methodological limitations have been discussed.¹ As applies generally,^{1,2} suicide among both young and middle aged men was almost always associated with mental disorders, and complicated comorbid conditions were common. At death the younger men more often suffered from some psychotic disorder and the middle aged men from alcoholism.

The prevalence of psychotic disorders among the younger men (25%) was higher than that found in a similar age group in Greater Montreal and Quebec City (9%; men who committed suicide in hospital were excluded)³ and in two studies of suicide among young people in San Diego and Gothenburg (17% in both studies).^{2,4} The prevalence of personality disorders among the younger men (43%, or 56% when undetermined cases were excluded) accords with other studies (36% and 42%) among young adult victims⁵ and 57% among young men with axis II disorders.³ Overall, these results suggest that about half of the young people (35%² and 64%⁴) or young men (59% and 60%³) who commit suicide are suffering from a depressive syndrome. The notable exception to the rather uniform view of mental disorders among suicide victims in all these studies is the prevalence of psychoactive substance use disorders other than alcoholism. The prevalence of such disorders was high in San Diego (66%)² but lower in Quebec (28%)³ and Gothenburg (16%).⁴ It was rare in our study (5%),

reflecting the relatively low prevalence of drug misuse in Finland, particularly in rural areas.

Suicide among the older men was typically related to alcohol dependence (56%) or depressive syndromes (64%), or both, and more severe forms of these diagnoses (major depression and alcohol dependence) were more common than among the younger men. The distribution of mental disorders among the middle aged men accords more with earlier psychological autopsy studies of suicide. These differences between men of different ages have implications for the planning of treatment programmes aimed at suicide prevention.

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Children who miss immunisation: implications for eliminating measles

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The United Kingdom aims to eliminate indigenous measles by the year 2000. National coverage of measles, mumps, and rubella immunisation is currently 92%, and protective efficacy of measles vaccine is around 90-95%.^{1,2} Even with high immunisation coverage, however, primary vaccine failure will continue to sustain measles transmission in the community.² Thus a two dose measles immunisation schedule has been used for several years in the United States and is now proposed for the United Kingdom.³ Most (97%) children who fail to respond to a single dose will produce antibody after reimmunisation.⁴ The most cost effective option is probably to give a second dose at the same time as the existing preschool booster of diphtheria-tetanus and polio.

For this strategy to be successful it is important to know what proportion of children who miss out on measles, mumps, and rubella immunisation are likely to attend for a preschool booster, and how many will miss out on both. I examined data on children in South Glamorgan to answer these questions.

Subjects, methods, and results

I carried out a retrospective cohort study of all children resident in South Glamorgan who had been born in 1989, using immunisation records held on the child health computer. These records are initially generated from birth notifications and are regularly updated. Information on immunisation status is provided by general practitioners and child health clinics. In South Glamorgan the computer record is used to validate doctors' claims for payment for reaching immunisation targets, so the data are accurate and up to date.

I analysed whether children had been immunised

against measles, mumps, and rubella by their second birthday and whether they had received the preschool booster. The relation between the two immunisations was analysed by calculating relative risks and 95% confidence intervals.

Information on 6136 children was available; there were 5868 live births in 1989, the discrepancy being due to transfers in and out of the district (table).

Relation between uptake of measles, mumps, and rubella vaccine and preschool booster

	Preschool booster	No preschool booster	Total
Measles, mumps, and rubella vaccine	4868	332	5200
No measles, mumps, and rubella vaccine	516	420	936
Total	5384	752	6136

Uptake of measles, mumps, and rubella immunisation in the birth cohort was 84.7% by the age of 2 years and that of the preschool booster 87.8% by the age of 5. Of the 936 children who had not had measles, mumps, and rubella immunisation, 420 had not received the booster. Overall, 5200 children were immunised against measles, mumps, and rubella, but 332 of them did not receive the booster. Children who had been immunised against measles, mumps, and rubella were almost twice as likely to receive a preschool booster as those who had not (relative risk 1.70, 95% confidence interval 1.60 to 1.80). Given that all children receiving the booster would also receive measles immunisation if it were offered as a preschool booster, 4868 (79.3%) of the birth cohort would receive two measles doses, 848 (13.8%) would get one measles dose, and 420 (6.8%) would get none.

