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Target Audience Penetration by a Healthy Lifestyle Promotion Programme: Results From The Kilkenny Health Project*

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Abstract: Between 1985 and 1992 County Kilkenny was the site of an evaluated programme of community intervention which aimed to reduce the population's heart disease burden by promoting the adoption of a healthy lifestyle. This paper analyses data on public awareness of the Kilkenny Health Project's activities collected in a 1990-91 evaluation survey. The implications of the findings for healthy lifestyle promotion programmes supporting the achievement of the targets set in the recently unveiled national health strategy are discussed.

I INTRODUCTION

Epidemiological research has shown that the risk of developing heart disease or cancer — which, along with accidents, are the major causes of premature death in Ireland — is closely related to the composition of a

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population's diet, its smoking prevalence, its alcohol consumption and its levels of physical exercise. Thus health-enhancing changes in currently prevailing lifestyles hold out the prospect of a significant reduction in the present burden of limiting illness and premature death. The achievement of such potential health gains is the overall objective of the recently unveiled national health strategy (Department of Health, 1994), which sets medium-term targets for reductions in the rates of the three main causes of premature mortality and identifies six key areas — smoking; alcohol; nutrition and diet; cholesterol and blood pressure; exercise; causes of accidents — on which health promotion programmes will focus.

While some changes in the social environment — such as increased restriction of smoking in the workplace — are envisaged, the successful achievement of the national health strategy's targets appears to be primarily dependent on the widespread adoption of a more healthy lifestyle within the population in response to the stimulus of public communication campaigns. The theory, practice and evaluation of such campaigns has given rise to an extensive international literature. But, while this is undoubtedly a valuable source of generalised guidance for campaign planning in an Irish context, planners also need to take into account the specificity of the national-state structures through which communication will be channelled to an Irish public. The pattern of health promotion initiatives in the USA, for instance, strongly reflects the availability of Public Service Announcement time on radio and television which stations are obliged to donate free of charge in order to meet the licensing requirements of the Federal Communications Commission: Irish health promotion enjoys no similar facility. Virtually universal registration and a high level of regular consultation with general practitioners (GPs) providing medical care free of charge to all underlies the strong UK emphasis on general practice as a base for health promotion initiatives. In the Republic of Ireland the population is segmented into those entitled to free GP care and those who are not: the two groups vary markedly in consultation frequency and only the former are accounted for by a registration system. The school systems of different countries all contain a potential captive audience for health education but between these systems there are major differences in management structure, curriculum content and value orientation which may facilitate or restrict opportunities for health communication with pupils.

A small Irish health communication literature, internally fragmented by the prevalence of a tight focus on particular advertising campaigns or school/parent programmes, has, however, left the Irish structural specificities largely unexplored to date. The Kilkenny Health Project was a multi-faceted intervention programme which operated at the local community level of a

county between 1985 and 1992. Data collected in the course of its evaluation provide an opportunity to examine how public awareness of the output of health promotion messages the project disseminated through the simultaneous use of a range of channels of communication was created. In this article these data are analysed and the implications of the findings for the targeting of the communication campaigns that support the current national strategy are discussed.

II THE KILKENNY HEALTH PROJECT: EVALUATION DESIGN AND CHANGE PROCESS MODEL

The Kilkenny Health Project was designed as a quasi-experiment in which a "treatment" community receiving an intervention programme (Kilkenny) is compared with a similar "control" community which was not exposed to the intervention (Offaly). Data were collected in both of the communities, principally through disease registers and through baseline (pre-programme) and termination (post-programme) surveys. A period of five years intervened between the baseline and the termination surveys (O'Mahony, Conroy, Shelley, *et al.*, 1991; Shelley, Daly, Graham, *et al.*, 1991; Murray, 1992).

Within this design net change — that is, the change in the treatment community over the period of the programme net of the change in the control community over the same period — is the key outcome evaluation measure. Change within the control community represents the amount of change occurring without any special intervention being undertaken: the additional change (if any) that remains in the treatment community after this "secular" component is netted out constitutes what can be specifically attributed to the intervention programme. Effective intervention is expected to show a pattern of statistically significant net change across its evaluated outcomes.

The planned setting in motion or speeding up of a process of widespread behaviour change within the community is envisaged as having a number of distinct stages. It begins with creation of awareness and transmission of information in order to build up motivation for change. Next altered behaviour patterns are adopted and maintained. This should feed into changes in the prevailing levels of disease risk factors which should translate over time into lower morbidity and mortality rates. It is recognised that the realisation in practice of the logical progression of this change process model may well encounter blockages. The development of personal skills and the creation within the community's culture and physical environment of supports for the adoption and maintenance of behaviour change are seen as being crucial constituents of interventions with the capacity to overcome such blockages (Kilkenny Health Project, 1986, pp. 16-19).

