# Section of Epidemiology & Preventive Medicine

*President* J N Morris FRCP

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## President's Address

## Four Cheers for Prevention

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The years since the war, the 1960s in particular, have been great years for the promotion of health and prevention of disease. We could all make our own lists – just let me recall some of the more obvious achievements in this country:

Subsistence poverty reduced
Gross subnutrition in mothers and children virtually eliminated
Seven million new houses built
The Clean Air Act
Immunization against polio, measles, rubella
Rh disease prevented
Safety of medicines provision
Several occupational cancers controlled
Institutionalism reduced in mental hospitals and other places
The breathalyser
Crash helmets

There is, moreover, substantial knowledge waiting to be applied in practice, or applied more fully: about birth control, for example; cigarettes; fluoridation; sugar, dental caries and obesity; seat-belts; industrial safety; rehabilitation. The message may be as old as the hills, but modern studies on the role of 'mothering' and sensory-inputs (and in the poor countries of good nutrition) in the mental development of the young child offer the hope for the first time of a knowledge-based mental health programme and general preventive psychiatry.

I want to talk about the meaning and nature of 'prevention' in the context of today's needs in a 'developed' society, indulging little in science fiction if only because it's so hard to keep up with what is already fact. I will be looking only at parts of the field, virtually confining myself to the second half of life and omitting, for example, most of the ground on communicable disease and on the environment surveyed so magisterially by the Chief Medical Officer (Godber 1971). Where we do not know, my concern will be with the D rather than the R of 'R and D' (Research and Development). In the foreground are the constraints of social policy and the about-to-be rationalized health service. I have chosen to speak of four principles of attack, four strategies, but of course they overlap. My first is central to a society like ours, its health problems dominated by the 'chronic diseases'. I refer to the role in prevention of:

(1) *The Quality of Medical Care*

In the fifty years of the therapeutic revolution, since the discoveries of insulin and liver, mankind has been blessed by science and technology with a wonderful arsenal of powerful and effective remedies. I am thinking of the treatment of several cancers, adrenal and other hormonal crises, malignant hypertension, shock and hæmorrhage, respiratory failure, renal failure, depression, heart valve surgery, life-endangering arrhythmias, asthma, tuberculosis, septicæmia, the care of very small babies, &c., to mention only some situations in which lives can be saved and that are directly related therefore to my theme of 'prevention'. These can be epitomized in the dramatic achievements of emergency surgery – and of resuscitation, nursing, anæsthetics, laboratory investigation and everything else that may be, so often is, vital from hour to hour.

My illustration will, I hope, be familiar. In almost every condition where hospital treatment is likely to affect the outcome, case fatality is higher in the regional board hospitals than in the teaching hospitals of the National Health Service. In the Social Medicine Unit we first demonstrated this disparity fifteen years ago, prompted, as so often happens, to ask the epidemiological question

*Table 1*

**Serial admission to two teaching hospitals (A & B) and three regional board hospitals (C, D & E) of the National Health Service, and deaths; simple enlargement of prostate (Ashley *et al.* 1971)**

| | *All admissions* | | | *Planned admissions* | | *Unplanned* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *All cases* | | *Operated* | | *Not operated* | |
| | *No.* | *Deaths* | *Case fatality (%)●* | *No.* | *Deaths* | *No.* | *Deaths* | *No.* | *Deaths* | *No.* | *Deaths* |
| *Hospitals* | *(1)* | *(2)* | *(3)* | *(4)* | *(5)* | *(6)* | *(7)* | *(8)* | *(9)* | *(10)* | *(11)* |
| A & B | 514 | 8 | 1.6 | 399 | 3 | 115 | 5 | 106 | 2 | 9 | 3 |
| C | 185 | 6 | 1.9 | 104 | 1 | 81 | 5 | 76 | 2 | 5 | 3 |
| D & E | 233 | 26 | 8.7 | 53 | 1 | 180 | 25 | 123 | 5 | 57 | 20 |

