

# The Prevention of Chronic Non-Communicable Diseases: Generating Evidence and Supporting Decision Making for Public Policy

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# Overview of talk

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The problem – using diabetes as an example

Generating evidence

- Policy formulation and implementation
- Impact on outcomes

Supporting policy decision making

- Use of modelling

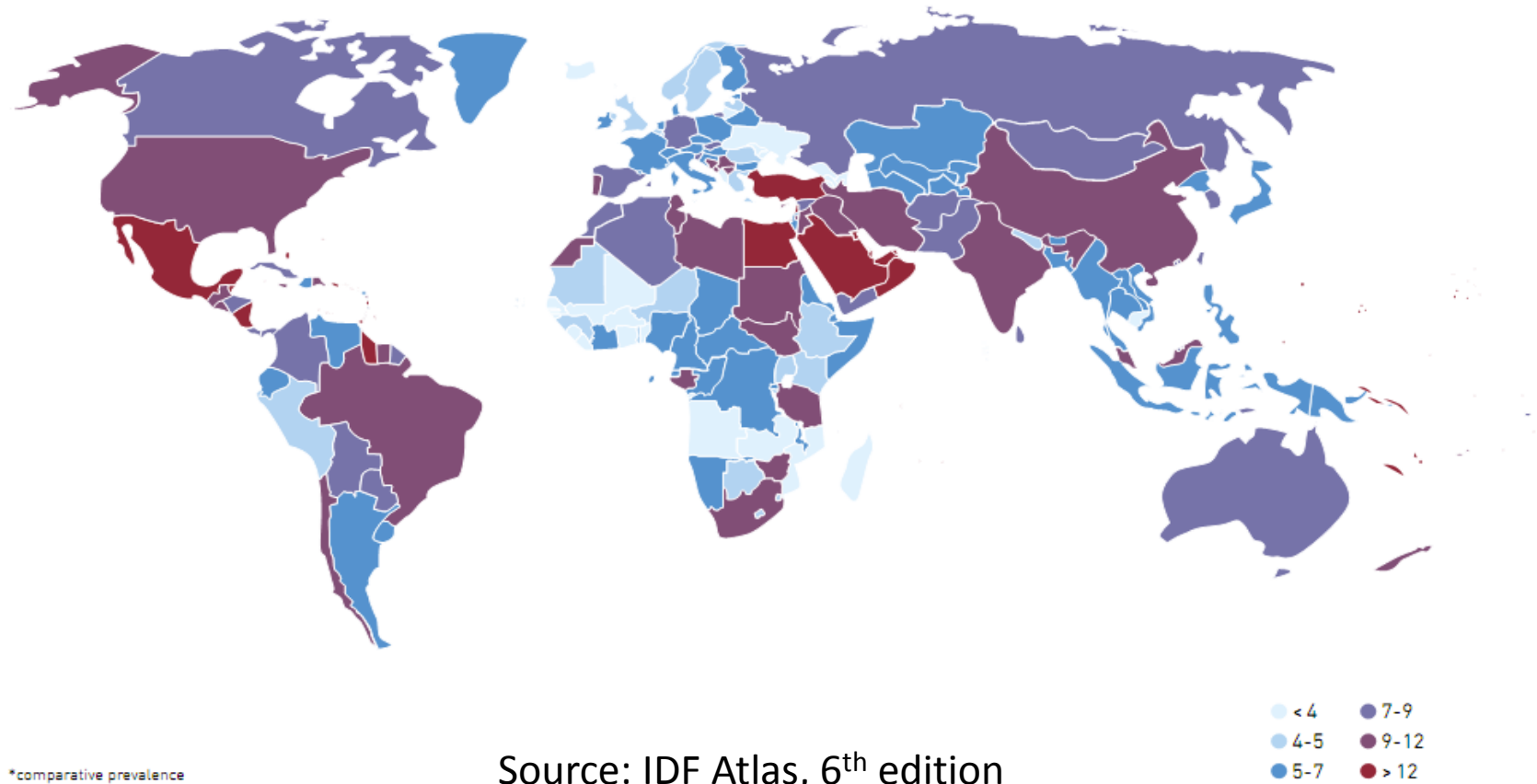
# The problem

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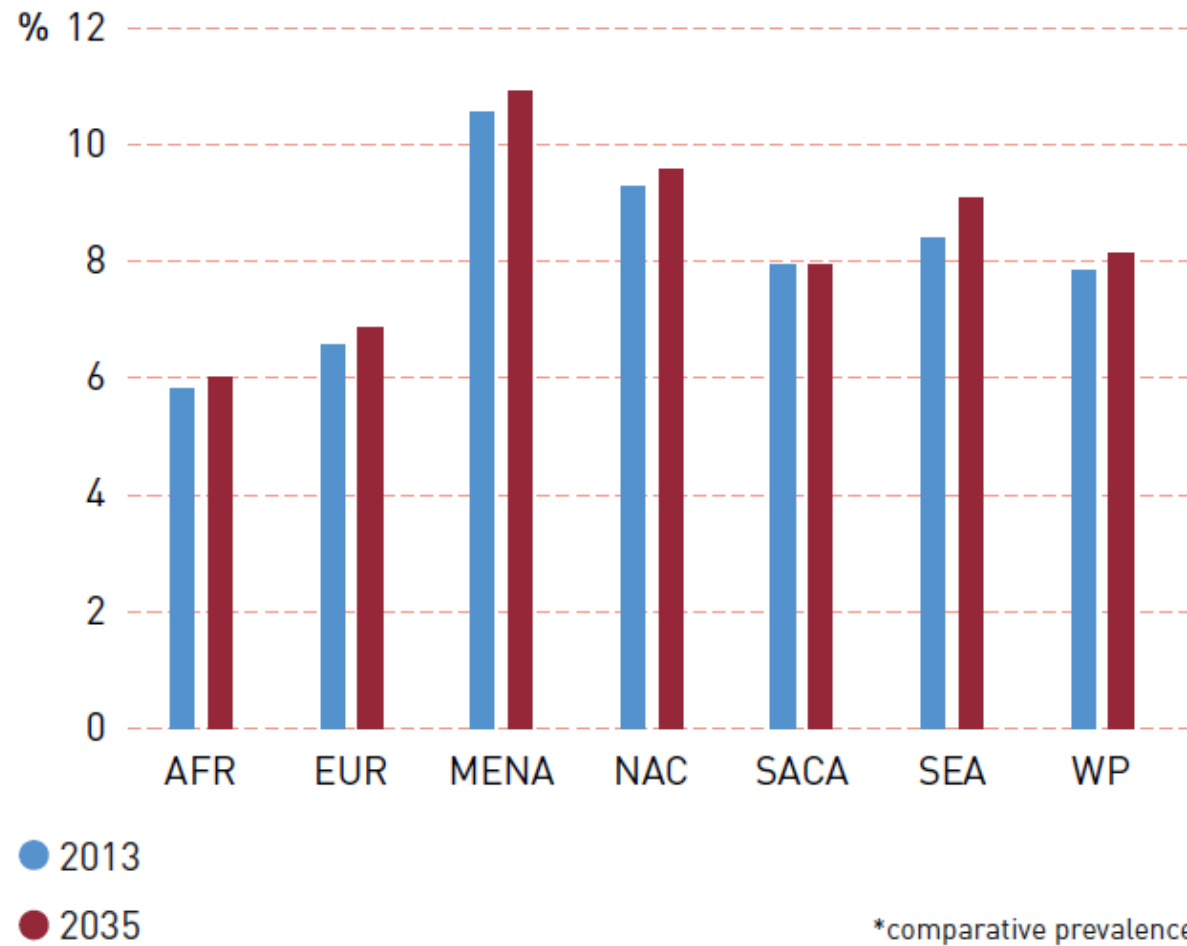
USING DIABETES AS AN EXAMPLE

