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HEALTH HAZARDS OF CIGARETTE SMOKING

CURRENT POPULAR BELIEFS

BY

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If any serious attempt is to be made to bring about a voluntary reduction in cigarette consumption, it is of some importance to have reasonably reliable information on the extent to which the risks of smoking are recognized by members of the general public. This paper, based upon sample interview surveys carried out in Edinburgh, describes the nature of current attitudes and beliefs on this subject and attempts to trace the pattern of their distribution in the community.

The information was collected in the course of an inquiry into the effectiveness of a health education campaign concerned with the dangers of cigarette smoking. This campaign, which was organized by the Edinburgh City Corporation, began early in 1959 and its first phase had been completed by April. The research inquiry was made up of two parallel surveys, carried out respectively before (November, 1958) and after (May, 1959) the campaign, so that a comparison of the two sets of results would give some indication of the extent to which habits and beliefs had been modified during the course of the campaign. Certain questions were asked only in the first survey and some only in the post-campaign interviews, but most were asked on both occasions. In the tables which follow, we shall therefore be dealing sometimes with the results of one or the other survey, and sometimes with a combination of the two; but the findings of the two surveys have been combined only when the differences between them were statistically insignificant.

METHOD

Two samples of names were drawn from the Edinburgh Electoral Register. A two-stage sample design was used, six of the 23 wards of Edinburgh being chosen systematically when the wards had been ranked according to an index of housing conditions.‡ Two sets of 130 names were then drawn from the Electoral Register of each of the six wards, and in this way two samples of 780 were made up. The outcome of our attempts to interview the members of the two samples in their homes is shown in Table I.

TABLE I

SAMPLE ACHIEVED AND REASONS FOR FAILURE

Month		November	May
Interviewed		590	596
Died		11	10
Removed		74	66
Other Failures:	Temporarily away	34	46
	Too ill, old, deaf	27	15
	Unable to contact	8	18
	Refusal	36	31
Total		780	782

Ten per cent. of the people originally chosen from the electoral register had died or removed. If these

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‡ The percentage of the population living two or more per room This was available from the 1951 census.

are excluded, on the grounds that they were no longer available for interview, the success rate becomes 85 per cent. and the proportion of refusals 5 per cent.

Beliefs About Smoking and Lung Cancer

The principal focus of interest in this inquiry was on popular attitudes and beliefs concerning smoking as a cause of lung cancer. In the interview, however, this central issue was approached indirectly. The first relevant question was asked only of those members of the sample who at the period of the interview were smoking regularly. They were asked whether they would like to give up smoking if they could do so easily, and if so for what reason. More than two-fifths of all the smokers admitted that they would be glad to give up the habit if this could be achieved effortlessly, and among their reasons the expense of smoking ranked highest; this was mentioned by two-thirds of those concerned, while only 3 per cent. referred to a fear of cancer and over one-quarter gave some other health reason.

Those of our informants who had ever smoked regularly were also asked whether they thought that smoking affected or had affected their health in any way. As many as one in three of those smoking at the present time believed that their health had been affected; this belief was shared by half of those who had given up the habit. Perhaps surprisingly it was the younger men who were the more likely to hold this view, the proportion who claimed that smoking had harmful effects on their health declining from one-half of the men below the age of 35 to one-quarter of those aged 55 or more. The conditions most frequently mentioned were breathlessness and cough, each specified by between one in seven and one in eight of those who had ever smoked.

If a substantial minority of smokers believes smoking to have been personally harmful, a very large majority of both smokers and non-smokers expressed the view that smoking might affect the health of *other* people; respiratory symptoms were most frequently referred to, and cancer was mentioned by only one in nine. It is worthy of note that two-thirds of all those who believed that smoking could affect health spontaneously attached some qualification to their reply—the most common being "if the person is a heavy smoker".

Although only 11 per cent. of our informants mentioned cancer spontaneously as a possible consequence of smoking, all but 2 per cent. of them had heard or read of the theory that there was a causal relationship. In view of the fact that it is quite common for 20–30 per cent. of the general public to be wholly unaware of major current political issues, this figure does represent a remarkable degree of public awareness.

