CERVICAL CYTOLOGY IN NORTHERN IRELAND: AN OPERATIONAL REVIEW

by

C. D. BROWN, B.Sc.(Econ.), Grad. I.P.M., and
G. A. LYCH, M.B., D.M.R.T., F.F.R., F.F.R.R.S.C.I.

Northern Ireland Radiotherapy Centre, Purdysburn, Belfast

INTRODUCTION

CERVICAL CYTOLOGY was introduced into Northern Ireland in 1962 when a programme for the taking of smears from patients attending Gynaecological and Obstetrical clinics in teaching hospitals in the Belfast area was initiated (Willis and Woods, 1969). In 1965 the screening programme was extended throughout Northern Ireland, using a variety of medical settings (Robertson and Crozier, 1968). The comprehensive service has therefore been in operation for some five years.

This paper concentrates on the problems of organisation and acceptance of cervical cytology in Northern Ireland. The authors are aware that consideration of these operational aspects might be considered premature as the evidence in favour of cervical cytology as a preventive measure is, as yet, uncertain. Knox (1966) in a scrutiny of the available evidence remarks, 'There is an informed scepticism of the claims made of it'. Evidence from British Columbia is far from conclusive, even after considering the recent decline in incidence as indicated by Fidler et al (1968). On the other hand, a recent report from Aberdeen indicates a significant fall in the incidence of cervical cancer and an increase in the five year survival rate (Macgregor, Fraser and Mann 1971), after a very high rate of screening had been achieved. Figures from the Office of Health Economics (1969) suggest that cervical cytology cannot be justified on grounds of economic investment alone, as can, for example, health education on cigarette smoking or a programme of influenza vaccination. While acknowledging this uncertainty there does appear to be a case for examining a service which has been so widely adopted as that of cervical cytology in the United Kingdom. Also, the conclusions might be of general applicability in helping to formulate policy for the introduction of other preventive measures.

Three aspects of the service are examined:

(i) The source of the smears;
(ii) The social and demographic characteristics of the population screened, and
(iii) The interaction of (i) and (ii).

An analysis of these particular features should provide some clues as to the appropriate direction of the service in the future, and, in particular, the development of health education.

MATERIALS AND METHODS

Other papers in this field (Wakefield and Sansem 1965, Robertson and Crozier, 1968, Willis and Wood, 1969) have relied upon data taken from the laboratory reports which of practical necessity do not include a large number of social and demographic variables. Even where specific attempts have been made at recording the social class of the client, difficulties have arisen with unclassified records, e.g., in Manchester (Sansem, Wakefield and Yule, 1970) social class was missing from
11.5 per cent of all smears received from general practitioners. However, the material analysed in this paper is part of a much larger community survey to determine the relationship between knowledge of cancer, and attitude towards the disease.

A random sample of approximately one in 1,000 women aged 20 and over from the whole of Northern Ireland was drawn from the population register of the General Health Services Board, using a random number technique. In January 1970, the participants were interviewed, mainly by graduate Psychology students. A response rate of 84.1 per cent was achieved with a total sample of 531.

The following variables were recorded at interview:
1. Tested/not tested.
2. Where test was taken, i.e. hospital, maternity hospital, local authority health clinic, general practitioner or family planning association.
3. Age.
4. Marital status.
5. Occupation, later assigned to a social class using the Classification of the Registrar-General 1966.
6. Age on completion of full-time education.
7. Geographical location; which was consequently analysed in terms of urban, i.e. the greater Belfast area, semi-urban, i.e. towns of more than a population of 5,000 and rural, constituting the rest.
8. Knowledge of cervical cytology as a preventive measure.
9. Knowledge of symptoms of cancer of the cervix.

As Wakefield (1969) has shown that some women are not aware of having been tested, this method of self-classification, at interview, might be slightly deficient in differentiating between the screened and unscreened participants.