# Prevalence estimates of diabetes, 20-79 years (%), 2013

Map 2.1 Prevalence\* (%) of diabetes in adults (20-79 years), 2013

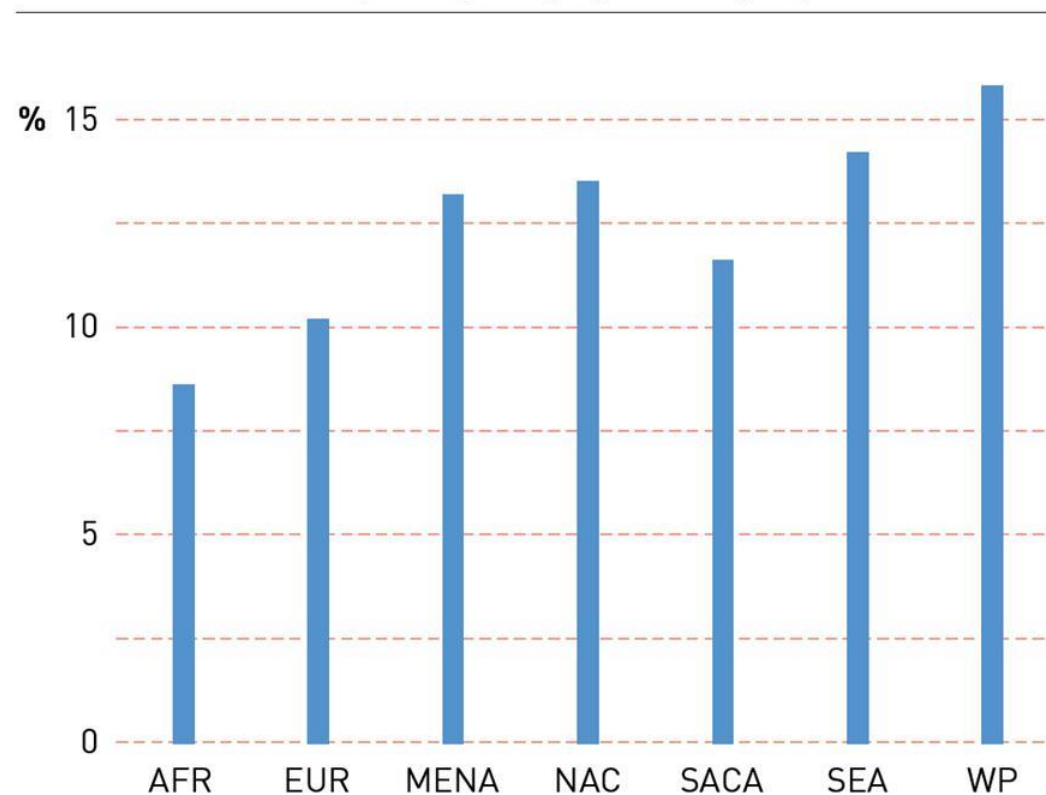


**Figure 2.1** Prevalence\* (%) of diabetes (20-79 years)  
by IDF Region, 2013 and 2035



Source: IDF Atlas, 6<sup>th</sup> edition

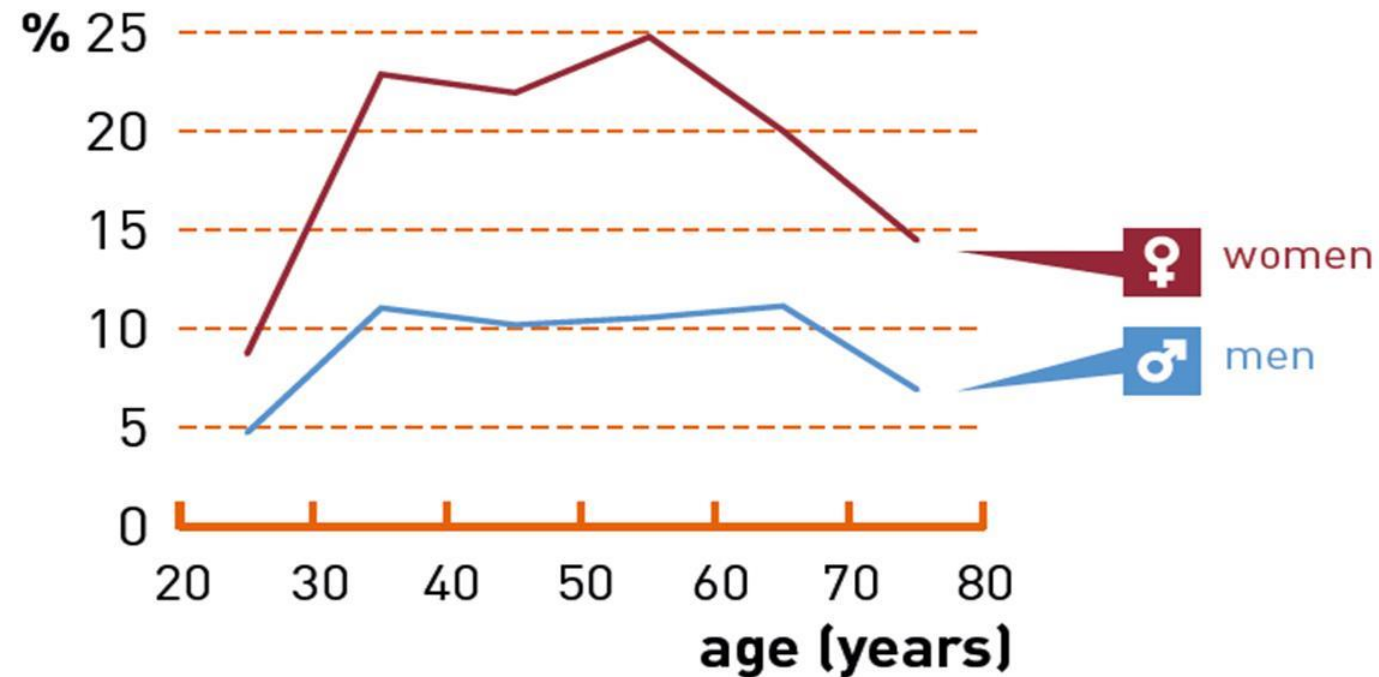
# Diabetes related mortality as a percentage of all deaths, by region, 2013



Attributable mortality based on relative risk of death in people with diabetes

# Percentage of total deaths due to diabetes, MENA region

Percentage of all-cause mortality due to diabetes  
by age (20-79 years) and sex:

