

Public Health Nutrition:

Major Areas in Need of Decisions

Update on trans and saturated fats

What might taxes and regulations have to offer?

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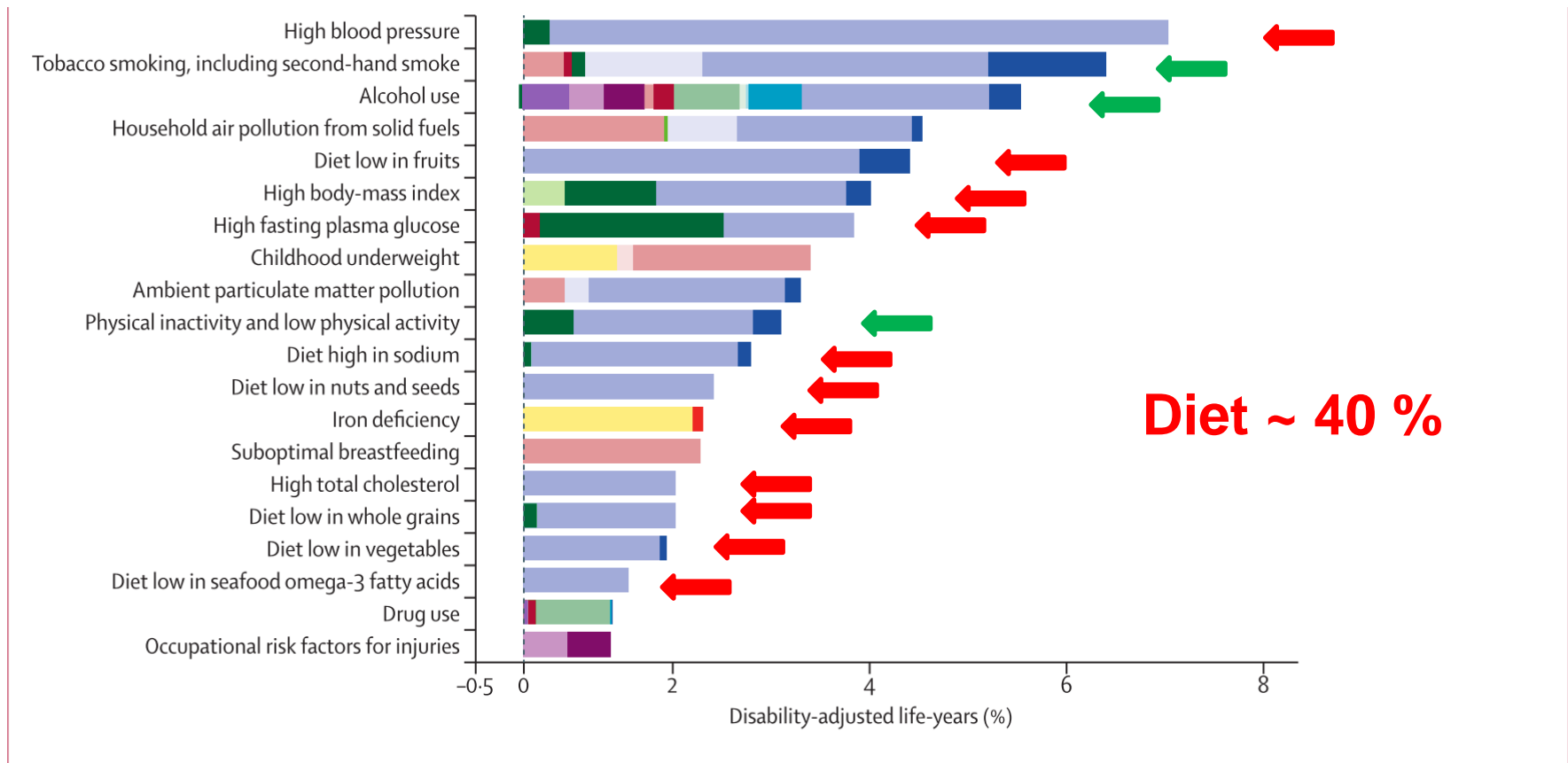
Commercial interests



I have nothing to declare!

Burden of disease in 2010

Percentage of global disability-adjusted life-years



From basic food to junk food in 40-50 years



Coca-Cola



Intake of fatty acid in general populations

Systematic review of data from 40 countries

% of population consuming higher saturated fat than 10% E
% of population consuming polyunsaturated fat less than 6% E

