Author’s Response

Associations between dietary methods and biomarkers, and between fruits and vegetables and risk of ischaemic heart disease, in the EPIC Norfolk Cohort Study: response to letter by McNeill et al.

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We recognize the concerns of Dr McNeill and colleagues concerning the use of FFQ in epidemiological studies. However, all the issues they raise were considered in our paper.1

First, it is clear that the biomarker data do relate more closely to the intake data obtained from the records than the FFQ. This better agreement however cannot be attributed to the fact that the biomarker data was collected around the same time as the food diary. We show in Table 3 that even when several years separate the collection of the biomarkers from the dietary intake data, the results from the records agree more closely with the fat and carbohydrate biomarkers than those from the FFQ. There was a highly significant increase in plasma vitamin C over 4 years which limited its usefulness as a long-term biomarker of intake.

Second, we state in the paper that ‘plasma vitamin C is a biomarker of fruits and vegetable consumption and unlikely to be the active protective factor since supplements of pure vitamin C have had no effect on IHD mortality’.2 Hence we showed the results for effects of fruits and vegetables on IHD risk in Table 4 and Figure 1.

Third, we have no evidence that more educated participants are more likely to complete the diary since 93% of recruited participants in the EPIC Norfolk cohort agreed to complete both the food diary and FFQ.3 As we state in the paper ‘as data on all exposures were available on the same individuals, it is unlikely that the apparent lack of effect of fruits and vegetables on IHD risk when assessed by FFQ is accounted for by socioeconomic factors, especially as the FFQ is recommended because it is less demanding for participants to complete’.

Fourth, it is self evident that the analysis of records is more expensive than that of the FFQ. However, the costs of recruitment, follow up and collection of dietary data in cohort studies is largely the same. Any statistical power gained by using FFQ on larger sample sizes will not outweigh measurement error if that measurement error is not random, for example, in the case of fruits and vegetables.1,3 As we state in the paper, ‘improved accuracy is a cost effective way of avoiding substantial infrastructure requirements for recruitment and follow up of massive population cohorts in which interaction between gene variants and dietary or other environmental variable exposure is to be assessed’.4

Use of the food diary has not reduced either the quantity or quality of research in this area. For example, by pooling efforts, the UK now has a cohort of 100 000 individuals in which diet has been assessed by the food diary (http://www.srl.cam.ac.uk/cnc). Although we have found that storage of written records for later analysis in nested case-control studies, together with biological samples for biomarker analysis, has been a useful strategy, we recognize that there are alternatives to the food diary such as repeated recalls or other ways of documenting real time by web-based methods as we suggest in the paper. We hope McNeill will agree that new approaches in dietary methodology are necessary to meet the needs of epidemiological studies.

References


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