A prospective Health Impact Assessment with DYNAMO-HIA

The case of Swedish Alcohol Policy

Real Life Example

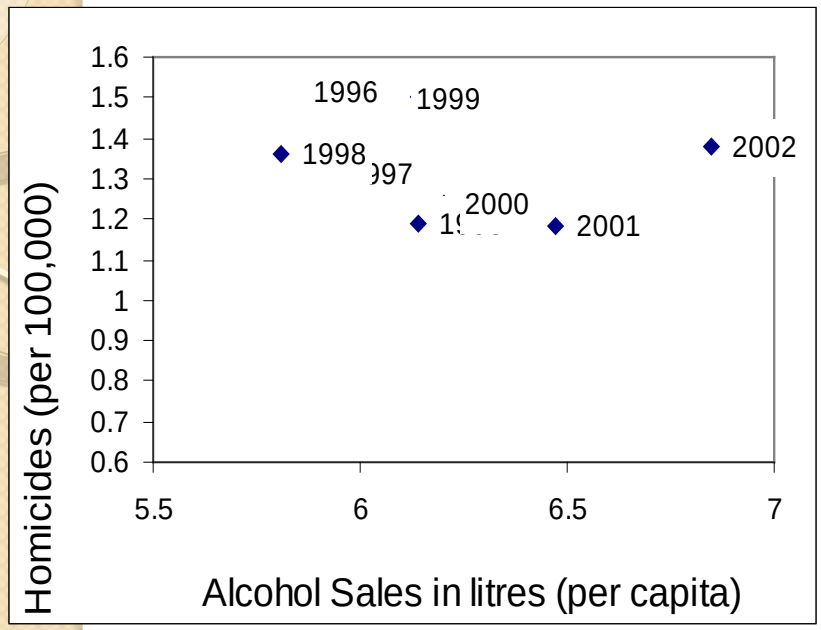
- EU-Commission ordered Sweden to allow private imports of alcohol
  - This was on grounds of economic harmonization
- Swedish Government contested this decision by commissioning a study to assess the health impact of such a liberalization

