Logic Models, evaluation and systematic reviews
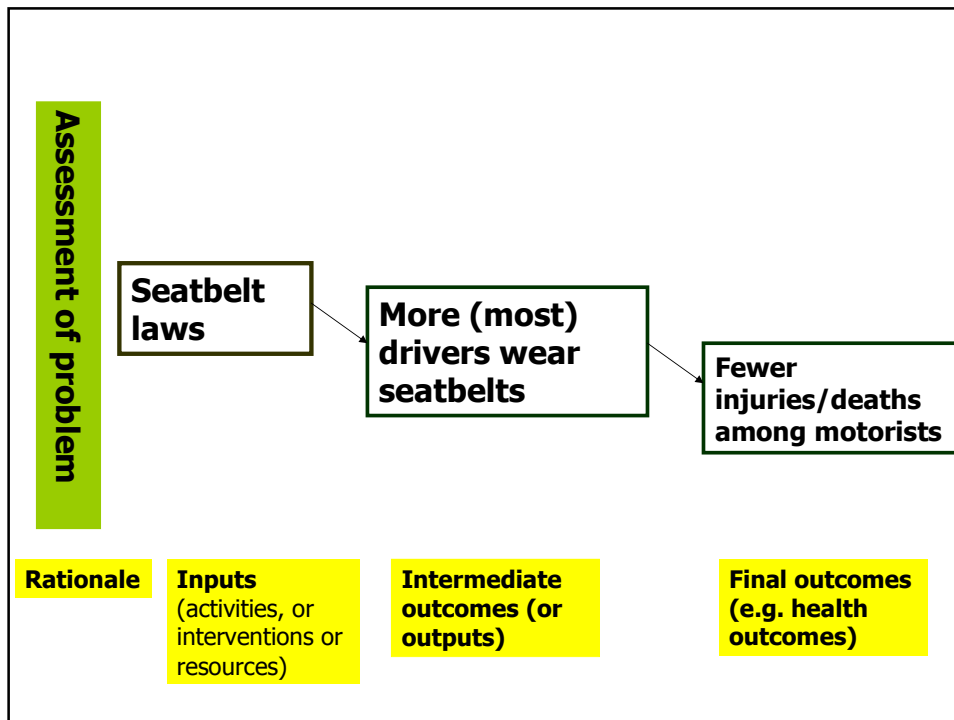
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What is a logic model?

- A description of our theory or assumptions about how an intervention affects outcomes (rather than a description of what happens in real life)
- It describes our "theory of change"

Assessment of problem

| Seatbelt laws | → | More (most) drivers wear seatbelts | → | Fewer injuries/deaths among motorists |

Rationale | Inputs (activities, or interventions or resources) | Intermediate outcomes (or outputs) | Final outcomes (e.g. health outcomes)
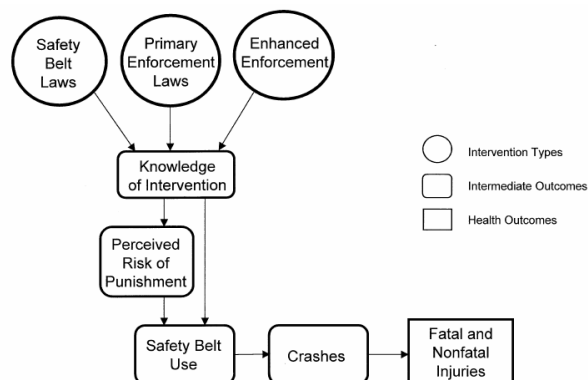
Why logic models?

