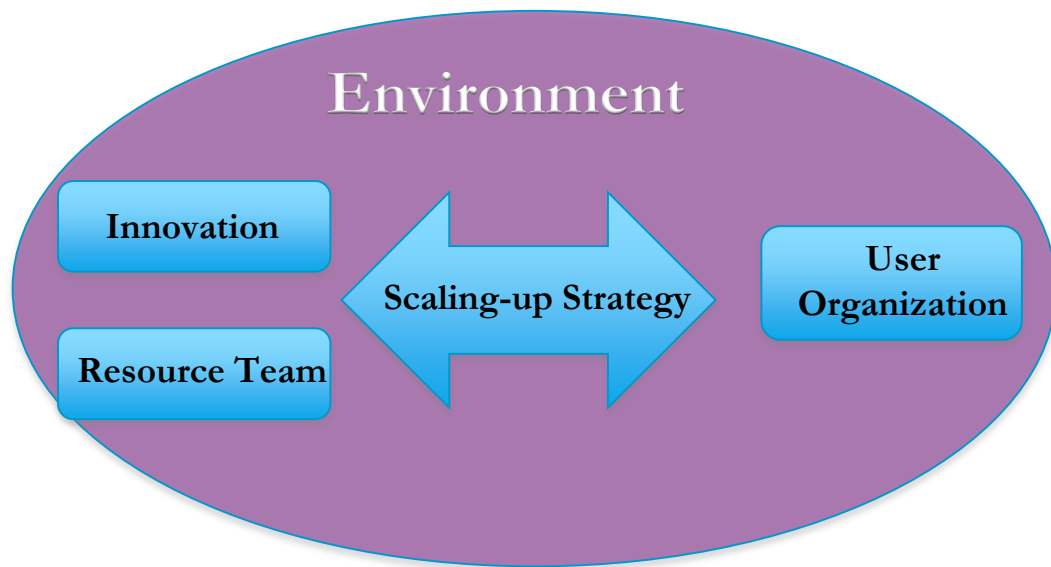


*Trust* is the cornerstone  
 of building effective  
 partnerships.

Tseng, Easton and Supplee 2017



# Scaling Up: The Elements

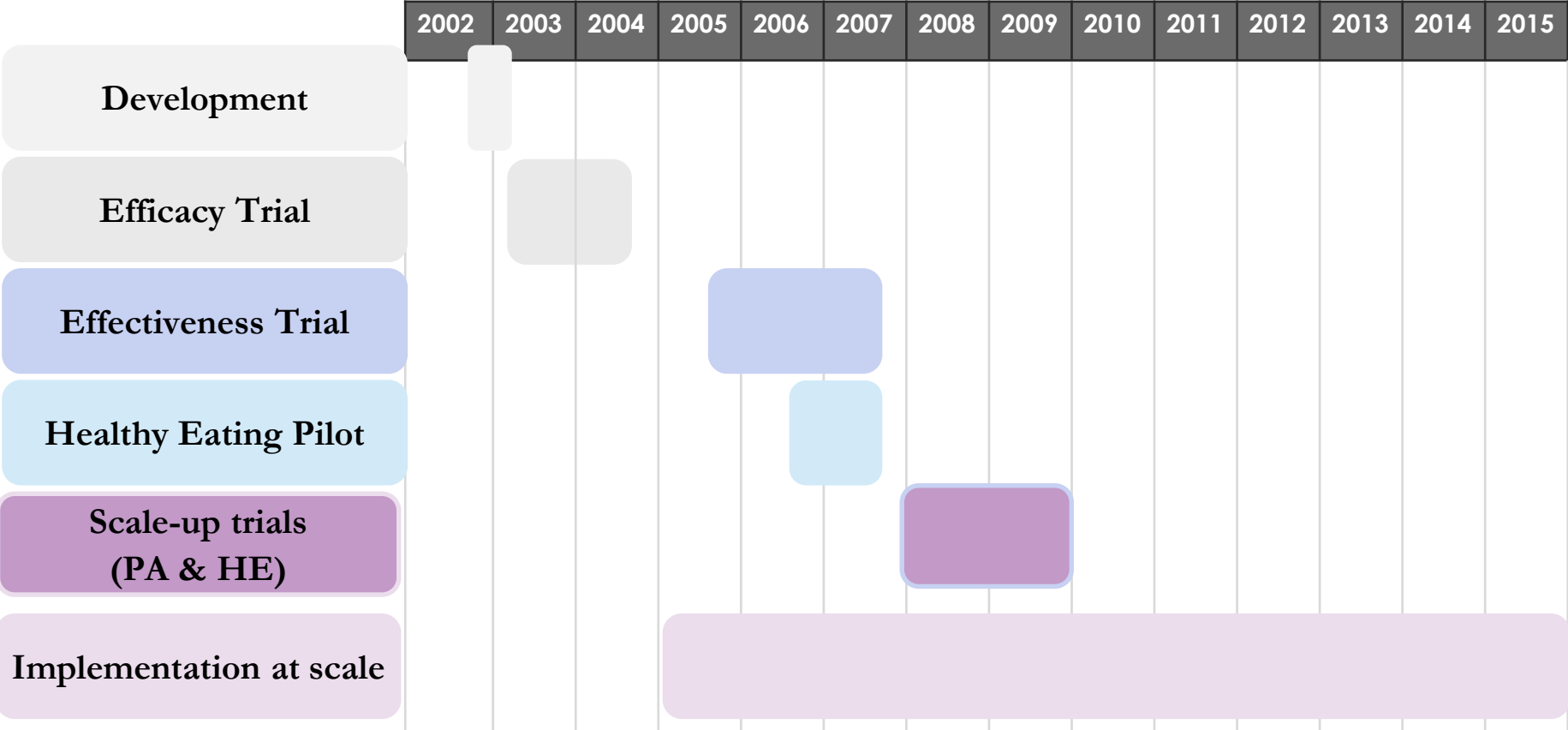


Simmons & Shiffman 2007, Scaling up health service innovations. World Health Organization Chapter 1; ExpandNet/WHO Framework for Scaling up (*WHO & ExpandNet 2010*)

## RESOURCE TEAM/TECHNICAL SUPPORT UNIT:

- credibility with the user organization;
- appreciation of the user organization's capacities and limitations;
- an understanding of the political, social and cultural environments
- the ability to generate technical resources;
- relevant technical skills;
- training capacity;
- management skills.