●Age-standardized on teaching hospital 'population'

by a clinical observation. At the London Hospital, where we then were settled, there seemed never to be a fatal case of appendicitis in its huge surgical practice, whereas the Registrar General was reporting 800 deaths a year. For a long time we hoped that the surgeons themselves would take up the question but, apart from a complaint that the public could be unnecessarily alarmed by this kind of investigation, there was no response. So we proceeded to the next step ourselves, together with two teaching and three regional board hospitals, as typical as we could find, and using simple enlargement of the prostate as 'marker'. Table 1 shows a striking difference in case fatality (column 3). As expected, this was higher in all the hospitals among the unplanned emergency admissions (columns 5, 7); fatalities in the planned admissions from the waiting list were remarkably low. But two other features will be noticed: the gross excess of unplanned admissions to Hospitals D and E (180 of 233) and the number of deaths in these men (25). Columns 8 and 10 begin to explain where the trouble lay. Compared with D and E, the other hospitals not only admitted fewer emergencies, often sick old men with acute retention of urine, but operated on more of those they did admit, with consequent better overall survival figures: prostatectomy is at present indicated in virtually every case. Hospitals D and E had a much heavier load of the most difficult cases, the lowest operation rate and the highest death rate. The other side to the record is that with the greatest requirements, the most crises, D and E also had the least resources of staffing, buildings and other facilities. The mismatching is seen at its most extreme in the local admissions to Hospitals A and E, which are only a mile or two apart: 71% of the local cases over 75 and 88% of the local men who were confused and/or in congestive failure were admitted to Hospital E.

In this study, that is to say, we have moved from questions of clinical skills and judgment, the customary context of discussion of quality of medical care, to something else without which these may come to naught. We are considering instead the quality of social organization: how closely community resources are matched to meet community needs, which is a question of health services management, and priorities in resource allocation. That technical capability and social provision are so often out of joint is of course at the heart of today's discontents, extending far beyond medical care. Thus, too often, we fail to relate even ample resources to popular needs determined in any objective way; the inequality and injustice that result have proved a most intractable problem throughout the twenty-five years of the health service – and it was far worse before. A bit more for everybody, which is likely to be the official reaction, cannot itself be the answer to defects in distribution (even if hospitals were the right place to spend more money).

The results of this case study are disquieting. How common this kind of situation is I cannot say, nor whether it is limited to prostatic hyperplasia: the current boom in geriatric surgery makes it urgent to find out. The situation in coronary thrombosis (e.g. Table 2) is even more important to elucidate, in view of the general and understandable pessimism over the treatment of acute heart attacks and the much larger numbers of deaths. Such a contrast in coronary death rates would be regarded as a major achievement if produced in a planned clinical trial. Are some of these 'excess' deaths in the regional board hospitals preventable? I have no idea. In view of the differences in the natural history of these conditions factors other than those we have been considering for prostatic hyperplasia must be involved. There could scarcely be a simpler illustration of the need for better health intelligence systems on a population basis, for systematic information on how health services affect the

*Table 2*

**Case fatality of ischæmic heart disease in the teaching and regional board hospitals of the National Health Service. Unplanned admissions 1964–66.**
**10% national sample. Hospital Inpatient Enquiry, England and Wales (Morris 1969)**

| | *Teaching hospitals* | | | | *Regional board hospitals* | | | |
|---|---|---|---|---|---|---|---|---|
| | *No. of cases* | | *Case fatality (%)* | | *No. of cases* | | *Case fatality (%)* | |
| *Age* | *M* | *F* | *M* | *F* | *M* | *F* | *M* | *F* |
| 45–54 | 361 | 78 | 11.1 | 7.7 | 2730 | 579 | 14.9 | 14.5 |
| 55–64 | 594 | 189 | 16.8 | 16.4 | 4600 | 1680 | 22.4 | 22.5 |
| 65–74 | 311 | 239 | 27.3 | 24.9 | 3126 | 2235 | 36.9 | 34.6 |

