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Book review

Handbook of Health Economics☆

Frans Rutten*, Han Bleichrodt, Werner Brouwer, Marc Koopmanschap, Erik Schut

Department of Health Policy and Management, Institute for Medical Technology Assessment, Erasmus University, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands

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1. Introduction

Editors and authors should be complimented for their impressive attempt to provide a fair account of the state-of-the-art in health economics. To review such an extensive work in a short time span, we decided to select certain chapters for more in depth study. This selection was based on our areas of expertise under the restriction that all major research areas distinguished in the handbook should be covered.

Before turning to the review of the separate chapters, let us first make some general comments about the handbook. An important first question is whether all relevant research areas are covered and whether this has been done in a balanced way. Of course, exhaustive coverage in one book is unattainable for a large area like health economics. Rather the question is that regarding balance and possible lack of bias. In that respect, the book focuses on the US literature and health care system with 24 chapters written by US authors and only 11 by European and Canadian authors. The more traditional economic areas are generally covered by the US authors, emphasising a neo-classical rather than an institutional paradigm, and boundary topics like 'equity' and the 'measurement of health' are covered by the non-US authors. This structure both reflects the contributions in the health economics literature and

☆ Handbook of Health Economics, Volumes 1a and 1b, A.J. Culyer and J.P. Newhouse (Eds.), published by North Holland (an imprint of Elsevier Science, Amsterdam, The Netherlands). Volume 1a and b (ISBN: 0-444-82290-9, 1996 pages, US$ 215), Volume 1a (ISBN: 0-444-50470-2, 936 pages, US$ 125), Volume 1b (ISBN: 0-444-50471-0, 1060 pages, US$ 125)

* Corresponding author. Tel.: +31-10-4088552; fax: +31-10-4089094.
E-mail address: f.rutten@bmg.eur.nl (F. Rutten).

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the large variation in US health care institutions, and is only troublesome in some chapters as suggested below.

More worrying is the neglect of problems in low-income countries and the work on system analysis (performance indicators), health care finance (role of user fees in developing countries, public–private mix, medical savings accounts), prevention and health promotion (early child development programs), and on the cost-effectiveness of specific interventions in these countries (compare the references in WHO, 2000). Furthermore, while ample attention is given to the demand side of the health care market (parts 2, 3 and 5 on demand, insurance and medical care market), the extensive literature on health care supply (production and cost functions, labour market, manpower planning, etc.) is not considered. More specific remarks on topics missed will be made in the detailed review of chapters.

The editors use a schematic structure by Williams (1987) to explain the organisation of the book (see Fig. 1). This scheme distinguishes an 'engine room' of four key areas (A–D)

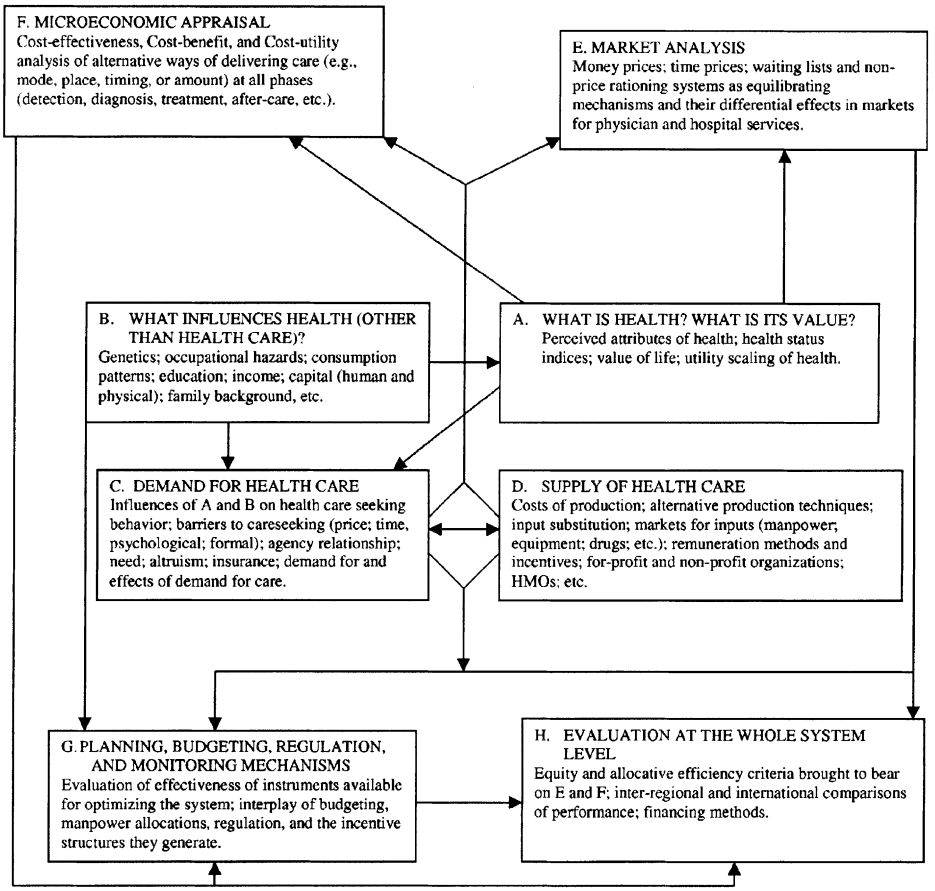

Fig. 1. A schematic of Health Economics. Reprinted from the Handbook of Health Economics, Vol 1a & 1b, A.J. Culyer and J.P. Newhouse (Eds.), p4, 2000, with permission from Elsevier Science.

and four peripheral boxes (E–H) representing empirical fields of application. The contents of all boxes are covered by several chapters. Chapters in turn often belong to more than one box.

Somewhat surprisingly, the seven parts in which the book is partitioned are not arranged according to these boxes. It is difficult to grasp the logic of the order in which these seven parts are presented and the way chapters dealing with a topic are arranged in these parts. The first part considered in volume 1A is not the best choice to achieve focus and homogeneity. A motley collection of topics is treated under the general heading 'overviews and paradigms', among which 'international comparison', 'normative economics' and 'cost-effectiveness analysis'. A more logical order would be to start with the characteristics of health care that require specific attention from an economic perspective (asymmetric information, physician agency now in part 3) and then consider the supply of health care (mostly lacking), the demand for health care (now part 2), health insurance (now part 3), health care markets (now part 5 and partly part 3), market regulation (part 6) and the analysis of systems (now partly in parts 1 and 9 on equity of systems). It is equally unclear why part 4 on 'specific populations' is placed between 'insurance' and 'markets' and why 'health habits' (part 7) precedes 'health' (part 8).

Relatively little attention is paid in the various chapters to the impact of health economic work on health policy and practice. The editors in their introductory chapter rightly suggest that this impact has been large both by successfully introducing economic concepts to policy makers and practitioners and by supporting policies at all levels of health care decision-making. Furthermore, examples of an institutional role for health economics can be provided, such as the requirement to use economic evaluation studies for policy decisions on the introduction or reimbursement of new medical technologies. Where applicable, we will consider the impact of health economics on health care in the detailed chapter reviews below.

The target readership for the book is the typical UK masters student embarking on a masters degree in health economics or the US first year graduate in a doctoral program. They will probably find some chapters less accessible than others, but will value the comprehensiveness and wealth of the handbook. Also the index seems to work well for those needing a quick update on a specific topic.

2. Overviews and paradigms

Chapter 1 on international comparison focuses on the explanation of international variation in health care expenditure and reports on the well-known high explanatory power of aggregate income with reported elasticities of unity or slightly higher. The authors, Gerdtham and Jönsson, give a thorough overview of the macroeconometric work in this area. They explain the various models used and discussed their appropriateness in the estimation of the relationship between health care expenditure and several explanatory variables, including aggregate income. Gerdtham and Jönsson distinguish between first-generation studies (cross-section bivariate and multivariate regressions) and second-generation studies (panel data analysis and unit root and cointegration analyses) and discuss the use of fixed versus random effects models and ways to correct for the presence of non-stationary variables

(with deterministic or stochastic trends). These sections somewhat overlap with chapter 6 on health econometrics. There is still debate on whether non-stationarity is actually a problem in the OECD data sets, which are primarily used for these studies.