- Theoretical plausibility
- Theory behind the intervention and why effects on sub populations (re: health equity) need to be considered
- Demonstrates the hypothesised relationship between interventions and their intended outcomes
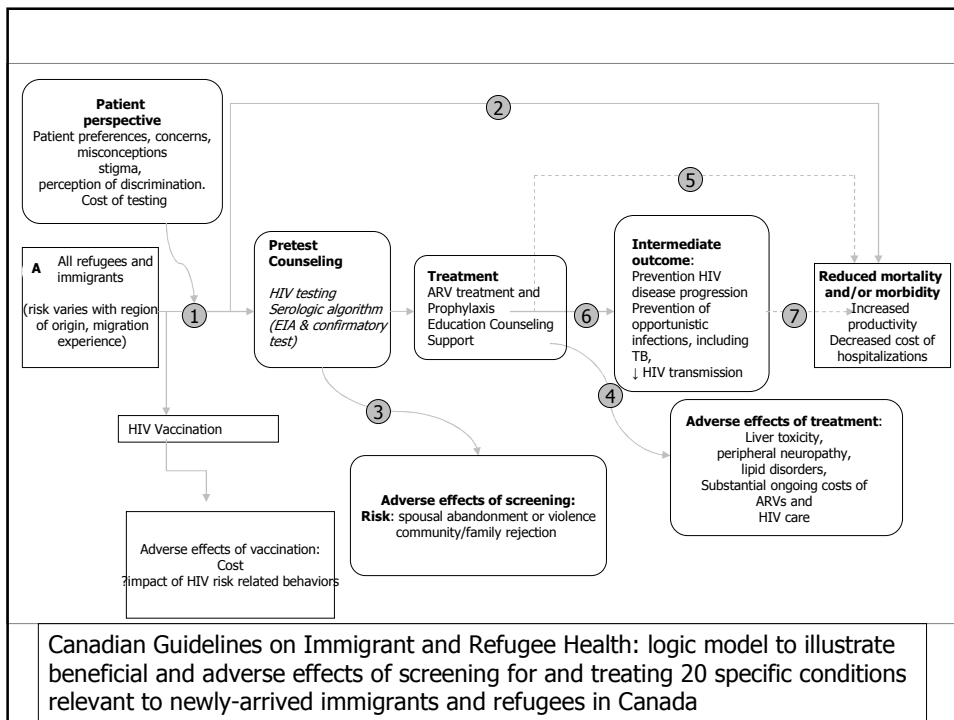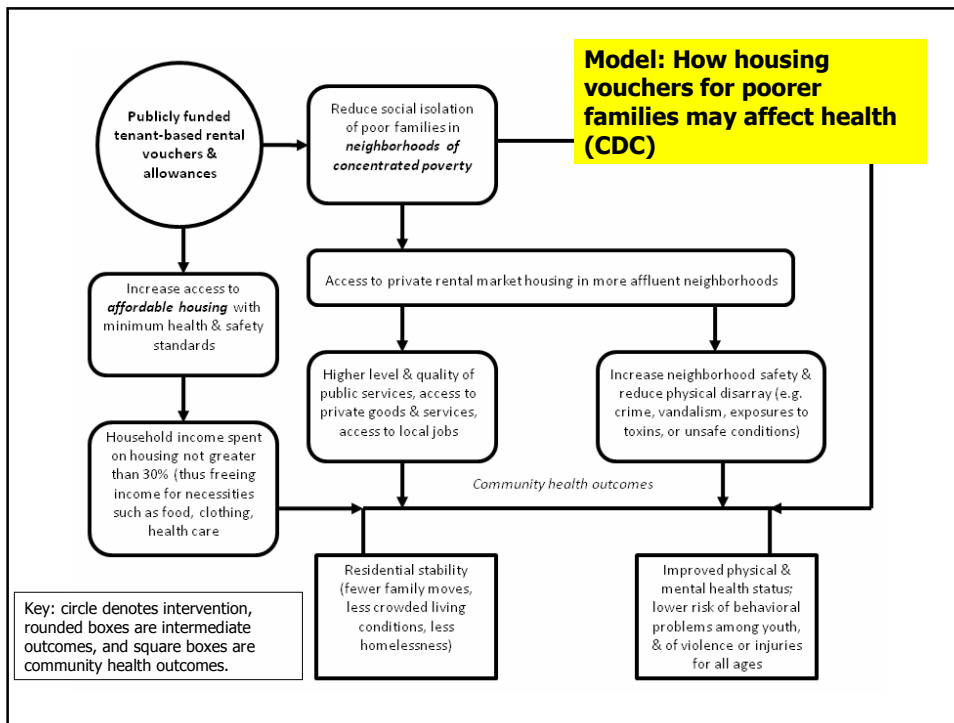
Developing a logic model

