Soz Präventivmed 1993; *38*: 259–267

0303-8408/93/050259-09 $1.50 + 0.20/0

Research and teaching in social and preventive medicine and in public health *

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The discussion is an old one: where is the demarcation line between public health and social and preventive medicine? To what extent is social and preventive medicine determined by its public health perspective? What other perspectives are there to this discipline; and in this context, what is the relationship between social and preventive medicine and clinical practice? How do the answers to these questions influence the teaching of medical students? And as far as research is concerned, what is the role and place of applied as opposed to basic research in a university department of social and preventive medicine?

In this article, answers to these questions will be sought by reviewing how the discipline has developed during the past twenty years. Illustrations will be taken from work done during this time at the Department of Social and Preventive Medicine of the University of Berne. A concern in much of this work has been its practical applicability, and thus, questions concerning the ties between research and its application will accompany this review.

Social and preventive medicine and public health

First of all, are social and preventive medicine and public health different terms for one and the same discipline? Certainly, there is a *common goal*, which is to *promote, maintain and improve health and well-being, and to prevent disease*. Both are, as Noack et al.[1] have pointed out, concerned with three perspective:

- a *population-related perspective*
- a *preventive perspective* and
- an *environmental perspective*, because environmental influences on health and disease are a major basis for solving health problems. Needless to say, for both social and preventive medicine and public health, the environmental perspective does not only refer to a purely biomedical model of thinking, but rather to a comprehensive biopsychosocial model[2].

Figure 1 shows how these two disciplines can be seen to relate to each other. Public health, as a very large, multidisciplinary task, is represented as a larger circle than social and preventive medicine. Of course, there is a large overlap between the two, mainly because they share in the three perspectives just mentioned.

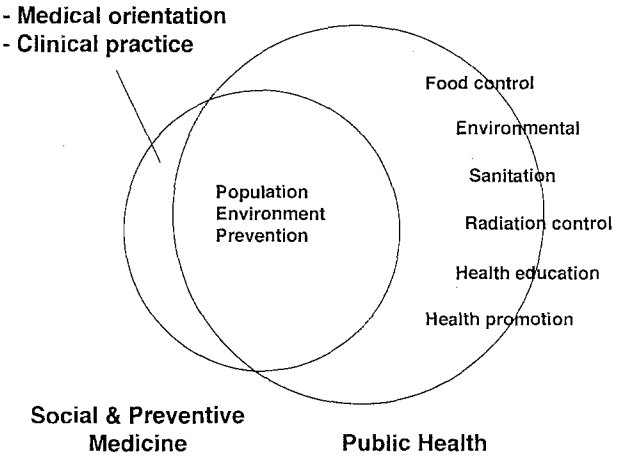

Fig. 1. Social and preventive medicine and public health: overlapping and non-overlapping aspects.

But those parts of the two circles which do not overlap should not be ignored. Public health, besides its medical focus, also acts in more technical contexts such as in food control, environmental sanitation, and radiation control, and in more society-oriented contexts such as in school health education, community drug prevention or worksite-based health promotion. Although physicians may play a certain role in the non-medical areas, these are closer to other professional fields such as chemistry, physics, educational science or social science than to medicine. All of these areas of public health are based on common principles, including the three perspectives mentioned above, and on the use of epidemiology as a scientific basis and tool.

Social and preventive medicine and medical practice

Seen this way, social and preventive medicine represents that part of public health which has a medical focus, and logically then, social and preventive medicine is the connecting element between public health and medical practice. Just as Society consists of individuals, activities planned for populations also require activities on the individual, or

* Paper presented at a symposium on "The Public Health Perspective of Social and Preventive Medicine", in celebration of the 20th anniversary of the Department of Social and Preventive Medicine, University of Berne, 25 June 1992 in Berne.

clinical level, and this applies as much to preventive patient services as to the social support aspects of patient care. Research and teaching in social and preventive medicine therefore have to consider both the population and the individual care levels.

Basic versus applied research

Finally, the roles of basic and applied research, as they present themselves in social and preventive medicine and in public health, have to be weighed against each other. Models of disease causation are an indispensable precondition for action in primary prevention, and to develop and test these models requires scientific research of a basic type, covering the physical as well as the social aspects of the web of causation of disease, and of health.

