Update on life-style and cardiovascular prevention: Stakeholders and Problems

Wednesday 29th January 2014

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INTERHEART Study  “nine potentially modifiable risk factors account for over 90% of the risk of an initial acute myocardial infarction” Population attributable risk fractions

Nutrition: other food-related policy areas:

- obesity and chronic diseases
- climate change
- biodiversity
- efficient use of resources
- food security
- education
- food safety
- trade
- public procurement
- environmental protection
- agricultural policy
- retail & marketing
- taxation and subsidy
Burden of disease attributable to 20 leading risk factors in 2010 expressed as a percentage of global disability-adjusted life-years


Diet ≈ 40%
International mortality trends 1968-2003
men, coronary heart disease [CHD]

Why have CHD mortality rates halved?

Source: BHF Heartstats (WHO statistics Men aged 35 - 74, Standardised)
EXPLOITING THE IMPACT MODEL

1. Replication in other populations
2. Populations with RISING CHD
3. Calculating life-years gained
4. Cost effectiveness
5. WHAT IF treatment uptakes increased?
6. WHAT IF risk factors reduced further?
What about CHD trends in HIGH incidence populations? 

Central European countries

Poland, Czech Republic
IMPACT: CHD mortality fall **Poland** 1991-2005
P. Bandoz et al  BMJ 2012

**Risk Factors worse +7%**
- Obesity (increase) +4.5%
- Diabetes (increase) +2.5%

**Risk Factors better -66%**
- Cholesterol (diet) -39%
- Smoking -11%
- Physical activity -10%
- Population BP fall 0% (↑Men ↓Women)

**Treatments**
- AMI treatments -5%
- Unstable angina -4%
- Secondary prevention -7%
- Heart failure -12%
- Angina: CABG surgery -2%
- Angina ASA -1%
- Hypertension therapies -2%
- Statins (Primary prevention) -3%

**Unexplained** -10%

26,200 fewer deaths in 2005 →
Explaining the CHD mortality fall in the Czech Republic 1985-2007:

RESULTS

- Risk Factors worse: +6%
- Risk Factors better: -64%
- Treatments: -41%
- Unexplained: -2%

12,080 fewer Deaths in 2007

1985 → 2007
What about CHD trends in LOW incidence populations? Mediterranean countries Italy
Explaining the fall in coronary heart disease deaths in Italy 1980-2000

42,927 fewer deaths

Risk Factors worse +4 %
- Obesity (increase) + 2%
- Diabetes (increase) + 2.5%

Risk Factors better -44 %
- Cholesterol -25 %
- Smoking - 9%
- Population BP fall - 4 %
- Physical activity (incr.) - 6 %

Treatments -55 %
- Angina -12 %
- CABG & PTCA - 2 %
- Angina: Aspirin etc - 1 %
- Hypertension therapies - 1 %
- Statins 1° prevention - 2 %

Palmieri et al Am J Public H 2009
What about CHD trends in high incidence populations?

Nordic countries

Sweden, Finland
Explaining the CHD mortality fall in Sweden 1986-2002

13,180 fewer Deaths in 2006 →

Risk Factors worse +11%
- Obesity (increase) +3%
- Diabetes (increase) +8%

Risk Factors better -66%
- Cholesterol (diet) -39%
- Population BP fall -9%
- Smoking -20%
- Physical activity -13%

Treatments -36%
- AMI treatments -6%
- Unstable angina -2%
- Secondary prevention -12%
- Heart failure -7%
- Angina: CABG & PTCA -3%
- Hypertension therapies -4%
- Statins (primary prevention) -2%

Unexplained -9%

Bjorck et al Eur Heart J 2009
IMPACT model: CHD mortality fall in Finland 1982 - 1997

-71% Risk Factors
- 53% Cholesterol
- 11% Smoking
- 7% Blood pressure

-24% Treatments
- 4% AMI treatments
- 8% Secondary prevention
- 2% Heart failure
- 8% Angina: CABG & PTCA
- 2% Angina: Aspirin etc

-5% Other Factors

375 fewer deaths in 1997 →

Explaining the fall in coronary heart disease deaths in England & Wales 1981-2000

Risk Factors worse +13%
- Obesity (increase) +3.5%
- Diabetes (increase) +4.8%
- Physical activity (less) +4.4%

Risk Factors better -71%
- Smoking -41%
- Cholesterol -9%
- Population BP fall -9%
- Deprivation -3%
- Other factors -8%

Treatments -42%
- AMI treatments -8%
- Secondary prevention -11%
- Heart failure -12%
- Angina: CABG & PTCA -4%
- Angina: Aspirin etc -5%
- Hypertension therapies -3%