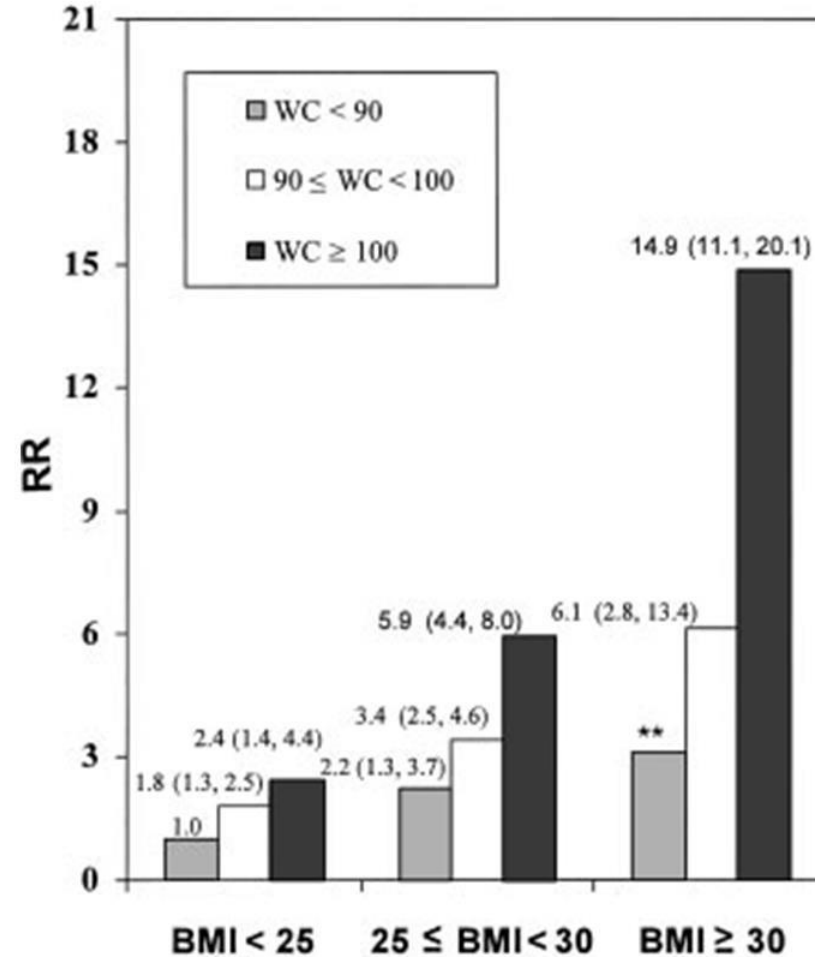


# Risk factors for Type 2 diabetes

<b>Modifiable risk factors</b>	<b>Non-modifiable risk factors</b>
Overweight & obesity	Age
Physical inactivity	Sex
Dietary factors	Family history type 2 diabetes
Alcohol consumption	Genes/genetic markers
Tobacco smoking	Previous gestational diabetes
Previously identified glucose intolerance (IFG & IGT)	Ethnicity
Prenatal and early life influences	



# BMI, waist circumference, and relative risk of incident type 2 diabetes



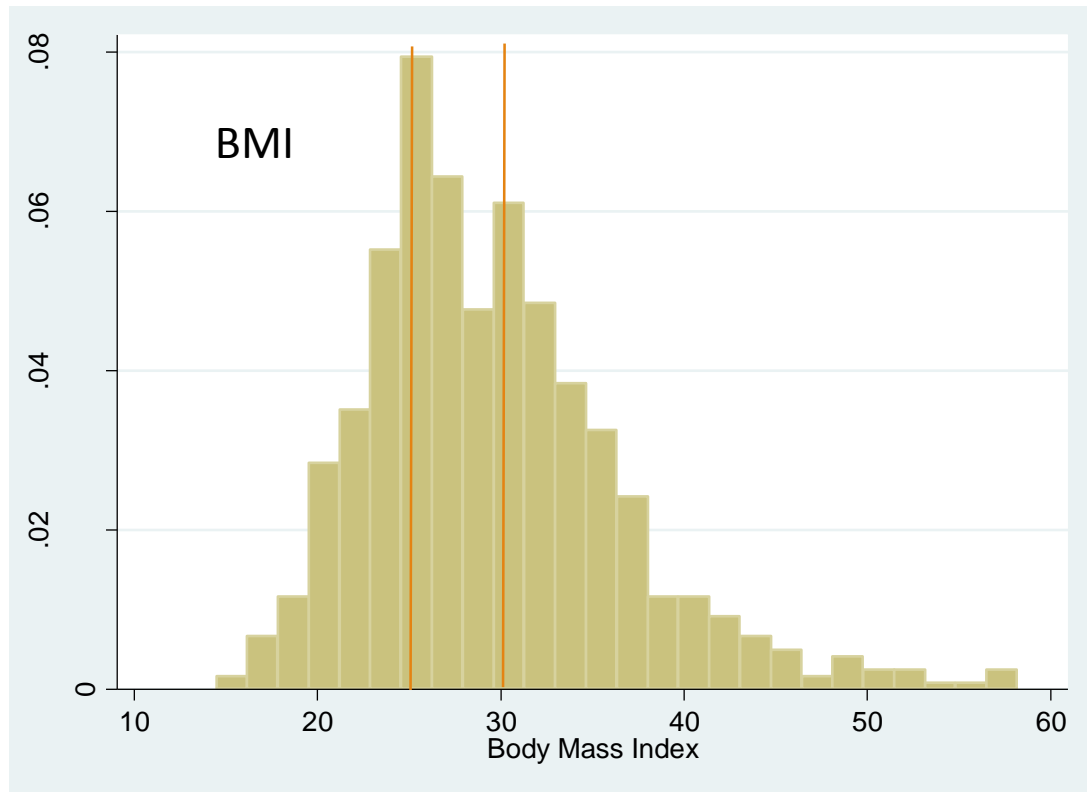
# Reduced risk of Type 2 diabetes in individuals at high risk

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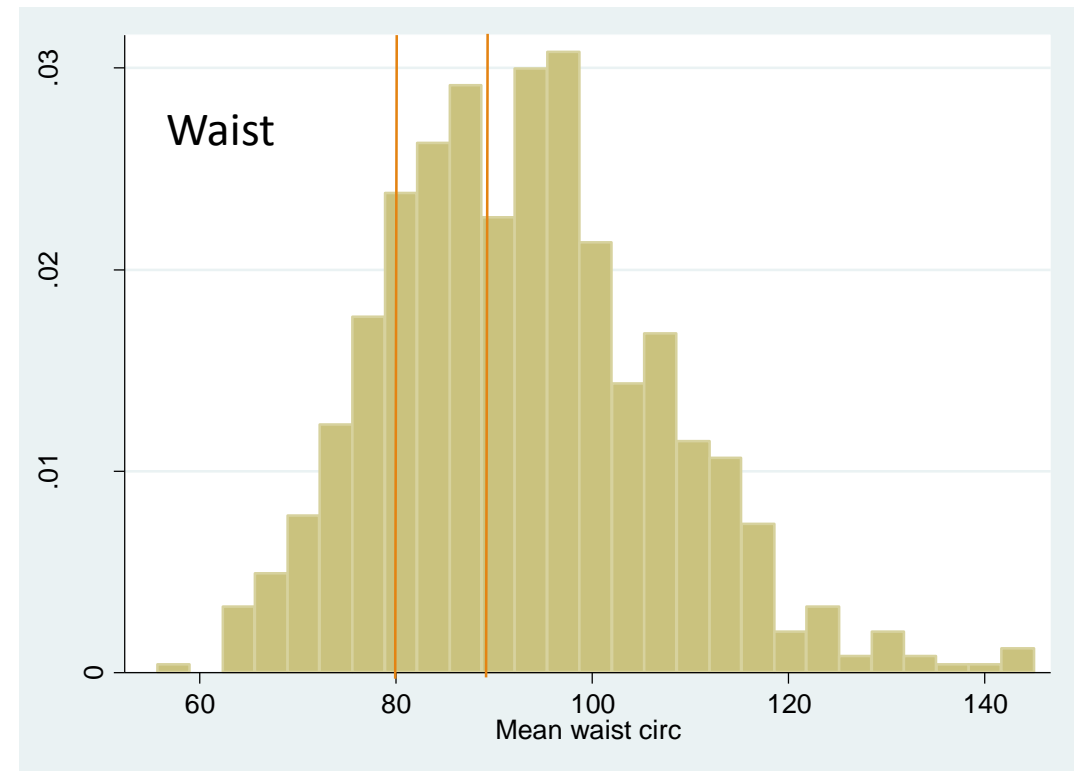
- 17 studies
- Reduced risk in intervention group
  - Life style intervention: 0.51 (0.44 – 0.60)
  - Oral DM drugs: 0.70 (0.62 – 0.79)
- Numbers need to treat (over 3 to 6 years)
  - Life style 6.4
  - Pharma 10.8



