General introduction to DYNAMO – HIA tool

Wilma Nusselder

On behalf of the Coordinating Center

EUPHA Preconference on DYNAMO-HIA, Amsterdam, November 11, 2010

What is the health impact of

Increase price of smoking

Increase excise tax on alcohol

Ban advertising unhealthy foods

For comparisons quantification is needed

What has more impact? Intervention affecting A

RR is 4

2% exposed

Disease risk is 4%

Reduction in exposure is 50%

OR B

RR is 2

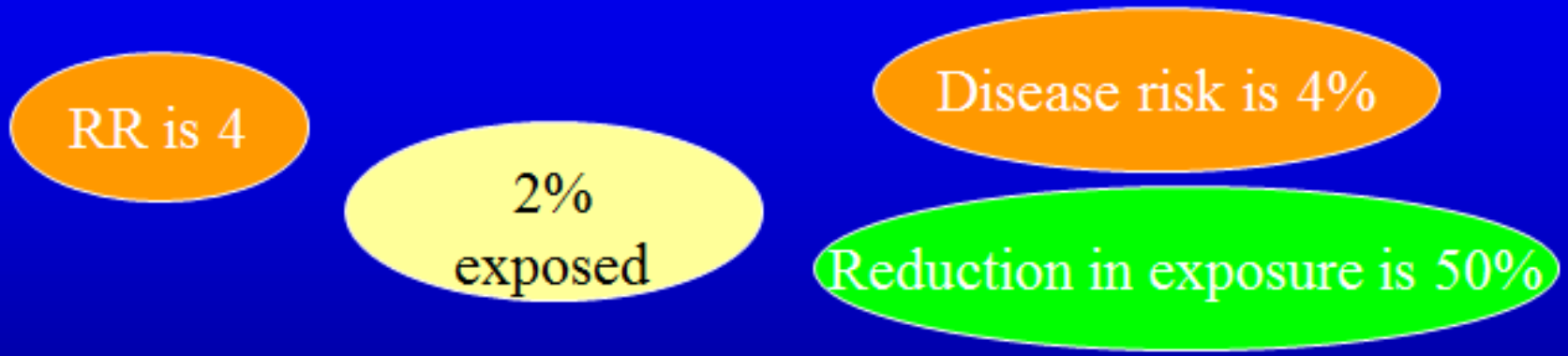
20% is exposed

Disease risk is 2%

Reduction in exposure is 60%

For comparisons quantification is needed

What has more impact? Intervention affecting A



OR B

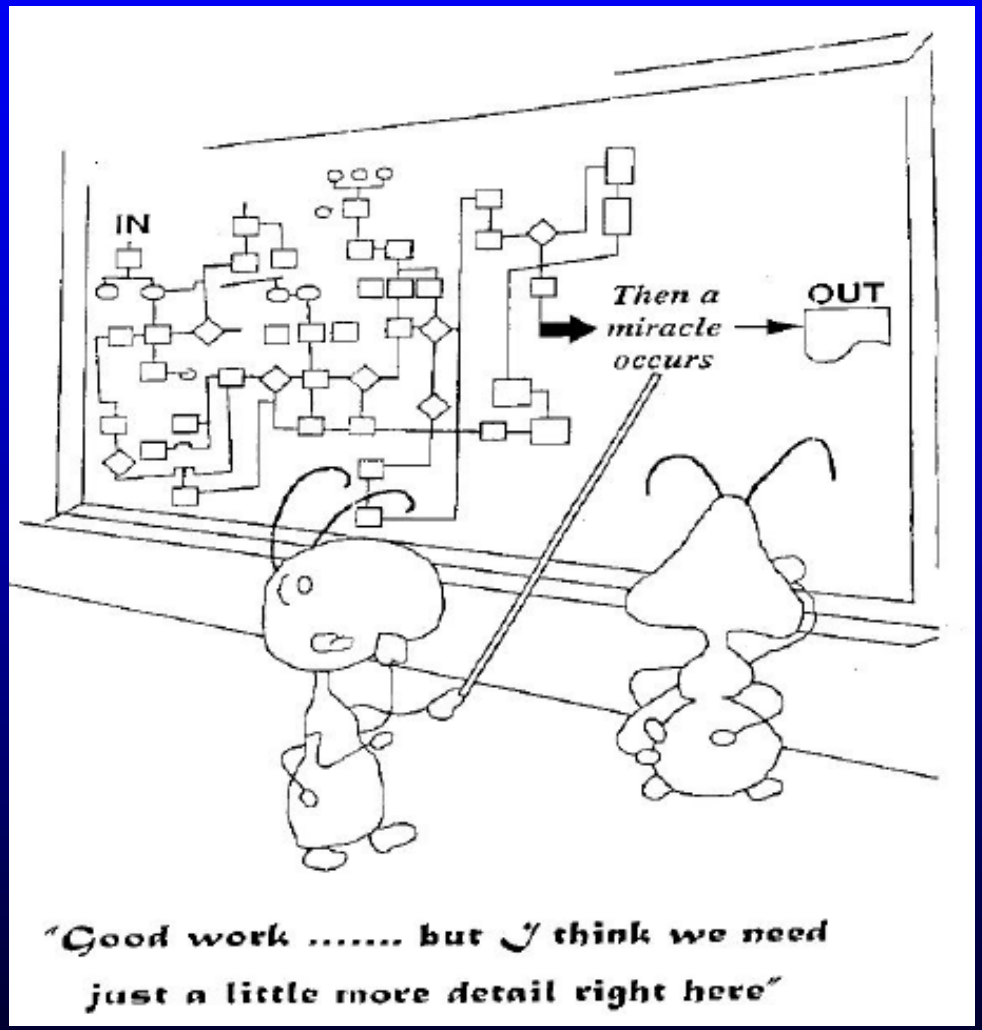
For quantification a tool is needed

Prediction of health effects due to changes in lifestyle factors is complicated by fact that:

- Effect depends on multiple factors:
  - % with risk factor
  - % with disease
  - RR
  - age distribution
- life style risk factors often affect multiple diseases
- life style risk factors often affect mortality, and hence population exposed to the policy

So where are policy makers without a quantitative model?

