

Is clinical prevention better than cure?

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In wealthy countries, the focus of clinical care is changing from cure to prevention, to anticipate future diseases in currently healthy individuals. We review the challenges that clinicians face, such as: prevention can cause harm; predicting the benefit of preventive activities for the individual, as opposed to the group, can be difficult; prevention is not of equal value to everyone; and prevention is beginning to take priority over treatment. Clinicians need to be vigilant to avoid colluding with those who have vested interests in some preventive activities.

Finding the right balance between prevention and treatment is a daily challenge. Many reasons exist for the increased emphasis on prevention, including the identification of risk factors for disease, increased social expectations of a long and healthy life, and collusion of many commercial and professional interests in profiting from the creation of new markets:¹⁻³ the social, professional, and financial rewards for prevention can be considerable.

In clinical care, treatments are intended to cure or alleviate symptoms and signs. By contrast, prevention is done to ward off something in the future. Clinical prevention, including immunisation and lifestyle advice, is an important and positive component of almost every clinical visit. However, with increasing responsibility for specific populations and recognition of the many diverse influences on the occurrence and progression of illness, the concepts underlying prevention have become muddled. For example, is the identification of a risk factor always (or even generally) an indication for preventive activities? Prevention has always had its detractors,^{4,5} but new thinking is needed about the benefits and potential harms of prevention in clinical practice.^{6,7} The potential consequences of preventive measures include: possible disruption of cultural and individual capacities to cope with sickness, pain, and death; increased fear and perception of illness where none exists; and clinicians' frustration over a growing list of requirements that are impossible to accommodate within the clinical visit.^{1,2,8,9}

Here, we explore several specific challenges and suggest possible ways of tackling them. Clinicians all over the world, but particularly in wealthy countries, are our target audience because we argue that many preventive interventions are promoted without sufficient evidence of their benefits, cost-effectiveness, and feasibility in routine clinical visits, within which preventive strategies must compete with the management of the problems that patients present.

Prevention has an aura of omnipotence and good sense.⁶ However, is it always true that prevention is better than cure? Consider the example of hypertension:

evidence exists that the benefits of screening and treating substantially outweigh the harms; yet treatment can be complex and expensive, making it difficult for clinicians to carry out the recommended control strategies.¹⁰ Furthermore, treatment for hypertension almost always heightens anxiety and usually needs many consultations and examinations, and drugs that patients must take for the rest of their lives—a particularly important issue for young adults with mild hypertension, and with no guarantee of individual benefit.¹⁰

In many ways, the pitfalls of prevention mirror those of clinical care: setting of priorities, gathering and interpreting evidence, weighing benefits and costs in the presence of comorbidity, and being aware of the possibility of adverse events. The principle of “first do no harm” is paramount. Prevention needs more careful assessment than does treatment because it is presented as beneficial to people who are well—indeed, it is typically initiated by the doctor rather than the patient—and yet carries a real risk of causing harm. Therefore, clinicians should give cautious guidance and provide careful ongoing monitoring for psychological and physical side-effects.¹¹

The individual's current level of health should always be taken into account because clinicians, in their attempt to do everything possible, will initiate multiple preventive, diagnostic, and therapeutic activities, each of which leads to interventions with well documented but poorly recognised ill effects.¹² The administration of several interventions and medications, even if each is of high quality, increases the risk of adverse effects and drug interactions: hence the potential importance of quaternary prevention—ie, actions taken to identify patients who are at risk of over-medication, to protect them from new medical interventions.^{13,14} Quaternary prevention is particularly relevant in the elderly, whose comorbidity is associated with increased fragility. Clinicians have ethical obligations to protect patients at risk of harm from excessive interventions.

Clinical prevention based on the identification of risk factors has stimulated the development of prediction rules that use clinical findings to make a diagnosis or predict an outcome, of which the Framingham coronary heart disease risk function is perhaps the best known. Prediction rules have become popular as aids in planning preventive and curative interventions. However, the widespread application of prediction rules has taken place through prediction rules being equated with decision rules, population risk being translated into individual risk, and rules being applied to populations other than those on whom they were developed (the use of the Framingham risk function being an example). Diseases have been recast on the basis of often arbitrary laboratory

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values. We impute disease and risk factors to healthy individuals, and turn people into patients, without any evidence of benefit to them individually. Only a few prediction rules have undergone formal impact analysis, to assess whether they improve patient outcomes when used as decision rules in actual clinical practice.¹⁵ Without such analysis, clinicians cannot know whether a prediction rule will help or harm. The growing popularity of rules, despite these caveats, seems to be part of an increasingly desperate need to simplify the complexity and difficulty of judgments needed in the care of individual patients, but even computerised algorithms need clinical judgment in their application.

