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Introduction

Equity has long been considered an important goal in the health sector. Yet inequalities between the poor and the better-off persist. The poor tend to suffer higher rates of mortality and morbidity than do the better-off. They often use health services less, despite having higher levels of need. And, notwithstanding their lower levels of utilization, the poor often spend more on health care as a share of income than the better-off. Indeed, some nonpoor households may be made poor precisely because of health shocks that necessitate out-of-pocket spending on health.

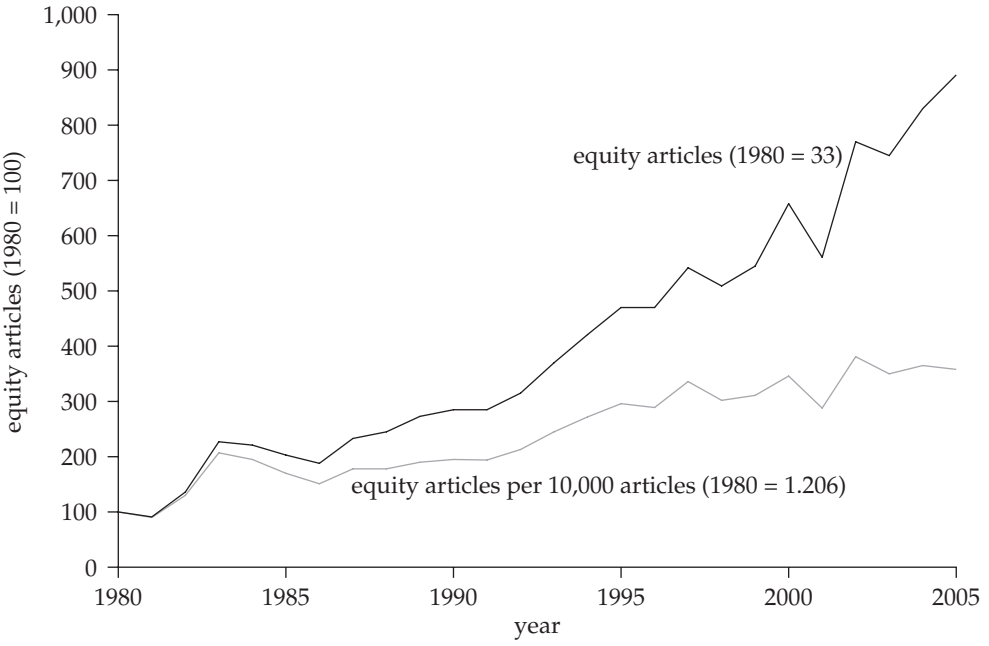
Most commentators accept that these inequalities reflect mainly differences in constraints between the poor and the better-off—lower incomes, higher time costs, less access to health insurance, living conditions that are more likely to encourage the spread of disease, and so on—rather than differences in preferences (cf. e.g., Alleyne et al. 2000; Braveman et al. 2001; Evans et al. 2001a; Le Grand 1987; Wagstaff 2001; Whitehead 1992). Such inequalities tend therefore to be seen not simply as inequalities but as *inequities* (Wagstaff and van Doorslaer 2000).

Some commentators, including Nobel prize winners James Tobin (1970) and Amartya Sen (2002), argue that inequalities in health are especially worrisome—more worrisome than inequalities in most other spheres. Health and health care are integral to people's capability to function—their ability to flourish as human beings. As Sen puts it, "Health is among the most important conditions of human life and a critically significant constituent of human capabilities which we have reason to value" (Sen 2002). Society is not especially concerned that, say, ownership of sports utility vehicles is low among the poor. But it *is* concerned that poor children are systematically more likely to die before they reach their fifth birthday and that the poor are systematically more likely to develop chronic illnesses. Inequalities in out-of-pocket spending matter too, because if the poor—through no fault of their own—are forced into spending large amounts of their limited incomes on health care, they may well end up with insufficient resources to feed and shelter themselves.

