

Each year in England and Wales around 2,000 women die from cancer of the cervix - a largely preventable cause of death. Many different factors may collaborate in causing this disease, as comparison of the lives and circumstances of affected women has shown, but the tendency has been to publicise a single causative agent arising from theories about women's sexual behaviour. Despite considerable progress in recent years in finding other contributory factors, the notion that female promiscuity 'causes' cervical cancer has proved very hard to shake.

Although we experienced a substantial reduction in mortality from this cancer in the UK during the 1950s and 60s, we seem to have stuck at 2,000 deaths a year in the last decade. More worrying still is the fact that women who are in their forties now are developing cervical cancer at a rate 60% higher than the previous generation, and the mortality rate for women under the age of 35 has doubled in the last 10 years. During the same period, other nations (most notably in Scandinavia) have continued reducing their avoidable deaths to very low levels. Their success has been based on an effective system of screening women at risk for early signs of cancerous changes in cells lining the cervix - a test known as the cervical smear.

Figure 1 shows the appearance of normal cells from the cervical lining (the epithelium) which have been obtained from a smear, and figure 2 shows how cervical cells look after they have undergone transformation to their malignant form. The normal cells are able to divide and reproduce themselves only infrequently to replace worn-out cells, whereas the malignant cells divide continuously to form a rapidly-growing colony. Cancer cells have the additional property of being able to migrate through healthy tissue and enter the blood stream, which transports them around the body until they lodge in suitable distant sites and produce more colonies of cancerous tumours, usually with fatal results.

Although all cancer cells share these two properties - continuous cell division and migratory ability - some properties of the normal cell type from which the cancer cell developed are retained. This is why different tissues produce cancers of different prognosis and patterns of spread; for example, lung cancer is faster-spreading and more rapidly fatal than many other cancers, whereas cervical cancer cells are relatively slow-growing in most women and tend not to spread beyond the cervix for many months, even years. This rather prolonged initial period of change from the normal to the cancerous state allows time for detection and for extremely effective treatment to be initiated - hence the conclusion that most deaths from cervical cancer are preventable, providing

that a comprehensive system of screening all women regularly and accurately can be set up, as the Swedes have done.

The failure of the current screening programme in the UK has been due to a lack of essential co-ordination at a national level, relying instead on the haphazard contact of women with GPs and family planning services, compounded by a wholly inadequate system of recall to check on women whose smear was equivocal. The result has been a disproportionate and random number of younger women being screened, a massive failure to screen older women who are at significantly greater risk, and the scandal of women who were not told that their smear looked malignant until it was too late for treatment.

But if a comprehensive screening programme could save lives on the scale that other nations have achieved, why should we be concerned about what causes cervical cancer in the first place? The answer is twofold: first, being diagnosed as having a pre-cancerous smear is distressing and treatment has personal and financial costs, so knowing more about causation could decrease the number of women affected; and second, the incidence of the disease has taken a worrying upturn in recent years, and if this is to be halted we need to know why it has occurred.

The age-group most at risk are between 45 and 64 years of age, but the doubling of deaths in the last 10 years

Social Side of Cancer

Cancer of the cervix is largely preventable, argues **Basiro Davey**. And its causes are more social than sexual

'Cancer cells have the additional property of being able to migrate through healthy tissue, and enter the blood stream*'



among younger women has provoked news stories about a virulent new sexually-transmitted infection spreading through the promiscuous young women of the 'pill' generation and catching up with them in their thirties. Media hype has simply ridden on the back of official statements. For example: 'The two earlier peaks (in mortality) correspond with the times when the relevant generations of young women experienced freer sexual relationships - during the two world wars - and the recent steep upward trend corresponds with a further recent profound change in sexual behaviour.' (from *Trends in Cancer Mortality, 1951-1980*, Government Statistical Service, 1983). Recent research showing that prognosis is better in younger age groups should do much to allay fears that a new, more aggressive form of cervical cancer has developed in young women.

So what is the evidence that having several heterosexual partners has anything to do with the transformation of normal cervical cells to the malignant state? Most of the evidence that we have about the underlying causes of cancer of the cervix has been supplied by epidemiology rather than by biological science.

