The changing pattern of cervical cancer in Northern Ireland 1965 – 1989

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SUMMARY
There was a change in pattern of and increased prevalence of cervical cancer in Northern Ireland from 1965 to 1989, characterised by an increased incidence in women under 40 years. These changes occurred despite special screening of younger women, although the screening programme has probably prevented an even greater increase in incidence of the disease. To reduce the incidence of cervical cancer, not only systematic screening but also cervical smears at more frequent intervals would be required.

INTRODUCTION
Community cervical screening commenced in a random fashion in Northern Ireland in 1965. The effect of this screening on the incidence or mortality from cervical cancer is unknown, as the registration of cancer, especially of the cervix, is very incomplete in the province. We therefore assessed the incidence of cervical cancer in Northern Ireland from 1965 to 1989 by a study of biopsy records to determine the impact of 25 years of cervical screening on changes in the pattern of the disease.

METHODS
Biopsy reports of all cases of cervical cancer occurring in Northern Ireland from 1965 to 1989 were reviewed in a survey of the records of the four histopathology laboratories in the province. Microinvasive cases were excluded, and invasive cases included only when the depth of invasion was considered by the histopathologist to be more than 5 mm. This decision was made because it became clear that in an appreciable number of biopsies intraepithelial neoplasia involving the endocervical crypts was difficult to differentiate from microinvasion, especially if there was an associated inflammatory reaction. There was also a marked variation in the frequency with which microinvasion was reported between different laboratories, also reflecting this difficulty in interpretation. Cases of adenocarcinoma were only included if the pathologist considered that the tumour was definitely cervical rather than endometrial in origin. During the study other potential sources of inaccuracy became apparent. In some cases the distinction between microinvasive and fully invasive disease was not clear from the report.

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In others, carcinoma secondary to the cervix had been miscoded as primary cervical cancer, or diagnostic problems arose because the patient had a history of carcinoma in another organ. Whenever possible any uncertainty in diagnosis was resolved by a review of the biopsy or examination of the patient’s hospital notes. By these means patients were grouped according to their year of diagnosis, age and the histological type of the tumour. In 37 cases (2.4%) the patient’s age could not be determined and these cases were excluded.

RESULTS
The age-specific incidence rates of cervical cancer, excluding microinvasive cases, for five year periods from 1965 – 89 are shown in the Table. During the period 1975 – 89, the incidence in women aged less than 40 has more than doubled. The increase first affected those under 30 years, the rate not increasing in those aged 30 – 39 until 1980. From 1975 – 89 cervical cancer declined in those aged 45 – 59.

| Age (years) | 1965 – 9 | 1970 – 4 | 1975 – 9 | 1980 – 4 | 1985 – 9 |
|------------|----------|----------|----------|----------|----------|
| 20 – 24    | 0.0      | 0.0      | 11.3     | 9.7      | 12.4     |
| 25 – 29    | 17.7     | 23.9     | 41.5     | 31.1     | 34.1     |
| 30 – 34    | 28.1     | 50.1     | 46.7     | 99.4     | 108.5    |
| 35 – 39    | 92.2     | 72.4     | 81.0     | 101.4    | 162.5    |
| 40 – 44    | 155.7    | 100.5    | 79.7     | 157.9    | 208.3    |
| 45 – 49    | 174.3    | 220.1    | 139.8    | 137.2    | 107.0    |
| 50 – 54    | 251.1    | 242.0    | 169.4    | 179.4    | 155.6    |
| 55 – 59    | 205.7    | 282.4    | 224.9    | 195.5    | 174.4    |
| 60 – 64    | 192.7    | 169.5    | 156.7    | 198.1    | 221.6    |
| 65 – 69    | 164.4    | 135.4    | 175.2    | 182.5    | 243.3    |
| 70 – 74    | 140.9    | 137.3    | 206.7    | 116.4    | 180.9    |
| 75 – 79    | 115.0    | 121.7    | 105.4    | 61.7     | 136.0    |
| 80 +       | 62.4     | 87.6     | 107.9    | 68.7     | 84.0     |