- Rarely developed "from scratch"
- May not always be appropriate
to finalize a logic model before
doing the review
    - Iterative process…
- Consulting stakeholders
- Reviewing existing theories
- Reviewing existing evidence


More detailed logic models- some examples

Dinh-Zarr et al. Reviews of Evidence Regarding Interventions to Increase the Use of Safety Belts. *Am J Prev Med* 2001;21(4S):48–65)

Diagram 1

Model: How housing vouchers for poorer families may affect health (CDC)

- Publicly funded tenant-based rental vouchers & allowances
- Reduce social isolation of poor families in *neighborhoods of concentrated poverty*
- Increase access to *affordable housing* with minimum health & safety standards
- Access to private rental market housing in more affluent neighborhoods
- Household income spent on housing not greater than 30% (thus freeing income for necessities such as food, clothing, health care
- Higher level & quality of public services, access to private goods & services, access to local jobs
- Increase neighborhood safety & reduce physical disarray (e.g. crime, vandalism, exposures to toxins, or unsafe conditions)

Community health outcomes

- Residential stability (fewer family moves, less crowded living conditions, less homelessness)
- Improved physical & mental health status; lower risk of behavioral problems among youth, & of violence or injuries for all ages

Key: circle denotes intervention, rounded boxes are intermediate outcomes, and square boxes are community health outcomes.

Diagram 2

Patient perspective
Patient preferences, concerns, misconceptions stigma, perception of discrimination. Cost of testing

A All refugees and immigrants (risk varies with region of origin, migration experience)

Pretest Counseling
HIV testing Serologic algorithm (EIA & confirmatory test)

Treatment
ARV treatment and Prophylaxis Education Counseling Support

Intermediate outcome:
Prevention HIV disease progression Prevention of opportunistic infections, including TB, ↓ HIV transmission

Reduced mortality and/or morbidity
Increased productivity Decreased cost of hospitalizations

HIV Vaccination

Adverse effects of screening:
Risk: spousal abandonment or violence community/family rejection

Adverse effects of treatment:
Liver toxicity, peripheral neuropathy, lipid disorders, Substantial ongoing costs of ARVs and HIV care

Adverse effects of vaccination:
Cost
?impact of HIV risk related behaviors

Canadian Guidelines on Immigrant and Refugee Health: logic model to illustrate beneficial and adverse effects of screening for and treating 20 specific conditions relevant to newly-arrived immigrants and refugees in Canada

Logic model for the "Pawsitive Directions" Canine Program at Nova Institution for Women

- The next logic model derives from an evaluation of the "Pawsitive Directions" Canine Programme for women prisoners.

