An Assessment of the Returns on Health Investments Throughout the Life Course

Submitted by: Russia
An Assessment of the Returns on Health Investments throughout the Life Course

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Distribution of Years of Life Lost by Broader Causes. 2008

Global Health Observatory Data Repository
Distribution of Years of Life Lost by Broader Causes. 2008

Noncommunicable diseases:
- cardiovascular
- cancer
- broncho-pulmonary
- diabetes


All NCD have general risk factors

Death

Days of disability

AH (35,5)
Hyper-TC (23)
Smoking (17,1)
Small veg, fruit cons. (12,9)
Obesity (12,5)
Alcohol (11,9)
Low ph activity (9)

Alcohol (16,5)
AH (16,3)
Smoking (13,4)
Hyper-TC (12,3)
Obesity (8,5)
Small veg, fruit cons. (7,0)
Low ph activity (4,6)

7 risk factors define risk of death (%) and disability (%) population of Russia

P. Marques, World Bank, 2005
## Strategies of NCD prevention in frame of public health

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Implementation</th>
</tr>
</thead>
</table>
| Population                          | - healthy life-style propaganda  
|                                     | - national, regional and communities integrated programs on NCD prevention and life-style changes |
| High risk strategy                  | - risk factors correction in out-patients departments, health centers  
| (to determine in population high risk persons and active preventive measures) | - screening of population |
| Secondary prevention                | - provision of full treatment standards (drugs, intervention, surgery)  
|                                     | - risk factors correction |

## Cost-effectiveness of preventive measures implemented in population strategy
Contribution of medical measures and measures for RF correction to decrease in mortality from CHD in various populations

%  
120  
100  
80  
60  
40  
20  
0  

Treatment  RF correction  Uncertain factors

USA/92-98  New Zealand 1/81  Netherlands 74-81  USA/92-98  Finland/72-82  New Zealand 1/81  Canada and United Kingdom/80  Italy/50-80  USA/92-98  Finland/72-82  Sweden/72-81

Di Chiara A, Vanuzzo D. Does surveillance impact on cardiovascular prevention?  

Success basis: fight against smoking, decrease BP and TC mainly on population level
Mortality from coronary heart disease in men aged 30 to 59 y.o. in 1972-2006

An example of an effective population program: the North Karelia Project

The beginning of the North Karelia Project
Dissemination of the project to the entire nation

The economic effect of prevention throughout Finland (reduction of costs associated with CVD) in 20 years

<table>
<thead>
<tr>
<th></th>
<th>Age 35-64</th>
<th>Age 35 and older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct costs</td>
<td>106,0</td>
<td>625,9</td>
</tr>
<tr>
<td>Indirect costs</td>
<td>-734,4</td>
<td>-734,3</td>
</tr>
<tr>
<td>Total costs</td>
<td>-628,4</td>
<td>-108,4</td>
</tr>
</tbody>
</table>
Population-based measures on tobacco smoking restriction

One of the most cost-effective measures, a significant saving of health care costs

- A significant increase taxes on tobacco products (by 2.6 dollars per a pack of cigarettes)
  - California, from 1990 to 1998
  - The cost savings of the health system only in California are 3 billion dollars

- Raising the legal smoking age from 18 to 21 years
  - Only in the State of California
  - The cost savings of 24 billion dollars

- The population program smoking restriction in Australia
  - The initial investment was 176 million dollars
  - Decrease of smoking prevalence by 10%
  - The cost savings of 8.6 billion dollars


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Population prevention in scales of the British population (10 years)

Global risk reduction, salt and trans-fat restriction

- Decrease in risk of cardiovascular diseases for 1% in population scales
  - Economy of 30 million pounds sterling a year

- Legislative restriction of salt consumption to 3 g per day
  - Prevention of 30,000 cardiovascular events
  - Economy of 40 million pounds sterling a year

- Legislative restriction of the trans-fats contents to 0.5% from the general caloric content
  - Save of 570,000 years of life
  - Economy of 230 million pounds sterling a year

Population-based measures to increase fruit and vegetable consumption in France

<table>
<thead>
<tr>
<th>Information campaign</th>
<th>10 million € Information campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life-years saved</td>
<td>414 life-years saved</td>
</tr>
<tr>
<td>Cost per life-year</td>
<td>3,000 € for 1 life-year saved</td>
</tr>
</tbody>
</table>

| Reduction of VAT on vegetables/fruit by 1.8% | 5024 life-years saved | 99,000 € for 1 life-year saved |

| Subsidizing consumption through fruit and vegetable stamps given to low-income consumers | 1032 life-years saved | 474,000 € for 1 life-year saved |

Information campaign was the most cost-effective

Cost-effectiveness of high risk and secondary prevention strategy

(life course connected preventive measures implemented in primary care)
Multifactorial prevention program in primary care (Russia)

