women who underrate screening facilities. Little or no emphasis has been placed on studying behavioural factors and on the relationship of non-use of cervical cytology with non-use of other preventive health measures. This present study, undertaken as a parallel endeavour to the randomized controlled trial (RCT) reported in the preceding abstract by Carruthers, seeks to rectify this omission and focuses on a wide range of factors which, it is hypothesized, may influence a woman's response to either a self-administered cytopipette screening test or to a doctor-administered cervical smear test.

The methodology for the RCT is described by Carruthers. Nineteen to 20 weeks after the introduction of the study women were classified as acceptors or non-acceptors, according to their response to two postal invitations to take either a cytopipette or scrape smear test; 52.7% of pipette and 50.5% of scrape invitees (in each case N = approximately 10,000) were deemed to have responded, i.e., they used the pipette and reaped it to the laboratory, or they replied indicating willingness to attend the L.A. clinic or their family doctor's surgery to take a smear test. Only 38.9% of the scrape invitees were however subsequently tested. What is meant by an acceptance rate for cervical screening? Is it the percentage who agree to be tested or the percentage actually tested? Further research is needed to identify and explain differences between these two groups.

Random samples of the female population resident in the survey area (Horsham) were interviewed during one of three periods—before any invitations were sent out, after 9 to 10 weeks, or after 19 to 20 weeks. Analysis of this information is now proceeding, but some brief details are given from interviews with a 10% sample of the total female population during the latter period. A unique approach of this present study has been an opportunity to compare acceptors and non-acceptors in relation to their attitudes to cervical cancer and preventive health tests and the reasons they gave for accepting or declining invitations to take cervical tests. In addition to such well-recognized factors as age, parity, social class, and marital status, preliminary analysis also suggests statistically significant differences between acceptors and non-acceptors for a wide variety of psychosocial variables (e.g., frequency of contact with, attitudes to, and satisfaction with health services, perception of susceptibility and severity of cervical and other forms of cancer, fear of contracting cervical and other forms of cancer, and attitudes to and knowledge of preventability and curability of cervical cancer). On this basis there would appear to be distinctive and diverging health attitudes between the two groups. Care is, however, needed in interpreting these findings, particularly since some non-acceptors may be thought of as having valid reasons for their failure to respond (i.e., health reasons, pregnancy, doctor's advice, age, previous test within six months, etc.), and may in fact exhibit far from negative attitudes to cervical screening. Thus it is necessary to analyse the interview data in terms of women who accept, those who have a valid reason for non-acceptance and those without a valid reason for non-acceptance. Classification after 19 to 20 weeks suggests that 52% were acceptors, 15% were non-acceptors with a valid reason, and 33% were non-acceptors without a valid reason.

Analysis of questionnaire data, currently in progress, will permit a wider definition of response to cervical screening as part of the sociomedical milieu, and in the context of general health behaviour, and also, it is to be hoped, the highlighting of key areas for health educational strategies and intervention in relation to high at-risk groups.

**Third Session (Chairman: Professor E. G. Knox)**

*Is Hodgkin's Disease Contagious?* L. J. Kinlen, M. C. Pike, and P. G. Smith (DHSS Cancer Epidemiology and Clinical Trials Unit, Department of the Regius Professor of Medicine, Oxford)

A number of 'outbreaks' of Hodgkin's disease have recently been described in which the disease appears to have shown epidemiological characteristics of a contagious disease, with a long and variable latent period between the 'transmission' of the disease and the onset of symptoms (Vianna et al., 1971, 1972). It has not been possible to assess the statistical significance of these reported outbreaks and the application of Knox's method for the detection of space-time clustering of cases of the disease in the Manchester region has yielded negative findings (Alderson and Nayak, 1971b). This latter result might be expected, however, even if the disease is contagious, if its latent period is long. In such circumstances, a better approach, which also does not require the collection of information from contacts of persons, is to use a generalization of Knox's method which we have previously proposed (Pike and Smith, 1968). This method is, however, critically dependent upon assumptions about the length of the latent period, and if this varies widely from case to case in an unknown way then the test will be weak.

By careful questioning of patients, Vianna and his colleagues were able to establish the existence of direct contacts between patients, and this clearly constitutes better epidemiological evidence of contagion than crude space-time clustering, provided that the statistical significance of the observed amount of contact between the patients can be calculated. Vianna and his colleagues also measured the amount of contact between matched control patients and found it much less than among the Hodgkin's disease patients. The major criticism of this study is that they only chose controls for those Hodgkin's disease patients involved in 'links' with other patients rather than choosing matched controls for all patients with the disease over the period of the study. Some of the problems of choosing matched controls are discussed by Smith and Pike (1972). We are currently engaged in a study along these lines taking all Hodgkin's disease patients diagnosed under age 40 in the Oxford Regional Hospital Board area during the 10 years 1961-70.