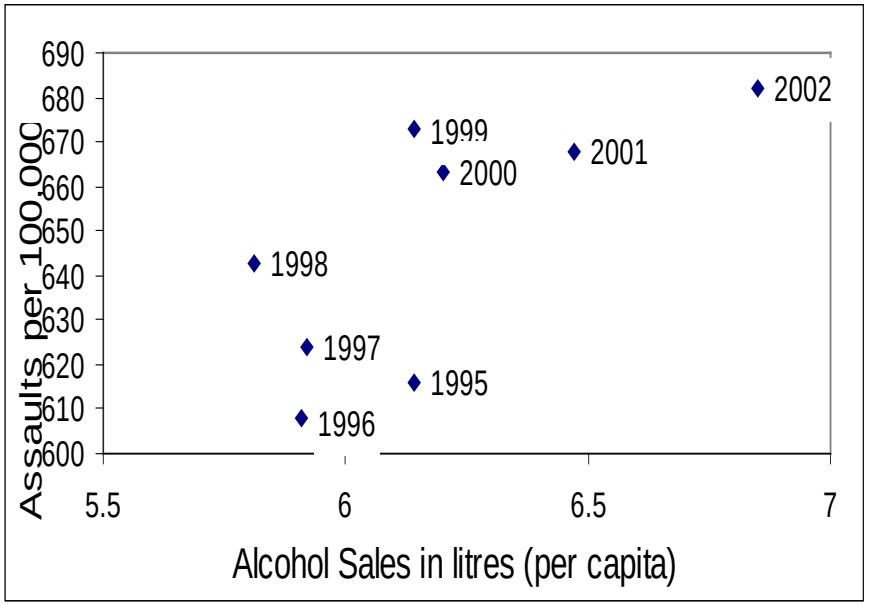
Original Study I

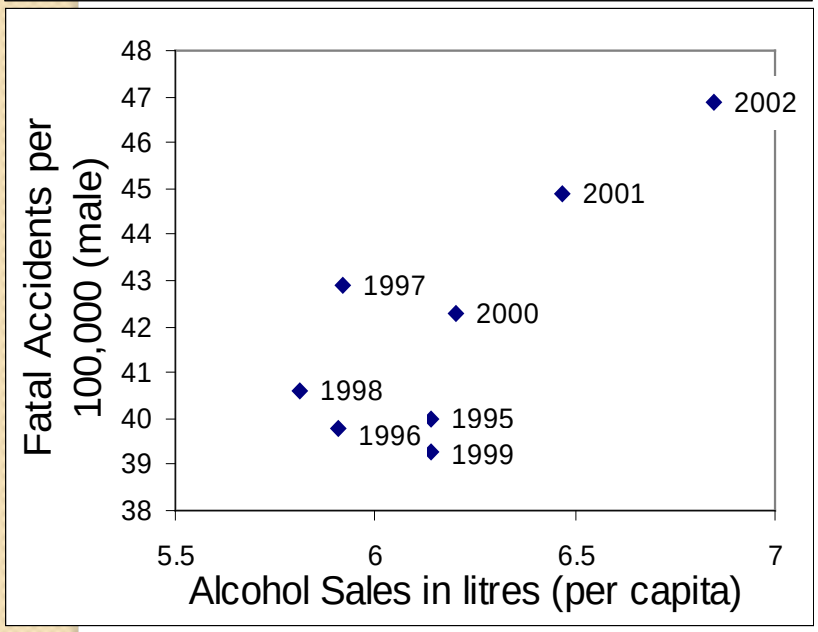
- This study was, in effect, a prospective HIA
- Study is split in two steps:
  - Estimating change in alcohol consumption
  - Estimating effect on harm indicators (mortality, crime, accidents)

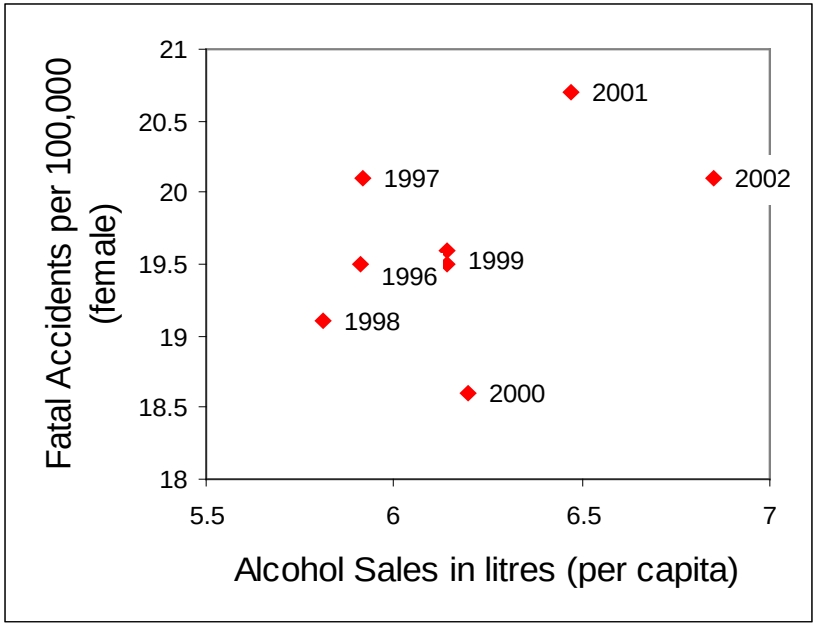
Original Study II

- Estimating a long-term relationship, usually based on
  - aggregate (population level)
  - pooled (several countries)
  - time-series data (annual or quarterly)
- Adjusting for further variables as suggested by (economic) theory


Homicides (per 100,000)
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
1996
1999
1998
2002
2000
2001
5.5
6
6.5
7
Alcohol Sales in litres (per capita)


Assaults per 100,000
690
680
670
660
650
640
630
620
610
600
2002
1999
2001
2000
1998
1997
1995
1996
5.5
6
6.5
7
Alcohol Sales in litres (per capita)


Fatal Accidents per 100,000 (male)
48
47
46
45
44
43
42
41
40
39
38
2002
2001
1997
2000
1998
1995
1996
1999
5.5
6
6.5
7
Alcohol Sales in litres (per capita)