The results of applying these sophisticated techniques are somewhat disappointing and are presented with many caveats. Among the non-institutional variables, the effect of aggregate income is dominant and other variables like age structure, unemployment and female labour force participation are insignificant. Among the institutional variables, the use of primary care as gatekeeper, the reimbursement model (typology OECD), and public sector provision decrease expenditure, while fee for service increases expenditure relative to capitation. Gerdtham and Jönsson suggest that the discussed econometric studies should be better founded in theory and suggest to explore a wider macroeconomic framework. In addition, new variables may be considered like government budget deficits and tax subsidies of health insurance.

The studies considered in this chapter address positive questions, but recently an important attempt to take a more normative approach towards comparative studies of health care systems was taken by the World Health Organisation in the World Health Report 2000. The WHO study differs in many respects from the studies discussed by Gerdtham and Jönsson. It comprises all countries (at the cost of inaccurate data from many non-OECD countries, see for instance Williams, 2001) and data are collected to measure more institutional variables. The analysis in the WHO-study is a significant departure from the studies discussed by Gerdtham and Jönsson and looks like a promising extension of this area in health economics.

In chapter 2, Hurley shows the implications of the normative framework used for the analysis and conclusions concerning the operation of health care systems, market failure and health care insurance. A central element is the debate on the appropriate assumptions and methods to be used in normative analysis of health care, focusing on the welfarist and other, for example extra-welfarist, positions in this debate. As key elements in the welfarist methodology, Hurley mentions individual sovereignty, welfarism (focus on utility), willingness to pay as a monetary metric for utility, market allocation as a reference standard, and a separation of efficiency and equity, with a focus on efficiency.

First Hurley concentrates on the relationship between the view on efficiency and the normative framework used. He summarises criticism on welfare economics, such as the assumption of individual sovereignty, the validity of willingness to pay and whether utility should be the key element in the social welfare function. Hurley does not exactly circumscribe the term extra-welfarism, but mentions as its main ingredient the argument that health instead of utility should be the most relevant outcome for normative analysis in the health sector.

Hurley gives an excellent overview of possible frameworks of analysis. He distinguishes five types of social welfare functions: three individualistic types (sum maximising, Paretian and Bergson Samuelson) and two non-individualistic (decision-maker and Mooney's communitarian approach). He combines these five functions with the two most prominent paradigms on the outcome of interest, welfarist and extra-welfarist, producing a total of 10 possible normative approaches. This overview is very helpful in judging the normative assumptions of health economic studies. It shows for example that the communitarian approach, which explores the relationship between individual and societal preferences, in principle could be applied in a welfarist and in a non-welfarist framework.

Hurley proceeds with the question to what extent health care is different and to what degree welfarists and extra-welfarists have different views on this subject. He shows that welfarists stress demand as a key concept, whereas need is crucial for extra-welfarists. When alleviating the consumers burden of informational asymmetry, the welfarists rely somewhat more on providing additional information, while extra-welfarists more often tend to advocate supply-side regulation. With respect to moral hazard Hurley shows that the welfare implications of cost sharing may depend on the assumed mix of reduction of necessary and unnecessary care.

In a separate paragraph, Hurley discusses equity. After defining several standard equity notions, he inevitably arrives at some sort of social welfare function as analytical framework. For the difficult tasks of defining the functions weights, his first suggestions are the fair innings example of Williams and the DALYs of Murray and Lopez (1996).

Discussing economic evaluation of health care programs, Hurley shows that welfarists and extra-welfarists have divergent opinions on the very important question how to value the extension of a human life: monetary or non-monetary, based on individual or societal preferences, including or excluding non-medical costs, etc. A related, equally important, question of course is whether the CUA threshold should be allowed to vary among individuals, according to their preferences.

He concludes by stating that normative economic analysis of the health care sector is inescapably a form of social ethics, dependent on our analytic and empirical understanding of social values.

Chapter 4 by Garber provides a selection of methodological issues related to cost-effectiveness analysis (CEA) of health care. The author deliberately uses a welfare economic framework to address the question whether decision-making based on cost-effectiveness analysis will lead to a distribution of resources that is desirable in terms of social welfare. This choice clearly limits the scope of the chapter but is on the other hand helpful in judging the implications of his conclusions.

In the first part, Garber clarifies the difference between average and incremental cost-effectiveness ratios. He clearly prefers incremental ratios, illustrated by examples of choosing between multiple alternatives and the role of (extended) dominance. He does not address the possibility of an inefficient starting point from which decisions, based solely on incremental cost-effectiveness results, could be sub-optimal. In such a case, average cost-effectiveness ratios as compared to the null situation may be sensible complementary information, see Murray et al. (2000).

Garber states that the league table approach is a poor guide for rational medical choices, because studies listed in the table may use different methodologies, the ranking of interventions is highly dependent on the specific programmes listed, and the table does not show how much we should spend. Instead he presents the Garber–Phelps approach. The health care allocation problem is viewed here as a simple von Neumann Morgenstern utility maximisation problem, the first order conditions of which may be expressed in a form that serves as a cost-effectiveness threshold. The value of the threshold depends on the inclusion of unrelated future medical costs. Meltzer extended this approach showing that future non-medical consumption should also be included for programs prolonging life. Garber concludes that decisions based on CEA may be optimal from a welfarist view, but only if costs and outcomes are measured properly, including unrelated future medical costs.

If quality-adjusted life years (QALYs) as used in studies cannot be interpreted as utilities, the welfare economic properties of CEA may be less favourable. Garber states that if QALYs measure only health-related quality of life, as often occurs, and omit to measure relevant non-health aspects as consumption, financial status and general well-being, the adverse effects of a poor health state may be underestimated. On the other hand, Garber is pragmatic in admitting that even flawed measures of utility can provide reasonable prioritisations of programs and are clearly preferable to decision-making ignoring costs and health effects of policy alternatives altogether.

With respect to the proper measurement of costs in cost-effectiveness analysis, Garber unfortunately does not mention the methodological questions concerning time costs and productivity costs (of both patients and informal caregivers). Instead, he focuses on the question whether to include fixed medical costs into the costs of health care programmes. Garber states that the advice of the panel on cost-effectiveness in cost and medicine (Gold et al., 1996) to exclude fixed costs can be very problematic in case of substantial fixed costs or research and development costs. He argues convincingly that using marginal cost figures in cases that market prices are clearly higher than marginal costs (for example in the market for medications) may not be sensible.

Although Garber is quite critical about CEA from a welfarist perspective, he thinks that CEA can be a useful aid to decision-making in health care. Exploration of its welfare economic foundations may help to resolve issues in the analysis of costs and quality of life.

In chapter 5, Phelps addresses the issue of incomplete information in the health care market. Incomplete information is especially prominent in health care because insurance blunts consumers' incentives to search for lower prices and quality and there are limitations on advertising. Furthermore, systems to protect property rights on process innovation are lacking causing insufficient investment in the production and dissemination of information. The extent to which search behaviour is discouraged by insurance depends on the type of insurance. Coinsurance decreases the incentive to search, but for instance the payment of a fixed amount per event preserves incentives. An instructive overview of models to explain incomplete search behaviour is presented. These models suggest that a higher fraction of consumers who are shopping leads to lower prices and if a sufficiently large number shop, the price will be at the competitive (minimum average) cost level. Because health insurance both lowers demand elasticity and also reduces the number of searchers (if the costs of searching are not covered) the latter situation will not easily occur in the health care market and prices will generally vary.

