

consisting of non-drinkers, beer drinkers, spirits drinkers, and beer and spirits drinkers. The drinkers, again, could have ranged from those who drank beer or spirits only once a month to those who had more than five drinks a day. This would falsely increase the risk among those who did not drink wine and give a falsely low risk for those who did drink wine. Indeed, it is difficult to believe that a drink of wine only once a month can reduce the risk of cardiovascular death by 31%. If this is true it supports the premise that drinking wine may be associated with other favourable traits that influence cardiovascular risk.³

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- 1 Grønbaek M, Deis A, Sorensen TIA, Becker U, Schnohr P, Jensen G. Mortality associated with moderate intake of wine, beer, or spirits. *BMJ* 1995;310:1165-9. (6 May.)
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Risk function had peculiar properties

EDITOR.—Morten Grønbaek and colleagues' study of mortality associated with moderate intakes of wine, beer, or spirits presents relative risks of death as functions of consumption of each type of beverage.¹ Apparently none of the first order interactions between levels of consumption of different beverages were significant. Ignoring interactions, however, leads to a model with peculiar properties, for it implies that one can simply multiply the relative risks for each type of beverage.

Thus the authors' estimates imply that a person drinking three to five drinks daily of each of wine, beer, and spirits (a total of nine to 15 drinks daily) has a relative risk of death from coronary heart disease of 0.43 compared with someone who never drinks alcohol. For deaths from other causes the relative risk between these two extreme groups of people is 0.82. Such estimates are hard to take seriously, so the model clearly cannot be extrapolated this far. Even at lower consumptions for the separate beverages, however, an absence of interaction seems unlikely.

Since one of the study's main conclusions rests on the upturn of the risk function for the highest category of consumption of spirits it seems important to ensure that the model estimates are valid not just for moderate consumption but for the highest category considered. We wonder how sensitive the conclusion about spirits is to the assumption of no interaction.

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Study confounded by lack of correction for social class

EDITOR.—Morten Grønbaek and colleagues' paper on the possible health benefits of drinking wine¹ attracted wide attention in the media in Norway. It might be wise to obey the slogan "never check a

good story." However, the reporting of associations between risk factors and health outcomes in the medical literature is plagued with the various interpretations of causation, and the media made no exception this time.

No one who knows the social habits of Scandinavians should overlook the possible confounding of wine drinking by social class and related lifestyles. It is a pity, then, that this well conducted study leaves some doubt about whether social class or social status was controlled for properly. Classification by social class is not done in standardised ways in the Scandinavian countries,² yet mortality in most European countries shows a strong (and increasing) gradient with social class.^{2,3} The Danish paper presents education and income (loosely named "socioeconomic conditions") as covariates, only to leave us with the intriguing statement, "We found that wine intake was positively correlated with social class variables (data not shown), but the protective effect of wine, with regard to mortality, was not significantly weakened when we controlled for this factor."

In this case, I think that the data, on one or both factors, should have been shown so that we could more easily rely on any biological mechanism and not feel compelled to maintain healthy lifestyles most prevalent among affluent people.

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- 1 Grønbaek M, Deis A, Sorensen TIA, Becker U, Schnohr P, Jensen G. Mortality associated with moderate intake of wine, beer, or spirits. *BMJ* 1995;310:1165-9. (6 May.)
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Authors' reply

EDITOR.—Our paper had some impact in the media, most of which was beyond our control. We admit that we were cautious about inferring causation.

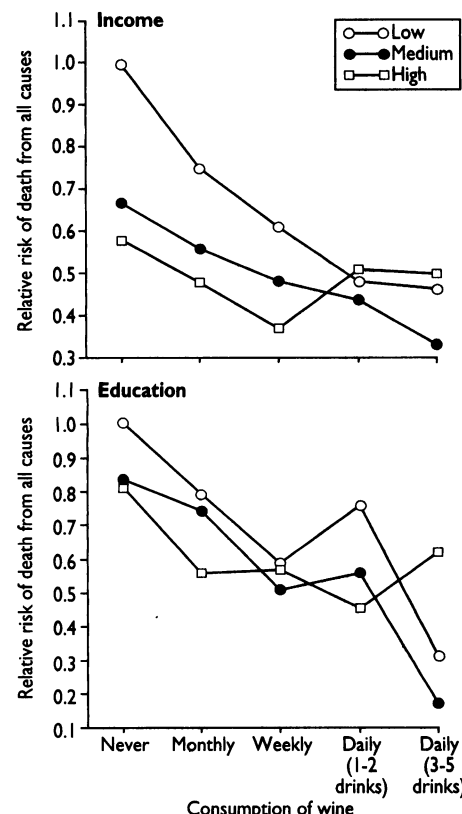
To simplify interpretation of our analyses we excluded people who drank more than five units of any beverage daily. Victoria Wilson and colleagues are concerned that we thereby introduced bias by excluding beer drinkers who were not wine drinkers. In analysis of crude data this group might increase the mortality among those who do not drink wine. In our analysis, however, we controlled for the intake of other types of beverages, which implies that we estimated the effect of wine intake within each category of intake of other types of beverages. We found no significant interaction between the three types of beverage in their effects on mortality, which suggests that the effect of wine is the same irrespective of the habit of drinking beer and spirits.

There probably is a U shaped relation between wine intake and mortality, but this would not contradict our conclusion about a different mortality at moderate intakes of beer, wine, and spirits. Indeed, wine may be the only beverage exhibiting this pattern.

Steiner Westin is concerned about confounding by social class. Intake of wine was strongly corre-

Percentages of people drinking wine weekly or more frequently by income and education

	Income			Education		
	Low	Medium	High	Low	Medium	High
Men	9.4	18	35.4	11.9	19.1	35.0
Women	11	17.8	31.5	10.2	20.0	35.5



Relative risk of death from all causes by income and education, according to consumption of wine

lated with income and education (table). The figure shows the relative risk of death from all causes by income and education. For all the curves the reference group (relative risk set at 1) is people who never drank wine in the groups with low income and a low level of education. Generally, consumption of wine seems to have a beneficial effect on mortality independent of socioeconomic conditions.

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Performance indicators for general practice

Emphasis is changing from quality assurance to continuous quality improvement

EDITOR.—Performance indicators have long been used in the United States as a tool of quality assurance programmes and are now being promoted in Britain.¹ The emphasis of quality assurance on identifying "problems" and the "bad apples" in medicine is, however, now being viewed in the United States as counter productive. Unsurprisingly, it is difficult for a negatively oriented process to engender the enthusiasm and capture the support of health care professionals. That is not to say that standards are not required, but in the United States the emphasis is changing from quality assurance to continuous quality improvement.

The Joint Commission on Accreditation of Healthcare Organisations has used performance indicators as part of its quality assurance programme and will continue to do so, but it is placing increasing emphasis on continuous quality improvement.² Many general practitioners must fear