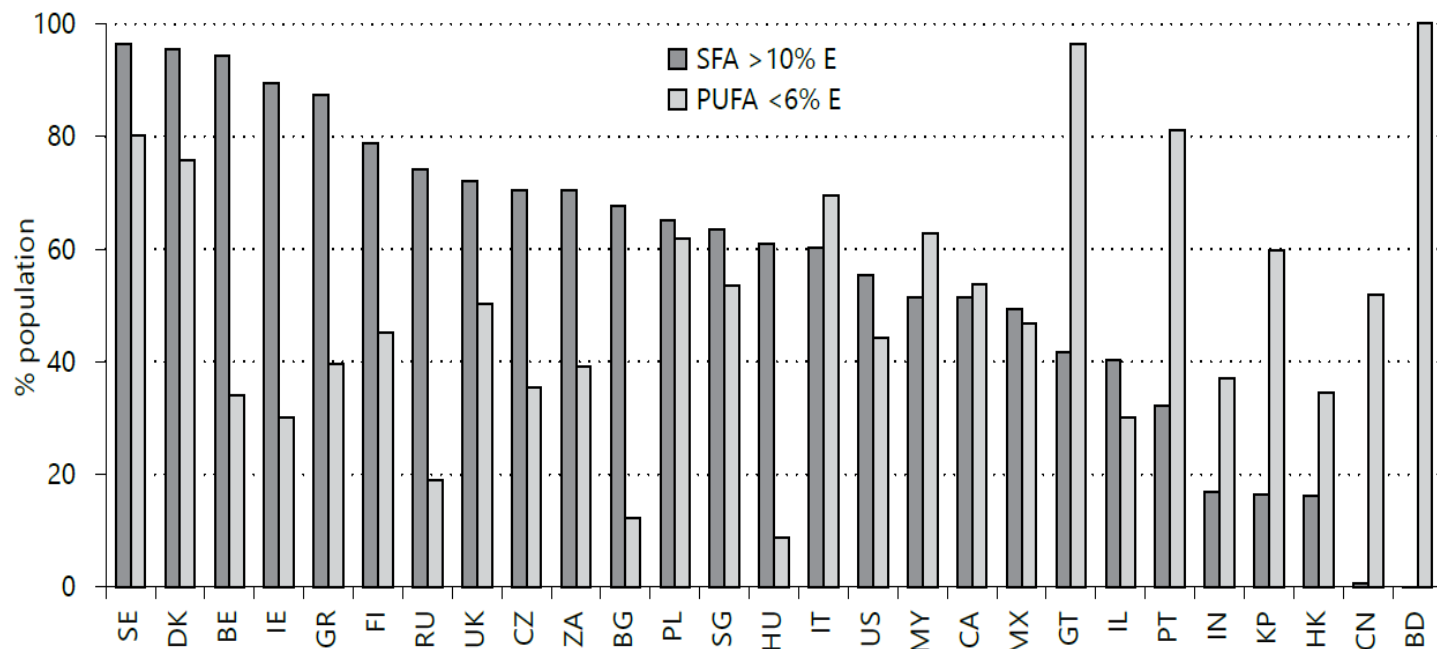


Fig. 3. Percentage of population consuming higher SFA (>10% E) and lower PUFA (<6% E) than recommended. SE = Sweden; DK = Denmark; BE = Belgium; IE = Ireland; GR = Greece; FI = Finland; RU = Russia; UK = United Kingdom; CZ = Czech Republic; ZA = South Africa; BG = Bulgaria; PL = Poland; SG = Singapore; HU =

Hungary; IT = Italy; US = United States; MY = Malaysia; CA = Canada; MX = Mexico; GT = Guatemala; IL = Israel; PT = Portugal; IN = India; KP = South Korea; HK = Hong Kong; CN = China; BD = Bangladesh.

Saturated fat and CHD

(Ecological study)

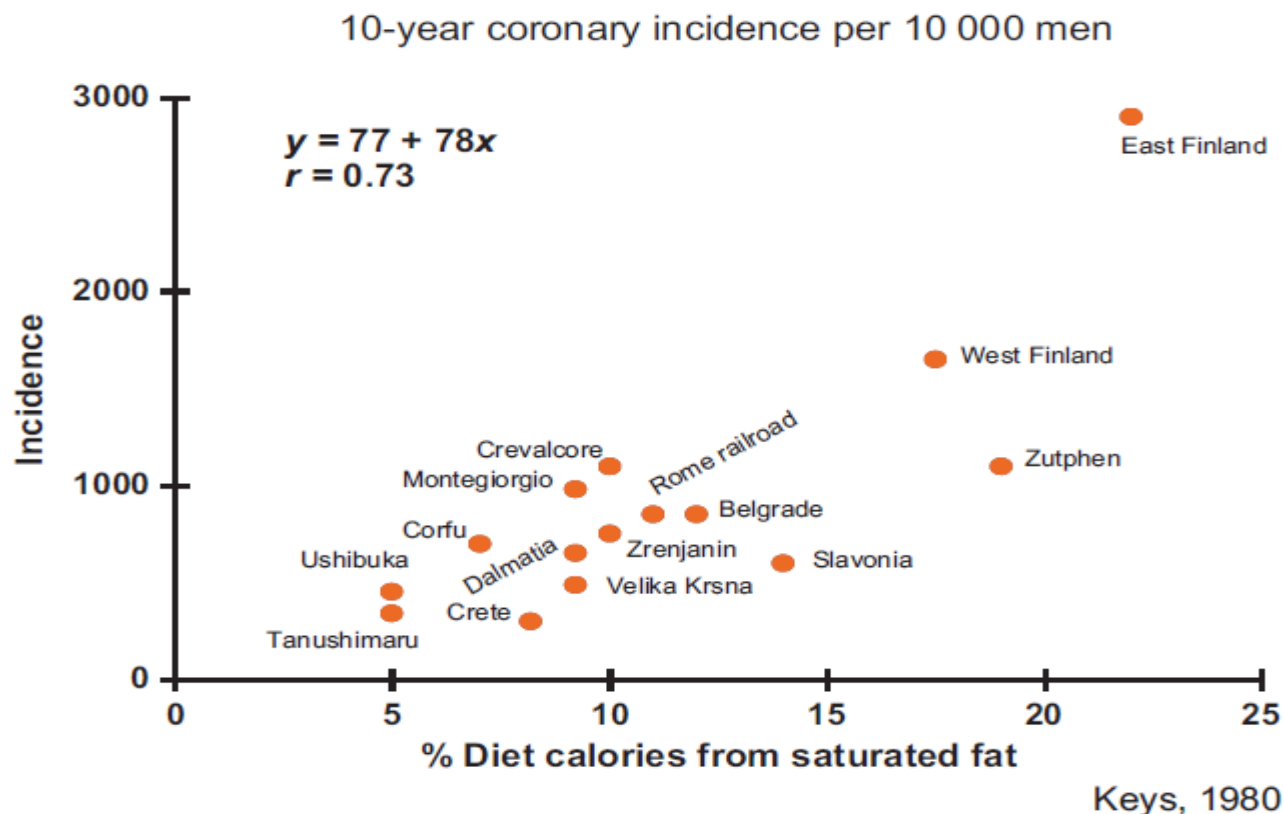


Fig. 2 Ten-year coronary death rates of the cohorts plotted against the percentage of dietary calories supplied by saturated fatty acids (modified from the reference [9]).