On the supply side, there seems to be disagreement about the production function among health care providers as may be concluded from observed practice variation. Phelps convincingly argues that neither income and price-elasticities nor substitution nor severity of illness nor patient preferences are likely to explain the huge variation. Rather doctor variables like 'schools of thought', 'local practice' and 'styles' may explain variation in physician resource use. Phelps prefers to term these doctor variables 'incomplete information about the efficacy of treatment', assuming that the provider is a good agent for the patient. The increasing role of practice guidelines and the easy access to information about efficacy of treatment can be expected to diminish this information gap. Other supply side variables (e.g. financial incentives), however, may add to this variation in providers' behaviour, although the specific studies quoted control for differences in fee schedules. The actual welfare loss

resulting from practice variation is roughly estimated to be of the same order of magnitude as the welfare loss associated with perverse incentives in health insurance.

Finally, the (lack of) incentives to close the information gap are discussed. Compared with the incentives in the market for pharmaceutical products, the incentives to invest in new treatment strategies and the dissemination of these are weak, as meaningful property rights cannot be defined. Public action seems required to perform studies to improve treatment and spread information on best treatment options. The enormous welfare loss supports the public good nature of such information and provides an argument for increased investment in, among others, economic evaluation of treatment strategies.

Chapter 6 by Jones is on health econometrics. Jones' central thesis is that there has been a wealth of applied econometric work in health economics over the past decade. This wealth of research reflects that health economics is a rich area for using microeconometric methods because of the importance of individual heterogeneity, selection problems and latent variables, and the availability of large, often longitudinal, individual level datasets. The chapter reviews much of the applied work focusing on the use of individual level data and microeconometric techniques. The emphasis lies on model specification and estimation techniques, although frequent reference is made to diagnostic tests.

The chapter is structured around the nature of the data to be analyzed. The general structure of each section is to start with an intuitive discussion of the problem at hand then to move to estimation techniques, and rounding off with a discussion of applications in health economics. Section 2 discusses the general problem whether it is possible to identify causal effects from empirical data. Jones argues that two important problems here are self-selection bias and unobservable individual heterogeneity that is correlated with the regressors (heterogeneity bias). These problems have led to three different estimation approaches: the use of longitudinal data which allow to control for individual effects that remain constant over time, the use of instrumental variables and the use of selectivity models.

Section 3 is on qualitative-dependent variables. The section starts with the well-known case where the dependent variable is binary and logit and probit models are used. Jones then discusses successively the cases where the dependent variable is multinomial but ordered, for example, measures of self-assessed health, and where it is multinomial and unordered, for example the choice of an insurance plan. Several complications are discussed, often related to selectivity bias, and appropriate estimation techniques are given.

Section 4 treats limited dependent variables and the three approaches that have been used to model these: two-part, selectivity, and hurdle models. The choice of model ultimately depends on the nature of the data and Jones gives an instructive taxonomy of cases. The remainder of the section discusses the three approaches. The choice between a two-part and a selectivity approach to model the demand for medical care has provoked a vigorous debate in the health economics literature. Jones gives a balanced overview of this debate.

The problems of heterogeneity bias and endogeneity bias, i.e. the case where the explanatory variables themselves are endogenous are central in Section 5. These biases are frequently encountered in studies of health production. Problems are often compounded by the presence of latent variables, such as health, which can lead to selection bias. Section 6 discusses models for hierarchical and longitudinal data. Multilevel models are used to analyze data that fall naturally into hierarchical structures, such as outcome measures of

patients in different hospitals. An important choice in multilevel models is whether higher level effects should be treated as fixed or as random. Jones gives an elucidating account of the pros and cons of these two approaches. A problem with longitudinal health data is the simultaneous existence of unobservable heterogeneity and the need to use non-linear models to deal with qualitative and limited dependent variables. These problems are particularly acute in dynamic models that include lagged variables.

Sections 7 and 8 are on the related topics of count data regression and survival analysis. Count data regression is appropriate when the dependent variable is a non-negative integer count, such as the number of GP visits. The basic count data model is the Poisson model. Problems arise if the frequency of zeros in count data is large and if there is heterogeneity bias. Survival or duration analysis models the time elapsed until an event occurs. The most obvious application is to mortality rates. The common duration model is Cox proportional hazard model. Jones explains how to deal with heterogeneity bias which may cause biased individual estimates. The chapter concludes with a discussion of stochastic frontier models, used to analyze the efficiency of health care organizations.

The chapter is not for the faint-hearted. The number of topics treated in a relatively modest amount of pages is impressive. Moreover, Jones treats not only techniques but also gives extensive coverage of empirical studies. At places, too much space is devoted to empirical studies and Jones looses himself in uninstructive detail. This occasionally goes at the expense of the discussion of techniques which is generally rather terse and not always easy to follow. The chapter is extremely useful as a source of reference. As such, it offers convincing testimony of the diversity of applied health econometric work over the past decade.

3. Demand and reimbursement for medical services

Chapter 9 by McGuire discusses physician agency. Ideally, physicians should be perfect agents for patients, providing complete and unbiased information to the patients, who then may decide in all sovereignty on what to do (as described in chapter 8 by Zweifel and Manning). However, in real life physicians may not always act like that. They have the opportunity and (as economists believe) the incentives to be less than perfect agents. This chapter critically reviews the theoretical and empirical literature on what is commonly known as ‘physician agency’, comprising studies of physician market power, behaviour and motives. The goal of the chapter is to ‘draw on the contributions of many writers to develop a working model of physicians that can handle the key elements of physician and patient interaction and the associated institutions’ (p. 463). The chapter is built in such a way that it develops this working model stepwise, starting with the simplest model of the physician market (a straightforward demand and supply model) and subsequently considering physician behaviour with complete information, uncertainty about treatment effects and asymmetric information, physician-induced demand and physician objectives other than income maximisation. The discussions of these issues have some overlap with parts of the chapters by Cutler and Zeckhauser [11] and by Chalkley and Malcomson [15]. The chapter does not provide an introduction to the general principle–agent theory, which would have been helpful for the intended readership. In addition, there is only little attention

for the question of how to improve physician agency and the role and goals of patients in this principle–agent relationship.

McGuire starts by providing some information on prices, income of physicians, supply and specialisation of physicians, which is interpreted in a simple demand–supply framework. The figures presented are all from the US, other countries are occasionally mentioned only to contrast them to the US situation. McGuire explains that even in a monopolistic competitive market with complete information physicians can influence the quantity demanded by patients, due to non-retradability of physician services and non-contractible input (quality or effort) of physicians. Subsequently, the effects of uncertainty about efficacy of treatment and asymmetric information are considered. Here, another way of influencing patient demand is introduced: persuasion. Persuasion can be used by physicians in order to increase demand and thus maximise income. In that light, explicit attention is paid to physician-induced demand (PID), one of the most discussed and examined issues in health economics. McGuire points out that the ample empirical evidence of PID needs close examination, as results can also be interpreted in other ways. One of the problems of course is the difficulty of empirically separating persuasion from the non-contractible features of physician services quality and effort. The same problem is present in empirically investigating the extent of PID due to defensive medicine, which is put forward by McGuire as a relatively new source for PID.

McGuire subsequently moves away from income maximisation and discusses other physician objectives, such as complying with medical ethics and seeking the patient's best interests. Most attention is focused on the alternative objective of a target income. The target income hypothesis is often used to explain PID (demand may be induced in order to ensure an acceptable income-level for the physician). McGuire argues that the target income hypothesis stems from the behavioural economic stream of literature, but subsequently tries to formalise it in a utility maximising framework. He argues that target income behaviour and income maximisation lie at opposite ends of a spectrum of income effects: "When income effects are all that matter around a certain point, physicians act so as to pursue a target. When income effects are absent, physicians maximise income." (p. 524). The empirical evidence presented does not provide definite answers to support or reject the presence of income effects. Furthermore, McGuire argues that the target income hypothesis is implausible for two reasons. First, in a setting with multiple payers there is an infinite number of combinations of quantities to reach the target. McGuire does not, however, explain why physicians should bother about finding a unique solution for reaching the target. Second, he contends that it is difficult to explain how and why targets are set. Here, McGuire largely ignores behavioural economic insights, which might have been helpful to explain targeting behaviour. Behavioural economics focuses on understanding and describing behaviour that deviates from the behavioural assumptions in neo-classical economics. Several concepts from the behavioural economic literature could prove helpful here. For example, reference points for income may be determined by income-levels of peer groups. Also, diminishing sensitivity may cause the marginal effects for changes close to the reference level to be greater than those for changes further away from the reference point, while mental accounting denotes the idea that persons group financial flows into categories, each with an explicit budget — or using another term: target (e.g. Rabin, 1998; Thaler, 1999).

