

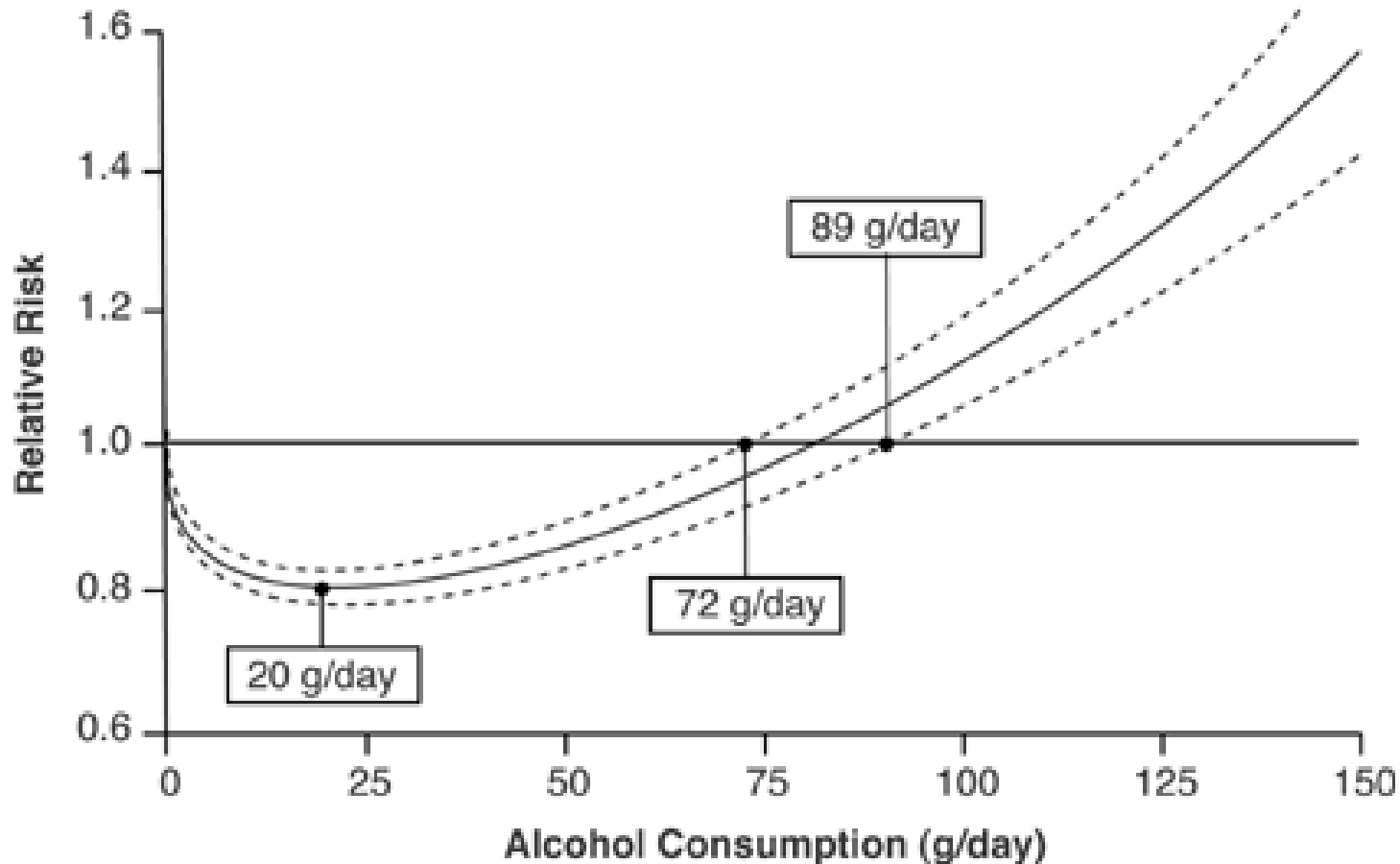
# Eating habits in the beer consumer

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# J-shaped relation alcohol and coronary heart disease