Trans fats (TFA)

Ruminant TFA (rTFA) > < industrial TFA (iTFA)

- ⊗ **rTFA: gut bacteria of ruminant animals**
- ⊗ **iTFA: Partial hydrogenation of oils and fat**
- ⊗ **iTFA → Increased risk of CHD**
 - ⊗ **2% increase in total energy → 23% increase in CHD**
- ⊗ **No positive dietary role of iTFA**
- ⊗ **WHO/FAO 2003: Trans fat < 1 % of total energy intake**
 - ⊗ **Increasing pressure on food producers**
- ⊗ **Millions of European still consume TFA**
 - ⊗ **Adolescent males, university students, and customers at certain ethnic food outlets and fast food restaurants**

Type of Dietary Fat and Risk of Coronary Heart Disease The Nurses' Health Study 14-Year Follow-up

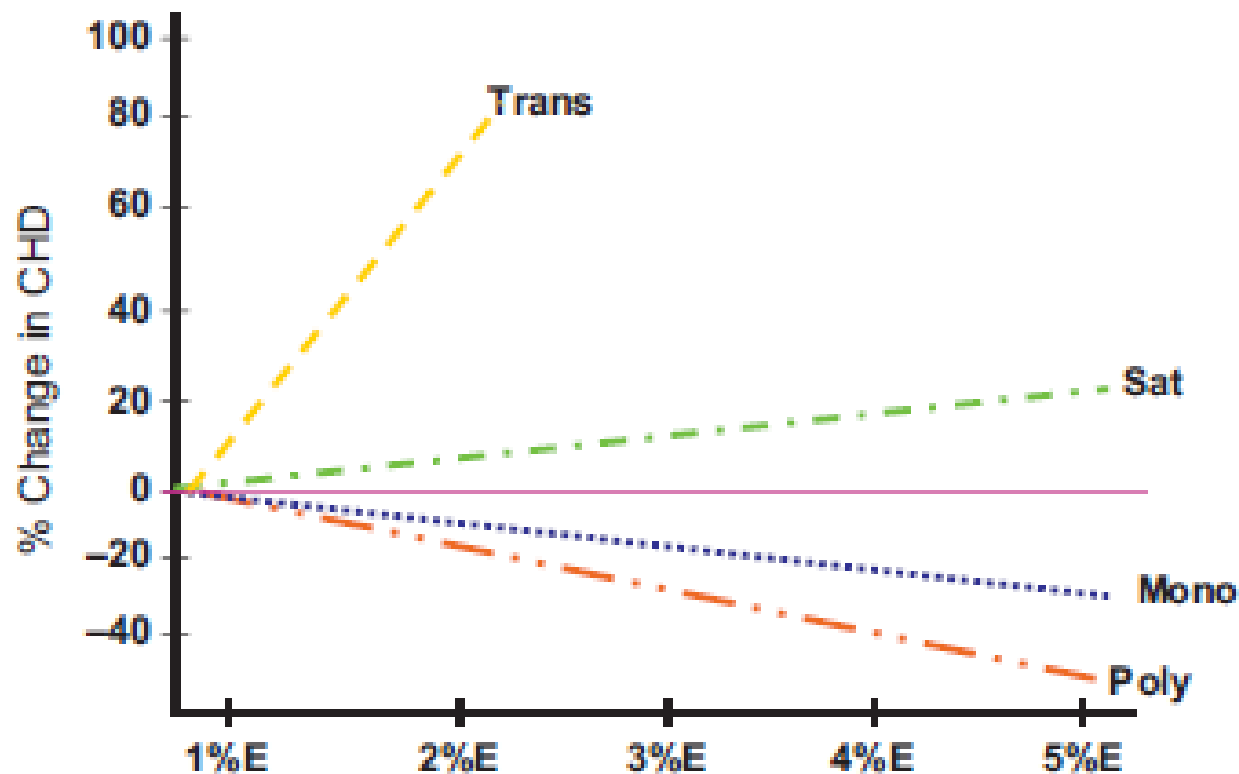
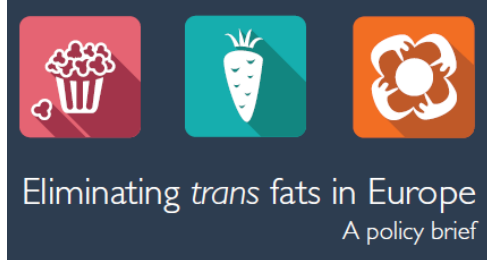


Fig. 4 *Multivariate relative risks of coronary heart disease with increasing intakes of specific types of fat, compared with the same energy intake from carbohydrate. Data are based on 14 years of follow-up in the Nurses' Health Study (from the reference [20]; used with permission).*