It by no means follows however, that acceptance of the theory is equally widespread. When the members of our sample were asked to give their own views on the subject, all shades of opinion arose, from those who believed implicitly that cigarette smoking was causally related to lung cancer, to those who disagreed strongly. An attempt was made to assess some of the qualifications and doubts which arose, and the replies were classified as follows:

Reply	Per cent.		
Agrees—smoking can cause cancer—unqualified	19		
Agrees—smoking can cause cancer—if heavy smoker or smoked for long time	11	33	52
Agrees—smoking can cause cancer—if inhales	1		
Agrees—smoking can cause cancer—if prone or disposed to chest conditions	2		
Thinks may be true—"there may be something in it"		19	
Doubtful—thinks probably untrue—occurs as often in people who don't smoke	7		
Disagrees	18	25	
No opinion, open mind, cannot decide		23	
Sample (=100 per cent.) November and May		1,186	

People who smoked were more inclined to discount the theory that smoking could cause lung cancer than those who did not. The proportions who either denied or at least questioned the existence of an association were one-third of the smokers, one-fifth of those who had smoked in the past and no longer did so, and one-sixth among those who had never smoked. The relationship between smoking habits and beliefs is shown in Table II (overleaf).

We have shown elsewhere that there is a definite correlation between smoking habits on the one hand

TABLE II

RELATIONSHIP BETWEEN SMOKING HABITS AND BELIEFS ABOUT SMOKING AS A CAUSE OF CANCER AS PERCENTAGE OF SAMPLE

Smoking Habits	Smokes Now	Smoked Formerly	Never Smoked Regularly
Agreement that smoking can cause cancer: unqualified	13	26	26
Agreement that smoking can cause cancer: if heavy smoker	11	10	11
Agreement that smoking can cause cancer: if inhales	1	2	1
Agreement that smoking can cause cancer: if prone to chest trouble	1	3	2
Open mind—may be true—"there may be something in it"	19	23	19
Doubt—probably untrue	9	4	6
Disagreement	23	16	11
No opinion—cannot decide	24	16	25
Sample (=100 per cent.) November and May	627	115	444

and occupational class and level of educatior on the other. (Cartwright, Martin and Thomson 1959). Is it not possible that the greater readiness of non-smokers to accept the belief that cigarette smoking is a potent cause of lung cancer is primarily a reflection of the fact that their average levels of education and of employment are rather higher than those of smokers? Middle-class people are in fact more receptively disposed towards theories bearing a scientific or medical hallmark, but our present data confirm that the individual's smoking habits exercise an independent effect upon his judgement of this particular theory. Thus, of the smokers in white-collar occupations one in three accepts with or without qualification the view that cigarette smoking can cause lung cancer, while almost half the non-smokers of comparable occupational level share this opinion. Only 11 per cent. of the smokers in semi-skilled or unskilled employment fall into this category, compared with 22 per cent. of the non-smokers of similar occupational status.

The frequent references made in the first phase of our inquiry to the risks particularly associated with "heavy smoking", with the implication that there existed something in the nature of a critical level of cigarette consumption below which the risk of lung cancer was negligible, led us in planning the second stage to try to find out where the dividing line was drawn—what in fact was believed to constitute "heavy smoking". The results of this attempt are set out in Fig. 1, and Fig. 2 (opposite), where they are shown separately for groups of different smoking habits.