In this article the focus is on awareness generation and the channels through which the special stimulus of the intervention programme was communicated. The data presented therefore refer only to the treatment community, Kilkenny. Other data from the evaluation surveys provide the basis for net change comparisons to be made between Kilkenny and Offaly in relation to public knowledge concerning coronary heart disease, lifestyle behaviours and major coronary heart disease risk factor levels. Preliminary descriptive comparisons between the counties across this range of outcomes have been published and a paper which takes the penultimate stage in the envisaged change process — shifts in risk factor levels — as its analytical focus is in press (Kilkenny Health Project, 1992; Shelley, Daly, Collins, *et al.*, forthcoming). Although an initial stage outcome, awareness generation is one that also merits serious attention. An intervention's feasibility should be demonstrated rather than presumed and there is a strong emphasis in recent contributions to the literature on community health promotion programme evaluations on the need for "dose" of intervention exposure information to provide the context within which a treatment community's response is appraised (WHO Regional Office for Europe, 1988, p. 24; Flora, Lefebvre, Murray, *et al.*, 1993; Pirie, Stone, Assaf, *et al.*, 1994).

III THE KILKENNY HEALTH PROJECT: COMMUNICATION INITIATIVES

Supported by funding from government sources and from the Irish Heart Foundation, the Kilkenny Health Project was initiated with the aim of reducing heart disease among the people of County Kilkenny by promoting community-wide adoption of a healthy lifestyle. The choice of Kilkenny as the intervention programme's host was influenced by a number of factors. The county has a history of community development and is well known for its civic spirit and county pride. There is a mixture of urban and rural communities in the county. It was accessible to the academic and other national institutions whose support for the development and evaluation of programmes was needed. The South Eastern Health Board, within whose region Kilkenny is located, were willing to collaborate with the Project.

Within Kilkenny, Project intervention took a wide variety of forms, spanning innovations in the ways in which health services are provided, courses for adults and young people within the educational system, contact with community groups and use of mass communications media. Within the health sector, the Project directly provided a dietitian counselling service to which clients were referred by general practitioners. It organised group work skills training for Public Health Nurses and other professionals. It also co-

ordinated a programme of free health check-ups carried out by general practitioners which was initially offered to all Kilkenny residents in their 40s and was extended, after two years in operation, to those in their 30s.

Two rounds of visits to all of the county's primary schools distributing informative games and posters were undertaken by the Project's Education Officer and its mascot, Benjy the cat. The Project also adapted a US primary school programme *Race to Health* and facilitated its introduction into Kilkenny schools. At second level it offered support for the provision in Kilkenny schools of an Irish-devised, junior cycle lifeskills programme, *Learning for Life*. Cookery demonstrations organised by Project staff were initially offered as part of the adult education programme of the Kilkenny Vocational Education Committee (VEC): later the Project developed *Look Good, Feel Good* classes, combining an exercise session with discussion of a health-related topic, and introduced these as a programme option. During the course of the Project speakers gave lectures and talks to a wide range of Kilkenny community groups. In conjunction with the Irish Countrywomen's Association (ICA) meetings were held for all the parishes in the county during the Project's first two years.

In the communications media field the Project from the outset established links with the local press. In November 1985 a "Healthy People" column was initiated in the weekly *Kilkenny People* newspaper. Articles on healthy eating were also regularly placed in the *Kilkenny Standard* after its appearance on the scene in 1989. In May 1986 the Project launched its own free newsletter *CATCH*, of which three issues were usually produced each year. *CATCH* was distributed with the *Kilkenny People* and was also available through outlets such as doctors' surgeries and local health centres. With the advent of licensed local radio broadcasting, Project staff became regular contributors to a lunchtime chat show on *Radio Kilkenny*. The Project also devised a series of information leaflets on coronary heart disease risk factors, produced videos on how to make healthy food choices and published its own cookbook. Competitions and features in *CATCH* dovetailed with the distribution of materials in schools while video showings structured a second round of intensive contacts with community groups during the final two years of the evaluation period. Communicating intervention programme messages through channels accessible to both Kilkenny and Offaly risked "contaminating" the quasi-experiment by exposing the control community to the intervention. This consideration led the Project to initially adopt a policy of not actively seeking the attention of the national level broadcasting and print media. Over time this policy was relaxed somewhat (Kilkenny Health Project, 1986; 1987; 1989; 1990 and 1992).

IV THE IMPACT OF THE COMMUNICATION INITIATIVES IN COUNTY KILKENNY: SURVEY METHODS

A set of questions about knowledge of the Project and the channels through which this had been acquired were included in the termination survey carried out in County Kilkenny in 1990-91. The sampling frame, from which a sample of names and addresses was drawn, was the Register of Electors. This is an annually revised listing of all those eligible to vote in local, national or European elections. The sampling was performed using the RANSAM computer programme (see Whelan (1979) for a detailed description) which implements a multi-stage random sample incorporating both stratification and clustering, and giving each individual on the register an equal probability of being selected. A detailed study of the quality of the Register as a sampling frame (Keogh and Whelan, 1986) found that it was in reasonable concordance with the population as measured by the Census.

