Kriging: a novel approach to the investigation of spatial variation in the risk of developing rare diseases

K R MUIR, M A OLIVER, Ch. LAJAUNE, R WEBSTER, S E PARKES, R MANN
Queen's Medical School, University of Nottingham; School of Geography, University of Birmingham; Centre de Geostatistique, Fontainebleau, France; ETH Zurich, ITO, Schlieren, Switzerland; The Children's Hospital, Ladywood Middleway, Birmingham.

The spatial patterns of rare diseases are difficult to discern because of the low number of cases, variation in the populations at risk, and "noise." Childhood cancer is an example. Its aetiology is elusive, and before searching for possible causes in the environment we should know whether its distribution is other than random. None of the methods designed to detect a pattern has yet proved to be a complete solution.

We have analysed the spatial distribution of childhood cancer in the West Midlands of England systematically, using the variogram to discern any underlying structure, its form, and how much of the variation is purely random.

The cases were converted to an observed rate of incidence for each electoral ward and this was regarded as an estimate of the underlying rate that a child has of developing the disease. We then corrected these estimates of risk for non-random to account for the varying numbers of children in the wards. Finally, we used the variogram and the rates to estimate the local risk by kriging.

Both the variogram of the rate and that of the risk indicate spatial dependence in the disease; the wards where the risk of developing the disease is large are "clustered," as are those where the risk is small. It seems that if the risk of children's developing the disease varies from place to place and that it is by no means entirely random. The kriged map of the estimated risk for the region shows the areas of low and high risk. These areas have a "patchy" distribution. Further work is in hand to improve still further the precision of the estimates and to identify local environmental or other factors responsible for the observed variation in risk.

Non-response bias and replacement of non-respondents in an inner city survey of attitudes to breast cancer and screening

PAUL C LAMBERT, JOHANNES I BOTHA, TERJINDER K MANNU-SCOTT Department of Epidemiology and Public Health, University of Leicester and Leicestershire Health Authority.

Objective—To study non-response bias and use of replacements for non-responders in a community survey of attitudes to breast cancer and screening.

Design—A sample of inner city women aged 45-64 stratified by area and predicted home language, interviewed at home. Non-responders were replaced by a new sample, each matched to a non-responder by area and predicted home language. Non-responders from this second sample were then replaced. Refused non-responders were sent a shorter questionnaire (one page) by post.

Setting—Two inner city areas of Leicester: Braunstone and Highfields.

Subjects—Names of women were obtained from the family health service according to the family health service (FHSA) population register. There were 813 women in the original sample of which 447 (54.9%) were interviewed, 168 (20.6%) refused, and 175 (21.5%) were either not at the address given or could not be contacted after numerous visits. Similar percentages were obtained for first and second replacements. The shorter questionnaire, to refusers, was completed by 74% of the original sample, 67% from first replacements and 88% from second replacements.

Results—Responders and non-responders in both the first and second group of replacements did not differ in terms of predicted language or area lived in. The responding replacements and the original non-responders did not have different age distributions. The two groups differed in their intentions to attend the breast screening appointment. About 90% of the responding replacements stated that they would attend the screening appointment compared with only 90% of those who had refused (p<0.001). However, they were more uncertain to "attend" question in the interview and that in the refusers' questionnaire differed in the amount of detail provided. Of those who said that they would attend, 81% of responding replacements and 88% of the original refusers actually did attend.

Conclusions—Use of the FHSA population register could lead to bias since there will be a number of individuals whose addresses are different from those stated in the register. On the other hand, there may be a number of individuals living in the area who will not be on the register since they are not registered with a general practice in that area. Although non-responders can be replaced with people identical in terms of area, language, age, etc., the sample remains one of responders only and so replacement does not alleviate the problem of non-response bias. It is probably just as effective to take a larger original sample in order to obtain the desired precision.

Nurses in health services research: present roles and future development

SUSAN READ Medical Care Research Unit, Department of Public Health Medicine, University of Sheffield.

The Report of the Taskforce on the Strategy for Research in Nursing, Midwifery and Health Visiting by the Department of Health is seen as a means of facilitating more research both in nursing and also by nurses in health services research. The report states that while valuable, money which exists, it is insufficient in scale, continuity, dissemination and utilisation, and lacks cumulative effect.

Little is known of nurses' contributions to health services research, particularly in multidisciplinary research units. In a recent review of public health research in Britain, McPherson refers to the contribution of economists, statisticians, sociologists, geographers, anthropologists, and psychologists in addition to medically qualified epidemiologists and public health practitioners, but he makes no mention of nurses. This does not mean that nurses are not involved in health services research; in the Medical Care Research Unit at Sheffield, for instance, five contract researchers are nurses. There is scope, too, as Hurst and Thompson point out, for nurse researchers within the NHS, as part of the effort to base the contracting process on properly researched information. The Health of the Nation's strategy too, calls for partnership between research and action in the pursuit of health gain. Because of their relative size as a manpower resource it follows that nurses should often be involved at all levels in this work.

During 1993 an implementation group will be seeking to take forward the strategy's recommendations; to assist the group the presenter is assembling baseline information on nursing research in the NHS regions. The poster will discuss the new strategy and its implementation. The poster will also act as a focus for nurses attending the Society for Social Medicine Annual Meeting, so that they may share information with the researcher, and will also encourage discussion of nurses' roles in health services research more generally.
the percentage response rate is, in itself, meaningless, the problem of bias in findings arises if responders are different from non-responders. Because of the sampling and data collection method used respondents here were a mixture of non-responders. The high exclusion and refusal rate indicate the difficulty of contacting this group. Nevertheless, findings generally confirm results from previous studies showing that, for example, non-responders tend to be younger and are more likely to smoke and drink alcohol regularly. New information about health checks and the need for information about smoking and alcohol for health care strengthens the argument that more information about non-responders is crucial to the interpretation and use of data collected in postal surveys. Perhaps enough is now known to argue that non-responders should be considered as a target group for health promotion purposes. At the very least individuals could be sent local information about where to go for health care tailored to their age and gender group. Non-responders’ needs may be different to identify, but should not be ignored.

Lifestyle surveys—the complete answer?

REGINA DENGLER (Department of Public Health Medicine and Epidemiology, University of Nottingham)

Objectives—To describe the characteristics of respondents who omit smoking and alcoholic questions in lifestyle surveys and discuss possible resulting bias.

Survey methods—The 1991 Trent Health Lifestyle Survey in which a postal questionnaire was used.

Subjects—A total of 12,989 respondents (62% response rate).

Results—All questions in the survey had some missing values, ranging from 1% to 35%. There was a tendency for respondents who had left school aged 14 years or younger to omit questions. Smoking status was not completed by 9%. Compared with others, this group was more likely to be aged 55–70 years (40% versus 24%), live in council rented accommodation (19% versus 14%) and have a long-term problem/disability (29% versus 24%). They were also less likely to have the use of a car (25% versus 16% no use of car). In contrast, drinking status was not completed by only 1% of respondents. Of these, 27% were retired, compared with 10% from the survey population. Consequently, a higher proportion of non-responders to this question was aged 55–70 years (46% versus 27%). Non-responders to the question were also more likely to be council tenants (24% versus 14%). However, a quarter of those who did not complete that question did complete a complex table reporting one week’s alcohol consumption nearer to the previous week.

Conclusions—Respondents who omit questions are usually excluded from the analyses thereby introducing a potential source of bias. This is of particular concern as smoking and drinking are two key health indicators. The earlier school leaving age of respondents who missed questions suggests that some may be less healthy than those who do not. Non-responders were also shown to leave school earlier than others. Common to both groups is the tendency to be council tenants. Respondents who continued smoking and/or drinking question tended to be older. In contrast, non-respondents tended to be younger. Studies have shown that non-respondents tended to be smokers and heavier drinkers than responders: it may be that the pattern is similar in those who do and do not complete smoking and drinking questions. The health risk is sufficiently well known. Smoking is, arguably, increasingly socially unacceptable. These factors may help to explain why smoking questions are comparatively poorly completed. On the other hand, alcohol consumption, which was relatively well reported, is generally socially acceptable except in specific situations such as driving. This is less plausible explanation for the difference of completion rates between the two subjects.

Healthquest Southeast—carrying out a region wide health survey

ALAN MARYON, DAVID BARKER (South East Institute of Public Health)

Healthquest SouthEast is a region wide postal survey of a random sample of over 46,000 residents aged 16 years and over within the South East Region Health Authority. It is the largest survey of its kind to have been carried out to date. The objectives of the study are to collect baseline information on health status, service use (primary and secondary), life style and sociodemographic characteristics. Other areas are private health insurance, accidents, and “cares”. The information collected is not currently available from any other source and is unique in that it is drawn from the general population, not only from service users. It will be used to inform health needs assessment, target services, identify gaps in service provision, monitor future strategies, and inform commissioning. A pilot study of 850 residents in West Lambeth was carried out to test the questionnaire, two layout designs, and take up of translation services offered, and assistance for the disabled. A validation exercise of the sampling frame was also carried out via general practitioners and the effect on response of a third reminder endorsed by general practitioners was tested.

Results of the pilot study are available.

Data collection for the Healthquest survey is now complete. A region-wide valid response rate of 55% was achieved. The highest district response rate being 64%.

A press release is available providing a preliminary region-wide profile of smoking and alcohol consumption. The full report was to be released in May 1993.

Health and housing survey—Belfast 1992

5 MCCLAIN, J GINGLE Department of Public Health Medicine, Eastern Health and Social Services Board, Northern Ireland

Background—The Health Organisation has developed a “Health for All” policy to improve the health practices and procedures of member states. Within this context the organisation launched the “Healthy Cities Initiative” with the aim of allowing member states to benefit from sharing each others work. In Belfast, a collaborative research project was organised involving the Eastern Health and Social Services Board (EHSSB) and the Northern Ireland Housing Executive (NIHE).

Aims—The aim of this study was to examine the extent to which self reported health varied between urban and rural areas.

Design—The study examined six different housing environments built after 1900 in the Belfast urban area. The sampling frame for the study was provided by the NIHE’s corporate database and produced a sample of 696 residents across the six housing environment.

The response rate to the study was 76%.

Discussion—This poster will report on the initial findings of the impact of housing on health in the Belfast urban area. The problem will be analysed by the different sociodemographic characteristics of the population. The Nottingham Health Profile and the General Health Questionnaire have been used to assess levels of morbidity within these six housing areas. The relationship between morbidity scores and aspects of the physical environment will be discussed. The data will also allow comparisons to be drawn with similar studies undertaken in the UK.

Survey of health needs on the Broadwater Farm Estate

P WHINSEB, K ZAHIR, P TOWS (Department of Public Health, New River Health Authority, and the Broadwater Farm Estate Council of Community Organisations, London)

Background and objectives—Local concern about health and access to primary health care in the partici- pant residents’ organisations to assess the health, determinants of health, and health care needs of residents of the Broadwater Farm Estate.

Design—Pilot survey of 107 (1 in 10) households, using a questionnaire administered by trained volunteer residents.