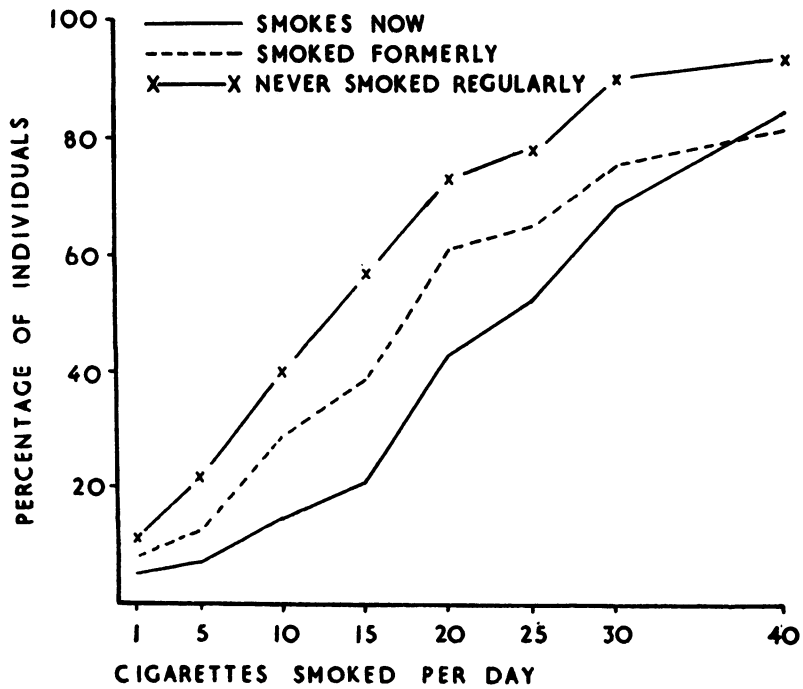

FIG. 1.—Supposed level at which danger of lung cancer starts, in terms of cigarettes smoked per day, according to current smokers, former smokers, and non-smokers.

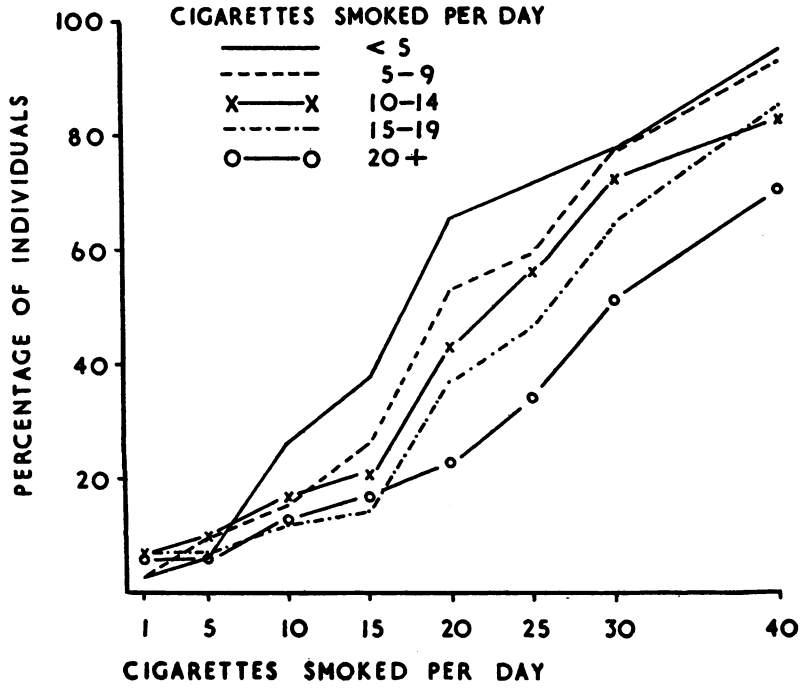

FIG. 2.—Supposed level at which danger of lung cancer starts, in terms of cigarettes smoked per day, according to current smokers.

The boundary between safety and danger was most commonly placed in the region of 20 cigarettes a day; half of all the people interviewed thought that no risk of lung cancer was incurred as long as 20 or fewer cigarettes a day were smoked. The line was not drawn in precisely the same place by smokers and non-smokers alike. Current smokers were likely to be more optimistic, and to assume that danger was first encountered in the region of 25–30 cigarettes a day, while those who had never smoked were more often inclined to think of a daily consumption of 15 cigarettes as borderline; people who had at one time smoked but had since given up the habit occupied an intermediate position. Fig. 2, which includes only current smokers, shows how sharply "light" smokers differ from "heavy" smokers in their notions of what constitutes a dangerous level of tobacco consumption. The most marked disagreement concerns the risk associated with smoking 20–25 cigarettes a day. Thus only one in five of the people who themselves smoke 20 cigarettes a day is prepared to believe that a risk of lung cancer is incurred at this rate, but the danger is conceded by twice as many of those whose daily consumption is 10–14 and three times as often by the lightest smokers (less than 5 a day).