The main deficiencies identified in that study, under-representation of young single persons and newly-formed households have little relevance in the present context as inclusion was restricted to those aged between 35 and 64. This restriction is a normal feature of heart disease prevention project evaluation surveys and derives from a concern to try and measure the effects of intervention on mortality, which is thankfully rare among the young and regrettably uncertain in the quality of its certification among the old (Murray, 1992). The exact procedures used to draw this age-restricted sample for the termination survey were similar to those used in the earlier baseline survey which have been described elsewhere (Shelley, Daly, Kilcoyne, *et al.*, 1991). In all, 802 individuals participated in the Kilkenny termination survey. Participation involved a visit to a health centre and the taking of biomedical measurements and samples as well as the completion of two questionnaires, one self-administered and the other administered by a survey nurse (the questions about awareness of the Project and the means by which this was acquired formed part of the self-administered questionnaire). While increasing assurance that the data collected would be reliable and of high quality, these survey arrangements might be expected to depress its response rate. The rate achieved was over 70 per cent in both the baseline and termination surveys, however. This compares quite favourably with those reported by social surveys carried out via the standard method of home visits.

V THE IMPACT OF THE COMMUNICATION INITIATIVES IN COUNTY KILKENNY: RESULTS

In all 11 questions were asked about knowledge of the Project and the channels through which this had been acquired. More differentiated response

categories were used in the questions about readership of the "Healthy People" column in the *Kilkenny People* newspaper and about readership of *CATCH*: the distributions of responses to these items are shown in Tables 1 and 2.

Table 1: *"Have you Read the Articles in the Kilkenny People Newspaper which are Written by the Kilkenny Health Project?"*

Response	*Per Cent*
Do not read the *Kilkenny People* newspaper	13
Did not see any articles written by the Kilkenny Health Project	5
Saw Kilkenny Health Project articles but did not read them	12
Read Kilkenny Health Project articles sometimes	47
Read Kilkenny Health Project articles regularly	23
Total	100

Table 2: *"The Kilkenny Health Project's Magazine is called CATCH. Did you Read CATCH?"*

Response	*Per Cent*
Never saw CATCH	21
Saw occasional CATCH but did not read it	13
Read CATCH sometimes	38
Read CATCH two or three times a year	28
Total	100

The other questions used a "Yes", "No", "Unsure or don't know" response format. These questions, and the distributions of responses to them, are shown in Table 3.

From these tables a gradient for the contributions of the different communication channels to audience consciousness within the 35-64 year age group emerges. Knowledge of the Project's existence had reached almost everyone through one source or another. The *Kilkenny People* articles, *CATCH* and Project leaflets reached around two-thirds of their potential audience at least "sometimes". Local radio and material distributed in schools brought the attention of around half the potential audience to the Project. For the Project's cookery book, an awareness impact is reported in less than a third of cases. A similar level of impact is reported for RTE radio and the national television channels, media whose usage was — as noted above — inhibited by research design contamination fears. Meetings drew in 12 per

Table 3: *Awareness of the Kilkenny Health Project Through Other Forms of its Output of Activity*

	Per Cent		
Question	*Yes*	*No*	*Unsure or Don't Know*
"Before you were asked to take part in this survey, had you heard of the Kilkenny Health Project?"	93	6	1
"Have you seen a Kilkenny Health Project leaflet about diet or smoking or heart disease?"	67	26	7
"Have you, or has someone in your household, seen the Kilkenny Health Project cookery book?"	29	57	14
"Have you, or has someone in your household, seen a Kilkenny Health Project video about choosing or cooking healthy food?"	6	88	6
"Did you ever hear someone from the Kilkenny Health Project on RTE radio?"	29	64	7
"Did you ever see anything about the Kilkenny Health Project on television?"	28	60	12
"Did you hear anything about the Kilkenny Health Project on Radio Kilkenny or on any other local radio?"	46	48	6
"Have you ever attended an ICA meeting, a VEC lecture or had any other meeting where someone from Kilkenny Health Project was speaking about the Project or about Health lifestyles and preventing heart disease?"	12	87	1
"Did you see any of the leaflets or posters or other materials which were distributed in schools by the Kilkenny Health Project?"	49	46	5

cent of the potential audience at some time or another while the videos, which were used in conjunction with such meetings in the later part of the Project's evaluation period, were seen by 6 per cent.

A number of socio-demographic characteristics of respondents were recorded in the survey: age, sex, marital status, age left school or full-time study, Irish Social Class (see O'Hare, Whelan and Commins, 1991), current employment status and area of residence. When the information on contact with Project activities and materials is broken down by each of these socio-demographic variables the most striking contrast occurs in the case of sex. Female respondents report more contact than males for all 11 items. Eighty

per cent of female respondents read the *Kilkenny People* articles and *CATCH* at least "sometimes" while 19 per cent had attended a meeting or lecture at which a Project representative spoke.

