Statistics show that of those who contract the habit of eating very few ever survive

GG Giles

Cancer Epidemiology Centre, The Cancer Council Victoria, Carlton South, Victoria, 3053

Proving the links between food and nutrition and the incidence of chronic disease is not a trivial task. Studies of nutritional epidemiology face major problems including: how and when to measure diet, measurement error(s), difficulties of distant recall, ubiquitous exposures of limited range, correlated exposures and temporal change in dietary intakes. In designing research program of diet and chronic disease (principally cancer) in the late 1980s, we paid careful attention to some of these problems particularly recall bias, and the range of and measurement of dietary intakes. To avoid recall bias we decided to perform a prospective study – The Melbourne Collaborative Cohort Study (1). This had significant implications in terms of staff commitment, infrastructure and funding because the design required large numbers of subjects in order to obtain sufficient outcomes within a reasonable period of time and to measure with any precision the modest observed estimates of risk associated with (error prone) measures of dietary intake. Even cohort studies find dietary associations difficult to measure when the population sampled is uniform in its food habits; e.g. it is difficult to show associations between cancer and fat intake when few members in the population obtain less than 40% of their calories from fat. To increase the range of dietary exposures we followed the example of the European Prospective Investigation of Cancer (EPIC) by including people from different ethnic groups who would increase the range of foods and nutrient intakes of interest; e.g. fatty acids and antioxidant vitamins. A food frequency questionnaire (FFQ) with which to measure dietary intakes was developed from information collected in 8-days of weighed food records from ~300 people born in each of Australia, Italy and Greece (2). The 121 item FFQ was translated into Italian and Greek and administered to 41,500 Melbourne residents aged 40–69 years in 1990–4. To characterise the FFQ performance and to be able to adjust analyses for measurement error, a validation study was carried out on a random sample of ~300 participants with equal numbers from each sex, age group and ethnic group. The validation study included a repeat FFQ 12 months after recruitment and blood samples. During the 12 months subjects kept four 3–4 day food diaries (totalling 14 days) and collected overnight urines. Several comparisons were performed – FFQ1 vs FFQ2, FFQs vs food diaries, FFQs and food diaries vs urine and plasma analyses. During the course of a case-cohort analysis including several disease endpoints, several plasma analytes have also been performed in the validation study samples. Of particular interest are plasma phospholipid fatty acid concentrations and carotenoid levels. Analyses performed to date within the validation study (3) and in studies that have used the FFQ (4) suggest that its performance is acceptable for use in many Australian epidemiological studies.

References

1 Giles GG. The Melbourne Study of Diet and Cancer. Proc Nutr Soc Aust 1990; 15: 61–68.

2. Ireland P, Jolley D, Giles GG, *et al.* Development of the Melbourne FFQ: a food frequency questionnaire for use in an Australian prospective study involving an ethnically diverse cohort. Asia Pacific J Clin Nutr 1994; 3: 19–31.

3. Ireland P, Jolley D, Giles GG. Determinants of serum levels of retinol, b-carotene and a-tocopherol in men and women born in Australia, Greece and Italy. Asia Pacific J Clin Nutr 1994: 3; 169–177.

4. Hodge A, Giles GG, Patterson A, Brown W, Ireland P. The Anti-Cancer Council Victoria FFQ. Relative validity of nutrient intakes compared with diet diaries in young to middle-aged women in a study of iron supplementation. ANZ J Publ Health 2000; 24: 576–83.