BELIEFS ABOUT OTHER HEALTH HAZARDS OF SMOKING

A fairly widespread reluctance to believe that smoking and lung cancer might be causally connected did not imply a general refusal to recognize possible harmful consequences of smoking. We have already mentioned the rather surprisingly high proportion of people who claimed that smoking had adversely affected their health, and we now consider the views popularly held on the relations between smoking and particular conditions. As Table III (overleaf) shows, of nine conditions asked about specifically only rheumatism was almost universally believed not to be more common among smokers than non-smokers. Smoking was admitted as a cause of cough and of breathlessness by a large majority of the sample, and as a cause of bronchitis and catarrh by nearly half. One person in three believed that indigestion, stomach ulcer and tuberculosis occurred more commonly among smokers.

In contrast with views on lung cancer, differences

TABLE III

CONDITIONS BELIEVED TO BE CAUSED AND/OR AGGRAVATED BY SMOKING, AS PERCENTAGE OF SAMPLE

Condition	Opinion	Thought to be Caused by Smoking	Thought to be Aggravated by Smoking
Breathlessness	Yes	69	88
	No	18	7
	Don't know	13	5
Bronchitis	Yes	48	88
	No	35	6
	Don't know	17	6
Catarrh	Yes	43	73
	No	36	17
	Don't know	21	10
Cough	Yes	89	93
	No	7	4
	Don't know	4	3
Heart Diseases	Yes	18	46
	No	51	33
	Don't know	31	21
Indigestion	Yes	31	49
	No	48	36
	Don't know	21	15
Rheumatism	Yes	2	13
	No	73	67
	Don't know	25	20
Stomach Ulcer	Yes	32	61
	No	47	26
	Don't know	21	13
Tuberculosis	Yes	30	69
	No	46	19
	Don't know	24	12
Sample (=100 per cent.) November		590	

TABLE IV

RELATIONSHIP BETWEEN SMOKING HABITS AND BELIEFS ABOUT SMOKING AS A CAUSE OF VARIOUS ILLNESSES, AS PERCENTAGE OF SAMPLE

Conditions from which smokers are more likely to suffer	Opinion	Smoking Habits		
		Smokes Now	Smoked Formerly	Never Smoked Regularly
Breathlessness	Yes	71	82	63
	No	19	13	17
	Don't know	10	5	20
Bronchitis	Yes	42	65	53
	No	40	22	30
	Don't know	18	13	17
Catarrh	Yes	42	50	41
	No	42	30	30
	Don't know	16	20	28
Cough	Yes	88	82	92
	No	8	13	4
	Don't know	4	5	4
Heart Disease	Yes	18	22	19
	No	56	38	46
	Don't know	26	40	35
Indigestion	Yes	32	26	29
	No	52	49	43
	Don't know	16	25	28
Rheumatism	Yes	3	3	1
	No	77	70	68
	Don't know	20	27	31
Stomach Ulcer	Yes	29	43	33
	No	54	43	37
	Don't know	17	13	30
Tuberculosis	Yes	24	45	36
	No	56	33	35
	Don't know	20	22	29
Sample (=100 per cent.) November		313	60	217

of opinion between smokers and those who had never smoked were not on the whole very striking, and in those instances where non-smokers differed they were less likely to insist on the harmful effects of smoking than to have no opinion on the matter (Table IV). The group of people who had smoked regularly in the past, but had since given up the habit was of particular interest. It did not lie mid-way between the other two groups, but contained a relatively high proportion who believed that smoking could cause breathlessness, bronchitis, catarrh, stomach ulcers and tuberculosis. It would seem that belief in and/or experience of these associations may be more likely to induce people to give up smoking than a knowledge of the association between cigarette smoking and lung cancer.

We asked also whether, given that an individual suffered from one of the conditions listed above, smoking would be likely to make the condition worse and found a very marked acceptance of the belief that smoking aggravated certain symptoms and diseases. Half of the sample believed that smoking could cause bronchitis or catarrh, but nine-tenths and three-quarters respectively thought that smoking would tend to aggravate them. Between 60 and 70 per cent. agreed that tobacco might be harmful to a sufferer from stomach ulcer or tuberculosis, and nearly a half held similar views on heart disease and indigestion.