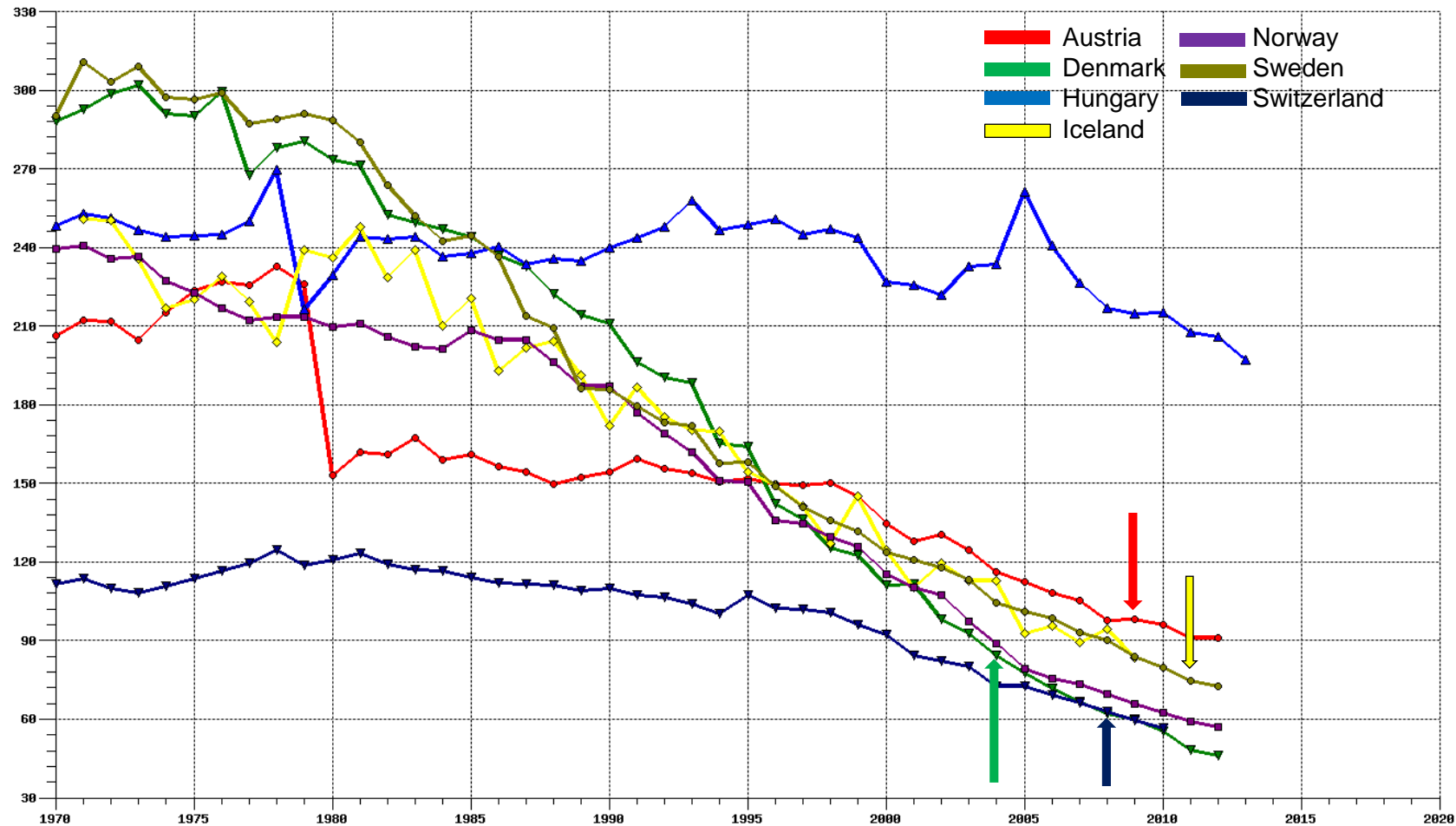
September 2015

r-TFA excluded

Country	Dates	Limits
Denmark	1st January 2004	2g per 100g of fat or oil
Switzerland	1st April 2008	2g per 100g of vegetable fat or vegetable oil
Austria	1st September 2009	2g per 100g of fat or oil
Iceland	1st August 2011	2g per 100g of fat or oil
Norway	16th January 2014	2g per 100g of fat or oil
Hungary	18th February 2014	2g per 100g of fat or oil
Sweden	Passed (March 2011). Not yet implemented	2g per 100g of fat or oil

Voluntary programmes: Belgium, Czech Republic, France, Germany, Netherlands, Poland, UK

Mortality from CHD



WHO database October 2015

A general ban is presently under evaluation in EU



i-TFA may be easy to combat

What about saturated fats?

How to assess an effect of taxation on saturated fats?

⌘ Modelling studies (plenty)

- ⌘ Data from food surveys or experiments
- ⌘ Data on (own and cross) price elasticity (e.g. - 0.40: 10 % rise in price → 4 % decline in consumption)
- ⌘ Changing diet → lipids/salt → CHD and mortality

⌘ Empirical data ("real life") (seldom)