# Phased Scale-Up of AS! BC





Article

# Scaling up Action Schools! BC: How Does Voltage Drop at Scale Affect Student Level Outcomes? A Cluster Randomized Controlled Trial

Lindsay Nettlefold <sup>1</sup>, Patti-Jean Naylor <sup>2</sup>, Heather M. Macdonald <sup>1,3</sup> and Heather A. McKay <sup>1,3,4,\*</sup>

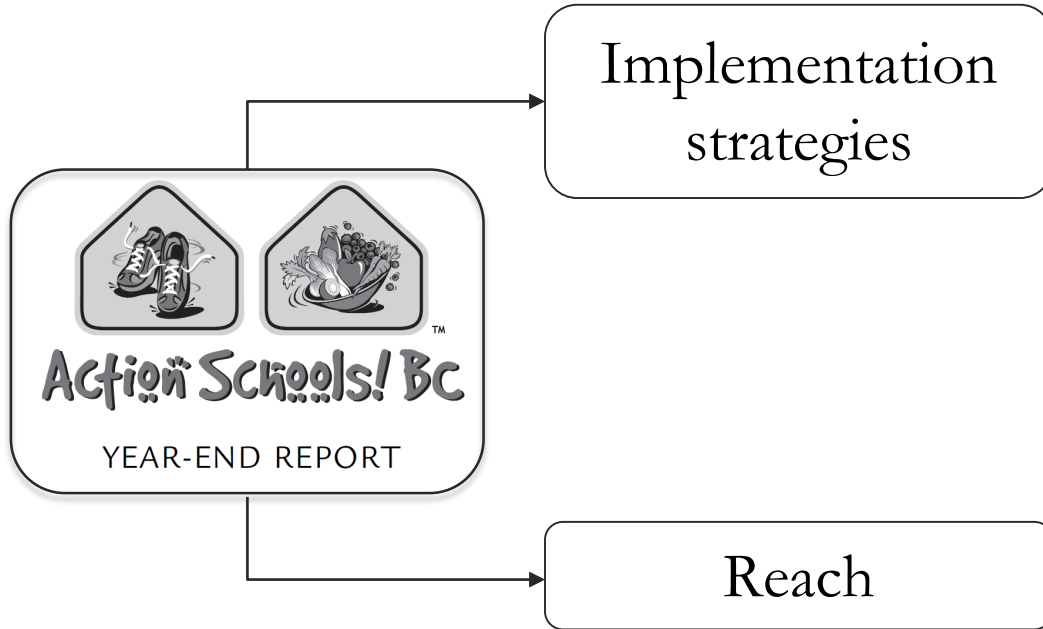
*Int. J. Environ. Res. Public Health* **2021**, *18*, 5182. <https://doi.org/10.3390/ijerph18105182>

# Objectives

- 1 Describe strategies that supported implementation and scale-up
- 2 Evaluate implementation and impact within 2-year, cluster RCT

# 1

## Describe strategies that supported implementation and scale-up



- Categorized  
(Leeman et al. 2017)
  - Aligned with taxonomy  
(Powell et al. 2015)
  - Specified  
(Proctor et al. 2013)
- 
- Implementation strategies
  - Intervention

# 1

## Describe strategies that supported implementation and scale-up

### Implementation process strategies

(13)

- Ongoing consultation
- Technical assistance
- Local needs assessment
- Readiness, barriers, facilitators
- Promote adaptability
- Access funding
- Provide equipment
- Develop/distribute materials
- Obtain and use feedback
- Capture and share local knowledge
- Provide incentives
- Advisory boards and workgroups
- Create an implementation blueprint

### Capacity-building strategies

(7)

- Ongoing training
- Make training dynamic
- Obtain and use feedback
- Identify and prepare champions
- Train the trainer
- Provide equipment
- Develop/distribute materials

### Scale-up strategies (5)

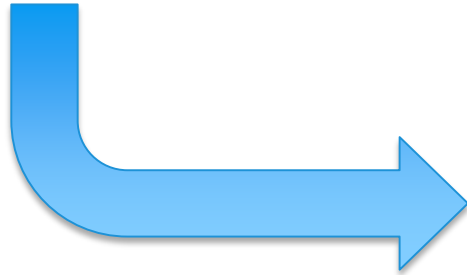
- Promote network weaving
- Work with educational institutions
- Develop and distribute materials
- Increase demand
- Educational meetings

1

Describe strategies that supported implementation and scale-up

## Reach (implementation strategies)

- Presentations to all school districts (by end of year 2)
- >5,000 workshops
- >220 AS! BC Trainers