# Body mass index and waist circumference in women ( $\geq 25$ yrs) in Barbados



BMI  $\geq 30$ : 43.4% (39.5, 47.3)

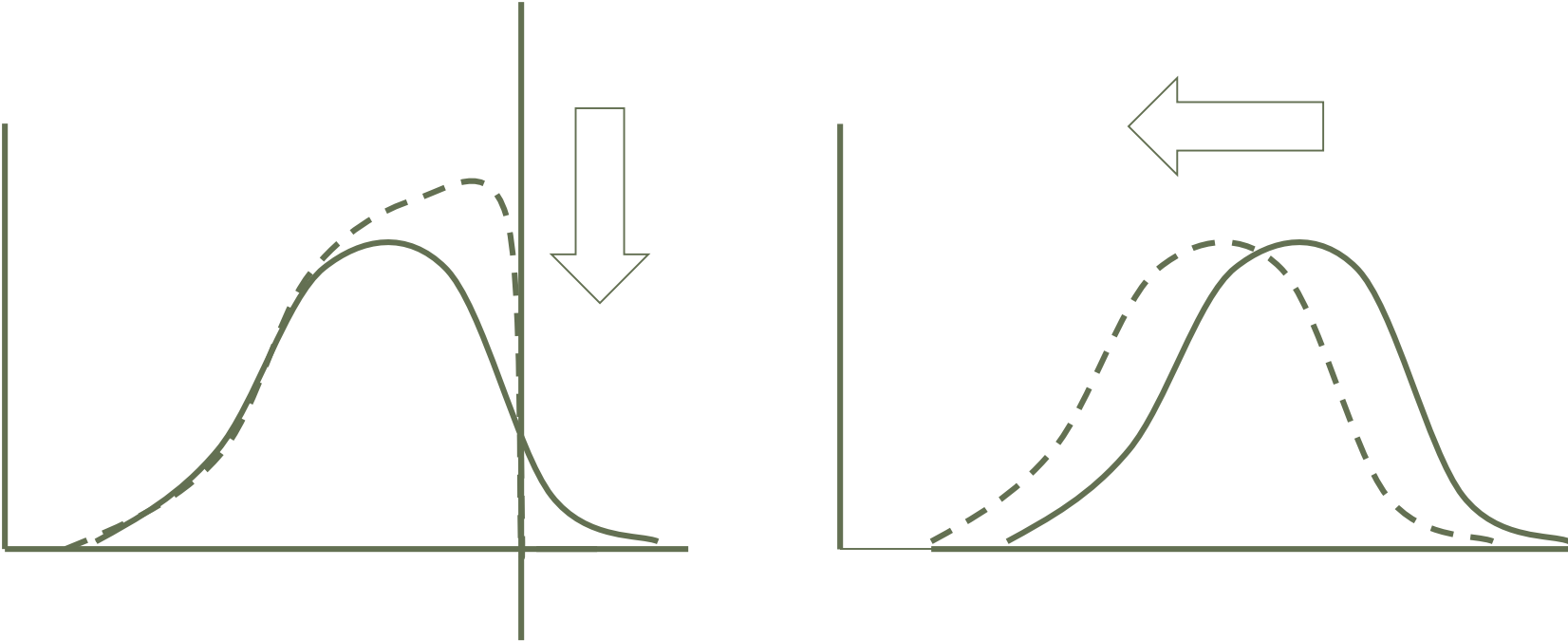


Waist  $\geq 88$ cm: 61.7% (58.0, 65.2)

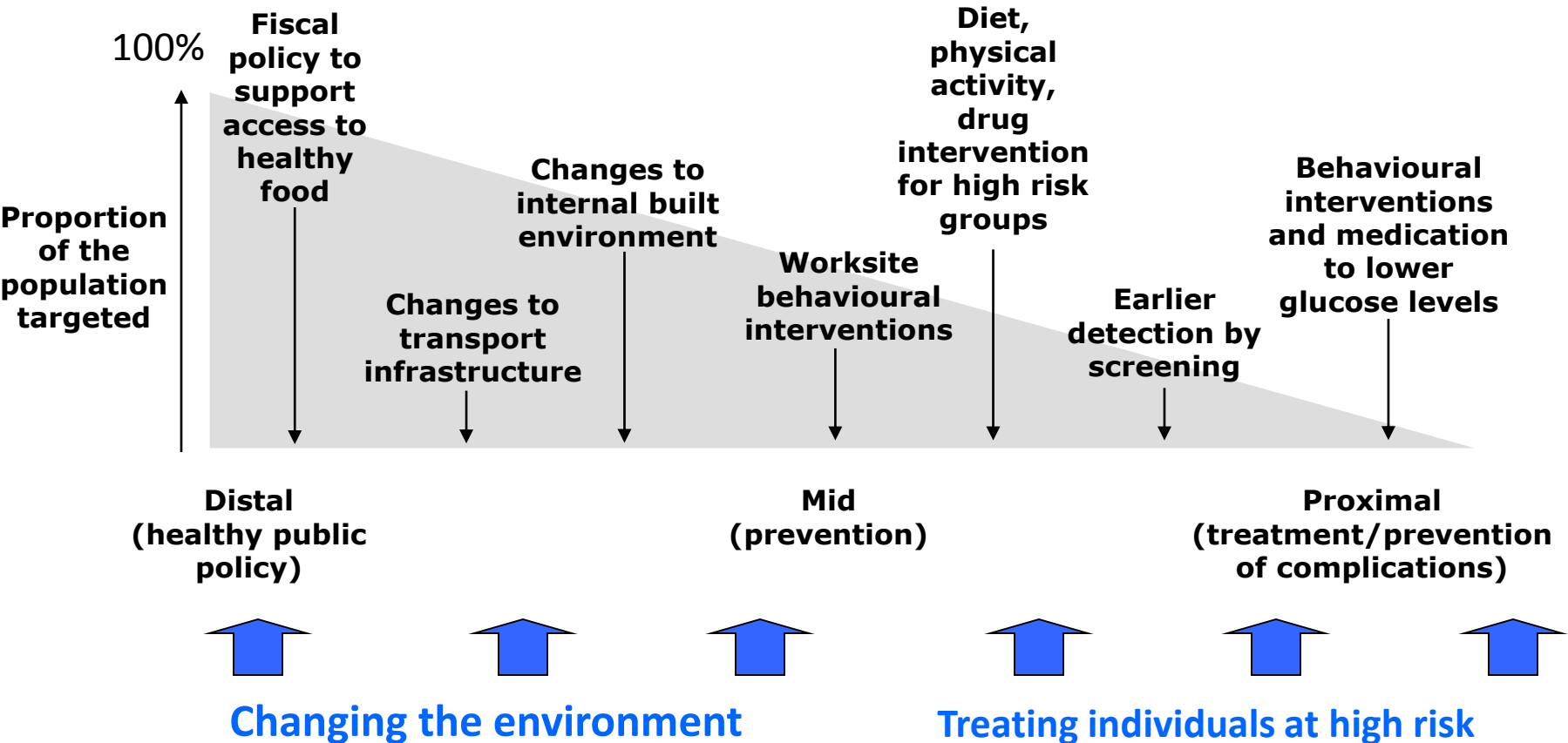
Source: Barbados Health of the Nation Study, 2014