*Table 3*

**Incidence of cardiovascular disease in middle-aged London busmen during ten years, by initial casual systolic blood pressure. Rates per cent.** Sample of men examined in 1957–60, free then of recognizable cardiovascular disease, and followed for ten years (Morris *et al.* 1966, Gardner *et al.* 1973)

| | | | First episodes | | |
|---|---|---|---|---|---|
| *mmHg* | *No. of men* | *IHD●* (%) | *Cerebro-vascular disease* (%) | *Other vascular disease* (%) | *Deaths all causes* (%) |
| −129 | 118 | 9 | 2 | 2 | 17 |
| 130− | 216 | 10 | 3 | 4 | 17 |
| 150− | 171 | 17 | 5 | 4 | 26 |
| 170− | 103 | 25 | 9 | 16 | 49 |
| 190+ | 39 | 35 | 21 | 10 | 54 |
| Total | 647 | 16 | 5 | 4 | 27 |

● All manifestations

people's health, so that at least we know what we ought to be trying to do. 'Academics' have a particular responsibility here, and a none too glorious record.

(2) '*Early Diagnosis*'

But, of course, we are all agreed that far too much of medical care is absorbed in advanced disease, in rescue, reprieve, patching up and lost causes, marginal benefits and diminishing returns. Somehow, the balance has to be redressed towards a more constructive effort, to turn back the tide of chronic disease, listen to the plea of the Secretary of State 'to turn off the tap'. So I now ask today's most fashionable question: can these chronic conditions, presenting so often in a crisis, be recognized earlier, cut short, or, at the least, can their complications be prevented? The theory often is ambiguous, the practice, meanwhile, plain disappointing: the successes of early diagnosis in antenatal care and pulmonary tuberculosis are proving hard to emulate. But there are hopes today of averting some of the common breakdowns of old age, of detecting breast cancer advantageously earlier, of controlling periodontal disease; and we can now make a start on reasonably firm ground with the *control of high blood pressure*. Let us look first at what is here at stake.

Table 3 shows the future risks of ischæmic heart disease, cerebrovascular disease, and overall mortality, relative to the initial blood pressure level, in an ordinary population sample. (The Table is based on the casual systolic levels; in our experience the diastolic pressure is not quite as powerful a predictor.) Now moderate and severe hypertension can be lowered by today's potent and fairly well tolerated medicines: so the 'preventive' question is, can these be used to control hypertension among people who do not feel at all ill before complications strike the target organs? Typically, the trial by the Veterans Administration in Washington (1970), based essentially on pressure readings, lowered the high pressures and yielded a very substantial reduction of cerebrovascular accidents, heart failure and renal failure. For a public health man the main interest lies in the hope of reducing strokes – which they achieved. There is no single medical measure, in the words of the WHO Seminar which reviewed the subject (1971), that would make such a contribution to the quality of life in old age as the *prevention of stroke*. There is another consideration too: cerebrovascular disease 'consumes' something of the order of 10 000 000 hospital and nursing home bed-days a year in this country, and the figure is rising. Hypertension, of course, is a major factor; and there is a contribution here also to our psychogeriatric predicament.

In any condition as common as hypertension – at 105 mmHg diastolic blood pressure, a customary clinician's definition, we may be dealing with 3–4% of the middle-aged population and perhaps a quarter of a million symptomless and at present untreated cases – any hope for wide adoption of control measures must depend on interesting the public, then offering acceptable regimens which can be fitted into ongoing clinical services. *Clinical:* this is a miniature of one of the forces now unifying the health service, to enable *community* preventive programmes to be mounted and followed up in difficult *individual* treatment lasting perhaps the lifetime. Our own feasibility study (Fig 1) is based on general practice and the team of family doctors, using also public health nurses in case finding among the total practice population (this will be a big step forward), and for surveillance of the treatment (so will this). A special screening 'clinic' has been set up for the

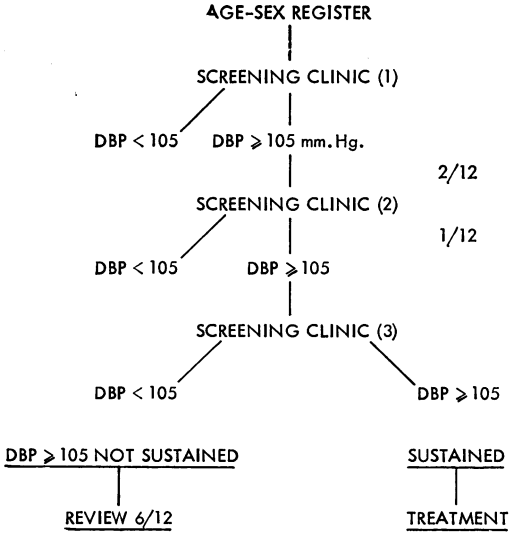


Fig 1 *Plan of control of high blood pressure in a general practice* (*Hodes* et al. *1973*)

