Registers in general practice give cumulative rather than point prevalence

EDITOR,—In a way I am relieved that David P Strachan and colleagues found a 43% cumulative incidence of reported asthma and wheeze by age 33 in their analysis of the 1958 cohort of the British national child development study.¹ This is in addition to the reported prevalence of asthma and chronic obstructive pulmonary disease of around 30% found in adults in a screening study in general practice in the Netherlands in 1992.² These studies establish an order of magnitude of period and cumulative prevalence of obstructive airways disease that is substantially higher than the commonly cited range of 5–10%.^{3,4} They make the overall prevalence of asthma recorded by the clinicians in the practice in which I work (17% in 1994,⁵ after cumulative recording since 1990) look like an underestimate, whereas some people have suggested that it might represent overdiagnosis.

These studies raise the methodological problem of coding asthma, particularly as computerised clinical records are now causing an explosion of diagnostic registrations. Even if diagnostic coding were standard (which it is not in asthma) and there were not temporal trends, over time any clinical database that uses routine coding to build up a register will reflect the cumulative rather than the point prevalence. In asthma this will tend to remove evidence of the peaks in incidence in childhood and will eventually lead to the highest prevalences seeming to occur at greater ages, incremental changes in prevalence between ages reflecting new, incident cases.

In clinical records it is appropriate to continue to register the fact that a patient has asthma, even if the disease is not currently active, as it may affect treatment (for example, by being a contraindication to β blockers) and the diagnosis of further chest symptoms. In terms of clinical review, however, it is becoming necessary to look at active asthma as it is impossible to review up to half of the population regularly. These issues in informatics need to be addressed in clinical practice and epidemiological studies based on routine data.

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Asthma or wheezy bronchitis in childhood is independent risk factor for wheezing symptoms in adulthood

EDITOR,—David P Strachan and colleagues' large prospective cohort study shows that recurrence of wheezing after prolonged remission during late adolescence was strongly associated with atopy and cigarette smoking.¹ We believe that it is important to distinguish wheezy bronchitis from asthma in childhood since the prognosis differs considerably between these conditions.

We have reported a 25 year follow up of three groups of children who were originally diagnosed in 1964 as having asthma, wheeze in the presence of upper respiratory infection (wheezy bronchitis), or no respiratory symptoms. The study in 1964 was a random community survey of 1 in 5 primary schoolchildren in the city of Aberdeen in 1962. Of these 2511 children, 121 were identified as having asthma and 167 as having wheezy bronchitis. We have traced roughly four fifths of these children, now aged 34–40, together with a comparison group randomly selected from the 2223 subjects who had no respiratory symptoms in the original study.²

Subjects who had had asthma in childhood were more likely to have wheezing sufficient to impair activity, to produce phlegm, to have airflow obstruction, and to show increased responsiveness to methacholine than those who had had no respiratory symptoms in childhood. In subjects who were classed as having had wheezy bronchitis in childhood, however, symptoms, ventilatory function, and bronchial reactivity did not differ from those in subjects who had had no respiratory symptoms in childhood. Subjects from the original group with asthma were more likely than those from the original group with wheezy bronchitis to be atopic, as defined by reactivity on skin testing, total serum IgE concentrations, or results of specific IgE radioallergen sorbent tests.³

Although the design of our study does not allow us to comment on a disease free interval, our findings are similar to those of Strachan and colleagues and provide additional information. We found that independent risk factors for wheezing symptoms in adulthood include current smoking, atopy, and asthma or wheezy bronchitis in childhood. The outcome for subjects who had been classified as having wheezy bronchitis in childhood was, however, significantly better than that for those who had been classified as having asthma, and we believe that wheezy bronchitis may be a different disease entity. We would be interested to know if Strachan and colleagues analysed their data using the original classification of childhood asthma or wheezy bronchitis. We strongly suspect that in their population, too, the incidence and rate of recurrence of wheezing during adult life will be related to this original classification.

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Author's reply

EDITOR,—Kim Hinshaw asks whether the beneficial association between bleeding during pregnancy and asthma relates to bleeding in the first or second trimester. Unfortunately, the information from the 1958 perinatal morbidity survey

does not distinguish between bleeding in the first trimester and bleeding at other times.

My colleagues and I are aware that false positive results may emerge from multiple comparisons, as Rollo Clifford points out, and we therefore stated that the associations with maternal albuminuria and antenatal haemorrhage were unexpected and "deserve further investigation." Until these relations have been confirmed in other datasets it would be premature to speculate about their causal interpretation. To shed more light on this issue we are currently investigating the association of childhood asthma with obstetric complications in the offspring of the 1958 birth cohort.

Clifford is concerned at the imprecision of the questions used in the interviews with the 1958 cohort. In our discussion we acknowledged the imperfection of parental recall and suggested that "our estimates of cumulative incidence ... are likely to be conservative." A positive response to the questions, however, does not necessarily mean that the subject had asthma in the sense that the term is currently used by medical practitioners, as even a single episode of wheezing illness would be included. Thus a direct comparison with case registers in general practice, as suggested by Anna Livingstone, could be misleading.

In their studies Sue Ross and colleagues distinguished "asthma" from "wheezy bronchitis" according to whether there was a clinical history of wheezing in the absence of infection. In the 1958 cohort the two disease labels were not distinguished at all at ages 16 and 23 and the responses at age 7 relate to the doctors' diagnoses and parental labels applied in 1965. As there is ample evidence that the proportion of all wheezy children who have been diagnosed as having asthma has increased substantially over the past 30 years, we considered it more useful to combine asthma and wheezy bronchitis as a single entity for our analysis.