- This is a canine-handler training program that introduces women inmates to the basics of dog care and training, based on the principles of pet-facilitated therapy.
- **http://www.csc-scc.gc.ca/text/rsrch/reports/r108/r108-eng.shtml**
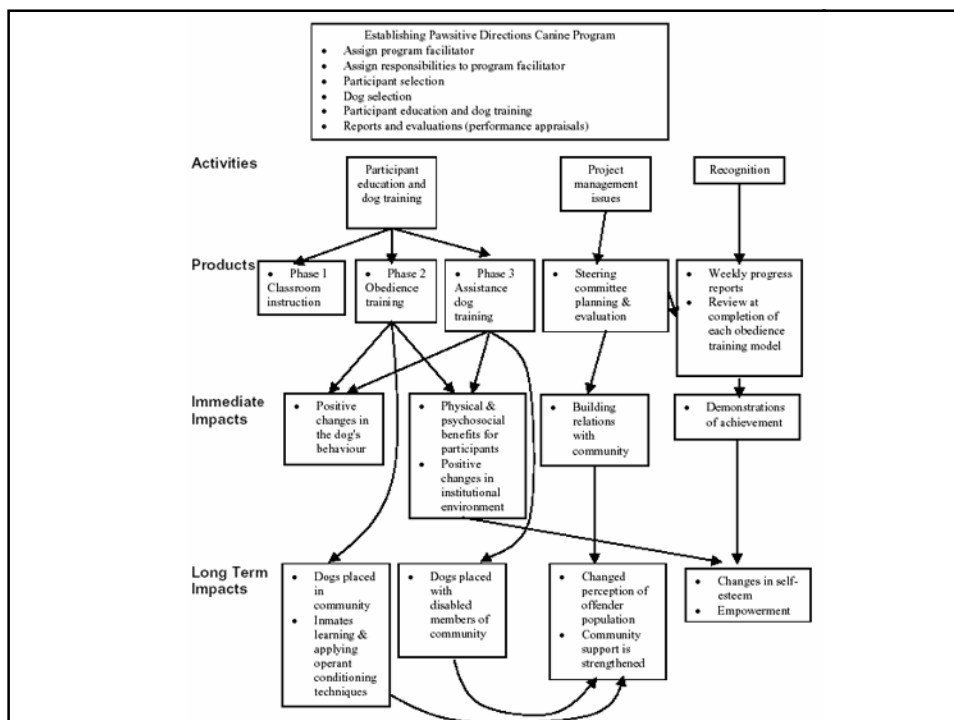
Question: Is this a logic model?
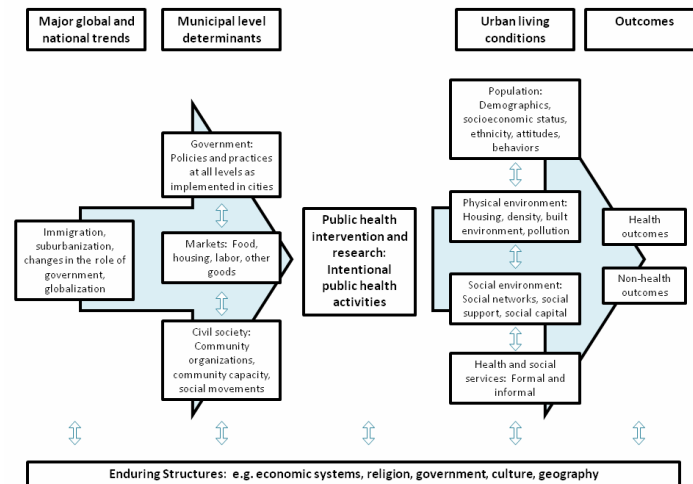
Systematic review of slum upgrading strategies to improve living conditions in developing world cities

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Re-cap:
Added value of logic models

- Clarifying thinking! (*What are we thinking about how this will work?*)

- Checking consensus (*Are we all thinking the same thing?*)

- Refining review question (*what components/pathways are we/should we be focussing on in this review, or evaluation?*)

- Focussing on components (*Should we "lump" or "split"?*)

- Guiding inclusion & exclusion criteria (*"What sort of evidence do we need, and are we likely to find about the stages?*)

...Added value of logic models (continued)

- Justifying need for subgroup analyses (e.g. according to sex/gender, socioeconomic status) (*"What works for whom, in what circumstances"*)

- Explaining the rationale behind surrogate outcomes used in the review (*Related to the previous point*)

- Interpreting results based on intervention theory and systems thinking

- Illustrating how harms, feasibility, and cost issues are connected with interventions

- Dissemination: Communicating with others about the intervention and the review findings

Particularly useful…

- …when it is difficult to work out what the actual intervention "is"

- …when you know nothing about an intervention…but you have to do a review or an evaluation