The rise of health equity research

Health equity has, in fact, become an increasingly popular research topic during the course of the past 25 years. During the January–December 1980 period, only 33 articles with "equity" in the abstract were published in journals indexed in Medline. In the 12 months of 2005, there were 294 articles published. Of course, the *total* number of articles in Medline has also grown during this period. But even as a share of the total, articles on equity have shown an increase: during the 12 months

Figure 1.1 *Equity Articles in Medline, 1980–2005*[1]



Source: Authors.

of 1980, there were just 1.206 articles on equity published per 10,000 articles in Medline. In 2005, the figure was 4.313, a 260 percent increase (Figure 1.1).

The increased popularity of equity as a research topic in the health field most likely reflects a number of factors. Increased demand is one. A growth of interest in health equity on the part of policy makers, donors, nongovernmental organizations, and others has been evident for some time. Governments in the 1980s typically were more interested in cost containment and efficiency than in promoting equity. Many were ideologically hostile to equity; one government even went so far as to require that its research program on health inequalities be called "health variations" because the term "inequalities" was deemed ideologically unacceptable (Wilkinson 1995). The 1990s were kinder to health equity. Researchers in the field began to receive a sympathetic hearing in many countries, and by the end of the decade many governments, bilateral donors, international organizations, and charitable foundations were putting equity close to—if not right at—the top of their health agendas.[2] This emphasis continued into the new millennium, as equity research became increasingly applied, and began to focus more and more on policies and programs to reduce inequities (see, e.g., Evans et al. 2001b; Gwatkin et al. 2005).

[1]The chart refers to articles published in the year in question, *not* cumulative numbers up to the year in question. The numbers are index numbers, the baseline value of each series being indicated in the legend to the chart.

[2]Several international organizations in the health field—including the World Bank (World Bank 1997) and the World Health Organization (World Health Organization 1999)—now have the improvement of the health outcomes of the world's poor as their primary objective, as have several bilateral donors, including, for example, the British government's Department for International Development (Department for International Development 1999).

Supply-side factors have also played a part in contributing to the growth of health equity research:

- Household data sets are more plentiful than ever before. The European Union launched its European Community Household Panel in the 1990s. The Demographic and Health Survey (DHS) has been fielded in more and more developing countries, and the scope of the exercise has increased too. The World Bank's Living Standards Measurement Study (LSMS) has also grown in coverage and scope. At the same time, national governments, in both the developing and industrialized world, appear to have committed ever more resources to household surveys, in the process increasing the availability of data for health equity research.
- Another factor on the supply side is computer power. Since their introduction in the early 1980s, personal computers have become increasingly more powerful and increasingly cheaper in real terms, allowing large household data sets to be analyzed more and more quickly, and at an ever lower cost.
- But there is a third supply-side factor that is likely to be part of the explanation of the rise in health equity research, namely, the continuous flow (since the mid-1980s) of analytic techniques to quantify health inequities, to understand them, and to examine the influence of policies on health equity. This flow of techniques owes much to the so-called ECuity project,[3] now nearly 20 years old (cf., e.g., van Doorslaer et al. 2004; Wagstaff and van Doorslaer 2000; Wagstaff et al. 1989).

The aim of the volume and the audience

It is those techniques that are the subject of this book. The aim is to make the techniques as accessible as possible—in effect, to lower the cost of computer programming in health equity research. The volume sets out to provide researchers and analysts with a step-by-step practical guide to the measurement of a variety of aspects of health equity, with worked examples and computer code, mostly for the computer program Stata. It is hoped that these step-by-step guides, and the easy-to-implement computer routines contained in them, will complement the other favorable demand- and supply-side developments in health equity research and help stimulate yet more research in the field, especially policy-oriented health equity research that enables researchers to help policy makers develop and evaluate programs to reduce health inequities.

Each chapter presents the relevant concepts and methods, with the help of charts and equations, as well as a worked example using real data. Chapters also present and interpret the necessary computer code for Stata (version 9).[4] Each chapter contains a bibliography listing the key articles in the field. Many suggest

[3] The project's Web site is at http://www2.eur.nl/bmg/ecuity/.

[4] Because of the narrow page width, some of the Stata code breaks across lines. The user will need to ensure breaks do not occur in the Stata do-files. Although Stata 9 introduces many innovations relative to earlier versions of Stata, most of the code presented in the book will work with earlier versions. There are however some instances in which the code would have to be adjusted. That is the case, for example, with the survey estimation commands used in chapters 2, 9, 10, and 18. Version 9 also introduces new syntax for Stata graphs. For further discussion of key differences, see http://www.stata.com/stata9/.

further reading and provide Internet links to useful Web sites. The chapters have improved over time, having been used as the basis for a variety of training events and research exercises, from which useful feedback has been obtained.