4. Insurance markets, managed care and contracting

Part 3 of the handbook is devoted to insurance markets, managed care and contracting. Cutler and Zeckhauser set the stage in chapter 11 by providing a thorough anatomy of health insurance. From the theoretical and empirical literature on (health) insurance they draw five important 'anatomical lessons'.

1. Health insurance involves a fundamental tradeoff between risk spreading and appropriate incentives to reduce moral hazard (through coinsurance arrangements) and supplier-induced demand (through managed care).
2. Principal–agent problems between health insurers and health care providers have provoked an integration of insurance and provision, intended to align incentives.
3. Competition among health insurers is a mixed blessing because it is accompanied by adverse selection. Adverse selection induces healthy people to opt for less generous health insurance and encourages health insurers to adopt measures that deter the sick from enrolling.
4. Because health insurance is contracted for annually, it does not provide protection against falling into a worse risk class. The absence of a market for intertemporal health insurance results in an important welfare loss that is likely to expand as the ability to predict future health status increases.
5. It is still unclear which approaches to health insurance promote health in the most cost-efficient manner.

The anatomical lessons are largely based on the anatomy of the US private health insurance system. Although Cutler and Zeckhauser begin their chapter with a paragraph on health insurance structures in developed nations, their discussion of other countries than the US is confined to less than half a page. The focus on the US health insurance system is understandable, given the authors' background and the abundance of excellent theoretical and empirical research into the functioning of the US health insurance system. Nevertheless, the almost complete negligence of health insurance systems in other countries is an important omission, because the health insurance system in the US differs significantly from those in other developed nations. Most countries either have a social health insurance system or a tax-financed health care system. Tax-financed health care systems, in which health care is purchased by the government, are extensively discussed by Chalkley and Malcomson in chapter 15. By contrast, however, the handbook barely pays attention to social health insurance systems, in which health services are purchased by social health insurance bodies. As we will argue below, social health insurance systems provide solutions to some of the problems of private health insurance markets as formulated in the anatomical lessons.

We will discuss some of the anatomical lessons in more detail. In the first lesson, the authors explain that full insurance for health care is not optimal because more generous insurance increases consumer-initiated or supplier-induced moral hazard. The authors review the empirical evidence on moral hazard and conclude that "essentially all economists accept that traditional health insurance leads to moderate moral hazard in demand", while "the demand elasticities in the Rand experiment have become the standard in the literature" (p. 584). They then discuss the implications of these findings for the optimal design of a health insurance policy. Simulated optimal health insurance policies typically have much

higher coinsurance rates (at least 25%) and stop-loss amounts (exceeding US$ 25,000) than found in real world health insurance markets. The authors suspect that tax subsidies for employment-based health insurance in the US are the main reason why real world policies are more generous than optimal policies.

However, there is a number of other important reasons why the "optimal" insurance policy might not be optimal. First, the use of the Rand estimates as the gold standard to determine the optimal insurance policy is disputable. Although the Rand experiment is the best designed health insurance experiment that has been (and probably will be) performed, its results at the microlevel cannot be directly translated to the macrolevel of the health care system. A large scale introduction of "optimal" insurance policies could reduce moral hazard by much less than predicted by the experiment, because health care providers would probably be able to offset part of the reduction of moral hazard by creating additional demand for their services (Barer et al., 1979). Second, in a recent paper, Nyman (1999) explained that the welfare loss due to moral hazard has been substantially overestimated, because a crucial benefit of health insurance — providing access to otherwise unaffordable health care — has been ignored. Because of this access value of health insurance, real world policies (as well as the Rand experiment) usually include stop-loss provisions that are much lower than those included in most "optimal" insurance policies (Blomqvist, 2001; Nyman, 2001). In addition, studies that simulate optimal health insurance policies also ignore the presence of strong altruistic preferences in health care. Aaron (1981) argues that people's concern about inequality is differentiated since they place different weights on inadequate consumption of different commodities. Aaron argues that a preference for "commodity egalitarianism" seems to apply to most health services.[1] The distributional effects of high coinsurance rates are not neutral, but will especially harm the chronically ill and low-income groups. As already noted by Arrow (1963), in health care markets efficiency and distributional issues cannot be separated because the conditions for perfect competition cannot be fulfilled and costless income redistribution is not feasible. Optimal coinsurance rates would be much lower if one would include the externality of altruistic preferences in the analysis. Finally, aside from the previous objections, "optimal" health insurance policies would only imply optimality from a utilitarian perspective. Other distributional principles (e.g. egalitarian, libertarian) would result in different designs of an optimal health insurance policy.

Cutler and Zeckhauser devote a substantial part of the chapter to the problem of adverse selection. Adverse selection is defined as the phenomenon that "when plans can only charge average prices, generous plans will disproportionately attract sicker people, and more moderate plans will disproportionately attract healthier ones" (p. 607). Cutler and Zeckhauser first summarize the seminal paper by Rothschild and Stiglitz (1976) who show that in the presence of two risk groups and asymmetric information, adverse selection will either result in a separating equilibrium with incomplete insurance coverage for low-risks or in no equilibrium at all. The Rothschild–Stiglitz model with two risk types suggests that at least some high risks will be in their most preferred plan while low-risks may be distorted into

[1] In a subsequent discussion of adverse selection (lesson 3), Cutler and Zeckhauser themselves not only recognise the presence of altruistic preferences but even assume that those preferences directly influence market performance. Specifically, they argue that health plans do not charge individuals premiums based on their expected cost "*since it is widely believed that it is not fair to make people pay a lot more just because they are sick*" (p. 607).

less generous plans. However, Cutler and Zeckhauser show that this outcome may be reversed in situations with more than two risk groups. Either way, adverse selection results in a welfare loss that the authors depict as an undesired side effect of competition in health insurance markets. Two objections can be made to this conclusion, however. First, models of adverse selection usually assume the absence of moral hazard. Keeping in mind the first anatomical lesson, however, adverse selection may also generate a welfare gain insofar as it urges people to buy less than complete coverage. Dionne and Doherty (1992) argue that self-selection may help solve moral hazard problems as well as adverse selection problems. Second, contrary to what the authors suggest, adverse selection *may not result from competition but from regulation* (Pauly, 1985). In a competitive health insurance market where consumers are allowed to choose between policies with a high and a low deductible, health insurers appear to be quite capable in eliminating most of the consumer information surplus by risk rating (van de Ven and van Vliet, 1995). But health insurers are often not allowed to risk rate since employers or governments force them to charge average premiums for heterogeneous risk groups (van de Ven et al., 2000).[2] Premium rate restrictions are typically imposed by employers or governments to enforce cross-subsidies between risk groups, because such a cross-subsidization would not occur in a purely competitive insurance market. Hence, *the underlying problem of competition in health insurance is the fact that risk rated premiums are generally considered to be an unfair outcome of unfettered competition*. Premium rate regulation, however, clearly is an imperfect way to mitigate this unfavorable outcome of competition. Not only because it leads to adverse selection by the insured, but, perhaps more importantly, because it also instigates cream skimming by the insurer. As shown by van de Ven and Ellis in chapter 14, an adequate system of risk-adjusted premium subsidies combined with ex-post risk sharing could effectively guarantee fairness while reducing adverse and favorable selection in competitive health insurance markets.

