Diabetes prevention: The global spread and dissemination of effective programs

Brian Oldenburg
Professor of International Public Health
Monash University
AUSTRALIA
brian.oldenburg@monash.edu


Diabetes
the health tsunami
of the 21st century


366 million


$465 billion

A crisis of our own creation


4 out of 5 low and middle income countries


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Diabetes Prevalence in Kerala and China

Age group	Kerala, India [1]		China [2]	
	Male	Female	Male	Female
20-29	0.0	3.7	2.6	1.2
30-39	7.9	10.4	5.2	3.0
40-49	16.0	17.9	11.1	7.3
50-59	26.1	40.6	15.5	13.1
60-69	35.1	41.0	18.1	20.3
70+	NA	NA	21.8	22.0
Total	15.6	19.4	10.6	8.8

1. Thankappan K R et al Indian J Med Res 2010; 131:53-63 (adapted). 2. Yang W et al N Engl J Med 2010; 362: 1090-1101.

Two key challenges

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1. To develop programs that are more feasible for ‘real world’ implementation

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2. To extend the global reach of programs, particularly to ‘resource poor’ countries, where the burden is substantial

- **How to do this?**

Evidence from efficacy trials for lifestyle prevention in 'high risk' individuals

Intervention	Risk reduction*	Lifestyle targets
1. Fin-DPS (2001) Diet + PA + WL / Control	4 yrs: 58% 7 yrs: 43%	Diet: fibre ↑, total fat ↓, saturated fat ↓ Physical activity: varied, moderate ↑ Weight ↓
2. US-DPP (2002) Diet + PA + WL / MED / Control	3 yrs: 58% (LS) 31% (MED)	Diet: "healthy", calories↓, fat ↓ Physical activity: varied, moderate ↑ Weight ↓
3. IDPP (2006) Diet + PA / MED / Diet + PA + MED / Control	2,5 yrs: 28,5% (LS) 26.4% (MED) 28.2% (LS + MED)	Diet: calories↓, refined carbohydrates ↓, sugar ↓, fibre ↑, fat ↓ Physical activity: brisk walking ↑
3. Japanese Prevention Trial (2005) Diet + PA + WL / Control	4 yrs: 67.4%	Diet: vegetables ↑, amount of food ↓, fat ↓, alcohol ↓ Physical activity: : varied, moderate ↑ Weight ↓
4. Da-Qing, China, (1997) Diet / PA / Diet + PA/ Control	Cumulative 6-yr incidence: 41-46% vs. 68%	Diet: vegetables ↑, sugar ↓, alcohol ↓ Physical activity: varied

*Relative risk reduction, except in the Da-Qing Study, which reported cumulative incidence rate

Tuomilehto et al., 2001; Knowler et al., 2002; Ramachandran et al.; 2006, Kosaka et al., 2005; Pan et al., 1997

What the efficacy trials for diabetes prevention demonstrate?

- Lifestyle change is more effective than drug treatment in preventing/delaying progressing T2DM in high risk individuals

- Among leaner Asian populations, T2D risk is significantly reduced despite relatively small overall changes in risk patterns
  - i.e. Healthier diet and increased physical activity have a positive influence on risk even when weight changes are small

How to ’scale up’?

- Efficacy trials mostly tested interventions that are too costly and intensive to be implemented in ”real world” settings
  - **Fin-DPS** had a median 20 individual counseling sessions by a dietician (with a masters level university degree) + free access to gym
  - **US DPP** was delivered by ”case managers”, with 16 sessions over 24 weeks + individual follow-up sessions every 2 months + supervised physical activity sessions
  - **Da-Qing Study** had group counseling weekly for first month, monthly for 3 months and thereafter every 3 months + individual dietary counseling by physician

From efficacy to implementation

- Implementation trials started quickly emerging around the world from early 2000's
- Variety of settings, target groups, delivery modes…
- Standardised risk tests to screen participants at risk
- Small to moderate effects of interventions on risk factors
- Main emphasis on testing intervention – Processes that would guarantee systematic identification, counseling and follow-up not developed

Finnish DPS – Challenges for replication?

- **Resource-intensive**
  - Individual counselling by licensed dieticians
  - 3-year program
  - Median number of appointments 20
  - 20% of participants assigned to VLC-diet
  - Free access to gym and personal training program

- **Unrealistic for implementation in the primary health care setting**

Where??