ATTITUDES TOWARDS RESTRICTIONS ON SMOKING

It has been suggested from time to time that more widespread restrictions might be imposed on smoking in public places. What measure of public support would such proposals command? As Table V (opposite) shows, attitudes vary widely, and differences of opinion between smokers and non-smokers, though always marked, are less striking than the variations in attitude associated with different places. Thus nearly four-fifths of the entire sample, including 72 per cent. of the regular smokers, were in favour of a ban on smoking in cinemas. At the other extreme, less than one-eighth of all our informants favoured a similar ban in public houses, and only about one-fifth of those who had never smoked regularly and a very much smaller

TABLE V

ATTITUDES TOWARDS BANS ON SMOKING, AS PERCENTAGE OF SAMPLE

Places where Smoking might be Banned	Opinion	Smoking Habits			
		Smokes Regularly	Smoked Formerly	Never Smoked Regularly	All Subjects
Cinemas	For ban ..	72	89	87	80
	Against ban	20	5	5	13
	Immaterial	8	5	8	7
Theatres	For ban ..	69	82	83	76
	Against ban	20	7	7	14
	Immaterial	11	11	10	10
Buses ..	For ban ..	50	59	58	52
	Against ban	31	20	21	26
	Immaterial	19	20	20	20
Restaurants	For ban ..	43	54	64	53
	Against ban	42	22	22	32
	Immaterial	15	24	13	15
Private Offices	For ban ..	23	24	34	27
	Against ban	32	20	21	27
	Immaterial	45	56	44	46
Public Houses	For ban ..	8	5	19	12
	Against ban	68	42	33	52
	Immaterial	25	53	48	36
Sample (=100 per cent.) May		314	55	227	596

proportion of those who had given up the habit supported the idea of such a restriction. On the other hand, although two-thirds of the regular smokers expressed themselves as positively opposed to a ban on smoking in public houses, the non-smokers, who were more likely to be either non-drinkers or only occasional drinkers, were more often indifferent. The suggestion that smoking in theatres might be banned received only slightly less support than the corresponding proposal for cinemas, and was not more frequently opposed. It is perhaps surprising that half the regular smokers as well as about three-fifths of the non-smokers were in favour of prohibiting smoking on buses, and that almost as many smokers were well disposed towards the idea of a similar ban in restaurants. This last proposal revealed the largest measure of disagreement between smokers and non-smokers; the conclusion of a meal is of course one of the most favoured occasions for smoking, while the association of food and tobacco smoke is one that non-smokers seem to find particularly distasteful. Only a minority of our informants, whatever their own smoking habits, expressed support for the suggestion that smoking might be restricted in private offices; almost half the entire sample, however, had no definite opinion on the subject.

It would seem then that—to the extent that Edinburgh provides a representative sample of the general population—there might well be some scope for the introduction of restrictions on smoking in public places which would not give rise to widespread objections. The attitudes which underlie public readiness to accept such limitations should not however be misinterpreted. Bans on smoking are not generally seen as a means of trying to reduce, however slightly, the level of tobacco consumption; they are favoured mainly because smoking is believed to create a "dirty" or "stuffy" atmosphere, or to be in other ways mildly offensive to non-smokers.

By contrast, there would in the present state of public opinion be comparatively little support for more drastic political measures aimed at discouraging tobacco consumption. Asked whether they thought that the advertising of cigarettes and tobacco should be prohibited by law, only 19 per cent. of our sample expressed approval of the suggestion. Almost all our other informants—including a large majority of non-smokers—opposed the idea. Similarly, when asked whether the Chancellor of the Exchequer should increase the duty on tobacco, lower it, or leave it at its present level, only 16 per cent. of the sample voted for an increase. There was naturally a division of opinion between regular smokers (only 9 per cent. of whom supported this proposal) and the others, but even among those who had never smoked support for an increase in duty was expressed by only three in ten. These views are consistent with the attitudes expressed concerning the restriction of smoking in public places. It is obviously thought reasonable to curb smoking in circumstances where it may prove mildly injurious or distasteful to many non-smokers; but the personal health of the smoker does not enter into consideration, and there is no enthusiasm for more extreme measures directed at persuading smokers to give up or reduce smoking in their own interests.