The US Preventive Services Task Force assesses single interventions for asymptomatic patients, but gives no indication as to how they should be combined. Furthermore, its recommendations are not intended for patients who have already developed symptoms or signs of disease, or have comorbidity: no information exists about the suitability of the recommendations in such situations.¹⁶ The US National Commission on Prevention Priorities (USNCCPP) indicates that not all preventive activities have the same benefit, adverse-effect profile, and cost, and recommends that clinicians should not devote their time to all recommendations equally.¹⁶ Therefore, USNCCPP acknowledges that clinicians must apply judgment in adhering to recommendations, taking into account different biological, cultural, social, and economic contexts, patients' preferences, the natural history of the disease, co-occurring risks, relative, attributable, and absolute risk, and prevalence in the population.

Patients are important partners in medical care. When risk behaviour is viewed as a balancing act on the part of patients, it becomes easier to appreciate that many patients take risks not because of ignorance, but after weighing rewards against risk. Even if benefits could be guaranteed (which is never the case), risk compensation may explain why the obvious potential of many preventive activities (such as use of seat belts or condom promotion) is never fully realised.¹⁷

The knowledge of benefits to individuals of most preventive activities is rudimentary, and no information exists to assess benefits in the presence of co-occurring risks. Risk assessment, at best, is an inexact science, and estimated risks can and do change. In general, recommendations for preventive activities are mainly based on relative risk, but attributable risk is a more important consideration. How frequent is the risk in the population? Is it frequent enough to have a substantial effect on the health of that population?

The Seven Countries study showed how the likelihood of benefit for some preventive interventions varied according to the population. In the populations studied, the relative increase in long-term mortality due to coronary heart disease for a certain increase in blood pressure was similar, but the absolute risk at the same

blood pressure varied substantially.¹⁸ Standard recommendations for screening, diagnosis, treatment, and follow-up of hypertension would lead to different outcomes in different populations. Many screening recommendations do not adequately consider differences in yield and costs in different populations.

Preventive and treatment interventions have a different effect on life expectancy. Therefore, care of illness should not be compromised in favour of preventive activities, and should receive priority for available resources (clinicians' time being perhaps the most important).¹⁹ In the UK, use of inhibitors of angiotensin-converting enzyme in heart failure has a potential health gain of 308 deaths deferred per 100 000 people per year, whereas that for screening and treatment of hypertension of 71 deaths deferred per 100 000 people per year.²⁰ However, incentives for performance are not commensurate because screening and treatment of hypertension was rewarded with about 25 500 euros per year for a typical health centre (a patient population of 5500 with three general practitioners) compared with 3500 euros per year for use of inhibitors of angiotensin-converting enzyme in heart failure in 2005.²⁰ Clinical activity is thus skewed towards preventive activities, to the detriment of illness care.

Clinicians have a clear understanding that social and economic conditions are the cause of many health problems. They know that the answer to homelessness is housing, to hunger is food, and to illiteracy is education. They know that they cannot usually intervene, but they still consider these questions in the care of patients. In the same way, clinicians know that they cannot prevent all health-related problems and that they should consider possible interventions carefully and with caution. Clinicians need more help from researchers, free from conflicts of interest, to think how best to target interventions, share decisions with patients about possible benefits and harms, assess the possible effects on both individual and population health, and estimate the opportunity costs.^{18,20-22}

In an era of population-based medicine in clinical settings, physicians, and especially primary-care physicians, can use their collective influence to suggest better ways to provide evidence for prevention. We propose the following principles to guide the assessment of new recommendations of clinical prevention:

- Evidence of benefits and feasibility must be tested in ordinary practice. The issue is not primarily one of evidence, but rather it is what evidence is sought, for what purpose, how it is interpreted, and what might be contraindicated, and in what instances—the same issues as for clinical management of illness, but with the added challenge of doing no lasting or serious harm to people who feel well. Information is needed about differential effects on different populations and groups of patients, taking into account age, sex, and socioeconomic status as a minimum.