Number of saved healthy life by active preventive measures

Duration of observation period | Returns of the investments for each $1 used during the preventive measures
--- | ---
5 years | 2.3$
10 years | 5.8$
**Economic impact of measures to encourage smoking cessation in primary care**

<table>
<thead>
<tr>
<th>Type of intervention</th>
<th>The cost of 1 life-year saved in pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple advice on smoking cessation (3 minutes)</td>
<td>174</td>
</tr>
<tr>
<td>Simple advice on smoking cessation + informational materials that the patient can take home</td>
<td>221</td>
</tr>
<tr>
<td>Simple advice + informational materials + nicotine replacement therapy</td>
<td>269</td>
</tr>
<tr>
<td>Simple advice + informational materials + nicotine replacement therapy + recommendation to visit a specialized clinic</td>
<td>225</td>
</tr>
</tbody>
</table>


**Cost effectiveness of nurse led secondary prevention clinics for coronary heart disease in primary care**

Patients with CHD attending special classes, including prevention counseling for smoking cessation, nutrition and physical activity and monitoring adherence to treatment

<table>
<thead>
<tr>
<th>Additional costs for one patient per year</th>
<th>Clinics for patients with coronary heart disease</th>
<th>Clinics for patients with coronary heart disease and heart failure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£136</td>
<td>£425</td>
</tr>
<tr>
<td>The cost of 1 quality-adjusted life year saved</td>
<td>£1097</td>
<td>£13 158</td>
</tr>
</tbody>
</table>


Stimulation of a balanced diet in patients with previous myocardial infarction

- Dietary advice during a 1-h consult with the research cardiologist and dietitian “to adopt a Mediterranean-type diet” for patients after a first acute myocardial infarction. In addition, intervention participants were supplied with rapeseed margarine.

- Additional costs for 4 years - €615

- The cost of 1 quality-adjusted life year saved - €579


Lifestyle modification in primary care for individuals at high risk of diabetes

Diabetes Prevention Program (DPP) – randomized clinical trial in people with impaired glucose tolerance or fasting hyperglycemia (preventive consultation on risk factors in primary care), followed by 10 years of observation and supportive consultation

The cost of a quality-adjusted life year saved - $ 10.037

The Diabetes Prevention Program Research Group. The 10-Year Cost-Effectiveness of Lifestyle Intervention or Metformin for Diabetes Prevention: An Intent-to-Treat Analysis of the DPP/DPPOS. Diabetes Care April 2012 vol. 35 no. 4 723-730
Behavioral Counseling Interventions to Promote a Healthful Diet and Physical Activity for Cardiovascular Disease Prevention in Adults: U.S. Preventive Services Task Force Recommendation Statement

**USPSTF Assessment**

The USPSTF concludes with moderate certainty that medium- or high-intensity behavioral counseling interventions in the primary care setting to promote a healthful diet and physical activity have a small net benefit in adult patients without CVD, hypertension, hyperlipidemia, or diabetes.

Virginia A. Moyer, MD, MPH; and on behalf of the U.S. Preventive Services Task Force

*Ann Intern Med.* 26 June 2012

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**Economic costs of various strategies to save 1 life**

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Population</th>
<th>High-risk Compliance</th>
<th>Secondary prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy lifestyle education through mass media</td>
<td>$60</td>
<td>$230</td>
<td>$234</td>
</tr>
<tr>
<td>Population complex program in Sweden</td>
<td>$2002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population program on smoking cessation</td>
<td>$3200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population program on CHD risk reduction</td>
<td>$4966</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population program in primary care</td>
<td>$3260</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population program on CVD risk reduction</td>
<td>$2900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated prevention program in primary care</td>
<td>$41530</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking cessation program</td>
<td>$7500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking cessation program</td>
<td>$29000</td>
<td></td>
<td></td>
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<tr>
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<td>$41530</td>
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<td></td>
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</tbody>
</table>

### Annual investment for NCD prevention in the Russian Federation according to the draft of State Program “Development of health system in RF” (federal level, main positions)

<table>
<thead>
<tr>
<th>Purposes</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life-style promotion and early RF detection</td>
<td>10 billions rubles</td>
</tr>
<tr>
<td>Development of primary care</td>
<td>1.6 billions rubles</td>
</tr>
<tr>
<td>Providing of population by drugs, medical devices and diet food for disabled children</td>
<td>69.8 billions rubles</td>
</tr>
</tbody>
</table>

#### Regional budgets for the same purposes
Conclusion

1. Contribution of NCDs to public health and socioeconomic losses in APEC economies is very high and does not depend on income level of an economy.

2. Population strategy of NCD prevention, based on a healthy life-style, is of most cost-effective.

3. Risk factors correction in high-risk patients and secondary strategy implementation in clinical practice are necessary, available and cost-effective.