Background: Prevalence of the problem or condition, current context

Data on prevalence of injury; analysis of policy or other context in which the intervention is being implemented
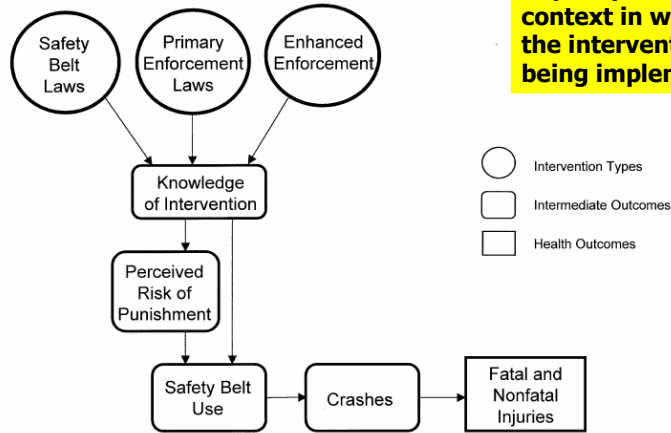
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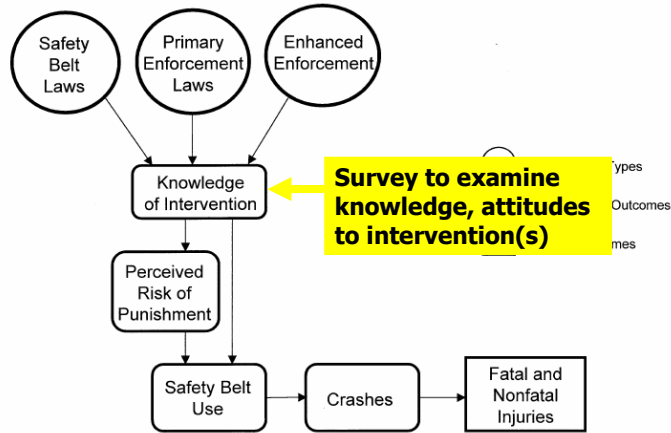

Background: Prevalence of the problem or condition, current context

Information on types of intervention – how implemented, flexibility in implementation
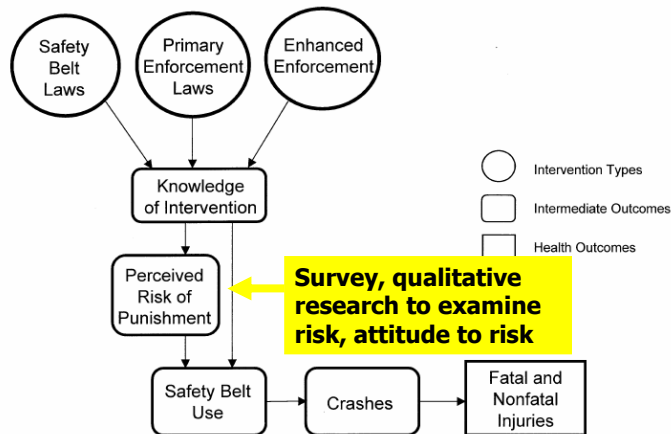
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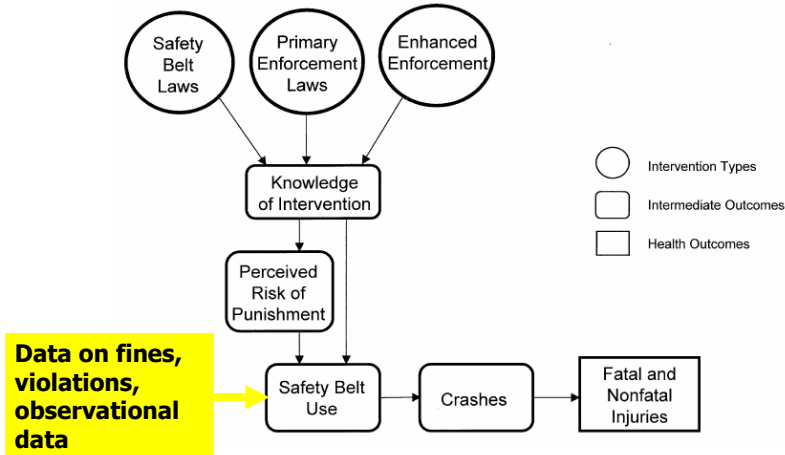**Background: Prevalence of the problem or condition, current context**

Survey to examine knowledge, attitudes to intervention(s)

Dinh-Zarr et al. Reviews of Evidence Regarding Interventions to Increase the Use of Safety Belts. Am J Prev Med 2001;21(4S):48–65)