study; some retraining is involved. Two local district general hospital physicians are expert advisers and, of course, all the services of the hospitals are available for the special case. The control of hypertension is likely to be the next thrust for preventive medicine, and it will represent a sizeable diversion of resources. Ours may not be the most efficient approach, but we have not yet reached the stage when an issue like this is dealt with systematically by a Community Medicine Board, responsible for initiating the necessary operational research and experiment in new health services.

My next 'strategy' I have called:

(3) *Protecting the Vulnerable Individual*

Pushing further back into the natural history of the epidemic chronic diseases, I want now to be more speculative and fly a kite, to point to dilemmas in our present knowledge and to question whether it is not time to be thinking of another, more physiological, approach to prevention.

Consider the natural history of ischæmic heart disease (IHD) in the population. By middle age the underlying coronary atherosclerosis is present in most men. On its basis, about 1 man in 5 develops clinical myocardial ischæmia by the time he is 65, probably 1 in 4 by 70 (good population data peter out by the late 60s). Goodness knows what is the rate of the subclinical. The gene pool for these conditions must therefore be very widespread; moreover, such common everyday occurrences cannot be due to wayout behaviour or exceptional stresses; they must be part of everyday living (Morris 1970). Many of us cannot take it, cannot cope with the challenges of ordinary life as we like to lead it: they are beyond our limits of healthy adaptation.

Consider next the most practical fact learned in epidemiological research about ischæmic heart disease. It is illustrated in Table 4, was first established in Framingham and is by now beyond dispute. The men scoring low on the 'risk factors', the lowest two-fifths are virtually immune to the most serious manifestations of IHD; by contrast 1 in 4 of the highest fifth, the worst off in terms of blood pressure, plasma cholesterol level, family history, &c., developed a heart attack, fatal often before there was any chance of treatment.

*Table 4*

**Incidence and prediction of ischæmic heart disease in middle-aged London busmen during ten years**
Men were scored for 9 'risk factors' as determined at their initial examination: systolic blood pressure; the height of blood cholesterol; skinfold-thickness; smoking habits; whether they were drivers or conductors; &c.

| *Fifths of men* | *No. of men* | *No. of first heart attacks● when men are classified into fifths by their scores* |
|---|---|---|
| 1 Lowest score | 120 | 1 |
| 2 | 119 | 5 |
| 3 | 118 | 16 |
| 4 | 118 | 13 |
| 5 Highest score | 118 | 28 |

●'Heart attack' = first episode of acute myocardial infarction and sudden death ascribed to IHD (as Table 3)

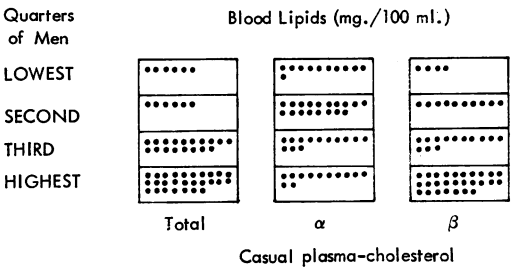


Fig 2 *Incidence of ischæmic heart disease in middle-aged London busmen during 5–10 years, by initial lipoprotein cholesterol; the men are classified into equal quarters by their levels. Each dot represents a first episode of IHD (as Table 3)*