Differential impacts by area of residence, social class and age finished schooling were also apparent. Area of residence was coded into three categories — Kilkenny City and environs, Other Urban, Rural — and for 9 of the 11 awareness items frequency of contact is greatest in the case of city residents. The exceptions were the interlinked "seen a Kilkenny Health Project video" and "attended an ICA ... or any other meeting" items where contact was highest among those resident in Other Urban areas. In relation to the Irish Social Class scale, a pattern of the three non-manual classes at the top and the three manual classes at the bottom prevailed for 9 of the 11 awareness items. Manual classes reported greater awareness than the non-manual ones for the "ever see anything on television" and the "see any of the leaflets ... or other materials which were distributed in schools" questions. Age left school or full-time study shows a clear tendency for those with more schooling to have had more awareness of the Project. Age and marital status breakdowns do not produce a clear pattern. In the case of current employment status, awareness is consistently highest among those on home duties (an almost 100 per cent female group) and among the small (since people over 65 were not sampled) retired category.

Moving on to multivariate analysis of project awareness, a wider range of independent variables was explored. It has been argued that motivation to acquire information about subjects like cardiovascular health arises primarily out of particular life situations in which individuals find themselves. "Situationally sensitive" variables may therefore be better predictors of motivation to acquire such information than cross-situational variables of the socio-demographic kind (Ettema, Brown and Luepker, 1983). Situational sensitivity would suggest that people who have been medically treated for heart diseases or experience symptoms or have a history of such diseases in their family background would show greater receptivity to messages about prevention. Here this was probed through three dummy variables:

> Medical Treatment Related to Heart Disease took the value 1 where a respondent reported any of the following: having had a heart attack or a stroke, having been told by a doctor that he or she had diabetes, having been treated for high blood pressure or raised blood cholesterol, having in the past two weeks taken aspirin for heart disease or used other heart tablets. Where none of these applied, the value of this variable was 0.
>
> Symptoms Suggestive of Heart Disease took the value 1 where responses indicated the presence of any of the following: angina, peripheral

vascular disease, dyspnoea or possible infarction. Where the symptoms of none of these conditions were indicated, the value of this variable was 0.

Family History of Heart Disease took the value 1 where any near relative — parent, sibling or child — of the respondent had a heart attack or coronary thrombosis. Where near relatives had not experienced such illness, the value of this variable was 0.

The current lifestyle pattern of respondents was also introduced. The survey asked about exercise, intake of fruit and vegetables, sugar intake, a range of other healthy eating indicators, smoking and drinking as well as carrying out height and weight measurements from which Body Mass Index can be calculated. A healthy pattern was defined as: engaging in vigorous physical activity for at least 20 minutes once a week or more often; eating fresh fruit seven times weekly and also eating vegetables other than potatoes seven times weekly; adding no more than two teaspoonfuls of sugar to drinks or cereals per day; having a positive rather than a negative rating on at least 7 out of the 10 other healthy eating indicators; being in the "acceptable" range for Body Mass Index; not smoking and having an alcohol intake within the recommended "sensible drinking limits".

The 10 other healthy eating indicators used were type of milk usually drunk; number of eggs eaten per week; type of spread usually eaten on bread; number of times boiled or baked potatoes were eaten per week; number of times chips or roast potatoes were eaten per week; the number of times fish was eaten per week; the number of times chicken was eaten per week; the number of times other meat was eaten per week; the number of times fried foods were eaten per week and the number of times carry-out or take-away food was eaten per week. A positive rating occurred where whole milk was not usually drunk; less than 7 eggs were eaten per week; low fat spread or soft polyunsaturated margarine was used; boiled or baked potatoes were eaten five or more times per week; chips or roast potatoes were eaten no more than twice a week; fish was eaten once or more times per week; chicken was eaten twice or more times per week; other meat was eaten no more than eight times per week; fried foods were eaten no more than three times per week and take-away food was eaten no more than once per week.

Under each of the main headings defined above respondents scored 1 where they reported a healthy behaviour pattern and 0 where they did not. The seven main headings were then combined to create an overall Health Habits Score, a continuous variable where a high value indicates the relative prevalence of healthy lifestyle features and a low value their relative absence. The procedures followed represent an effort to draw upon the full range of

lifestyle information collected in the survey rather than an attempt to identify the subset of variables that most efficiently predicts a healthy lifestyle pattern. While the thrust of current advice on healthy lifestyle promotion is certainly reflected by the Health Habits Score, there is also, inevitably, a degree of arbitrariness in the setting of the cut-off points separating "good" from "bad" behaviour.

