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Living close to industry

EDITOR,—Ian Harvey describes some of the difficulties of determining whether living close to industry harms people's health.¹ Scottish studies that colleagues and I carried out during the 1970s and 1980s used several techniques for sharpening the focus on this type of epidemiology of small areas.^{2,3}

Firstly, when studying air pollution from local industries, beware overreliance on traditional fixed monitoring sites, which are usually too few and inappropriately located. Concentrations of air pollutants from a fume stack change dramatically within short distances, so that "precise" results from such monitoring sites can lead to misclassification of exposed and non-exposed populations; furthermore, such techniques rarely enable one industry's local pollution pattern to be distinguished from that of another. Keynes's dictum about economics—that it is better to be approximately right than precisely wrong—is also true in environmental epidemiology, and approximate patterns of pollution (notably of metals) can be obtained by use of low technology samplers, including soils and moss bags.⁴ Such samplers are inexpensive, are independent of power supplies, are ignored by vandals, provide a detailed and extensive network of sampling sites where data on pollution are most relevant, can sample for long enough for seasonal variations to be discerned, and can assess past pollution patterns. Low technology samplers indicate the approximate locations of pollution hot spots (and hence the most exposed populations); thereafter, the precise details of toxicological relevance may be obtained from high technology equipment installed where most appropriate.

Next, beware the circular area around a source of pollution. This is much favoured by armchair epidemiologists to define the so called exposed population, but its simple geometry ignores fundamental realities determining exposure to pollution: the directions of winds associated with the pollution; local topography; the height of the fume stack; the consequent extent of the "umbrella effect"; and the pattern gleaned from observations of physicians, environmental health officers, residents, farmers, and veterinarians. Such information permits even the most funds starved epidemiologists to demarcate exposed neighbourhoods reasonably realistically and a priori.⁵ This pilot epidemiology may persuade local authorities to fund follow up studies.

Thirdly, apply Hill's criteria for causation, but be aware that the realities on which these guidelines operate may need probing. For example, a factory that has operated for decades may change its processes or raw materials radically, thereby causing an unsuspected release of pollutants with new toxicological potentials.

Finally, public health practitioners should respond constructively to residents' concerns and to requests for advice or collaboration from environmental health departments. Too often have such opportunities for benefiting the public's health been missed.

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Monitoring effects of deprivation on health

EDITOR,—Recent reports have restated the link between socioeconomic deprivation and experience of poor health.^{1,2} Children are sensitive indicators of deprivation, and their health experience reflects the health inequalities in the wider adult population.³ In our district we have been looking at ways of monitoring the effects of deprivation on the community through the experiences of children, using data from the routine contract minimum dataset.

There were 4037 hospital admissions among 41 152 children (aged 0-15) resident in Kensington, Chelsea and Westminster Health Commissioning Agency from April 1993 to March 1994. The rate of admission was 98.1/1000 children, ranging from 68/1000 to 118/1000 in six localities. Further work to examine these differences looked at admission rates in children under 16 in each of 44 electoral wards within our district. The admission rates varied more than threefold, ranging from 43.5/1000 children to 153.4/1000. When mapped these variations seemed to be related to the variation in the Jarman score for each ward.⁴ This was confirmed when the data were plotted and supported by a highly significant correlation coefficient ($r=0.68$, 95% confidence interval 0.48 to 0.81; figure).

Admission rates per 1000 children aged 0-15 plotted against Jarman scores for 44 electoral wards in London, April 1993 to March 1994

These results show the wide variations in admission rates in children and that these correlate closely with deprivation. This finding may be due to increased use of health care in deprived areas because of social factors or to actual increased morbidity in the child population. Regardless of which point of view is taken, children in deprived areas clearly receive hospital care more frequently than those in other areas, with the attendant disruption of family life and consumption of health resources.

Health authorities need to target deprived areas to examine these trends in more detail. The use of hospital discharge data linked to other sources of routine data presents an opportunity to develop routine ways of monitoring the effects of deprivation

on morbidity and complements the use of mortality indicators for similar purposes.⁵

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Teenage pregnancy and deprivation

EDITOR,—Philip McLoone and F A Boddy highlight the differences in mortality experienced by residents of areas characterised by different degrees of deprivation.¹ Using the same classification as part of a needs assessment of teenage pregnancy (Scottish needs assessment programme), we have studied conception rates among teenagers and the outcome of these pregnancies in relation to deprivation.