Results—Seventy two questionnaires (67%) were completed. The median age of respondents was 37 years and fewer than 10% were of retirement age. More than half were from ethnic minority groups, predominantly Afro-Caribbean. Half the households included children; one quarter were single parent families. Forty per cent of economically active residents were unemployed. Many complained of problems with their accommodation, the commonest being cockroach infestation (65%). Overall, 35% of respondents were current cigarette smokers, with a higher prevalence in Europeans (48%) than in other ethnic groups (27%). More than 10% of respondents reported a weekly alcohol intake greater than nationally recommended limits. Specific and persistent health problems were reported by 28% of respondents; their prevalence was higher in Europeans (41%) than in Afro-Caribbeans (14%). The prevalence of chronic disability was 5%. Almost all households (99%) were registered with a general practitioner and most (78%) were satisfied with the care received. However, most residents (70%) indicated a wish to transfer to a practice nearer to their residence. This was available. Of 18 mothers with children under 5 years of age, two had no antenatal care in pregnancy. Five of the 18 babies had been of low birth weight (<2.5 kg) and three of the babies had received no immunisations. A lack of locally accessible antenatal and child surveillance clinic facilities was identified by the residents. Almost half of the respondents wanted information on health issues; stress and mental illness, diet, women’s health issues, sexual health, and the haemoglobinopathies were the concerns most often raised.

Conclusions—The results suggest that several factors are present which may have an adverse
Food poisoning notifications: is it worth investigating sporadic cases?

NIGEL UNWIN, MICHAEL PAINTER (Infection Control and Surveillance Unit, Manchester)  
Background—Notifiable communicable diseases fall into two broad categories: those for which notification is required for long term surveillance, and those for which notification is required to allow prompt public health action. Food poisoning falls mainly into the latter category. However, it is not clear what action should be taken following the notification of apparently sporadic cases. In Manchester an attempt is made to investigate each food poisoning notification. Environmental health officers (EHOs) seek information from contacts (eg. in a questionnaire on each notified individual). The information sought includes a detailed history of symptoms, knowledge of other cases, and food eaten in the week prior to the onset of symptoms.  

Objectives—To assess the effectiveness of investigating apparently sporadic cases of food poisoning.  

Method—A review of all the questionnaires completed by EHOs investigating food poisoning notifications in 1990.

Main outcome measures—Identification of food source; detection of unknown outbreaks of food poisoning.  

Results—There were 278 food poisoning notifications and EHOs were successful in contacting 199 (72%). The median time from onset of symptoms to receipt of the notification by the MOE was 9–10 days, and from onset of symptoms to contacting an EHO was 12–13 days. Symptoms were still present in 33 cases at the time of contact. Where symptoms were no longer present their median duration was 4–5 days. In only 16% (80) of those contacted was it possible to strongly implicate a particular food source. 

In the remainder either the information collected gave no idea as to the likely source (122 cases, 61%) or a highly tentative “possible” food (a food commonly implicated in food poisoning, such as chicken, eggs or “take away” fried rice, consumed within the likely incubation period) was identified (57 cases, 29%). Information on food consumed was missing in four cases. Whether or not a positive stool culture was reported made no difference to the likelihood of identifying a food source. A food source was no more likely to be implicated in those contacted relatively quickly from the onset of symptoms (4 days) than those contacted relatively more slowly (10 days) compared with those who were not. No unknown outbreaks of food poisoning were discovered.  

Conclusion—Seeking further information from sporadic notified cases of food poisoning was of little benefit in identifying the food source and did not identify any unknown outbreaks of food poisoning. What the most appropriate response is to sporadic cases of food poisoning requires further investigation and recommendations are made for further studies.

Evaluation of partner notification for sexually transmitted diseases

JANET G MURRAY, LESLEY FRENCH, ANNE M JOHNSON (Academic Department of Genito-Urinary Medicine, University College London)  
Background—Partner notification (PN), informing the partner(s) of those with a sexually transmitted disease (STD) with a view to investigation and treatment, has been important in community control of STDs for 60 years. It is pertinent to re-examine the activity, both because of the rise in reported chlamydia and recent resurgence of gonorrhoea, and Department of Health recommendations regarding PN in HIV infection. Routine collection of PN data for genitourinary medicine (GUM) clinic returns was stopped in 1987, therefore no routine outcome measures are available. A study was undertaken to evaluate the process, data recording, and outcome of PN.  

Objectives—(i) To describe the process of PN in a GUM clinic. (ii) To measure effectiveness of the intervention for PN, and (iii) To examine adequacy of information sources. (iv) To provide recommendations for change if required. 

Setting—A GUM clinic in central London. Guidelines state that patients with gonorrhoea, syphilis, and chlamydia should be referred to a health adviser for PN. Contact slips are used for PN and should be returned to the clinic after partners are investigated. Routinely, patients do not see health advisers for follow up of PN.  

Methods—Case note and computerised data review of patients attending with gonorrhoea, syphilis, and chlamydia during three months in 1992. Process indicators were the number of patients (i) counselled regarding PN, (ii) counselled by a health adviser, and (iii) asked about success of PN at follow up. Outcome indicators were numbers of partners (i) identified, (ii) informed, (iii) examined, (iv) diagnosed and (v) treated, and (vi) the proportion of patients presenting due to PN.  

Results—A total of 174 cases were identified (104 chlamydia; 70 gonorrhoea; four syphilis), with 142 reviewed to date. Of these, 23% presented as contacts, 80% were counselled, 69% by a health adviser. Outcome of PN was discussed with 39%. A total of 235 partners were identified. Of these, 26% were untraceable and 5% were not informed. Thirty-five per cent were informed, 16% were treated epidemiologically and 6% had a positive diagnosis. In 34% of cases, no information was available. All this information was obtained from the index case notes. Corroboration from partners’ case notes was possible for 20 partners and from contact slips for two partners.  

Discussion—Guidelines for PN are not being followed rigorously. Routinely documented information does not allow measurement of effectiveness, particularly because of lack of standardisation of routine record keeping and inadequate recording of outcome of contact notification. For future evaluation, information readily available within the clinic could be captured routinely. Consultation between all disciplines involved is necessary to develop cohesive policies for PN and effective information systems. The following points might be considered: strengthening the role of health advisers in follow up of PN; standardising recording of information on outcomes; establishing a system of cross referencing of case notes within the clinic, possibly with contact slips. Implementation may be difficult because of the sensitive nature of the information.

Use of covariance structure analysis for a follow up study of AIDS patients, St Mary’s Hospital 1983–90: statistical modelling of Pneumocystis carinii pneumonia episode and two year survival

F KUPIEK, F J BECK, B S PETERS (Academic Department of Public Health, St Mary’s Hospital Medical School, London; Department of Genito-Urinary Medicine, St Mary’s Hospital, London)  
Objectives—To test the use of covariance structure analysis in describing complex multivariate effects between pathophysiological parameters, health and drug treatment, service utilisation and outcome of the first Pneumocystis carinii pneumonia (PCP) episode.  

Methods—Covariance structure models were tested using data which were collected retrospectively from case notes of AIDS patients with their first PCP episode treated at St Mary’s Hospital 1983–90, and followed up for two years from time of AIDS diagnosis. 

Main outcome measures—Survival of the first episode of PCP within 30 days from discharge and survival time within two years from time of AIDS diagnosis.  

Results—Basic model of the determinants of outcome of an episode of PCP comprised two factors, relating severity of HIV disease as defined by lymphocyte count and baseline haemoglobin level on hospital admission, and case severity of PCP represented by A-a gradient on admission. Adding the variable coinfection increases the predictive power of the model, acting mainly as a measure of immunosuppression. Variations of the basic model showed that the effect of AZT on admission was not significant in this context, but that anti-PCP treatment was. The basic model can be extended to include two year survival from time of AIDS diagnosis, variables of health service utilisation prior to admission, and the time interval between HIV infection and first episode of PCP.  

Conclusion—The value of covariance structure analysis assessing complex multivariate effects in public health studies has been demonstrated by modelling determinants of the outcome of the first PCP episode in a longitudinal perspective. Earlier access to health services, as well as treatment during the admission, all affect the outcome. In contrast, the effect of AZT given on admission was not significant for either outcome measure.

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Northern Region Young Persons’ Malignant Disease Registry 1968–93

LORNA MORE, ALAN W CRAFT, LOUISE PARKER (Children’s Cancer Unit, Department of Child Health, University of Newcastle upon Tyne)  
The Northern Region Children’s Malignant Disease Registry was established in 1968 when it began to register all children who developed cancer before their 15th birthday while resident in the Northern Region.
Trends in incidence and survival of childhood leukaemia in the Northern Region, 1968-91

M COLE, A W CRIFT, J R MANN (Department of Child Health, University of Newcastle upon Tyne, and Department of Medical Statistics, University of Newcastle upon Tyne)

Objective—To study trends in incidence and survival of childhood leukaemia and to assess the influence of possible prognostic factors upon survival.

Design—Retrospective study of data collected as part of the Northern Region Young Persons' Malignant Disease Registry.

Setting and participants—586 children diagnosed with leukaemia before their 15th birthday while resident in the Northern Region of England during the period 1968-91.

Main outcome measures—Incidence and survival rates of childhood leukaemia, including acute lymphoblastic (ALL), acute myeloid (AML), and chronic myeloid (CML) leukaemia.

Results—A total of 586 cases of childhood leukaemia were registered, 490 ALL, 49 AML, and 10 CML. There are significantly more males than females, a sex ratio of 1:0.80 (95% CI 1:0.68, 1:0.93). The annual incidence of ALL has increased significantly (p<0.004); no significant increase was established for AML or for CML (p>0.05). The average annual increase in ALL incidence was 0.53 cases per million children under age 15. Year, age, and white blood count at diagnosis are all significant prognostic factors in the survival of children with ALL (p<0.005); year of diagnosis and white blood count at diagnosis significantly affect survival of children with AML (p<0.001), with a difference established for ALL or AML (p<0.05). Too few cases of CML were registered for useful analysis. The hazard ratio, which has a relative risk interpretation, calculated as (95% CI 0.95, 1.0) for children diagnosed with ALL in 1991 as opposed to 1968, a 94% reduction in risk. A 75% reduction in risk was estimated for AML, a relative risk of 0.25 (95% CI 0.09, 0.66). Five year survival rates for ALL have improved dramatically, estimates for children diagnosed under the age of 3 with the median WBC at diagnosis have risen from 9% (diagnosis in 1968) to 88% (diagnosis in 1992). Estimates of two year survival rates for children diagnosed with AML having the median WBC have risen from 10% (diagnosis in 1968) to 59% (diagnosis in 1991). Conclusions—The annual incidence of childhood ALL is increasing. The prognosis of children with ALL and AML has greatly improved since the Northern Region Young Person’s Malignant Disease Registry was established in 1968.

Hodgkin’s disease in children 1957-86: a large population based study

S E PARREES, N A G G OAD, R M KIRK, T J JONES, A H CAMERON, J R MANN (West Midlands Regional Children’s Tumour Research Group, The Children’s Hospital, Birmingham)

We studied 148 children registered with the West Midlands Regional Children’s Tumour Research Group (WMRCTRGR) as presenting with Hodgkin’s disease (HD) in 1957-86. Hospital case notes were obtained and pathology material was reviewed, resulting in the exclusion of seven patients. Cases were restaged using the Ann Arbor system.

The age-standardised incidence rate (ASR) for the period 1963-76/7, with a statistically significant increase (ASR 8.2, p<0.05). Median age was 11y 7m and there was a significant increase in those in the 10-14 age group in the second half of the period (p<0.02). Eighty seven patients were male, 54 female, giving a significant M:F ratio of 1:6:1 (p<0.01). The mixed cellularity subtype was more common in those aged less than 10 years, with nodular sclerosis disease seen more in those aged more than 10. Males predominated in all subtypes at all ages. Overall survival at 5 years was 76% (65% at 10 years), with no differences in survival by sex, age, histological subtype or stage, but there was a significant difference (p<0.001) in survival between the first and last decades, indicating dramatic improvements in the efficacy of treatment.

