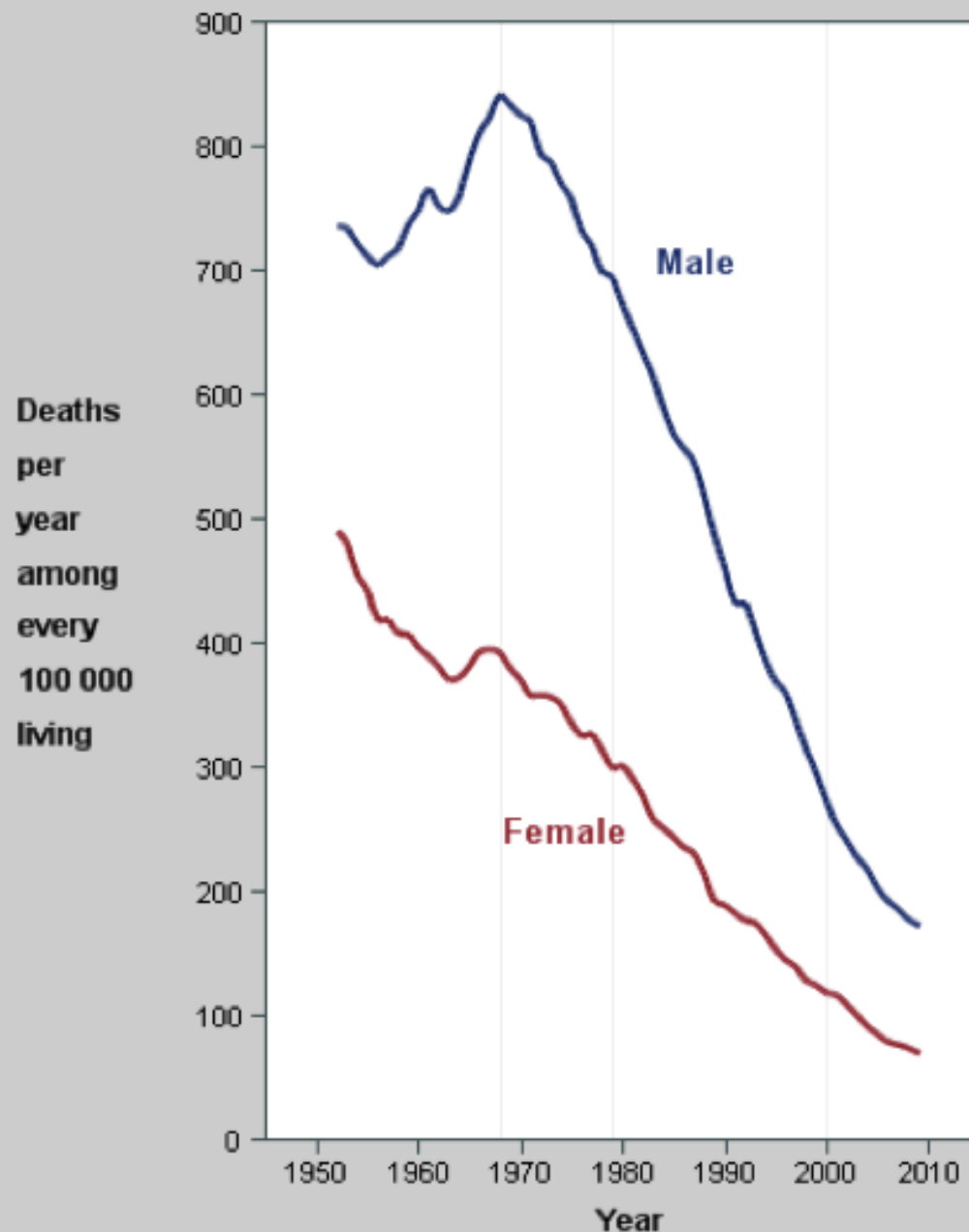


“Which diet is best for our  
vascular health and why?”

Rod Jackson

May 2015

## Mortality trends for all vascular disease: age 35-69 years, New Zealand (Aotearoa)



### Male deaths from this cause at age 35-69 years in 2009:

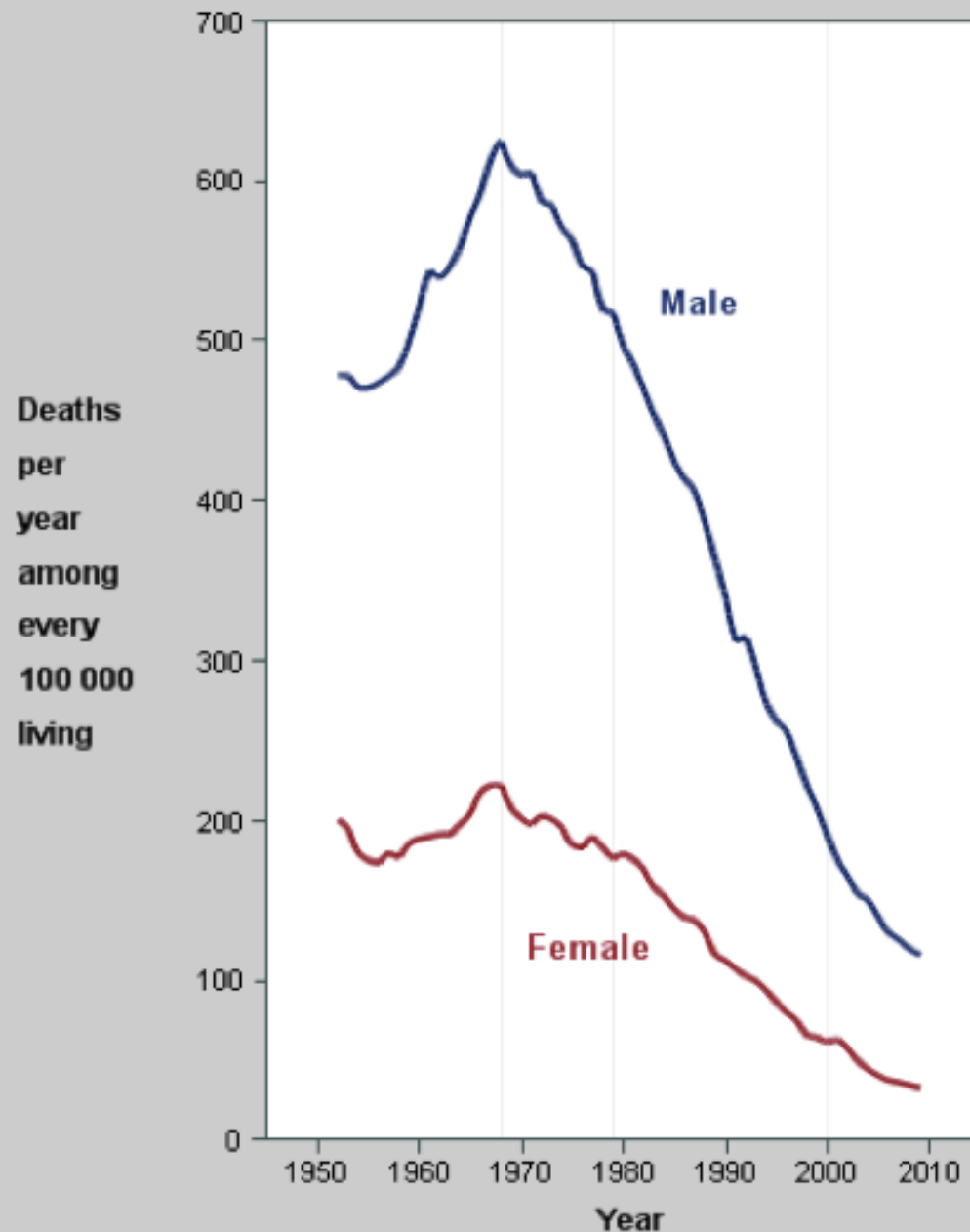
- 1274 (30% of deaths at this age)
- 173 out of every 100 000 males at this age, a rate which was:
  - 36% less than in 2000 (rate: 271)
  - 77% less than in 1975 (rate: 755)
  - 76% less than in 1955 (rate: 711)

### Female deaths from this cause at ages 35-69 years in 2009:

- 513 (17% of deaths at this age)
- 70 out of every 100 000 females at this age, a rate which was:
  - 41% less than in 2000 (rate: 119)
  - 79% less than in 1975 (rate: 335)
  - 84% less than in 1955 (rate: 441)

Created: 17 May 2013, 4:34 pm  
Males & females, ages 35-69 years  
Vascular diseases  
New Zealand

## Mortality trends for coronary heart disease: age 35-69 years, New Zealand (Aotearoa)



### Male deaths from this cause at age 35-69 years in 2009:

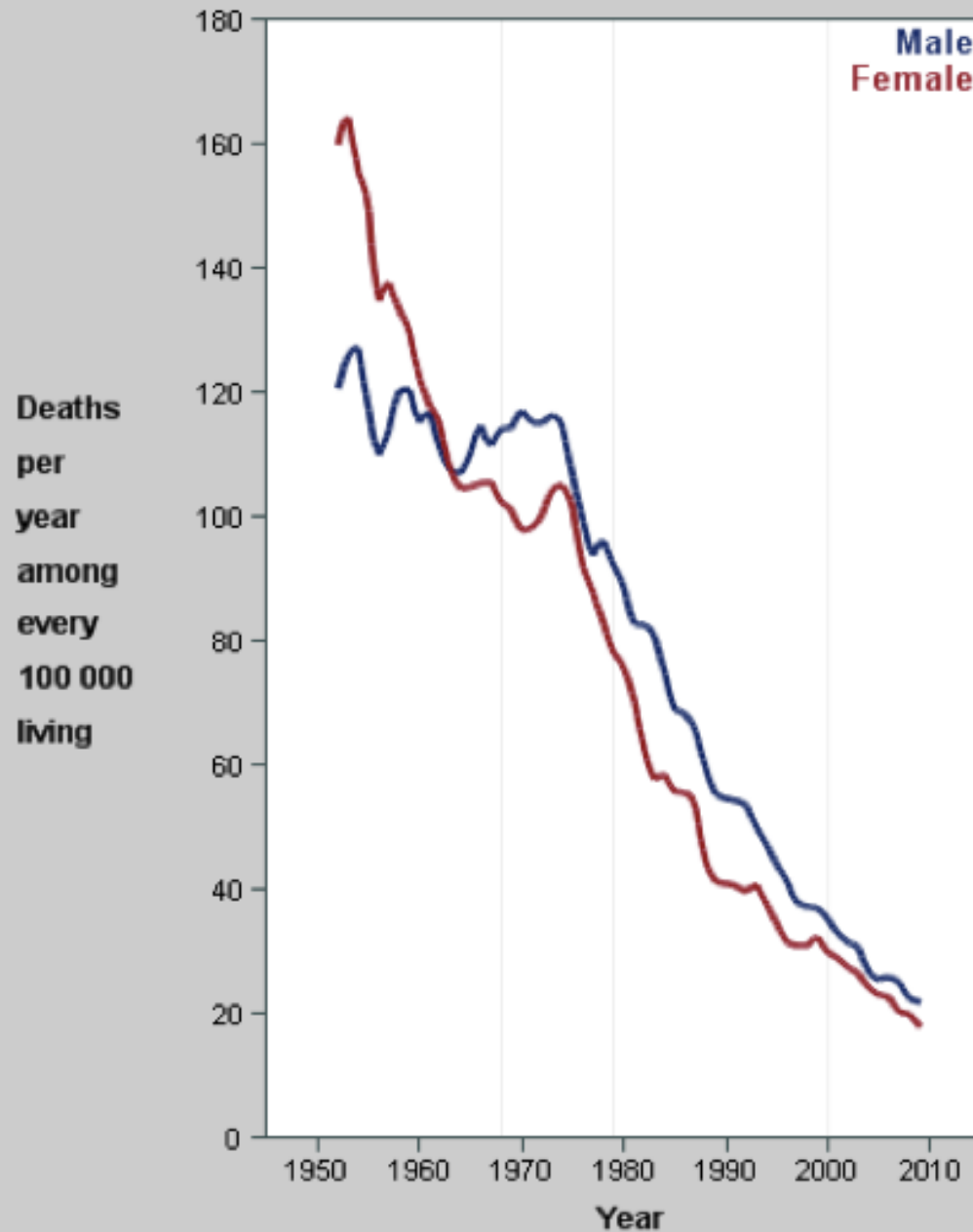
- 845 (20% of deaths at this age)
- 116 out of every 100 000 males at this age, a rate which was:
  - 39% less than in 2000 (rate: 190)
  - 79% less than in 1975 (rate: 562)
  - 75% less than in 1955 (rate: 470)