The target audience comprises researchers and analysts. The volume will be especially useful to those working on health equity issues. But because many chapters (notably chapters 2–6 and chapters 10 and 11) cover more general issues in the analysis of health data from household surveys, the volume may prove valuable to others too.

Some chapters are more complex than others, and some sections more complex than others. Nonetheless, the volume ought to be of value even to those who are new to the field or who have only limited training in quantitative techniques and their application to household data. After working through chapters 2–8 (ignoring the sections on dominance checking in chapter 7 and on statistical inference in chapter 8), such a reader ought to be able to produce descriptive statistics and charts showing inequalities in the more commonly used health status indicators. Chapters 16, 18, and 19 also provide accessible guides to the measurement of progressivity of health spending and the incidence of catastrophic and impoverishing health spending. Chapter 14 provides an accessible guide to benefit incidence analysis. The bulk of the empirical literature to date is based on methods in these chapters. The remaining chapters and the sections on dominance checking and inference in chapters 7 and 8 are more advanced, and the reader would benefit from some previous study of microeconometrics and income distribution analysis. The econometrics texts of Greene (1997) and Wooldridge (2002) and Lambert's (2001) text on income distribution and redistribution cover the relevant material.

Focal variables, research questions, and tools

Typically, health equity research is concerned with one or more of four (sets of) focal variables.[5]

- Health outcomes
- Health care utilization
- Subsidies received through the use of services
- Payments people make for health care (directly through out-of-pocket payments as well as indirectly through insurance premiums, social insurance contributions, and taxes)

In the case of health, utilization, and subsidies, the concern is typically with inequality, or more precisely inequalities between the poor and the better-off. In the case of out-of-pocket and other health care payments, the analysis tends to focus on progressivity (how much larger payments are as a share of income for the poor than for the better-off), the incidence of catastrophic payments (those that exceed a prespecified threshold), or the incidence of impoverishing payments (those that cause a household to cross the poverty line).

[5]For a review of the literature by economists on health equity up to 2000, see Wagstaff and van Doorslaer (2000).

In each case, different questions can be asked. These include the following:

1. *Snapshots*. Do inequalities between the poor and better-off exist? How large are they? For example, how much more likely is it that a child from the poorest fifth of the population will die before his or her fifth birthday than a child from the richest fifth? Are subsidies to the health sector targeted on the poor as intended? Wagstaff and Waters (2005) call this the snapshot approach: the analyst takes a snapshot of inequalities as they are at a point in time.
2. *Movies*. Are inequalities larger now than they were before? For example, were child mortality inequalities larger in the 1990s than they had been in the 1980s? Wagstaff and Waters (2005) call this the movie approach: the analyst lets the movie roll for a few periods and measures inequalities in each "frame."
3. *Cross-country comparisons*. Are inequalities in country *X* larger than they are in country *Y*? For example, are child survival inequalities larger in Brazil than they are in Cuba? Examples of cross-country comparisons along these lines include van Doorslaer et al. (1997) and Wagstaff (2000).
4. *Decompositions*. What are the inequalities that generate the inequalities in the variable being studied? For example, child survival inequalities are likely to reflect inequalities in education (the better educated are likely to know how to feed a child), inequalities in health insurance coverage (the poor may be less likely to be covered and hence more likely to pay the bulk of the cost out-of-pocket), inequalities in accessibility (the poor are likely to have to travel farther and for longer), and so on. One might want to know how far each of these inequalities is responsible for the observed child mortality inequalities. This is known as the decomposition approach (O'Donnell et al. 2006). This requires linking information on inequalities in each of the determinants of the outcome in question with information on the effects of each of these determinants on the outcome. The effects are usually estimated through a regression analysis; the closer analysts come to successfully estimating causal effects in their regression analysis, the closer they come to producing a genuine explanation of inequalities. Decompositions are also helpful for isolating inequalities that are of normative interest. Some health inequalities, for example, might be due to differences in preferences, and hence not inequitable. In principle at least, one could try to capture preferences empirically and use the decomposition method to isolate the inequalities that are *not* due to inequalities in preferences. Likewise, some utilization inequalities might reflect differences in medical needs, and therefore are not inequitable. The decomposition approach allows one to isolate utilization inequalities that do not reflect need inequalities.
5. *Cross-country detective exercises*. How far do differences in inequalities across countries reflect differences in health care systems between the countries, and how far do they reflect other differences, such as income inequality? For example, the large child survival inequalities in Brazil may have been even larger, given Brazil's unequal income distribution, had it not been for Brazil's universal health care system. The paper on benefit incidence by O'Donnell et al. (2007), which tries to explain why subsidies are better targeted on the poor in some Asian countries than in others, is an example of a cross-country detective exercise.