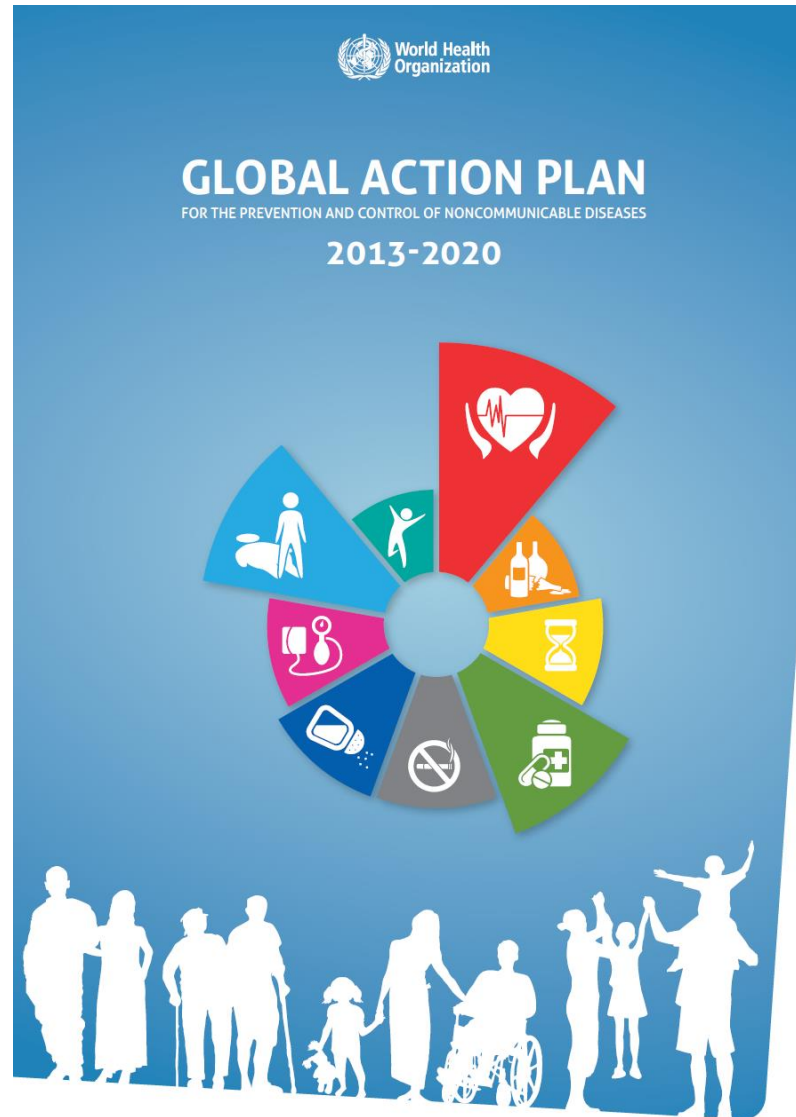
# High Risk versus population wide approaches to prevention

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# Examples of Potential Proximal and Distal Interventions to Reduce the Burden of Type 2 Diabetes





**Includes public policy recommendations to reduce:**

- Smoking
- Excess alcohol
- Unhealthy diet
- Physical inactivity

**Noted that:**

A guide based on current evidence and intended to act as a basis to expand the evidence base

Even those policy interventions thought to be highly cost effective not assessed for specific country contexts

# Generating evidence to guide policy implementation

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EXAMPLE OF THE 2007 PORT OF SPAIN DECLARATION ON  
NCDS









# Port of Spain Declaration on NCDs

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15 Point Declaration, 27 commitments

Including:

- Multi-sectoral national NCD Commissions
- Risk factor reduction, including implementation of FCTC
- Health Care, quality and coverage
- Surveillance
- Caribbean Wellness Day

# Evaluation of the Port Spain Declaration 7 years on

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- ❑ Overall goal:
  - ❑ Review progress and identify barriers and facilitators on policy development & implementation
  - ❑ Assess health impact
  - ❑ Assess political impact
  - ❑ Identify potential revenue sources to further support NCD prevention and control
  - ❑ Guide further implementation of effective policy measures
- ❑ Multi-partner study
- ❑ Funded by Canadian International Development Research Centre (IDRC)

# Seven country case studies

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## Objectives:

- A. *Reported* formulation & implementation vs *effective* formulation & implementation
- B. Use of multi-sectoral approaches
- C. Factors associated with success and its lack in achieving (a) and (b)
- D. Any evidence on health impact

## Mixed methods:

- Policy document review
- Key informant interviews
- Review of available health data

# Identifying causal factors in policy formulation and implementation – the need for theory

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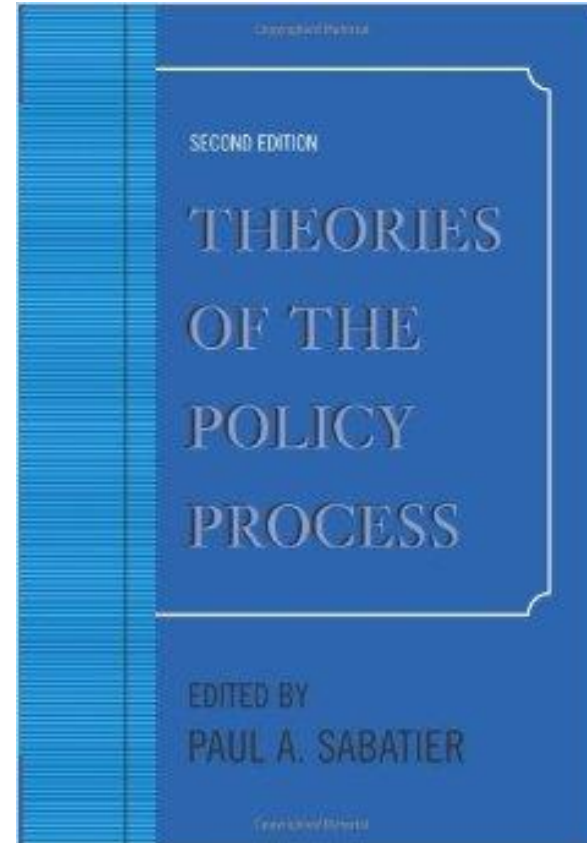
E.g.s

## Multiple streams theory

- Problems, policies, politics, role of 'policy entrepreneurs'