- ⌘ Spontaneous price changes
- ⌘ Taxation

Modelling studies

- Effect on total calories purchased
- No effect on fat purchased

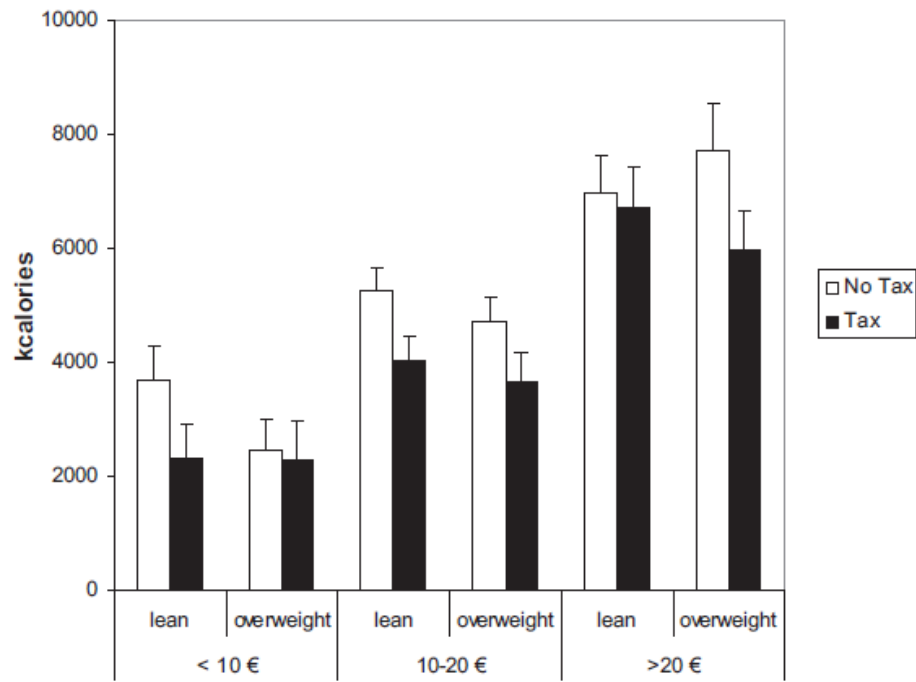


Fig. 1. The effect of budget, overweight and tax on purchased calories from high energy dense products (mean and S.E.M.).

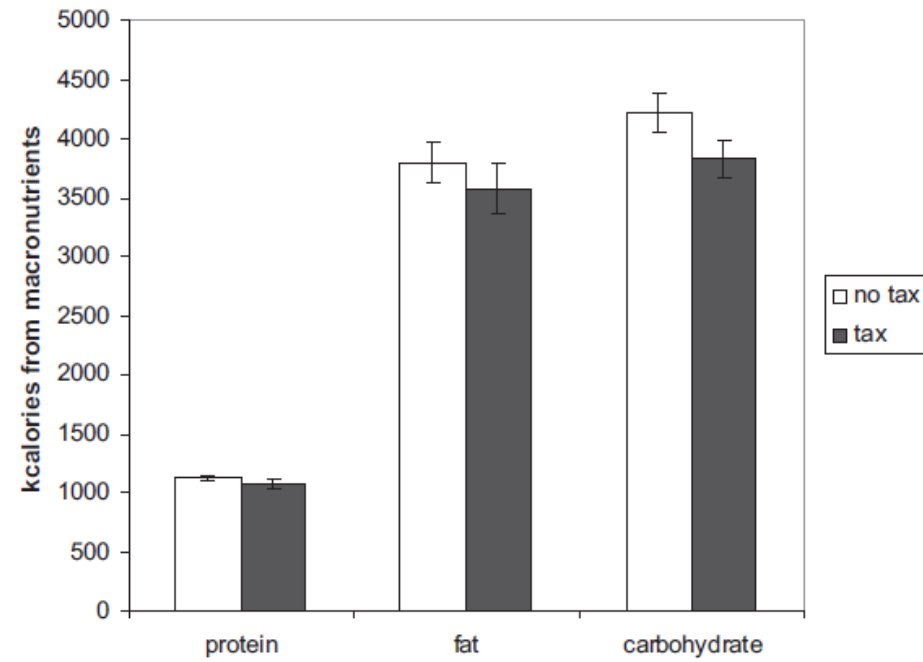


Fig. 2. The effect of tax on calories from carbohydrates, fat and protein (mean and S.E.M.).

Real life experiments

- ❧ **Price changes in China 1989-93** (Guo X et al. J Nutr 1999)
 - ❧ Cohort of 3780 households
 - ❧ Large and significant price effects
 - ❧ Lower fat intake among the rich
- ❧ **EU subsidies on whole milk**
 - ❧ Denmark: Price 25% ↑ sale 25% ↓
- ❧ **The Danish fat tax**



The Danish fat tax in short

- ❧ **What?** A tax of DKK 16.00 per kg of saturated fat in dairy, margarine, oils, meat and composite foods containing these foods, i.e. cookies, crisps and ready meals (minimum threshold: 2.3 % saturated fat)
- ❧ **When?** October 2011 to January 2013 (15 months)
- ❧ **Who?** Tax paid by producers and importers
- ❧ **Why?** To finance tax reliefs and improve health
- ❧ **Effect on price?** 4.1 % (0.1%-16.2%)



Effect of Danish fat tax

Three different analyses

- ③ **Panel questionnaire – 10-15 % reduction**
(Jensen JD et al, Food Policy 2013)
- ③ **Model looking at minced beef and cream - 4-6 % reduction** (Jensen JD et al, Publ Health Nutr 2015)
 - ③ **Econometric analyses (Linearized Almost Ideal Demand System (LAIDS))**
 - ③ **Sale in one supermarket (Coop Denmark)**
- ③ **Total sale of fat products – 0.9 % reduction**
(Bødker M et al, Prev Med 2015)
 - ③ **Nearly all outlets (Nielsen ScanTrack)**
 - ③ **No “hard data” on substitution**