## Reach (intervention)

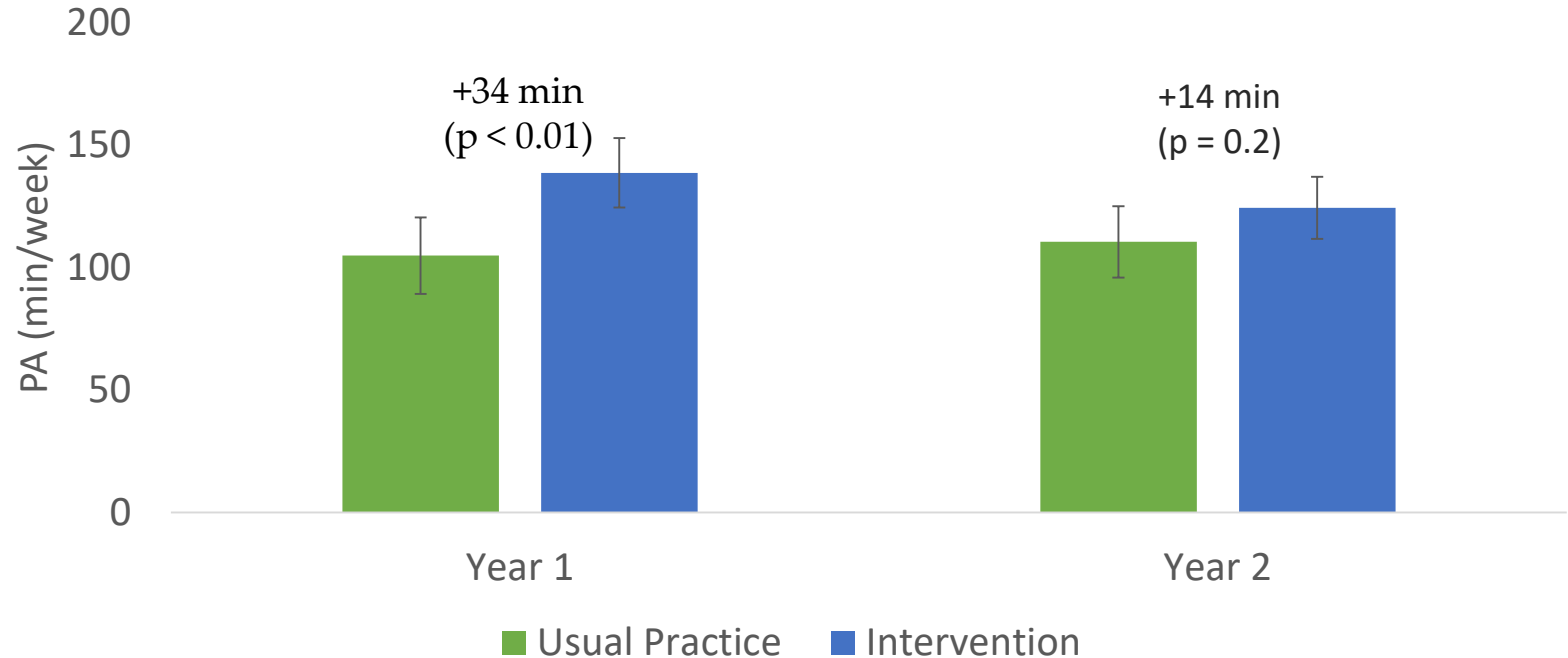
- >1,400 schools (>90%)
- >87,500 teachers/administrators
- ~500,000 students



## 2

## Evaluate implementation and impact within 2-year, cluster RCT

## Physical Activity delivery by teachers



## 2

## Evaluate implementation and impact within 2-year, cluster RCT

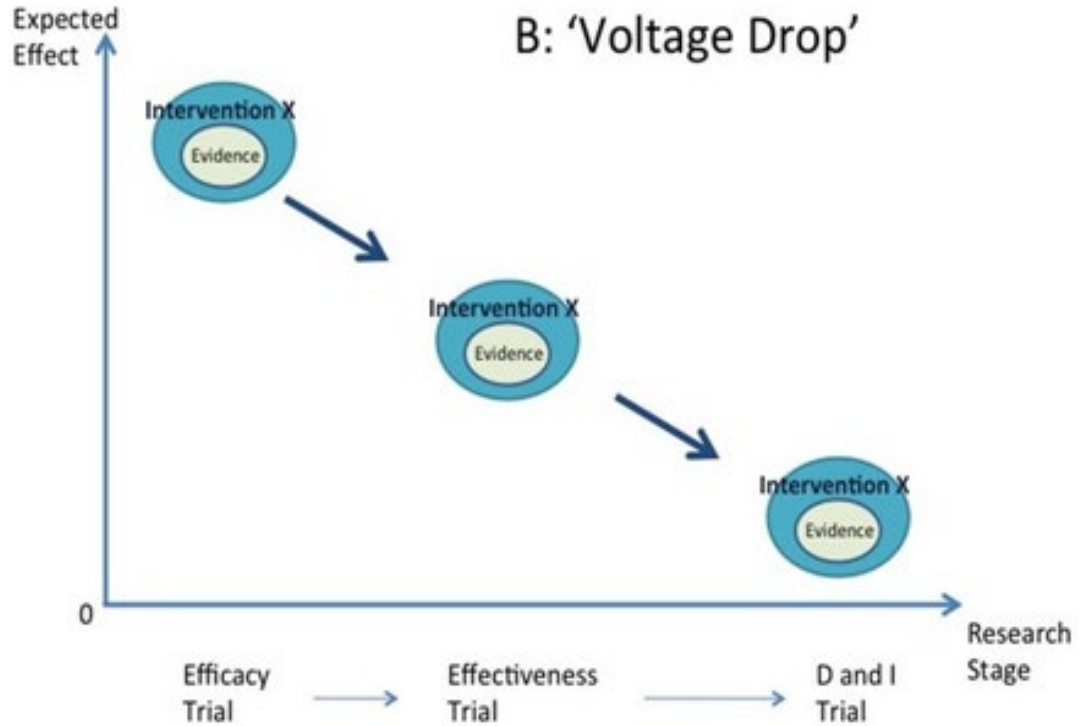
## Effect sizes (student outcomes)

	Girls		Boys	
	Year 1	Year 2	Year 1	Year 2
Fitness (# laps)	0.48	-0.06	0.28	0.03
Total PA (counts/min)	0.01	-0.2	0.05	-0.04
MVPA <sub>ACCEL</sub> (min/day)	0.0	-0.1	-0.16	-0.06
MVPA <sub>PAQ</sub> (min/day)	0.05	0.17	-0.1	0.04

# 'Voltage drop' with scale-up

Median 'voltage drop' of 59%

AS! BC 'voltage drop' of 64%



Chambers et al. Implementation Sci 2013

# ISSUE (10 minutes)

## Voltage Drop

- Is it inevitable at scale-up?
- What are the potential reasons for voltage drop?

