# The value of NCD modelling and the role of EConDA

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#EConDAconf

www.econdaproject.eu

This presentation arises from the project EConDA which has received funding from the European Union in the framework of the Health Programme

EConDA

Economics of Chronic Diseases

# What is NCD modelling?

- Computer model that simplifies reality
- Estimates the extent different inputs (e.g. behaviours) affect different outcomes (e.g. disease).
- NCD modelling estimates the extent to which one or more risk factor (e.g. smoking and obesity) affects the incidence of NCDs.

# The value of NCD modelling

Eur J Epidemiol (2014) 29:867–870
DOI 10.1007/s10654-014-9978-0

COMMENTARY

## The Brighton declaration: the value of non-communicable disease modelling in population health sciences

Laura Webber · Oliver T. Mytton · Adam D. M. Briggs · James Woodcock · Peter Scarborough · Klim McPherson · Simon Capewell

87% deaths due to NCDs in Europe

How will the burden change over time?

What are the effects of policy interventions?

Modelling is key for resource planning, surveillance, responding to the NCD epidemic

# Methods – What is microsimulation?

- A range of different methods used
- Microsimulation methods simulate a virtual population.
- Reproduce the characteristics and behaviour of a large sample of individuals
- Characteristics can evolve over the life course, for example births, exposure to risk factors.

# Why microsimulation?

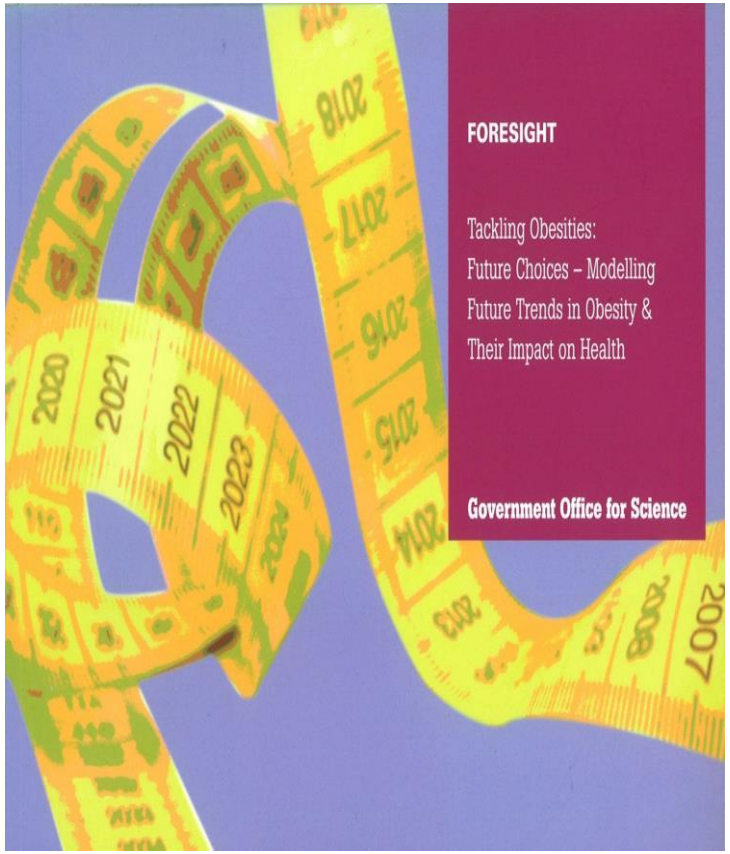
- Best method for risk factor and chronic disease modelling by the OECD (Oderkirk, 2012).
- Can simulate entire populations.
- Offer flexibility to test a range of 'what if" policy scenarios related to prevention, treatment and the organisation and financing of care.
- more capable of answering a greater variety of challenging policy questions.
- Take account of history – which matters when considering NCDs.
- Account for dynamical changes in risk factors over time.