*Food and health:* I want to concentrate on the high blood cholesterol level for several reasons. First, because it contributes so much to these predictions; it is the most powerful of the 'risk factors' yet identified and may have to be present before the others can matter. In Western populations the incidence of IHD rises steeply as blood cholesterol increases above about 200 mg/100 ml and, as might be expected, with refinement of lipid analysis prediction is more specific (e.g. Fig 2) – truly, a major health indicator. Secondly, taking an ordinary diet, in today's commonplace range of fat intake many men react with high blood cholesterol values (Fig 3); diet of course is not the only factor in determining lipid levels. This is human variation, individual inequality, as in the requirements for protein and vitamins, for sleep, in reactions to medicines, &c. (Nordin 1972, Tracey 1971, Waterlow 1971). Thirdly, it is possible appreciably to lower most high cholesterol levels by an acceptable and healthy diet, mainly by reducing the saturated fat intake (Shaper *et al.* 1972). So the question becomes, can we make use of this information, identify those so vulnerable, and try to protect them? From early in life when adaptation still is physiological, should we seek to prevent high blood lipid levels (for the present those values at the upper end of the cholesterol distribution)? Before atherosclerosis is established, a long time ahead of epidemic clinical disease and while it still may be avoidable? Should we try to protect those with such organ inferiority, locus minoris resistentiæ? Should we offer them education as part of a new individualized modern hygiene, an alternative mode of behaviour, for the second half of life? Beginning, say, when young people get married and settle down (though it would be better even

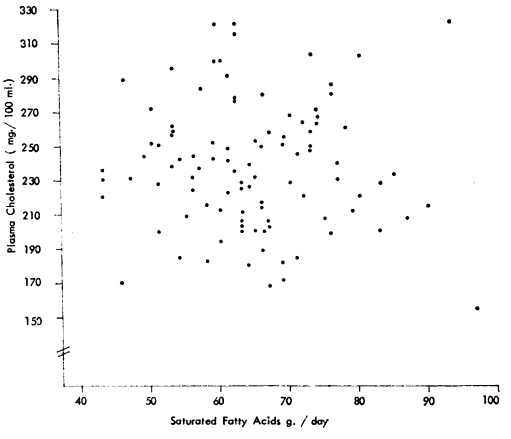


Fig 3 *Blood cholesterol levels in 99 bankmen aged 40–45 in relation to their intake of saturated fat (cf. Morris* et al. *1963)*

earlier – 'coronary disease is a pædiatric problem')? Is there possibly here a new 'wisdom of the body and understanding of the heart'? Might not this be a very positive activity, truly health-promoting, for the family doctor who through his contact with individuals could influence also the social pattern (Casdorph 1971)?

The question is one for judgment in face of inconclusive data, a familiar enough situation and one I recently experienced in pure culture, though the term could scarcely be less appropriate. As members of the BBC's advisory group on the social effects of television, we had to consider, and recommend – somebody has to recommend, it can't be wished away – what should be done about violence on the screen, and the possible long-term dangers to the mental and social health of the British people, no less, in the virtual absence of any relevant evidence at all, or anything that we would recognize as evidence. Let us return with relief to the simplicities of the serum cholesterol. This is a question of priorities, too; but there is little doubt about the claims of that metabolic embodiment of advanced, industrial, high-consumption societies: the cluster of bad family history, obesity, raised blood lipids, coronary atherosclerosis, diabetes, ischæmic heart disease, shortened life, to one or more of which the majority, perhaps all, the men of our time are subject by middle age. IHD is the paradigm of a disease of many causes, but reduction of high blood cholesterol levels could be one physiological answer to some of the metabolism under strain, thus 'preventing' one of the main precursors of IHD. Should an intensive community-based metabolic study be started, or a clinical trial? Any trial in 20-year-olds would not give us the facts we most want inside another twenty or twenty-five years. Or do we decide there is enough indirect and collateral evidence on the possible benefits of reducing high blood lipid levels, that there is no reason to suppose this would be harmful, and prudently advise a change of habit? It is high time to be starting a debate on the numerous personal, social and daunting technical problems that so obviously arise. Meanwhile, however, the general issue may be forced upon us. One of the malnutritions of affluence is the rising consumption particularly of dairy fat, responsible for the trend shown in Fig 4 (Marr 1973). Prophecy is hazardous, but if this trend continues unchecked it could be common before the end of the 1970s to take half the calories in fat and as much as a quarter in saturated fat. Whatever the confused story of national diets vis-à-vis coronary disease, to depend more each year on these would make little sense and is quite unlikely to be healthy.