## Advocacy coalition framework

- Interactions of different interest groups to influence policy



# Realist approach to policy evaluation

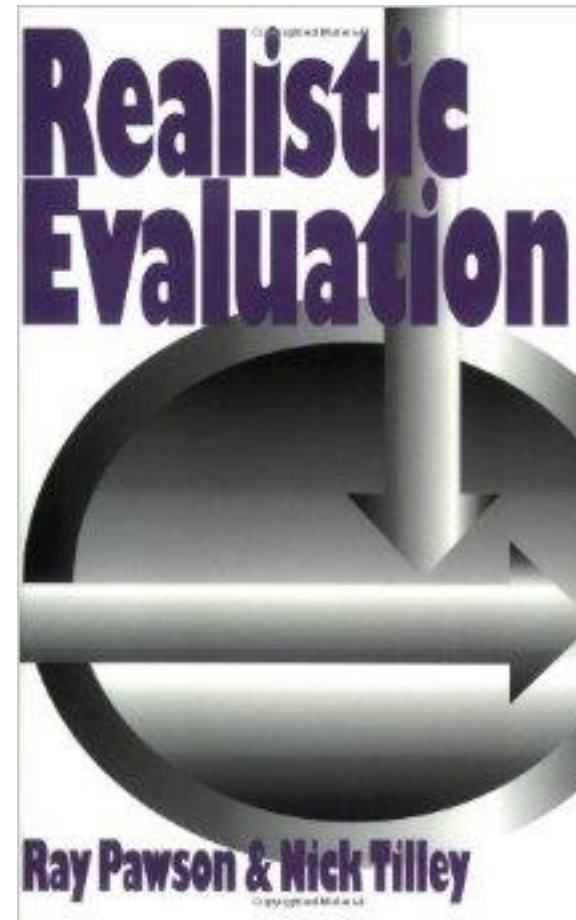
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Asks: 'What works for whom in what circumstances and in what respects, and how?'

- (Does not ask: what works, or does this programme work?)

Aims to identify: Context/Mechanism/Outcome configurations

Starts with theory and ends with refined theory



# Realist evaluations should:

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Show what combinations of attributes (contexts and mechanisms) need to be in place to achieve particular outcomes

Contribute to developing theory to guide successful policy implementation in different settings



# Relating success in policy implementation to health outcomes

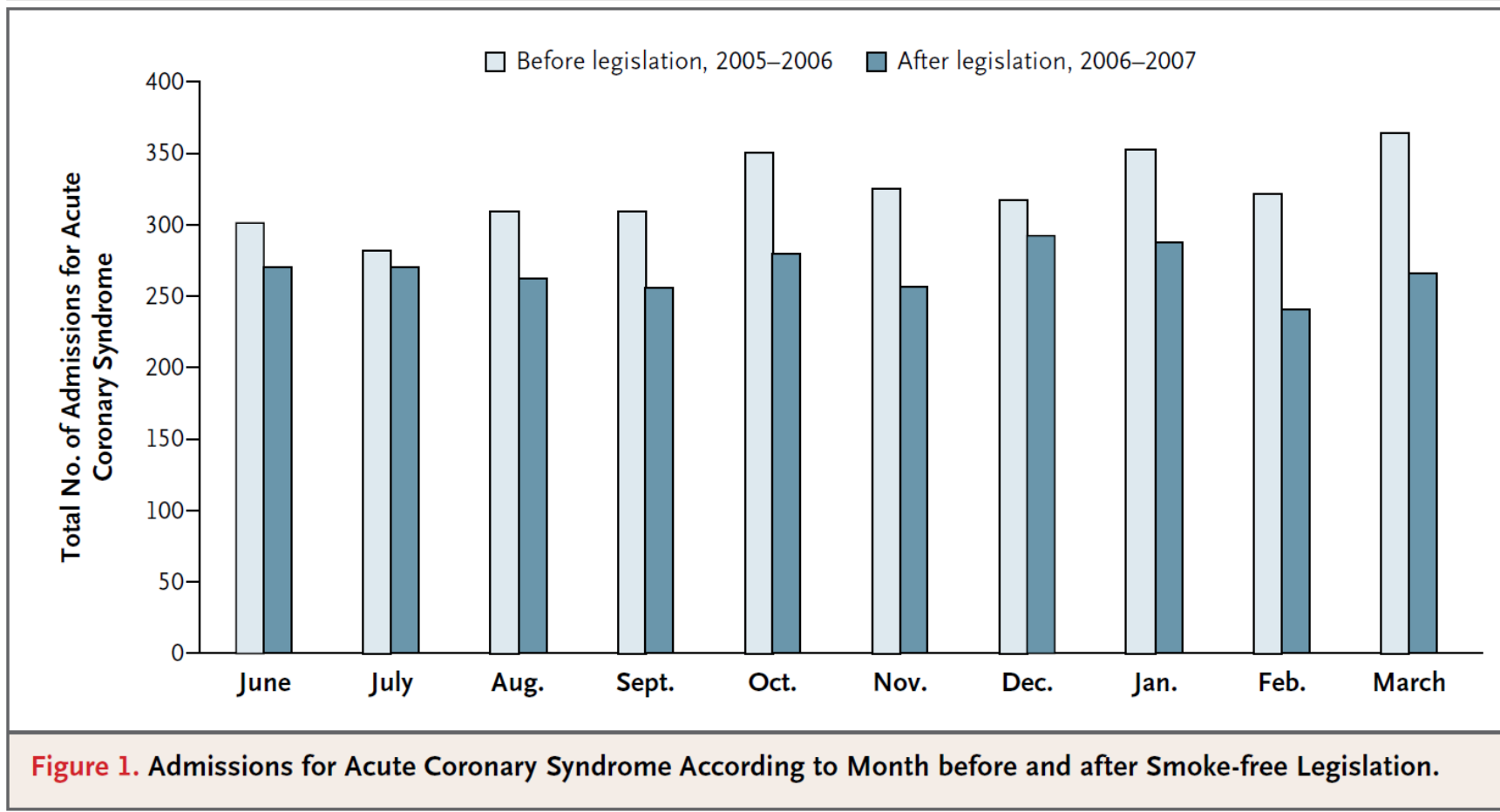
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Treating policy interventions as 'natural experiments'. Examples of possible non randomised designs

- 'Before and after' evaluations, with good data on how the intervention was implemented
- 'Step wedge' - if similar interventions in different setting, implemented sequentially
- Multi-centre / country studies, where a measure of policy compliance is related to health outcomes
- Time series analysis - when the policy intervention is implemented at a specific time point or period.

# Admissions for acute coronary syndrome in Scotland and banning smoking in public places

17% fall,  
compared to 3%  
per year over  
previous 10  
years



Using evidence to supporting  
decision making for healthy  
public policy

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# Approaches to promoting greater use of evidence in for healthy public policy making

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- Prepare and communicate data effectively, simply and persuasively
  - Policy briefs
  - 30 second sound bite
- Personalise messages
  - Case studies of policy initiatives
  - Human stories
- Use epidemiological and systems models to assess the potential impact of different policy options
  - Involve policy makers in model development and choice of policy options
- Provide costed incremental options, and cost of not taking action

*Based on: Bull WHO 2012;90:847*

# Building a diabetes epidemiological model

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# Limitations of IDF Diabetes projections

- Only use data on urbanisation and age /sex
- Do not explicitly take into account trends in major diabetes risk factors so may be “conservative”
- Every time the IDF update the diabetes atlas projections rise!

## Developing a simple Model for use in data poor settings: *Desired features*

- Simple to implement and use
- Few data requirements
- Transparent, easy to understand and challenge assumptions
- Platform for economic analysis and policy scenario analysis, including prevalence forecast.