68,230 fewer deaths in 2000 →
IMPACT model: CHD mortality RISE in Beijing 1984 - 1999

DEATHS ATTRIBUTABLE TO RISK FACTOR CHANGES

Cholesterol 77%

- Diabetes 19%
- BMI 4%
- Smoking 1%

370 FEWER DEATHS BY TREATMENTS

- AMI treatments 41%
- Hypertension treatment 24%
- Secondary prevention 11%
- Heart failure 10%
- Aspirin for Angina 10%
- Angina: CABG & PTCA 2%

Critchley, Capewell et al
Circulation 2004 110: 1236-1244
CVD Prevention
Food Policies
are powerful
CVD mortality reductions with healthier US food policy options

**US 2006 baseline: 810,000 CVD deaths**

Feasible changes:

- **Nuts**: +1 portion
- **Wholegrains**: +10% energy
- **Fruit**: +1 portion
- **Veg**: +1 portion
- **Trans fats**: -1% energy
- **Salt**: -2g/day
- **Veg Oils**: +3% energy
- **Seafood**: +1 portion

Fewer CVD deaths:

Mozaffarian & Capewell  BMJ 2011 343 d5747
CVD mortality reductions with different UK food policy options

UK 2006 baseline: 94,675 CHD deaths & 55,245 stroke deaths

<table>
<thead>
<tr>
<th>Transfats</th>
<th>SatFats</th>
<th>Salt</th>
<th>Fruit &amp; Veg</th>
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<td>(\uparrow 1%) energy</td>
<td>(\downarrow 3) grams</td>
<td>(\uparrow 1) portion</td>
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<tr>
<td>(\downarrow 3) energy</td>
<td>(\downarrow 3) grams</td>
<td></td>
<td>(\uparrow 3) portions</td>
</tr>
</tbody>
</table>

M O’Flaherty et al WHO Bulletin 2012
CVD prevention strategies

High Risk Individual approach

Population-based approach
CVD prevention approaches

Blood Pressure distribution in the population
CVD prevention: High risk individual approach

Blood Pressure distribution in the population

BP >140 mmHg

Medications

Systolic BP

Prevalence

%
Population-based CVD prevention strategy

Prevalence %

Systolic BP

Shifting Blood Pressure distribution
Population-based CVD prevention strategy

Shifting Blood Pressure distribution

Prevalence %

Systolic BP

110 120 130 140 150 160
Population-based CVD prevention strategy

Shifting Blood Pressure distribution

Fewer BP >140 mmHg
Less treatments

Prevalence %

Systolic BP

Population-based CVD prevention strategy

Shifting Blood Pressure distribution

Fewer BP >140 mmHg
Less treatments

Deaths prevented or postponed (Sensitivity analysis)

Population diet change

Diet change in CHD patients

High Risk Statins

Population secular BP trends

Treating High Risk

Blood Pressure

Cholesterol

BMC Public Health 2007 7 117
Will CVD prevention widen health inequalities?
The **UK high risk approach** for preventing CVD

**UK Department of Health programme:**

* **NHS Health Checks**

- All adults aged 40+ screened for CVD risk
- If 20%+ risk CVD event in the next ten years, treat with:
  - lifestyle advice plus
  - tablets to reduce cholesterol & blood pressure

Capewell & Graham PLoS Medicine 2010
Evidence that high risk approach may increase social inequalities

Prescribing gradients

Long term adherence

Smoking cessation

Nutrition interventions in individuals

Ashworth, M, QJof Amb Care Management: 2008; 31; 220;
Vrijens B, BMJ 2008;336:1114; Morisky D. Clin Hypertension 2008; 10; 348
Evidence that whole POPULATION CVD prevention reduces social inequalities


15 year risk of CHD death

- calculated in British men aged 55
- quantified the benefits of decreasing risk factors uniformly across population
  
  [systolic blood pressure ↓10mmHg
  total cholesterol↓ 2mmol/l & glucose ↓ 1 mmol/l ]

- Would reduce the absolute mortality gap between affluent & deprived by ≈70%
Evidence that whole POPULATION CVD prevention reduces social inequalities

Diet interventions

Folic acid fortification of cereals (USA population 1996)

Blood folate levels: Social gradients ↓↓↓ ≈ 70%
Evidence that whole POPULATION CVD prevention reduces social inequalities

- cigarette price increases more effective in deprived groups  
  Townsend BMJ 1994; 309; 923

“increase in tobacco price may have the potential to reduce smoking related health inequalities”