**Toward a New Comprehensive International Health and Health Care Policy Decision Support Tool**

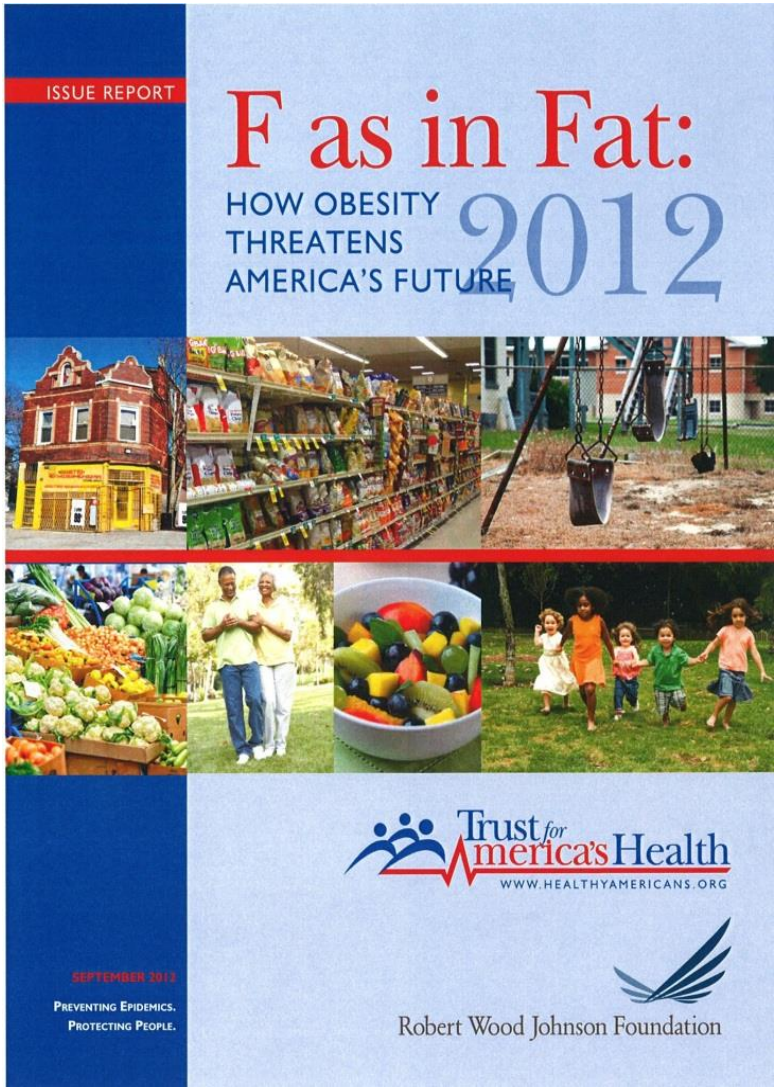
Jillian Oderkirk, Franco Sassi, Michele Cecchini and Roberto Astolfi, OECD Health Division

# Where we started

McPherson K, Marsh T, Brown M. *Foresight tackling obesities: Future choices – modelling future trends in obesity and the impact on health.* Foresight Tackling Obesities, 2007: Future Choices http://www.foresight.gov.uk.



# Reports and papers

# Reports and papers

Downloaded from http://bmjopen.bmj.com/ on September 5, 2015 - Published by group.bmj.com

Open Access Research

BMJ Open

## The future burden of obesity-related diseases in the 53 WHO European-Region countries and the impact of effective interventions: a modelling study

Laura Webber,[1] Diana Divajeva,[1] Tim Marsh,[1] Klim McPherson,[2] Martin Brown,[1] Gauden Galea,[3] Joao Breda[3]

OPEN ACCESS Freely available online

PLOS ONE

## High Rates of Obesity and Non-Communicable Diseases Predicted across Latin America

Laura Webber[1]*, Fanny Kilpi[1], Tim Marsh[1], Ketevan Rtveladze[1], Martin Brown[1], Klim McPherson[2]

1 National Heart Forum, London, England, 2 New College, University of Oxford, Oxford, England

**Abstract**

Non-communicable diseases (NCDs) such as cardiovascular disease and stroke are a major public health concern across Latin America. A key modifiable risk factor for NCDs is overweight and obesity highlighting the need for policy to reduce prevalence rates and ameliorate rising levels of NCDs. A cross-sectional regression analysis was used to project BMI and related disease trends to 2050. We tested the extent to which interventions that decrease body mass index (BMI) have an effect upon the number of incidence cases avoided for each disease. Without intervention obesity trends will continue to rise across much of Latin America. Effective interventions are necessary if rates of obesity and related diseases are to be reduced.