- Not all preventive activities are of equal value. New proposals should be compared with old ones. Clinicians must decide which preventive services to offer, and policy makers must decide which services to promote. Therefore, they all need information with which to assess the greatest return on investment. New preventive activities should include information about effectiveness in avoiding future illness burdens versus dealing with a current one. For whom, and under what circumstances, is prevention better than cure?
- Reduction of relative risk is not enough. Absolute risk differs in different populations. Attributable risk is an important characteristic of evidence; yet it is generally missing in the randomised clinical trials that produce evidence. The relative frequency of the problems for which evidence is sought must be known before the usefulness of evidence can be interpreted. Therefore, decisions about priorities for prevention targeted at populations, including clinical populations, need to take attributable and relative risk into account
- All trials on which policy is to be based should assess and report harms arising from implementation of the intervention. New proposals should not transform prediction rules into decision rules without robust impact analysis.

The pressure to do more, whether in prevention or treatment, is relentless. The effect of vested interests, which now includes those physicians who are being paid for performance of certain evidence-based interventions, demands that greater caution should be used in interpreting the utility of recommended interventions. Prevention interventions take from the poor and give to the rich. Insecure, impoverished, culturally disenfranchised or alienated people are less likely to take part in preventive activities than people with greater resources. Thus, doctors who treat well people are better remunerated.

New health challenges need new types of medical interventions. Old-style prevention is not more justified than old-style treatment. More money spent on preventive care for the rich people, who are in a better position to demand it, takes time away from the poor people, who have greater needs for their health problems.

Conflict of interest statement

We declare that we have no conflict of interest.

References

- 1 Illich I. Medical nemesis. The expropriation of health. New York: Pantheon Books, 1976.
- 2 Moynihan R, Smith R. Too much medicine? Almost certainly. *BMJ* 2002; **324**: 859–60.
- 3 Gervas J. Screening for serious illness. Limits to the power of medicine. *Eur J Gen Pract* 2002; **8**: 47–49.
- 4 Cochran AL. The widening horizon of preventive medicine. The medical officer of health as an epidemiologist. *R Soc Health J* 1955; **75**: 584–87.
- 5 Holtzman NA. Prevention: rhetoric and reality. *Int J Health Serv* 1979; **9**: 25–39.
- 6 Gray JA. Postmodern medicine. *Lancet* 1999; **354**: 1550–53.
- 7 Fugelli P. The Zero-vision: potential side effects of communicating health perfection and zero risk. *Patient Educ Couns* 2006; **60**: 267–71.
- 8 Barsky AJ. The paradox of health. *N Engl J Med* 1988; **318**: 414–18.
- 9 Bodenheimer T. Primary care—will it survive? *N Engl J Med* 2006; **355**: 861–64.
- 10 Canadian Health Services Research Foundation. An ounce of prevention buys a pound of cure. *J Health Serv Res Policy* 2004; **9**: 191–92.
- 11 Stewart-Brown S, Farmer A. Screening could seriously damage your health. Decisions to screen must take account of the social and psychological costs. *BMJ* 1997; **314**: 533–34.
- 12 Starfield B. New paradigms for quality in primary care. *Br J Gen Pract* 2001; **51**: 303–09.
- 13 Gervas J. Diagnostic and therapeutic activity moderation. Quaternary and genetic prevention. *Gac Sanit* 2006; **20** (suppl 1): 127–34.
- 14 Bentzen N. WONCA Dictionary of General/Family Practice. Copenhagen, Denmark: Laegeforeningens Forlag, 2003.
- 15 Reilly BM, Evans AT. Translating clinical research into clinical practice: impact of using prediction rules to make decisions. *Ann Intern Med* 2006; **144**: 201–09.
- 16 Maciosek MV, Coffield AB, Edwards NM, Flottesmesch TJ, Goodman MJ, Solberg LI. Priorities among effective clinical preventive services: results of a systematic review and analysis. *Am J Prev Med* 2006; **31**: 52–61.
- 17 Richens J, Imrie J, Copas A. Condoms and seat belts. The parallels and the lessons. *Lancet* 2000; **355**: 400–03.
- 18 van den Hoogen PC, Feskens EJ, Nagelkerke NJ, Menotti A, Nissinen A, Kromhout D. The relation between blood pressure and mortality due to coronary heart diseases among men in different parts of the world. *N Engl J Med* 2000; **342**: 1–8.
- 19 Heath I. In defence of a National Sickness Service. *BMJ* 2007; **334**: 19.
- 20 Fleetcroft R, Cookson R. Do the incentive payments in the new NHS contract for primary care reflect likely population health gains? *J Health Serv Res Policy* 2006; **11**: 27–31.
- 21 Haynes B. Can it work? Does it work? Is it worth it? The testing of healthcare interventions is evolving. *BMJ* 1999; **319**: 652–53.
- 22 Steinberg EP, Luce BR. Evidence based? Caveat emptor! *Health Aff* 2005; **24**: 80–92.