But knowledge about disease causation is not enough to lead to effective prevention though this was still widely believed twenty years ago. Preventive strategies have to be developed which are based on knowledge about local circumstances, needs and opportunities. It is the task of applied research to provide these insights, before research-based action and the type of research which accompanies the action can enter into a profitable interplay. In the past, this interplay was already practised in the control of infectious disease, but little experience exists in the context of chronic disease control. Knowledge about the type of applied epidemiological research needed to support preventive activities has been scarce, and it is here where one focus of our interest and that of our department has been.

As summarized in Figure 2, interventions have to be preceded by research in several areas, including the needs and current circumstances of the target populations, before decisions on strategies and intervention components can be taken. As activities proceed, they have to be accompanied by systematic evaluation and followed by new rounds of fact-finding, decision-making, intervention and evaluation. Applied research in public health as well as in the public-health-related aspects of social and preventive medicine will deal with segments of this cycle.

To illustrate this principle, practical examples from two current areas of concern will be presented: the prevention of tobacco-related disease through the promotion of smoking cessation in medical practice, and the planning of programmes for the disabled elderly and their families.

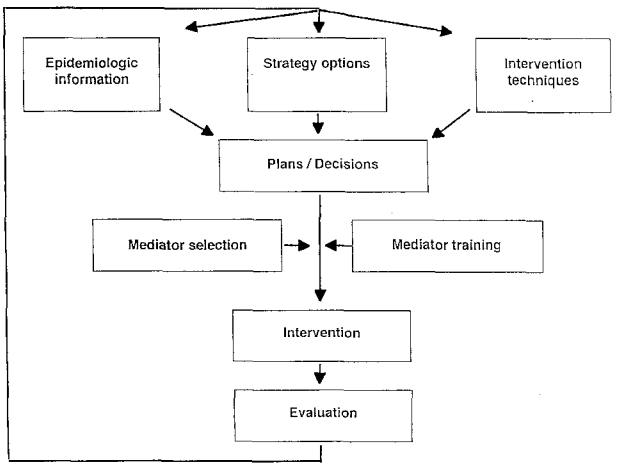

Fig. 2. Flow chart of interaction of public health action and its supporting research.

Practice-oriented research in the prevention of tobacco-related disease through the promotion of smoking cessation

In the context of promoting smoking cessation as a part of a multi-dimensional action programme to prevent smoking-related disease, a number of questions can be derived from the flow diagramme shown in Figure 2. As presented in Table 1, a first group of questions is concerned with the *scope and nature of the problem* in general, and serves to define the goals and content of intervention activities. A second group of questions serves as a *basis for selecting appropriate intervention strategies*, for instance in terms of target populations and selection of mediators. The third group is concerned with *intervention techniques*, and a last question is that of the *long-term evaluation in terms of smoking and morbidity trends.*

Studies to determine the scope and nature of the problem

What messages should be communicated, and how?

It is generally agreed that when the U.S. Surgeon General's Report[3] was published in 1964, the question of disease causation by smoking was settled to the extent necessary to decide on practical action. Epidemiological data was available, but the problem had to be communicated as understandably as possible to decision-makers and the public. This is why an effort seemed worthwhile to translate the then new results of the large cohort studies on

Tab. 1. Research as a basis for promotion of smoking cessation.

Application	*Research question*
Scope and nature of the problem	Is smoking a priority topic? What is the message?
Choice of strategies	Which target populations? What type of mediators?
Choice of techniques	What cessation techniques?
Long-term evaluation	Smoking trends? Disease trends?

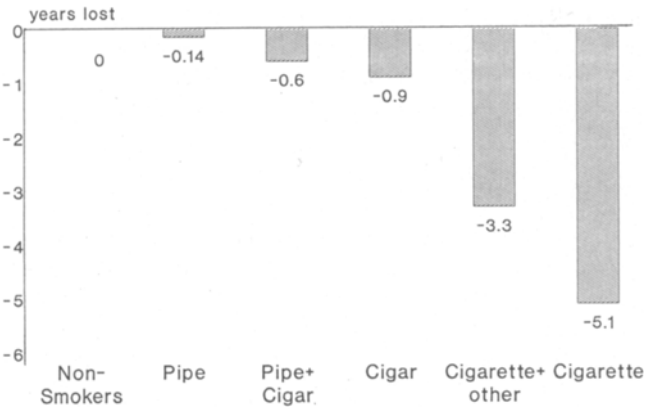

Fig. 3. Loss of life expectancy at age 40 in relation to smoking (based on ref. 5).