Without quantitative tool

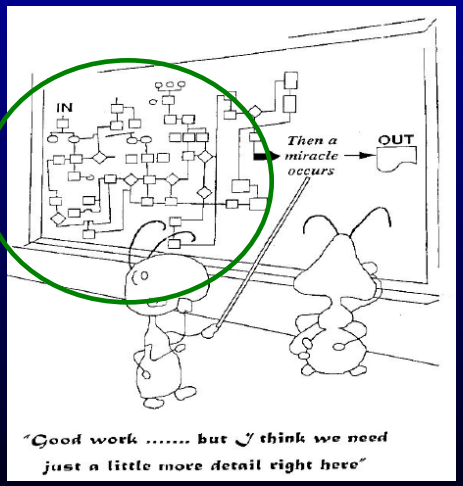


DYNAMO-HIA: what does it add?

- Projects how changes in risk factor distribution affect disease-specific and summary measures of population health, based on causal pathway in epidemiology and Markov modeling

- Organizes and stores necessary input data

- Syntheses according to standard causal pathway



DYNAMO-HIA

DYNAMO-HIA is a ready-to-use tool to project the effects of changes in risk factor exposure due to policy measure or intervention on disease-specific and summary measures of population health

DYNAMO-HIA models multiple risk factors

- Model is generic, risk factors can be selected or added by users

- Model includes already few example risk factors

risk factors can be selected/ added by users

- Model includes already 9 diseases:
  Diabetes, IHD, stroke, COPD
  Cancers: lung, breast, colorectal, oral, oesophagus

diseases can be selected/added by users

DYNAMO-HIA tool

Risk factors

(e.g. smoking, BMI, alcohol)

↓

Diseases

(e.g. coronary heart disease, diabetes, several cancers)

↓

Morbidity/Mortality/LE/DALE

Scope of DYNAMO

Description of baseline situation

↓

Estimation of change in exposure to determinants of health

DYNAMO-HIA

↓

Estimation of change in health outcomes

What is needed for quantification with DYNAMO-HIA

1. Input data

   -> large dataset in the tool

2. Expectations about effect of intervention/policy on risk factor exposure (also in future)

   -> USER

3. Computer with DYNAMO tool

   -> tool will be provided today

Data

Type of data

- Population numbers
- Newborns (optional)
- Incidence, prevalence and mortality for relevant diseases
- All-cause mortality
- All-cause disability (optional)
- Exposure distribution of risk factors
- RRs linking exposure to health outcomes

General:

- All data by single-year of age (0-95 years) and sex
- Flexibility in choice risk factor exposure, disease type and transitions between risk factor states

Only population-based data

Tool starts from population-based data

It uses in calculation:
Incidence of diabetes in 40 year old women with overweight

Often not available

But data need is:

- Incidence of diabetes in 40 year old women
- % overweight for 40 year old women
- RR association between overweight and diabetes

**Available &
Used in DYNAMO-HIA**

Data already in the tool

For large number of EU countries:

- Population numbers (all MS)
- Projected Newborns (all MS)
- Incidence, prevalence and mortality for 5 cancers, IHD, stroke, COPD, diabetes (10 MS)
- All-cause mortality (all MS)
- All-cause disability (all MS)
- Exposure distribution of smoking (3 categories + time since quitting), BMI (mean, 3 categories, alcohol (5 categories) (at least 18 MS)
- RRs linking exposure to health outcomes (one set)

DYNAMO HIA

a Dynamic Model for Health Impact Assessment

Large set of output measures

- Future risk factor prevalence by age, sex and year
- Future disease prevalence by age, sex and year
- Future mortality/survival by age, sex and year
- Structure of population by age, sex, diseased vs. non-diseased
- Summary measures of population health
  - Life expectancy
  - Life expectancy with(out) diseases
  - Disability-adjusted Life expectancy

cohort and population

DYNAMO HIA

a Dynamic Model for Health Impact Assessment

Important features

- Simulates a real life population trough time
- Is based on epidemiological evidence + available data
- Provides large set of outcome measures
- Is publicly available + no programming skills needed
- Data are included for large set of EU countries

Funding

• Funded by the Executive Agency for Health and Consumers (EAHC)

• Part of the EU Public Health Program 2003-2008 of the European Commission's Directorate General for Health and Consumer Affairs (DG SANCO)

• Co-financing from the Erasmus Medical Center Rotterdam, the Institute of Public Health and the Environment in the Netherlands, the Catalan Institute of Oncology, the International Obesity task force, the London School for Hygiene and Tropical Medicine, the Haughton Institute in Dublin, and the Instituto Tumori in Milan.