The fourth anatomical lesson points at a major problem of private health insurance markets: the inability to offer insurance against becoming a high risk in the future. A market for lifetime medical insurance is missing because future medical costs are highly unpredictable and non-diversifiable, as a result of which insurers refuse to write insurance for such risks. However, as pointed out by van de Ven et al. (2000), a system of risk-adjusted premium subsidies cannot only address the problem of risk selection, but also the problem of renewable insurance, because the future subsidy value can be adjusted to the change in the individual's risk characteristics.

The predominance of social health insurance in most developed nations might well be explained by the fact that mandatory universal health insurance can solve the problems of adverse selection (lesson 3), unfairness, and the non-existence of intertemporal insurance (lesson 4). In addition, most social health insurance schemes to some extent rely on user charges to reduce moral hazard and are accompanied with extensive supply-side government regulation to combat supplier-induced demand (lesson 1). In comparison with social insurance, however, private health insurance offers more choice (except for the sick), whereas competition among insurers might provide more incentives for efficiency at the microlevel of the health care system. An increasing number of countries is gradually

[2] To some extent risk raking may also be mitigated by transaction costs (Newhouse, 1996). In addition, Cutler and Zeckhauser argue that fairness may play a role in curbing premium differentiation (see Footnote 1).

replacing supply-side regulation by some form of regulated or managed competition to include choice and incentives for efficiency into their social health insurance systems. In chapter 14, van de Ven and Ellis explain why an adequate system of risk adjustment is indispensable for attenuating problems of risk segmentation that threaten the effectiveness of managed competition for resource allocation in health care. They also provide an overview of the current practice of risk adjustment and risk sharing in 11 countries.

5. Specific populations

Why devote a chapter to the economics of mental health? Frank and McGuire give a number of compelling arguments in chapter 16: mental illness is most prevalent and disabling, it has the highest direct costs, indirect costs almost twice the direct costs, and huge external effects (crime, accidents, child abuse and neglect, homelessness, etc.). It has the highest proportion of patients undertreated and overtreated, the latter probably being a typical US phenomenon. Insurance for care for mental health and substance abuse (MH/SA) is often more limited than for general health care, but this may also be more true for the US than for other countries. This limited coverage was inspired by the belief that psychotherapy in particular is discretionary and the demand for this service rather elastic, which was confirmed by both observational and experimental health insurance experiment (Rand HIE) studies.

Generally, both supply-side rationing and demand-side cost sharing are applied and those two should be balanced. Frank and McGuire show that maximising benefits over costs implies that if managed care rationing is done efficiently, full coverage of mental health services does not produce losses due to moral hazard and has the benefit of not imposing financial risks. Furthermore, managed care allocation should be done such that the implied costs per unit of output (e.g. cost per QALY) or the shadow price is equal across services (compare chapter 4). Quite different contract arrangements exist in so-called ‘managed behavioural health care’. This has been inspired by the inefficiently low levels of insurance for behavioural health and by selection problems in the 1980s in the US. A typical phenomenon here are ‘behavioural health carve-outs’, where the health insurance and/or management function are separated out for MH/SA. The carve-out programs may diminish selection-related incentives as MH/SA is separated from the integrated health plans, among which there is competition for the ‘good risks’. Disadvantages of such carve-out programs may exist when ‘integrated care’ is better than ‘fragmented’ care and administrative costs and opportunities for cost-shifting and other forms of strategic behaviour increase.

Finally Frank and McGuire point at the important role of public provision of inpatient care for the most seriously ill, also inspired by public safety concerns. They observe an unresolved tension between the insurance and medical care delivery aspects of mental health care and the public safety role. The chapter convincingly shows that the specifics of mental care merit special consideration from the economic perspective. Although parts of the discussion in this chapter can only be appreciated fully in the US context readers from elsewhere will recognise many of the problems considered and see these reflected in specific arrangements for this sector in their own country.

6. The medical care market

Part 5 deals with the functioning of medical care markets. In chapter 20, Dranove and Satterthwaite provide a general overview of the peculiar "industrial organization" of health care markets. Point of departure of their analysis is Arrow's proposition that because health care markets fail to achieve an optimal state, society will to some extent at least recognize the gap and non-market social institutions will arise attempting to bridge it (Arrow, 1963). However, as argued by Pauly (1978, p. 19), the problem is that we only know that such public and private institutional arrangements might improve matters, "but it is a large step from *might* to *will*". What is clear, according to North (1994), is that in a world of positive transaction costs "institutions are not necessarily or even usually created to be socially efficient; rather they, or at least the formal rules, are created to serve the interest of those with the bargaining power to create new rules" (pp. 360–361). Obviously, this observation holds true for the medical care sector, where the highly imperfect and unevenly distributed information causes substantial transaction costs and unequal bargaining power. According to Dranove and Satterthwaite, most of the studies that fall under the industrial organisation of health care rubric can be characterised as attempts to better understand to what extent non-market social institutions overcome the market's basic difficulties.

Dranove and Satterthwaite focus solely on the institutional structures that are employed to deal with the imperfections of the health care marketplace in the US. Over the last 30 years they distinguish three different institutional regimes that have successively dominated the organisation of the US health care market: (1) independent physicians and cost-based reimbursement for hospitals; (2) regulation; and (3) managed care. The first regime is also labelled "patient driven competition". Hospitals compete on the basis of quality attributes for physicians and physicians compete on the basis of price and quality attributes for patients. The second regime is characterised by prospectively reimbursed hospitals and (incompletely) price regulated physicians, both competing on the basis of non-price attributes. In the third regime — managed care — payers compete on the basis of price, administrative convenience, and the attractiveness of their provider networks while hospitals and physicians compete on price and quality attributes, both for inclusion into provider networks and for individual patients. This regime is labelled "payer driven competition".

The authors' main proposition is that despite the distinctiveness of these three regimes, each can be understood through a model of monopolistic competition in which competitors possess and can manipulate quality attributes. The authors conclude from an examination of the theoretical arguments and a review of the empirical evidence that in each regime providers respond to economic incentives in a manner consistent with economic theory. However, they concede that economic theory still has no satisfactory explanation for pricing decisions by hospitals and medical specialists in the first regime. Since hospitals facing patient-driven competition are likely to experience price-inelastic demand, the question remains why they did not charge much higher prices than they did. "Perhaps", according to the authors, "the answer lay in the fact that the vast majority of hospitals were and continue to be non-profits". If the non-profit status would explain pricing behaviour of hospitals, however, then theory still cannot explain pricing decisions by medical specialists such as surgeons, who also face a price-inelastic demand but are not constrained by non-profit motives.

Dranove and Satterthwaite explain the shift of regimes primarily by the growing complexity and costs of medical care, which induced successive transfers of the agency role from primary care physicians to the government and then to health plans or managed care organisations. One can question, however, whether the third regime really replaced the second regime or merely augmented it. The second regime only involves an institutional change of the public sector (medicare and medicaid), while the third regime describes a subsequent change of the private health insurance sector. Hence, health care providers currently seem to operate in two rather than one institutional regime, one prevailing in the public and the other in the private sector.

The authors maintain that each regime represents, for its time, a sensible response to market failure. Yet, as is also clear from their analysis, each regime has its own weaknesses. In the first regime, primary care physicians were imperfect agents because they were not good price shoppers and health care costs were escalating. In the third regime, however, managed care organisations may also turn out to be imperfect agents because they are not good quality shoppers: if consumers do not have precise measures of quality, then price competition gives providers incentives to cut back on quality. Quality measurement and its translation to comprehensible consumer information is still in its infancy, although the authors discern a growing movement to measure quality of health plans. Additional weaknesses of the third regime, which are extensively analysed by Cutler and Zeckhauser in chapter 11, are failures of private health insurance markets themselves, such as adverse selection, lack of access and non-existence of intertemporal insurance.