Epidemiologists collect national and local data about the incidence of a particular condition and then attempt to locate statistically-significant *associations* between the disease and demographic features of affected people such as age, social

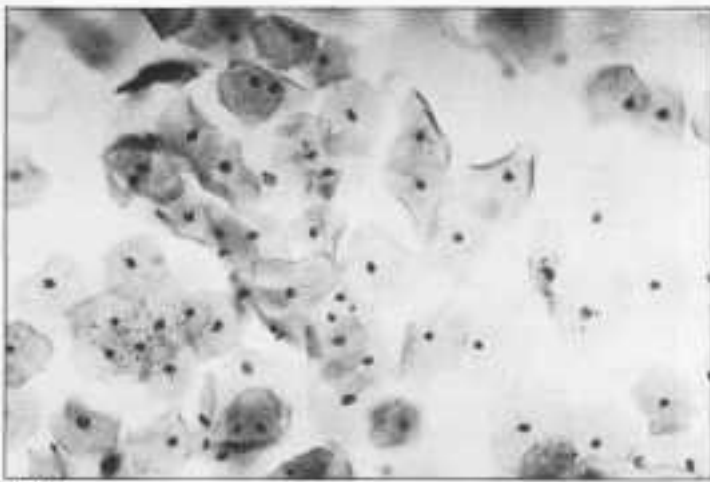


Figure 1

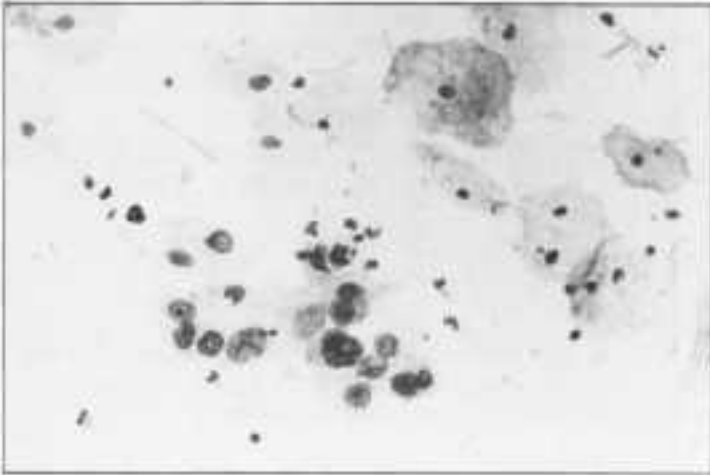
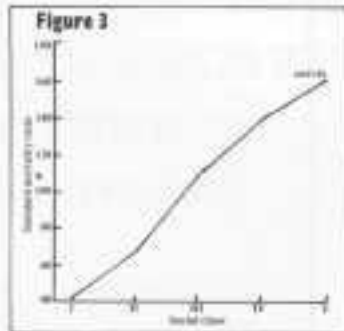


Figure 2

Figure 1: Cells from a healthy cervical smear magnified about 200 times. The regular polygonal shape of the cells and the small dark central nucleus are characteristic of this cell type.

Figure 2: Cells on the lower left of this smear have a characteristic malignant appearance; they are smaller and irregular in shape, and the nucleus takes up a very large proportion of the volume of the cell.

Figure 3: Mortality from cancer of the cervix among married women in England and



Wales in 1971, by their husband's occupational social class (OPCS, 1978).

'It may well be that a virus will be identified as a major cause of cervical cancer - but in 1988 the jury is still out'



fied in unequivocal association with cervical cancer. Several studies have found increased incidence of herpes simplex virus or papilloma viruses (which cause genital warts) in cells taken from cervical cancers, but the results are not conclusive since these viruses cannot be found in all affected women and their presence in others could be coincidental rather than causal. It may well be that a virus or combination of viruses will be identified as a major underlying cause of cervical cancer - but in 1988 the jury is still out.

The interest among social researchers in *women's* sexual behaviour goes back a long way. It is no surprise therefore that women presenting for cervical smear tests have been increasingly subjected to questioning about their sexual activity since the late 1970s, some of it with moralistic overtones. Much distress has been caused to women who had changed sexual partners frequently at the implication that they were to blame for their cancer, and much bewilderment to women who had kept a single partner and yet somehow got the message that they could not be telling the truth. It was not until 1981 that the results of a carefully controlled study showed that the number of sexual partners of *husbands* prior to and during marriage was a significant risk factor for affected women who had themselves reported no other sexual partner.

But the focus on the sexual behaviour of either partner draws attention away from the single most important feature of the epidemiology of cervical cancer - its profound association with social class (figure 2). No other cancer has such a steep class gradient, with women in social class 5 (using the Registrar General's classification) being four times more likely to die from cancer of the cervix than women from social class 1. How can this be explained in terms of promiscuity? No study has shown that working-class women and men are more likely to have many sexual partners. It has been argued by Victoria Gillick and others that the contraceptive pill is to blame for the increase in cervical cancer, but working-class women are more likely to use barrier methods of contraception than the supposedly liberating pill. In fact the small increase in cervical cancer detected among pill-users is *independent* of the number of sexual partners, indicating that the pill may have some chemical effect on the cervix which promotes cancer.