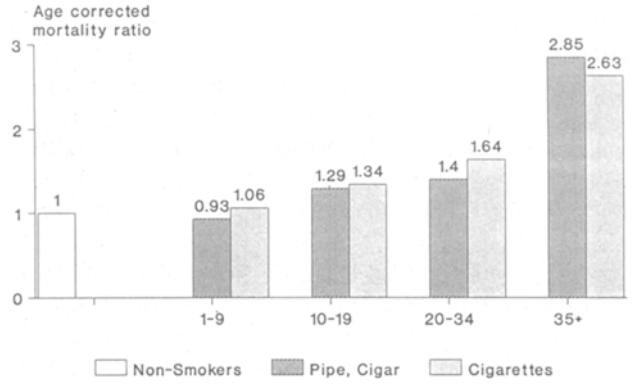

Fig. 4. Mortality by type of product smoked. Swiss physicians 1955 to 1974 (based on ref. 11).

smoking and mortality[4] in a way better understandable to the public, and I attempted to express them in terms of the loss of life expectancy related to smoking. Figure 3 shows the principal results of that work published in 1965[5], in particular that loss of life expectancy is 5 to 8 years greater for smokers than for non-smokers. Media interest could indeed be stimulated as intended, and the same was again the case recently, when the Swiss Federal Office of Public Health published a report[6] based on computations done at our department by Pfluger[7], to the effect that in Switzerland, each year around 10000 deaths are attributable to smoking. A further question was concerned with what should be the exact *content of educational messages*. In particular, a question of interest a number of years ago was how safe it was for smokers to switch from cigarettes to other products such as cigars and pipes. Because cigar and pipe smoking was rather widespread in Switzerland, this question was of particular importance in this country. Based on previous work on this issue[8,9], the first large project of the then newly-founded department was to add a further follow-up to a cohort study of Swiss physicians started by Gsell during the nineteen-fifties[10]. As Figure 4 shows, regular cigar and pipe smoking was indeed associated with an increased risk of death, and, as the study further showed, this involved the same diseases that had already been shown to be associated with cigarette smoking[11]. The practical consequence was that it could no longer be recommended to switch from cigarettes to cigars or pipes, or to start smoking these products rather than cigarettes.

Studies as a basis for selecting preventive strategies

What are the target populations for smoking cessation?

The next set of questions is aimed at specifying what population segments should primarily be aimed at with smoking cessation programmes, and who would be suited to act as mediators. One particular question concerning the target population for smoking cessation programmes is about social class-specific differences in smoking habits. Figure 5, based on a population survey directed by Horst Noack and coordinated by Walter Weiss in our department[12] shows that in Switzerland, as in other countries, there are considerable differences in smoking habits by social class, with more smokers in the lower socio-economic strata[13]. The practical consequence is that most of the work on motivating and assisting smokers toward cessation should be targeted at lower social class populations. Of course, this finding is not surprising given the long-known pattern of health behaviour by social class[14] as well as earlier studies done in Switzerland[15,16], but data that is local and recent can be expected to have more effect on decision-makers, however convincing the studies from the international literature may be to scientists. In many countries, such as the United States[17] and England and Wales[18], there is a tradition of having studies done periodically by government agencies, but where there is no such tradition, and the corresponding know-how is restricted, university departments of social and preventive medicine and public health seem well suited

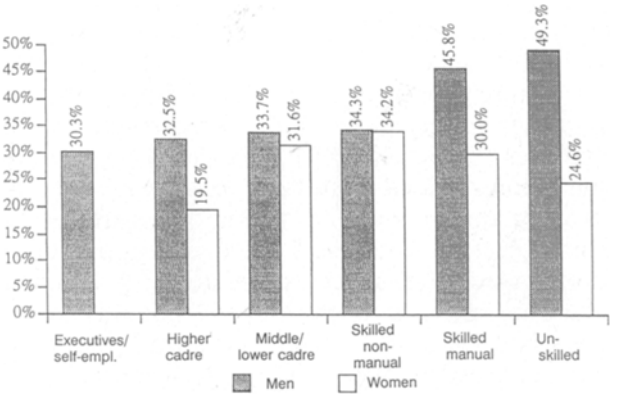

Fig. 5. Smoking habits by social class in five Swiss cantons. Data from the Swiss Intercantonal Health Indicators Project (ref. 13).