# Two Case Studies

**CHOOSE**  
to **MOVE**

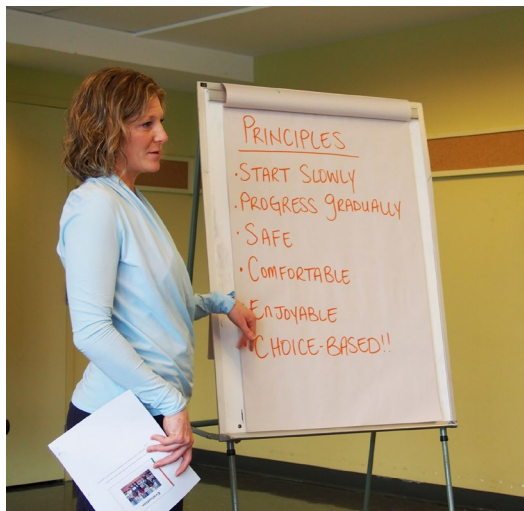




- 85% of seniors do not meet PA guidelines
- 90% are sedentary for >8 hrs/day

# Choose to Move

A choice-based, health-promoting physical activity intervention for older adults.



One-on-one  
Consultation (x1)



Motivational Group  
Meetings (x4)



Telephone  
Check-ins (x10)



x3



x2



x2



Active Phase

3 months

Maintenance  
Phase

6 months

# Choose to Move: implementation structure

## Prevention Delivery System

Community organizations  
Provincial coordinator  
Recreation manager/coordinator  
Activity coaches

## Prevention Support System

CTM project team: two principal investigators, program manager and RAs

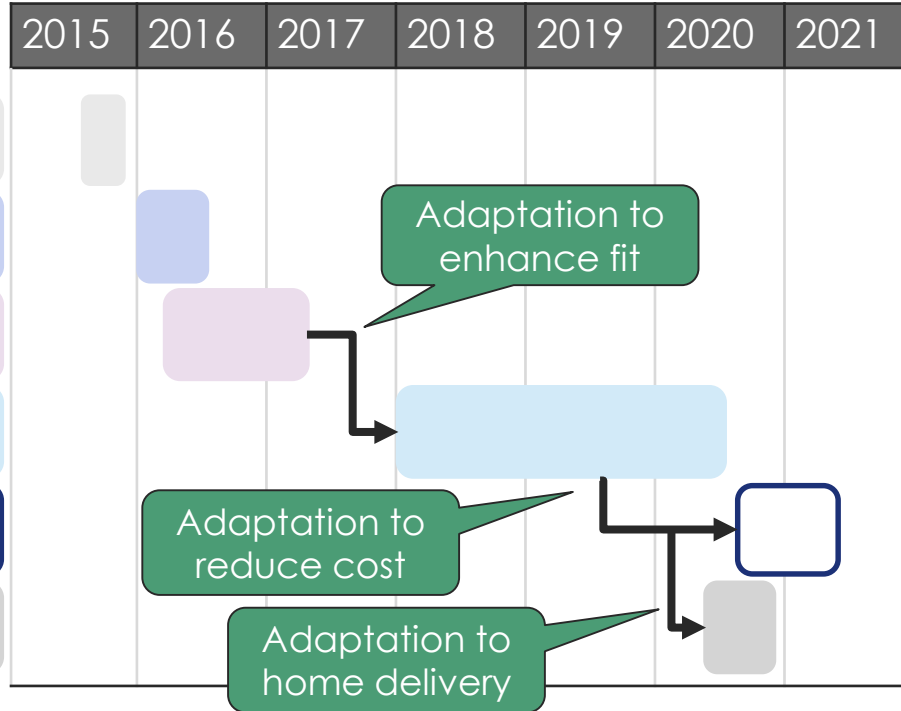
## Prevention Synthesis and Translation System