**Results**

The overall rate of testing amongst women aged twenty and over, from all sources, was 23.2 per cent. However, as previously mentioned, Wakefield (1969) found in a sample of women in the Manchester area that 9 per cent of tested females were not aware of having been tested. If a similar pattern exists in Northern Ireland this would mean an upward adjustment of 2.3 per cent making an overall rate of 25.6 per cent. This figure is compared with those of England and Wales in Table I. However, these figures are crude rates; i.e. they do not take into account the differing age and social class structures and the percentage of married women in the different regions; and must be regarded with care. The Department's figures might also conceal a number of second tests as they are calculated from laboratory returns. It is interesting to note that the South Western Region has the second lowest figure. It is a region not dissimilar to Northern Ireland, being dominated by one major city (Bristol) with the remainder of the population living in towns and isolated farmsteads.

During the preliminary analysis it was found that 1 per cent of single women had been tested compared with 29.1 per cent of married/once married respondents. Marital status is therefore a very important factor but unfortunately, due to the small number of tested single women in the sample, the subsequent investigation was based solely on the data for married/once married women.
### Table I
**Percentage of women screened in each hospital region**

| Region                  | 1964–1969          | % of women aged 20 or over tested |
|-------------------------|--------------------|-----------------------------------|
| Northern Ireland        | 23.3               |                                   |
| Northern Ireland adjusted| 25.6               |                                   |
| East Anglia R.H.B.      | 44.5               |                                   |
| Birmingham              | 44.5               |                                   |
| Leeds                   | 41.2               |                                   |
| Liverpool               | 28                 |                                   |
| Manchester              | 47                 |                                   |
| Metropolitan N.E.       | 44                 |                                   |
|                         | N.W.               | 55                                |
|                         | S.E.               | 46.5                              |
|                         | S.W.               | 47.5                              |
| Newcastle               | 44.5               |                                   |
| Oxford                  | 53                 |                                   |
| Sheffield               | 54                 |                                   |
| South Western           | 37                 |                                   |
| Welsh                   | 40                 |                                   |
| Wessex                  | 41                 |                                   |

*Source: Department of Health and Social Security, London.*

### Table II
**Percentage of married women screened by social class**

| Registrar's General Social Class | % of women aged 20 or over tested |
|----------------------------------|-----------------------------------|
| I                                | 59                                |
| II                               | 35                                |
| III                              | 33                                |
| IV                               | 26                                |
| V                                | 22                                |

### Table III
**Percentage of married women screened by age**

| Age                      | % of women tested |
|--------------------------|-------------------|
| 20–29 years              | 45                |
| 30–39                    | 43                |
| 40–49                    | 28                |
| 50–59                    | 12                |
| 60 plus                  | 2                 |
| 40 plus, and in social class IV & V | 14               |
The social class gradient is illustrated in Table II. The rates vary from 58.8 per cent for social class I to 21.6 per cent for class V. Similarly the age rates (Table III) decline from 44.6 per cent for the 20 to 30 age group to 2.2 per cent for the over sixties.

The population tested can be logically divided into two parts:
(a) Clients tested because of their particular health circumstances, e.g. pregnancy, desire for family planning advice, referral to gynaecological clinic or presentation at a venereal disease clinic.
(b) Clients motivated by their general practitioners or themselves.

Obviously there is some interaction between the two groups; for example, if a woman has been tested in hospital it eliminates the need for her to go to a clinic or general practitioner for a test. Also, the categories are not mutually exclusive, because some of the participants have been tested in more than one medical setting. (In the sample of women tested) 75 per cent belong to the first category and 25 per cent to the second.

The univariate analysis was therefore divided into two parts (a) all sources of smears and (b) smears from general practitioners and local health authority clinics. With all sources of smears (Table IV) social class and education were significant, age and knowledge of cervical cytology as a preventive measure highly significant. In the self or doctor motivated group (Table V) social class had a larger effect, while knowledge of cervical cytology was again significant. The rate for small towns was significantly higher than for greater Belfast or the rural areas. Age was no longer significant, as the majority of younger women are tested at the maternity clinics.