Indicators of overall health status such as the presence or absence of a major chronic illness or infirmity or the respondent's self-rating of his or her health as "excellent, good, fair or poor compared with someone of your own age" have a good record as predictors of mortality, adjustment to major illness and usage of health services (Blaxter, 1990; Nolan, 1991). Receptiveness to health promotion messages might also be hypothesised as being positively or negatively affected by a target audience member's overall health status. The termination survey did not inquire into its respondents" overall health status but it did include a self-rating of "your present physical condition" whose five response options ranged from "very good" through "good", "fair", and "not very good" to "bad". This was introduced into the analysis as a continuous variable.

For the multivariate analysis two socio-demographic variables — age and social class — were entered as continuous variables. The remaining categorical socio-demographic variables were transformed into the following series of dummies:

Female Sex: taking the value 1 where the respondent is female; otherwise zero.

City Resident: taking the value 1 where the respondent is a Kilkenny city resident ; otherwise zero.

Other Urban Resident: taking the value 1 where the respondent resides in an Other Urban area; otherwise zero.

Married: taking the value 1 where the respondent is married; otherwise zero.

Widowed, Divorced or Separated: taking the value 1 where the respondent is widowed, divorced or separated; otherwise zero.

Full-time Employed: taking the value 1 where the respondent is in full-time employment; otherwise zero.

Unable to Work: taking the value 1 where the respondent is unable to work owing to permanent sickness or disability; otherwise zero.

On Home Duties: taking the value 1 where the respondent is engaged in home duties; otherwise zero.

Left School at 14: taking the value 1 where the respondent left school or full-time study at or before the age of 14; otherwise zero.

Left School at 15: taking the value 1 where the respondent left school or full-time study at or after the age of 15; otherwise zero.

Left School at 16: taking the value 1 where the respondent left school or full-time study at the age of 16; otherwise zero.

Left School at 17: taking the value 1 where the respondent left school or full-time study at the age of 17; otherwise zero.

Left School at 18: taking the value 1 where the respondent left school or full-time study at the age of 18; otherwise zero.

Because of the multiplicity of channels through which the Project's messages were transmitted, a dependent variable of central interest is the number of different sources which contributed to the creation of the respondents" project awareness. To measure this an Overall Awareness Score was computed. In this score, having heard of the Project scored 1, as did a "yes" answer to any of the other questions listed in Table 3, being either an occasional or a regular reader of *CATCH* and being either an occasional or a regular reader of the "Healthy People" column. Possible values of the Overall Awareness Score therefore ranged from 0 to 11, and all of the awareness items carry the same weight within this overall score.

As the Overall Awareness Score is a continuous variable a least squares regression model is appropriate for regressing this awareness score on the full set of independent variables described above. The model was fitted using stepwise independent variable selection with the criterion for entry set at a probability of F of .10 and the criterion for removal set at a probability of F of .15. The results are shown in Table 4.

Table 4: *Factors Predicting Overall Awareness of Project Activities in 765 Respondents*

Variable	*Regression Coefficient (B)*	*Standard Standard Error of B*	*Standardised Regression Coefficient (Beta*	*T-Statistic*	*Significance of T*
Female Sex	.811190	.184074	.169597	4.407	.0000
Irish Social Class	−.145377	.053106	−.101165	−2.737	.0063
City Residence	.672958	.194597	.121790	3.458	.0006
Health Habits Score	.201709	.065796	.117015	3.066	.0083
Left School at 14	−.640445	.219763	−.112259	−2.914	.0037
Age	.021993	.010520	.074800	2.091	.0369
Left School at 17	.415478	.248499	.061998	1.713	.0871

Out of the 20 independent variables examined, 7 met the criterion for entry into and retention within the model. No variable which had been entered was subsequently removed. Within this group of 7, there is a mixture of positively and negatively signed coefficients. The results indicate that the awareness score rose significantly with age, female sex, Kilkenny city residence, a high healthy habits score and leaving school aged 17: it fell significantly as the class spectrum is crossed from higher professional to unskilled manual worker and if the respondent left school at or before the age of 14. The R^2 figure, showing the proportion of variation in the Overall Awareness Score explained by the model, is a modest 12 per cent.

Among the individual generators of awareness aggregated to form the Overall Awareness Score, readership of the *Kilkenny People* column and of *CATCH* were of particular interest since both these media had offered the Project recurring opportunities to communicate messages its own staff had framed throughout most of the evaluation period. The response categories shown in Table 1 and Table 2 were regrouped, dichotomising respondents in each case into readers or non-readers.