There were two second malignancies (one acute myeloid leukaemia and four solid tumours), all of which could have been treatment-related. A positive family history of cancer was found in 11 patients, four with disease diagnosed before that of their child. Higher social class was found in more of the children aged over 10 years than in those aged less than 10 years (19% vs 5%), indicating a possible role for socioeconomic factors in the aetiology of the disease. Geographical analysis has been carried out and the results will be presented.

Maternal malignancies and childhood sarcoma in the northern region: an interim report

A M ROBINSON, J L PARRER, A W CRIFT (Department of Child Health, University of Newcastle upon Tyne)

Objective—The project aims to study the possible increased risk of cancer in mothers of young persons (0-24 years) who developed a sarcoma, and whose cancer registration details are held by the Northern Region Children’s Malignant Disease Register (NRCMDR). Design—A case-control study comparing the incidence of malignant disease in mothers of young persons suffering from specific malignancies with a group of closely matched control mothers taken from a local maternity hospital birth register. Assessment of their health status was by questionnaire completed by their current general practitioner (GP).

Subjects—The mothers of 513 young persons (0-24 years) treated for rhabdomyosarcoma, osteosarcoma, soft tissue and Ewing’s sarcoma in the northern region since 1953, and 1026 matched control mothers (two per study mother) matched by: (1) date of birth and sex of child; (2) maternal age (±3 years) at birth of child and at first full-term pregnancy (where possible); (3) Social class assessed from the paternal occupation at birth of child. Internal data—the mother’s name, maiden name, and paternal occupation at birth of the young persons were ascertained from NRCMDR records and copies of the young persons’ birth certificates from the NHS central registry (NHSCR). Between July 1992 and April 1993, 431 birth certificates had been received from the NHSCR. An additional 11 were not for the correct child, with cases for 1 case not being traced at NHSCR (including three born outside the UK). A further 56 are awaited. The mother’s current family health service authority (FHSAs) area and GP were ascertained from NRCMDR records, local FHSAs, the NHSCR and the Department of Social Security.

By April 1993, 388 mothers had been traced (361 alive, 27 deceased). The response rate to GP questionnaires was 95% (p<0.001). There were 15 cases of malignant disease, including seven cases of carcinoma of the breast. Tracing mothers with no recorded date of birth and for whom the young person’s birth certificate was unavailable, and the mother had died or left the area in the last five years, is proving difficult. The policy of destroying FHSAs clinical records and the limited period of retention of computerised records after an individual has left a FHSAs has exacerbated this problem. Similar difficulties are encountered when attempting to contact the family doctor. Archive records are incomplete. Access restrictions imposed by the Data Protection Act, have had serious repercussions on both man hours and the time scale of the project.

Screening babies for neuroblastoma: parental anxiety in false positive cases

S BELL, M COLE, J L PARRER, A W CRIFT (Department of Child Health, University of Newcastle upon Tyne)

Background—A programme of screening 6 month old babies for neuroblastoma, a rare cancer of childhood, was conducted over a four year period in four health districts in

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northern England. Urine collected onto filter paper was analysed to estimate levels of the catecholamine metabolites vanillylmandelic acid (VMA) and homovanillic acid (HVA), an increment which could indicate the presence of a tumour. Altogether 20 829 infants were screened. Ten had raised VMA and HVA levels (more than 3 SD above the mean) and were referred to hospital for clinical investigations. Two of these were found to have neuroblastoma, and the remaining eight, in which no such disease was found, were classified as false positive cases. The false positive cases were all asked to provide serial urine samples over a period of several months until it returned to normal.

Objectives—To ascertain the reactions and experiences of parents of the false positive infants.

Method—A specifically designed semi-structured questionnaire was used and covered aspects such as parents’ reactions to the positive result, length of time between result and clinical investigations, parents’ level of confidence regarding results of the investigations and their subsequent perception of their child. Parents were interviewed in their own homes by one member of the research team.

Results—There were eight false positive cases and seven parents agreed to participate in the study. Parents of five children described themselves as being worried/very worried at the positive result, some contemplating the treatment involved and the possibility that their child could die. Parents waited a maximum of three days between receiving the positive result and the clinical investigations. What constituted an acceptable waiting period varied widely. Parents of two children reported the wait to be “too quick”, one was investigated the same day as receiving the result and one three days later, whereas waiting two days was “too long” for another parent. Three infants were investigated at hospital on one occasion, two twice, and one on three occasions. One infant was in hospital at the time of the positive result with an unrelated condition and the parents were unaware of any neuroblastoma specific investigations having taken place. The mother of one child was dissatisfied with the handling of the investigations, reporting lack of information and opportunity to discuss questions, and being subsequently more anxious about her child. Parents of two children reported “concerns” which they attributed to neuroblastoma screening. In one case their concern extended to a child born subsequently and in the other had deterred them from having more children.

Conclusions—The fears of false positive cases suffered excessive anxiety despite the supposed low risk, and the project’s lack of support. Substantial support and reassurance are needed to prevent long term unnecessary concern about the child’s health and that of any siblings.

Improving cervical screening: action in an inner London district

CAROLE FURLONG, MARK MCCARTHY (Department of Public Health, Camden and Islington Health Authority)

Background—Evidence that a population based cervical screening programme can reduce cervical cancer deaths is drawn from experience in Canada and Scandinavia. In the 1980s the Department of Health decentralised the UK national call-cervical service to district level. In a 1991 report to Parliament on the implementation of this new programme by the National Audit Office, the inner London health authority of Camden and Islington was identified as having, at 30%, the worst coverage (women age 20–64 screened within last 5-5 years) in the country. We sought to investigate the reasons for this, and to improve it.

Methods—Working through the district cervical screening coordinating committee we discussed the service with key staff in the family health services authority (FHSAs), the three hospital cytology laboratories, the health promotion department and selected general practices. We also used data available to the FHSAs.

Results—General practices showed a linear distribution in coverage from high to poor: against expectation, the top two were single handed, but lack of a practice nurse was strongly associated with low coverage. Coverage was distributed relatively uniformly across age groups. In FHSA lists, screening at 35%, can be effectively tackled by GP practices correcting their monthly prior notification lists, but more resources are required for the increased clerical work. The laboratories had differing criteria for defining smears as abnormal and had no “fail-safe” procedure. A system to include tests from STD clinics needed to be devised. The health promotion department and FHSA devised an improved call letter for women, with advice in several languages.

Conclusion—This “action research” sought to identify causes and implement solutions by working with staff, clinicians, and managers. A key to success has been cross-agency working. Coverage has improved (58% in women age 25–64 in the last quarter of 1992), so that more practices are achieving target levels for FHSA payments. The next stage is to improve the response rate from women who appropriately receive call letters.

Predictors of informal carers’ satisfaction with services delivered by general practitioners to cancer patients in their last year of life

WALID K FAKHOURY, JULIA ADDINGTON-HALL (Department of Epidemiology and Public Health, University College London)

Background—Although informal carers’ satisfaction with services has often been used as an outcome measure in studies evaluating services for the dying, little research has been done on the predictors of satisfaction. Better understanding of what determines satisfaction is needed if purchasers and providers are to act with confidence on the findings of post-bereavement surveys of palliative care.

 Aim—to examine the predictors of informal carers’ satisfaction with general practitioners’ services delivered to cancer patients in their last year of life.

Subjects and methods—Data collected for the Regional Study of Care for the Dying was used in the analysis. A random sample of cancer and non-cancer deaths in 20 health districts in England was drawn. About seven months after the death, interviewers tried to contact the person who could tell them most about the last 12 months in the lives of these people. A 69% response rate was achieved, giving a sample size of 3696. In this analysis, 1858 respondents who were relatives or close friends of people who died from cancer were included. Information was collected on patients’ and carers’ characteristics, use of and satisfaction with services, and adjustment to bereavement. In this paper, logistic regression was used to identify those patient and carer characteristics which had the strongest independent relationships to satisfaction with GP services.

Results—Dissatisfied carers were more likely to be reporting for deceased who had lived in a council accommodation, lived alone, were “non-white”, and who died in a hospital. Dissatisfied carers were more likely than satisfied carers to have rated their health negatively, to have high scores in the General Health Questionnaire, and to have poor adjustment to bereavement. The deceased’s dependency needs and symptom distress, the carers’ need or more help at home, the perception of caring as a burden, and restriction in the carers’ activities were also related to satisfaction.

Conclusion—These results highlight the danger of generalising that satisfaction with the service is determined solely by the characteristics of that service. The implications of this will be discussed.

CARDIOVASCULAR DISEASE

Uses of linked hospital discharge records—the changing pattern of ischaemic heart disease in Scotland

PHILIP MCLOONE, KEVIN MCGREGOR Public Health Research Unit, University of Glasgow

Objective—to investigate the potential of the linked SMR1 (Scottish Morbidity Record 1) dataset for describing changes in hospital utilisation and the changing pattern of morbidity within the population. Ischaemic heart disease (ICD codes 410–414) is used as an illustration.

Design—Analysis of linked computerised records of general hospital discharges with background information drawn from the 1981 and 1991 censuses.

Subjects—All males discharged from Scottish hospitals during the period 1984–90 with a diagnosis of ischaemic heart disease recorded on their SMR 1 discharge records. These individuals were assigned to one of four area types using postcode sector of residence.

Results—Mortality from ischaemic heart disease has been falling in Scotland with deprived areas having a mortality rate of 1.3 times that of the affluent areas. This differential does not seem to widen over the period. In contrast, the discharge rate and number of beds used per head of population have been rising; however, the average length of stay for continuous inpatient stay has fallen. Deprived areas have consistently greater age standardised initial hospitalisation incidence rates than affluent areas, with a relative difference of 1.2. The age standardised prevalence of those who have been admitted to hospital with a diagnosis of ischaemic heart disease during the period is roughly 4% for deprived areas, as estimated by 1990. Rural areas have an excess mortality rate after an initial diagnosis of ischaemic heart disease of around 6% compared with the urban areas.

Conclusions—The linked dataset does seem to provide a basis for investigating questions.
about morbidity in the Scottish population and it could have applications for studying variations in health outcomes. However, at present, there are problems in estimating incidence and prevalence due to the relatively limited period of linked data available. As time goes by it is hoped that these problems will lessen and a clearer picture of morbidity will emerge.

Audit of management of anticoagulant outpatients
F TAYLOR, G TAN, M RAMSAY, A RENTON, J GABBY, H COHEN.

Aims and Objectives—To develop a audit instrument to evaluate anticoagulant treatment at an anticoagulant clinic in a London hospital in order to monitor and to demonstrate its adaptability by using it at different sites. To improve the quality of anticoagulant treatment in everyday practice by auditing current practices at the hospital.

Methods—A proforma was designed to review anticoagulant clinic case notes retrospectively. The outcome measures were completeness of clinical administrative data and documentation of clinical information, control of anticoagulation and specific clinical events during the previous six months.

Subjects—A total of 152 patients attending an anticoagulant clinic: 47 patients started on anticoagulant treatment within the past six months (group A), 50 patients who had been attending for more than six months but less than two years (group B), and 55 patients who had been on oral anticoagulant treatment for more than two years (group C).

Results—Patients’ age and address were recorded in 98% and 91% of cases respectively. In contrast, the referring consultant’s name and general practitioner’s address were recorded in only 44% and 40% of cases respectively. Following initial consultations, the reason for anticoagulation was recorded in 70% of cases, a target DNB of 90% of cases prescribed drugs in 93% of cases. Amongst women of child bearing age, only five of 11 (55%) notes recorded a discussion of contraception and in only 32% of cases was there a record of having addressed alcohol intake. During the previous six months, 57% of patients in group A, 56% of those in group B, and 51% of group C spent more than 50% of the follow up period outside the target INR range, but groups B and C tended to be overanticoagulated and group A to be underanticoagulated. Three major bleeds were recorded during the six month period, all associated with overanticoagulation and all had been group B patients.