**DISCUSSION**

Epidemiological studies indicate that in the development of cancer of the cervix, women of low socio-economic class and aged over forty are most at risk. These facts were emphasised in the report of the Registrar-General for England and

**TABLE IV**

*Univariate analysis – all sources of smears*

| Variable                                      | Degrees of Freedom | \( \chi^2 \) | \( P \)          |
|-----------------------------------------------|--------------------|-------------|-----------------|
| Age                                           | 4                  | 29.30**     | <0.005          |
| Social class                                  | 4                  | 9.93*       | 0.05–0.25       |
| Education                                     | 2                  | 7.90*       | 0.025–0.01      |
| Urbanity                                      | 2                  | 4.17        | 0.25–0.1        |
| Towns v. rural                                | 1                  | 2.79        | 0.1–0.05        |
| Urban v. rural                                | 1                  | 3.66        | 0.1–0.05        |
| Urban v. towns                                | 1                  | 0.004       | >0.9            |
| Knowledge of cervical cytology as a preventive measure | 1 | 30.69** | <0.005 |
| Knowledge of symptoms of cancer of the cervix | 1 | 0.77 | 0.5–0.25 |

**Significant at the 1% level**

*Significant at the 5% level*
### Table V

**Univariate analysis – Self or doctor motivated**
*(General Practitioner/or Local Health Authority cervical cytology clinic)*

| Variable                                      | Degrees of Freedom | $\chi^2$  | P       |
|-----------------------------------------------|--------------------|-----------|---------|
| Age                                           | 4                  | 7.005     | 0.25-0.1|
| Social class                                  | 4                  | 15.62**   | <0.005  |
| Education                                     | 2                  | 5.22      | 0.1-0.05|
| Urbanity                                      | 2                  | 9.55*     | 0.01-0.005|
| Towns v. rural                                | 1                  | 7.68*     | 0.01-0.005|
| Urban v. rural                                | 1                  | 1.23      | 0.5-0.25|
| Urban v. towns                                | 1                  | 9.20**    | <0.005  |
| Knowledge of cervical cytology as a preventive measure | 1    | 14.81**   | <0.005  |
| Knowledge of symptoms of cancer of the cervix | 1                  | 0.60      | 0.5-0.25|

**Significant at the 1% level.**

*Significant at the 5% level.

Wales (Kennaway 1948). Unfortunately, the present survey shows that these are the groups with the lowest rates of testing here in Northern Ireland. Again, the incidence of cervical carcinoma has been shown to be highest in urban as contrasted to rural communities (Coppleston, 1969). The findings indicate that amongst the self motivated group, i.e. those tested by the general practitioner and at the local authority cervical cytology clinic, the percentage screened is highest in the towns, and this suggests that if the programme is to be really effective, then the rates must be increased, not alone in the rural parts of the province, but particularly in the greater Belfast region.

It might reasonably be asked if attention should be directed towards single women whose rate of testing depresses the overall total. Studies have revealed that virgin and celibate women are almost without risk (Martin 1967). Even with the influence of the permissive society, there certainly would not appear to be a very strong case for diverting effort and resources to this particular group of the community.

The survey shows that only 23 per cent of women aged twenty and over were tested. Even this figure, low as it is, can be very misleading, when we consider that almost 75 per cent of the women screened were tested because of their particular health circumstances, e.g., attendance at maternity, family planning, gynaecological or venereal disease clinics, i.e., ‘captive clients’. Obviously most of these women are in the younger age groups and whilst it is important that they should be tested, one might reasonably suggest that future growth of the service must come from the local authority and general practitioner sector; especially in testing the high-risk low-responding groups. How is this to be achieved? Robertson and Crozier (1968) have argued that further development of the service is now as much dependent upon effective publicity, as upon the provision of laboratory facilities. In this study there is no direct evidence that health education increases the rate of testing, but it is interesting to note that a significant group of untested women were unaware of
cervical cytology as a preventive measure. It seems extremely unlikely that without such knowledge this particular group will come forward for testing.