6. *Program impacts on inequalities*. Did a particular program narrow or widen health inequalities? This requires comparing inequalities as they are with inequalities as they would have been without the program. This latter counterfactual distribution is, of course, never observed. One approach, used in some of the studies in Gwatkin et al. (2005), is to compare inequalities (or changes in inequalities over time) in areas where the program has been implemented with inequalities in areas where the program has not been implemented. Or inequalities can be compared between the population enrolled in the program and the population not enrolled in it. This approach is most compelling in instances in which the program has been placed at random in different areas or in instances in which eligibility has been randomly assigned. Where this is not the case, biases may result. Methods such as propensity score matching can be used to try to reduce these biases. Studies in this genre are still relatively rare; examples include Jalan and Ravallion, who look at the differential impacts at different points in the income distribution of piped water investments on diarrhea disease incidence, and Wagstaff and Yu (2007), who look inter alia at the impacts of a World Bank-funded health sector reform project on the incidence of catastrophic out-of-pocket spending.

Answering all these questions requires quantitative analysis. This in turn requires at least three if not four ingredients.

- First, a suitable data set is required. Because the analysis involves comparing individuals or households in different socioeconomic circumstances, the data for health equity analysis often come from a household survey.
- Second, there needs to be clarity on the measurement of key variables in the analysis—health outcomes, health care utilization, need, subsidies, health care payments, and of course living standards.
- Third, the analyst requires a set of quantitative methods for measuring inequality, or the progressivity of health care payments, the incidence and intensity of catastrophic payments, and the incidence of impoverishing payments.
- Fourth, if analysts want to move on from simple measurement to decomposition, cross-country detective work, or program evaluation, they require additional quantitative techniques, including regression analysis for decomposition analysis and impact evaluation methods for program evaluation in which programs have been nonrandomly assigned.

This volume will help researchers in all of these areas, except the last—impact evaluation—which has only recently begun to be used extensively in the health sector and has been used even less in health equity analysis.

Organization of the volume

Part I addresses data issues and the measurement of the key variables in health equity analysis. It is also likely to be valuable to health analysts interested in health issues more generally.

- *Data issues.* Chapter 2 discusses the data requirements for different types of health equity analysis. It compares the advantages and disadvantages of different types of data (e.g., household survey data and exit poll data) and sum-

marizes the key characteristics of some of the most widely used household surveys, such as the DHS and LSMS. The chapter also offers a brief discussion and illustration of the importance of sample design issues in the analysis of survey data.

- *Measurement of health outcomes.* Chapters 3–5 discuss the issues involved in the measurement of some widely used health outcome variables. Chapter 3 covers child mortality. It describes how to compute infant and under-five mortality rates from household survey data using the direct method of mortality estimation using Stata and the indirect method using QFIVE. It also explains how survey data can be used to undertake disaggregated mortality estimation, for example, across socioeconomic groups. Chapter 4 discusses the construction, interpretation, and use of anthropometric indicators, with an emphasis on infants and children. The chapter provides an overview of anthropometric indicators, discusses practical and conceptual issues in constructing anthropometric indicators from physical measurements, and highlights some key issues and approaches to analyzing anthropometric data. The chapter presents worked examples using both Stata and EpiInfo. Chapter 5 is devoted to the measurement of self-reported adult health in the context of general population health inequalities. It illustrates the use of different types of adult health indicators—medical, functional, and subjective—to describe the distribution of health in relation to socioeconomic status (SES). It shows how to standardize health distributions for differences in the demographic composition of SES groups and so provide a more refined description of socioeconomic inequality in health. The chapter also discusses the extent to which measurement of health inequality is biased by socioeconomic differences in the reporting of health.
- *Measurement of living standards*. A key theme throughout this volume and throughout the bulk of the literature on health equity measurement is the variation in health (and other health sector variables) across the distribution of some measure of living standards. Chapter 6 outlines different approaches to living standards measurement, discusses the relationship between and the merits of different measures, shows how different measures can be constructed from survey data, and provides guidance on where further information on living standards measurement can be obtained.