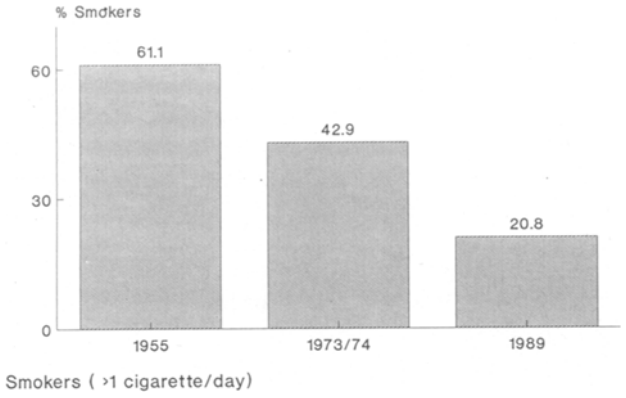

Fig. 6. Smoking habits of Swiss physicians, 1955 to 1989 (ref. 19).

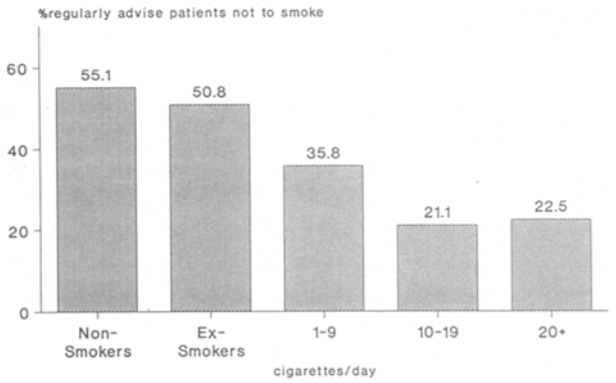

Fig. 7. Advice on smoking by smoking status of physicians (based on ref. 22).

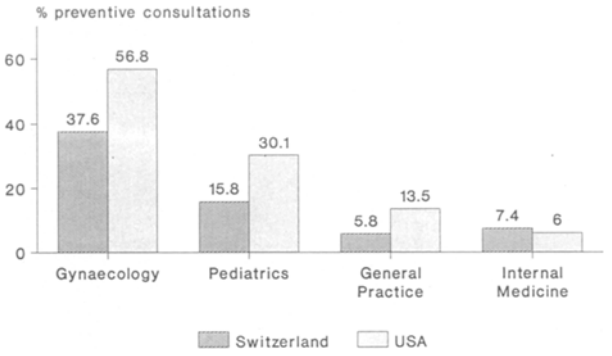

Fig. 8. Proportion of consultations concerned with prevention by physicians of different specialities in Switzerland and the United States, 1977/78 (based on ref. 23).

to initiate and conduct studies that can serve as demonstration projects for future government surveys.

Are physicians suited to be mediators in smoking cessation?

The next question was about the suitability of physicians as mediators for smoking cessation programmes. As shown in Figure 6, in 1955, over 60 percent of male physicians in Switzerland had been smokers, but this proportion had decreased successively to twenty percent by 1989[19]. Although this is still more than the ten percent of smokers observed among physicians in some Anglo-Saxon countries[20,21], even in Switzerland physicians have thus demonstrated that it is *possible* to give up smoking and to continue staying off cigarettes.
Common sense would lead one to expect that non-smokers are better suited as mediators for smoking cessation messages than smokers, but this hypothesis had yet to be tested. As Figure 7, based on data published in 1976[22] shows, physicians who are non-smokers or former smokers indeed report significantly more smoking advice activities than physicians who are smokers. Stimulated by this early observation, we have recently taken this question up again in a more general form together with Ulrich Grüninger and Marco Casanova, on the basis of a survey conducted in 1989, and we expect from it certain clues as to how to increase the preventive activities of physicians.
That an increase is still feasible is demonstrated in yet another study of physicians' activities in Switzerland (Figure 8), which suggested that Swiss gynaecologists, pediatricians and general practitioners spend considerably fewer of their consultations doing preventive work than do their American colleagues[23].