(4) *A Healthier Mode of Life*

This of course takes me into more familiar territory. How can we influence the social pattern and prevalent life styles and shift norms of behaviour (food habits are proverbially slow to change)? That is far the best way, and, if we cannot, we are likely to fail also with high-risk groups and vulnerable individuals; all three certainly have to be confronted at the same time. The agonizing question is how, when popular behaviour is changing so fast and often, how can we encourage it towards better health? Prevention today is often a matter of individual and family behaviour in a society too often exerting the wrong pressures. There is no more difficult issue for any of us, public and professional. Few victories for behaviour change are recorded at the beginning of this paper to cheer us on our way.

By tradition, I ought now to pause and consider the state of the nation and the condition of the people, at any rate the major intersections with health. But what can I usefully add to the daily heartsearching? (It has to be that often: thus, suddenly, the whole mood of the country seems to be in flux with the reappearance of mass

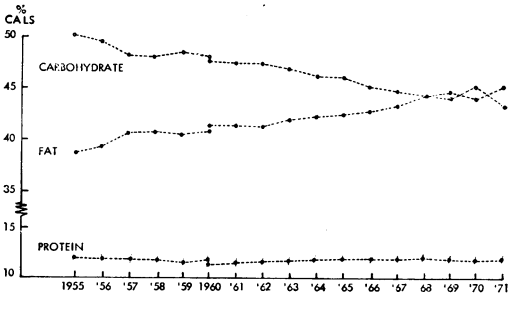


Fig 4 *Mean proportion of calories derived from carbohydrate, fat and protein per person in households of 2 adults under 55 years of age; no children (National Food Survey Committee 1955–71)*

unemployment.) In public health the comparison of today's technological revolution is with the first industrial revolution and its breakneck changes. The framework of society, however, has proved as resistant to the buffetings of the last twenty-five years of peace as to five years of total war: the inequality of wealth and property seems to have budged little in the upheaval and, latterly, the disparities also of income by not very much. (The failure is spelled out in the entrenched inequality of opportunity for our children.) But the cultural changes are truly historic, including vast subterranean shifts in the balance of feeling and thinking in an attempt to come to better terms with the irrational, very evident in the arts where 'anything goes', and in the new commitment to human relations. There is a revolution of rising expectations, spreading across the social classes, in mental health, personal fulfilment and family life, and the claim to 'happiness' of a secular society. None of these are based either on knowledge or experience and they entail wholly unrealistic hopes of doctors, science and medicine. New sources of health are perhaps being released in the new freedoms; but how little we understand, still less control, is nowhere more evident than among young people, the product of a lifetime of good health and nutrition and of a revolution in child care. Up to now it is evident that modern child-centred upbringing frequently is poor preparation for adult life and for the achievement of young people's aspirations for the world and for themselves; it too often leads to unhappiness and waste – *vide* the contemporary epidemics, major or minor, of crime, self-poisoning, drug abuse, accidents, campus strife, violence, unwanted pregnancy. More generally, the changes in sexual attitudes and behaviour have direct impact throughout medicine and public health; an experiment on the health of at least two generations is under way, the repercussions echoing into the distance. In theory, the abatement of guilt and anxiety which, on balance, may be occurring, could be of mass benefit, freeing energies for constructive purposes; but the theory is too slender for any prediction and we must wait and see, hopefully, wishing them well – while helping any way we are able, practising elementary prevention and not merely picking up the casualties. The loss of 'deference' and of young people's respect for 'authority' (so painful to a middle-aged teacher who in his own time was respectful at least of learning) makes the task no easier (Ariès 1960, Fiedler 1965).

*Ingredients of a health policy:* The main question we have to ask is whether it is possible to describe any general causes of health for today that could take us further than those responsible for so many of the victories of the past (and still to come in developing countries). It is these 'general' nonspecific causes in the mode of life, established in ages of folk wisdom as well as ad hoc investigation, that so often have been effective in improving health. I refer to provision of the basic 'necessaries of healthy life', to a standard of living above subsistence, to environmental hygiene, living space, nutritional adequacy, and so forth (Chadwick 1842; Simon; Thackrah; Burt; Boyd Orr; and the rest) whose beneficence is exemplified in the health of mothers and children today. Can we advance beyond these to complementary rules for the second half of life? To simple principles of behaviour for everyone to practise which would not interfere with more important matters? That may offer an escape from the trap that the more medical care is supplied the greater is the demand? The answer is beginning to be 'Yes'.