Active Aging Research Team



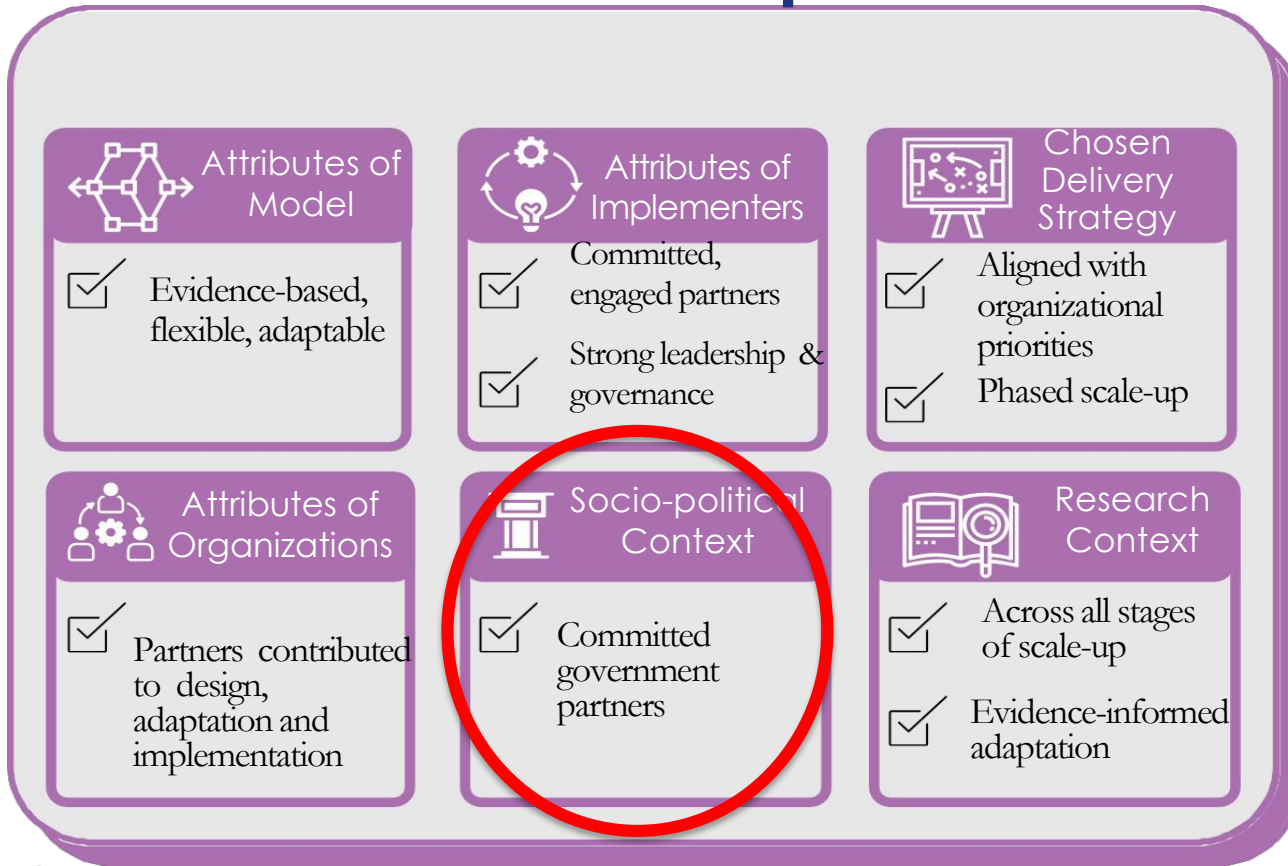
# Phased Scale-Up

New delivery partners



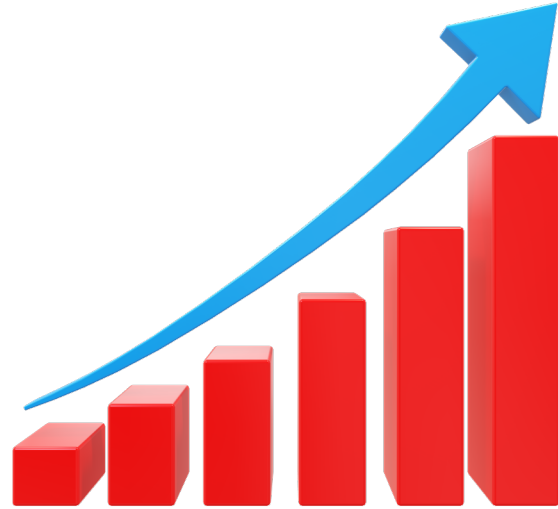
Mackey et al. JAPA 2018  
McKay et al. TJACSM 2019  
McKay et al. TJACSM 2017  
McKay et al. BMC Public Health 2018  
McKay et al. BJSM 2019  
Sims-Gould et al. BMC Public Health 2019  
Gray et al. Prev Sci 2020

# Scale-Up Framework



Yamey et al  
2011. PLoS Med:  
8(6)

# Implementation



**Implementation and  
scalability**



# Choose to Move



## REACH

Phase 1

**8**

communities

**8**

programs

**67**

participants

All Phases

**87**

**318**

**2988**

# Dose received



82% attended  $\geq 75\%$  of the group meetings



95% completed  $\geq 70\%$  of the check-ins

McKay et al 2018. BMC Public Health

18(1)

Organization Leads

Recreation Managers  
Coaches

Recreation Coordinators  
Participants

Activity



# Lessons Learned



Authentic partnerships are key (and take time)