Development and evaluation of smoking cessation techniques

Effective intervention methods are a primary precondition for successful public health campaigns, and in the context of smoking control, this includes smoking cessation techniques and aids. We started working in this area in the 1960s with psychoanalytically oriented smoking cessation group sessions, organized together with teachers of an American high school in which a smoking education campaign was conducted. The result was disappointing[24], and emphasis in such programmes soon shifted from a psychoanalytical to a behavioural psychological framework.
The question of smoking cessation was taken up again in 1976, when two doctoral students, Conrad Frey and Christoph Beglinger, developed and evaluated a set of self-teaching smoking cessation manuals based on behavioural techniques. Smokers wishing to quit were recruited through a popular radio programme, and thus the department found itself as an initiator not only in the area of public-health-oriented population studies, but also in that of public service programmes[25]. Similar self-teaching materials were also published elsewhere, and one of them, which had been developed in the United States by the American Lung Association[26], was later translated into German, French

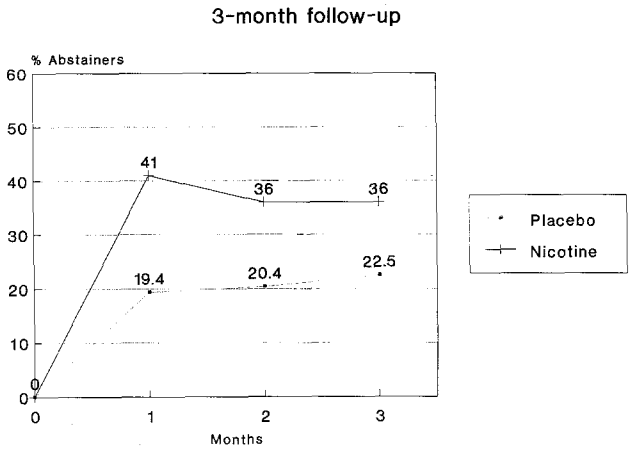

Fig. 9. Abstention rates among smokers using a nicotine patch or a placebo patch. Three-month follow-up in a randomized controlled field trial in medical practice (based on ref. 29).

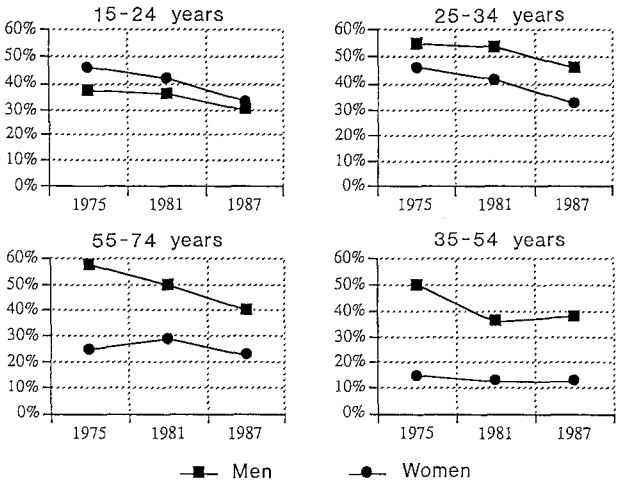

Fig. 10. Trend of smoking habits in Switzerland 1975–1987, based on data obtained jointly with the Swiss Institute for Prevention of Alcohol and other Drug Problems (ref. 13, 32).

and Italian, and widely used in Switzerland[27]. A few years after publication, we had an opportunity of evaluating this Swiss version, and found that the chance of success in terms of smoking habits at one-year-follow-up was considerable. But it depended greatly on the method of recruitment of smokers. Those recruited through physicians' practices appeared to be more dependent smokers or less motivated quitters than those who responded to mass media publicity[28].