Conclusions—There is scope for improvement in documentation of clinical information and administrative details. Feedback of the results of this audit is taking place, and a more comprehensive clinic frontsheet is being incorporated into the clinic notes. Efforts are being made to improve anticoagulation management by regular specific enquiry related to clinical events such as a change in medication or side effects.

Audit of patients’ understanding of anticoagulant treatment
FIONA TAYLOR, MARY RAMSAY, GRACE TAN, A RENTON, JOHN GABBY, HANNAH COHEN.

Aims and Objectives—To develop a method for auditing patient awareness of anticoagulant treatment and to conduct an audit of current practice at an anticoagulant clinic in a large London district general hospital. More specific aims were to document what information had been given to patients and by whom, and to determine patients’ knowledge and understanding of their treatment.

Methods—An anonymous self completed questionnaire was handed to patients for demographic and clinical details, what information they had been given, and the source of their information. Their knowledge and understanding was then tested with a “true” section with true and false answers.

Results—A total of 50 newly referred patients were recruited (75% response rate). Patients were poorly advised by ward doctors and written information was not always given on discharge. Anticoagulant clinic doctors were better at giving information but not all important items were covered in all cases. Despite patients reporting to have received clear advice, their knowledge and understanding of anticoagulation was poor. Although 46 (92%) patients correctly answered that oral anticoagulants thin the blood only 27 (54%) patients were able to identify three or more possible side effects from a list of six (eg nosebleeds, blood clots). Clear advice on alcohol was reported to have been given to 11 (82%) patients yet only 26 (52%) correctly identified an excessive level of alcohol consumption which should be avoided. Similarly, 37 (74%) patients reported having been clearly advised on what to avoid, but not all only eight (16%) could identify three drugs from a list of seven (eg aspirin, nurofen) which could adversely interact with anticoagulation.

Conclusions—Advice on anticoagulant treatment is not always given to patients by medical staff and the use of counselling checklists is recommended. Where advice is given, however, patients do not always understand the implications of treatment, but will not take appropriate action and avoid inappropriate behaviour. Reinforcement of clear and consistent advice by the use of non-medical counsellors and educational guides is advised.

Stroke and lifestyle patterns of cigarette smoking, body fat, and exercise
ROGER SHIPTON, M Sc, Lict, and GEORGE MEDICINE, University of Birmingham, UK.

Objective—To assess the impact, over a lifetime, of lifestyle related risk factors for stroke, particularly cigarette smoking, body fat, and exercise.

Design—Case-control study.

Setting—General practice population in west Birmingham (101 000).

Results—A total of 125 stroke patients and 198 controls were included in the analysis. Eighty one strokes had cerebral infarction andnine cerebral haemorrhage, proved by computerised tomography or autopsy. The age and sex adjusted relative risks for cigarette smoking were: current—2.6 (95% CI 1.3, 5.5), 1.9—3.4 (95% CI 1.4, 8.8), 1.6—10.9 years—2.4 (95% CI 0.8, 6.8), 1.6—2.9 years—1.9 (95% CI 0.6, 5.8). Those in both the lower and upper quartiles of subcutaneous skinfold thickness were at increased risk of stroke compared with the middle quartiles—age and sex adjusted odds ratios 2.1 (95% CI 1.2, 3.9) and 2.1 (95% CI 1.1, 3.9) respectively. No adverse effect of current smoking was found among those of the middle quartiles. The risks of lifelong maximum reported body mass index were assessed. A strong gradient of increasing risk was seen for maximum reported body mass index among never smokers (p<0.01). The maximum daily exercise between 15 and 25 years and 25 and 40 years were at reduced risk of stroke—age and sex adjusted odds ratios 0.33 (95% CI 0.2, 0.6) and 0.43 (95% CI 0.2, 0.8) respectively.

The population attributable risk suggested 50% of strokes in this population were caused by a history of cigarette smoking. A combination of cigarette smoking, excessive body fat, and lack of vigorous exercise was estimated to have caused 75% of strokes.

Conclusions—The results suggest that cigarette smoking, past or present, excessive body fat, and lack of exercise may together cause the major proportion of strokes in the age group studied.

Stroke services—purchasing for health gain
S LAW (London School of Hygiene and Tropical Medicine)

Results—One of the key roles for health authorities as a result of the NHS reforms is to purchase health care services in response to the defined health needs of local residents within available resources. Purchasers must set priorities for needs assessment work and for resource allocation both across and within health problem areas. Health authorities must redefine objectives, and expect to be evaluated in terms of health gain. A key question is how can purchasers identify those services that maximise health gain for their populations?

The purchasing agenda must consider an appropriate framework for decision making about resource allocation, the processes to be followed, and the desired outcomes. The framework and techniques used in health economics, particularly cost-benefit analysis, could be useful to purchasers in their approach to the above challenges.

Aim—This study examines the approach adopted by one health authority to develop a purchasing strategy for stroke services based on defined health need, the views of local providers, patients and carers.
Results to date—A draft purchasing strategy is near completion for Oxfordshire Health Authority which will propose a radical reorganisation of local stroke services, both for primary and secondary care. It is anticipated that this strategy will result in measurable benefits to stroke patients and their carers.

This presentation will outline the different aspects of the review, which include: an epidemiological report, utilisation data, a costing study, interviews—with national stroke ‘experts’ and with local providers and voluntary agencies, an audit of process and outcomes for stroke patients and their carers, and the results of a national conference held for purchasers of stroke services.

Alcohol intake as a risk factor for peripheral arterial disease

R JEPSON, G R FOWKES, P T DONNAN (Wolfson Unit for the Prevention of Peripheral Vascular Diseases, University of Edinburgh)

Background—The relationship between alcohol intake and risk of cardiovascular disease has been investigated widely in recent years, with evidence suggesting that moderate drinkers have a lower risk of disease than abstainers or heavy drinkers. This relationship has been described as “U” shaped. Research, however, has concentrated on acute cardiovascular events, particularly coronary heart disease mortality, with little attention paid to chronic manifestations of atherosclerosis such as peripheral arterial disease in the legs.

Objective—To examine the relationship between different categories of alcohol (total alcohol, beer, wine, and spirits) and peripheral arterial disease.

Design—A cross sectional survey of the general population (the Edinburgh Artery Study).

Setting—The city of Edinburgh.

Subjects—A random sample of 1592 men and women aged 55-74 years selected from the age-sex registers of 10 general practices, geographically and socioeconomically spread throughout the city.

Main outcome measures—Intake of total alcohol (and separately as beer, wine, and spirits) using a one week recall method; the ankle brachial pressure index (ABPI) which is inversely related to degree of peripheral atherosclerosis.

Results—There was no association between ABPI and alcohol consumption in women, but in men total alcohol consumption was significantly associated with a high ABPI (p<0.05). In men the ABPI was related to wine consumption (p=0.001) but not beer or spirits. On adjusting for age and cumulative lifetime cigarette smoking, the association of wine consumption with the ABPI was diminished but remained statistically significant (p<0.05).

On adjusting for age and social class, however, the relationship of total alcohol intake and wine consumption with the ABPI became non significant (p>0.05).

Conclusion—In women there is no relationship between alcohol consumption and the ABPI. In men, greater alcohol consumption is related to a high ABPI and this relationship is linear rather than “U” shaped. Any protective “effects” of alcohol relate to wine consumption rather than beer or spirits. Wine consumption could, however, simply be an indicator of other social class differences affecting the risk of disease.

Role of duplex scanning in epidemiological studies of venous disease

C J EVANS, G R FOWKES, G C LENG, P STONEBRIDGE, P L ALLAN, P T DONNAN, C V RUCKLEY (Wolfson Unit for the Prevention of Peripheral Vascular Diseases, Department of Public Health Sciences, University of Edinburgh; The Royal Infirmary of Edinburgh)

Disease of the venous system is a major problem affecting western societies. Varicose veins occur in approximately 15% of the total UK population, and 1% of people suffer from varicose ulcers at some time in their life. The number of lost working days is considerable, and it has been estimated that up to 40% of district nursing time is taken up with the treatment of varicose ulcers.

Despite this, little epidemiological research has been conducted in the field of venous disease, due in part to the difficulties in measuring the extent of disease in the general population. However, recent advances in technology have led to the development of non-invasive methods of studying the venous system. The duplex scan allows direct visualisation of the veins and the blood flowing within them, and examination of their function. This provides an opportunity to study the early stages of the disease, prior to the development of symptoms, and should lead to a better understanding of the natural history and aetiology of venous disease.

To be used as a research tool in epidemiological studies, the duplex scanner has to be both a valid and reliable method of measurement. Studies have shown it to be at least as good as descending phlebography in detecting venous reflux and as a screening method it has the advantage of being non-invasive. Its reliability as a method of measurement has still to be confirmed.

We recently carried out a study looking at the intraobserver and interobserver variability of duplex scanning of the leg veins of patients with known advanced venous disease. The study involved 21 patients with open or healed varicose ulcers, each of whom had two duplex scans performed on two separate visits by a team of three observers.

Preliminary results show no significant difference in results between two of the observers who had received the same initial training prior to the study, but significant variation of results from the third observer (p=0.001) who had used the technique for some time.

Further results will be presented and possible explanations for the observed differences analysed. The implications for the planning of future epidemiological studies will be considered.

Acceptability of surgery in patients with leg ulceration

P J FRANKS, M I OLDROYD, C J MOFFATT, R M GREENHALGH, D M NOTT

(Department of Surgery, Charing Cross and Westminster Medical School, London)

Objective—To determine what proportion of patients with leg ulceration would consider surgical intervention to heal and prevent recurrence of their leg ulceration and to find factors which influenced this decision.

Design—All patients with healed or current ulceration were interviewed about their willingness for assessment and surgery. Related to clinical measures and perceived health status by Nottingham Health Profile (NHP).

Setting—Community leg ulcer clinics throughout Riverside District Health Authority.

Patients—All patients attending for current leg ulceration or follow up for comparison stockings.

Main outcome measures—Willingness for venous assessment and surgery related to social and clinical measures.

Main results—Of 168 patients currently attending, 149 agreed to take part in the study. Of these, 83 of 149 (56%) wished to be assessed. Eighty patients had been told that they would not benefit from surgery. The remaining 45 of 141 (32%) said that they would be willing to consider surgery. Most common reasons for refusing surgery were age (28) and refusal to attend a hospital (14).

Neither the presence of a current ulcer nor long duration of ulceration were significantly associated with willingness for surgical correction. However, both age >70 years (OR=1.92; 1.25; 2.92; p=0.002) and poor mobility by >median score on the NHP mobility scale (OR=1.56; 1.02; 2.38; p=0.033) significantly deterred patients from surgery.

Conclusions—Only one third of patients with either current or previous leg ulceration wished to be considered for simple varicose vein surgery. This may limit the impact of surgery in treating these patients.

Social factors in venous ulcer healing

P J FRANKS, M I OLDROYD, C J MOFFATT, R M GREENHALGH (Department of Surgery, Charing Cross and Westminster Medical School, London)

Objective—To determine which social and clinical factors are associated with healing in patients with venous ulceration.

Setting—Patients were interviewed on social factors at their first visit to a community ulcer clinic. They were treated for ulceration using a high compression bandage system, then re-interviewed after 12 weeks.