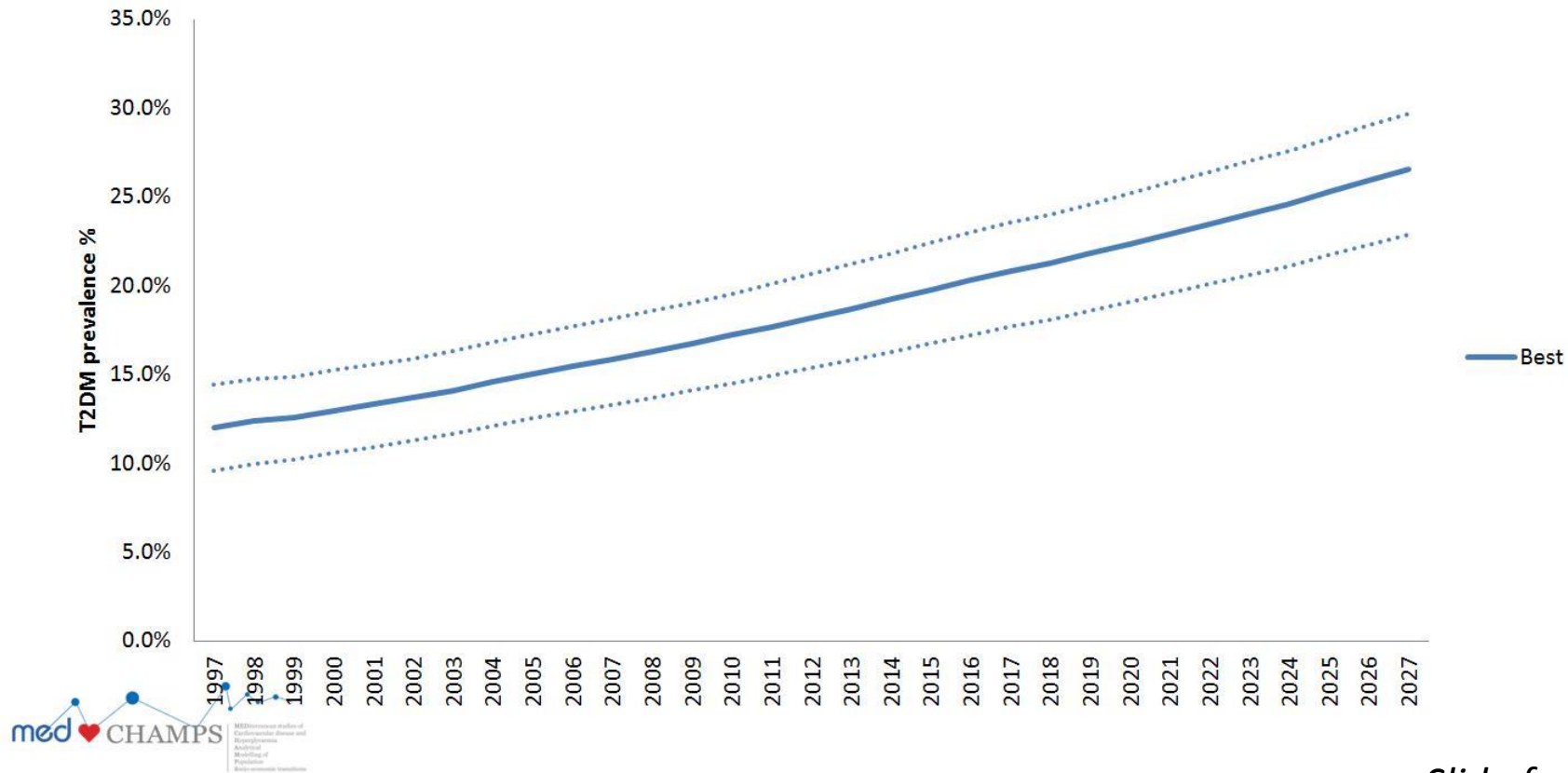
# KEY PARAMETERS

Parameter	Source
Population (structure and trend)	Data
Obesity (prevalence and trend)	Data
Smoking (prevalence and trend)	Data
Diabetes incidence	DISMOD/Other
Diabetes prevalence	Data
Diabetes Specific mortality	DISMOD/Other
General mortality	Data



# FORECASTING T2DM TUNISIA, 1997 - 2027

Diabetes prevalence, Men & Women



Using systems thinking and  
modelling to engage policy  
makers

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# Policy option appraisal for complex systems

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Health outcomes arise in complex systems

Nonlinear relationships

Time delays

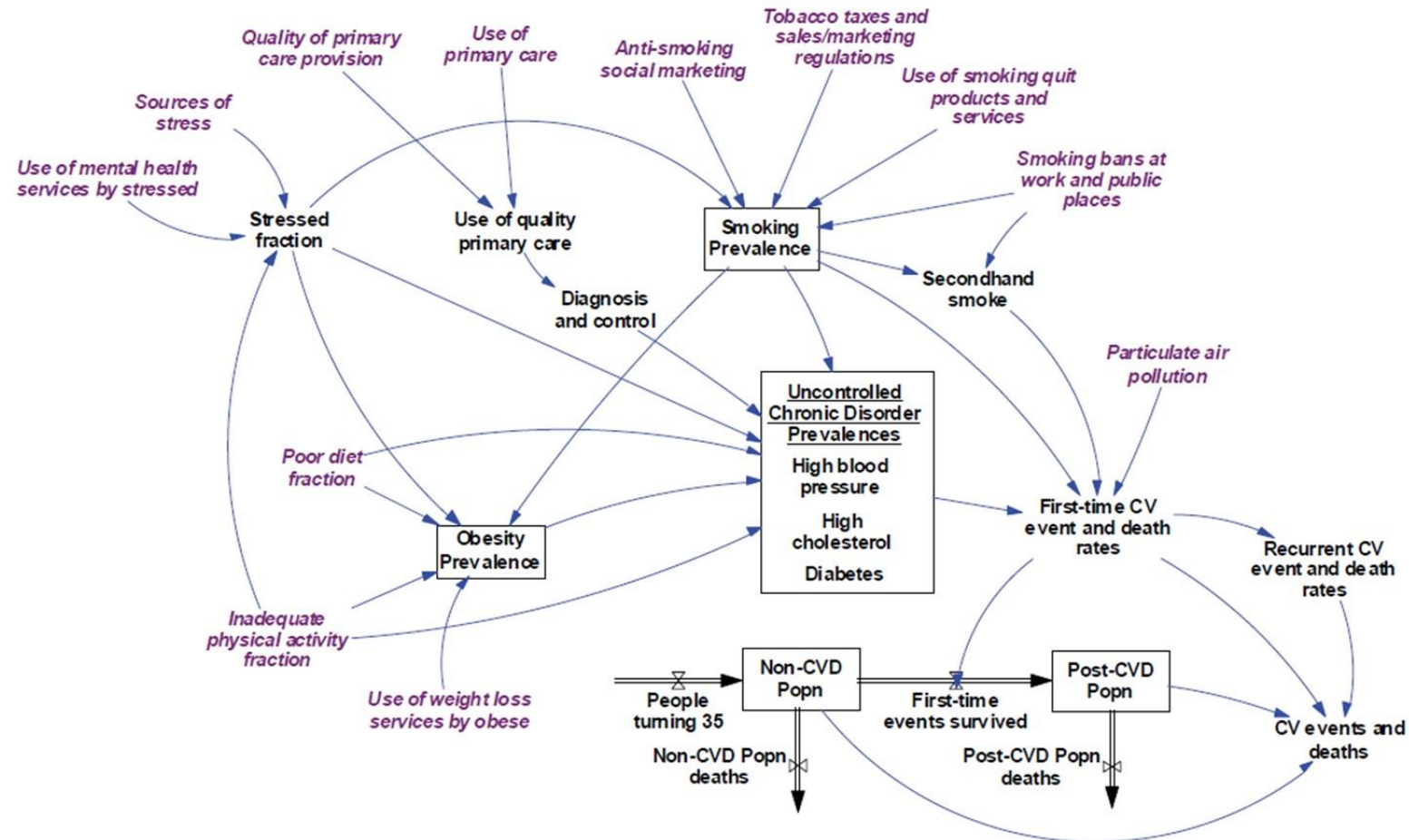
Feedback loops

A system can not be understood simply as the sum of its parts

Policy option appraisal *should* be improved by explicitly taking into key features of the system