### Female deaths from this cause at ages 35-69 years in 2009:

- 230 (8% of deaths at this age)
- 33 out of every 100 000 females at this age, a rate which was:
  - 47% less than in 2000 (rate: 61)
  - 82% less than in 1975 (rate: 184)
  - 81% less than in 1955 (rate: 175)

Created: 17 May 2013, 4:34 pm  
Males & females, ages 35-69 years  
Coronary heart disease  
New Zealand

## Mortality trends for stroke: age 35-69 years, New Zealand (Aotearoa)



### Male deaths from this cause at age 35-69 years in 2009:

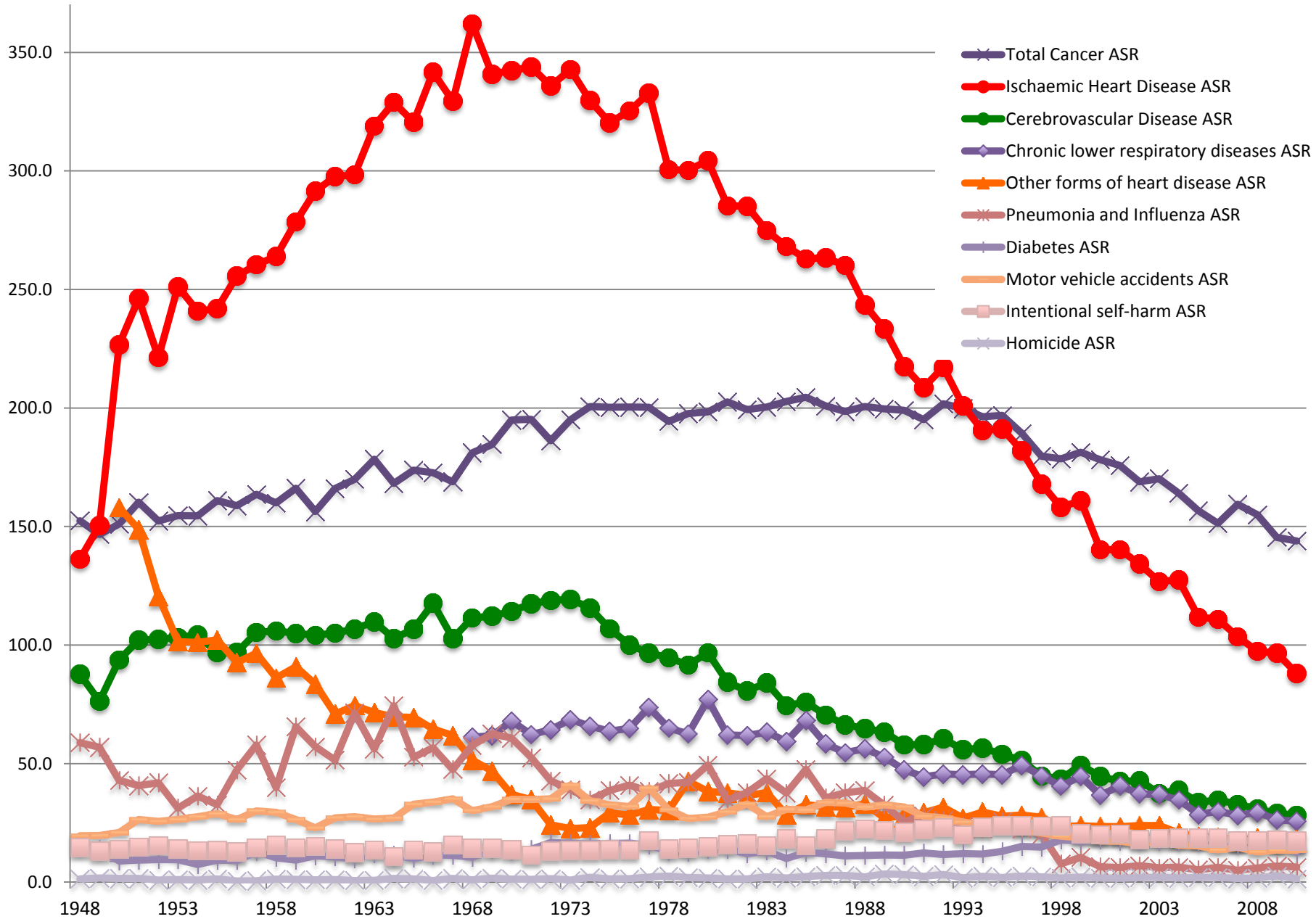
- 164 (4% of deaths at this age)
- 22 out of every 100 000 males at this age, a rate which was:
  - 38% less than in 2000 (rate: 35)
  - 79% less than in 1975 (rate: 106)
  - 81% less than in 1955 (rate: 117)

### Female deaths from this cause at ages 35-69 years in 2009:

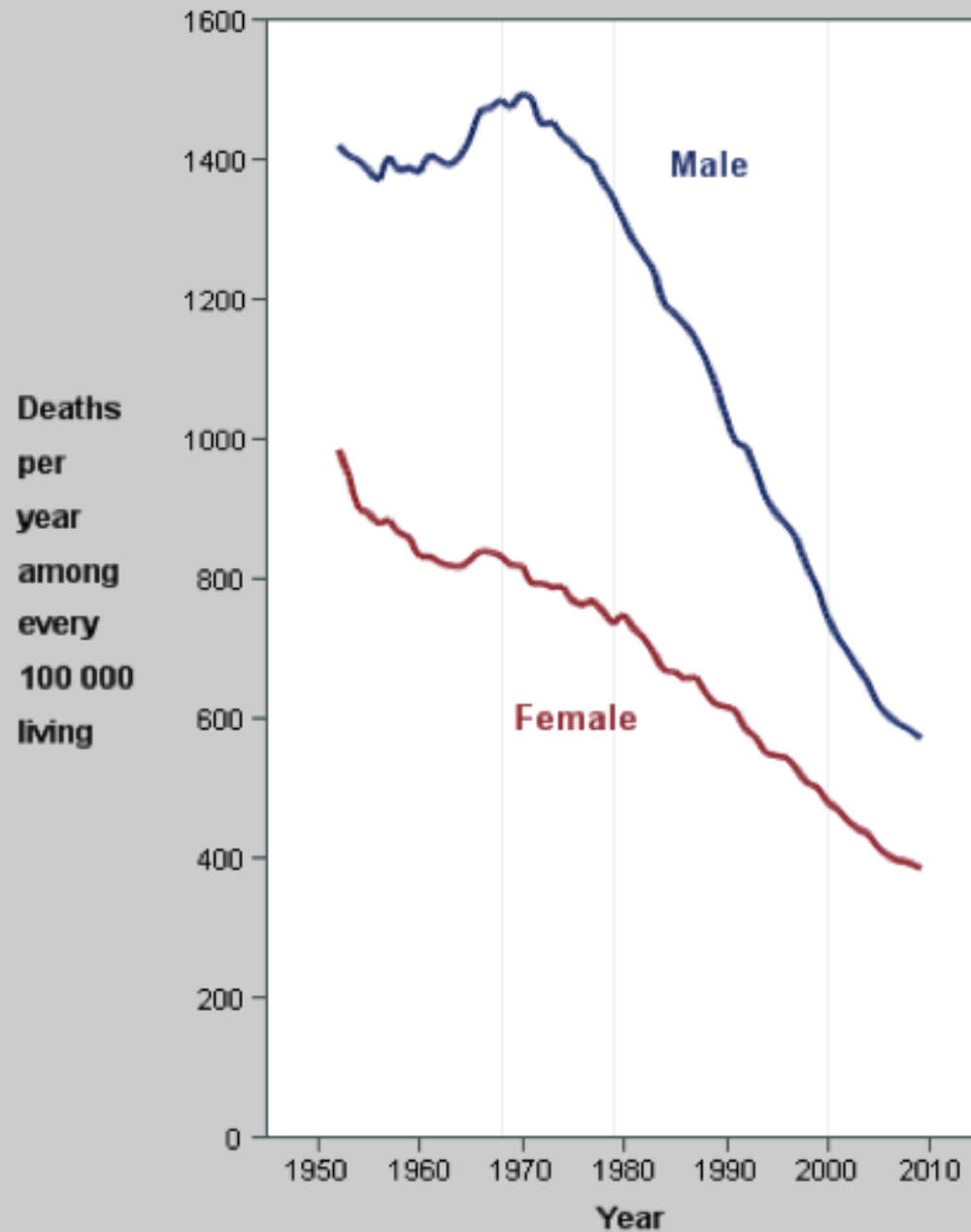
- 134 (4% of deaths at this age)
- 18 out of every 100 000 females at this age, a rate which was:
  - 40% less than in 2000 (rate: 30)
  - 82% less than in 1975 (rate: 101)
  - 88% less than in 1955 (rate: 149)

Created: 17 May 2013, 4:34 pm  
Males & females, ages 35-69 years  
Stroke  
New Zealand

# deaths from heart disease & other causes: NZ



## Mortality trends for all causes of death: age 35-69 years, New Zealand (Aotearoa)



### Male deaths from any cause at age 35-69 years in 2009:

- 4281 (29% of all male deaths)
- 572 out of every 100 000 males at this age, a rate which was:
  - 23% less than in 2000 (rate: 743)
  - 60% less than in 1975 (rate: 1421)
  - 59% less than in 1955 (rate: 1384)

### Female deaths from any cause at ages 35-69 years in 2009:

- 3046 (21% of all female deaths)
- 387 out of every 100 000 females at this age, a rate which was:
  - 19% less than in 2000 (rate: 480)
  - 50% less than in 1975 (rate: 768)
  - 57% less than in 1955 (rate: 893)