Background: Prevalence of the problem or condition, current context

Survey, qualitative research to examine risk, attitude to risk
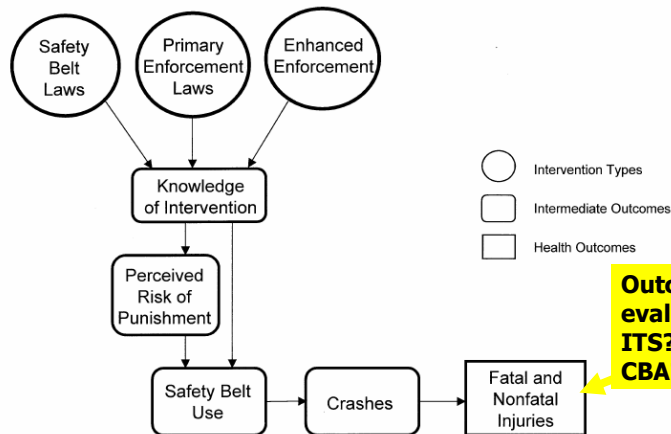
Dinh-Zarr et al. Reviews of Evidence Regarding Interventions to Increase the Use of Safety Belts. Am J Prev Med 2001;21(4S):48–65)

Background: Prevalence of the problem or condition, current context

Safety Belt Laws

Primary Enforcement Laws

Enhanced Enforcement

○ Intervention Types
▢ Intermediate Outcomes
▢ Health Outcomes

Knowledge of Intervention

Perceived Risk of Punishment

Data on fines, violations, observational data

Safety Belt Use → Crashes → Fatal and Nonfatal Injuries

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Outcome evaluation: ITS? RCT? CBA?

Dinh-Zarr et al. Reviews of Evidence Regarding Interventions to Increase the Use of Safety Belts. Am J Prev Med 2001;21(4S):48–65)

An example…in the United States, the Robert Wood Johnson Foundation has suggested a range of strategies to combat childhood obesity in schools and communities*

- *Increase the availability of healthy foods at home*
- *Offer healthy food choices at schools*
- *Increase physical activity in schools*
- *Increase physical activity in communities*
- *Reduce children's screen time at home*
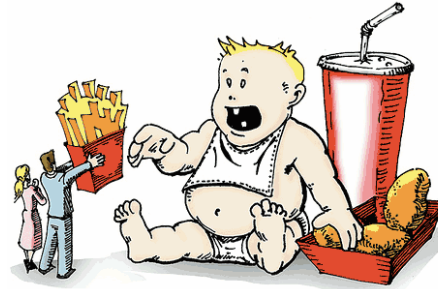
* Stroup et al. 2009: Reversing the Trend of Childhood Obesity Prev Chronic Dis 2009;6(3)
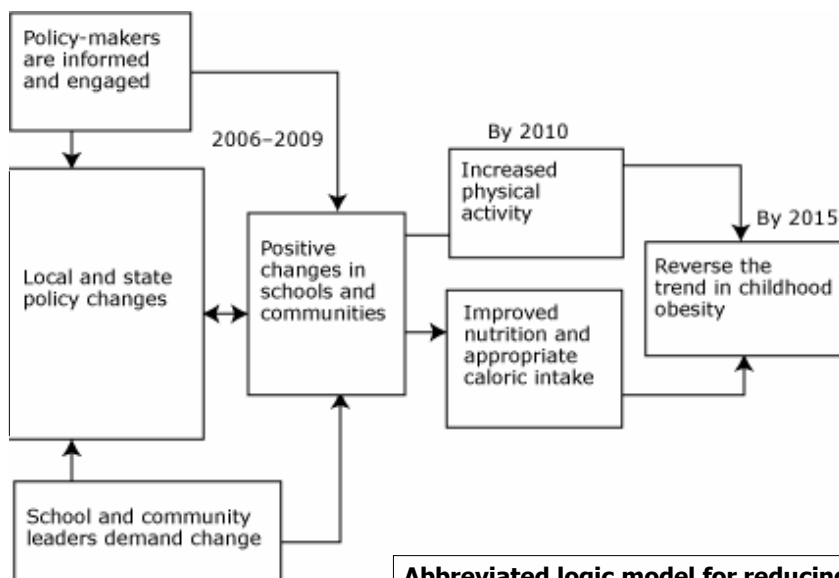
Abbreviated logic model for reducing childhood obesity (Stroup et al., 2009)