Conclusion

- ❧ **Banning trans fat could be a way forward. We need to assess the effect**
- ❧ **Isolated taxation on saturated fat may not be the optimal solution**
 - ❧ **Demand for food is inelastic**
 - ❧ **Substitution effects may obscure health benefits**
 - ❧ **Combined tax/subsidies, calorie tax – maybe combined with traffic light nutrition labelling**
(Nnoaham et al., 2009; Tiffin & Arnoult, 2011)
 - ❧ **Price increase by >20% to have an effect on population health?** (Mytton et al., 2012)
- ❧ **Be aware of industrial influence**



Thank you for your attention



Ekstra slides

Price trend in USA

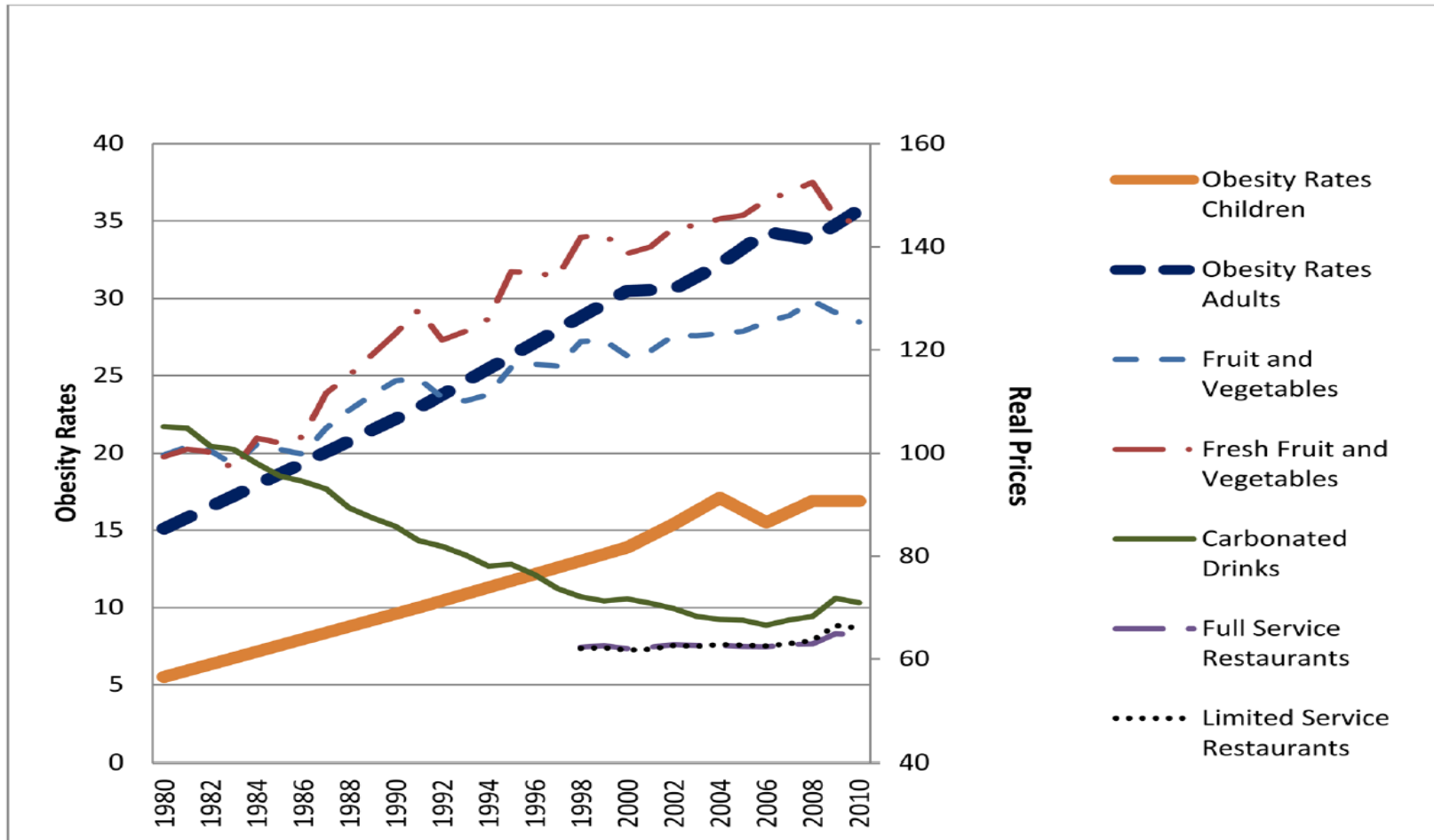


Figure 1.

Trends in Selected Food and Beverage Prices and Obesity Rates among Children and Adults in the U.S., 1980–2011

Note: Authors' calculations based on data obtained from the Bureau of Labor Statistics, 2012.