Created: 17 May 2013, 4:34 pm  
Males & females, ages 35-69 years  
All causes  
New Zealand

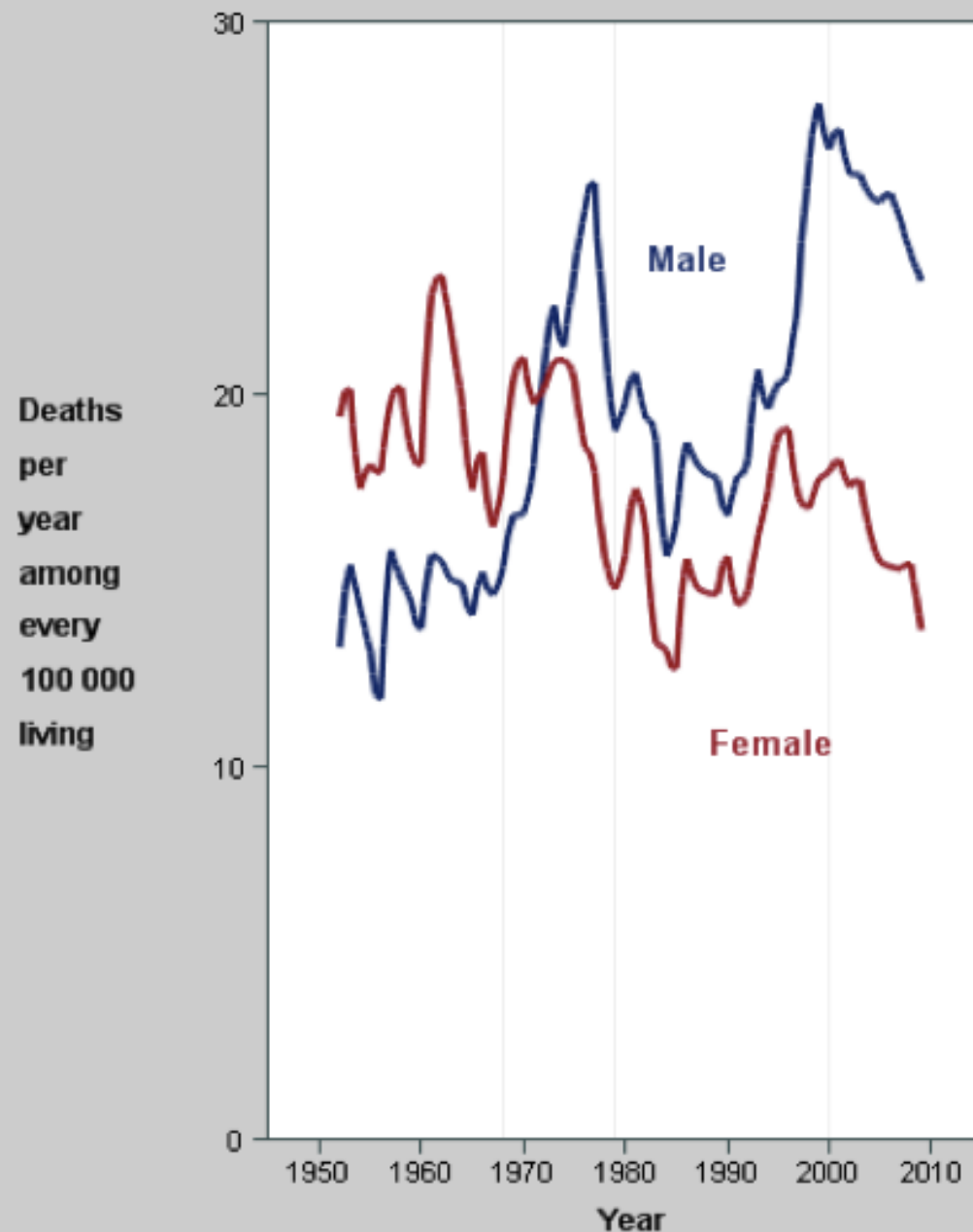
# **Contribution of trends in survival and coronary-event rates to changes in coronary heart disease mortality: 10-year results from 37 WHO MONICA Project populations** *Lancet* 1999; 353: 1547-57

*Hugh Tunstall-Pedoe, Kari Kuulasmaa, Markku Mähönen, Hanna Tolonen, Esa Ruokokoski, Philippe Amouyel, for the WHO MONICA (monitoring trends and determinants in cardiovascular disease) Project\**

**Findings:** Contribution to changing CHD mortality varied, but in populations in which mortality decreased, **coronary-event rates contributed two thirds and case fatality one third.**

**Interpretation:** Over the decade studied (*1980-5 through 1991-5*), the 37 populations in the WHO MONICA Project showed substantial contributions from changes in survival, but the major determinant of decline in CHD mortality is whatever drives changing coronary-event rates.

## Mortality trends for diabetes: age 35-69 years, New Zealand (Aotearoa)



### Male deaths from this cause at age 35-69 years in 2009:

- 171 (4% of deaths at this age)
- 23 out of every 100 000 males at this age, a rate which was:
  - 13% less than in 2000 (rate: 27)
  - 1% less than in 1975 (rate: 23)
  - 76% more than in 1955 (rate: 13)

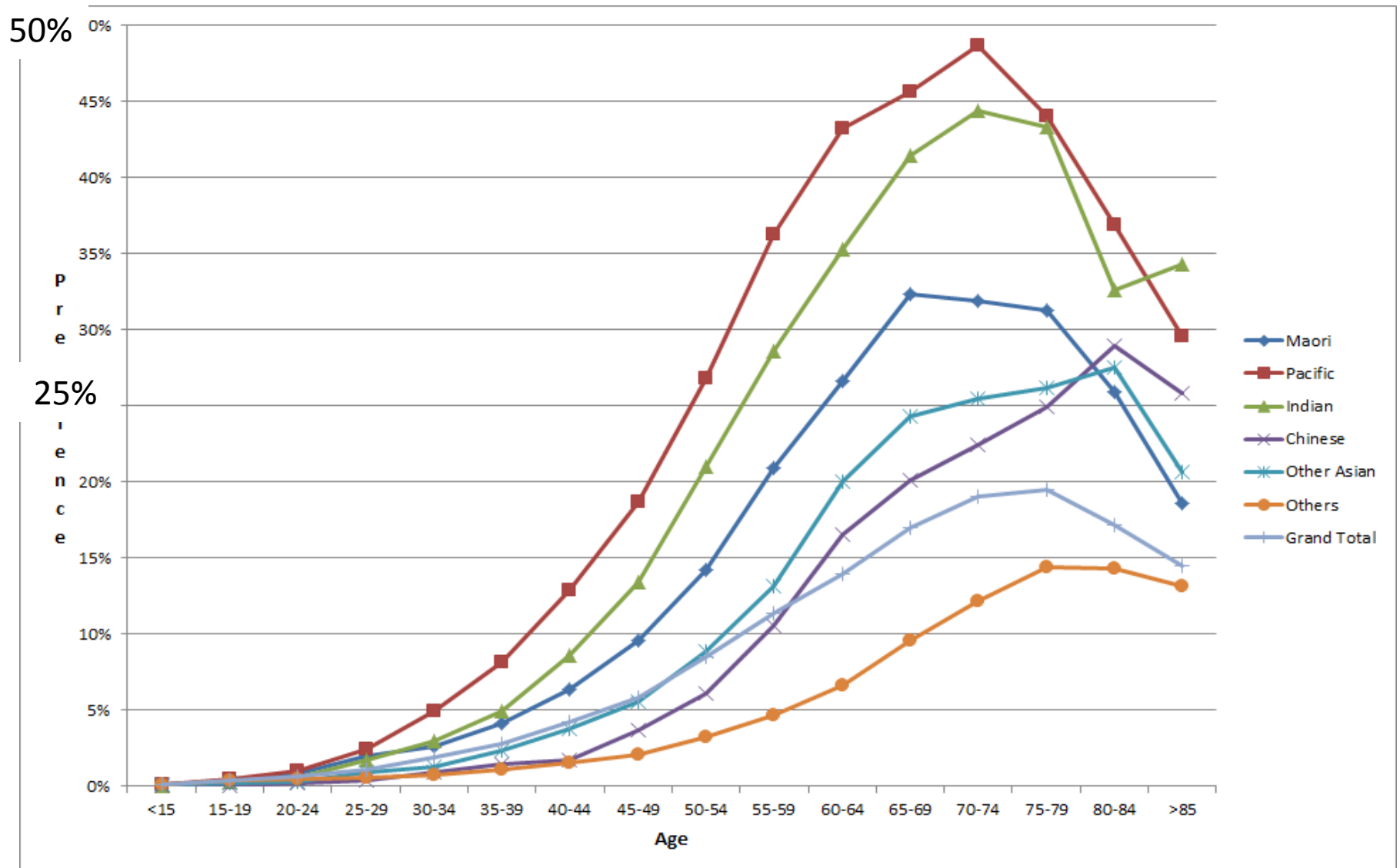
### Female deaths from this cause at ages 35-69 years in 2009:

- 91 (3% of deaths at this age)
- 14 out of every 100 000 females at this age, a rate which was:
  - 24% less than in 2000 (rate: 18)
  - 33% less than in 1975 (rate: 20)
  - 24% less than in 1955 (rate: 18)