Some principles can be suggested, if not yet with the understanding we would wish. The first is as old as Hippocrates: *the exercise of mind and body*. The exercise of functions is necessary for health; with disuse they wither and waste away. I am referring to physical activity, employment of the mind and faculties, social participation – throughout life. Only a quarter of the sedentary-working middle-aged men we are now studying seem to take anything deserving of the name of 'vigorous exercise', that could induce and maintain cardiovascular fitness, protect against coronary disease and its precursors. Sedentary living is, of course, one of the great ecological alterations of modern times, but the consequences in population physiology, musculoskeletal/hæmodynamic/metabolic, and the psychological implications have yet to be spelled out (Morris 1970). Today, the need to apply this notion of health-as-activity is most obvious among the retired. Social forces and personal inclination too often combine to enforce idleness, too radical a disengagement and catabolism. A positive self-image evidently is the key to vigour in old people, and how they react will surely depend on how the rest of society esteems them. Many old people will not want to be too reflective and few will want to look forward, so concentration on the present seems a sensible prescription, often made hard to fill. The handicap of those with too little money and too little education is one of the grossest of today's social inequalities. (Birren 1964.)

*The control of caloric intake*, the second of the 'general causes' and today's other great dietary issue in this field, and its role in protecting cardiovascular health is too hackneyed a subject. The fashion for slimming is an unexpected ally. The suggestion that overeating early in life lays down the basis in extra fat cells for later obesity is, of course, of great interest.

*Cigarettes:* About these I will say only that in view of the evidence on how easy it is to be 'hooked' (Russell 1971), and how soon coughing may begin, stopping youngsters from starting to smoke – again – is the vital issue, and the contradictory signals they receive from government and society cannot possibly help. Small majorities in the House of Commons we were told are difficult, large majorities even more so; middling majorities we now see are the very dickens. Meanwhile, the insinuation of the cigarette industry into sport creates exactly the wrong kind of image, makes a mockery of 'health education' and is surely the work of the devil.

*The management of social 'stress'* is an even more difficult and confused issue. To identify characteristic psychic and social stresses liable to be too much for people is our duty both as epidemiologists and as community physicians. And of course this is a challenge also to the new Social Services (Seebohm 1968). It is the prerogative of public health to be simple and direct, so I will illustrate from the kind of piecemeal and practical approach that is immediately open and could be useful, mentioning two different situations – a problem of growth and change, and the pressures put on society's underdogs. It must always be presumed that there will be an imperfect fit between people and their environment, that some or many will be expected to take more stress than is good for them, or more than they comfortably can. Under new or greater pressures, new groups or bigger numbers will break down, the particular expressions, interpersonal, physical, accidents or whatever, depending on a multitude of factors, inborn, in the life-history and in the environment. This is merely to extend the argument from before (Brown & Birley 1970, Hinkle 1967, Rahe & Lind 1971). Whether there is more 'stress' generally today than at other periods, and whether we are more or less competent to deal with it, how effective the modern defences are by comparison, are speculations I cannot dwell on here.

'It is changes that are chiefly responsible for diseases, especially the violent alterations' (Hippocrates). Here it is fair enough to mention that extreme case, the bulldozer. I was ashamed recently, when appealed to by local citizens, to discover not merely how little I knew myself but how little data I could find, even short term and proximate, still less the beginnings of an overall picture, on what happens when sections of the city are torn up to build a highway like the London motorway box to cope with the virtually unrestrained growth of the motor car. We urgently need information and a public health policy on the possible hazards of *too much change:* For fragile community ties? Mutual aid among families? Gifts between neighbours? Identity in the old? For the chronic, relapsing sick? Those who just will not be able to cope? Anybody's mental health? How long a checklist? Should not such be included in 'planning'? And how do they compare with the anticipated benefits? (Duhl 1963, Roth 1972).