Logistic regression is the appropriate method of analysis here since both of these dependent variables are dichotomous, rather than continuous, in nature. The results of regressing readership of *CATCH* and readership of the *Kilkenny People* column on the full set of independent variables, again using the forward stepwise independent variable selection method and the same significance level criteria for entry and retention, are shown in Tables 5 and 7 respectively. Each of these tables is accompanied by another employing a method commonly used to overcome the difficulty attached to interpreting logistic coefficients. This transforms the coefficients to produce a predicted probability, which varies between 0 and 1, of an event — in this case the reading of *CATCH* or the *Kilkenny People* column — occurring. The procedure involves constructing a set of baseline cases, calculating their predicted probabilities and examining how these are affected by introducing specific variations into the baselines (Norusis, 1990, pp. 47-48).

Table 5: *Logistic Regression of Readership of CATCH: Number of Respondents = 751*

Variable	*Regression Coefficient (B)*	*Standard Error of B*	*Wald Statistic (1 df)*	*Significance of Wald*
City Residence	.7255	.2048	12.5431	.0004
Female Sex	1.1376	.1796	40.0995	.0000
Left School at 14	−.4283	.1939	4.8777	.0272
Health Habits Score	.2455	.0634	14.9745	.0001

Table 6: *Predicted Impact of Different Variables on the Probability of Being a Reader of CATCH*

	(1)	(2)	(3)	(4)
Baseline	0.88	0.66	0.60	0.32
Female	—	0.86	—	0.60
Male	0.71	—	0.32	—
City resident	—	—	0.75	0.49
Not city resident	0.79	0.48	—	—
2 good health habits	0.82	0.60	—	—
6 good health habits	0.93	0.80	0.80	0.56
Left school at or before 14	0.83	0.55	—	—
Left school at an older age	—	—	0.69	0.42

(1) Baseline = woman, city resident, 4 good health habits, left school aged 15 or older.
(2) Baseline = man, city resident, 3 good health habits, left school aged 15 or older.
(3) Baseline = woman, not city resident, 2 good health habits, left school at or under 14.
(4) Baseline = man, not city resident, 2 good health habits, left school at or under 14.

Table 7: *Logistic Regression of Readership of the Healthy People Column: Number of Respondents = 742*

Variable	*Regression Coefficient (B)*	*Standard Error of B*	*Wald Statistic (1 df)*	*Significance of Wald*
Irish Social Class	−.0980	.0510	3.6872	.0548
City Residence	.7611	.2153	12.4978	.0004
Female Sex	.8705	.1828	22.6654	.0000
Health Habits Score	.2074	.0651	10.1515	.0014

The association between message exposure and positive health habits that features in all three analyses might suggest that the Project was largely engaged in preaching to the already converted. This can, however, be shown to be a misleading conclusion. For each item making up the Health Habits Score, the termination survey inquired whether the respondent had during the past 5 years attempted, successfully or otherwise, to change his or her lifestyle. Table 9 combines this information on orientation to changing lifestyle habits with the previously described classification of the current state of these habits. There is no simple division between the conforming and

the uninterested: those who have tried to make positive changes in the past 5 years with regard to exercise, weight and dietary composition range from one-third up to two-thirds of respondents.

Table 8: *Predicted Impact of Different Variables on the Probability of Being a Reader of the Healthy Column People Column*

	(1)	(2)	(3)	(4)
Baseline	0.88	0.70	0.63	0.44
Male	0.76	—	0.42	—
Female	—	0.85	—	0.66
City resident	—	—	0.79	0.63
Not city resident	0.78	0.52	—	—
2 healthy habits	0.83	0.65	—	—
6 healthy habits	0.92	0.81	0.80	0.65
Unskilled manual class	0.84	0.66	—	0.42
Skilled manual class	—	—	0.68	0.47
Higher professional class	0.90	0.76	0.74	0.54

(1) Baseline = woman, city resident, 4 healthy habits, other non-manual class.
(2) Baseline = man, city resident, 3 healthy habits, skilled manual class.
(3) Baseline = woman, not city resident, 2 healthy habits, unskilled manual class.
(4) Baseline = man, not city resident, 2 healthy habits, semi-skilled manual class.

Table 9: *Lifestyle Components: Classification of Current State and Efforts at Change in the Past Five Years*

	Current State and Change Status				
Lifestyle Component	*Healthy, No Change Attempted*	*Healthy Change Attempted*	*Unhealthy, Change Attempted*	*Unhealthy, No Change Attempted*	*Row Total*
	%	%	%	%	%
Exercise	7	8	34	51	100
Fruit and Vegetable Intake	15	27	28	30	100
Other Healthy Eating Indicators	18	51	15	16	100
Weight Range	28	7	36	29	100
Sugar Intake	42	23	13	22	100
Cigarette Smoking	66	10	16	8	100
Alcohol Drinking	67	10	6	17	100

Orientation to lifestyle change was further explored by taking the 7 lifestyle components in Table 9 and, in each instance, dichotomising between those who reporting attempting change (scored 1) and those who did not (scored 0). Current state was disregarded for the purposes of this exercise. The seven items were then added to create an overall Efforts at Change Score. This score was regressed on the full set of independent variables used in the previous regression analyses plus the Overall Awareness Score. As before, the model was fitted using stepwise independent variable selection with the criterion for entry set at a probability of F of .10 and the criterion for removal set at a probability of F of .15. The results are shown in Table 10.