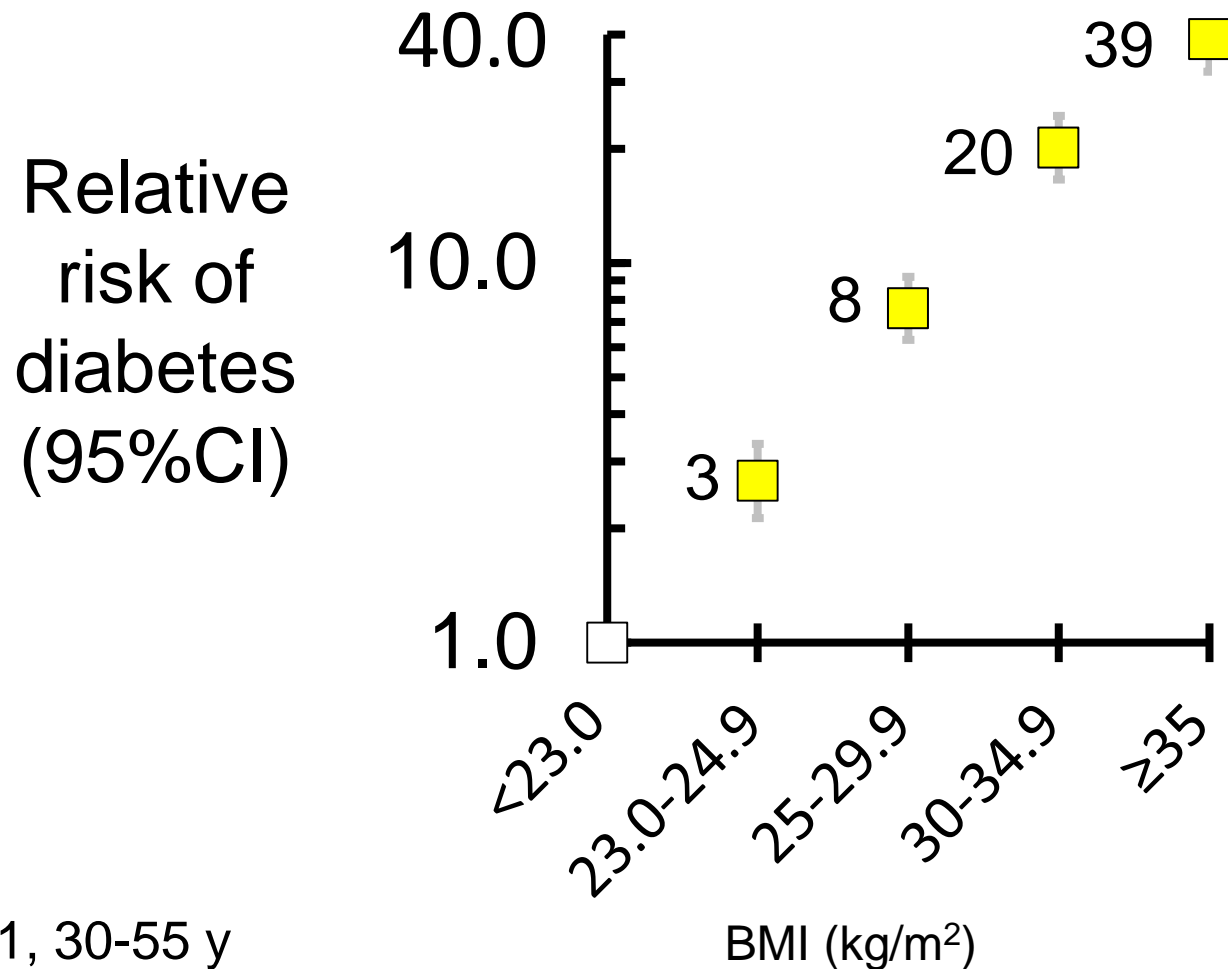
Created: 17 May 2013, 4:35 pm  
Males & females, ages 35-69 years  
Diabetes  
New Zealand



# prevalence of diabetes in female New Zealanders in 2011



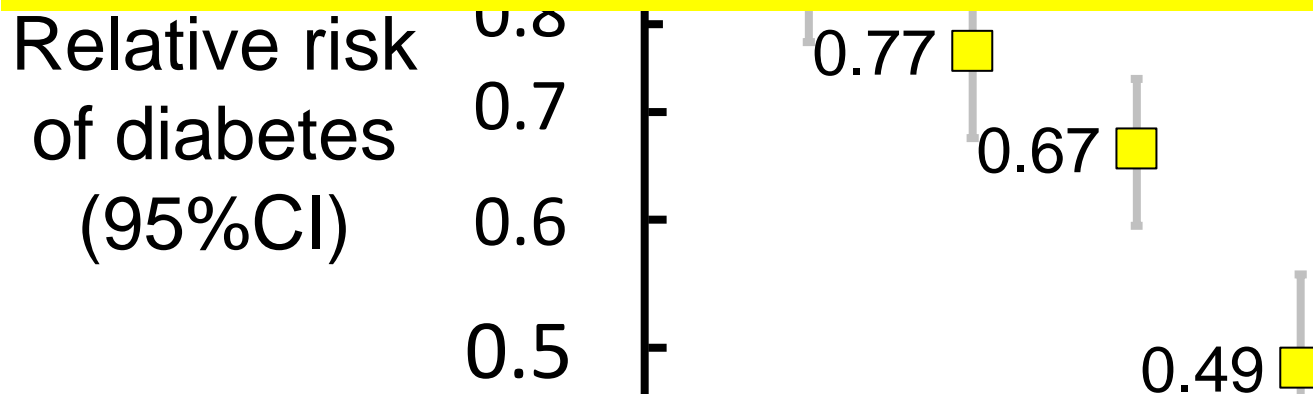
# Nurses Health Study: BMI & diabetes risk



84941, 30-55 y  
16 y follow-up  
3300 cases

# Nurses Health Study: diet & diabetes risk

diet score: intakes of trans fat & cereal fiber,  
glycemic load, PUFA:SFA intake

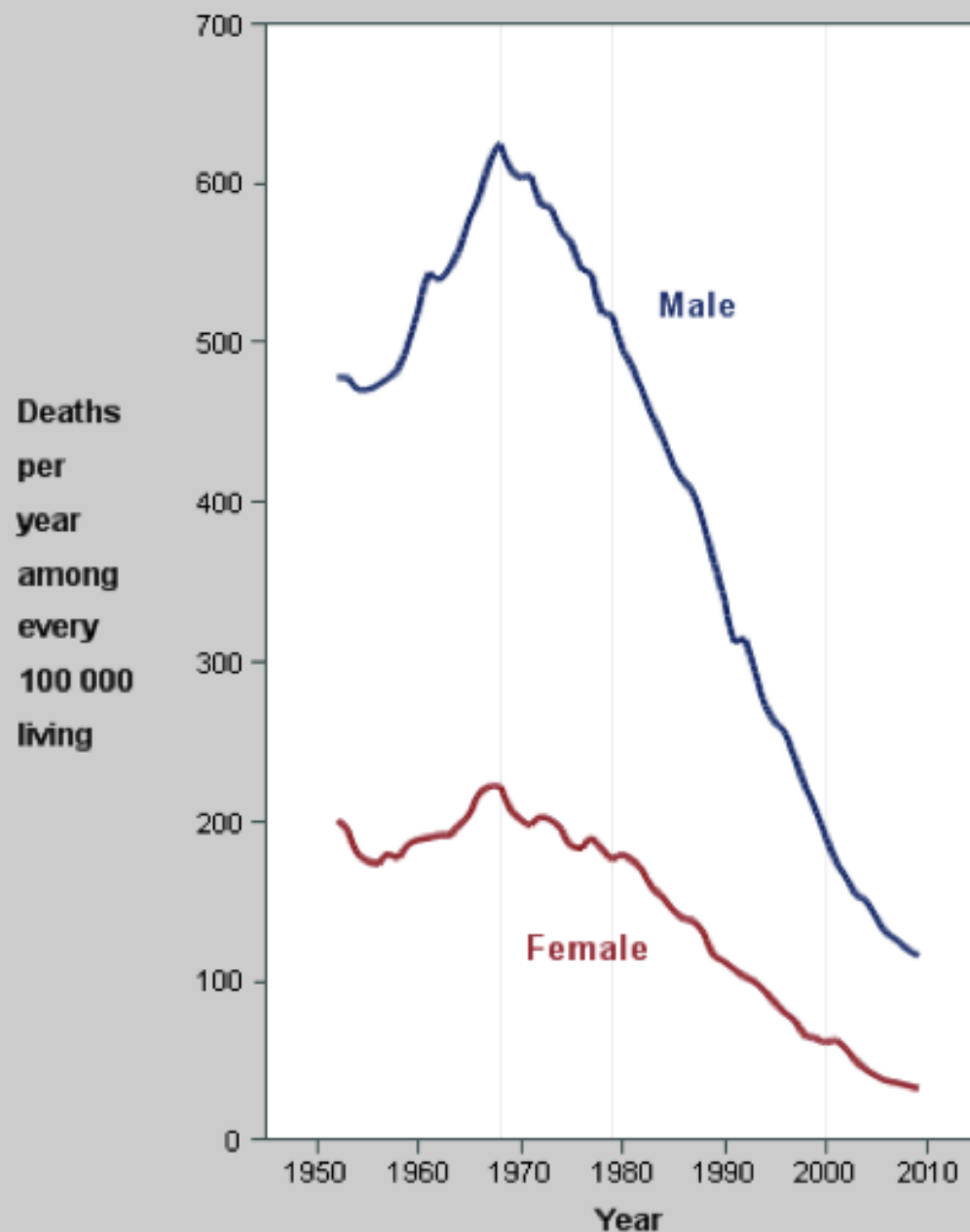


for diabetes risk, it's not what you eat,  
it's how much

Quintile of diet score

84941, 30-55 y  
16 y follow-up  
3300 cases

## Mortality trends for coronary heart disease: age 35-69 years, New Zealand (Aotearoa)



### Male deaths from this cause at age 35-69 years in 2009:

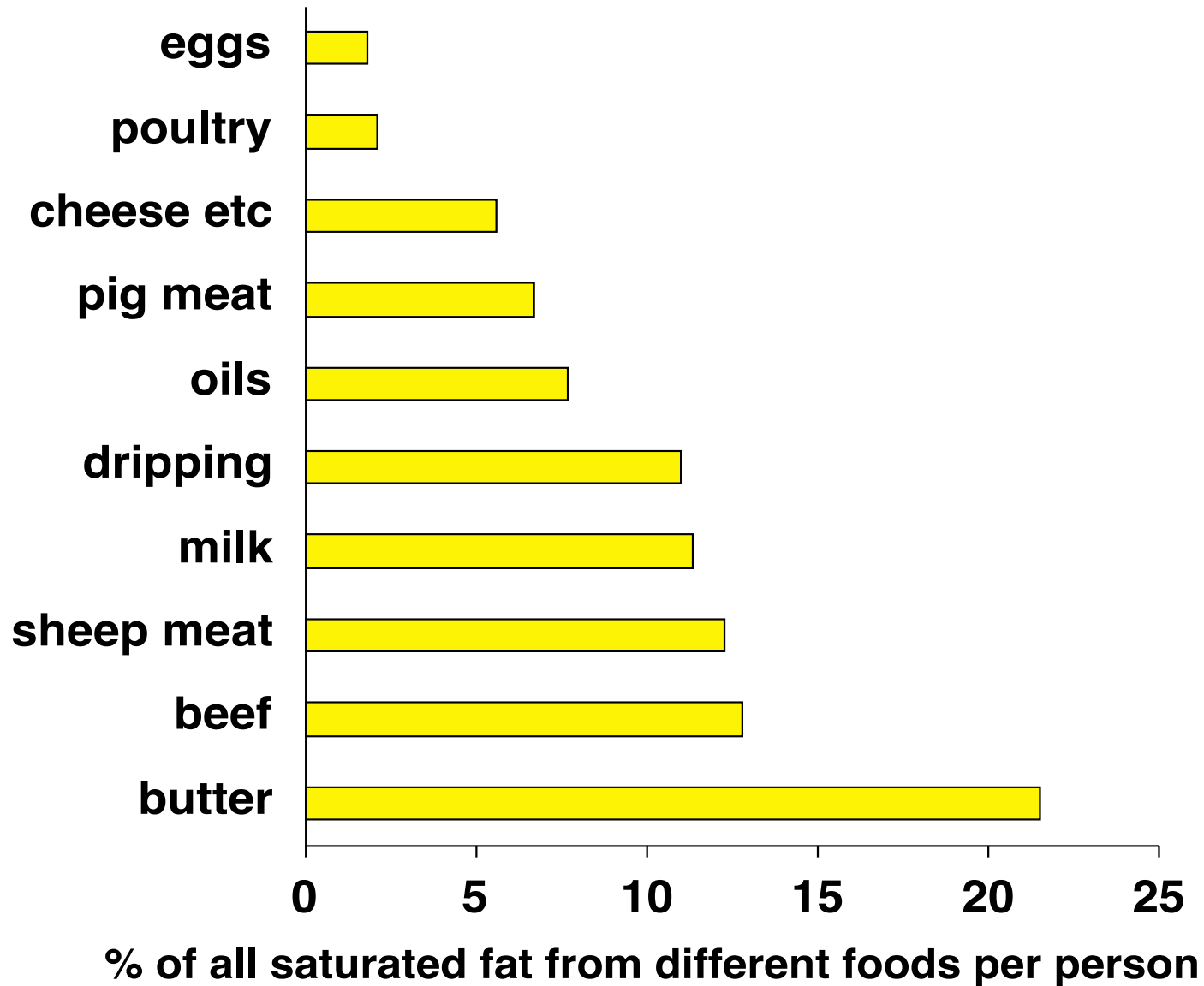
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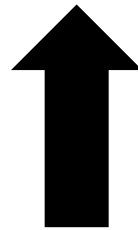
- 230 (8% of deaths at this age)
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  - 81% less than in 1955 (rate: 175)

Created: 17 May 2013, 4:34 pm  
Males & females, ages 35-69 years  
Coronary heart disease  
New Zealand

# sources of saturated fat in New Zealand diet

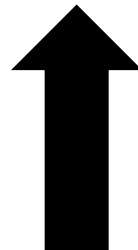


increases CHD risk



?