Social factors—Community leg ulcer clinics held in health centres throughout Riverside District Health Authority.

Patients—All patients referred to community leg ulcer clinics with venous ulceration.

Main outcome measures—Factors significantly associated with healing within 12 weeks of the start of treatment.

Main results—Of 168 patients with venous ulceration, 87 (52%) healed after 12 weeks of treatment. Stepwise logistic regression analysis identified ulcer size >10 cm2 (OR=0.48, 95% CI 0.27, 0.83; p=0.004), duration of ulceration >6 months (OR=0.66, 95% CI 0.46, 0.94; p=0.018), and contact with family and friends <1 per day (OR=0.64, 95% CI 0.42, 0.98; p=0.033) as significant independent factors for poor ulcer healing. Lack of central heating was also associated with failure to heal, but failed to achieve statistical significance (OR=0.71, 95% CI 0.50, 1.01; p=0.052).

Conclusions—Clinical features combined with social factors such as social isolation and lack of central heating may play a part in prolonging venous ulcer healing.
Use of record linkage to maintain the Leicester Diabetes Register

J D LANGLEY, J L BOTHA (Department of Epidemiology and Public Health, University of Leicester)

The Leicester Diabetes Register is a computerised live register of approximately 5000 insulin users who are resident in Leicestershire, and it is estimated to be 90% complete. Primary data capture is from clinical notes and is input by two part-time clerical officers. The register is used for epidemiological and clinical research, and for planning purposes.

The computer software used for the register was developed in-house and is implemented using Borland's Paradox relational database package which ensures a fast response time even on large numbers of records, and will run on any IBM PC-compatible machine. The software was designed with a view to building extensions to allow, for example, capture of more clinical information items for audit purposes.

Successful use is made of record linkage techniques to check and improve the accuracy and completeness of the register. These techniques use routine sources matching to avoid duplicate registrations at input and a fractioning heuristic algorithm, which after linkage yields a list of potential links (pairs of records ranked in order of the probability in favour of the link being real. These probability scores are used to select a subset of potential links which are most likely to need a human judgment. Much manual checking is thus avoided.

Use of these techniques allows us to: (1) check for duplicates by linking the register to itself; (2) check for deaths by record linkage to the Leicestershire Mortality List, a computerised register of deaths in Leicestershire residents, containing 97% of deaths within one month of occurrence; (3) check for migrations and to cross-check the accuracy and completeness of patients' identifying details by record linkage to a subset of the family health services authority's computerised 'population' register.

The use of record linkage programmes is run three times per year facilitating optimal use of limited human resources in keeping the register up to date.

Mortality among people with diabetes: use of population based registers and record linkage

N T RAYMOND, J D LANGLEY, E GORDON, J L BOTHA, A C BURDEN, J R HEARNshaw, P G F W FLETCHER (Department of Epidemiology and Public Health, University of Leicester; Diabetes Clinics, Leicester General Hospital and Leicester Royal Infirmary.)

Accurate mortality estimates in people with diabetes mellitus (DM) cannot be obtained from routine sources because death certificates often fail to mention DM. The existence of a population-based DM register enables such estimates to be made by identifying people with DM who had died and then finding their death certificates. In Leicestershire a computerised register of approximately 5000 residents with insulin treatment is estimated to be approximately 90% complete. Another computerised register of Leicestershire residents who have died exists, containing death certificates for 97% of deaths within one month of death.

The registers are regularly linked to keep the DM register up to date, and such record linkage also provides an efficient means of identifying people with DM who had died and their causes of death. A total of 300 deaths occurred between 01/01/89 and 30/06/92 in Leicestershire residents with DM aged 17–94 years, 90% with type II DM. Their death rates were compared with those of the general population over the same period by indirect standardisation.

Only 58% of death certificates mentioned DM. The all cause standardised mortality ratio (SMR) was raised in both sexes, significantly so in all age groups under age 75. Females aged 15–44 had the highest SMR (5.7, 95% CI 2.5, 12.9). Ischaemic heart disease (IHD, ICD9 rubrics 410–414) accounted for 36%, and cerebrovascular disease (CVA, ICD9 rubrics 430–438) for 13% of deaths. Cause specific SMRs were significantly elevated for IHD (2.095%, CI 1.6, 2.5) and CVA (1.8, 95% CI 1.3, 2.5) in both sexes, and for accidental/suicidal deaths (ICD9 rubrics E800–E999) in females (6.7, 95% CI 3.6, 12.6).

Record linkage of geographically based diabetes and death registers is a good source of information on local diabetes related mortality, providing a useful local monitor of diabetes care.

Women's satisfaction with maternity services in the Eastern Health and Social Services Board (EHSSB) Northern Ireland in relation to the House of Commons Health Committee's 1992 recommendations

M O BRIEF, N MAYS, C BEATTIE, M SCOTT ("Health and Health Care Research Unit, The Queen's University of Belfast; 2 Department of Public Health Medicine, Eastern Health and Social Services Board, Northern Ireland.)

The House of Commons Health Committee's report on maternity services recommended giving women a greater choice in the services available to them. In particular "low risk" women should be able to choose antenatal care and delivery in a small unit provided throughout by midwives.

Although the maternity service in the EHSSB is consultant-led, there are considerable differences in the size of units which offers a timely opportunity for comparison between small and large facilities. The total number of births to EHSSB residents in 1992 at each of the seven hospitals offering maternity care ranged from 679 to 2612, with WTE consultants in obstetrics and gynaecology ranging from 1:23 to 3:54. This paper discusses the extent to which maternity care in the EHSSB corresponds to the House of Commons recommendations and describes any difference between "small" (<1000) and "large" units (>1000 deliveries).

Results show that women's experiences and satisfaction with maternity services in the EHSSB carried out in early 1992 will be discussed. Women resident in the EHSSB who were pregnant or had recently received maternity care in the EHSSB were surveyed. The board's policy on maternity care is for 100% hospital delivery and all seven maternity units in the board were included in the survey. All women who were delivered on any date within a five week period in early 1992 were surveyed (n=965); mothers of stillborn babies or who had died were included.

Women were surveyed using an adapted form of the OPCS (1987)2 questionnaire designed for postal self completion to assess their satisfaction with all aspects of their maternity care from antenatal check ups and classes through to care at home after leaving hospital. A response rate of 76% (n=736) was obtained.

Preliminary analysis suggests no significant difference between the small and large units on many of the key issues arising from the House of Commons recommendations. The following areas will be described: (1) type of service provided (eg continuous care by midwife); (2) midwife led antenatal care; (3) rate of interventions; (4) feeding method chosen with support and advice provided; (5) location; (6) information received.


Antenatal detection of the small for gestational age fetus in a regional health authority

R H B DE COURCY-WHEELER, C D A WOLF, A FITZGERALD, J D S GOODMAN (Department of Public Health Medicine, UMDS, St Thomas's Campus, London.)

Objective—To investigate how small for gestational age (SGA) fetuses are detected and managed.

Design—A postal questionnaire. (2) Prospective regional cohort of low birth weight infants (LBWI <2500 g). Setting—The 18 delivery units of one regional health authority.

Subjects—(1) A postal questionnaire to all 65 consultant obstetricians; all directors of community midwifery; the senior sister in each of the antenatal clinics; all departments of obstetric ultrasound; 283 general practitioners in two health districts. (2) LBWI cohort: all babies weighing less than 2500 g born to regional residents from September-December 1992.

Results—(1) The response rate was 71% over all. The definition of SGA used by ultrasound departments varied: 10th centile in one hospital, 5th or 2-5th centile in the other 17. The perceived detection rate of SGA was 68% (interquartile range 50–75%) with significant differences between professionals (p<0.002). The implications of these differences for either professional and community midwives (p=0.03). Forty seven per cent of obstetricians made no distinction antenatally between SGA and intrauterine growth retardation. The proportion of LBWIs that did not significantly influence management. (2) LBWI accounted for 6-9% of the region’s deliveries. Forty one percent of LBWIs were <10th centile. The antenatal detection rate by clinical suspicion and ultrasound scan was 35%.
Conclusions—There was a difference between the expected and actual antenatal detection rates of SGA. The first reason being that there were different definitions of SGA so that most units were only identifying smaller fetuses <5th centile. Secondly the major screening test for SGA, symphysis-fundus height measurement was not used widely especially in those areas where most of any antenatal care occurs. Furthermore, with less than half of the region’s obstetricians making a distinction between SGA and its pathological subgroup, IUGR, some interventions based on SGA alone may be unnecessary. Thus, it would appear that unit and regional guidelines on the definition and detection of SGA and IUGR are required, especially with moves to devolve antenatal care to the community care.

In addition there is a need to determine, through regional cohort studies of LBW, the influence of antenatal detection and management of SGA and IUGR on mortality and long-term morbidity.

Changes in women’s socioeconomic status and successive birthweights

ANN BITHUNE (Longitudinal Study Medical Analysis Section, Health Statistics Division, ONS, which in turn is part of DCLG) Objectives—To examine differences in successive birthweights by the mother’s marital status, social class (according to occupation), and social background.

Design—Using information in the OPCS Longitudinal Study from birth registration and the 1971 census. The mother’s social background was defined according to her father’s social class at the 1971 census. A total of 16,967 women born since 1950 with at least two singleton births and who only had births between the 1971 census and the end of 1988.

Main outcome measures—Differences between first and second birthweights of successive singleton live births by mother’s marital status and social class. Social class is defined by occupation of the child’s father where the information is available, otherwise by the occupation of the child’s mother.

Results—The majority of women (86%) had at least two births, 48% were married and in the same social class as their backgrounds. Parity 2 women aged 20–24 from a manual background (n=2374) who are no longer married at their second births have higher proportions with lighter second births than those who remain married in a manual social class (p<0.01), regardless of whether of not they change social class. More women from a non-manual background remain married and socially stable.

Conclusions—Preliminary investigation suggests that it is changes in marital status and not in social class that have the stronger association with changes in birthweight between the first two successive, live, singleton births. This is influenced by background as women from a manual background are less likely to change social class. The most favourable second birthweight is for women from a non-manual background who remain married.

Size and maturity at birth in North East Thames 1989–90

A S HILDER (Department of Epidemiology and Medical Statistics, London Hospital Medical College, London) Aim—To examine the distribution and effect of growth and maturity at birth in the North East Thames Regional Health Authority.

Background—The registration authority in the UK are required to review stillbirths and infant deaths to provide direction for further action. Separating maturity from size at birth is of value both to those developing and monitoring mortality programmes and those responsible for child health services. Methods—(1) Source of data: birth notifications provided by maternity units to community health services form the basis of a register of all children in the region. Anonymous data were provided by each health district, in a common format, for all registerable births. Mortality from child health registries was validated by linkage with non-confidential death registration data, which provide a consistent source of ICD-coded cause of death. Deaths were categorised as aneupaum or due to congenital abnormality, anoxia, immaturity, or evidence of SIDS, or other causes. (2) Classification of growth: records were grouped according to maturity, with cut-off points at 32 and 37 completed weeks’ gestation. The two more mature groups have been classified as small or appropriate for gestational age (SGA-AGA), using the 10th centile standards from a recent neonatology text.