Ongoing communication is critical



Multi-pronged recruitment



Program champions essential



Adaptation is inevitable



Evidence matters



Systems are dynamic



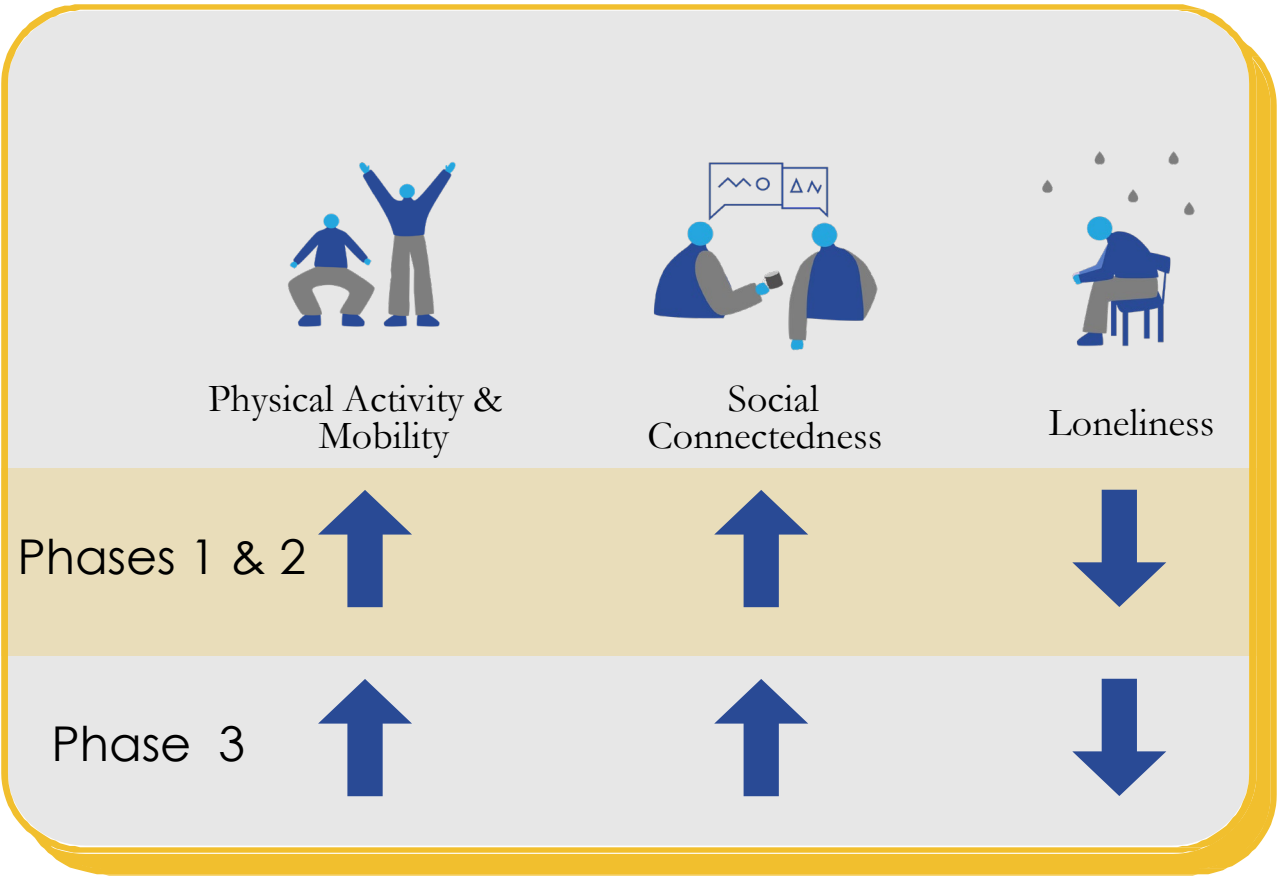
Plan for scale-up from the start

# Impact



**Implementation and  
scalability**





Physical Activity & Mobility

Social Connectedness

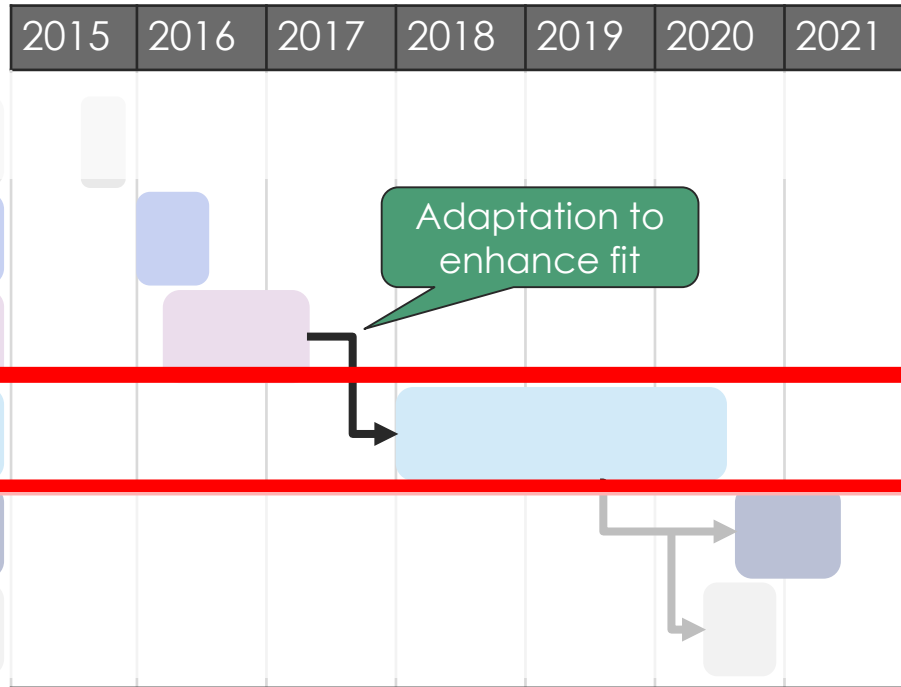
Loneliness

Phases 1 & 2

Phase 3

McKay et al 2018. BMC Public Health

# Voltage drop



Phases 1 & 2  
60 min one-on-one  
4 group meetings  
10 phone calls

Phase 3:  
60 min one-on-one  
5 group meetings  
6 phone calls

McKay et al., BJSM, 2018  
Gray et al., Prev Sci, 2020

# Voltage drop at broad scale-up

% of Phases 1&2 effect maintained in Phase 3



PA & Mobility

**60-74 y**

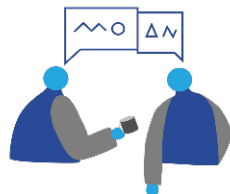
PA: 53%

Mobility:  
53%

**≥ 75 y**

PA: 97%

Mobility:  
15%



Social isolation

122%

355%



Loneliness

74%

35%

# ISSUE

Fidelity

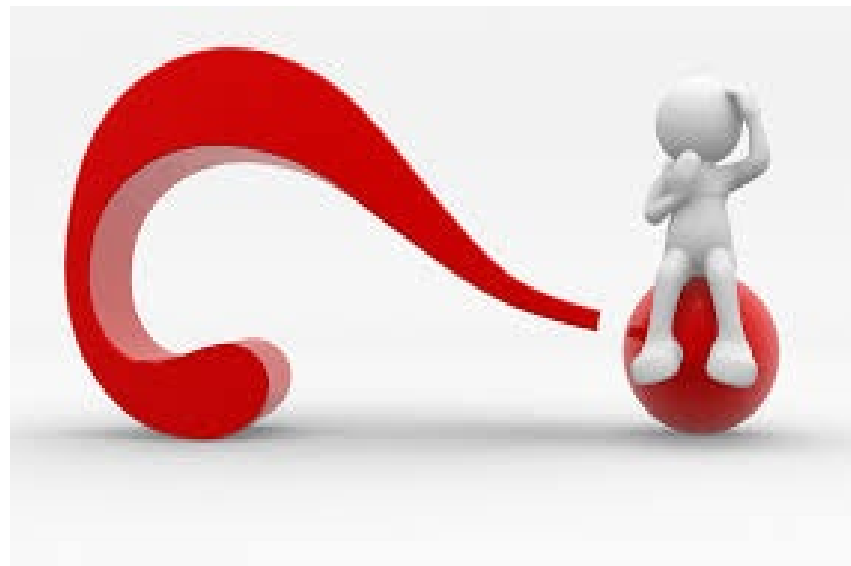
Adaptation



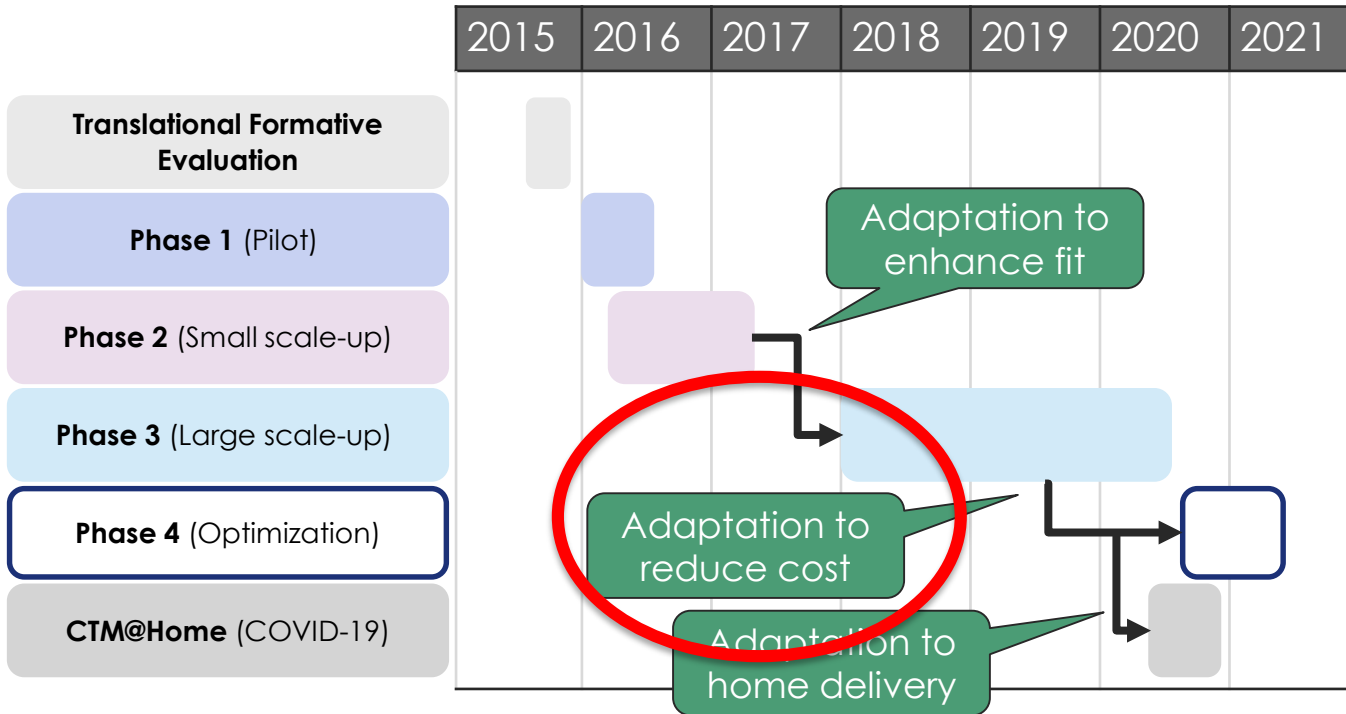
- What adaptation have you made to your intervention? To your implementation strategies?
- How do you balance fidelity to the original intervention with the diverse needs of implementers and the different contexts for delivery at broad scale?

*Stirman et al. 2013*  
*Castro et al 2004*  
*Harden et al. 2017*

# Questions



# Adapting Choose to Move



Mackey et al. JAPA 2018  
McKay et al. TJACSM 2019  
McKay et al. TJACSM 2017  
McKay et al. BMC Public Health 2018  
McKay et al. BJSM 2019  
Sims-Gould et al. BMC Public Health 2019  
Gray et al. Prev Sci 2020

# Framework for Reporting Adaptations and Modifications-Expanded\*

## PROCESS

### WHEN did the modification occur?

- Pre-implementation/planning/pilot
- Implementation
- Scale up
- Maintenance/Sustainment

### Were adaptations planned?

- Planned/Proactive (proactive adaptation)
- Planned/Reactive (reactive adaptation)

### WHO participated in the decision to modify?

- Political leaders
- Program Leader
- Funder
- Administrator
- Program manager
- Intervention developer/purveyor
- Researcher
- Treatment/Intervention team