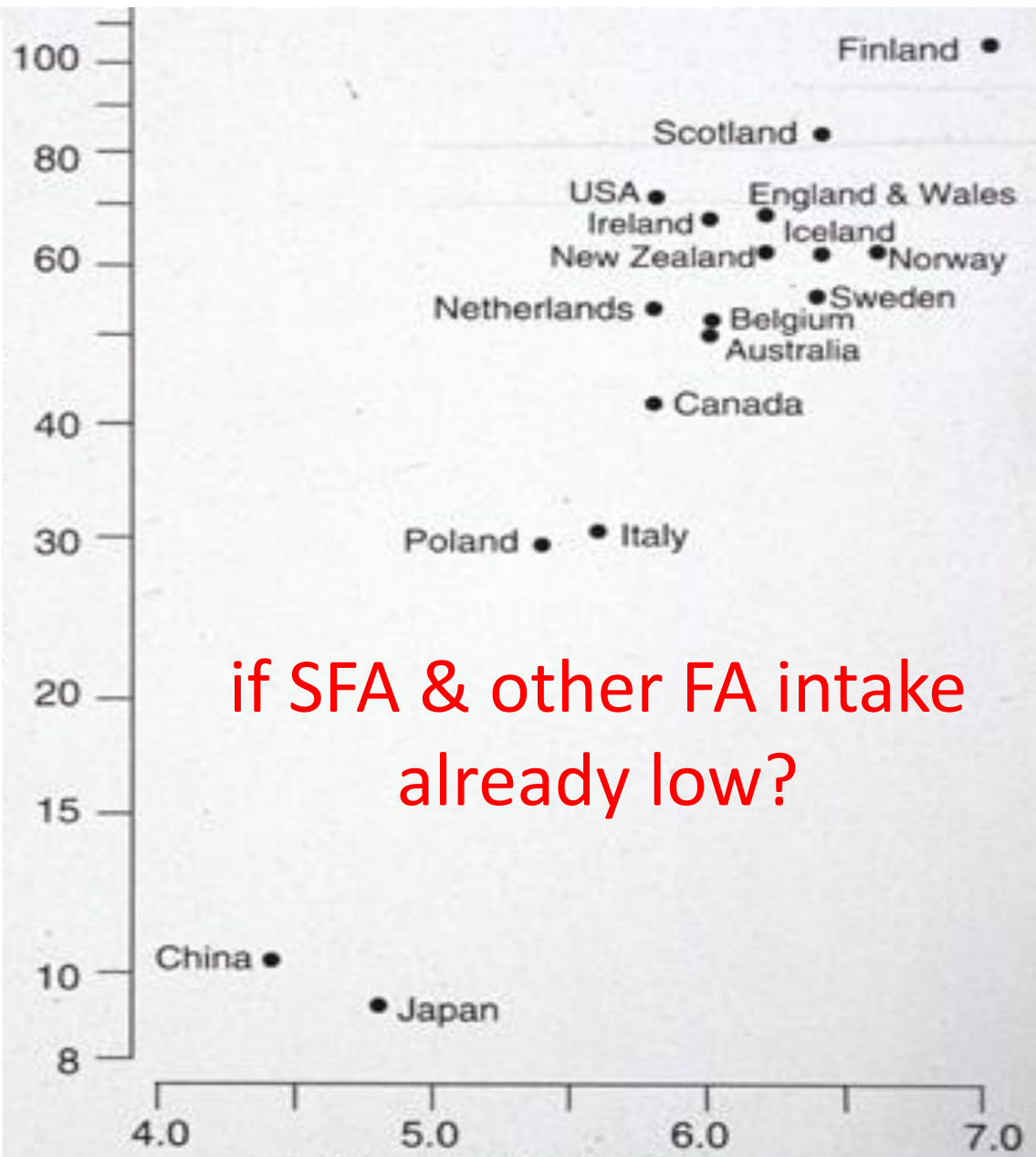
increases blood LDL cholesterol



?

a diet high in SFA

CHD deaths (per 10,000 per year)



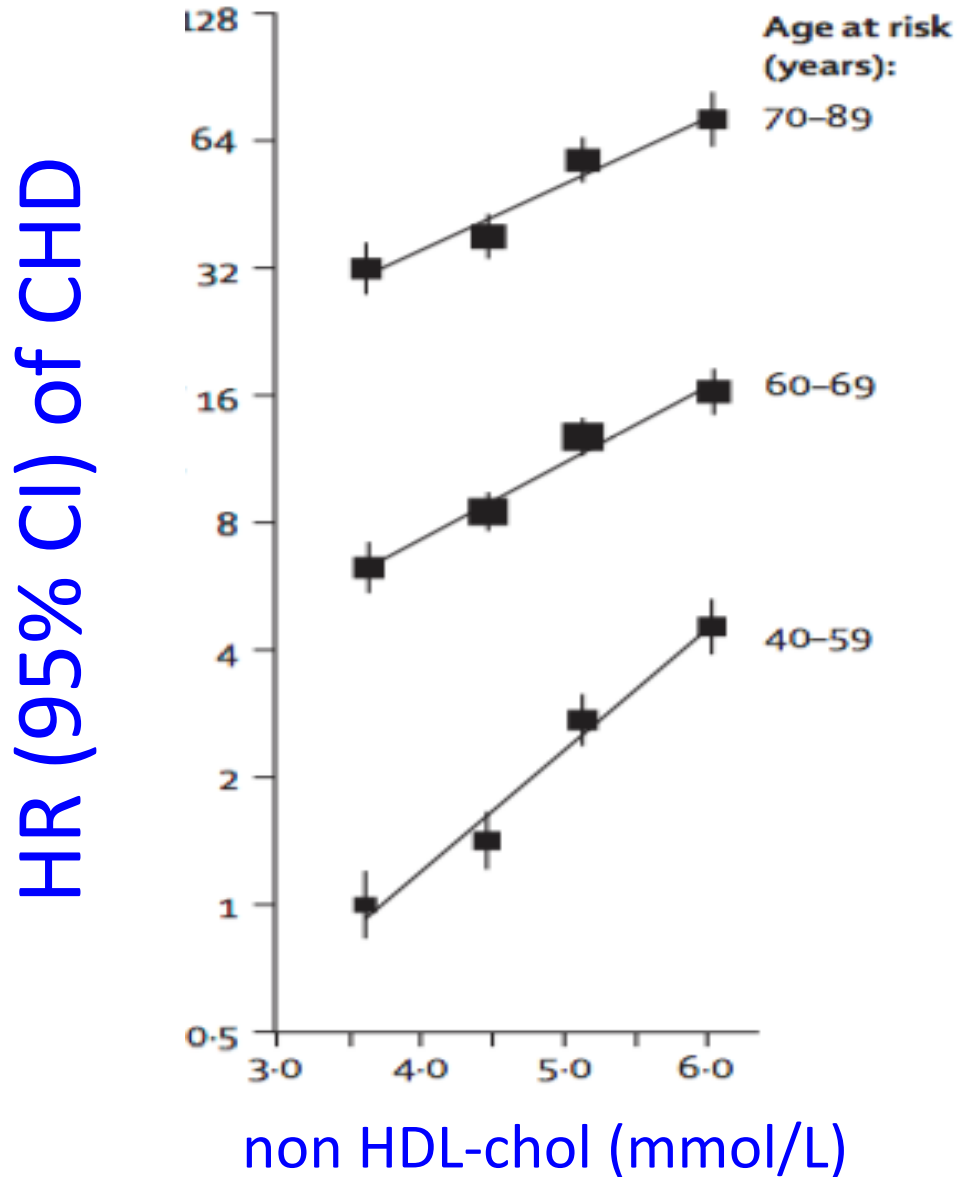
if SFA & other FA intake  
already low?

CHD  
mortality  
rates by  
average  
blood  
cholesterol  
levels in  
different  
countries

average blood cholesterol levels (mmol/L)