Results—Records relating to 114,841 residents with complete birthweight and gestational age data were examined. Extreme outliers (0.6%) were identified as probable transcription errors and excluded. There were 1525 (1%) records with gestations below 32 weeks, 6633 (6%) recorded as 32-36 weeks’ gestation, of whom 792 (12%) were SGA, and 8534 (8%) records of SGA term infants. Growth at each gestational age showed a consistent excess of SGA in preterm infants, and fewer than the expected 10% SGA in term infants. Infants of teenage mothers, single mothers, mothers booking after 20 weeks, and mothers in more deprived city districts were more likely to be SGA, preterm, or both. Over 70% of stillbirths and neonatal deaths and 45% of postneonatal deaths were born preterm and/or SGA. SGA infants were at least twice as likely to die as AGA infants of comparable maturity, for all causes except postneonatal infection in the moderately premature. Conclusions—Size and maturity at birth continue to be major risk factors for mortality in the first year, with substantial contributions to postneonatal mortality and all causes of death in the first year of life in this region. Weight for gestational age standards in current use do not seem to reflect present norms. While local standards can be developed, an up to date national standard is required.

Design—Analysis of data obtained from women attending their first booking clinic.

Setting—Three large maternity units completely serving a defined catchment area in the East Midlands (University Hospital, Nottingham, City Hospital Nottingham, Derby City Hospital). Subjects—All women delivering at the above hospitals who were the first to report computerised obstetric records.

Results—After adjusting for known physiologic factors which influence birthweight (gestational age, maternal weight, fetal sex, maternal height, twin order and parity), the effects of smoking, alcohol consumption, bleeding during pregnancy, maternal blood group, diastolic and systolic blood pressure, weight gain per week, and Jarman score, on birth weight were each examined separately. Smoking, weight gain per week, Jarman score, and interaction between weight gain per week and maternal weight at booking were found to be significant. These combined with the physiological factors above explained 36% of the variation in birthweight. Alcohol was also found to be significant although this effect disappeared after smoking was adjusted for. Similarly systolic blood pressure was of marginal significance but this effect was lost after the adjustment for diastolic blood pressure which in turn was lost after the adjustment for the Jarman score.

Conclusion—In this study, smoking and weight gain per week were both factors which are modifiable and were found to have a strong influence on birthweight. Alcohol consumption similarly may be of some importance. As a result, should we be encouraging women more to change their habits and if they do can we determine what extent will smoking changes influence the birthweight of their infant?

Use of regional child health records to study risk factors for cerebral palsy in multiple births

A MUKA, E ALBERMAN, P EVANS (*LJNERM-U149, Paris and Department of Epidemiology, London School of Hygiene; †Wolfson Institute of Preventive Medicine, St Bartholomew’s Hospital Medical College; ‡Department of Clinical Epidemiology and Medical Statistics, London Hospital Medical College) Objectives—To explore associations between multiple birth and cerebral palsy (CP) by linking data from a regional computerised cases of cerebral palsy with multiple births included in a regional child health computer system.

Design—With permission from all relevant districts, an anonymous file of birth data relating to multiple births was extracted from the regional child health computer system. Initials, date, and place of birth were retained for identification. These were matched with cases in the regional CP register.

Setting—North East Thames Regional Health Authority (NETRHA) Subjects—Over 13,000 multiple births on the NETRHA child health computer files (RICHS) and nearly 800 resident children notified by one of multiple sources as having cerebral palsy (CP), all born since 1980.

Main outcome measures—Matched cases in matching and reasons for failure; and an assessment of new information gained.

Results—Forty three births had been reported to the CP register as multiple. Thirty one were eligible for matching and 28 had RICHS of CP were obvious matches with RICHS. In two of the remaining five cases of failure to match, it was known from the CP register that the co-twin
had died in utero. In the others the RICHES data were incomplete. The matching exercise revealed an additional four definite and seven likely matching births but not reported as multiple to the CP register. If these are confirmed the prevalence of multiple birth in the CP cases is 7% (54 cases), similar to that from other sources. In addition the exercise provided data on the birthweight and survival of the co-twins (or triplets) that could be compared with a large contemporary control series of multiple births. Even allowing for reporting from the CP twins were probably almost 10 times more likely to have had a stillborn co-twin. They were also more likely to be small-for-dates and preterm than the control twins, and further comparisons are underway.

Conclusion—The linkage of CP case registers with regional birth data is a method of setting up a "retrospective/prospective cohort", and allows studies of association between rare conditions such as multiple birth and CP. Its full potential can only be realised when both data sets are complete and accurate, not as yet the case for all years of NETHRA study, but even given gaps in data the exercise has proved its use and could be repeated in other regions with CP data.

Causal modelling: a novel approach to the exploration of adverse birth outcome in Pakistani Muslim families

S R Proctor, J Smith (Clinical Epidemiology Research Unit, Bradford Health Authority) Objectives—To establish the relative contribution of the confounding variables which may adversely affect birth outcome in Pakistani Muslim families in Bradford.

Design—The problem or "issue" is the association of certain variables, eg consanguinity, with an adverse effect on birth outcome (high perinatal mortality and/or children born with complex congenital malformations) in Pakistani babies. It can be explored by a process of causal modelling incorporating five stages as follows:

1. Cognitive mapping: subjective interpretation of what one already knows or believes. Existing literature would suggest consanguinity is the preferred explanation.

2. Frame analysis: perception of the "issue" from more than one view point e.g. all or none, or from different sources.

3. Official version: Propounded by the medical profession; alternative "frame" development, eg by social scientists, may lead to redefinition of the problem.

4. Quantification: Problem is measurable by ethnic specific mortality rates. Only recently has there been any effort to address "likely causes and components"—an adequately more important issue.

5. Political agenda setting: Dominated presently by professional groups. Focus on individual "victim blaming" action and comparatively little attention to wider issues, eg deprivation and racism.

Setting—The two maternity hospitals in Bradford.

Subjects—All Pakistani born/ethnic origin women, and every third UK born ethnic origin woman (according to the sequence in the delivery register), who deliver at either maternity unit from November 1991 to present.

Main outcome measures—A critical analysis of the relative contributions of the variables that may adversely affect birth outcome using causal modelling techniques. These variables may be grouped as those relating to: migration, political issues, health care, environment, culture, and individual health.

Conclusions—Birth outcome is a complex phenomenon which is subject to a wide variety of confounders. Few issues can be fully or authoritatively defined as they are liable to change over time as a consequence of new facts or changing values. Causal modelling permits definition and revision of the issue and allows for a novel exploration of the complexities and alternative theory development.


Fiona Alderdice, Ann Johnson, Alison MacFarlane, Tracey Petty (National Perinatal Epidemiology Unit, Oxford).

The sharp increase during the 1980s in the survival of very low birthweight babies (under 1500g) may have resulted in an increased number of survivors with disabilities. At present there are no routine statistics which can be used to monitor trends in childhood health status at a national level. In order to assess the contribution of very low birthweight babies to the overall prevalence of disability in the community it is necessary to have information on the rates of impairments and disability in very low birthweight and other birthweight groups.

Our aim is to develop and validate a postal survey method using questionnaires to parents, general practitioners, and teachers, in order to measure time trends in disability among children identified from birth registrations. We anticipate that the development of a monitoring system will have three stages: a feasibility study in the Oxford region, a national pilot study, and finally the setting up of the national monitoring system.

This paper examines the findings of stage 1, the Oxford region feasibility study which will be completed in July 1993. The sample consists of 1320 children drawn from children born alive to residents of the Oxford region in 1985 and is stratified by birthweight. Questionnaires on health and development were sent to each child's parents, general practitioner, and teacher, where appropriate. The results presented reflect the problems encountered in tracing children, the biases due to attrition and non-response using this method, and the concordance of information from our data with other sources. The feasibility of using a postal survey method for monitoring child health is discussed in the light of these findings.

Economics of a hospital at home scheme for hip fracture patients

William Hollingworth, Chris Todd, Jennifer Parker, Jennifer Williams (Health Services Research Group, Institute of Public Health, University of Cambridge; Peterborough District Hospital; Department of Public Health and Policy, London School of Hygiene and Tropical Medicine)

Objectives—To ascertain the economic impact of early discharge to hospital at home after fractured neck of femur.

Design—Population based quasi-experimental study. One group has “hospital at home” as an option for rehabilitation while a comparison group has no such service available.

Setting—District hospital orthopaedic and rehabilitation wards, community and hospital at home scheme.

Patients—A total of 1104 consecutively admitted patients with fractured neck of femur. Twenty four patients from outside the district were excluded.

Main outcome measures—Cost per patient episode, number of bed days spent in hospital, social cost to informal carers, and patient use of other community health services.
Results—The hospital at home group spent significantly less time as inpatients (mean of 32.5 days versus 41.7 days, p<0.001). Those patients who were discharged early spent a mean of 11.5 days under hospital care. The total direct cost to the health service was significantly less for hospital at home patients (£4884.09 versus £5605.51; p=0.048). The general results were not sensitive to the necessary assumptions in the costing methodology.

Conclusions—Approximately 40% of patients with fractured neck of femur are suitable for early discharge to a scheme such as hospital at home. Variability of such a scheme may lead to lower direct costs of rehabilitative care despite higher readmission costs. These savings accrue largely from shorter orthopaedic and geriatric ward stays and required the freed hospital beds to be filled efficiently.

Factors influencing the use of community health and social services by the 65+ age group

DAVID BONIFACE, MICHAELA GOTTES, MICHAEL DENHAM (University of Hertfordshire, Hatfield, UK; Noulshank Park Hospital, Harrow, UK)

The future development of community health and social services depends on an understanding of the relationship of key demographic, health, social and economic factors to current services use. This paper reports a more comprehensive study than any published previously.

Data gathered by interview in 1990/91 on 184 residents aged 65 years and over in North West Thames Regional Health Authority were made available to the research team. The services studied consisted of two provided by the NHS (GP and district nurse) and four provided by the local authorities (home help, meals on wheels, luncheon club and day centre for the elderly). Age group (65-74, 75-84 and 85+ years) and health status were significantly related to the use of all six services. Health status was defined in terms of the types and numbers of limiting and non-limiting long term illnesses. Variation in use of health and social services by aged over 65 years was not explained by age and health status was found to be largely explicable by five further factors: mental state (GHQ), living alone or not, gender, weighted income; and occupational group. Loglinear modelling produced statistically significant odds ratios for many of the relationships after adjusting out the influences of age and health status. The pattern of relationships was consistent with the local authority provision being targeted narrowly on the most poor and needy while the NHS provision is serving the full range of the over 65 population.

Suggestions are made of ways in which the introduction of the Community Care Act might serve as an opportunity to improve provision of these services to keep pace with anticipated demographic changes to the size and socioeconomic structure of the over 65 age groups.

Outcome measures of community services for people with dementia

HIGGINS, C WINGET, M RAMSEY (Department of Public Health, Kensington & Chelsea and Westminster Health Authority)

Dementia is an irreversible condition which results in a decline in cognitive faculties. It occurs in 5–10% of the population over 65 years of age and prevalence increases, so that about 20% of those over 80 years of age are affected. Kensington & Chelsea and Westminster Health Authority in central London purchases a variety of community support services to assist in the care of people with dementia and their family members. The patterns of services are varied and there is a need to measure health care outcomes.

Objectives—To adapt and develop outcome measures of community health services for people with dementia.

Methods—Questionnaire survey of: 30 individuals working for community health services, caring specifically for people with dementia; a small sample of lay carers; and representatives from local general practitioners and nursing services, to determine the important outcomes of community services. Review of all possible outcome measures and analysis of whether these are sensitive to the desired outcomes of community services for reliability and practicality. Testing use of outcome measures with services.

Results—Outcome measures are required in four areas: the patient, including maximizing physical and social functioning; psychological well-being; the lay carers or family members, including their psychological wellbeing, physical health, and satisfaction with care; coordination and shared care with other services; and place of care. Very few of the measures developed for research purposes were appropriate in service settings, because they usually took too long to complete. Also, the majority of measures for dementia assessed memory, which is not an appropriate outcome of services, only an indicator of clinical severity. We will report the detailed testing of four possible measures in the teams, and the difference between outcomes identified by carers and professionals.