- Individual Practitioners (those who deliver it)
- Community members
- Recipients

Optional: Indicate who made the ultimate decision.

### WHAT is modified?

- Content
- Modifications made to content itself, or that impact how aspects of the treatment are delivered
- Contextual
- Modifications made to the way the overall treatment is delivered
- Training and Evaluation
- Modifications made to the way that staff are trained in or how the intervention is evaluated
- Implementation and scale-up activities
- Modifications to the strategies used to implement or spread the intervention

### At what LEVEL OF DELIVERY (for whom/what is the modification made?)

- Individual
- Target Intervention Group
- Cohort/individuals that share a particular characteristic
- Individual practitioner
- Clinic/unit level
- Organization
- Network
- System/Community

### Contextual modifications are made to which of the following?

- Format
- Setting
- Personnel
- Population

### What is the NATURE of the content modification?

- Tailoring/tweaking/refining
- Changes in packaging or materials
- Adding elements
- Removing/skipping elements
- Shortening/condensing (pacing/timing)
- Lengthening/ extending (pacing/timing)
- Substituting
- Reordering of intervention modules or segments
- **Spreading (breaking up session content over multiple sessions)**
- Integrating parts of the intervention into another framework (e.g., selecting elements)
- Integrating another treatment into EBP (not using the whole protocol and integrating other techniques into a general EBP approach)
- Repeating elements or modules
- Loosening structure
- **Departing from the intervention ("drift") followed by a return to protocol within the encounter**
- **Drift from protocol without returning**

### Relationship fidelity/core elements?

- Fidelity Consistent/Core elements or functions preserved
- Fidelity Inconsistent/Core elements or functions changed
- Unknown

## REASONS

### SOCIOPOLITICAL

- Existing Laws
- Existing Mandates
- Existing Policies
- Existing Regulations
- Political Climate
- Funding Policies
- Historical Context
- Societal/Cultural Norms
- Funding or Resource Allocation/Availability