From: Corrao *et al.*, 2000



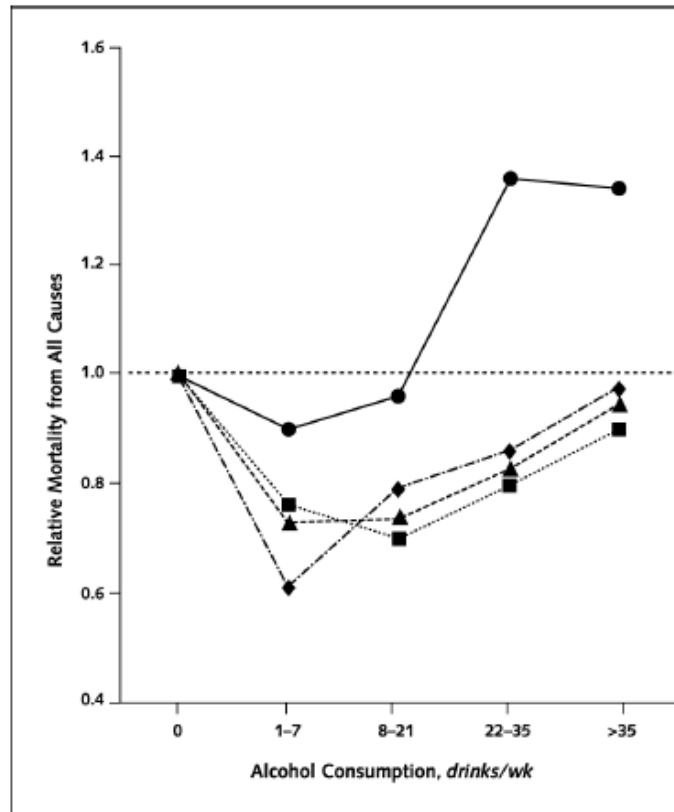
# The French Paradox

- Formulated by French epidemiologists in the 1980s:
  - The observation of low coronary heart disease (CHD) death rates despite high intake of dietary cholesterol and saturated fat
- Explanation:
  - Underestimated CHD mortality: however, only a low bias
  - Correlation: does not take into account causality between risk factors and CHD mortality
  - High consumption of (red) wine



# Associations beer, wine, spirits & health

Figure 1. Relative risk for death from all causes in relation to total alcohol intake.



Data pertain to non-wine drinkers (circles), wine drinkers (triangles), drinkers for whom wine made up 1% to 30% of their total alcohol intake (diamonds), and drinkers for whom wine made up more than 30% wine of their total alcohol intake (squares). Relative risk is set at 1.00 among nondrinkers (<1 drink/wk). Estimates were adjusted for age, sex, educational level, smoking status, physical activity, and body mass index.

- Gronbaek et al. 2000: 24,523 adults from Copenhagen City Heart Study
- Moderate alcohol consumption associated with lower mortality, compared to non-drinkers
- Wine drinkers had a decreased mortality risk compared with non-wine drinkers



# Differential effects alcoholic beverages

- Protective associations of wine and CHD / mortality compared with beer or wine consumption confirmed in several observational studies, but not all
- Explanation:
  - Substance in wine that adds to the beneficial effect of ethanol
  - Confounding by genetic, psychosocial and lifestyle factors
- Klatsky, 2003: 128,934 adults from Northern California 1978-1985: wine drinkers had lower mortality risk than beer or liquor drinkers
  - Wine drinkers were more often women, college graduates, non-smokers and temperate drinkers



# Factors influencing relation alcohol and mortality

- Drinking pattern: Beer drinkers are more likely to progress to heavier drinking (Jensen, 2002)
- Social variables: Wine intake positively correlated with social class variables (Gronbaek, 1999)
- Personal variables: Wine drinkers had higher IQ and optimal functioning on personal and psychiatric level (Mortensen, 2001)
- Subjective health: Beer drinkers had a higher odds of having suboptimal health compared to wine drinkers (Gronbaek, 1999)
- ..... Diet



# Systematic review

- Alcoholic beverage preference and dietary habits in healthy adults
  
- Literature search up to March 2013 in 3 databases:
  - Medline
  - ISI Web of Knowledge
  - PsycINFO
  
- 4,345 unique hits → 16 studies included

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(in press)

# Systematic review: results

## ■ Study characteristics

- 14 cross-sectional studies & 2 ecological studies (household and supermarket transactions)
- Spain, U.S., Denmark, Finland, U.K., Italy, and France
- Between 1997 - 2012

## ■ Alcoholic beverage preference:

- Denmark, U.S., Finland: most women preferred wine, most men preferred beer
- France, Italy, Spain: majority of total population preferred wine





# Systematic review: results

## ■ Beer preference:

- Persons who bought beer in the supermarket, bought less healthy foods and more unhealthy products in Denmark and U.K. (Johansen, 2006; Gell, 2011)
- U.S. adults who preferred beer, had lowest intakes of fruit and vegetables (McCann, 2003) and adhered least to the Healthy Eating Index (Forshee, 2006)
- Spanish beer drinkers adhered less to dietary guidelines (Valencia-Martín, 2011) and less to a Western or Mediterranean diet (Sánchez-Villegas, 2008)



# Systematic review: results

- Beer preference:
  - No large differences in Western or Mediterranean populations
  - Persons who preferred beer were more likely to be male and current smoker
  - In several studies, persons with a beer preference had the highest educational attainment



# Systematic review: results

- Wine preference in Northern-European countries and U.S.:
  - Wine preference associated with higher intake of fruit, vegetables, fish, salads, and olive oil in a large Danish sample (Tjønneland, 1999)
  - In the U.S., wine drinkers had highest intake of fruit, vegetables, dietary fibre (Barefoot, 2002), lowest intake of fast foods and more likely to be vegetarian (Paschall, 2004)
  - Wine drinkers had higher SES, lower BMI, more likely to be female