The most recent work on smoking cessation techniques is again based on cessation advice in medical practice, and examines the effectiveness of nicotine substitution by means of a transdermal nicotine patch. Figure 9 shows the results of a double-blind randomised trial after three months of observation[29]. They suggest that a medically-oriented model of smoking cessation advice, including support by prescribed medication, is of great interest as a public health strategy to reduce the rate of smoking in the population.

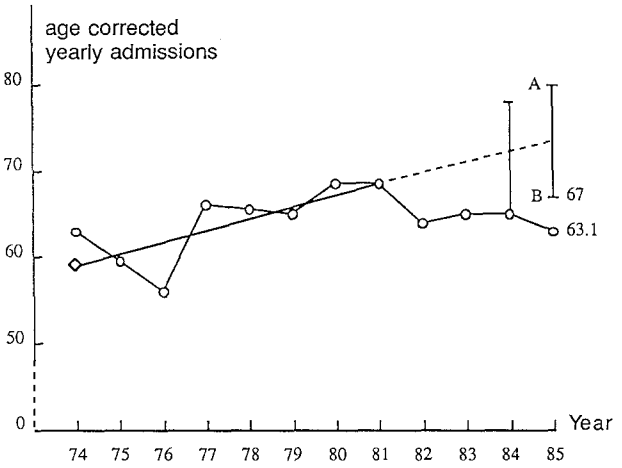

Fig. 11. Trend of hospitalisation due to myocardial infarction, VESKA hospital cohort 1974–1985 (from ref. 33).

Application in practice and teaching

Practical application of research results may not be considered as an academic activity, but when experienced professionals in the field are rare, as is the case in Switzerland, university departments may get involved on that level as well. This was the case recently in connection with a programme offered by the Swiss Medical Association, when Ulrich Grüninger from our department, jointly with Conrad Frey and others, developed continuing education courses in smoking cessation counselling for physicians[30].

On the other hand, teaching medical students *is* a major responsibility of our department, and so we introduced smoking cessation counselling in the teaching of medical students as well. But student interest was rather moderate. Apparently, the old observation is confirmed here that the interest in practical aspects of prevention is limited, as long as there are no immediate and well specified reponsibilities in preventive care to prepare for[31].

Evaluation in terms of smoking and morbidity trends

The final type of study in any public health programme concerns the evaluation of its long-term effects on health behaviour and health. Figure 10 shows that in Switzerland, between 1975 and 1987, smoking rates have indeed fallen in most age groups, in particular among men ([13] based on [32]). And as Figure 11, taken from a thesis by Peter Berweger[33,34] shows, the morbidity trend for myocardial infarction, as measured by hospital admissions, also decreased for persons under 65 years of age. As was shown in the same study, about

Tab. 2. Research as a basis for organisation of care for the disabled elderly.

Application	*Research question*
Scope and nature of the problem	Frequency of the problem? Influencing factors?
Choice of strategies	Which target populations? What type of support? (What supporting organisations?)
Choice of techniques	(What support techniques?)
Long-term evaluation	(What long-term impact?)

half of the decrease of mortality from myocardial infarction, which had been reported before, could be assigned to the effects of prevention – including the decrease of smoking rates – and about half to decrease of hospital mortality[34]. More recently, death rates from lung cancer have also fallen among men in Switzerland[35], strongly suggesting a beneficial effect of effort to promote non-smoking and to support smoking cessation activities.

Research on the planning of care for the elderly

It is not possible here to discuss other areas of work in similar detail, but in order to avoid a one-sided impression, a few examples from another research programme – that on disablement and the service needs of elderly persons – will be presented. This programme was decided on very soon after the department had taken up its work, because at that time, epidemiological data for predictions and planning for the elderly were almost entirely lacking in Switzerland. Table 2 summarises the research questions of relevance in this context.

