of financing regional and national specialties, and also the particular requirements of the teaching hospitals.

With the formation of the AHA's in 1974, with defined areas and with responsibility for both hospital and community services, it seemed appropriate to see if it were possible to derive an allocation formula, the main element of which is an 'equal spend per head of population at risk'. Taking one of the new English regions, models of inpatient flows across boundaries for hospital services were derived from HIEP and the notional catchment populations of the AHA's were calculated. Little variation was found in morbidity or social structure between the areas, but a small adjustment was made for age-sex distribution. The allocation for community services was based on actual populations, with weighting both for the age-sex bands using each service and for relative importance of each service to total expenditure.

This formulation reveals the implications of an equitable distribution of funds and so enables adjustments to be made in the future, while allowing the RHA to use explicit weights for different services. At the same time, AHA's are free to spend their 'fair' share as they choose.


Since iodine-131 treatment was introduced for thyrotoxicosis the development of cancers among patients to whom it has been given has been monitored. Between 1949 and 1967 some 35,000 patients were notified to the National Cancer Registry as having received this treatment. Mortality in this group, 3,997 of whom died by the end of 1967, has been compared with that in England and Wales. Patients with thyrotoxicosis treated by other means were not registered; the analyses thus do not distinguish effects of the disease from those of the therapy.

The analyses were presented not only to show what happened to the patients but to demonstrate methodological aspects of multiple cause coding. Analysing all the conditions mentioned on death certificates yields much additional information, even for rapidly fatal diseases which would not be expected to appear on death certificates except as the underlying cause.

Thyroid cancer mortality was greatly increased, but investigation of these cases showed that the majority were thyroid cancers registered in error or diagnostic errors; the true excess was small. Breast cancer mortality was also substantially increased, and as cervical cancer mortality was slightly in excess of expected it seems unlikely that this was due to an atypical distribution of reproductive histories. Mortality from lymphatic leukaemia was increased; this showed particularly in the multiple cause analyses.

Four hundred and fifty three deaths were attributed to thyrotoxicosis which was also mentioned on a further 399 death certificates but not as the underlying cause. Mortality from ischaemic heart disease was approximately doubled, and deaths from embolism increased many times; many of the latter certificates mentioned atrial fibrillation.

**Person-to-Person Transmission of Hodgkin's Disease.** P. G. Smith, M. C. Pike, L. J. Kinlen, and Alison Jones (Department of Health and Social Security Cancer Epidemiology and Clinical Trials Unit, Oxford)

Vianna and his colleagues 1-2 have recently described situations in which Hodgkin's disease appears to have been contagious with a long and variable latent period between 'transmission' of the disease and the onset of symptoms.

Space-time clustering of the disease has not been detected3 but this is not surprising if a long and variable latent period exists. A generalization of Knox's method4 has been applied to data from the Oxford Cancer Registry. This method overcomes the problems associated with a long latent period but does not cope with a variable latent period unless there is an a priori way of assigning a specific latent period to each patient. Assuming a similar latent period for each patient, a slight excess was found of pairs of patients with clinical onsets between 9 months and 18 months apart, which would be compatible with a latent period of this length, but the excess is not convincing.

A case-control study is under way in Oxford in which all Hodgkin's disease patients, aged under 40 years and resident in a defined area, diagnosed in the period 1962 to 1971 have been identified. Patients and their matched controls (matched for age, sex, social class, area of residence, and admission to hospital in the year of diagnosis of the patient) are being interviewed to obtain a history of their place of residence, schooling, work, and any social activities which may have brought them into regular contact with other people. To date 91 patients and 66 controls have been interviewed. A number of 'links' have been established between pairs of patients (some pairs attended the same school at the same time, others worked in the same factory at the same time, etc.) but a preliminary analysis suggests that a similar number of links is present among the matched controls.

**REFERENCES**


**Occurrence of Childhood Neoplasms in Sibships.** G. J. Draper, M. M. Hef and J. F. Bithell (Department of Social Medicine, University of Oxford)

The Oxford Survey of Childhood Cancers now covers both registrations and deaths from neoplastic disease in Britain. Between 1953 and 1971 about 18,000 cases have been included, and interviews have been obtained with nearly 80% of the parents of these children.

Information has been collected about the occurrence of both malignant and benign neoplasms among relatives; more than 100 families have been identified in which one or more sibs of an affected child are also affected. In 17 of these sibships the affected children have each had a retinoblastoma, a disease in which it is recognized that a proportion of cases have a simple genetic origin. The remaining sibships include a wide range of different
diagnoses, though within a sibship there is a tendency for
the affected children to have similar diseases.
A method for estimating the risk for sibs of affected
children, as compared with the general population, has
been developed, taking into account the problems
associated with varying probabilities of ascertainment
and changes in family size which arise in a continuing
survey. This is an extension of Weinberg's sib method for
estimating genetic segregation ratios.