Although other studies have documented the long term prognosis of wheezing illnesses in childhood, the unique feature of our study was the comparison of recurrence of wheezing after prolonged remission with the incidence of wheezing among subjects with no history of asthma or wheezy bronchitis in childhood. General practitioners such as Livingstone who maintain a register of patients who have had asthma in the past may be well placed to advise previously wheezy adolescents that they are at greater risk than others of developing respiratory symptoms if they smoke as adults.

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Changing the threshold of body mass index that indicates obesity affects health targets

EDITOR,—Body mass index, calculated from a subject's height and weight, is widely used to indicate obesity.¹ Although the index is acknowledged as an adequate summary of obesity, the thresholds for categorising underweight, normal weight, overweight, and obesity have varied. In the past, different thresholds were accepted for men and women, with women broadly requiring a lower body mass index for inclusion in each category.² Underweight was indicated in a man by a body mass index of <20.0 and in a woman by a body mass index of <18.6. Obesity was indicated by a body mass index of ≥ 30.0 and ≥ 28.6 , respectively. This is important in the setting and monitoring of targets for obesity. The *Health of the Nation* now defines obesity as a body

Table 1—Number of subjects in each category of body mass index (calculated from self reported weights and heights*) when different and common thresholds were used for men and women†

	Men (n = 1536)		Women (n = 1864)		Total (n = 3400)	
	Different threshold	Common threshold	Different threshold	Common threshold	Different threshold	Common threshold
Underweight	114	114	60	210	174	324
Normal weight	781	781	1008	1069	1789	1850
Overweight	536	536	560	417	1096	953
Obese	105	105	236	168	341	273

*Not all responses were usable.

†Thresholds when different values were used for men and women were: underweight, <20.0 (men) and <18.6 (women); normal weight, 20.0-24.9 (men) and 18.6-23.8 (women); overweight, 25.0-29.9 (men) and 23.9-28.5 (women); and obese, ≥30.0 (men) and ≥28.6 (women). Common thresholds were: underweight, <20.0; normal weight, 20.0-24.9; overweight, 25.0-29.9; and obese, ≥30.0.

mass index of >30.0 for both men and women.³ Alternative definitions have been used elsewhere.

In Somerset some health targets were monitored by postal questionnaire surveys in 1987 and 1992. In 1987 a systematic random sample of 5000 residents of Somerset health district aged 16-64 was taken from the family practitioner committee's register, and in 1992 a sample of 6009 such residents was used. The same questions on self reported height and weight were included in both questionnaires, and the response rate was 58.3% (2915/5000) in 1987 and 57.6% (3463/6009) in 1992.

Table 1 shows the distribution of the respondents among the categories of body mass index in 1992. Using common thresholds greatly reduces the proportion of women categorised as obese (from 12.7% to 9.0%) and overweight (from 30.0% to 22.4%) and increases the proportion categorised as underweight (from 3.2% to 11.3%). These changes affect the distribution of obesity in the whole population, reducing the figure from 10.0% to 8.0%. Although the differences seem quite small, in terms of the Health of the Nation targets that focus specifically on obesity such a change in definition has profound consequences. In 1987, when thresholds that differed between the sexes were used in the survey in Somerset, 10.5% of women were found to be obese. This was the base from which the local target was set in 1992, requiring a reduction to 7.0% of women. Had thresholds been used that were the same in both sexes, the base figure in 1987 would have been 7.3% and the corresponding target for the year 2005 would have become 4.9%.

Health targets such as those associated with the Health of the Nation strategy require clear definitions, an understanding of the basic scientific problems underlying the targets, and regular review to take account of a changing knowledge base.

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Prevalence of obesity is low in people who do not eat meat

EDITOR,—Britain is failing to meet targets that have been set for reducing obesity.¹ One of the aims of the Health of the Nation strategy is to reduce the percentages of men and women who

are obese to 6% and 8%, respectively, by 2005,² but the *Health Survey for England 1994* shows that the prevalence of obesity had increased to 13.2% among men and 16.0% among women by 1994.³ This increase is probably partly due to a reduction in physical activity; the importance of the composition of the diet is not clear.⁴

We used data collected for the European prospective investigation into cancer and nutrition to examine the relation of obesity with meat consumption.⁵ A total of 3947 men and 17 158 women aged ≥20 were recruited during 1994 and 1995 through vegetarian and health food societies, shops, and magazines. Subjects were classified as meat eaters if they ate any meat, as fish eaters if they did not eat meat but did eat fish, as vegetarians if they did not eat meat or fish but did eat dairy products or eggs, and as vegans if they did not eat any of these four categories of food.

The mean ages of the men and women were 42.9 and 39.7 years respectively. Among both men and women, mean body mass index was

highest among the meat eaters, lowest among the vegans, and intermediate among the fish eaters and vegetarians (fig 1). These differences in body mass index are equivalent to mean differences in weight between meat eaters and vegans of 5.9 kg in men and 4.7 kg in women. In the groups that did not eat meat, mean body mass index was lower among those who had adhered to their diet for five or more years than among those who had adhered to their diet for a shorter period. This association with duration of diet suggests that the differences in body mass index are largely due to the qualitative differences between the diets of the four groups.

Among the meat eaters, after adjustment for age 6.4% of the men and 9.2% of the women were clinically obese (body mass index >30); these figures are well below the national averages but fail to reach the targets set in the Health of the Nation (fig 1). In contrast, the prevalence of obesity was well within these targets in all the groups that did not eat meat. These data suggest that a meat free diet is associated with a low prevalence of obesity.

This research was supported by the Imperial Cancer Research Fund and the Europe Against Cancer Programme of the European Commission.

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Fig 1—Mean (95% confidence interval) body mass index and percentage of subjects who were obese by type of diet (values are adjusted for age)