Part II outlines quantitative techniques for interpreting and presenting health equity data.

- *Inequality measurement.* Chapters 7 and 8 present two key concepts—the concentration curve and the concentration index—that are used throughout health equity research to measure inequalities in a variable of interest across the income distribution (or more generally across the distribution of some measure of living standards). The chapters show how the concentration curve can be graphed in Stata and how the concentration index—and its standard error—can be computed straightforwardly.
- *Extensions to the concentration index.* Chapter 9 shows how the concentration index can be extended in two directions: to allow analysts to explore the sensitivity of their results to imposing a different attitude to inequality (i.e., degree of inequality aversion) to that implicit in the concentration index and

to allow a summary measure of "achievement" to be computed that captures both the mean of the distribution as well as the degree of inequality between rich and poor.

- *Decompositions*. What are the underlying inequalities that explain the inequalities in the health variable of interest? For example, child survival inequalities are likely to reflect inequalities in education (the better educated are more likely to know how to feed a child efficiently), in health insurance coverage, in accessibility to health facilities (the poor are likely to have to travel farther), and so on. One might want to know the extent to which each of these inequalities can explain the observed child mortality inequality. This can be addressed using decomposition methods (O'Donnell et al. 2006), which are based on regression analysis of the relationships between the health variable of interest and its correlates. Such analyses are usually purely descriptive, revealing the associations that characterize the health inequality, but if data are sufficient to allow the estimation of causal effects, then it is possible to identify the factors that generate inequality in the variable of interest. In cases in which causal effects have not been obtained, the decomposition provides an explanation in the statistical sense, and the results will not necessarily be a good guide to policy making. For example, the results will not help us predict how inequalities in Y would change if policy makers were to reduce inequalities in X, or reduce the effect of X and Y (e.g., by expanding facilities serving remote populations if X were distance to provider). By contrast, if causal effects *have* been obtained, the decomposition results ought to shed light on such issues. Decompositions are also helpful for isolating inequalities that are of normative interest. Some health inequalities, for example, might be due to differences in preferences and hence are not inequitable. In principle at least, one could try to capture preferences empirically and use the decomposition method to isolate the inequalities that are *not* due to inequalities in preferences. Likewise, some utilization inequalities might reflect differences in medical needs and therefore are not inequitable. The decomposition approach allows one to isolate utilization inequalities that do not reflect need inequalities.

Part III presents the application of these techniques in the analysis of equity in health care utilization and health care spending.

- *Benefit incidence analysis*. Chapter 14 shows how benefit incidence analysis (BIA) is undertaken. In its simplest form, BIA is an accounting procedure that seeks to establish to whom the benefits of government spending accrue, with recipients being ranked by their relative economic position. The chapter confines its attention to the distribution of average spending and does not consider the benefit incidence of marginal dollars spent on health care (Lanjouw and Ravallion 1999; Younger 2003). Once a measure of living standards has been decided on, there are three principal steps in a BIA of government health spending. First, the utilization of public health services in relation to the measure of living standards must be identified. Second, each individual's utilization of a service must be weighted by the unit value of the public subsidy to that service. Finally, the distribution of the subsidy must be evaluated against some target distribution. Chapter 14 discusses each of these three steps in turn.