A question of general interest, to which our work gives at least a partial answer, concerns the phenomenon of "*compression of morbidity*"[36]. As Fries has shown[37], the progress reached during this century in decreasing mortality was achieved almost entirely by reducing premature death, and not by postponing the age at death of the very old. The question was left unanswered whether the postponement of death was accompanied by the postponement ("compression") of morbidity, or whether the life years gained were life years with

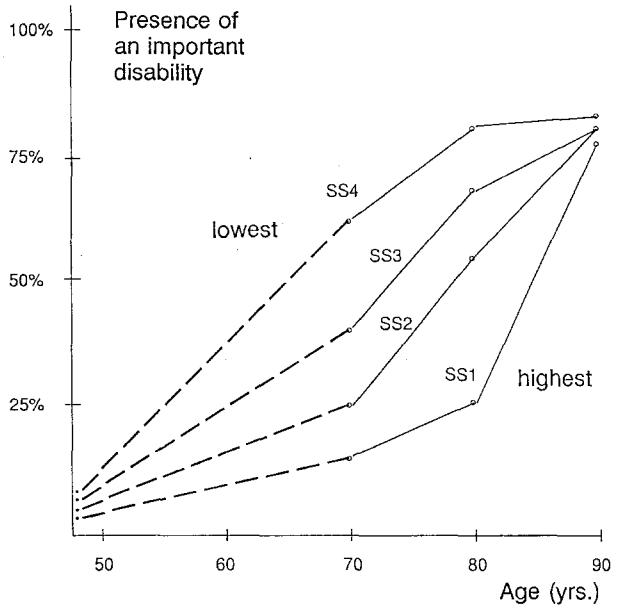

Fig. 12. Prevalence of disability by age and social class in an elderly urban and suburban population: evidence for compression of morbidity (based on a study described in ref. 38, 39).

disablement. Figure 12 shows how social inequality and age act together in determining the prevalence of disability in an elderly population. The lower the social class, the earlier a high rate of disability is reached, and the higher the social class, the later it is reached. But finally, at about 85 years of age, a similar age-specific prevalence rate of disability (of 75 to 80 percent) is reached in all socio-economic groups. In other words, this finding from a study conducted at our department in the late 1970s[39] provides evidence for the presence of compression of disability in the more privileged social classes as compared to the lower classes, where disability is perceived earlier. It suggests that there is hope that life expectancy free of disability could be increased if the advantages of higher social class life could be applied to members of all groups.

One of the most pressing questions in the care of the elderly concerns the possibilities of drawing on resources in the informal sector for providing nursing and household help for disabled elderly people, and one of the aims of our study was to reach a better understanding of the interplay of informal and formal social support networks. As Table 3 shows, using assistance in getting dressed as

Tab. 3. Principal providers of care to urban elderly persons in need for help in getting dressed. Comparison with elderly persons of remote mountain valley.

(%)	Nursing home	Spouse	Family members	Friends neighb.	Organis. help	Total
Unmarried	98.4	–	1.6	–	–	100.0
Married	25.3	74.7	–	–	–	100.0
Widowed	84.6	–	9.3	–	6.1	100.0
All	68.2	17.3	9.0	–	5.5	100.0
Mountain valley	0.0	39.7	59.7	0.7	–	100.0

an example, spouses represent a primary resource in nursing care as long as the elderly person in need of help is married. But once he or she is widowed, other relatives do not seem to replace the deceased spouse easily, and a majority of the elderly in need of help enter nursing homes. This was different in a remote mountain valley, where all elderly people, regardless of their level of disability were cared for by their own family members[40]. As a major lesson from this it can be suggested that formal service systems should start to support families before major crises such as the death of a spouse have occurred, and start to prepare additional family members for a future role in caring for the elderly person early.

Application for teaching

Unlike the research on smoking, the research on the needs of the elderly has had an important impact on clinically-oriented teaching activities. Ever since 1974, the fourth year medical students of the University of Berne, while assigned to practical training in internal medicine, have had to conduct a detailed patient interview on the social background of the patients and the social implications of their illness. A written report is handed in, which is then discussed in a final seminar together with the medical social worker of the particular hospital division. Hundreds of students have gone through this exercise so far, and in many cases this has stimulated their interest in the social dimension of patient care[41].

Conclusion

What can be concluded from these considerations and examples? They have shown that a department of social and preventive medicine at a medical school is in a good position to do research on, and to teach, both the public health and the clinical aspects of social and preventive medicine. It can do basic as well as applied research. Its activities can be oriented both toward the population and to the individual. The examples were chosen to demonstrate the possibilities and limitations of organised action to prevent disease on the one hand, and to improve needed social networks on the other.