Chapter 23 by Cullis, Jones and Propper (CJP) deals with waiting lists for medical treatment. Although waiting lists (or waiting time) may be perceived as a mere rationing device (deliberately used by policy makers) to reduce overall utilisation of health care and to optimally use existing capacity, often countries struggle [3] to reduce waiting lists, in the face of strong public pressure. The UK has a long history in fighting and (consequently) studying waiting lists, and that is probably why three British health economists were asked to write a chapter on waiting lists. [4]

The chapter is well organised. CJP first discuss the theoretical issues related to waiting lists, then empirical matters and finally policy issues. The theoretical section discusses Lindsay's demand-side approach (Lindsay, 1980) which indicates that demand will decrease when waiting times go up and Iverson's supply-side approach (Iverson, 1993) emphasising the role of the supply-side in maintaining waiting lists. The authors show that waiting lists are a complex matter and demonstrate that waiting lists are persistent due to an interaction between supply and demand factors. Other factors, such as maintaining waiting lists by physicians to be able to select medically interesting cases or to increase demand for private health care, add to the complex field of interests, incentives and pressures. In the section on empirical evidence, CJP critically review existing research both for the demand side and for the supply side. On the demand-side the focus is on the costs of waiting, derived from market

[3] A recent paper in *Nature* suggests that waiting lists are subject to power laws, implying that long delays (waiting times) will be extremely difficult to eliminate (Smethurst and Williams, 2001).

[4] The non-UK reader may sometimes get the idea that the chapter is quite UK-oriented, but this may also be considered a logical result from the fact that much of the work on waiting lists is performed by British researchers and in the British context.

data and from contingent valuation methods. On the supply-side, there is attention for the impact of increasing the quantity of supply (e.g. do more hospital beds reduce waiting?) [5] and inter-sectoral effects, which mainly examine the relationship between private care and public care (e.g. do people leave the public system in favour of private care when waiting time increases?).

Finally, the most relevant policy options in reducing waiting lists are discussed, such as demand rationing, supply expansion, subsidies to reduce waiting and encouraging private provision of health care. There is also attention for policies aimed at managing waiting lists. When the battle against waiting lists cannot be won, or when waiting lists are considered to be helpful in rationing health care, policy makers may use prioritisation of persons on waiting lists and reducing uncertainty of waiting for patients to make waiting less problematic.

An aspect that the authors could have emphasised more is the relationship between equity and waiting lists. Questions about equal access to health care can be important when discussing the stimulation of private health care or the prioritisation of patients. In private care, one allows high income groups to leave the public system, thus creating inequality in health care utilisation based on income, which may be considered undesirable. When prioritising patients on waiting lists according to productive possibilities, a similar inequity will occur. In The Netherlands, there is resistance both to allowing private health care facilities offering normal care outside the public system and to giving priority to certain groups based on potential loss of production (see Brouwer and Schut, 1999).

More research on waiting lists and waiting times is needed, also in terms of international comparisons. One would have expected an overview of health care systems with considerable waiting lists and the amount of time a patient has to wait on average. Such information is, however, simply not available. Until we can produce these basic figures (in a comparable way), really understanding the dynamics of waiting lists and the factors that influence them will prove extremely difficult. Reducing waiting times hence will inevitably take form of trial and error, as can be observed in many countries. CJP rightfully conclude that despite the considerable range of work on waiting lists and related matters, '*knowledge of these issues is of a meagre and unsatisfactory kind*'.

Chapter 25 by Scherer is on the pharmaceutical industry. The market for pharmaceutical products is one of the most international as incentives to take advantage of unique and exclusive product franchises are very strong. As competition increased and drug development became much more expensive (partly pushed by regulation) a merger wave took place in 1980s and 1990s. Regulation plays a major role in this market from 1962 onwards (partly triggered by the thalidomide disaster). Some studies suggest that the FDA and other registration authorities induced a major welfare loss because of postponed availability of new effective drugs. Others suggest that these developments pushed industries to target their R&D on drugs of higher effectiveness making them also more successful in less regulated markets (compare Japan with a weak regulatory system and low performance of domestic companies). Scherer suggests that it is difficult to assess the pros and cons of different extents of regulation in this market. In that respect, one may even consider for instance regulation merely requiring appropriate testing and disclosure of test data or abandoning the requirement of physicians' prescriptions. More severe regulation clearly imposes costs,

[5] Much attention is paid to the important study by Martin and Smith (1999).

but it is difficult to estimate its benefits. This discussion is even more important when considering patent protection world-wide, which may slightly increase the number of new drugs but leads to tremendous welfare losses in low-income countries provoking the recent discussions on property rights and court cases as in South Africa.

Pricing by manufacturers of branded and generic drugs is discussed as well as governments' attempts to cut costs such as stimulation of generic substitution and profits and price controls. Also market demand-side reactions by HMOs and pharmacy benefit management firms appear to have been successful in the US to get considerable discounts on wholesale list prices. An omission in the chapter is that the so-called fourth hurdle of requiring proof of cost-effectiveness from the manufacturer of a new drug as a way to inform pharmaceutical reimbursement policy is not discussed. Started in Australia and Canada this system, which makes extensive use of the expanding area of pharmacoeconomics, is now rapidly diffusing in Europe where already six countries have introduced it or plan to do so soon (Drummond et al., 1999). Also the development in the UK, where the National Institute for Clinical Excellence provides guidance on the use of new technologies, has a major impact on pharmaceutical markets in Europe. This fourth hurdle may further target R&D efforts, it adds to the regulation and the burden of proof for new products, and has the potential of bringing about a major change in the pharmaceutical market comparable to the introduction of registration in the early 1960s. And it is one of the clearest opportunities for a strong role for health economics in health policy.

7. Law and regulation

In the seventh part of the handbook three chapters are grouped together under the heading "law and regulation". The scope of the chapters is much narrower than the broad title suggests. They deal with the effects of malpractice legislation, antitrust legislation and the regulation of prices and investment in hospitals and focus entirely on the US health care system. We concentrate on antitrust enforcement in health care, which may be of increasing importance outside the US because of market-oriented health care reforms in a number of countries. In chapter 27, Gaynor and Vogt review issues relating to antitrust and competition in health care markets. Since antitrust analysis requires knowledge of health insurance and health care markets it is not surprising that there is a substantial overlap with the chapters by Cutler and Zeckhauser (chapter 11) and Dranove and Satterthwaite (chapter 20).

After a brief review of US antitrust legislation, Gaynor and Vogt discuss whether and how health care is different from other industries in ways that affect the optimality of competition. The economic rationale for antitrust enforcement is to safeguard competition because perfect competition maximizes social welfare. Since perfect competition in health care markets is not feasible due to uncertainty and informational asymmetries that are inherent in the nature of medical care, the question is whether there is an economic justification for antitrust policy in health care. The authors explain that the answer to this question is not straightforward, since the effects of competition in health care crucially depend on the institutional structure. For instance, in the absence of price responsive buyers and cost-based reimbursement for hospitals — denoted by Dranove and Satterthwaite as patient-driven

competition — competition among hospitals may result in a wasteful medical arms race. In a review of the court decisions in hospital merger cases, Gaynor and Vogt point out that in 4 of the 12 cases, hospital mergers were allowed because courts found that they would reduce wasteful non-price competition. By contrast, in the presence of highly price responsive managed care plans — denoted by Dranove and Satterthwaite as payer-driven competition — competition may result in too low levels of quality, if adequate information about quality is lacking. In such a situation, vigorous antitrust enforcement may result in sub-optimal resource allocation. Another problem for antitrust enforcement in health care is that market conduct and pricing behavior by non-profit hospitals are not well understood. Merging non-profit hospitals often argue that their non-profit status makes it unlikely that they will exercise any market power. Gaynor and Vogt show that courts are quite sensitive to this argument and that in the last decade the only hospital merger case won by the antitrust authorities was a case where both hospitals were for profit.