# Systematic review: results

- Wine preference in Mediterranean countries:
  - Spanish wine consumers did not display healthier or unhealthier dietary habits (Carmona-Torre, 2007; Alcácer, 2008)
  - No association between wine and intake of fruit, vegetables and fish in Italian wine drinkers (Chatenoud, 2000)
  - No difference in adherence to Mediterranean diet in Spain (Alcácer, 2008) and other dietary patterns in France (Herbeth, 2012)
  - Those who preferred wine were older and had a higher BMI



# Systematic review: conclusion

- Alcoholic beverage preference, especially wine and beer consumption, is related to specific dietary habits, depending on the living area.
- Preference is also associated with many other factors, including age, gender, BMI, smoking habits, and education
- In Western countries, persons with a wine preference had in general healthier dietary habits compared to other preferences.
- Those who preferred beer displayed less healthy dietary habits, both in Western and Mediterranean countries



# Alcoholic beverage preference and diet: the Dutch National Food Consumption Survey 2007-2010

- Objective: to investigate the associations between alcoholic beverage preference and dietary intake (nutrients, food groups, dietary quality)
- 2,100 men and women aged 19-69 from the Dutch National Food Consumption Survey
- Alcoholic beverage preference: general questionnaire
  - If the average no. of reported glasses of a specific beverage comprised  $\geq 70\%$  of the total alcohol intake
- Diet: 2 non-consecutive 24 hour recalls

# Dutch National Food Consumption Survey 2007-2010

**Table 1.** General characteristics of 2,100 men and women aged  $\geq 19$  years from the Dutch National Food Consumption Survey 2007 – 2010 according to beverage preference

Preference	Beer	Wine	Spirits	Non-consumer
% (% male)	18 (86)	20 (28)	4 (44)	30 (34)
Age, y	40 (16)	49 (17)	43 (18)	43 (17)
Ethanol, g/d	19 [0-40]	14 [5-27]	8 [0-31]	0 [0-0]
Smoker, %	37	17	33	21
University, %	3	8	1	4
Energy, kcal/d	2,682	2,044	2,455	2,101



# Dutch National Food Consumption Survey 2007-2010

**Table 2.** Crude and adjusted<sup>a</sup> mean scores of the Dutch Healthy Diet Index in 2,100 men and women aged ≥19 years from the Dutch National Food Consumption Survey 2007 – 2010 according to beverage preference

Preference	Beer		Wine		Spirits		Non-consumer	
	Crude	Adj.	Crude	Adj.	Crude	Adj.	Crude	Adj.
Total score	58.8	61.7	66.0*	63.5	61.0	62.3	64.9*	63.9
1. Physical activity	8.2	8.5	8.7*	8.4	8.6	8.6	8.3	8.3
2. Vegetables	5.4	5.4	6.4*	6.0	5.2	5.2	5.5	5.6
3. Fruit (juices)	4.6	5.2	6.3*	5.7	5.5	5.7	5.7*	5.3
4. Dietary fibre	6.2	6.7	7.0*	6.7	6.0	6.3	6.9*	6.6
5. Fish	1.7	1.7	2.4*	2.1	1.7	1.7	1.7	1.8
6. Saturated fat	5.2	5.1	5.3	5.2	5.0	5.3	4.7	5.0
7. Trans fat	9.6	9.4	9.0*	9.2	8.8	8.9	9.1	9.2
8. Consumption occasions	9.4	9.7	9.6	9.4	9.8	9.9	9.7	9.6
9. Sodium	1.5	2.7	3.8*	2.9	2.7*	3.1	3.3*	2.8
10. Alcohol	7.1	7.3	7.5	7.7	7.5	7.8	9.9*	9.8*

<sup>a</sup> Adjusted for age, sex, BMI, smoking status, educational level, energy, total alcohol consumption, and drinking frequency and weighted for demographic factors, seasons and day of the week

\* P-value <0.05 compared with beer preference





# Alcoholic beverage preference and diet: the Dutch National Food Consumption Survey 2007-2010

- Most contrasts were detected between beer and wine consumers
- Beer consumers:
  - Higher absolute intake of energy and most macro- and micronutrients
  - Higher intake of potatoes, milk, breads, meat, margarine, soft drink
  - Adhered least to the Dutch guidelines for a healthy diet
- Most differences disappeared after adjustment for age, gender, BMI, smoking status, educational level, physical activity, total amount -and frequency of alcohol consumption



# Alcoholic beverage preference and diet: the Dutch National Food Consumption Survey 2007-2010

## ■ Conclusion:

- On the whole, those who preferred beer displayed more unhealthy dietary habits, whereas persons with a wine preference engaged in more healthy dietary habits
- These differences were largely explained by other socio-demographic and lifestyle factors
- It may be that alcoholic beverage preference is not independently related to health status, but merely a proxy for other factors



# Overall conclusion

- Quality of study design: ecological studies & cross-sectional studies versus observational studies and RCT's
- Observational (cohort) studies:
  - Study total alcohol consumption
  - Adjustment necessary for age, gender, SES, and lifestyle factors including diet
- New approach: Mendelian randomisation (Holmes & Dale, 2014)?



Thank you for your  
attention!

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