Conclusion—The development of outcome measures for community services which care for people with chronic conditions is problematic and many of the research instruments are not practical or are insensitive to change in service settings. This study indicates that some very simple recordings can be useful and the measures made by carers. It may be possible to extend this assessment to general practitioner or social services care, which may assist in community care assessment. The study also provides greater insight into the relative effectiveness of three different community based services.

Palliative care for HIV/AIDS and cancer patients—what are the differences?

H BUTTERS, R J M CROWS, H J HARRIS (School of Hygiene and Tropical Medicine, University of London)

Objectives—To compare the characteristics and problems of HIV/AIDS and cancer patients receiving palliative care.

Design—Prospective audit of consecutive referrals.

Setting—Two teams in a central London health district: a multidisciplinary HIV/AIDS team and a cancer team, caring for patients at home and in hospital.

Patients—A total of 18 HIV/AIDS and 192 cancer patients newly referred.

Measures—Support Team Assessment Schedule (STAS), a validated measure of palliative care. STAS has 17 items each rated 0 (best/no problem) to 4 (worst/severe problems). Ratings were completed for all patients at referral by team members and then regularly until death or discharge.

Results—There are from total of 118 AIDS and 128 of 192 cancer patients who died in care. Most (98%) HIV/AIDS patients were male, compared with 53% of cancer patients. The mean ages were 37.7 years (range 21-63) and 67.5 years (range 32-92) respectively. Median time in care for AIDS patients was 9.5 weeks (range 0-81) compared with 6 weeks (range 1-75) for cancer patients. Main reasons for referral to both teams were symptomatic control (AIDS: 68%; cancer: 48%) and hospital support (AIDS: 25%, cancer: 21%).

Is there an association between the volume of work carried out in UK hospitals and its outcome?

JEREMY JONES (Health Services Research Unit, Department of Public Health and Policy, London School of Hygiene and Tropical Medicine)

Objectives—Much research has been undertaken in the US into the relationship between the volume of work carried out and its outcome. This was initially based on an assumption that "practice makes perfect". However another hypothesis, of "selective referral", has been proposed. Studies in the US have shown support for each explanation.

Design—This paper reports the results of studies of the association between volume and outcome in the UK using prospectively collected data (on intensive care, maternity services, and cardiac catheter procedures) and routine hospital activity data from two regions. In most cases variations in volume are lower in UK datasets than in the US.

Main outcome measure—In common with US studies, mortality has been the principal outcome indicator. The extent of bias introduced by using in-hospital mortality rates has been assessed by comparing these with 30 day mortality rates. Complication rates have been used to assess outcome of cardiac catheterisation. Special care baby unit admissions and immediate APGAR scores were used as outcome indicators in obstetric services.

Results—Significant negative associations have been shown between observed death rates and hospital/unit volume. However, once diagnostic mix and patient severity have
been taken into account the strength of these associations is greatly diminished. Complication rates for cardiac catheter procedures were lowest at medium volume units (500–1999 procedures per year); these data contained no information on case mix. Another piece of work showed significant differences in diagnostic mix and comorbidity between units and therefore this result needs to be treated with caution.

Discussion—The research so far has raised three main questions: (1) Reliance on mortality as an outcome indicator may call the results of this work into question. The research has been limited to areas where mortality has been shown to be a usable outcome indicator; (2) defining volume from routine data requires further research: particularly using UK post-Kormer data; (3) volume has been used as a proxy for experience. Since the majority of studies have used routine data, the volume measure used has tended to be the present number of cases treated or procedures performed. Other methods of assessing experience might be tested. The policy applications of this research will also be considered in this paper.

Patient assessed outcomes in practice—are they useful?

N. B. TURBULL, L. M. DAVIES1 (Department of Public Health Medicine and Epidemiology, Queen’s Medical Centre, Nottingham; 2Department of Public Health Medicine, Nottingham Health Authority), Setting—With the increasing demands on limited resources both purchasers and providers of health care are under pressure to maximize efficiency without compromising quality. To do so they require information about the quality and effectiveness of care as well as its costs. In Nottingham, the district health authority, the hospitals, and the university are collaborating in a project to determine the usefulness of information provided by patients on outcomes from their treatment.

Objectives—To evaluate patient assessed outcome measures in different treatment settings and to examine the feasibility of collecting such data.

Methods—Patients completed a questionnaire before and at intervals after their treatment. The groups were: those undergoing a varicose vein operation either as a day case or an inpatient; those undergoing either an open or laparoscopic cholecystectomy; those referred to the orthopaedic department who were either wait listed or treated at a ‘fast track’ clinic.

Outcome measures—Health status as measured by SF-36, symptom relief, and satisfaction. Results—Post treatment health change was assessed as measured by changes in the dimensions of SF-36 and changes in symptoms is shown for the three groups including variation in scores by follow up medium volume units (500–1999 procedures per year).

Day surgery D&C: patients’ experiences

M PEETCUREw, L MOORE, N BLACK (Health Services Research Unit, London School of Hygiene and Tropical Medicine)

Objectives—Dilatation and curettage (D&C) is one of the surgical procedures that the Audit Commission has identified as suitable for day surgery. Despite the fact that it is also one of the commonest gynaecological procedures there is little recent research on patients’ experiences. This study collected information on women’s experiences of day surgery D&C.

Methods—Data were collected using a questionnaire on patients’ experiences of surgery developed by the London School of Hygiene and Tropical Medicine and the Audit Commission. Patients undergoing D&C as day cases (n=501) were asked to complete and return it three weeks after the operation. Response rates varied from hospital to hospital but were between 50–70%. Information was collected on patients’ satisfaction with the process of care, their use of post-discharge services, the effectiveness of the operation, and existence of complications. The responses of patients who had undergone D&C as an inpatient (n=51) were also compared on some variables.

Results—Process of care: High levels of satisfaction were expressed with the attitude of, and availability of help from nurses (99%, 98%) and to a lesser extent from doctors (91%, 83%). Eighty-nine percent of patients had been given an explanation of the procedure before hospitalisation, and 91% had received an explanation on the day. Seventy nine percent knew before admission when they would be discharged. Complications: 11% experienced a significant amount of pain during the 24 hours after the operation. Forty percent reported bleeding; 10% reported some other complication. Three percent had been readmitted for a problem related to their operation. Use of services: 30% had seen a GP and 13% had attended hospital outpatients. Over a third reported receiving a lot more help from family/relatives. Do/Not responds: Three quarters of women reported that their symptoms had improved since the operation; three quarters reported that the operation had not changed their day to day life and for 5% it had made it worse. Fourteen percent indicated that recovery was slower than expected. Group comparison: Day cases were younger than inpatients (p<0.001) and were significantly more likely than inpatients (p=0.03) to report postoperative bleeding. There were no differences between day cases and inpatients in speed of recovery, changes in symptoms, changes in day to day life, or of a GP since surgery. Overall satisfaction: 88% of day cases would recommend day surgery to a friend in a similar situation.

Conclusion: Patients seem satisfied overall with D&C carried out as a day surgical procedure. However, recovery was seen as slow by some and even three weeks after the operation most women reported no improvement in their day to day life. There are few differences between the experiences of day cases and inpatients. Where they exist they may partly be explained by the younger age of day cases. These results support the view that day surgery is an acceptable setting for D&C, but support the increasing concern that D&C is frequently used inappropriately.

MISCELLANEOUS HEALTH CARE STUDIES

Audit—a first step to involving pharmacists in health services research

S M COTTER, M MCKELVY, N D BARBER (Health Services Research Unit, London School of Hygiene and Tropical Medicine) Centre for Pharmacy Practice, School of Pharmacy, London)

Setting—Clinical audit provides a stimulus for pharmacists to evaluate their work and develop links with other professionals, especially doctors. Although doctors seem to be willing to involve pharmacists in audit, a small survey suggested that many hospital pharmacies were taking part.2 Audit could be a mechanism to encourage pharmacists to become involved in multidisciplinary health services research, but little is known about the extent to which they are already participating in audit or the activities that they are undertaking. We describe a nationwide survey that explores these issues. Methods—A postal questionnaire was sent to all NHS hospital pharmacies that provided clinical pharmacy services. This inquired about all aspects of hospital clinical pharmacy services and included three questions on pharmacists’ involvement in medical, clinical and pharmacy audit. These terms were defined in the questionnaire. Each question had a preceded section asking if pharmacy staff routinely participated in that audit activity and an open section inviting respondents to specify these activities. The question on medical audit additionally requested information on the extent of provision of information for the audit. The questionnaire had previously been pre-tested among panels of hospital pharmacists from England and Wales. A reminder was sent after six weeks.

Results—The response rate was 90% (416 of 462). Pharmacists contributed to medical audit in 49–8% of hospitals, undertook pharmacy audit in 26–7%, and participated in clinical audit in only 7–2%. Many pharmacies (56–5%) were involved in one or more types of audit but few (3–6%) in all three. Those pharmacies that contributed to medical audit provided financial information on drug use (83–3%), information on problems encountered in the drug use process (47–1%) and on adherence to agreed prescribing policies (60–4%), and assisted in the creation of prescribing policies (69–8%). Pharmacists often concentrated on audit of clinical pharmacy services.

Discussion—The results of this census survey show that pharmacists are becoming involved in the critical evaluation of health care, but mainly in those activities led by doctors. Their involvement in assessing their own activities is less well developed but growing. There is still little collaborative activity with other health care professionals. As the involvement of pharmacists in audit increases, it is likely that there will be growing demands for research based evidence to inform their judgements. The evidence currently available is extremely limited. The extent to which the needs of audit will provide an opportunity to link pharmacy practice research with main stream health services research, and the implications for both research communities, will be discussed.

1 Harris S. The pharmacist’s contribution to medical audit. MSc Thesis, School of Pharmacy, University of London, 1991.

Does audit change practice?

IRENE HIGGINSON, ELIZABETH BUTTERS (Health Services Research Unit, London School of Hygiene and Tropical Medicine)

Audit is now a requirement of all doctors in the National Health Services and is being
stipulated in contracts between purchasers and providers. However, the extent to which audit changes practice is not known.

Objective—To discover whether participation in prospective audit results in changes in practice.

Design—Observation and discussion with services partaking in audit and recording of any changes in practice.

Setting—Palliative care support teams in the south east of England. Eight teams in total, five caring for cancer patients and three for patients with AIDS and HIV. Verbal reports were also collected from three other teams and one in Ireland.

Results—The audit highlighted a number of problems which teams addressed to different degrees. These included identifying late referrals which led one team to review their referral criteria and develop new forms and leaflets and improve their communication with other professionals. The identification of uncontrolled dyspnoea resulted in a clinical algorithm to identify patients at risk of dyspnoea, but it did not prove possible to sustain use of the algorithm in continued practice. Similarly, two teams undertook a review of family needs which were identified, but remain to be addressed. In some services the audit drew attention to disagreements between doctors and nurses in their assessments. Four of the teams used the prospective assessments to aid the day to day management of patients. However, other teams did not, although they acknowledged participation in the audit changed their practice. Items were used as a checklist to ensure that all the needs were assessed and prioritised. Such changes would not have been found in a retrospective audit.

The main disadvantage of the prospective audit was the time taken to record data. Considering the results was often allocated insufficient time, and one team collected information on patients for a whole year before they reviewed any results.