Laws & Wald.  
Eur J Clin Nutr  
1994;48:305-25

# non HDL cholesterol & CHD risk

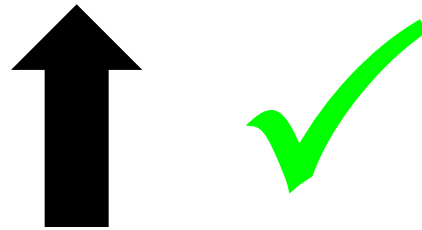


*Lancet* 2007

meta-analysis of 900,000 people in 61 cohorts followed for > 10 years

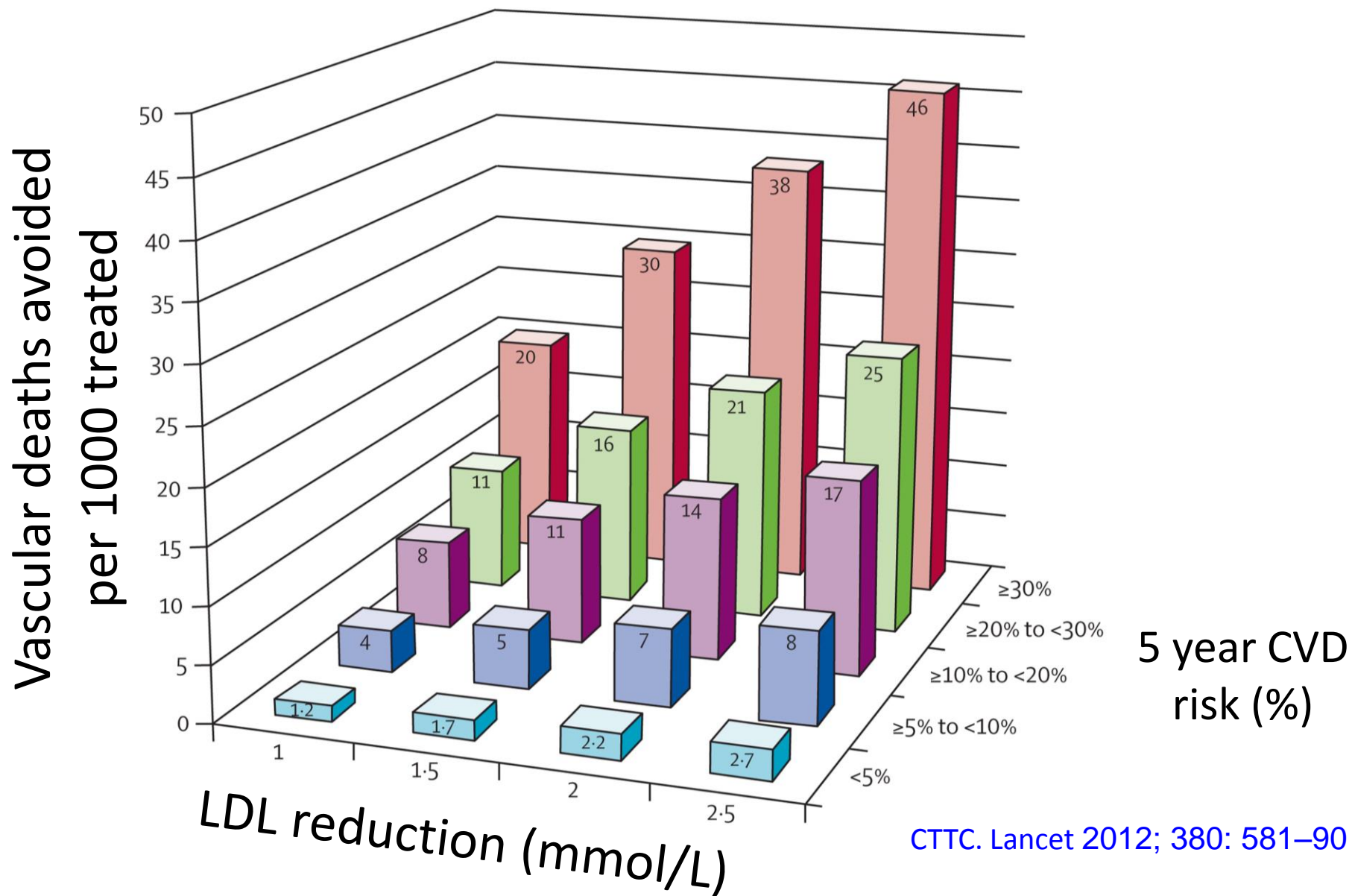


increase in CHD risk



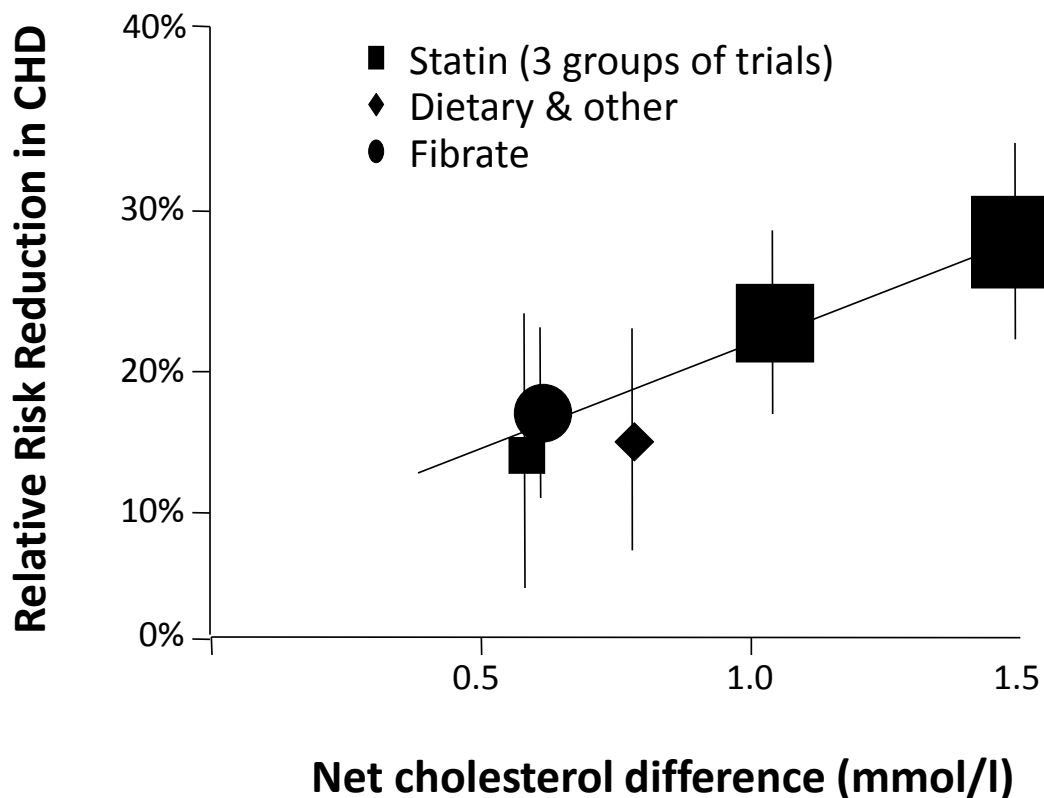
increase in blood LDL cholesterol

# vascular deaths prevented per 1000 treated with statins: by baseline risk and LDL lowering



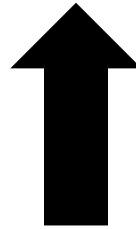
# Cholesterol lowering and CHD reduction in RCTS of diet or drugs