Table 10: *Factors Predicting Efforts at Lifestyle Change in 802 Respondents*

Variable	*Regression Coefficient (B)*	*Standard Error of B*	*Standardised Regression Coefficient (Beta)*	*T-Statistic*	*Significance of T*
Overall Awareness Score	.097883	.023484	.150029	4.168	.0000
Medical Treatment Related to Heart Disease	.710584	.139513	.189662	5.093	.0000
Left School at 18	.490229	.146872	.116635	3.338	.0009
City Residence	.356320	.127266	.098840	2.800	.0053
Age	–.021619	.007196	–.112698	–3.004	.0028
Full–time Employed	–.364341	.112831	–.116659	–3.229	.0013
Symptoms Suggestive of Heart Disease	.257330	.114548	.080053	2.246	.0250
Health Habits Score	.078503	.041184	.069803	1.906	.0570
Widowed, Divorced or Separated	.438141	.234033	.066500	1.872	.0616
Model $R^2 = 0.133$					

The Overall Awareness Score is a predictor of those who report having attempted to change health habits in the past 5 years. Among the other predictors, the appearance of the situational sensitivity variables Medical Treatment related to Heart Disease and Symptoms Suggestive of Heart Disease is striking, as these variables did not enter any of the models constructed in the course of regressing the Overall Awareness Score, readership of *CATCH* or readership of the *Kilkenny People* column. Their presence suggests that, in addition to the primary prevention initiatives of community health promotion, the secondary prevention work carried on with patients within the medical care system exerts an important influence over decisions to attempt changes in health-related lifestyle features.

VI DISCUSSION

The broad pattern of results is consistent across the multivariate analyses of awareness predictors. Kilkenny city residence, female sex and more good health habits have a strong positive relationship to awareness of the Project's messages while manual social class membership and early school leaving have a negative relationship.

An imbalance between its impact on Kilkenny city and on other parts of the county had become apparent from the Project's process evaluation data by the mid-point of its evaluation period. In addition to availing of new message dissemination opportunities as they arose, ongoing modification of the mix of channels used to communicate Project messages sought to specifically address this differential impact problem (Wallace, 1989; Murray, Shelley, Daly, *et al.*, 1994). Thus, when the Project was presented with a Reflotron machine in December 1988, a *Kilkenny Health Project Roadshow* format was devised offering blood cholesterol measurement and blood pressure checks supported by dietitian counselling and — where the results suggested it to be advisable — referral to the person's doctor. This mobile programme was delivered in various parts of the county in collaboration with local Public Health Nurses. These efforts were not, however, wholly successful in eliminating an impact imbalance whose implications for interventions mounted in support of the new national health strategy are unclear. It would be rash to assume that the greater urban message reception found in Kilkenny (where the Municipal Borough and its Environs had a combined population of around 17,500 in the 1991 Census) would be repeated in a city the size of Dublin where research has identified "black-spot" areas characterised by both high mortality rates and a high prevalence of lifestyle risk factors (Johnson and Dack, 1989; Johnson, Jennings, Fogarty, *et al.*, 1991). A study that drew its sample from Dublin and from a rural part of another Leinster county (McCluskey, 1989) provides evidence that health beliefs and practices do vary significantly by type of area. More effective intervention programming will need to take the existence of this variation into account and to proceed in tandem with research that explores it in greater detail.

The attraction of a mainly female audience by the Project was to be expected given its work in conjunction with organisations such as the Irish Countrywomen's Association and the emphasis it placed in its media messages on healthy food choices and preparation methods. Had more emphasis been placed on worksite programming by the Project, a gender differentiated impact might have been less in evidence. Worksite health promotion programmes have developed to the greatest extent in the USA where employers are heavily involved in providing health insurance as an employee

fringe benefit. The private health insurance system in Ireland does not operate in a way that creates significant costs that fall on employers and the health care cost containment concerns that have helped stimulate American workplace initiatives are largely absent in this country, although enterprises may avail of the screening and counselling services offered by organisations such as the Irish Heart Foundation and costs associated with absenteeism are an issue for many employers.

During the Project's lifetime business involvement tended to take the form of sponsorship of events with participation by the wider Kilkenny community rather than just its own workforces. Nationally recent worksite initiatives have included a health and lifestyle promotion campaign undertaken within the construction industry and Ireland's participation in a 7 country study of health promotion in workplaces sponsored by the European Foundation for the Improvement of Working and Living Conditions (Construction Industry Federation, *et al.*, 1992; Wynne, 1992). A large agricultural sector and the prevalence of small units in the manufacturing and service sectors are features of the Irish economy which create difficulties for the widespread diffusion of worksite health promotion programming. Persistently high unemployment rates and relatively low female participation in the paid labour force are other factors militating against the worksite becoming as prominent a focal point of health promotion strategy in Ireland as it has in some other countries.