Gaynor and Vogt particularly focus on three main areas in which antitrust policy has been applied to health care: hospital mergers, monopsony and foreclosure. They explicate that the theoretical and empirical literature in those areas suffers from serious shortcomings. For instance, they make clear that the choice of market definition in hospital merger cases lacks sufficient theoretical and empirical justification. In addition, they discuss a number of weaknesses of the price-concentration studies about hospital mergers and hospital competition. In both cases they develop alternative theoretical approaches, but the practical use of these approaches is limited because sufficient data are lacking. This brings the authors to the modest conclusion that "much remains to be understood about competition and antitrust in health care". Of course, such a conclusion is not very comforting for those currently involved in antitrust enforcement in the health care sector.

8. Health habits

Chapter 29 by Chaloupka and Warner gives a broad overview of the research on the economics of smoking. It has four main themes: the impact of cigarette price on demand, taxation and the social costs of smoking, advertising and tobacco control policies and the macroeconomic importance of the tobacco industry.

The chapter shows clearly that a substantial amount of research is focused on estimating the price-elasticity of the demand for cigarettes and attempts to explain smoking decisions in an economic framework. The majority of recent estimates for the price-elasticity of overall cigarette demand appear to be in the range of -0.3 to -0.5. Recent studies seem to confirm that the price sensitivity of cigarette demand is inversely related to age, so younger people are more sensitive to changes in price. The authors discuss several types of economic addiction models. The rational addiction model predicts that younger, less educated, and lower income persons will be more responsive to price; older, more educated, and higher income persons will be more responsive to new information on the health consequences of smoking. Studies using US data seem to confirm these predictions, but for other countries little empirical support is found. Criticism of the rational addiction model concentrates on the assumption of perfect foresight and suggests that rationality is more bounded and that people often underestimate the probability to get addicted and may regret past decisions.

The authors cite behavioural economic studies suggesting that the price-elasticity of demand is not constant but rises as the price of cigarettes rises.

The authors then discuss taxation and social costs of smoking. Cigarette taxes seem to be very regressive because taxes are flat and smoking prevalence is generally higher among lower income people. The public health community advocated large increases in tax, reasoning that smokers should cover the social costs of smoking and that taxation will discourage many (young) people from smoking, through the price effect. Most studies on the social costs of smoking use an attributable risk methodology, applied to disease prevalence and the human capital approach. Some more recent studies adopted an incidence approach and a life time perspective. It is interesting that Chaloupka and Warner point to the failure of studies to consider how smoking may complicate the course of many illnesses (such as diabetes) that are not directly associated with smoking. Some authors state that smoking may have some economic benefits such as reduction in social security payments and medical expenditures avoided due to smokers' premature death. The question is whether such negative costs should be included in the calculations (for example: to what extent are these real costs or transfer payments). This is now under debate. It is disappointing that the chapter does not discuss the issue of cost-effectiveness of medical and non-medical anti-smoking programs.

It is shown that in general, research produces no clear consensus concerning the effects of advertising on smoking. Advertisement bans only seem to have a temporary reduction effect, probably because effective alternative media were developed in response. However, some study results suggest that serious restrictions which are comprehensively enforced, combined with anti-smoking publicity, may lead to permanent reductions in cigarette demand.

Macroeconomic analyses of the contribution of the tobacco industry to the economy suggest that even within the most prominent US tobacco growing states, the consequences for regional employment would be limited if the industrial activities were curtailed. Alternative spending would generate as much employment as spending on tobacco. With respect to the balance of payments of countries, the consequences are only not negligible for nations such as Zimbabwe where tobacco is a very prominent element in export.

Chapter 31 by Kenkel is on prevention. The choice to present this chapter in a section on health habits, is explained by defining prevention as ranging '*from medical decisions such as vaccinations . . . to private lifestyle decisions such as regular exercise and non-smoking*'. As Kenkel indicates, such a broad scope makes it necessary to choose a focus. He does so by focusing on prevention in developed countries (especially the USA), largely ignoring the specific issues in prevention in developing countries. He furthermore confines the chapter to prevention normally associated with health care (leaving out for instance environmental economics and transport economics that also have 'preventive' elements) and to work *performed* by health economists, leaving out work from other disciplines on prevention that may be relevant for health economists.

In the main part of the chapter Kenkel discusses what prevention means in health economic models, discussing human capital models, insurance models and the supply of prevention. The most elaborately discussed human capital models emphasise the role of schooling, time preference, initial stock of health and age in the demand for prevention. Kenkel elaborates on the important issue of moral hazard in relation to prevention. The main question

is whether having insurance will lead to a reduction in prevention, due to ex ante moral hazard (changing behaviour before actually ill, engaging in more risky and less preventive behaviour), because the price of subsequent medical care consumption is lowered through insurance. As Kenkel discusses, moral hazard may lead to a reduction in preventive actions performed by the individual. However, insurance of preventive medicine may also lead to an increase in consumed prevention. In discussing the extent of the moral hazard problem, Kenkel presents a table with results from logit models showing the (standardised) relationship for men and women between health insurance and life-style factors such as obesity, smoking, drunk driving and breast examinations. From this, no strong indication for ex ante moral hazard can be derived (the only odd ratio significantly higher than 1 indicated an increased chance for men with insurance to be obese), but Kenkel rightfully argues that this evidence should be interpreted cautiously, because unobserved variables, like risk aversion, may have influenced these results. Kenkel furthermore describes other market failures that may lead to too little prevention: the existence of externalities, a lack of consumer information and underinvestment in the development of new preventive medicine. Governments may try to stimulate prevention in response to these market failures.

Kenkel also addresses the question of cost-effectiveness of prevention, without much elaboration on some controversies in cost-effectiveness analysis that are especially relevant for prevention. Given the rather narrow discussion of cost-effectiveness by Garber in chapter 4, such elaboration would have been welcome. Also lacking is a discussion of whether or not discounting future health effects (at the same rate as costs) is appropriate for the assessment of preventive medicine. Such a procedure makes it inherently difficult for prevention (with present costs and effects often in the far future) to be labelled as cost-effective. Some authors have argued against equal discount rates for costs and effects (e.g. van Hout, 1998), which can have great implications for the cost-effectiveness of prevention. Some policies to encourage prevention are highlighted, such as subsidies, improving access to preventive medicine and information dissemination.

9. Health

Chapter 32 by Dolan is on a central topic in health care resource allocation decisions, the description and valuation of health-related quality of life (HRQoL). The chapter gives an overview of the methodological advances that have been made in this field, particularly over the past two decades. Dolan defines the benefits that a patient derives from a particular health care intervention as enhanced quality and/or length of life. Hence, the focus is on cost utility analysis rather than cost benefit analysis in which option values and non-use values are also important. The common model to combine quality and length of life is the quality-adjusted life years (QALYs) model, which Dolan takes as the starting point of his analysis. To estimate QALYs, quality weights must be attached to HRQoL. Dolan presents a convincing case that these quality weights should be based on individual preferences.

The chapter is structured around six central questions. In "*What is to be valued*?", Dolan compares approaches based on the valuation of sequences of health states, such as Mehrez

and Gafni's (1989) healthy-years equivalent (HYE), and approaches based on the valuation of separate health states, such as QALYs. The former approach is more general, the latter more tractable. Which approach should be preferred depends ultimately on the validity of the preference axioms that are imposed. Dolan argues that the most problematic QALY assumption is separability over time. Evidence suggests that people take account of future health states when valuing current health. The theoretical properties of QALYs and of HYEs have led to a vigorous debate in the literature. Several contributions to the QALY–HYE debate were misdirected which has led to considerable confusion. Unfortunately, Dolan does not resolve this confusion completely due to some inaccuracies in his theoretical analysis. For example, on p. 1730 Dolan first writes, wrongly, that Miyamoto and Eraker's (1985) model is consistent with any risk posture and four lines further he writes, correctly, that their model requires constant proportional risk posture. "*How is it to be described*?" discusses the relative merits of disease-specific and generic descriptions of health. Dolan argues that generic measures are needed to inform resource allocation decisions across a range of diverse interventions. "*How is it to be valued*?" is on the three most commonly used methods to value health states: the visual analogue scale (VAS), the time tradeoff (TTO), and the standard gamble (SG). Dolan prefers the latter two because they are choice-based. He sees neither theoretical nor empirical grounds to choose between SG and TTO, although "the benefit of the doubt might be given to the TTO" (p. 1746). "*Who is to value it*?" presents in a balanced way arguments why patients should value health states (experience) and counterarguments why the general public should value health states (they are the ones to benefit). Empirical evidence shows that experience with illness leads to higher health state valuations. Hence, the question is an important one for resource allocation decisions.