Main Meta-analysis. BMC Public Health 2008; 8; 178
CVD prevention & health inequalities

VERDICT

♥ High Risk Strategies to screen & treat individuals typically widen social inequalities

♥ Population wide policy interventions usually narrow the inequalities gap

Capewell & Graham PLoS Medicine 2010
Whole-population approach for preventing CVD: successful policies

- Farmers’ subsidies to stop dairy & beef, start fruit & berry production (Finland)
- Support food reformulation (All)
- Banning transfats (Denmark, Switzerland, Austria)
- Slashing dietary salt (Finland)
- Promoting smoke-free public spaces (Ireland, UK, Italy, etc)
10 Recommendations

B. The oBesogenic environment

↑ Standards & lessons in schools
↓ Fast food outlets near schools
↓ Junk food advertising
10 Recommendations

C. Make the healthy Choice the easy Choice

↑ Food labelling
↓ Sugary drinks
↓ Built environment

Each 1/2 pack serving contains

<table>
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</tr>
<tr>
<td>Sat Fat</td>
<td></td>
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<td></td>
<td>10.8g</td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.1g</td>
</tr>
</tbody>
</table>

18% 1% 29% 54% 18%

of your guideline daily amount

Source: Food Standards Agency
92 litres of sugary drinks consumed per person in UK every year.

- 2% of adult calories
- 10% of childrens’ calorie intake

- Increasing tobacco & alcohol prices successfully reduces consumption
- 160 modelling studies suggest a 10% price increase in soft drinks will reduce consumption by 8%

- Successful precedents for similar duties *(Finland, France, Hungary & US states)*
- Small changes → big public health gains

Biggest health gains in lower income groups = a progressive policy
An EU-wide €0-20 per litre sugary drinks duty could raise around €8,000,000,000 a year...

...to pay for programmes to improve children’s health & the environment they grow up in:

- Providing free & high quality school meals
- Improving food education & skills
- Free fruit and vegetable snacks in schools
- Installing fresh drinking water fountains in schools

Ring-fencing of revenue from duties is popular - public support can double if it is spent on vital public services (eg education / health services)
SUPPORT: Implementation path for effective public health interventions
(eg. clean water, sanitation, pollution, immunisation, seatbelts, smokefree etc)

- SCIENCE evidence emerges
- UNDERSTANDING spreads
- PROFESSIONALS accept paradigm
- PUBLIC & POLITICIANS become aware, then supportive
- OPPOSITION from vested interests is slowly overcome
- REGULATION is introduced, often strengthened by
- TAXATION reinforces regulations (eg. Tobacco & alcohol control)
Within EU the CAP has caused:

- over-consumption of saturated fat-rich beef,
- over-consumption of saturated fat-rich dairy products,
- consumption of saturated fat-rich cakes, pies, pastries, etc.,
- under-consumption of fruit, vegetables and cereals,
- under-consumption of vegetable protein products containing “healthy” fats,
- overproduction of high tar tobacco (exported to developing countries), and
- high incidence and death rate from CVDs and cancers, both in EU and beyond.
The Protein Dietary Marker

Figure 3.1
Protein supply, 2007

Source: FAO (2010)
EU per-capita consumption of proteins from animal food products is more than double the world's average.
“Creating the conditions for easy access to healthy, sustainable and nutritious diet has clear public health benefits as diet is one of the major modifiable risk factor for chronic non-communicable diseases (obesity, diabetes, cardiovascular disease, cancer). The number of overweight children increases by 1.2 million per year and (with increase in child obesity 400,000 per year) in the EU. From a public health perspective, access to nutritious-effective food remains insufficient for some groups of EU citizens (e.g. the most deprived), availability of local and directly marketed food stuffs is limited, and acceptability is largely influenced by mass media which is biased towards unhealthy food stuffs (soft drinks, highly processed foods). Finally, there are concerns as regards other qualities of the food, which include the ethical factors related to production and the way animals are treated.”
Commissioner Cioloş: “The Common Agriculture Policy has a clear contribution to health policies, providing safe and diverse food, at affordable prices for consumers and in sufficient quantity, promoting a balanced nutrition, based on quality products. But we can do more to create synergies between agriculture, education and health, to ensure that European policies address the challenges of diet related chronic diseases“

EPHAC Policy Debate Public Health’s role in the CAP, European Parliament, June 16th 2011
One can conclude therefore that:

• while public health nutrition is identified as a very important and desirable objective (the rhetoric is fine!),

• its provision is still not yet awarded high priority within CAP reform discussions (the actions are minimal!).
Any questions?

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