Nurses' health study
dietary fats and risk of CHD

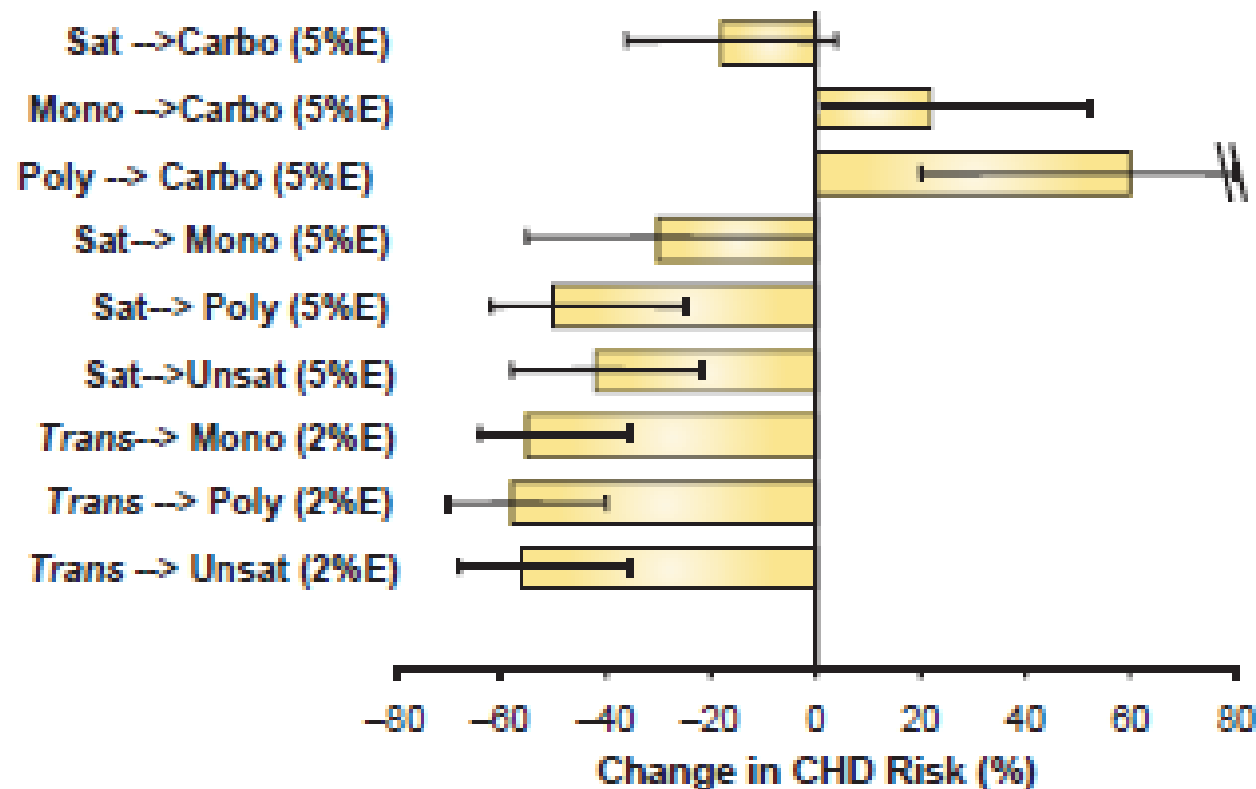
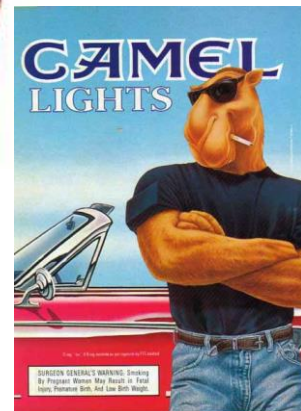


Fig. 5 *Estimated changes in risk of CHD for isocaloric substitution one type of fat for another. Data are based on 14 years of follow-up of 80 082 women in the Nurse's Health Study (from the reference [20]).*

Overconsumption and commercial interests

- ❧ **Overconsumption due to commercial interests has been known for centuries**
 - ❧ Gin Craze (London beginning of the 18. century)
 - ❧ Reaction against French brandy
 - ❧ Monopoly was broken
 - ❧ Five major laws 1729-51 to restrain the consumption
- ❧ **Now – overconsumption of junk food, tobacco, alcohol, drugs.....**