It is in practice impossible to value all health states and some interpolation is necessary. "*How are values for all health states to be generated?*" compares two approaches to interpolation. In the decomposed approach, dimensions of health states are valued separately and then combined into an aggregate score through a multiattribute utility function. In the composite approach, a subset of composite health states is valued and the values of the remaining health states are interpolated through econometric techniques. Little evidence exists on which approach is to be preferred. "*How are valuations to be aggregated?*" deals with the question which measure of central tendency should be used in the aggregation of valuations. For less severe and more severe health states, the distribution of valuations is often skewed and the choice of measure of central tendency can have an important impact on the aggregate value. This is, however, a largely unexplored area of research.

Dolan concludes with a research agenda. He argues that the main challenge is to understand the nature of preferences for health. Dolan pleads for a "philosophy of partial perspective" in which more emphasis is put on interactive preference elicitations. This is based on the idea that preferences are often constructed on the spot and therefore liable to inconsistencies.

Dolan gives an accurate and very useful overview of the state-of-the-art in health utility measurement. The chapter contains many insightful observations, reflecting Dolan's wide experience in the field. The chapter is easily accessible, also for non-specialists, and is likely to serve as a source of reference for research and teaching purposes alike.

10. Equity

In chapter 34 Wagstaff and van Doorslaer provide an overview of the economic literature on equity in health care financing and in the delivery of health care. Equity is considered within the context of a health care system and the authors indicate that the focus is 'on empirical work, especially that involving international and temporal comparisons'. The chapter provides the reader with both an indication of *how* to measure inequity and of the results *when* measuring these inequalities in different countries. It does not provide a welfare economic basis for the measurements, however. The main part of the chapter starts out with an informative and useful discussion of the question what equity entails. This is not merely an introductory section, but sorts out and discusses the different concepts used in the field of equity, such as altruism, social justice, access, receipt or consumption of health care and need and finally works towards applicable definitions of concepts in empirical research as well as justifying the choices made therein.

In the first empirical section, Wagstaff and van Doorslaer give an extensive discussion of equity in health care finance. They discuss vertical equity as well as horizontal equity, [6] first how it should be measured theoretically and subsequently the results from empirical research in this area. Measuring equity in health care financing is interesting, but it is not entirely clear what the results implicate. Note that health care financing is only one aspect of the total redistribution of income in a country. When total income redistribution is considered equitable, while having a regressive health care financing system, should we then be concerned with the latter? There seems to be a challenge in meaningfully relating the progressivity of health care financing to the total income distribution.

Then Wagstaff and van Doorslaer discuss equity in health care utilisation. Here, again a nice balance between a theoretical outline and empirical results has been struck. The section provides the reader with a thorough overview of the progression made in this research area. Methods used are increasingly refined and improved, for instance by using indirect standardisation instead of direct standardisation and consequently, results appear to be increasingly reliable (e.g. Gerdtham et al., 1999). One of the remaining problems in this research area is that the standardisation of health care utilisation does not include the type of disease. This may be relevant when disease patterns differ systematically between income groups *and* when the relationship between medical need and health care utilisation differs for disease patterns (depending on the availability and costs of treatments).

Finally, Wagstaff and van Doorslaer discuss equality of health, especially related to socioeconomic status. This concept of equality is more fundamental than the earlier two, but in that respect also less directly related to the health care sector. Indeed, as indicated in the chapter, equality of health seems an unattainable goal to which health care can only moderately contribute. The section mainly focuses on the contributions made by economists to this field (understandably) leaving out a vast amount of literature on socioeconomic inequalities in health from other disciplines.

[6] Vertical equity refers to the wish that persons with different incomes contribute differently to the health care system (i.e. those with higher incomes contribute more than those with lower incomes), while horizon equity refers to the wish that persons with equal incomes contribute equally to health care.

Overall, the chapter by Wagstaff and van Doorslaer is well-balanced. The chapter is not as accessible as some of the other chapters in the handbook (first year masters students — the intended readership of the handbook — may have difficulties in using this chapter as a practical guide in performing research in this area), but the consistently followed structure of theoretical outlines followed by empirical results is very clear and enables the authors in empirical sections to refer back to the theoretical sections and indicate what exactly is being measured. The chapter clearly demonstrates what progress has been made in this field especially in terms of methods and what problems remain to be solved. Hopefully, such progress can also be made in finding reliable and comparable data across different countries.

Chapter 35 by Williams and Cookson is on equity in health. The chapter gives an overview of the implications of various philosophical theories of justice for the way in which a welfare economist might appraise a particular distribution of health. Or, in the words of the authors: "what we are attempting here is the brutal task of forcing high-minded philosophical theories about distributive justice into the procrustean bed of welfare economics". The focus of the chapter is on health, measured by QALYs. The analysis is built on the assumption that health is the sole argument in the social welfare function. The authors acknowledge that this is a strong assumption and that it denies the opportunity to study tradeoffs between health and other desirable things. However, health is an essential ingredient for every individual's well-being, so treating it as the primary concern of public policy is defensible.

The main part of the chapter presents a taxonomy of theories depending on the nature of the objective function, the nature of the opportunity set, and the presence of side conditions on health outcomes. Discussed theories include among others utilitarianism (linear objective function, unrestricted opportunity set, unrestricted outcomes), Williams' (1997) fair innings approach (non-linear but smooth objective function, unrestricted opportunity set, unrestricted outcomes), the principle that there should be equality of access (unrestricted objective function, restricted opportunity set, unrestricted outcomes) and an extended version of Rawls' maximin rule (non-linear and kinked objective function, restricted opportunity set, and restricted outcomes).

When equity principles involve a maximand, then there is a role to play for economists. In that case, economists can contribute to the specification and estimation of a social welfare function which can help to enlighten the public policy process by making clear the tradeoff between equity and efficiency. The final part of the chapter discusses the research that has sought to quantify the equity–efficiency tradeoff in health. The literature is still at an embryonic stage. Most studies have difficulty to distinguish between equity and efficiency considerations. The little evidence that exists suggests that people are willing to sacrifice QALY gains for a more equitable distribution. We are still a long way from a well-specified social welfare function though. The authors conclude that a major challenge for future research is to "find a way of translating people's considered preferences about equity in health into measurements".

The main contribution of the chapter is the proposed taxonomy of theories. This taxonomy should help both researchers and policy makers to clarify their thinking about equity principles in health. The part on the estimation of the equity–efficiency tradeoff is somewhat disappointing, in particular with respect to the specification of the social welfare function. Here, the authors limit discussion to the fair innings approach and the DALY concept and

ignore other important contributions, most notably by Wagstaff's (1991). The authors also ignore the more basic problem whether a social welfare function can be specified at all, i.e. whether and to what extent it is possible to aggregate QALYs over individuals in a meaningful way. These omissions are unfortunate because the specification of the social welfare function is a field par excellence where health economists can contribute by discussing the possibility of aggregating individual health or utility and by identifying the assumptions on which the various specifications rest.

11. Conclusion

By discussing the 18 chapters above we hope to have given the reader a fair impression of the wealth of the material in this book. The editors must be complimented for bringing together the peers in health economics and getting them to deliver comprehensive and accessible descriptions of the state-of-science in each of their areas of expertise. We think that this achievement marks the maturity of the field of health economics and provides an excellent overview of its current status.

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