The conception rate among teenagers in Scotland rose from 40/1000 teenagers in 1983 to 51/1000 in 1991, falling to 46/1000 in 1993. Data about teenage conceptions (births, miscarriages, and terminations) were obtained from the Scottish morbidity records (SMR2 (maternity hospital discharge records)). Anonymised information about terminations of pregnancy was also obtained from the morbidity records (SMR1 (general hospital discharge records)). The age of a young woman at conception was calculated by subtracting the estimated gestation at the end of pregnancy from her age at delivery and then adding two weeks. Where length of gestation was missing it was assumed to be 40 weeks for births and 12 weeks for pregnancies ending in miscarriage. The deprivation category was derived from the post-code with Carstairs and Morris's 1991 classification of deprivation for Scotland and was assigned to 98.7% of the teenage pregnancies. Population totals of teenage girls by age were taken from data in the 1991 census.

During the three years 1990-92, 33 275 teenage pregnancies were recorded. At all ages (13-19 years) the pregnancy rate increased with deprivation, with a fourfold to fivefold difference in the rate between the women living in deprivation category 1 (most affluent) and those in deprivation category 7 (most deprived) (table). The outcome of pregnancy also varied. The proportions of pregnancies that resulted in the birth of a baby were 36% (260/731) in women in deprivation category 1

Teenage pregnancy rates per 1000 teenagers by age and deprivation category, Scotland 1990-92

Deprivation category	Age (years)				
	13-15	16	17	18	19
1*	3	17	24	31	37
2	5	26	40	53	61
3	7	35	53	67	72
4	9	49	75	94	103
5	12	68	95	116	123
6	11	66	104	122	137
7†	15	88	137	172	170

*Most affluent. †Most deprived.

and 73% (3147/4286) in those in category 7. Conversely, the proportions of pregnancies that resulted in termination were 50% (362/731) in women in deprivation category 1 and 14% (602/4286) in those in category 7. When planning health services to meet the needs of the population it is obviously essential to have information by deprivation category.

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Inequalities in health

Are increasing . . .

EDITOR,—George Davey Smith and Jerry Morris point out the increasing inequalities in health in Britain.¹ This issue is conspicuously absent from the *Health of the Nation* initiative.

In my annual report for 1991 I highlighted a difference of 10 years in the mean age at death between the most affluent and the most deprived wards in Coventry and the fact that in one ward over one third of male deaths occurred under the age of 65, whereas in a more affluent ward the figure was less than one in six. The corresponding figures for female deaths were more than one in four and less than one in 10 respectively. As a result of this, in 1991 Coventry Health Authority adopted a local health target, which states: "By the year 2000, the current differences in the mean age at death existing between the electoral wards in Coventry should be reduced by 10%, based on a 3 year moving average."

In response to this target Coventry Health Authority, Coventry Family Health Services Authority, and Coventry City Council established a policy of specifically targeting resources at deprived areas in terms of health promotion, the development of primary health care, and service provision. Figures for 1990-2, published in my annual report for 1994, show that the gap in mean age at death has remained constant, although overall life expectancy has increased roughly equally in deprived and affluent wards.

There is nothing to stop individual health authorities developing local health targets reflecting inequalities in health in the absence of central government guidance on this subject.

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1 Davey Smith G, Morris J. Increasing inequalities in the health of the nation. *BMJ* 1994;309:1453-4. (3 December.)

. . . or are they?

EDITOR,—Although the statistics of health inequalities in Britain discussed in George Davey Smith and Jerry Morris's editorial¹ seem impressive, the absolute scale and nature of the problem, and what indeed is to be done to resolve it, remain elusive. Thus, working as a general practitioner in inner city London with a wide social mix of patients I find it difficult to relate, for example, the twofold differential in infant mortality between social classes I and V to clinical practice. Death in infancy is nowadays very rare and when it does occur, whether from the sudden infant death syndrome or childhood malignancy, it occurs just

as often in professional households as working class households.

The discrepancy between the raw statistics of health inequalities and everyday experience is clarified by a closer examination of the causes of infant mortality (table), which confirms the twofold or 200% excess deaths between social class V and I. The overwhelming majority of infants, however, do survive the first year, and when the same data are presented as survival rates a slightly different picture emerges. Here the relevant figures for social class I and V are 994.4 and 988.8 per 1000 live births respectively, a survival advantage of only 0.6% for children born into professional families. The differential in infant mortality is accounted for predominantly by three major categories of disease—congenital anomalies, prematurity (including the respiratory distress syndrome), and the sudden infant death syndrome.