There would, therefore, appear to be an important information gap which can only be filled by health education through the mass media or communication on the personal level; but, which is the more effective? Katz (1957) with support from many others has postulated that communication flows in two steps from the mass media to the public via “opinion leaders” and has stressed the importance of personal communication in helping to bring about change. The acceptance of a cervical smear test has been examined in the light of this approach (Rolfe 1961). He found that in the American setting the local primary access physician was in fact a very powerful “opinion leader” and through face-to-face conversation could influence a very great number of patients to come forward for the test. In the National Health Service, therefore, it would appear that the general practitioner could very well have an important or, indeed a key role to play, not alone in the carrying out of the tests but in educating the public. Apart, however, from the general practitioner it is obvious too, that the local authority clinics have an important contribution to make. Wakefield and Baric (1965) for example have suggested that older women prefer the anonymity of a clinic, and particularly so, when the test is carried out by a female doctor.

This brief report is part of a larger survey on public attitudes to cancer in Northern Ireland (Brown and Lynch, to be published). Some of the other findings of the survey might explain, in part, the reluctance of women to come forward for the test. Whatever the explanation is, the authors suggest that the role of health education in persuading women to be screened might usefully be further considered. It is only by raising the percentage of women tested that the laboratory facilities can be exploited to their full potential, and that a drop in the incidence and mortality of cancer of the cervix can be anticipated in the future.

**SUMMARY**

In a sample of women aged twenty or over, interviewed in Northern Ireland:

(i) 23.2 per cent had been screened for cancer of the cervix.
(ii) 1 per cent of the single women had been tested.
(iii) 25 per cent of the smears were taken by general practitioners or local authority cervical cytology clinics.
(iv) The rates were lowest in the over forties and social class IV and V groups.
(v) A woman was more likely to have been tested by her general practitioner if she had lived in a town rather than in a rural area or Greater Belfast.

The implications for the programme of screening are discussed.

**ACKNOWLEDGEMENTS**

The work was financed by a generous grant from the Tenovus Organisation of Cardiff.

We are grateful to Dr. R. P. Maybin for the use of the population register of the General Health Services Board. Thanks are also due to Professor J. Pemberton (of the Department of Social and Preventive Medicine, The Queen’s University of Belfast) for his encouragement and advice, and Mrs. I. Hay for her help in data processing.

**REFERENCES**

COPPLESON, M. (1969). *Hosp. med.*, 2, 5.

GENERAL REGISTER OFFICE (1966). *Classification of Occupations*, H.M.S.O., London.
Fidler, H. K. Boyes, D. A. and Worth, A. J. (1968). *J. Obstet. Gynaec. Brit. Cwlth.*, 75, 392.
Katz, E. (1957). *Publ. Opinion Quant.*, 21, 61.
Kennaway, E. L. (1948). *Brit. J. Cancer*, 2, 177.
Knox, E. G. (1966). *Cervical Cytology: A scrutiny of evidence, in problems and progress in Medical Case*, Oxford University, London.
MacGregor E., Fraser, M., Mann, E. F. (1971). *Lancet*, 1, 7689.
O.H.E. (1969). *Factors which may affect Expenditure on Health*, O.H.E., London.
Robertson, J. H. and Crozier, E. H. (1968). *Ulster Med. J.*, 37, 136.
Rolfe, A. (1961). *Opinion leaders: Florida Cervical Cancer demonstration programme. Public Health Service. Department of Health Education and Welfare, Bethesda.*
Sansom, C. D., Wakefield, J., Yule, R. (1970). *Medical Officer*, 123, 26.
Wakefield, J. (1969). *Schweiz. med. Wschr.*, 99, 828.
Wakefield, J. and Baric, L. (1965). *Brit. J. Prev. Soc. Med.*, 19, 159.
Wakefield, J. and Sansom, C. D. (1966). *The Medical Officer*, 116, 145.
Willis, J. and Woods, J. (1969). *J. Irish med. Ass.*, 62, 383.