- *Equity in health service delivery*. Chapter 15 discusses measurement and explanation of inequity in the delivery of health care. In health care, most attention—both in policy and research—has been given to the horizontal equity principle, defined as "equal treatment for equal medical need, irrespective of other characteristics such as income, race, place of residence, etc." The analysis proceeds in much the same way as the standardization methods covered in chapter 5: one seeks to establish whether there is differential utilization of health care by income after standardizing for differences in the need for health care in relation to income. In empirical work, need is usually proxied by expected utilization given characteristics such as age, gender, and measures of health status. Complications to the regression method of standardization arise because typically measures of health care utilization are nonnegative integer counts (e.g., numbers of visits, hospital days, etc.) with highly skewed distributions. As discussed in chapter 11, nonlinear methods of estimation are then appropriate. But the standardization methods presented in chapter 5 do not immediately carry over to nonlinear models—they can be rescued only if relationships can be represented linearly. Chapter 15 therefore devotes most of its attention to standardization in nonlinear settings. Once health care use has been standardized for need, inequity can be measured by the concentration index. Inequity can then be explained by decomposing the concentration index, as explained in chapter 13. In fact, with the decomposition approach, standardization for need and explanation of inequity can be done in one step. This procedure is described in the final section of chapter 15.
- *Progressivity and redistributive effect of health care finance*. Chapter 16 shows how one can assess the extent to which payments for health care are related to ability to pay (ATP). Is the relationship proportional? Or is it progressive—do health care payments account for an increasing proportion of ATP as the latter rises? Or, is there a regressive relationship, in the sense that payments comprise a decreasing share of ATP? The chapter provides practical advice on methods for the assessment and measurement of progressivity in health care finance. Progressivity is measured in regard to departure from proportionality in the relationship between payments toward the provision of health care and ATP. Chapter 17 considers the relationship between progressivity and the redistributive impact of health care payments. Redistribution can be vertical and horizontal. The former occurs when payments are disproportionately related to ATP. The chapter shows that the extent of vertical redistribution can be inferred from measures of progressivity presented in chapter 16. Horizontal redistribution occurs when persons with equal ability to pay contribute unequally to health care payments. Chapter 17 shows how the total redistributive effect of health payments can be measured and how this redistribution can be decomposed into its vertical and horizontal components.
- *Catastrophe and impoverishment in health spending*. One conception of fairness in health finance is that households should be protected against catastrophic medical expenses (World Health Organization 2000). A popular approach has been to define medical spending as "catastrophic" if it exceeds some fraction of household income or total expenditure within a given period, usually one year. The idea is that spending a large fraction of the household

budget on health care must be at the expense of consumption of other goods and services. Chapter 18 develops measures of catastrophic health spending, including the incidence and intensity of catastrophic spending, as well as a measure that captures not just the incidence or intensity but also the extent to which catastrophic spending is concentrated among the poor. Chapter 19 looks at the measurement of impoverishing health expenditures—expenditures that result in a household falling below the poverty line, in the sense that had it not had to make the expenditures on health care, the household could have enjoyed a standard of living above the poverty line.

References

Alleyne, G. A. O., J. Casas, and C. Castillo-Salgado. 2000. "Equality, Equity: Why Bother?" *Bulletin of the World Health Organization* 78(1): 76–77.

Braveman, P., B. Starfield, and H. Geiger. 2001. "World Health Report 2000: How It Removes Equity from the Agenda for Public Health Monitoring and Policy." *British Medical Journal* 323: 678–80.

Department for International Development. 1999. *Better Health for Poor People.* London: Department for International Development.

Evans, T., M. Whitehead, F. Diderichsen, A. Bhuiya, and M. Wirth. 2001a. "Introduction." In *Challenging Inequities in Health: From Ethics to Action,* ed. T. Evans, M. Whitehead, F. Diderichsen, A. Bhuiya, and M. Wirth. Oxford: Oxford University Press.

Evans, T., M. Whitehead, F. Diderichsen, A. Bhuiya, and M. Wirth. 2001b. *Challenging Inequities in Health: From Ethics to Action.* Oxford: Oxford University Press.

Greene, W. 1997. *Econometric Analysis.* Upper Saddle River, NJ: Prentice-Hall Inc.

Gwatkin, D. R., A. Wagstaff, and A. Yazbeck. 2005. *Reaching the Poor with Health, Nutrition, and Population Services: What Works, What Doesn't, and Why.* Washington, DC: World Bank.

Lambert, P. 2001. *The Distribution and Redistribution of Income: A Mathematical Analysis.* Manchester, United Kingdom: Manchester University Press.