### ORGANIZATION/SETTING

- Available resources (funds, staffing, technology, space)
- Competing demands or mandates
- Time constraints
- Service structure
- Location/accessibility
- Regulatory/compliance
- Billing constraints
- Social context (culture, climate, leadership support)
- Mission
- Cultural or religious norms

### PROVIDER

- Race
- Ethnicity
- Sexual/gender identity
- First/spoken languages
- Previous Training and Skills
- Preferences
- Clinical Judgement
- Cultural norms, competency
- Perception of intervention

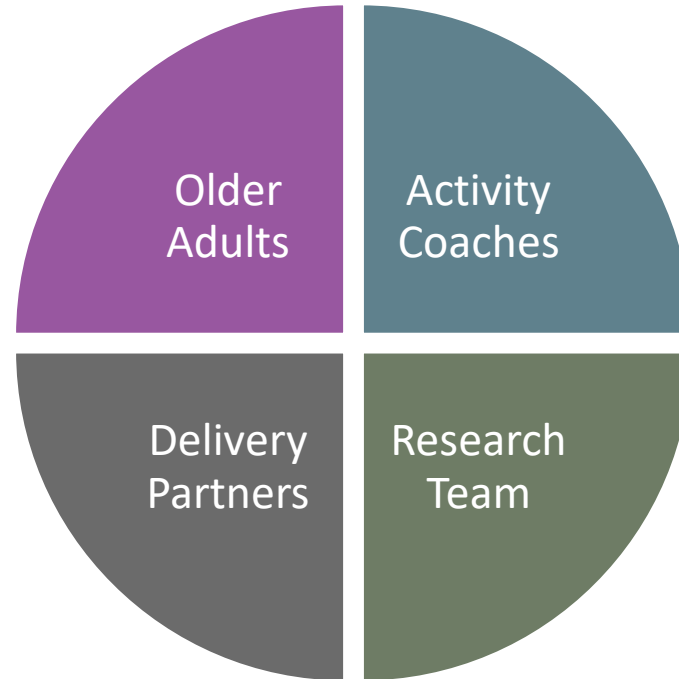
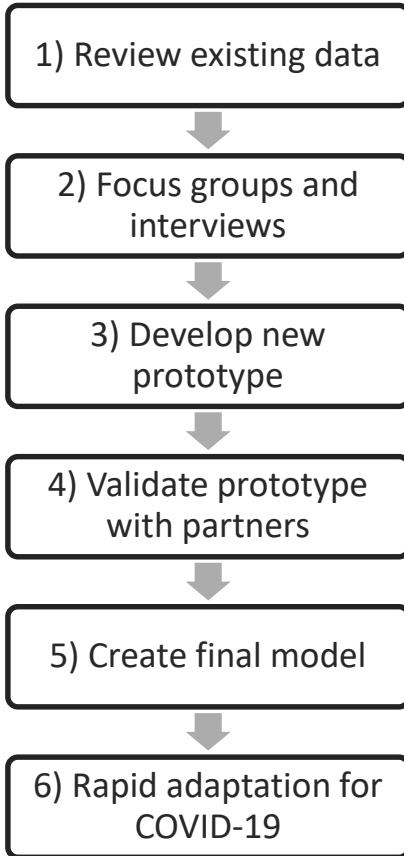
### RECIPIENT

- Race; Ethnicity
- Gender identity
- Sexual Orientation
- Access to resources
- Cognitive capacity
- Physical capacity
- Literacy and education level
- First/spoken languages
- Legal status
- Cultural or religious norms
- Comorbidity/Multimorbidity
- Immigration Status
- Crisis or emergent circumstances
- Motivation and readiness

### What was the goal?

- Increase reach or engagement
- Increase retention
- Improve feasibility
- Improve fit with recipients
- To address cultural factors
- Improve effectiveness/outcomes
- Reduce cost
- Increase satisfaction

# Methods





# Results - Final Model

## PHASE 3

## PHASE 4

6 months



3 months

60 min



30 min

5



8



**Core functions**

6



0

# Results – FRAME adaptation framework

**WHAT?** → Content, Context, Evaluation, Implementation Activities

## AT LEVEL OF INTERVENTION

- Content: Added, removed, reordered meeting content
- Context: group meetings only; online
- Evaluation: online data collection; modified outcomes

## AT LEVEL OF IMPLEMENTATION

- Online recruitment

**FIDELITY  
CONSISTENT**

# Reading List

1. McKay HA et al., Bright Spots, physical activity investments that work: Choose to Move: scaling up a physical activity model for older adults. Br J Sports Med 2018; 15:976-977. doi: [10.1136/bjsports-2017-098990](https://doi.org/10.1136/bjsports-2017-098990)
2. Gray SM et al., Getting Ready for Scale-Up of an Effective Older Adult Physical Activity Program: Characterizing the Adaptation Process. Prev Sci 2020; 3:355-65. doi: [10.1007/s11121-019-01085-3](https://doi.org/10.1007/s11121-019-01085-3)
3. McKay HA et al., Implementation of a co-designed physical activity program for older adults: positive impact when delivered at scale. BMC Public Health 2018; 18:1. doi: [10.1186/s12889-018-6210-2](https://doi.org/10.1186/s12889-018-6210-2)
4. Nettlefold LN et. al., 2021.Int J Environ Res Public Health, 18, 5182
5. Chambers DA et al., The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. Implementation Sci 2013; 8:1. doi: [10.1186/1748-5908-8-117](https://doi.org/10.1186/1748-5908-8-117)
6. Curran et al., Effectiveness-implementation hybrid designs: combining elements of clinical effectiveness and implementation research to enhance public health impact. Medical Care 2012; 50:217-226. doi: [10.1097/mlr.0b013e3182408812](https://doi.org/10.1097/mlr.0b013e3182408812)

# Reading List

7. Bopp M, Saunders RP, Lattimore D. The tug-of-war: fidelity versus adaptation throughout the health promotion program life cycle. *J Prim Prev.* 2013;34(3):193–207.

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# Thank you!

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