LETTERS TO THE EDITOR

Variation in hypertension in The Netherlands

SIR - Van de Mheen *et al* have reviewed studies on the prevalence of hypertension in The Netherlands.¹ They found a more than fivefold variation in different studies, explained by wide differences in methodology and by a period effect, and tried to estimate the prevalence of hypertension in The Netherlands.

We wish to comment on several points. Firstly, in two studies^{2,3} the subjects under treatment for hypertension were included in the prevalence number, whereas in the other studies⁴⁻⁷ they were excluded. Secondly, the diagnosis of hypertension was not reported correctly. In the study of van Ree, subjects with high blood pressure at the first (duplo) measurement were invited for a second measurement two weeks later, after which the diagnosis of hypertension was made. In the Groningen study, diagnosis was made after three different measurements, each separated by a week; this corresponds with the NUH study.³ In later studies more measurements were generally used or a longer rest period was taken before blood pressure measurement. In the Lelystad study,⁶ blood pressure was measured six times. The diagnosis of hypertension in this study was made on the basis of the last measurement, after a rest period of half an hour. If the diagnosis had been made at the first measurement, the number of hypertensive subjects would have been nearly double. With the subjects already under treatment included, the prevalence in the Lelystad study is very similar to that of the EPOZ study.²

Our third point is that it seems more correct to make a distinction between survey studies and case finding studies, instead of between survey studies and general practice studies. The NUHI study⁸ is the only case finding study and this explains the lower prevalence of hypertension in men, since women visit their doctor more often. Furthermore, the method of diagnosing hypertension was the same during the whole study period and the prevalence of hypertension has not really changed over the past 20 years (figure). In men there was a slight increase, and in women a slight decrease. The incidence has not changed since 1981. The higher incidence before 1981 was probably caused by the start of the registration and by screening for cardiovascular risk factors in part of the practice population.

Fourthly, hypertension was defined by van de Mheen *et al* as a diastolic blood pressure of 95 mmHg after three measurements, and patients under treatment for hypertension were included. It is unclear what the consequence of the definition of hypertension for inclusion of the reviewed studies in the analysis is because most of the studies do not meet this criteria. Therefore a pooled estimate of the prevalence of hypertension based on different criteria for hypertension (different dependent variables) is of doubtful value. The

The incidence (upper panel) and prevalence (lower panel) per 1000 patient years over the 20 year study period (NUHI study).⁸

period effect in particular is a methodological effect.

Blood pressure in The Netherlands may be decreased because of better treatment by general practitioners or other unknown factors. The prevalence of hypertension (defined as mentioned by the authors) cannot be estimated on the basis of screening surveys with one (duplo) measurement.

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Reply

Our paper¹ aimed to explain, as far as possible, the methodological variation in reported prevalences of hypertension between all studies to narrow the range of possible estimates. We used a theory-based statistical model to explain differences in registered observations. This model is based on two a priori hypotheses. The first is that all hypertension studies in The Netherlands tried to estimate the prevalence of hypertension in a more or less homogeneous population. The second is that no study reports a reliable estimate of the true prevalence of hypertension (otherwise, our study would have been meaningless).

1 Mheen PJ van, Bonneux L, Gunning-Schepers LJ. Variation in reported prevalences of hypertension in The Netherlands: the impact of methodological variables. *J Epidemiol Community Health* 1995;49:277-80.

2 Hofman A, Valkenburg HA. An epidemiological study of cardiovascular risk indicators (EPOZ). II Prevalence, tracing and treatment of hypertension in the general population. [In Dutch] *Ned Tijdschr Geneesk* 1980;124:189-95.

3 Schuurman FH. *A method for tracing and treatment of hypertension in general practice. The Groningen hypertension service*. [In Dutch] Groningen: University of Groningen, 1985. Thesis.