*People in distress:* Every society creates its own casualties, consigns some of its people, individuals and families, to a life under very special stress; by design or acquiescence, apathy or denial, it imposes its own deprivations, frustration and indignities on particular minority groups, denying their human needs and social rights. In our society such groups, and they often overlap, are the chronic poor in the cities, the abandoned aged, the children who are 'finished before they are five', jobless youngsters, the hundreds of thousands in substandard housing, the homeless, the middle-aged disabled thrown on the scrapheap, the patients in some 'chronic' hospitals, the coloured ghettoes, men in the local prisons, the deviants we harass – the catalogue of waste and misery could readily be lengthened. There is only too much scope for preventing the deposit of such groups in the first place; only too much opportunity for us then in our traditional role of protector of the weak, attorney of the poor, for surveillance, to avoid piling stress on top of stress, by social support and personal care to seek to reduce personal and family breakdown, disability, desperation. The cruellest are the most modern of casualties, the accumulating numbers kept alive by health services – by us – but only partly living, grossly handicapped with spina bifida (Lorber 1971), or brain injury, the severely subnormal, vegetating old ladies.

The outlines are emerging of a health policy for tomorrow's community physician in his task as epidemiologist, administrator of services, and also as community counsellor (Morris 1969): the reticence of medicine and public health on many of the great issues does us no credit. Cigarettes apart, we have too often been silent. Where has all the Victorian thunder gone? Do we deceive ourselves that the sources of health lie in medicine?

*Epidemiology of health:* But I want to make another suggestion. The next leap forward, I fancy, is likely to come from a shift in the emphasis of our studies – to healthy processes, to the social, cultural and economic conditions and sources of the people's good health. So, we might be able more effectively to promote normal functioning, build up population defences and resistance, fulfil potentials for growth and development. It will mean a new partnership with physiology and the behavioural sciences on the scale recently so productive with pathology and

clinical medicine. Study of high blood lipid levels, high blood pressure, and the dangers accompanying soft water, can, and does, tell us much about the other, the healthier, end of the distribution. But just who are the blessed with cholesterol of under 200, whose blood pressure does not escalate in middle age; why is Ipswich such a healthy town? For more useful definitions of health, healthy variation and adaptation, we shall have to rephrase the questions we ask. Understanding of physical fitness and cardiovascular efficiency, their conditions and consequences, surely is worth seeking not merely as a spin-off from the epidemiology of sudden death. The stakes are high: quite small shifts in population distributions of blood pressure or blood cholesterol to the left, for example, or of IQ or birth weights to the right (substantially lowering the numbers with seriously abnormal values) could confer profound benefits on community health, diminish suffering and lighten the burden on services out of all proportion.

Two challenges for this new epidemiology of health may be mentioned. One is to study ageing and the rate of ageing – its postponement, 'prevention', and, hopefully, the reduction of associated pathology. We have been too slow, for example, to investigate the remarkable splaying of the distribution, as well as the overall decline, of so many physiological variables that occurs with age; to ask how much is due to differential behaviour and environmental effects, contemporary or cohort, and how much is genetic or random. The other challenge is today's grand debate on environment and the quality of life (Goodman 1969, Harvard University 1972). A more systematic epidemiology of human needs, possibilities and limits could enlarge choice in a debate that is at present ill served by the validity of much of the data fed into it. We could help towards a more rational social accountancy, better estimating the costs in unhealthy conditions of existence and casualties, as well as what we are gaining in benefits to health from economic growth and technology. How far, fast, and well people can and do adapt, in what kind of social order, is peculiarly our territory for study (Morris 1970).

*Last Word*

The organization which embodies much of our own activity is now being refashioned. For the first time in history the formal structure of health services, in certain major aspects, will be designed to meet what we understand to be the needs of the people, and only secondarily in terms of professional and political pressures. I have tried to illustrate some of the avenues open and about to open for *prevention* – agenda for the new health authorities: in bringing to all fair shares of the life-saving potential of modern treatment, in containing the havoc of the chronic diseases by catching them earlier, in seeking a physiological hygiene for the vulnerable individual; in reducing avoidable misery, promoting a better society and healthier ways of living. Tomorrow's community physicians will have greater opportunities, and greater challenges to face. Let me close with a word to the 'academics' among us – we must do our part, too; we must not fail them.

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