Regression line almost exactly the same slope as predicted by cohort studies

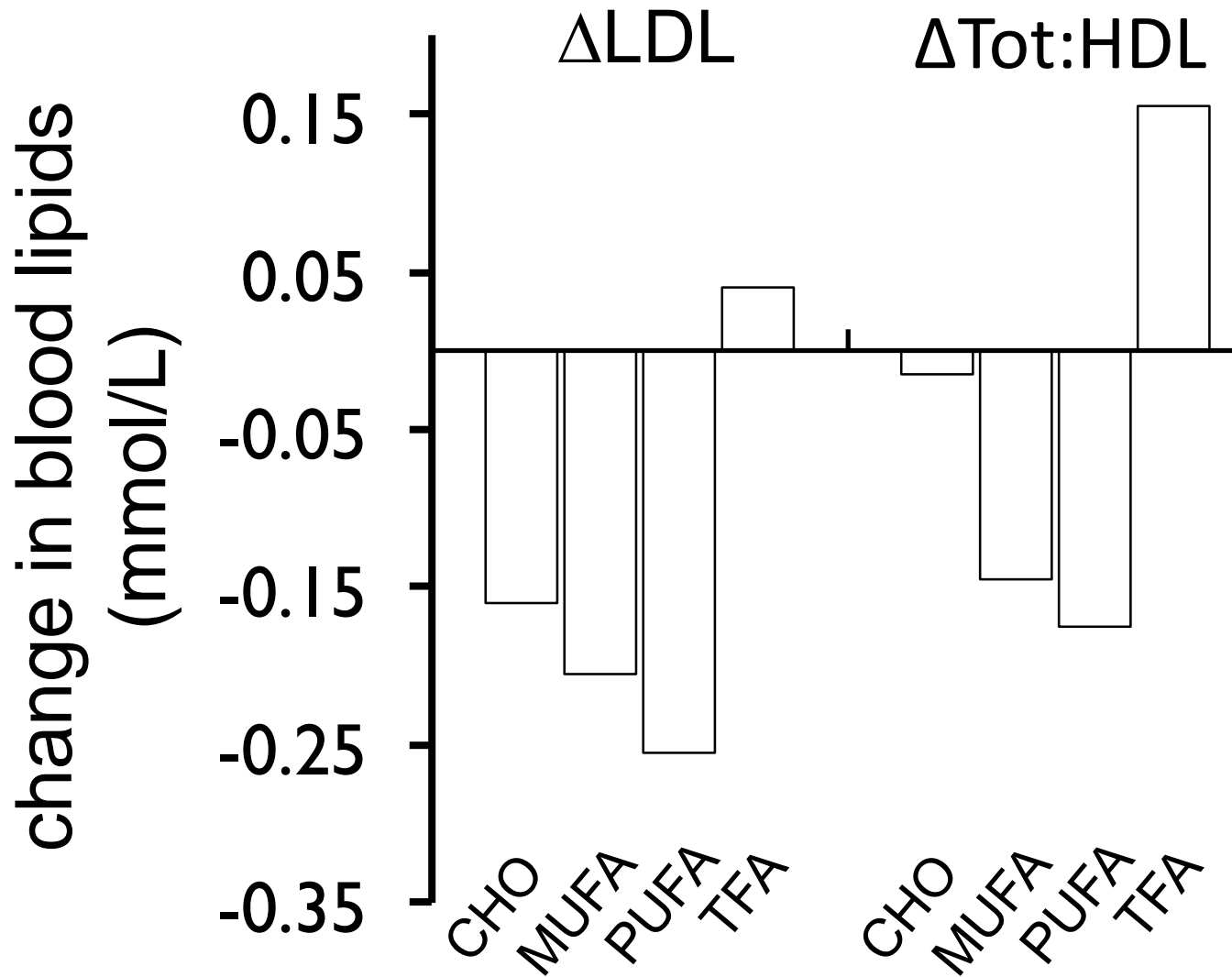


↑/↓ CHD risk

↑/↓ blood LDL cholesterol

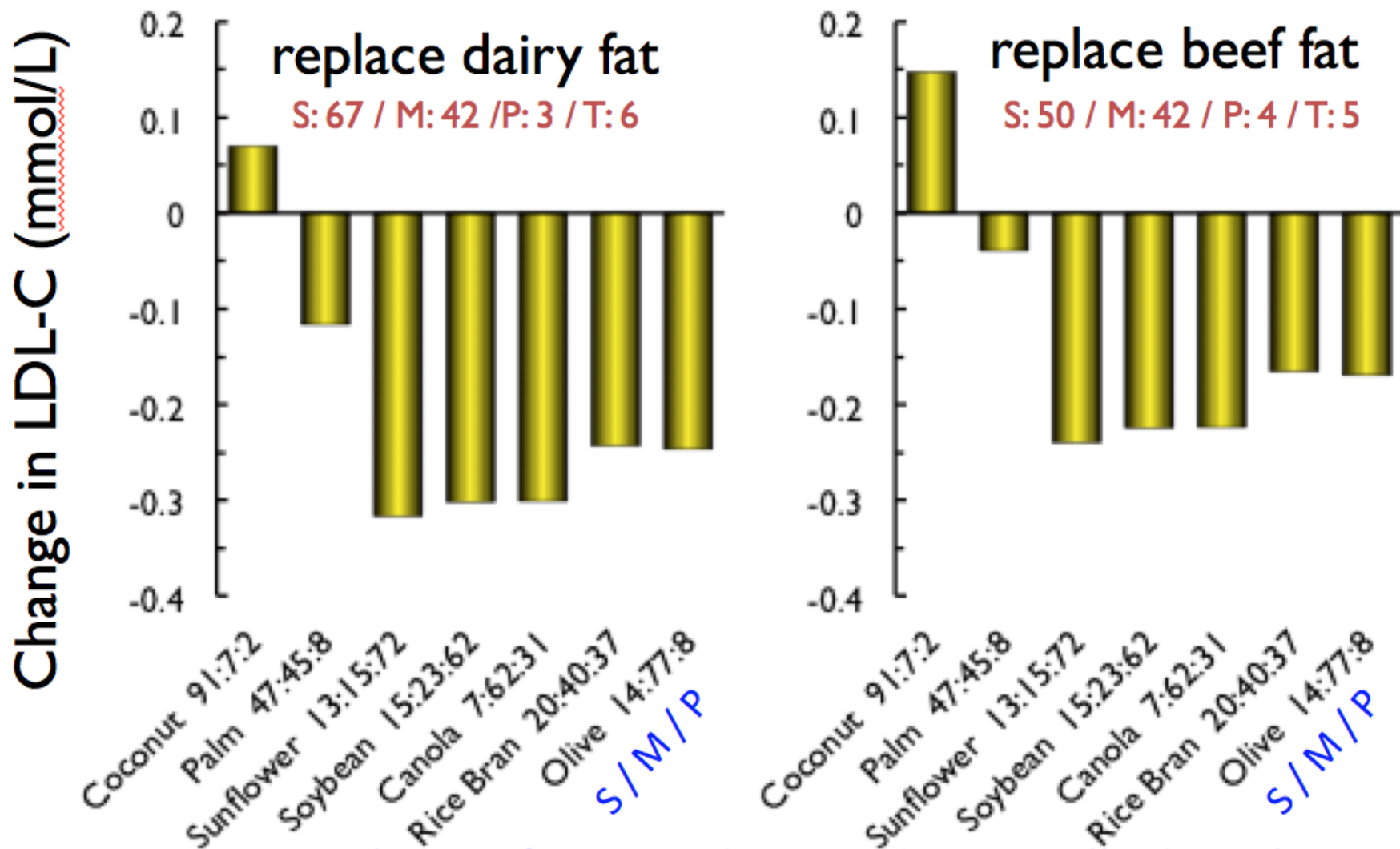


replacing 5% total energy from SFA with:



meta-analysis of 90 randomised controlled trials in people with SFA intake > 10% energy at baseline