Greenland Sea
Norwegian Sea
ICELAND
NORWAY
SWEDEN
FINLAND
RUSSIA
ESTONIA
LATVIA
LITHUANIA
BELARUS
North Sea
DENMARK
UNITED KINGDOM
IRELAND
NETHERLANDS
GERMANY
POLAND
UKRAINE
BELGIUM
LUX.
FRANCE
CZECH REPUBLIC
SLOVAKIA
MOLDOVA
AUSTRIA
HUNGARY
ROMANIA
SWITZ.
SLOVENIA
CROATIA
Serbia
BULGARIA
ITALY
SPAIN
TURKEY
GREECE
Mediterranean Sea
MOROCCO
ALGERIA
TUNISIA
MALTA


Hartola
Sysmä
Padasjoki
Heinola
Asikkala
Hämeen-koski
Hollola
Lahti
Nastola
Iitti
Kärkölä
Orimattila
Artjärvi
Pukkila

Ikihyvä
PÄIJÄT-HÄME 2002 - 2012
TUTKIMUS- JA KEHITTÄMISHANKE

GOAL Program for Good Ageing

GOAL Lifestyle Implementation Trial

- To implement the DPS findings in primary health care setting
- Aiming to change preventive practices and to provide tools for professionals
- **6 x 2-hour task-oriented group education and lifestyle counselling sessions over 8 months (socio-behavioural intervention)**

GOAL Implementation Trial:

Summary of findings

- Comparable outcomes to DPS

Absetz, P., Valve, R., Oldenburg, B., et al. Type 2 diabetes prevention in the “real world”: One-year results of the GOAL implementation trial. *Diabetes Care* 30, 2465-2470, 2007.

Absetz, P., Oldenburg, B., Hankonen, N., et al. Type 2 diabetes prevention in the “real world”: Three-year results of the GOAL implementation trial. Diabetes Care, 2009; 32 (8): 1418-20.

The “spread” of diabetes prevention programs from Finland to Australia

1. Diabetes Prevention Study (DPS in Finland)
2. GOAL program (Finland)
3. **Diabetes Prevention Program (DPP in Australia) – a ‘real’ world implementation trial in Australia**
4. “Scaling up” in Finland and Australia

Diabetes Prevention Program (DPP)(Australia)

- **Adapted from GOAL Program**
- **Setting**: Greater Green Triangle region of rural Australia
- **Participants:** 343 at risk individuals
  Recruited in General Practice reception areas
  FINDRISK risk score ≥ 12
- **Intervention**: 6 x 90 minute task-oriented group sessions over eight months
- **Theories:** Health Action Process Approach (HAPA), self-regulation theory, social learning theory, trans-theoretical theory of stages of change, empowerment-oriented counselling, goal-setting approach, self-efficacy and self-evaluation

Diabetes Prevention Program (DPP)(Australia)

- Comparable outcomes to DPS and GOAL programs in Finland

"Spread" of diabetes lifestyle prevention programs from Finland to Australia – How did this happen?

1. Diabetes Prevention Study (DPS in Finland)
2. GOAL program (Finland)
3. Diabetes Prevention Program (DPP in Australia)
4. "Scale up" in Finland and Australia
5. Other countries….