NICE National Institute for Health and Care Excellence

# Cost Effectiveness modelling

## Managing overweight and obesity among children and young people: lifestyle weight management services

Overview and resources | Guidance | Download | Share | Print

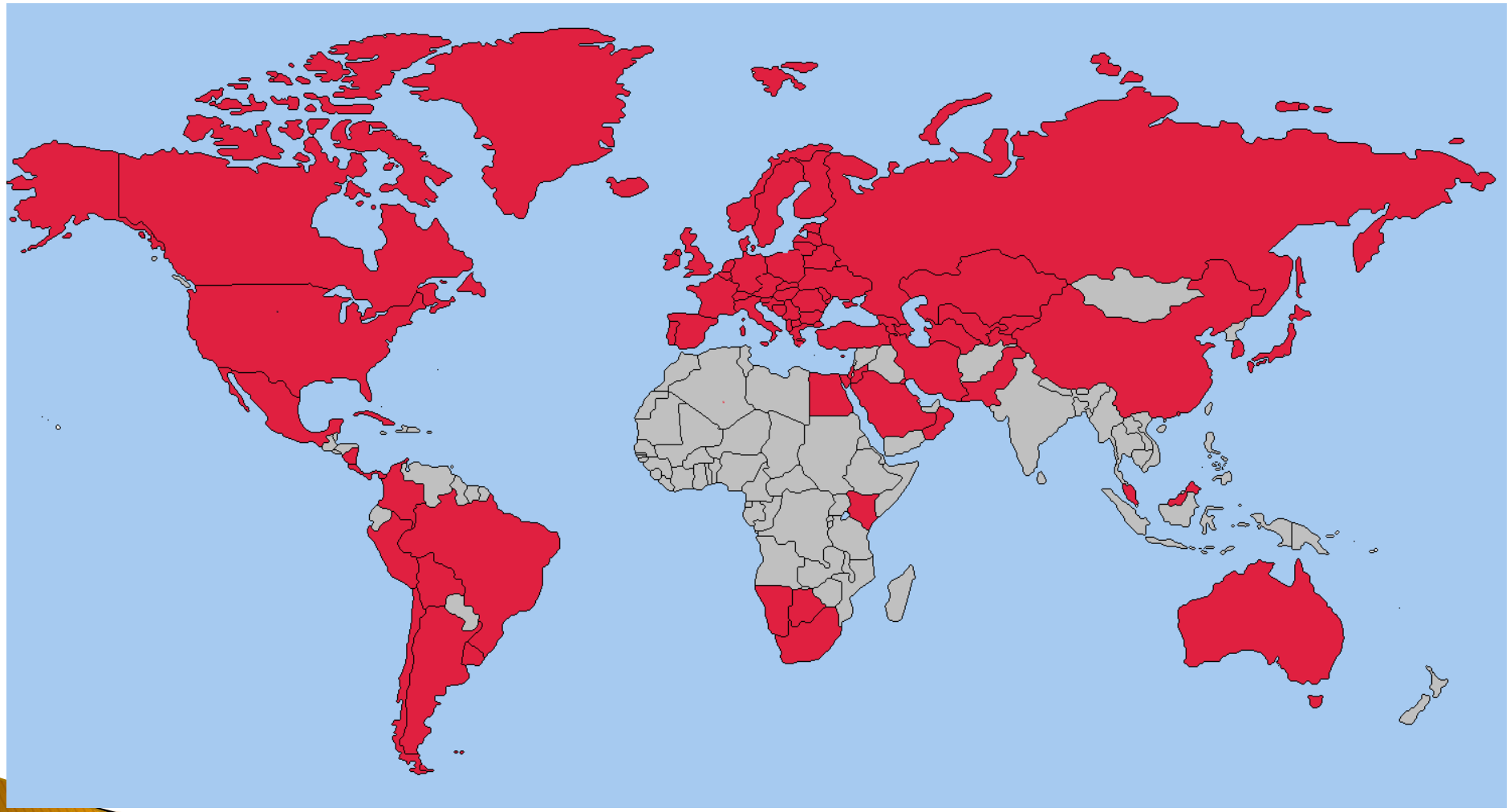
**NICE guidelines [PH47]** Published date: **October 2013**

## Managing overweight and obesity in adults – lifestyle weight management services

Overview and resources | Guidance | Download | Share | Print

**NICE guidelines [PH53]** Published date: **May 2014**

# Work throughout the World



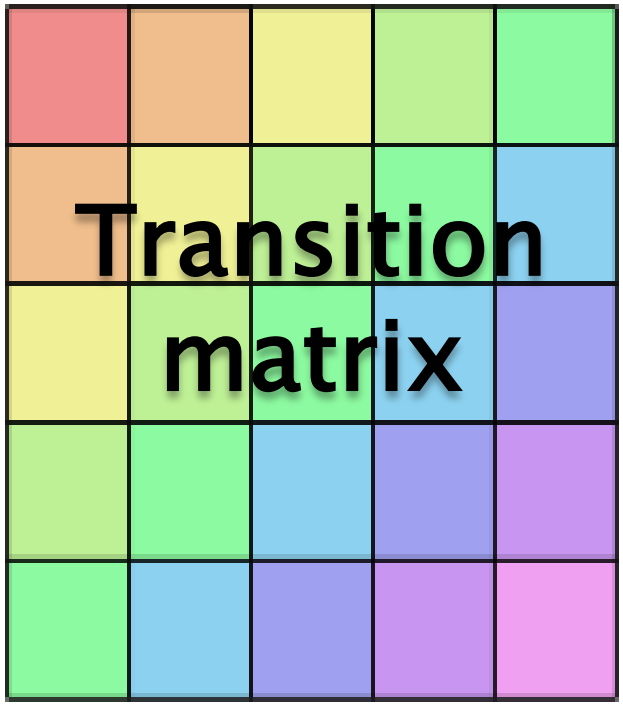
# Further development – EConDA

- Extended existing microsimulation to include **multi-stage** diseases
- Includes the ability to test **prevention, screening** and **treatment** interventions within **the same** model
- Tests the cost-effectiveness of a range of policy interventions across 8 countries
- Monitors future burden of behavioural risk factors by social groups
- Provides **tools** for use by policy makers to make the case for prevention policies for NCDs

# The future

- Multi-risk, multi-stage disease model to include:
  - Additional diseases (cancers, liver disease)
  - Additional combined risk factors (alcohol, salt, physical activity, cholesterol)
- New data

# The future: Multiple disease and disease stage transitions (for given sex and risk factors)

New disease state = 

x Previous disease state (age, sex, risk factors)

Each individual state is updated each year. The probability of getting a disease, dying from a disease. Age increases by 1 year each year.