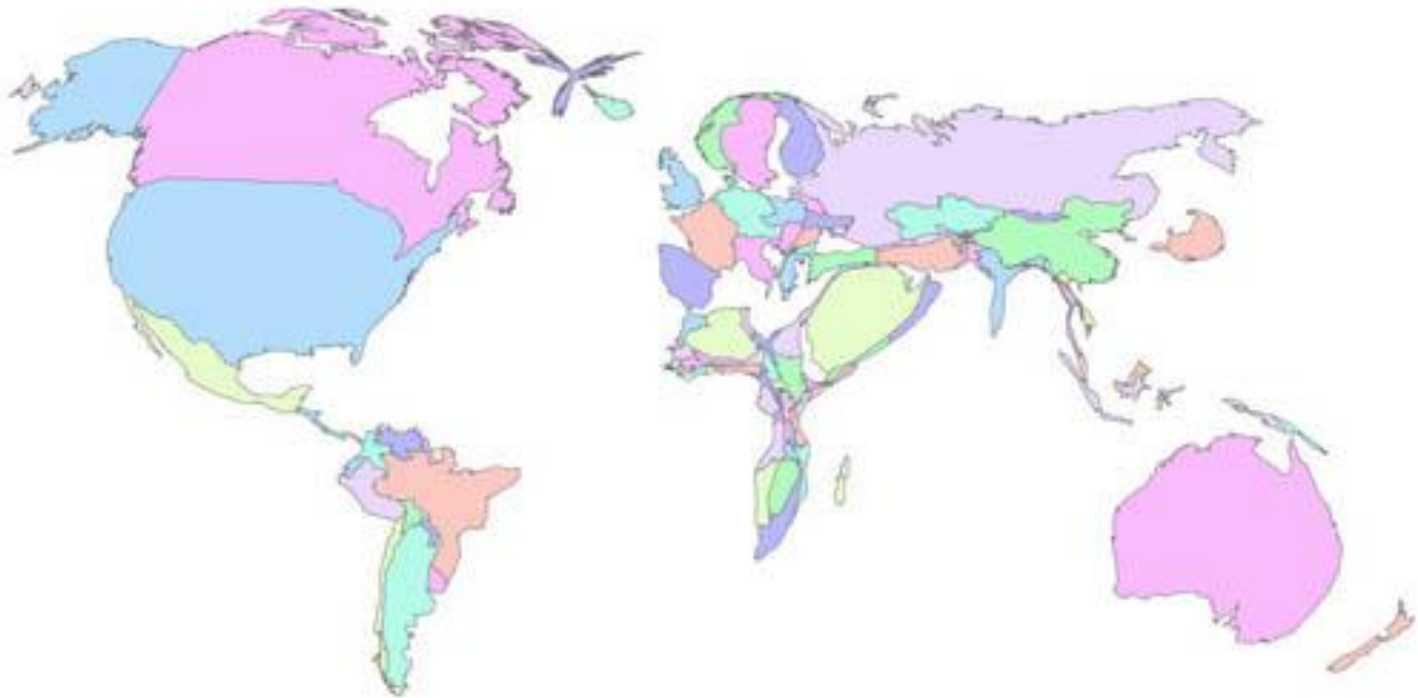
Industrial influence

"...it is not just Big Tobacco anymore. Public health must also contend with Big Food, Big Soda, and Big Alcohol. All of these industries fear regulation, and protect themselves by using the same tactics [...]. Not one single country has managed to turn around its obesity epidemic in all age groups. This is not a failure of individual will-power. This is a failure of political will to take on big business."

- WHO General-Director Dr Margaret Chan (2013)



Per capita caloric intake



World food programme: 2 billions are over nourished
1 billion is under nourished

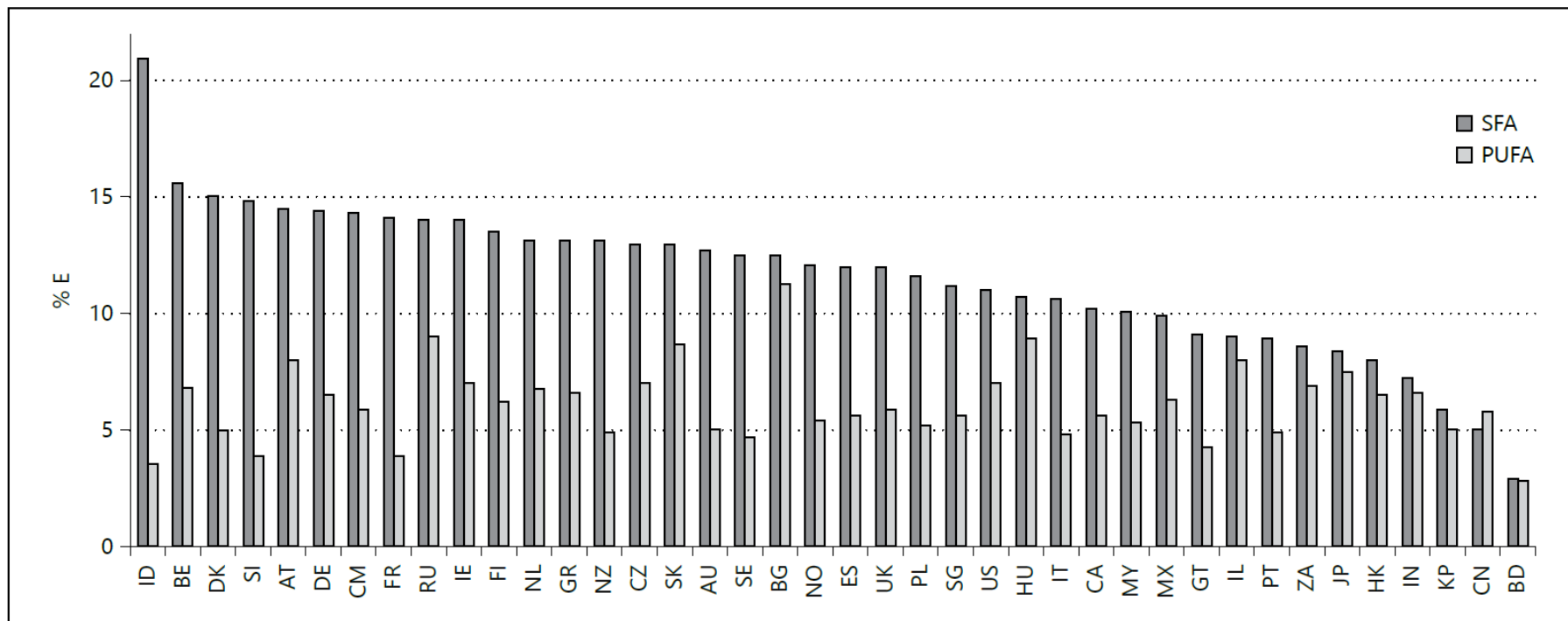


Fig. 2. Mean intake of SFA (intake in descending order) and PUFA in 40 countries. ID = Indonesia; BE = Belgium; DK = Denmark; SI = Slovenia; AT = Austria; DE = Germany; CM = Cameroon; FR = France; RU = Russia; IE = Ireland; FI = Finland; NL = Netherlands; GR = Greece; NZ = New Zealand; CZ = Czech Republic; SK = Slovakia; AU = Australia; SE = Sweden; BG =

Bulgaria; NO = Norway; ES = Spain; UK = United Kingdom; PL = Poland; SG = Singapore; US = United States; HU = Hungary; IT = Italy; CA = Canada; MY = Malaysia; MX = Mexico; GT = Guatemala; IL = Israel; PT = Portugal; ZA = South Africa; JP = Japan; HK = Hong Kong; IN = India; KP = South Korea; CN = China; BD = Bangladesh.