Comment

Concerns over the growing number of older children susceptible to measles have prompted the recent nationwide school immunisation campaign.² Although this short term measure should prevent the

predicted epidemic, a change in immunisation strategy will be required to eliminate measles. Uniform coverage of 95% with a 100% effective vaccine will be required to eliminate measles in a stable population.⁵ My results indicate that at current immunisation coverage, 6.8% of children would remain completely unimmunised with a two dose measles schedule incorporating a preschool booster. Given a primary vaccine failure of 5-10% for both immunisations and no acquired natural immunity before going to school, between 7.7% and 8.8% of children would remain susceptible to measles. At these rates a further primary school measles immunisation campaign might be necessary within the next few years.

National coverage of measles, mumps, and rubella immunisation has risen considerably over the past five years and preschool booster coverage is also improving (in South Glamorgan, from 84.2% in the 1985 birth cohort to 87.8% in the 1989 birth cohort). This means that a higher proportion of children could be protected

against measles by a two dose strategy in future birth cohorts. To ensure success, however, greater efforts will have to be concentrated on tracing persistent non-attenders for immunisation and on improving preschool booster coverage.

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Balti curries and iron

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Iron deficiency anaemia is the most prevalent nutritional problem in the world today and is recognised as a particular problem in developing countries. Those considered to be at greatest risk of developing nutritional iron deficiency are young children and women of reproductive age, especially pregnant and lactating women. Most cases of iron deficiency anaemia can be prevented or treated by iron supplementation and good nutrition.

The use of cast iron cookware has been shown to increase the iron content of food,¹ and the bioavailability of this contaminant iron has been shown to be high.² Although the use of cast iron cookware is not particularly widespread in the United Kingdom, it seems to be gaining in popularity and is specifically used in the preparation of an Indian cuisine known as balti, where the food (a curry) is served straight from a small cast iron wok. Recently cook-chill balti meals have been introduced into high street supermarkets, so we undertook a study to compare the iron content of these meals prepared in a cast iron balti wok with the food as bought.

Methods and results

Three cook-chill meals—a vegetable curry, a chicken curry, and a balti vegetable curry—were obtained from Sainsbury's supermarket. All three meals were divided into two weighed portions with one portion being

cooked in a balti wok on a low gas ring for 20 minutes. Both portions of each meal were freeze dried and ashed in a muffle furnace at 480°C for 48 hours and the iron content of each portion analysed in triplicate by flame atomic absorption spectrophotometry.³

The results of the analysis of iron content showed a considerable increase in all of the meals cooked in the balti wok (see table).

Comment

These data suggest that the iron intake of people consuming traditional balti meals could be extremely high, falling well outside the normal range of dietary intake (10-12 mg/day).⁴ For example, a meal of chicken and vegetable balti dishes could provide about 50 mg of iron. This would be a very useful source of dietary iron for vulnerable members of the population, such as women, 14% of whom have little or no body iron stores (serum ferritin <13 µg/l) and 4% of whom have iron deficiency anaemia.⁴

Giving dietary advice on iron is not easy because the absorption of iron from meals varies greatly. In fortified foods the chemical form of the added iron affects its bioavailability, which may in some instances be low. One of the richest sources of well absorbed iron is liver (7 mg iron/portion), but this contains considerably less iron than meals cooked in the balti wok. Foods prepared in cast iron cookware, such as balti curries, could therefore be included in the list of foods high in iron recommended for people with an existing or potential problem of iron deficiency. Except for people with hereditary haemochromatosis, who should be advised to avoid balti curries prepared in cast iron cookware, our findings show that balti meals not only add spice to your life but also provide a useful quantity of potentially absorbable iron.

Iron content* of commercially prepared curry meals before and after cooking in a cast iron balti wok

Food	Iron as purchased (mg/100 g)	Iron after cooking (mg/100 g)
Vegetable curry	0.86	10.67
Chicken balti	1.54	12.73
Vegetable balti	1.46	6.15

*The maximum assay variability was 0.8 mg/100 g.

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