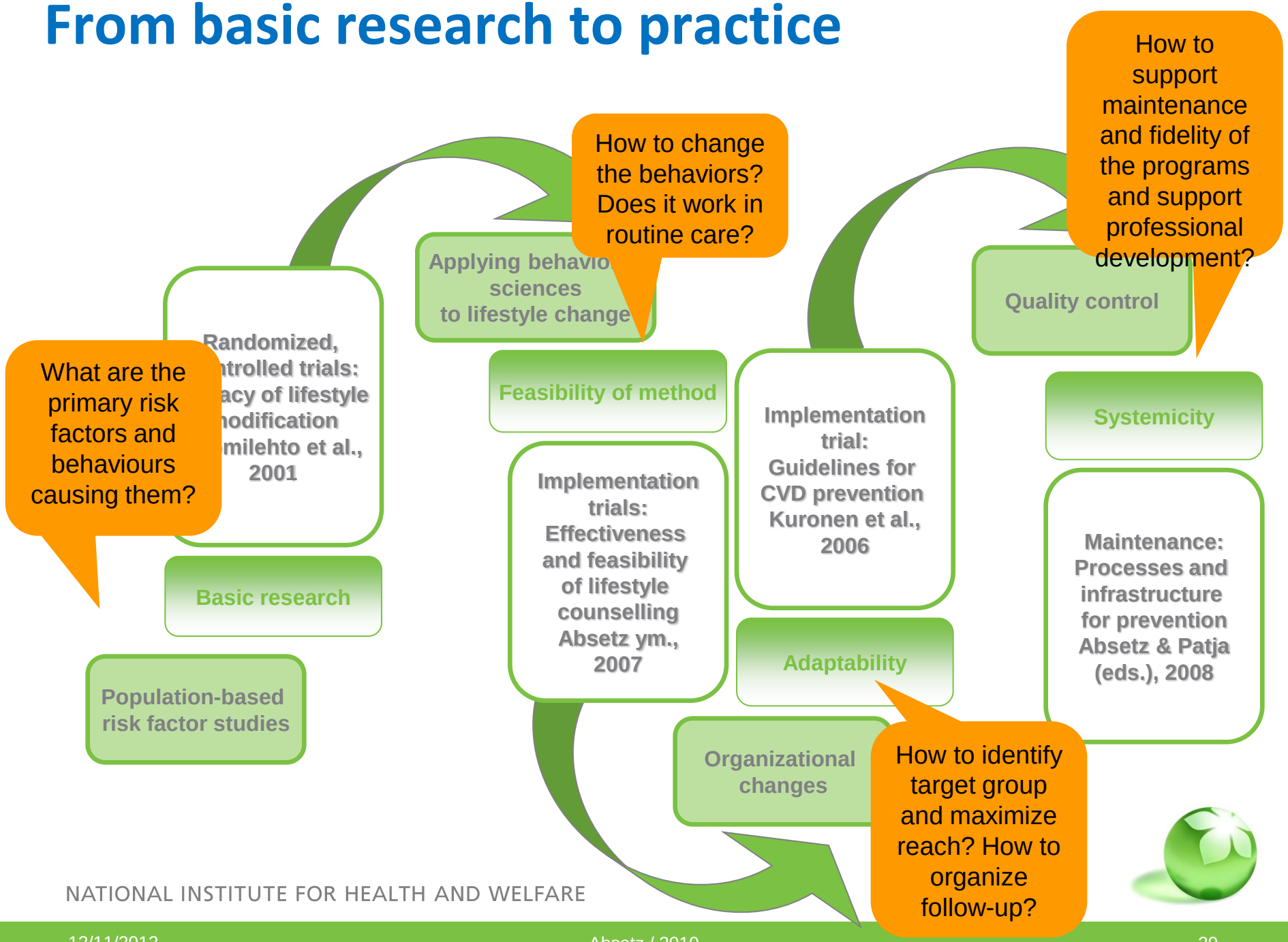
(**Oldenburg B et al.** The spread of diabetes prevention programs around the world. *Translational Behavioral Medicine*, 2011, 1(2): 270-282)