Two other factors have been shown to be associated both with social class and the incidence of cancer of the cervix - one is the tendency to smoke, and the other is the husband's occupation. Working-class women are more likely to smoke than women who are better off, and women who smoke are about seven times more likely to develop the

class, behaviour, occupation and so on. Epidemiological data therefore works at the level of the population rather than the individual, and can never provide conclusive proof of causation in a given person. Following on from anecdotal observations by 19th century doctors that celibate women rarely developed cancer of the cervix, epidemiological research showed that women with the disease had, on average, begun sexual intercourse at an earlier age and had experienced more male sexual partners than women in the same age-group whose cervix was normal. This finding, coupled with the trends over time cited above which

showed peaks after both world wars and again since the 1960s (supposedly encouraged by oral contraceptive pill), indicated that some aspect of sexual behaviour might be implicated in the events that triggered the condition.

In order to qualify unequivocally as a sexually-transmitted disease, an infectious agent must be isolated and identified as causing malignant transformation of cervical cells. Unlike the undisputed sexually-transmitted infections such as gonorrhoea and syphilis (which are caused by bacteria), and genital herpes and aids (caused by viruses), no infectious micro-organism has been identi-

disease than women who do not, regardless of any of the sexual risk factors. This indicates that smoking may have an independent carcinogenic action. This was lost on Albert Singer, senior gynaecologist, who wrote in 1983: 'It has been argued that the risk is not the direct effect of tobacco usage but possibly a reflection of the underlying sexual behavioural characteristics of women who are heavy smokers'. Back to the bedroom!

Finally, we come to the most submerged data of all - those figures that implicate industrial pollutants to which women are exposed either in the course of their own occupation or, more probably, brought home to them on the body and work clothes of their husband. In 1982, Jean Robinson, an independent researcher, gave evidence to the Royal College of Obstetricians and Gynaecologists that there was an association between the incidence of cervical cancer and the employment of the husband of affected women in a dirty, dusty job. As Robinson wrote in *The Times Health Supplement* (Nov 27, 1981): 'The typical victim is not a bright young career girl who had her fun and is now paying for it, but an elderly woman who lived for much of her life in a house without a bathroom and was married to a man who came home in dirty overalls.' If the primary cellular assault is indeed delivered by a purely chemical agent, for example a heavy

metal ion, the implications for health and safety at work are considerable and enormously costly. Far more acceptable to those who would have to finance better protection and washing facilities in the workplace would be a theory based on sexual misbehaviour by unhygienic men and women. Indeed, it has been pointed out that several of these so-called dirty, dusty jobs involved the men in long periods away from home, thereby offering ample opportunity for casual sexual contacts.

Robinson's research was buried until last year when the Office of Population Censuses and Surveys (OPCS) published its Decennial Supplement on Occupational Mortality, which examined husbands' occupations and found that there was a 'clear association of low ratios (of cervical cancer mortality) with non-manual work ... and high ratios with manual work (notably metal workers and building labourers)'. The OPCS report repeated earlier assumptions that the high rates among the wives of manual workers whose occupations involved absence from home was likely to be due to their husbands' sexual behaviour, but also noted that 'the relative cleanliness of an occupation may be a factor'. The fact that servicemen, deck and engine-room hands, bargemen and bus, coach and lorry drivers all stay away from home should not obscure the fact that all of these occupations also involve

prolonged contact with the oils, greases and metal dust associated with engines and machine tools.

We don't yet know with any degree of certainty what causes cancer of the cervix, despite the almost united medical and media message that promiscuous sexual behaviour is transmitting a carcinogenic virus. Certainly, much of the epidemiological evidence is consistent with the view that sexual intercourse introduces some causative agent (or most probably more than one) into the vagina - but one of these externally introduced agents may be industrial in origin, and other promoting factors such as oral contraceptives or cigarette smoking may be necessary before the final 'insult' tips the balance and a cervical cell becomes malignant. Until we know more about causation we won't be able to prevent new cases of the disease, or target screening programmes effectively. Moreover, we still have no data at all to help us unravel those concomitants of poverty such as physical or financial access to a daily bath or shower, a washing machine and a change of clothes after work which may be necessary social conditions for cervical cancer to flourish. Publicising cancer of the cervix as a venereal disease can only further deter those women from attending screening clinics who are already most at risk and whose access is limited by inadequate financial and educational means.

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