The results suggest that, in addition to the known
familial element in two or three rather rare diagnostic
groups, there is an approximately twofold increase in
risk for subsequent children if one child in a family is
known to have malignant disease. In absolute terms this
represents a risk of about 1 in 300 of developing
malignant disease by age 15, as compared with the overall
population risk of about 1 in 700.

A Study of Breast Cancer on the Isle of Wight. E. D.
ACHESON, S. ALLISON, W. R. EDWARDS, and R. WRIGHT
(Department of Community Medicine, University of Southampt)on)

This is a preliminary report of a survey in which family
histories of breast disease are being collected from all
mothers delivered of babies at St. Mary's Hospital,
Newport, Isle of Wight, together with specimens of breast
milk and blood from mothers with positive family
histories, and controls.

Of the 478 mothers delivered up to the end of August,
450 have been interviewed (94%). Information is
requested about breast disease in the patient's mother,
sisters, maternal and paternal grandmothers and aunts,
and in the husband's female relatives.

For patients giving a positive history samples of breast
milk and blood are collected, frozen, and stored. Similar
samples are collected for two controls matched to each
case for age and parity. The specimens will be examined
blind for virus antigen and tumour specific antibody.

If the age-specific incidence of breast cancer is known
and certain assumptions are made about the average age
of mothers having babies and of their mothers and
grandmothers, it is possible to estimate the proportion
of mothers who should report an affected relative. Assuming
a cumulative life risk of breast cancer of 5%, it was
estimated that about six mothers who had had breast
cancer and approximately 25 maternal and 25 paternal
grandmothers would be ascertained. In the event, this
estimate was remarkably accurate as regards the patient's
mother (5 cases) but there was a substantial deficiency in
relation to grandmothers (14 cases). This shortfall may
be due to patients' incomplete knowledge about their
grandmothers' illnesses.

A preliminary investigation of the accuracy of reports
of breast cancer was carried out. Of the 21 instances in
which it was known that the patient was treated for the
reported illness, a record was found for 17 and the
diagnosis of carcinoma was confirmed in 16. In the
remaining case the occurrence of a mastectomy was
confirmed but no histology given. It seems likely that a
positive history of breast cancer is accurate and that the
terms 'breast cancer' and 'breast removed' may prove for
practical purposes to be synonymous.

Medical Care for Stroke Patients in a Defined
Community. JEAN WEDDELL (Department of Social
Medicine and Clinical Epidemiology, St. Thomas's
Hospital Medical School)

A study was made of 380 patients who received medical
care for a stroke over a 12-month period from 1 June
1971, from a defined population of nearly 280,000. The
patients were seen as soon as possible after the stroke
and again three weeks and three months later. A record was
made of each place of care and the length of time spent
in each. The patient's ability to carry out the activities
day in daily living, to perform simple household duties, to
travel outside the home, and changes in their occupational
status were recorded. It was found that the Index of the
Activities of Daily Living was a good indicator of a
patient's survival as most of those who were dependent
at the first visit died. Most of the deaths had occurred
by the third week, leaving a survivor population of 198.
By three months 36 patients were still in hospital, 85
patients had gone home. The general practitioner cared
for 50% of patients immediately after the stroke, either
at home or in community hospitals. The Index of the
Activities of Daily Living was a poor indicator of the
patient's ability to lead an active life. Of those classed as
independent by this index only a small proportion could
still carry out simple household activities, travel by public
transport, drive a car, or pursue the same occupation.
Better measures of independence need to be developed
and methods to increase this independence need to be
evaluated.

Locomotor Disability—A Study of Need in an Urban
Community. MALCOLM THOMPSON, MARY ANDERSON, and
PHILIP H. N. WOOD (Royal Victoria Hospital, Newcastle
upon Tyne, and ARC Epidemiology Research Unit,
Manchester)

The Social Services Department in Newcastle upon Tyne
recently made a detailed survey of a sample of chronically
disabled and sick persons living within the city. Arthritis
and related rheumatic conditions were reported by 163
individuals, 39% of the total sample, and in 120 (28%)
these disorders were the major cause of disability. A
special study is being made to assess the medical care
needs of these persons with disorders of the bones and
organs of movement, and this preliminary report is based
on the first 78 individuals seen, 23 of whom were male
and 55 female.

They were predominantly elderly (mean age 69) and
many lived alone. One in 6 were single and 1 in 2
widowed (though only 1 in 4 of males were widowed).
Almost one-third were unable to attract attention in an
emergency. Stairs within or at the entrance to the home
caused difficulty for about half the respondents. The
principal limiting disability was located in the knees in
half, and elsewhere in the legs in a further quarter.
In almost three-quarters the main pathology was osteo-
arthritis. Other, non-locomotor, disabilities were present

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