To many, this research may seem less attractive than investigating the causes or mechanisms of disease, but it requires the same scientific rigour as all research does. At least for the development of this type of research, an academic environment is therefore indispensable, and for the publication of its results, a critical peer review system must be involved as a matter of course. Research in social and preventive medicine is, however, different from other academic research in that, because of national and regional differences in health status and health services, much of the work done is oriented towards particular situations. Whereas reports providing generally-applicable insights will find their way into the international journals, publication of results of local significance will often be restricted to more local journals. This should be kept in mind in evaluating candidates for academic promotion or scholarships.

There is much reason to expect that health problems both in our own population and throughout the world will increase in the future. Increasingly, knowledge about what should be done to solve the problems will be available, but more knowledge and experience about how to do it will be needed. Researchers as well as practitioners and, last but not least, decision-makers will have to work closely together and give of their best to solve these problems.

Summary

Both public health and social and preventive medicine are characterised by the common goal of promoting, maintaining and improving health and preventing disease, and both are concerned with a population-related, preventive and environmental perspective. But whereas public health is interdisciplinary and goes far beyond the medical focus, social and preventive medicine is medically based and forms a bridge between public health and medical practice. Research in a department of social and preventive medicine serves to support preventive and medico-social activities in medical practice as well as in public health. This is illustrated by results from research conducted at the author's department during the last twenty years. Examples are research in support of smoking cessation activities, and research used for the planning of care for the elderly. Both the research and the teaching activities of the department take into account the population focus of public health as well as the focus on individual medicine in clinical practice.

Résumé

La recherche et l'enseignement en médecine sociale et préventive et en santé publique

La santé publique aussi bien que la médecine sociale et préventive sont caractérisées par le but commun de promouvoir, maintenir et améliorer l'état de santé et de prévenir les maladies, et elles s'orientent vers une perspective de population, de prévention et environnementale. Mais la santé publique est interdisciplinaire et va loin au-delà de la médecine, tandis que la médecine sociale et préventive est basée sur la médecine et représente le lien entre la santé publique et la pratique médicale. La recherche d'un institut de médecine sociale et préventive sert à appuyer les

activités préventives et médico-sociales au cabinet médical aussi bien qu'en santé publique. Cela est illustré par des résultats de recherches conduites dans les vingt années passées à l'institut de l'auteur, et les exemples sont tirés de la recherche en appui de la promotion de la cessation de fumée et de la planification de la prise en charge des personnes âgées et handicapées. Les activités de recherche et de l'enseignement de l'institut tiennent compte de la perspective de population caractéristique de la santé publique, aussi bien que de la dimension de médecine individuelle caractéristique de la pratique clinique.

Zusammenfassung

Forschung und Lehre in Sozial- und Präventivmedizin und öffentlicher Gesundheit

Sowohl das Gebiet der öffentlichen Gesundheit als auch dasjenige der Sozial- und Präventivmedizin sind durch das Ziel der Förderung, Erhaltung und Verbesserung der Gesundheit sowie der Krankheitsvorbeugung gekennzeichnet, und beide beschäftigen sich mit einer bevölkerungsbezogenen, präventiven und umweltbezogenen Perspektive. Aber während die öffentliche Gesundheit stark interdisziplinär ist und weit über den medizinischen Fokus hinausreicht, ist die Sozial- und Präventivmedizin ein medizinisches Fach und stellt eine Brücke zwischen der öffentlichen Gesundheit und der ärztlichen Praxis dar. Die Forschung in einem Institut für Sozial- und Präventivmedizin dient der Förderung präventiver und sozialmedizinischer Tätigkeiten in der ärztlichen Praxis wie auch in der öffentlichen Gesundheit. Dies wird durch die Forschungstätigkeit des Instituts des Autors aus den letzten 20 Jahren illustriert, wobei Beispiele aus den Gebieten der Förderung der Raucherentwöhnung und der Betreuung behinderter Betagter dargestellt werden. Sowohl in den Forschungs- als auch in den Lehrtätigkeiten des Instituts finden der Bevölkerungsbezug der öffentlichen Gesundheit wie auch der individualmedizinische Ansatz der ärztlichen Praxis ihren Ausdruck.

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