The negative association between awareness and manual social class membership or having left school at an early age reflects a common pattern in health education research and could in the present context be interpreted in either a more or a less optimistic way. The most influential theoretical perspective in the health communication field, innovation-diffusion theory (Rogers, 1983; Macdonald, 1992), suggests a model of the process of social change whereby an initially small number of innovators, influenced by living abroad or by information communicated through the media, embark on and maintain healthier eating, drinking, smoking or exercise habits. Improved quality of life reinforces the new pattern. A threshold is crossed when innovative behaviours move from their initial adopters to the "early majority" as the media and commercial concerns come to see healthy lifestyles as credible norms for this particular society. This early majority is possibly influenced by its peer group experiences of changes in morbidity and mortality from heart disease, cancers and the other chronic diseases that dominate the modern pattern of ill-health. Continuing communication of the message that behaviours have changed and health has improved reinforces the commitment of the early majority and continues the wider diffusion of lifestyle innovation throughout the community.

Uneven responses from different social classes and levels of education would therefore be envisaged after less than 5 years intervention by innovation-diffusion theory. At such an early stage, success in influencing a community's opinion leaders to make lifestyle changes rather than their across-the-board adoption within the community is what this theoretical framework would propose as the appropriate focus. However, a less optimistic view of response unevenness might also be put forward. According to this view, some groups do not merely lag behind in the adoption of lifestyle innovation but are in danger of being altogether left out of the process of change. By comparison with other countries, and partly as a result of problems in obtaining the data needed, there has been relatively little analysis of and debate about socio-economic health differentials in Ireland (Cook, 1990). However, Nolan (1990) has overcome some of the data difficulties and shown the existence of significant differentials in standardised mortality rates between those in professional/managerial occupational groups and those in semi-skilled or unskilled manual occupational groups for men aged 15 to 64. Detailed social class analysis of the Kilkenny Health Project database is ongoing and will contribute a new dimension to our understanding of Irish socio-economic health differentials when it is completed.

In relation to the channels of communication that might be emphasised in the targeting of messages at specific social classes it is noteworthy that a pattern of the three non-manual classes at the top and the three manual classes at the bottom prevailed for 9 of the 11 awareness items in the Kilkenny termination survey. The questions where a manual class reported greater awareness than a non-manual one were the "did you ever see any of the leaflets or posters or other materials which were distributed in schools by the Kilkenny Health Project" and the "did you ever see anything about the Kilkenny Health Project on television" ones. An example of an initiative embodying school-home communication launched by the Project is *Race to Health,* an adaptation to the Irish context of a nutrition education programme produced by the Stanford Heart Disease Prevention Program which is designed for use by 9 to 10 year olds. The aim was to provide each child in this age group with a set of lessons for the programme and to provide each school with a teacher's guide to running it. Following a pilot phase of testing in a small number of schools, the programme was made generally available within Kilkenny in 1990. The programme consists of four lessons — on fat, sugar, fibre and salt. The four lessons in the programme identify the food sources of fat, sugar, salt and fibre and give suggestions for limiting or increasing these elements in the Irish diet as appropriate. The programme is intended to involve parents and others in the child's home and so lessons are designed to be completed primarily as homework, with parental participation

if needed (see Kilkenny Health Project (1990), p. 28). Nationally, endorsement of the Health Promoting School concept by the 1992 Education Green Paper (Government of Ireland, 1992) ought to be the prelude for a more extensive use of school-home communication within Irish health promotion initiatives.

Very little use was able to be made of television as a communication channel in Kilkenny during the course of the Project. As noted above, one reason for this was a constraint arising out of the Project's evaluation design: since the medium functions in Ireland on a national rather than a local basis, communicating intervention programme messages through channels accessible to both treatment and control communities risked "contaminating" the quasi-experiment. Contamination through exposure of a control community to the television output of an intervention programme has in fact recently occurred in the case of the UK's Heartbeat Wales, despite the strong element of regionalisation within both the BBC and the Independent television sectors (Nutbeam, Smith, Murphy and Catford, 1993). The risk of design contamination led the Project to initially adopt a policy of not actively seeking the attention of what anticipated communication effectiveness would otherwise have made a prime target — the national level broadcasting and print media. When a more positive attitude to the placement of materials in the national media was subsequently adopted, difficulty in attracting coverage was experienced apparently because national media gatekeepers perceived the Project to be a subject of limited, and largely provincial, interest. National health promotion programming will not be constrained with regard to television usage in the same way as a pilot research and demonstration project was: but, as long as paid advertising is the only direct form of access to the medium available, it will find it a very expensive option.

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