
Health Economics in Dentistry

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Synonyms

Medical economics; Economic evaluation; Health services management

Definition

Health economics is an independent branch of economics that is concerned both empirically and theoretically with the economic aspects of healthcare and more particularly with the production and distribution

of scarce health goods. The justification for a specifically economic consideration of the non-economic good represented by health is that many healthcare problems (a) are connected with economic phenomena and conditions, (b) can be described and quantified in economic categories, and (c) either can be solved by economic means or, in view of the ► **scarcity** of the resources required, call for a strategy based on economic considerations. In addition, of course, other, non-economic, approaches (e. g. evidence-based medicine/evidence-based dentistry, social medicine or social law) can be applied, the results of which can contribute on an interdisciplinary basis to analyses in the field of health economics.

History

The genesis of health economics as an economic discipline in its own right is closely bound up with the trend of healthcare costs and the consequent realization that not everything desirable in the field of health is affordable. In view of this somewhat gloomy state of affairs, health economics for a long time enjoyed a reputation as a “dismal science”. Yet health economics is not a mere policy instrument for containing costs, but in fact an indispensable aid to rational policy-making. In the particular field of dentistry, the subdiscipline of “dental health economics” has now come into being, albeit hesitantly. In 1973 the American economist Paul J. Feldstein published the first systematic consideration of health-economic issues in the dental field, *Financing Dental Care: an Economic Analysis* (Feldstein 1973). Dental health economics is still relatively undeveloped in the German-speaking countries as compared with the United States, the United Kingdom, the Netherlands and Scandinavia.

Basic Characteristics

The specific methods used in health economics are characterized by systematic comparison of the costs and benefits of given actions and the balancing of alternatives against each other. According to the World Health Organization’s standard definition, the function of health economics is “inter alia to quantify over time the resources used in health service delivery, their organization and their financing; the efficiency with which resources are allocated and used for health purposes; and the effect of preventive, curative, and rehabilitative

health services on individual and national productivity” (World Health Organization 1975).

Research Issues

Health economics in the sphere of dental care is concerned in particular with the analysis of issues in and aspects of the following fields:

- **Allocation:** Is the allocation of resources to dental treatment inadequate or excessive compared with those provided for other areas of demand such as nutrition or education? Within the field of dentistry, should more or less be spent on prevention relative to expenditure on curative treatment (Räbiger 1989)?
- **Efficiency:** Are dental services rendered at the lowest possible cost for a given quality of care (in accordance with the “► **minimum principle**”), or are as many dental services as possible at the highest possible quality rendered for a given level of resources? And how can economic incentives contribute to increased efficiency, for instance with regard to the remuneration of dentists (Tiemann, Klingenberger, Weber 2003)?
- **Distribution of health goods and services:** How are the benefits of the dental healthcare system distributed to different sections of the population? Is good-quality care received only by those who can afford the services, or is there an entitlement to good healthcare irrespective of income, age, etc.?
- **Creation of value:** What is the significance of the dental care sector as a factor of growth and value in the economy and as a source of income for those working in the sector?

Levels of Analysis

Health-economic analysis can be applied at different levels. On the *micro-level* it concerns the actions of individual actors (e. g. aspects of dentist-patient communication, or effective practice management), the emphasis being placed on microeconomic elements. This level is sometimes referred to as “health services management”. The *meso-level* examines the actions of the intermediate actors in the health system (e. g. associations of statutory health insurance funds, or regional associations of statutory health insurance dentists). Owing to the German tradition of strong corporatist structures, “intermediate-level control” is comparatively important in this country (Tiemann, Klingenberger,

Weber 2003). Finally, the *macro-level* is that of analysis of the characteristics of the system as a whole. The macro-level arises by the aggregation of individual actors into collectives such as “the dental profession”, or “patients”. “Health system analysis” is conducted from the macroeconomic point of view, and examines such issues as dental overprovision, underprovision and malprovision (SVRKAiG 2002).

Methods of Health-Economic Evaluation

For practical purposes, perhaps the most important aspect of health-economic evaluation in the dental field is assessment of the costs and effects of different therapies and/or preventive strategies. These are examined from various points of view, such as that of the individual patient, that of the health insurance sector, that of the dental industry or indeed that of society as a whole. The outcome parameters used are epidemiological data, such as the DMFT value for caries or the Community Periodontal Index (CPI) for periodontal status. To ensure that the results of health-economic evaluation studies can be validly interpreted, minimum requirements as to methodology and transparency must be observed (Drummond 2005). The most common types of studies are enumerated in Table 1.