The histological type of cervical cancer according to age group for each five year period is shown in the Figure. From 1965 to 1989 about 10% of all the cervical cancers in each five year period were adenocarcinomas or adenosquamous tumours. In 1980 – 84 there was a fivefold increase in adenocarcinoma affecting women aged less than 45 years compared to 1965 – 79. This increase was most marked in the 20 – 39 year age group. This increased incidence became even more marked in 1985 – 89 when adenocarcinoma occurred about eight times more frequently in those under 45 years, and in women aged 20 – 39 years these tumours constituted almost 20% of carcinomas.
Figure. Distribution of histological types of carcinoma according to age groups and period. Adeno-carcinoma includes 10% of adenosquamous tumours. Undifferentiated carcinomas are included with the squamous tumours. The figures on top of the columns indicate the number of each histological type.

DISCUSSION

In 1989 there were 547,941 women aged 20 years and over resident in Northern Ireland. Although this survey is based on a smaller population than those dealing with cervical cancer in Britain, its precision is increased by being based on biopsy reports. Northern Ireland is also a relatively discrete geographic area and is less affected by cross-boundary population changes which can influence results in larger regions. Moreover, most previous reports have relied on mortality rates which are subject to diagnostic inaccuracy and incomplete registration. Registration of cancer mortality varies in its completeness in Britain and, as in Northern Ireland, cervical cancer deaths are probably especially poorly recorded.1,2

Our results clearly show that since 1975 there has been a very marked change in the pattern of cervical cancer, characterised by an increased incidence of squamous carcinoma in young women followed five years later by a striking increase in adenocarcinoma in the same age groups. A similar increase in mortality rate among younger women was noted in England and Wales3 but the corresponding rise in incidence rates appears to have occurred five or more years earlier than in Northern Ireland. Almost certainly incidence rates in the province would have been appreciably higher in the absence of screening. Our results, for
example, do not include microinvasive cases which were detected by cervical smear and prevented from progressing. Also, from 1965 – 89 this laboratory detected moderate or severe dyskaryosis in about 4,600 women, which if untreated would also have increased the cancer incidence rate.

It is particularly disappointing to find that the incidence of cervical cancer in Northern Ireland has not decreased among younger women. During the 25 years of screening we estimate that about 1⋅25 million cervical smears have been examined in the province and a laboratory survey shows that 67% of these were from women 20 – 39 years old, a population comprising 226,194 in 1989. Despite this intensive screening effort it is women of this age group who are now showing a rising cancer incidence. Twenty years ago, in 1971 Brown and Lynch reported a population survey in the province which showed that even then 40% of women under 40 years had been screened at least once. In Britain it was estimated that by 1981 nearly 80% of women under 35 years were being screened.

Our results suggest some possible causes for this relative failure of screening. The incidence rates clearly indicate that the screening programme was being conducted in the face of an increasing rate of occurrence of cervical cancer, probably more pronounced than indicated by our incidence rates. Also of concern is the relatively marked increase in the proportion of adenocarcinoma in younger women. These tumours are much harder to detect than squamous carcinoma in their preinvasive stages. This change in pattern of adenocarcinoma might reflect an underlying change in the biology of the disease which if associated with a shortened intraepithelial phase of squamous tumours would make them more difficult to detect by screening. Such a possibility has been suggested by others but so far not substantiated.

Two other aspects of the screening programme in Northern Ireland could well be of importance in its relative failure. It was random in nature and probably less effective in attracting those young women most at risk, but a gross failure in this respect would be required to account for our results. Furthermore, doctors and patients were advised that smears should be repeated at five year intervals.

Although even a single negative smear has been said to have considerable protective value, there is evidence that false negative smears are not infrequent and that the protection given by one negative result is relatively low. Our findings show that random screening has been inadequate in the prevention of cervical cancer in Northern Ireland and we feel that even with systematic screening, a five year interval between smears will prove too long to counter an increasing incidence of disease.

We hope that a current study of the screening history with review of cervical smears from all those who developed cervical cancer from 1982 – 89 will provide more insight into some of these issues.

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