# predicted effects of substituting different fats on LDL cholesterol



meta-analysis of 90 randomised controlled trials

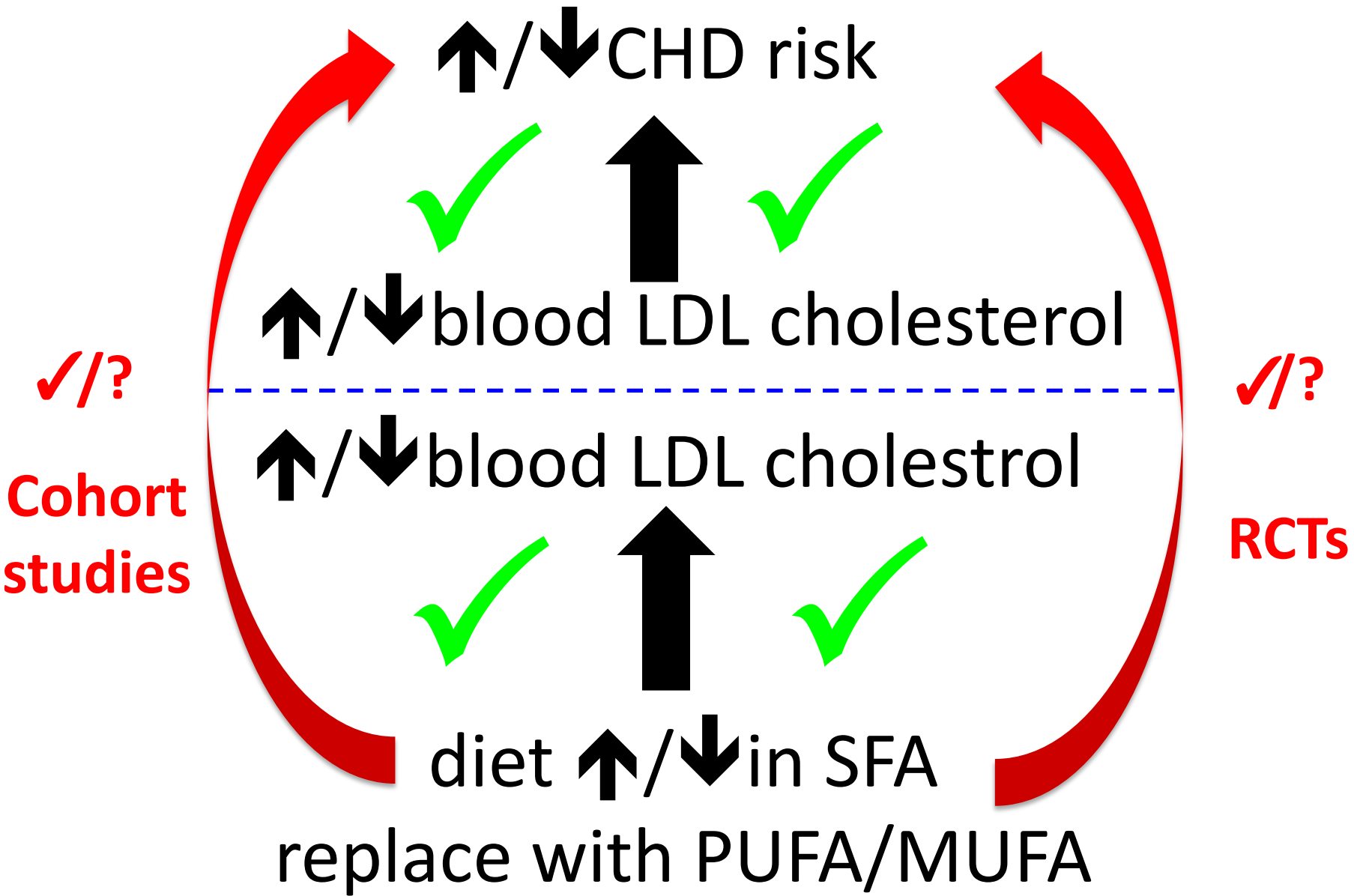
↑/↓ CHD risk

✓  
↑/↓ blood LDL cholesterol ✓

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↑/↓ blood LDL cholesterol

✓  
diet ↑/↓ SFA (replace with PUFA/MUFA) ✓



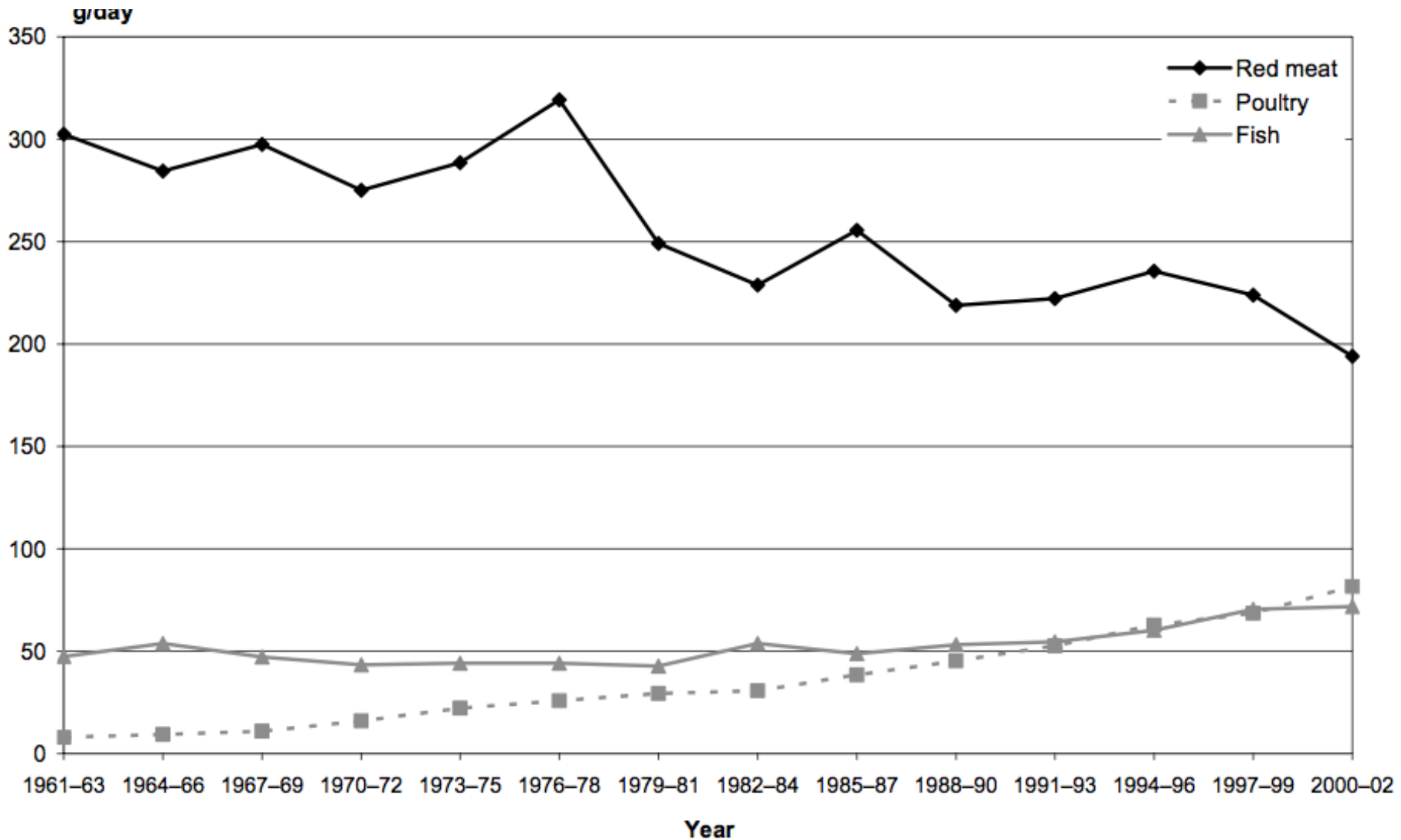


# NZ per capita supply butter & cream (g/day) 1961-2002



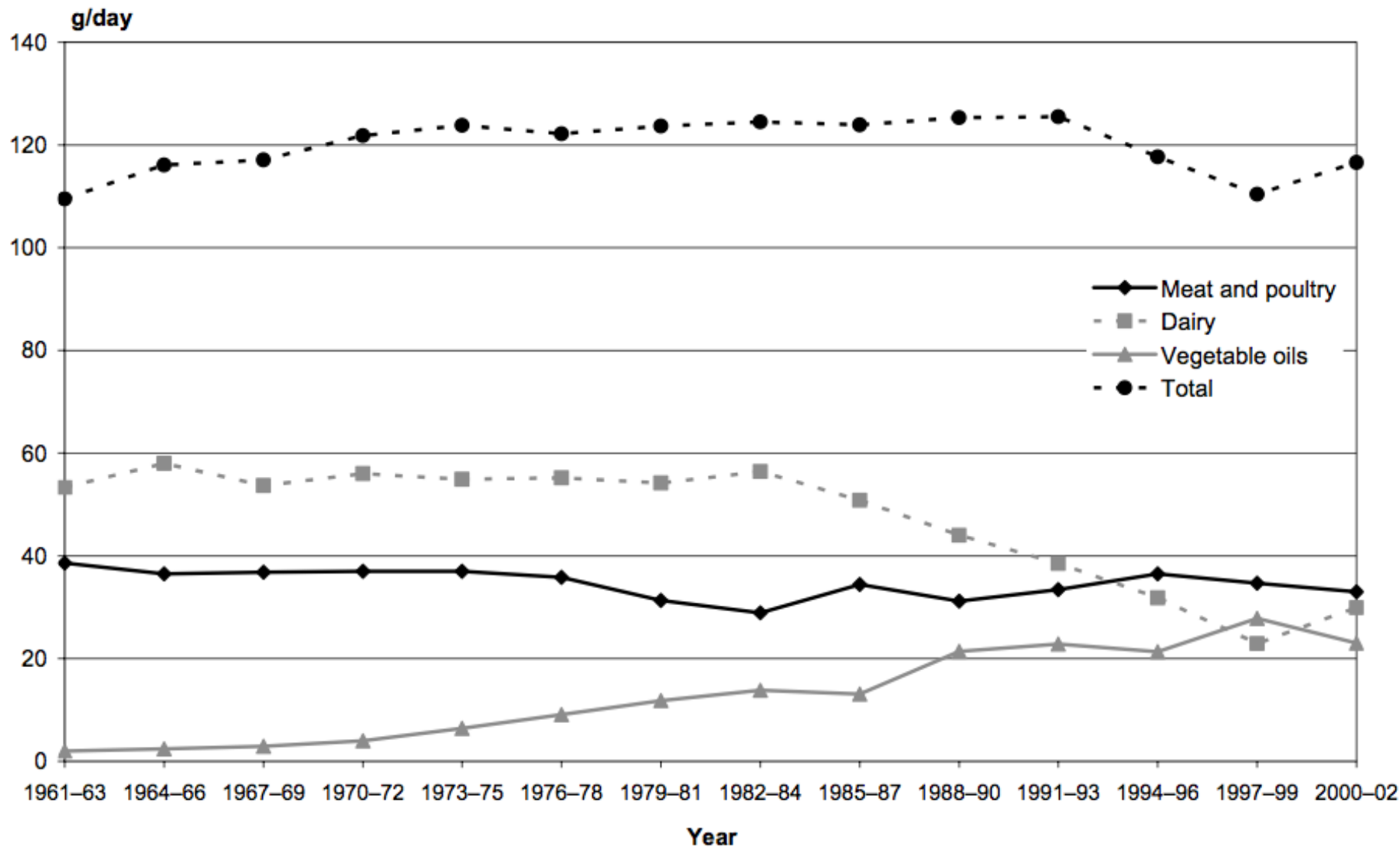
Source: FAOSTAT.

# NZ per capita supply of meat, poultry & fish(g/day) 1961-2002

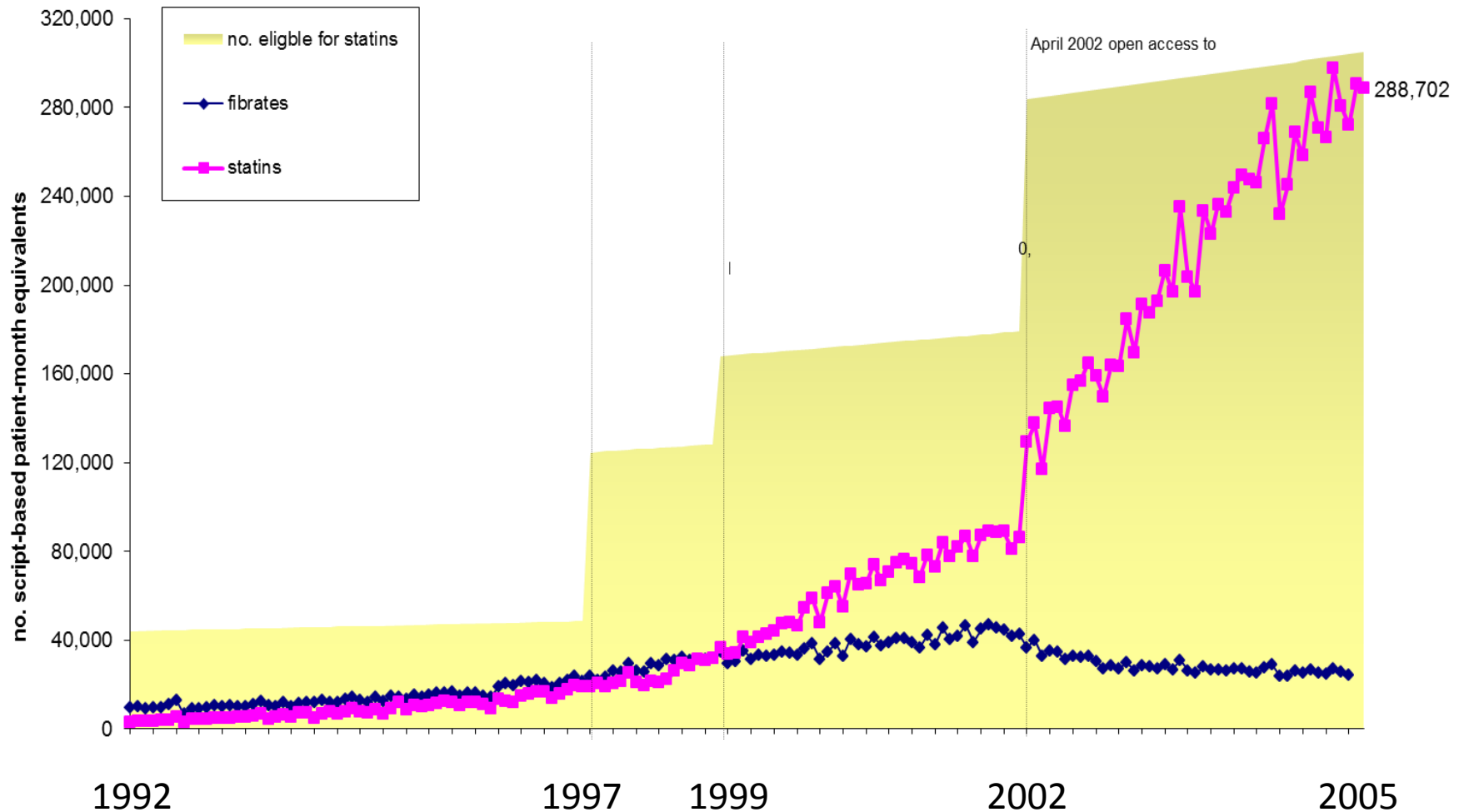


Source: FAOSTAT.

# NZ per capita supply of fat (g/day) 1961-2002



# New Zealand use of statins and fibrates



statins not commonly prescribed until about 2000

“which diet is best for our vascular health and why?”

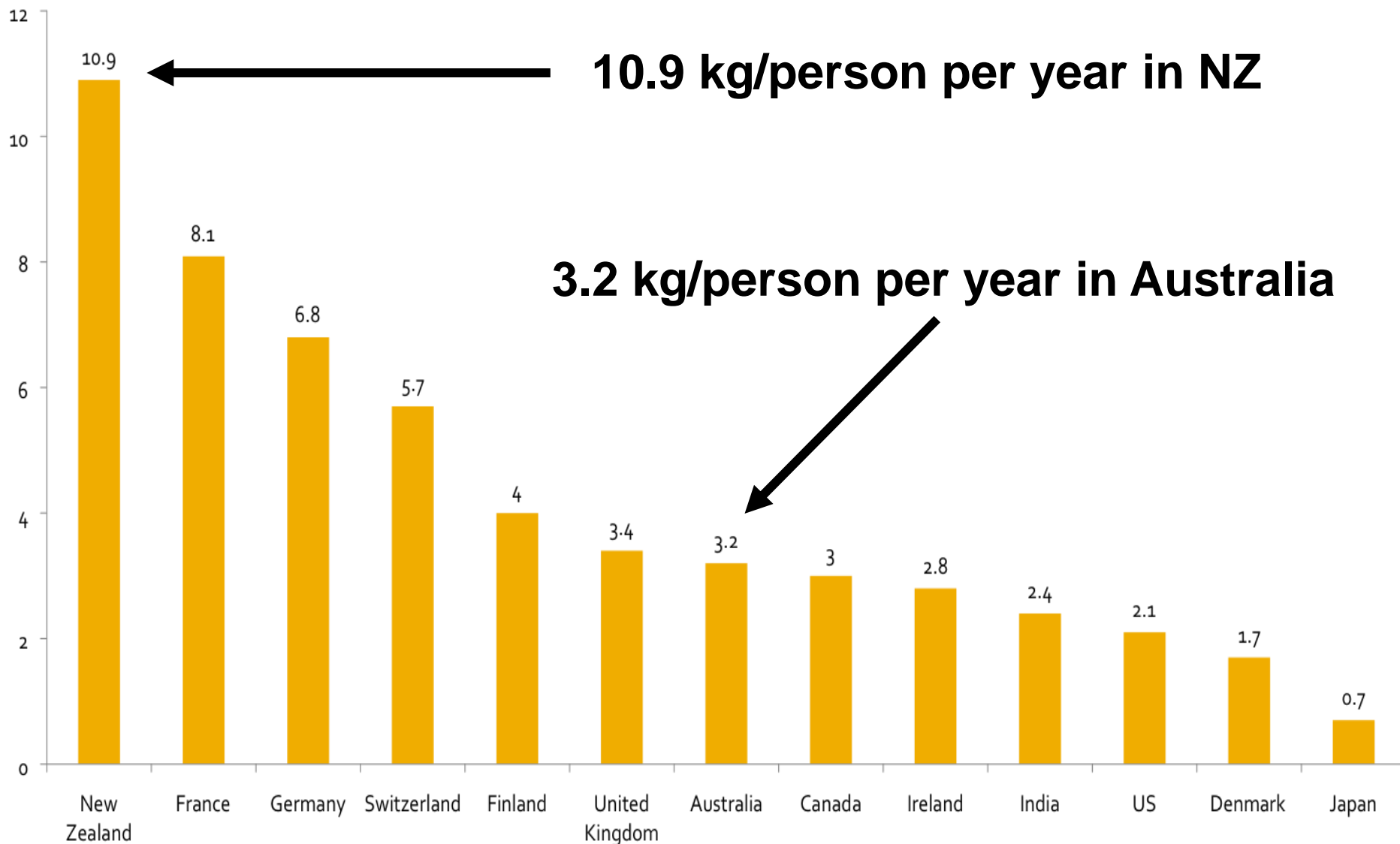
# all diets work for weight loss

- Low fat High carb (WHI)
- High fat Low carb
- Low glycaemic
- Vegan
- High fibre
- Calorie restricted
- etc

there is no one diet that's best for vascular health, but the common denominator is:

- all are low in animal & dairy fat (low SF)
- most are high in fruit & veges (low energy)

# per capita availability of butter 2003





# OECD coronary heart disease death rates: 2011