A strikingly large number of evaluation studies in the dental field are devoted to comparison of the costs of preventive strategies with their effectiveness (CEA). Preventive care concepts have a relatively long tradition in dentistry. The principal landmarks in the prevention of dental pathology in Germany are the placing of group-prophylactic measures for children on a statu-

tory basis in 1989 and the introduction of the system of individual prophylaxis in the statutory health insurance scheme in 1991. A comparison of the economics of various prophylactic measures (Saekel 2002) shows that all current measures of prophylaxis and tooth conservation are cost-effective and hence to be recommended in terms of health economics (Table 2). Apart from vaccination, no other field of healthcare has such high efficiency as dental prophylaxis, and in particular fluoridation for the prevention of caries (Räbiger 1989).

Similar studies have been carried out for a number of dental prosthetic treatments (Kerschbaum 1997; Walter et al. 1999). The usual method of calculating the cost of the alternatives is “decision tree analysis”. This is a methodological approach to the systematization of decision-making processes that uses what are known as transitional probabilities to predict the occurrence of various health-related states (e. g. secondary caries or tooth loss), sometimes extending over relatively long periods. In the case of long-term predictions, the costs of medical measures must be not only added together but also discounted. In the dental field, a long-term perspective is appropriate mainly in connection with the survival rates of restorations, prostheses and implants, and with the biomedical compatibility of various dental materials.

With regard to the development of cost utility analysis (CUA) and cost benefit analysis (CBA), health-economic research is still in its infancy, as investigation of the benefits of dental measures is enormously more complex in terms of methodology than determination of their costs. Owing to the relative non-availability of empirical data in the field of dental health-

Health Economics in Dentistry, Table 1 Systematization of types of health-economic evaluation

Non-comparative studies	
Cost of illness study (CIS)	Determination of the direct and indirect costs of an illness without consideration of effects.
Comparative studies	
Cost minimization analysis (CMA)	Determination of the costs of two or more alternative courses of action assuming equality of effects.
Cost effectiveness analysis (CEA)	Comparison of two or more alternative courses of action in terms of cost and effectiveness. This calls for a uniform effect dimension defined clinically or epidemiologically.
Cost utility analysis (CUA)	This combines different effect dimensions within the single effect dimension of “quality-adjusted life years” (► QALY), so that the relative value of therapies can be determined even where indications differ.
Cost benefit analysis (CBA)	This considers effects in terms of monetary units, thus providing a common dimension for costs and effects. The inputs and outputs of different courses of action can then be compared and balanced against each other.

Health Economics in Dentistry, Table 2 Economics of selected measures of prophylaxis and tooth conservation

Measure	Benefit : Cost (B/C)
Home use of fluoridated iodine salt	> 70
Group prophylaxis (age range 4–12 years)	5.1
Fissure sealing of permanent molars	2.3
Risk-based intensive prophylaxis as group prophylaxis	2.9
Risk-based intensive prophylaxis at the dental practice	1.2
Root canal treatment	16.7

care, ► [willingness-to-pay analyses](#) bear great difficulties. Yet research on the quality-of-life aspects of dental care has made significant progress with the development of the Oral Health Impact Profile (OHIP) for the determination of the benefit, or utility, of alternative dental treatments from the patient’s point of view. There is now a validated German-language short form of the OHIP questionnaire with 14 items (John et al. 2006), which allows problem-free assessment of patients’ oral-health-related quality of life at the dental practice or in appropriate studies.

Conclusion

The significance of health economics as an instrument of rational policy-making is likely to increase further in the future, as health – including oral health – is in economic terms a ► [superior good](#), which means that the demand for it increases disproportionately as incomes in society as a whole rise. The fact that medicine is a growth market is evident from the proportion both of the labor force (1970: 2.9%; 2004: 10.6%) and of GDP accounted for by the healthcare sector: in 2005 health-related spending averaged 9% of gross domestic product in the OECD countries, compared with only just over 5% in 1970.

Health economics, then, is fundamentally a science not of minimization but of optimization. Economic evaluations facilitate the choice of alternatives in dental practice in a situation of scarce resources. It would therefore be negligent to eschew health-economic approaches to issues in the field of dentistry.

Cross-References

- [Minimum Principle](#)
- [Quality-Adjusted Life Years \(QALY\)](#)

- [Scarcity](#)
- [Superior Good](#)
- [Willingness-to-Pay Analyses](#)

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