ASSESSING THE COST-EFFECTIVENESS OF PREVENTION

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ABSTRACT: In an era of limited resources, cost-effectiveness analysis and cost-benefit analysis (CEA/CBA) can be significant policy-making aids. Because the often stated belief that prevention is cost-effective has not been systematically examined, we surveyed about 250 CEA/CBA articles concerning prevention. We found that few authors have followed generally accepted methodological standards, which raised questions concerning the validity of their findings and conclusions. In addition, prevention itself is a problem in CEA/CBA because of such factors as the long intervals between interventions and outcomes, problems which have rarely been considered in the CEA/CBA prevention literature. At the same time, a number of high quality studies concerning prevention indicates that United States policy makers have not aggressively pursued significant opportunities to improve health through prevention, for example by immunizing the elderly and by screening for and treating hypertension. We recommend that analysts follow general methodological principles in CEA/CBA prevention studies to assure both valid and credible results.

Cost-effectiveness analysis and cost-benefit analysis (CEA/CBA) are advocated or used with increasing frequency as an aid to resource allocation decisions in the health-care sector. With the rising costs of medical care and the ever-increasing percentage of the gross national product devoted to health-care services, political pressures are growing to limit societal investment in health care to those services with a demonstrably high rate of return at least in health terms and, increasingly, in financial terms. Thus, one formulation holds that publicly funded activities must be "cost-effective."

At the same time, there has been more visibility given to prevention and a number of reports have suggested that expanded preventive activities could significantly improve the health of the American people. This recent political espousal of prevention is noteworthy, since resources for preventive services have always been limited. Preventive activities now consume an estimated one to two percent of the total annual national health expenditure.

Many who work in prevention have considered it self-evident that their activities are cost-effective. However, such conviction carries little weight with those outside the field. According to one observer, "Preventive medicine
contains more advocacy than reality and suffers from overpromotion in the face of underachievement. Fortunately, a growing body of sound scientific evidence of the effectiveness and cost-effectiveness of various preventive measures has been developed. This paper will review some of the evidence collected to date and discuss methods for better and more sophisticated analyses in the future.

It is important for advocates of prevention to build their case on sound methods and data. Without such a case, one runs the risk of arousing falsely high expectations that could eventually lead to political frustration and falling budgets for prevention activities. And without such studies, it seems unlikely that significant new prevention initiatives would be undertaken by the government. Thus, there is both a challenge and an opportunity. Evaluative techniques such as CEA/CBA give prevention a real chance to gain new supporters.

Prevention has several meanings, and it probably is not feasible to give a precise definition. Generally, prevention is distinct from treatment. Indeed, primary prevention activities are those that prevent the incidence of disease, health problems, or accidents. They may include activities outside the healthcare field entirely, such as installation of seat belts or air bags. Traditional public health activities such as provision of safe water and restaurant inspection prevent disease. Health education provided by physicians, agencies, or media may encourage people to adopt healthy habits and may be considered a part of preventive activities. Physicians also engage in primary prevention in their private practices, by giving immunizations, for example. On the other hand, prevention medicine specialists agree that secondary prevention, that is, early detection and treatment of disease to prevent further adverse consequences to the individual and usually carried out by physicians, is also part of the field. This leads to confusing definitions, in which treatment is included as a part of preventive activities. At the same time, many CEA/CBAs contrast prevention (including secondary prevention) with treatment. Since the purpose of our paper is to describe the literature, we will follow conventional usage and classify articles as their authors have.

DEFINITIONS OF CEA AND CBA

The terms cost-effectiveness and cost-benefit analysis refer to formal analytic techniques for comparing the positive and negative consequences of alternative projects. In practice, the comparison of costs and benefits is accomplished through a spectrum of approaches, ranging from sophisticated computer-based mathematical programming that manipulates large amounts of data to partially intuitive, best-guess estimates of costs and benefits. Any