Two key challenges

1. To develop programs that are more feasible for ‘real world’ implementation

- **How to do this?**

From basic research to practice



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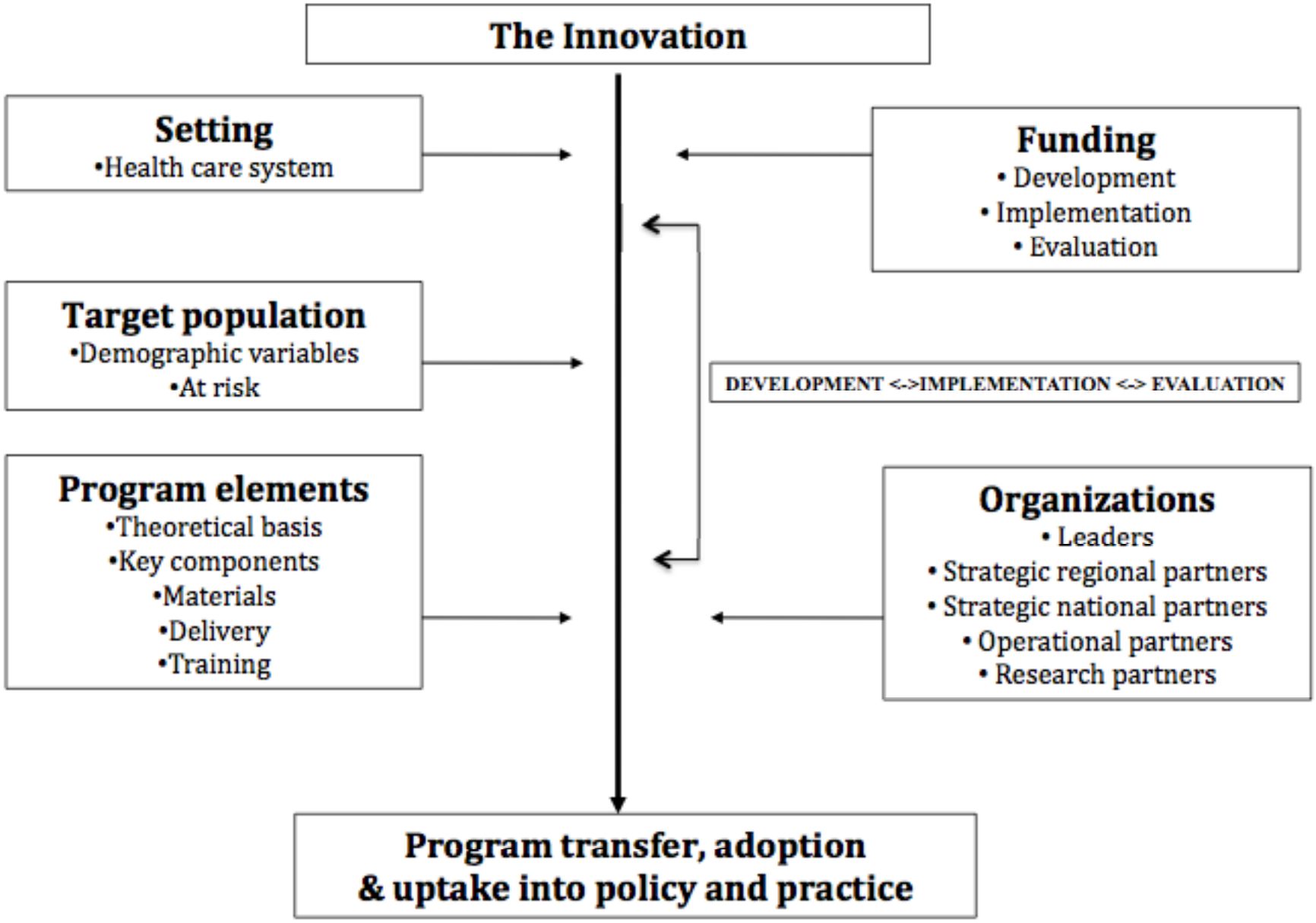
Lessons learnt from this series of trials – from efficacy to 'scaling up' (A global natural experiment)

- Programs evolve and are refined over time – How to maintain intervention impact??
- Need to plan for barriers and enablers to program adoption and international 'spread'
- Different health care systems and cultures between countries make a difference
- Vibrant collaboration between researchers and program leaders across countries allowed for swift transfer and adoption of program (<10 yr)


The Innovation
Setting
•Health care system
Funding
• Development
• Implementation
• Evaluation
Target population
•Demographic variables
•At risk
DEVELOPMENT <->IMPLEMENTATION <-> EVALUATION
Program elements
•Theoretical basis
•Key components
•Materials
•Delivery
•Training
Organizations
• Leaders
• Strategic regional partners
• Strategic national partners
• Operational partners
• Research partners
Program transfer, adoption
& uptake into policy and practice

- The Finland – Australian 'story' – the spread of diabetes prevention programs between Finland and Australia (2 very developed countries)

- **How to transfer such programs to LMICs such as India and China?**
  - **currently, a very small evidence base for the cultural and adaptation of such programs in LMICs**

Some key questions

- How to tailor programs to different communities, settings, cultures and countries?
- Distinguishing those program components that should be standardized VS those that may be tailored to local settings, needs, and opportunities?
- How to evaluate the ‘success’ of contexualisation?
- What does treatment fidelity mean when interventions are in diverse cultural contexts?