Conclusions—Audit can result in changes in practice, and requires a clear plan and leadership at the outset. Audit can also highlight disagreement between team members in terms of the approach to assessment and care plans need to be made to deal with this.

A rationale for rationing? a possible framework

E. E. M. KERNOHAN, F. ATHERTON, I. SMITH (Clinical Epidemiology Research Unit, Bradford Health Authority)

Health needs assessment (HNA) is not a new concept. In the 1960s, it was known as "social planning", in the 1970s as "rational planning", and in the 1980s as "resource allocation". However, the recent NHS changes have added teeth to the process, as needs assessment is now regarded as an integral part of the commissioning (and decommissioning) process. This process is being used to enhance effectiveness and efficiency of health and health care services and to continue to make them more sensitive and appropriate for local populations.

The HNA process is currently being undertaken in a number of key service areas and it is envisaged that the results will be used to change significantly, the health and health care services that are currently provided. Although it is led by public health medicine, it should be a corporate activity, also involving staff from planning, health promotion, and contracting, together with colleagues from the provider trusts.

The process being followed in Bradford used the health care cube framework for information analysis. This activity is widely regarded as being essential to the improvement of the health of the population of Bradford and in keeping with the Health of the Nation ethos. This paper presents the process from assessment of need for a single client group or disease/condition, eg heart disease, HIV/AIDS, maternity services, to enable resource allocations to be directed towards one programme for health improvement, compared with another, or indeed several others, eg heart disease or HIV/AIDS or maternity services.

Money for health? the implications of weighted capititation funding for the relationship between financial allocations and potential life lost

S. C. EDGELL (Department of Public Health Medicine, Salford Health Authority)

Study objective—To compare the relationship at district level between existing financial allocations and the rate of potential life lost, with that between target financial allocations and the rate of potential life lost.

Design—Age adjusted rates of potential life lost are calculated for the age range 1–64 years. Regression analysis is used to examine their association with existing and target dis-trict allocations (as determined by the national formula for weighted capititation funding).

Setting—All 19 district health authorities of the North Western Regional Health Authority.

Subjects—Residents of the county during the period 1987–91.

Results—Increasing rates of potential life lost predict increasing district allocations for both existing and target allocations. However, a greater proportion of the variation in existing allocations is explained by changes in the rate of potential life lost than is the case for target allocations. This is particularly true for males. Conclusions—The current formula for weighted capititation funding implies movement towards a weaker relationship between financial allocations and the rate of potential life lost. Further work is now needed to explore the implications of this for the link between funding and morbidity. Potential life lost has already been shown elsewhere to be the best available proxy for social class differences in mortality, and a wide range of effective interventions is available to decrease the burden of working years lost through premature mortality.

Variation in hospital activity in Scotland

ALASTAIR LEYLAND (Public Health Research Unit, University of Glasgow)

Objectives—To develop diagnosis specific measures of hospital performance by specifying a key severity measure encompassing both individual and area characteristics, and thereby to provide information for both purchaser and provider.

Design—Analysis of linked computerised records of hospital discharges with background information drawn from the 1991 census.


Subjects and methods—Multilevel modelling of 66 049 discharges from gynaecology in 1059 postcodes from 38 hospitals.

Main outcome measure—Length of stay in each of 15 diagnostic groups.

Results—The proportion of the total variance in length of stay attributable to differences at the hospital level ranges from 5% (non-inflammatory disorders including eg ovarian cyst, cervical polyp, non-inflammatory disorders of vagina—ICD 620–624) to 27% (contraceptive management—ICD V25). At the postcode level the range in variance explained is from 2% (non-inflammatory disorders) to 14% (female infertility—ICD 628). Mean lengths of stay tend to be increased among women from "deprived" postcodes and decreased among those from "affluent" postcodes independently of the available information relating to case severity. It is possible to place a cost upon the effect of each hospital, overall and by the individual diagnostic groups, in terms of months of bed days lost or gained as a result of the difference between the performance of that hospital and the Scottish average.

Conclusions—The degree of overlap of the confidence intervals around the performance measures is so great that one could have little faith in a "league table" produced from the results. The details of information available to the manager leads to the identification of the diagnostic groups in which the performance in that hospital differs from that of its peers. To the purchaser information is provided relating to the costs attached to a locality on the basis of its area characteristics. Subsequent analysis of rates of operation, death and readmission, and their integration with the model for length of stay, will provide a broader picture of performance within a specialty.

Variation in practice: opportunities for improving the cost effective use of radioiodine for hyperthyroidism

S. M. MCCHIHEL, A. J. HEDELEY (Department of Public Health, University of Glasgow and Department of Community Medicine, University of Hong Kong)

A UK survey of the treatment of hyperthyroidism by radioiodine was carried out between October 1988 and February 1991. Replies were obtained from 83 physicists (95% response rate) and 245 clinicians (80% response rate). The results showed a wide variation in current practice. This paper describes the variation in three areas of practice and the implications for cost effective treatment of hyperthyroidism.

The use of precision dosimetry or fixed activities of radioiodine—Fifty one percent of respondents used a fixed activity, 38% used an arbitrary scale for determining activity, and 11% used precision dosimetry. A randomised trial of dosimetry was used as a tool to measure the clinical outcome in treated patients. In year 11, with the same number of patients being treated as the survey data indicated, the use of precision dosimetry would result in 62% being euthyroid but 26% remaining hyperthyroid, while the fixed or arbitrary approach would...
result in 68-80% being euthyroid (depending on the activity) but 16-29% being hypothyroid. The use of liquid or capsule preparations of radioactive iodine is now the most common method in most centers. Only used liquid, 28% only used capsules and 18% would use either, depending on circumstances. Liquid is claimed to be cheaper and allows precise measurement of activity, capsules are claimed to be safer and more convenient. Some users recognize a case for both; at any particular time the benefit of one preparation may outweigh the disadvantages but the precise benefits and costs have not been questioned.

The use of follow up systems—Twenty three percent of respondents used a follow up system for the long term monitoring of post-treatment patients. Most clinicians (40%) offered attendance at an outpatient clinic, while 37% discharged patients to the general practitioner. A previous evaluation of the SAFUR follow up system for thyroid patients showed that it cost 60% of the cost of the traditional approach to long term follow up and yet current practice shows that this cost effective option is not routinely used for most post-treatment patients.

Development of health care planning in The Gambia and the role of Tesito projects

J WILSON, T DEALE (Ministry of Health and Social Welfare, The Gambia; Trafford Centre for Medical Research, Sussex University) Demography—A comparison of vital statistics for The Gambia and Wales in 1985-90 indicates that the live birth rate in The Gambia (46.8/1000 population) was nearly four times and the death rate (21.1/1000 population) nearly double that of Wales; the net effect is a natural population increase of 2.1% per annum. Maternal and child health—Infant mortality rate is very high, 18.4/1000 live births, nearly half that of Wales (8.9). Maternal mortality rate is extremely high, 10/1000 live births (1991), with a lifetime risk of dying in pregnancy which may be as high as 1 in 10. Statistics on the incidence and the prevalence of most other diseases in The Gambia are not readily available. Health care planning—Systematic planning of health services in The Gambia is at an early stage. Government policy is to move the provision of health care from curative to preventive care, from urban to rural care, and from institutional to ambulatory care. As far as possible all health services will be provided from local health centres and outreach clinics based in villages rather than from hospitals. The epidemiological requirements for a national health plan will be presented. Tesito projects—Public sector financial resources are insufficient to meet even essential health needs. The government is seeking to encourage greater community participation in both financing and managing health care facilities. “Tesito” projects, self-help projects with external sponsorship, are encouraged by the government. The development of a Tesito project will be described.

We suggest that for young men the increasing numbers remaining single or becoming divorced may explain about half of the increase in suicide observed between the early 1970s and 1991. This age group of men has also been affected by high unemployment rates, exposure to armed combat, increasing risk of imprisonment, and an increase in the misuse of alcohol and drugs. There is little evidence of a rise in the prevalence of mental illness, GP prescriptions for sedatives and tranquillisers (the most common method used by women) have fallen over the period. The geography of suicide shows patterns of high rates and increases in rural areas, but there are also urban areas with large increases.

Further research is needed to improve our knowledge about the impact of these and other factors on suicide rates.

Public health problems in an urban area in a country with long life expectancy

K TAKARA, O IDA, F SHISHIO, T TAKATORIGE, N NAKANISHI, K KUBODA (Department of Public Health, Osaka University Medical School, Japan) Objective—To find whether a society in a country with long life expectancy has few public health problems.

Setting—For each of the 24 districts of Osaka City, Japan, we surveyed the total area where flies breed readily and the total area treated to exterminate harmful insects in 1989 as indices of sanitary conditions; mortality from malignant neoplasm, cardiovascular disease, and cerebrovascular disease in 1989 as indices of health conditions; and the mean living area (expressed in terms of tatami mats) per household, the percentage of men currently married, and the unemployment rate in 1985 as indices of socioeconomic conditions.

Main results—The total fly-breeding area ranged from less than 50 m² to more than 1000 m² per 10 000 residents, and the total area where insects were exterminated ranged from 0 m² to more than 50 000 m² per 10 000 residents. Mortality from malignant neoplasm, cardiovascular disease, and cerebrovascular disease per 100 000 persons aged 50-64 ranged from 27.2 to 46.8, 6.3 to 19.2, and 2.9 to 13.6, respectively. The mean number of tatami mats per household, the percentage of men currently married, and the unemployment rate ranged from 17.1 to 23.7, 44.2% to 66.2%, and 3.6% to 13.3% respectively. Correlation coefficients between the fly-breeding area and mortality from malignant neoplasm, cardiovascular disease, and cerebrovascular disease were 0.391, 0.740 (p<0.01), and 0.641 (p<0.01), respectively. Correlation coefficients between mortality from cerebrovascular disease and the above socioeconomic factors were −0.582 (p<0.01), −0.490 (p<0.05), and −0.717 (p<0.01). Correlation coefficients between these socioeconomic factors and the fly-breeding were −0.556 (p<0.01), −0.592 (p<0.01), and 0.699 (p<0.01).

Discussion—Japan had the longest life expectancy reported in the world in 1985. Osaka City is a representative urban area in this country. The city is prosperous, but sanitary and socioeconomic conditions in the different districts vary widely. Economic prosperity may have given rise to these differences, which are correlated with mortality from three.
major causes of deaths in Japan. Even in an urban area in a country with long life expectancy, health conditions have not improved equally for all residents. This suggests that if life expectancy increases, more public health problems will have to be faced.

Evaluation of “no smoking day” 1992

S M MILLIN (Department of Public Health Medicine, Eastern Health and Social Services Board, Northern Ireland)

Objective—To establish baseline information on public attitudes to smoking related issues within the Eastern Health and Social Services Board (EHSSB) area. The research was part of a wider evaluation of “national no smoking day” and was carried out on 11 March 1992.

Design—A quota sample stratified on age and sex criteria, generated an achieved sample of 775 respondents from 27 different locations in the EHSSB area. These locations included hospitals, health centres, shopping centres, schools, and private industry.

Results—The survey achieved a response rate of 79%. Quantitative data were generated on issues such as passive smoking, smoking in public places, tobacco products and smoking on public transport. The data were analysed by gender, sex, social class and smoking status. With respect to attitudes towards smoking the survey found significant differences between various age groups, social class and respondents’ smoking status.

Conclusion—The evaluation was successful in generating baseline information on aspects of the No Smoking Day campaign in the EHSSB. The information will be used to inform future “no smoking day” initiatives and also aspects of the EHSSB’s overall strategy on smoking.