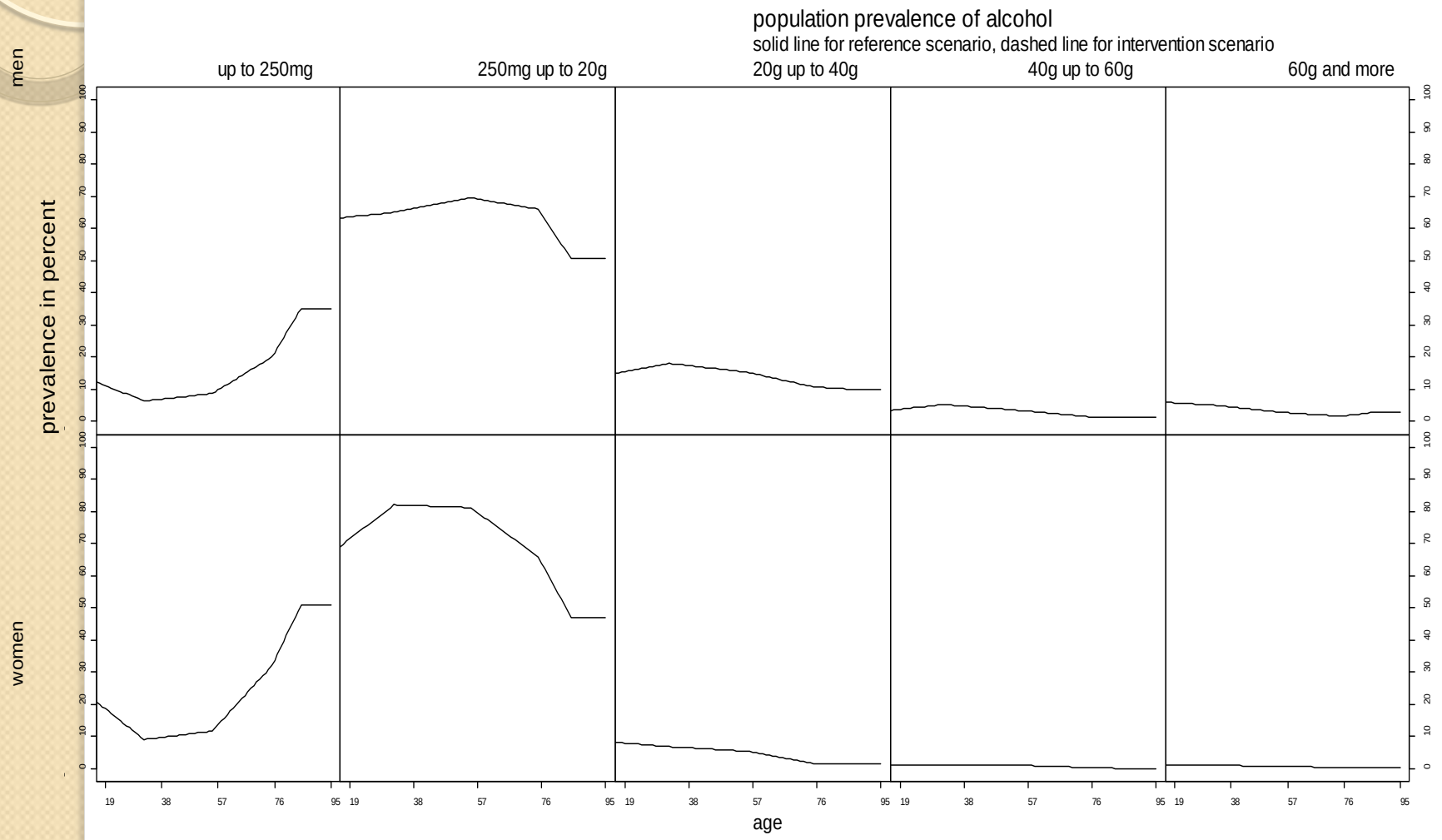

Fatal Accidents per 100,000 (female)
21
20.5
20
19.5
19
18.5
18
2001
1997
2002
1999
1996
1998
2000
5.5
6
6.5
7
Alcohol Sales in litres (per capita)