Lanjouw, P., and M. Ravallion. 1999. "Benefit Incidence, Public Spending Reforms and the Timing of Program Capture." *World Bank Economic Review* 13(2).

Le Grand, J. 1987. "Equity, Health and Health Care." *Social Justice Research* 1: 257–74.

O'Donnell, O., E. van Doorslaer, and A. Wagstaff. 2006. "Decomposition of Inequalities in Health and Health Care." In *The Elgar Companion to Health Economics,* ed. A. M. Jones. Cheltenham, United Kingdom: Edward Elgar.

O'Donnell, O., E. van Doorslaer, R. P. Rannan-Eliya, A. Somanathan, S. R. Adhikari, D. Harbianto, C. G. Garg, P. Hanvoravongchai, M. N. Huq, A. Karan, G. M. Leung, C.-w. Ng, B. R. Pande, K. Tin, L. Trisnantoro, C. Vasavid, Y. Zhang, and Y. Zhao. 2007. "The Incidence of Public Spending on Health Care: Comparative Evidence from Asia." *World Bank Economic Review,* in press.

Sen, A. 2002. "Why Health Equity?" *Health Economics* 11(8): 659–66.

Tobin, J. 1970. "On Limiting the Domain of Inequality." *Journal of Law and Economics* 13: 263–78.

van Doorslaer, E., A. Wagstaff, H. Bleichrodt, S. Calonge, U. G. Gerdtham, M. Gerfin, J. Geurts, L. Gross, U. Hakkinen, R. E. Leu, O. O'Donnell, C. Propper, F. Puffer, M. Rodriguez, G. Sundberg, and O. Winkelhake. 1997. "Income-Related Inequalities in Health: Some International Comparisons." *Journal of Health Economics* 16: 93–112.

van Doorslaer, E., X. Koolman, and A. M. Jones. 2004. "Explaining Income-Related Inequalities in Doctor Utilisation in Europe." *Health Econ* 13(7): 629–47.

Wagstaff, A. 2000. "Socioeconomic Inequalities in Child Mortality: Comparisons across Nine Developing Countries." *Bulletin of the World Health Organization* 78(1): 19–29.

Wagstaff, A. 2001. "Economics, Health and Development: Some Ethical Dilemmas Facing the World Bank and the International Community." *Journal of Medical Ethics* 27(4): 262–67.

Wagstaff, A., and E. van Doorslaer. 2000. "Equity in Health Care Finance and Delivery." In *North Holland Handbook in Health Economics,* ed. A. Culyer and J. Newhouse, 1804–1862. Amsterdam, Netherlands: North Holland.

Wagstaff, A., and H. Waters. 2005. "How Were the Reaching the Poor Studies Done?" In *Reaching the Poor with Health, Nutrition and Population Services: What Works, What Doesn't, and Why*, ed. D. Gwatkin, A. Wagstaff, and A. Yazbeck. Washington, DC: World Bank.

Wagstaff, A., and S. Yu. 2007. "Do Health Sector Reforms Have Their Intended Impacts? The World Bank's Health VIII Project in Gansu Province, China." *Journal of Health Economics*, 26(3): 505–535.

Wagstaff, A., E. van Doorslaer, and P. Paci. 1989. "Equity in the Finance and Delivery of Health Care: Some Tentative Cross-Country Comparisons." *Oxford Review of Economic Policy* 5: 89–112.

Whitehead, M. 1992. "The Concepts and Principles of Equity and Health." *International Journal of Health Services* 22(3): 429–45.

Wilkinson, R. G. 1995. "'Variations' in Health." *British Medical Journal* 311: 1177–78.

Wooldridge, J. M. 2002. *Econometric Analysis of Cross Section and Panel Data.* Cambridge, MA.: MIT Press.

World Bank. 1997. *Health, Nutrition and Population Sector Strategy.* Washington, DC: World Bank.

World Health Organization. 1999. *The World Health Report 1999: Making a Difference.* Geneva, Switzerland: World Health Organization.

World Health Organization. 2000. *World Health Report 2000.* Geneva, Switzerland: World Health Organization.

Younger, S. D. 2003. "Benefits on the Margin: Observations on Marginal Benefit Incidence Analysis." *World Bank Economic Review* 17(1): 89–106.