FAT AND HEART DISEASE
- Yes, we CAN make a change.
The case of North Karelia, Finland
Global Health Burden

Estimated global deaths by cause, all ages, 2005

Global Public Health in Transition

Chronic diseases — especially cardio-vascular diseases

- Leading health problem in industrialized countries
- Main killers and rapidly growing problem in developing countries
Lifestyle Transition

- Emerging global epidemic of NCDs is to a great extent a consequence of changes in the diets, of declining physical activity and of increase of tobacco use.
- The determinants of these changes are urbanisation, changes in occupations, population ageing and many global influences.
- Risks are increasingly accumulating in lower socio-economic groups of the population.
Deaths in 2000 Attributable to Selected Leading Risk Factors

- Blood pressure: 7,000,000
- Tobacco: 5,000,000
- Cholesterol: 4,000,000
- Underweight: 3,000,000
- Unsafe sex: 2,500,000
- Fruit and vegetable intake: 2,000,000
- High Body Mass Index: 2,000,000
- Physical inactivity: 1,500,000
- Alcohol: 1,500,000
- Unsafe water, sanitation, and hygiene: 1,000,000
- Indoor smoke from solid fuels: 1,000,000
- Iron deficiency: 500,000
- Urban air pollution: 500,000
- Zinc deficiency: 500,000
- Vitamin A deficiency: 500,000
- Unsafe health care injections: 500,000
- Occupational risk factors for injury: 500,000

Source: WHR 2002
Six of the Seven Top Determinants of Mortality in Developed Countries Relate to How We Eat, Drink and Move

Diet and physical activity, together with tobacco and alcohol, are key determinants of contemporary public health.
MORTALITY RATES OF ISCHAEMIC HEART DISEASE AMONG MEN IN SELECTED COUNTRIES

CHD mortality per 100,000 men in 1973

- FINLAND
- USA
- AUSTRALIA
- ENGLAND
- CANADA
- CZECHOSLOVAKIA
- NORWAY
- HUNGARY
- DENMARK
- BPD
- POLAND
- AUSTRIA
- HOLLAND
- SWEDEN
- ITALY
- PORTUGAL
- FRANCE
- JAPAN
North Karelia Project Principles for Defining the Intermediate Objectives

- Due to the chronic nature of CVD, the potential for the control of the problem lies in primary prevention.

- The risk factors were chosen on the basis of best available knowledge:
  - previous studies
  - collective international recommendations
  - epidemiological situation in North Karelia

- Chosen risk factors:
  - smoking
  - elevated serum cholesterol (diet)
  - elevated blood pressure
From Karelia to National Action

- First province of North Karelia as a pilot (5 years), then national action (1972–77)
- Continuation is North Karelia as national demonstration (1977–95)
- Good scientific evaluation to learn of the experience
- Comprehensive national action
North Karelia Project
Practical intervention

- Emphasis on persuasion, practical skills, social & environmental support for change

- Research team & local project office with comprehensive community involvement

- Main areas:
  1. Media activities (materials, mass media, campaigns)
  2. Preventive services (primary health care etc.)
  3. Training of professional and other workers
  4. Environmental changes (smoke free areas, supermarkets, food industry etc.)
  5. Monitoring and feedback
Evaluation / Monitoring

- North Karelia – all Finland
- Monitoring systems
  - health behaviour
  - risk factors
  - nutrition
  - diseases, mortality
Use of Butter on Bread (men age 30–59)

%  
100  
80  
60  
40  
20  
0  

North Karelia  
Kuopio province  
Southwest Finland  
Helsinki area  
Oulu province  
Lapland province
Butter consumption per capita in Finland
Milk Consumption in Finland in 1970 and 2006 (kg per capita)

- Whole milk
- Low fat milk
- Whole form milk
- Skim milk

NATIONAL INSTITUTE FOR HEALTH AND WELFARE
Change in fat content of Finnish cow milk

- Fen: $y = -0.16x + 362$
- Gen: $y = -0.16x + 358$

Graph showing the change in fat content from 1970 to 2010.
Use of Vegetable Oil for Cooking (men age 30–59)
Biscuit Example

• Leading Finnish biscuit manufacturer (LU Finland Ltd) has removed some 80,000 kg of SAFA by changing the fats used
• All trans fats removed
• Major change to rapeseeded oil
Fat Intake as Percentage of Energy in Finland

Recommendations
- Total fat (~30 EN%)
- SFA (~10 EN%)
- MUFA (10-15%)
- PUFA (5-10%)