Now with DYNAMO

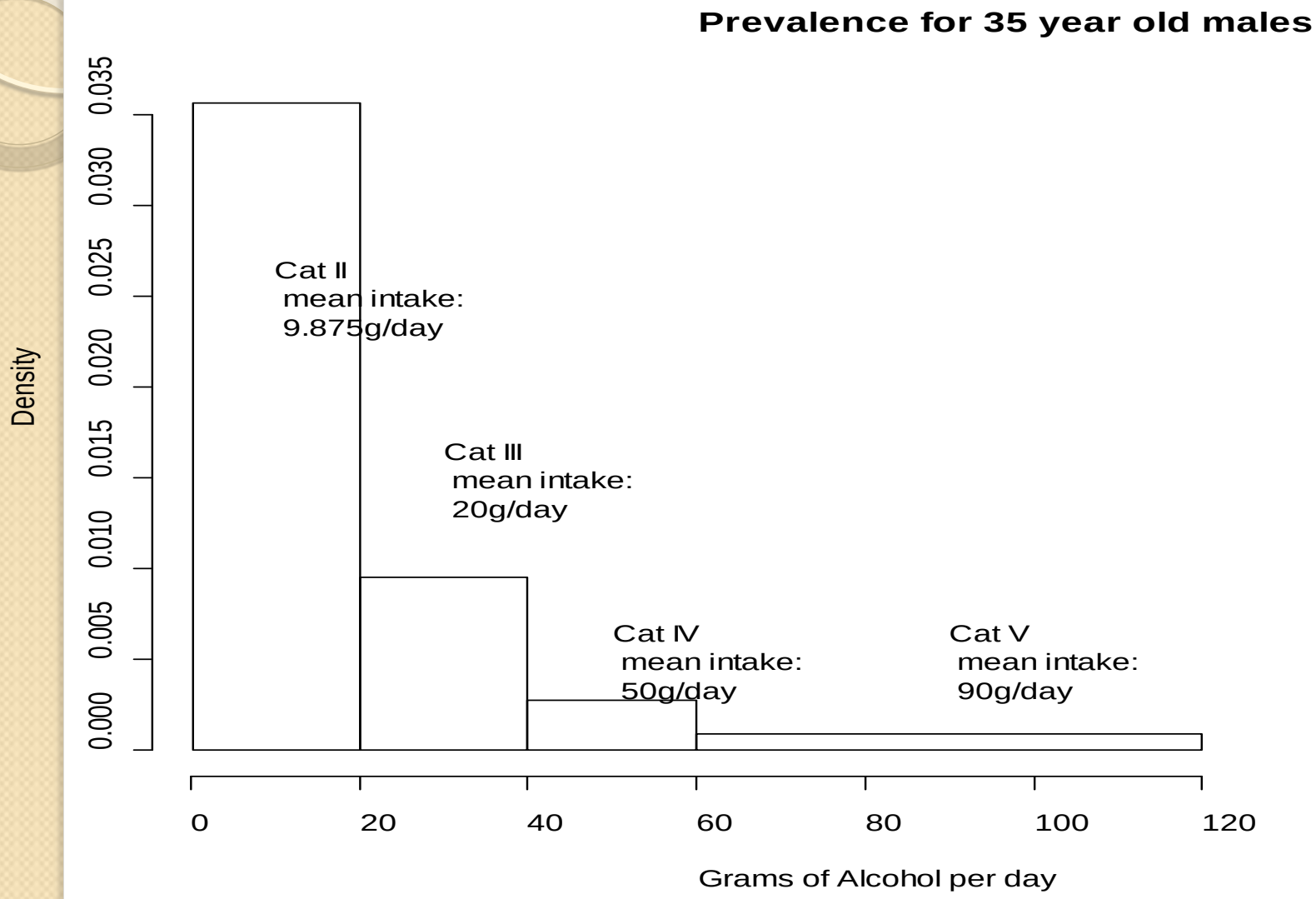
- Advantage
  - Includes diseases
  - Accounts for population structure
  - Uses epidemiological relative risks
  - Includes (almost) all the data you need

- Limitations
  - It needs an age structured intervention prevalence data
  - Alcohol harm measures are not included in the general data set

We have this as Reference:



A detailed look

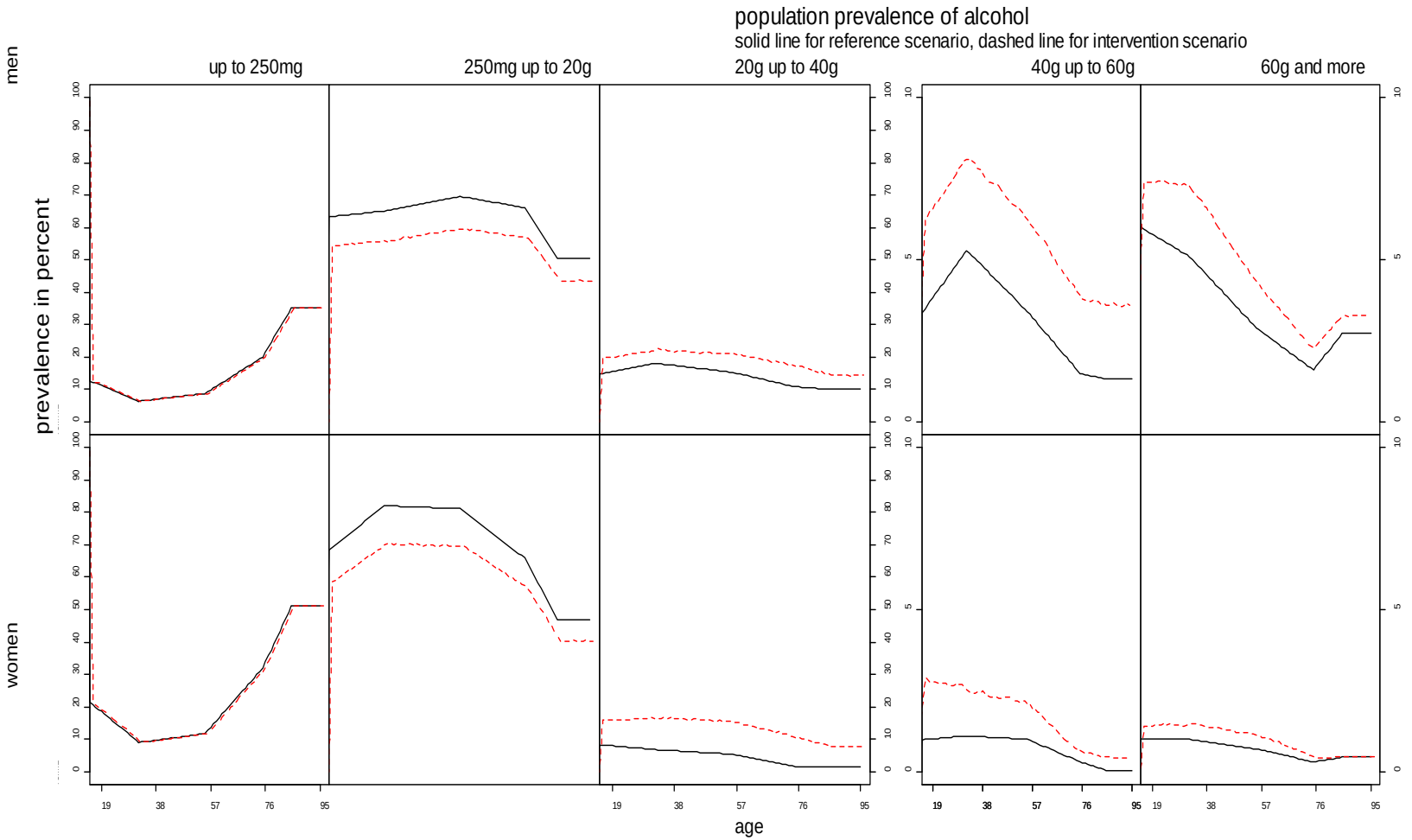


Our Approach

- Calculate the total mean consumption in Sweden
- Add the assumed change in consumption (1L) and calculate the average percentage change
- Draw individuals from each category assuming uniform distribution (each draw has a particular daily consumption, e.g. 14.2 mg)
- Multiply this consumption by the calculate percentage change
- Aggregate individuals in the 5 categories

Excel Example

Results


population prevalence of alcohol
solid line for reference scenario, dashed line for intervention scenario
men
women
up to 250mg
250mg up to 20g
20g up to 40g
40g up to 60g
60g and more
prevalence in percent
age
19
38
57
76
95

	Reference Scenario	Intervention Scenario	
	numbers	numbers	Difference
IHD	428,727	428,026	701
Stroke	192,924	194,616	-1,692
Diabetes	385,216	391,793	-6,577
Lung Cancer	5,753	5,750	3
Oral Cancer	11,738	12,495	-757
Esophageal Cancer	1,241	1,300	-59
Colorectal Cancer	47,775	48,062	-287
Breast Cancer	108,854	110,661	-1,807
COPD	131,118	130,850	268
With at least	1,081,720	1,088,547	-6,827
Size of total population	9,206,131	9,210,437	

Assumptions we made

- Uniform distribution within each category
- Each age group reacts with the same intensity (but not with the same amount!)
- Abstainers are mostly unaffected
- Instant effect of change, i.e. only changing the risk factor prevalence

Difference between the two approaches

- DYNAMO projects a lower number of death as the Regression approach
- Some reasons are
  - DYNAMO does not account for crime, accidents, suicides by abstainers or victims of heavy drinkers
  - An increase in overall alcohol consumption might yield an in more unhealthy pattern in consumption (increase in binge drinking)
  - Population aging?

Other Options Considered

- Using a prevalence observed in 2010
- Get more detailed data on the effects
  - By age
  - By sex
  - By consumption behavior
- Do you have a suggestions?