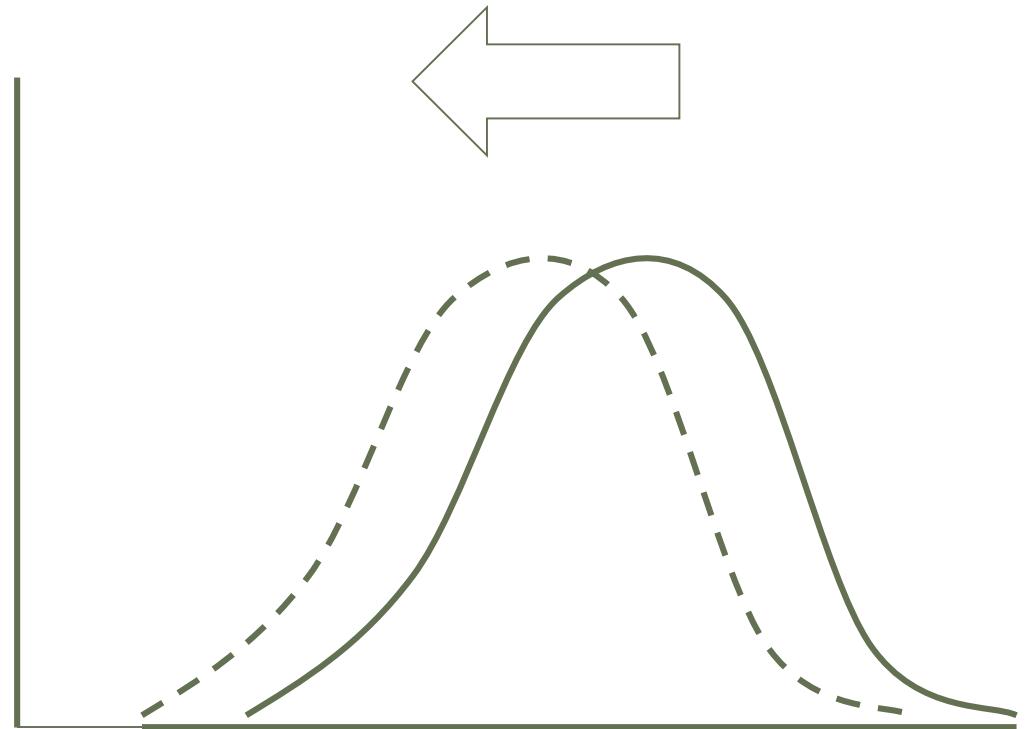
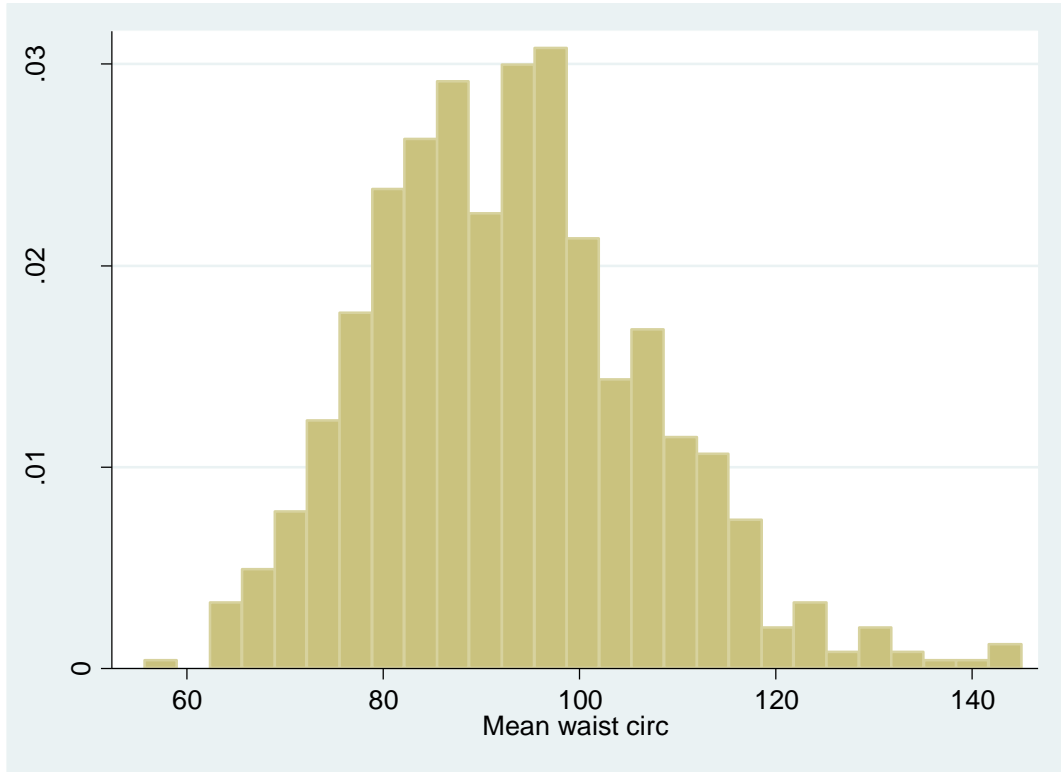
Group model building is a well defined approach to engage stakeholders in systems thinking and model building

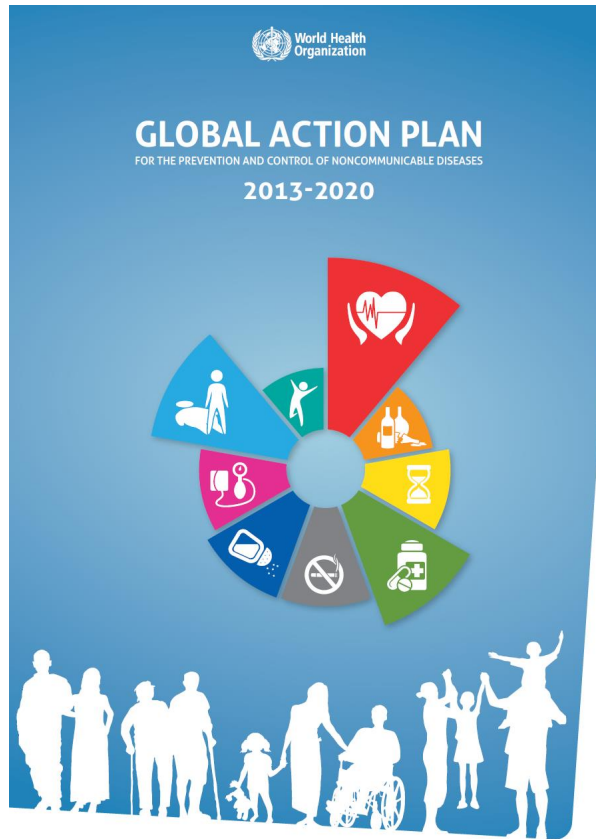
# A 'whole of system' approach to compare options for CVD interventions



In summary

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Limited evidence base

Evaluate and learn from current initiatives

Realist approaches acknowledge importance of context, while still aiming for generalizable theory

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## Researchers promoting use of evidence in policy making

- Many factors
- Role for modelling
  - 'What if' scenarios
  - Shared understanding of the system generating the problem



Thank you!