Infant mortality per 1000 legitimate live births, 1990

	Social class		
	I	V	Differential
Total	5.6	11.2	5.6
Congenital anomalies	0.9	2.0	1.1
Prematurity and respiratory distress syndrome	1.9	3.6	1.7
Sudden infant death syndrome	0.9	2.7	1.8

There are many causes of congenital anomalies including chromosomal and genetic abnormalities and intrauterine infections, but with the possible exception of folic acid supplementation for neural tube defects they are not readily amenable to prevention. The causes of prematurity are not known and again are not readily amenable to preventive intervention. By contrast, the sudden infant death syndrome is now recognised to be strongly influenced by sleeping position and has declined by 70% since the public health campaign advising that babies should sleep on their backs.

None of these three categories of disease is obviously related to poverty. So the vast edifice of argument about health inequalities mounted on the back of the twofold differential in infant mortality between the social classes is reduced to focusing on one truly preventable condition—the sudden infant death syndrome. Further, the actual excess in the number of deaths from this condition in social class V compared with social class I is only seven.

Despite the vast literature on health inequalities generated over the past decade this type of detailed examination of the statistics has never been undertaken. Why might this be? The findings contradict the argument that the health differential between the social classes is readily attributable to "poverty" and also raises doubts about the proposed solutions—a major political programme of income redistribution. The Black report, for example, called for "greater restrictions on the amount of wealth which can be inherited, establishment of minimal—and maximal—earnings, the recognition of right to full employment and a major upgrading of child and family allowances."² There may well be good political arguments for such policies but it is hard to see how they could have much influence on the causes of the social class differential in infant mortality.

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Payment for blood donations in Germany

EDITOR,—John D Cash, in his letter about proposed payment for blood donors in Germany, says that a statement made by me at the congress of the International Society of Blood Transfusion in Amsterdam in July had given the impression that the German government was planning to introduce a system of payment for all blood donors and that this payment would be DM50 (£20) per donation.¹ This interpretation of my statement is wrong. What I said was: "In Germany it is considered acceptable for a regular donor to receive a global reimbursement of up to DM50. This has been recommended by the working group on blood. The federal government is of the same opinion and considers it to be in conformity with the recommendations of the Council of Europe."

This statement reflects the existing practice of reimbursing expenses in Germany. The introduction of a new system of reimbursing expenses is totally out of the question. Moreover, my statement makes it quite clear that a differentiated system of reimbursing expenses, which is allowed for in the recommendations of the Council of Europe, operates in Germany. According to these recommendations, reimbursing direct travel and real time expenses is admissible, and in Germany the maximum limit for such reimbursements is DM50. Consequently, the various blood and plasma donation services in Germany reimburse different sums of up to DM50; in some cases no reimbursements are paid at all.

There is absolutely no reason, therefore, for colleagues in the member states of the European Union and the Council of Europe to be concerned about the practice of reimbursing expenses in Germany. What is of decisive importance is the careful selection of donors, which is awarded particular importance in Germany and is subject to constant monitoring and further development. It is because of this that the prevalence and incidence of HIV infection in Germany are quite low.

The German government also expects to make considerable safety gains in the area of blood and blood products by achieving the goal of self sufficiency. The aim here is to become self sufficient in plasma and plasma products. This is a matter of great priority and it is being pursued energetically. Among other measures the German government is promoting the setting up and expansion of plasmapheresis centres with government funds. The government assumes that in a few years' time self sufficiency will have been achieved.

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1 Cash JD. Payment proposed for blood donations in Germany. *BMJ* 1994;309:1160. (29 October.)

Measles campaign

EDITOR,—Nigel Higson questions several aspects of the recent measles and rubella immunisation campaign and makes comments about the participation of general practitioners in further campaigns.¹ Already, good evidence shows that the campaign has been a considerable success. Coverage for the November phase is around 90%; no district has reported <80% and at least 12 have reported ≥95% coverage. More importantly, we are already able to see a considerable impact on notifications of measles; these are now about half the level before the campaign and are falling (figure).

The World Health Organisation now recommends measles campaigns for countries whatever