Sources: Hasunen et al. 1976
Uusitalo et al. 1986
Kleemola et al. 1994
Findiet Study Group 1998
Männistö et al. 2003
Salt Intake in Finland 1977–2002

Per capita statistics
Dietary surveys, men
Dietary surveys, women
Sodium excretion, men
Sodium excretion, women

The Finnish Heart Symbol
Serum Cholesterol in Men Aged 30–59 Years

FINRISK Studies 1997 & 2002

North Karelia
Kuopio
Turku/Loimaa
Helsinki/Vantaa
Oulu
Lapland

FINRISK Studies 1997 & 2002
NATIONAL INSTITUTE FOR HEALTH AND WELFARE
Estimates of S-Chol changes in 1982–2002*

* Based on calculated intakes of dietary fatty acids and cholesterol. Standardized to the 2001 Finnish population. Users of cholesterol lowering medication excluded in -92 and -02.
** Trans fatty acids included as SFA

(Source: KTL/Valsta, Tapanainen, Laatikainen, Männistö, Vartiainen, in preparation)
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(Source: KTL/Valsta, Tapanainen, Laatikainen, Männistö, Vartiainen, in preparation)
Age-adjusted mortality rates of coronary heart disease in North Karelia and the whole of Finland among males aged 35–64 years from 1969 to 2006.

Mortality per 100,000 population

Age-standardized to European population

START OF THE NORTH KARELIA PROJECT

EXTENSION OF THE PROJECT NATIONALLY

- 85%

- 80%

NATIONAL INSTITUTE FOR HEALTH AND WELFARE
Observed and Predicted Declines in Coronary Mortality in Eastern Finland, Men
### Mortality Changes in Finland from 1969–71 to 2006 (Men 35–64 Years, Age Adjusted)

<table>
<thead>
<tr>
<th>Cause</th>
<th>1969–71 Rate (per 100,000)</th>
<th>2006 Rate (per 100,000)</th>
<th>Change from 1969–71 to 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>All causes</td>
<td>1328</td>
<td>583</td>
<td>- 56%</td>
</tr>
<tr>
<td>All cardiovascular</td>
<td>680</td>
<td>172</td>
<td>- 75%</td>
</tr>
<tr>
<td>Coronary heart disease</td>
<td>489</td>
<td>103</td>
<td>- 79%</td>
</tr>
<tr>
<td>All cancers</td>
<td>262</td>
<td>124</td>
<td>- 53%</td>
</tr>
</tbody>
</table>
From Karelia to National Action

Major Elements of Finnish National Action 1.

- Research & international research collaboration
- Health services (especially primary health care)
- North Karelia Project, other demonstration programmes
- Health Promotion Programmes (coalitions, NGO’s, collaboration with media etc.)
- Schools, educational institutions
Major Elements of Finnish National Action 2.

- **Industry, business – collaboration**
- **Policy decisions, intersectoral collaboration, legislation**
- **Monitoring system: health behaviours, risk factors, nutrition, diseases, mortality**
- **International collaboration**
Sound Combination of Population Strategy With High Risk Strategy

1. Population strategy:
   - Greatest public health gains
   - Cost effective
   - Results also in other health benefits

2. High risk strategy:
   - Great benefits to the persons concerned
   - Effective use of health services
CVDs are to a Great Extent Preventable Diseases

- **Medical evidence for prevention exists.**
- **Population-based prevention is the most cost-effective** and the only **affordable option** for major public health improvement in NCD rates.
- **Major changes in population rates can take place in a surprisingly short time.**
Finland Has Shown

- Prevention of cardiovascular diseases is possible and pays off
- Population based prevention is the most cost effective and sustainable public health approach to CVD control
- Prevention calls for simple changes in some lifestyles (individual, family, community, national and global level action)
- Influencing diet and especially quality of fat is a key issue
- Many results of prevention occur surprisingly quickly (CVD, diabetes) and also at relatively late age
- Comprehensive action, broad collaboration with dedicated leadership and strong government policy support
Finland
THANK YOU
Average contribution to SAFA intake by food groups among Finnish adults, 25-74 years (n = 2 039)
Average contribution to PUFA intake by food groups among Finnish adults, 25-74 years (n = 2 039)

PUFA %

- Fat spreads, dressings
- Cereal and bakery products
- Meat and poultry dishes
- Vegetable and potato dishes
- Dairy and cheese
- Other foods

FINDIET 2007