The analysis of such case-control data requires special statistical methods and we have recently suggested a technique of evaluating the significance of (a) the total 'effective' contact between all possible pairs of patients.
and (b) the number of patients involved in ‘effective’ contact with at least one other patient (Pike and Smith, 1972). Fortran IV subroutines are available for the computations involved.


Seasonal Variations of Mortality in Dakar and Implications in Public Health Planning. L. M. F. Massé, J. Verdier, and M. J. Lenan (Ecole Nationale de la Santé Publique, Dakar, Senegal)

In 1951-55 analysis of death records revealed two distinct seasonal patterns of mortality in the city of Dakar (Senegal Republic, West Africa): that for children, excluding newborn infants, showed a peak in the wet season (July, August, September); that for adults and for newborn infants showed two less marked peaks, one during the dry season (February, March, April) and one during the wet season (September, October). These two different patterns of mortality were found, more or less, in all ethnic, cultural, and occupational groups.

With the help of the Population Council an investigation on causes of death was undertaken to ascertain the main causes responsible for these seasonal variations of mortality (Massé, 1966).

Several hospital investigations were carried out to link mortality and morbidity patterns. For the paediatric data two series were analysed, one considering deaths in the paediatric ward, so that comparison with causes of death in Dakar could be made, and another considering the admissions for every disease for which there were enough observations.

The main causes of death of children were malaria, gastroenteritis, toxocosis, and malnutrition as in many other places; but also, diseases of the lung and pleural cavity, bronchitis, tonsillitis, ear and mastoid infection and measles. Data on morbidity yielded very similar results.

Another investigation carried out in 1968 and 1969 on causes of deaths and morbidity showed a very close similarity to that described in the 1951-1955 investigation, in spite of the introduction of control measures.


Space-time Clustering of Limb Defects in Cardiff. S. Lloyd and C. J. Roberts (Department of Social and Occupational Medicine, Welsh National School of Medicine, Cardiff)

In Cardiff in 1964-66 there were 14,451 singleton births, of whom 35 had syndactyly, 16 polydactyly, and 6 reduction deformities. When the cases were plotted on a spot map both syndactyly and polydactyly appeared to show spatial clustering. Five of the polydactyly cases came from the list of one general practitioner. (If it is assumed that each of the 130 general practitioners in Cardiff had the same number of patients, the probability of this happening by chance is 1 in 50,000.) Examination of these five cases of polydactyly, however, did not explain the apparent overall spatial clustering.

The problem of determining whether these apparent spatial clusters could have arisen by chance was approached as follows. Five sets of random samples were taken (each of the same size as the limb defects group) and the number of pairs less than 200 metres, 300 metres, 400 metres, and 500 metres apart were calculated for the limb defects group and for each of the random samples. A significance value was given to the observed number of pairs of limb defects satisfying each of the critical distances, assuming that its null distribution is Poisson with a mean estimated by the mean number of pairs of random samples satisfying the same critical distance. For all the values of critical distances the test was significant.

Space-time interaction was studied using Knox’s method. In none of the time-space categories set up a priori was there a significant excess of observed over expected pairs, although there was some suggestion that the proportion of pairs close together in time increased as they became closer in space.

Aggregation of the defects by social class is an unlikely explanation of our findings since the social class distribution of limb defects was similar to that of all singleton births in Cardiff. However, common ethnic or genetic factors (relatives with affected genes may live close to one another) or external agents (e.g., drugs or diet) could produce a spatial distribution similar to that described in this paper. These possibilities are being examined.

Maternal x-radiation and Chromosome Abnormalities in Subsequent Conceptions. Eva D. Alberman (Department of Public Health, London School of Hygiene and Tropical Medicine)

This investigation was planned to discover whether x-radiation of the ovaries causes genetic risk to subsequent conceptions.

The estimated cumulative x-ray dose received by the ovaries of a group of mothers subsequently delivered of an abortus of abnormal chromosome constitution proved to be significantly higher than that received by mothers subsequently delivered of normal babies, and than that received by mothers having abortions of normal chromosome constitution. Similarly, the preconception ovarian dose received by mothers of children with Down’s syndrome was slightly higher than that received by control mothers of children with other severe handicaps. The x-radiation appeared to enhance the effect of ageing on the ovum and, independently of ageing, the greatest effect seemed to be when the radiation had occurred long before conception.