4 Boot CPM. *Risk factors for coronary heart disease. Screening and intervention in general practice*. [In

Hence, the dependent variable is not "hypertension", as this variable has never been observed directly, but "being classified as having hypertension", with case definition, case detection, and case ascertainment as explanatory variables. The choice of the cut off point determines the specificity and predicts the probability of being classified as hypertensive or not. Passive case detection in general practices, based on multiple measurements at multiple points in time, is specific, but underestimates the true prevalence because many persons are not ascertained. Active case detection in screening surveys ascertains all cases, but overestimates the true prevalence because of measurement error. Policy makers need estimates of both recognised and unrecognised hypertensives in the population, as the unrecognised ones indicate unmet health care needs.

The statement of Bakx *et al* that we did not mention diagnosis correctly is wrong. They confuse the number of blood pressure measurements at the same visit and at different visits at different points in time. In the article, we clearly specified in the methods section, tables, results, and discussion not the number of measurements, but numbers of points in time. The variability between visits (an estimate of the intraindividual variation) is more important than the within-visit variability (an estimate of intraobserver variation).² In the Lelystad study, blood pressure was measured six times – all at the same visit.³ In the Groningen study, blood pressure was measured three times, at two visits.⁴ In the study of van Ree, blood pressure was measured at baseline screening, twice during the same visit.⁵ We ignored the other measurement in this study because it took place after a planned intervention with an unknown but intended effect on blood pressure levels. For the Lelystad study, the subjects treated for hypertension were included in the estimated prevalence, not excluded.

In our discussion of period trends in The Netherlands, we open by stating that the magnitude of the trend is "less credible" and possibly caused by older studies using more imprecise methodology. Obviously, it is better to study trends in the prevalence of hypertension within one study, provided that blood pressure measurements have been taken in the same way throughout the study and at multiple visits. However, the data presented by Bakx *et al* describe changes in the prevalence of hypertension in a general practitioners' patient population, in which a screening project was conducted during the study period, that aimed to trace (and treat) individuals with hypertension. The figures from the NUHI registry on hypertension are, to our knowledge, unpublished and hard to interpret without any information on age standardisation or confidence limits; the population covered is small and ageing. The figures are inconsistent; they might be used to support the claim that the incidence has

been decreasing. Even if methods of diagnosis have remained unchanged, methods of case detection have changed over these two decades, depending on the consultation threshold and the awareness of the population and the general practitioner.

Furthermore, hypothesising that the prevalence of hypertension has not changed over time demands an explanation of, for instance, the strongly declining stroke mortality over time.⁶ From other countries it is known that hypertension has contributed to this decline.^{7,8} If this were not the case in The Netherlands, we would have to come up with an alternative explanation for the declining trend in stroke mortality. Pending further data, we cannot reject the period effect we observed, indicating a declining prevalence of hypertension over time.

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Tuberculosis among homeless people

SIR – With other colleagues I recently reported an x ray screening programme at a temporary shelter for homeless people in London set up by the charity Crisis.¹ Active pulmonary tuberculosis was diagnosed in 1.5%. The authors thought this high rate a conservative estimate because many people with an x ray suggestive of tuberculosis were lost to follow up – a problem occurring frequently in surveys of homeless populations.

In a subsequent study, Crisis undertook x ray screening in London day centres and

hostels serving homeless people, many of whom were, or had been, rough sleepers. In an effort to maximise compliance, food vouchers were offered as incentives and an educational programme was provided for homeless people and their carers. Statutory and voluntary services in hospital and the community were contacted and their work was coordinated and facilitated. The methods are described in the Crisis report.² A very high level of compliance with investigation and treatment was attained.

Active pulmonary tuberculosis was diagnosed in 2% (95% confidence limits 1.0%, 3.4%). This rate is 20 times that in the last mass x ray survey in London in 1983 and two hundred times the current tuberculosis notification rate in England and Wales.

The urgent need to review and improve tuberculosis control programmes for homeless people has been affirmed recently³ and the Crisis guidelines² provide methods for doing so. The high prevalence of ill health, including tuberculosis, in the homeless is well documented.⁴ Health commissioning agencies need to consider the special needs of homeless people when assessing their purchasing requirements.

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NOTICES

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