DISCUSSION

Perhaps the most interesting aspect of these findings is that "anti-tobacco" attitudes are widespread in the general population and are by no means uncommon among smokers. The belief that smoking was potentially harmful to health was widely held, and its influence on respiratory conditions was particularly stressed; as many as one-third of all current smokers believed, rightly or wrongly, that their own health had been adversely affected; and there was a considerable measure of support for suggestions that smoking in certain public places might be restricted. These attitudes however are quite independent of any views on smoking as a possible cause of lung cancer. Many people who

believe that smoking causes or exacerbates cough, breathlessness, bronchitis and so on are unconvinced that smoking plays a large part in the aetiology of lung cancer, or even reject the theory outright. The man in the street is familiar with the commonplace, everyday illnesses and symptoms, and believes that he can understand their causation. Lung cancer is by comparison rare and hedged about by taboos; since it is known to carry a very high fatality rate, theories which impose a major responsibility for its causation upon the individual, as distinct from forces outside his control, are more likely to provide a reaction of denial and rejection. Views on the relation between smoking and lung cancer are, to a far greater extent than views on the other health hazards of smoking, a function of the smoking habits of the individual. The tendency to adjust one's beliefs so as to exonerate one's own behaviour is shown not only in the distribution of attitudes to the cigarette smoking—lung cancer hypothesis, but also in the common view that only heavy smoking was dangerous, with heavy smoking being defined as a level of consumption one step higher than one's own.

From the point of view of health education, it may be appropriate to draw the conclusion that a frontal attack on smoking habits based on pointing out their carcinogenic effects is misconceived. As we have shown both here and on a previous occasion (Cartwright and Martin, 1958) almost all members of the general public are aware of the hypothesis, and it is doubtful whether mere reiteration will make it more acceptable. But for every man or women who has given up smoking because of a fear of lung cancer, eight have given it up on other health grounds, and the suggestion is perhaps worth considering that a long-term campaign aimed at driving home the minor health hazards of smoking—which are rarely denied, do not evoke powerful emotions, and which many current smokers are prepared to admit that they have experienced—might prove more effective than one concerned solely with the risks of malignant disease.

SUMMARY

In connexion with the evaluation of a local authority health education campaign in Edinburgh, two parallel sample interview surveys were carried out, in November 1958 and May 1959. The samples, drawn from the electoral register, consisted of 780 and 782 adults respectively. Five hundred and ninety interviews were carried out in the first survey and 596 in the second. Death and removal together accounted for 161 of the 376 losses, temporary absence for 80, and refusal for 67.

One-third of current smokers, and one-half of former smokers, believed that smoking had affected their own health adversely. It was very generally agreed that smoking—or at any rate heavy smoking—was potentially harmful to health. Smoking, it was widely agreed, might cause breathlessness, cough, catarrh and bronchitis, and might aggravate these conditions as well as tuberculosis and stomach ulcer.

98 per cent. of those in the sample had heard of the theory linking smoking with lung cancer, but only 19 per cent. accepted it without qualification. Another third of the sample partially accepted the theory, and about half either rejected it or had formed no opinion on the subject. Acceptance of the theory was shown to be related independently to personal smoking habits and to occupational class. It was commonly believed that no risk of lung cancer was incurred as long as 20 or fewer cigarettes a day were smoked. However, the danger line was drawn at a higher level of consumption by smokers than by non-smokers; and when only current smokers were considered, it was found that they tended to believe that smoking only became "dangerous" when one smoked rather more than themselves did.

Substantial majorities of both smokers and non-smokers favoured the banning of smoking in cinemas and theatres, and about half the sample approved the idea of similar restrictions in buses and in restaurants—though with a fairly marked difference of opinion between smokers and non-smokers on the latter point. There was only minority support for a ban on smoking in private offices, and only one in eight thought that a similar ban should be imposed in public houses. Similarly, there was little enthusiasm, even from non-smokers, for the suggestions that advertising of cigarettes might be prohibited or that the duty on tobacco might be increased.

The implications of these findings for health education are discussed.

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REFERENCES

Cartwright, A., and Martin, F. M., (1958). *Brit. med. J.*, 2, 592.
——, ——, and Thomson, J. G. (1959). *Lancet*, 2, 725.