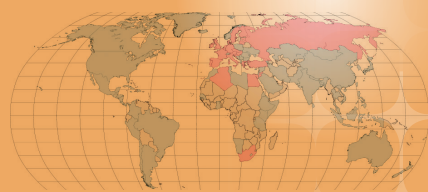


*A new, comprehensive and evidence-based resource
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In 3 Volumes



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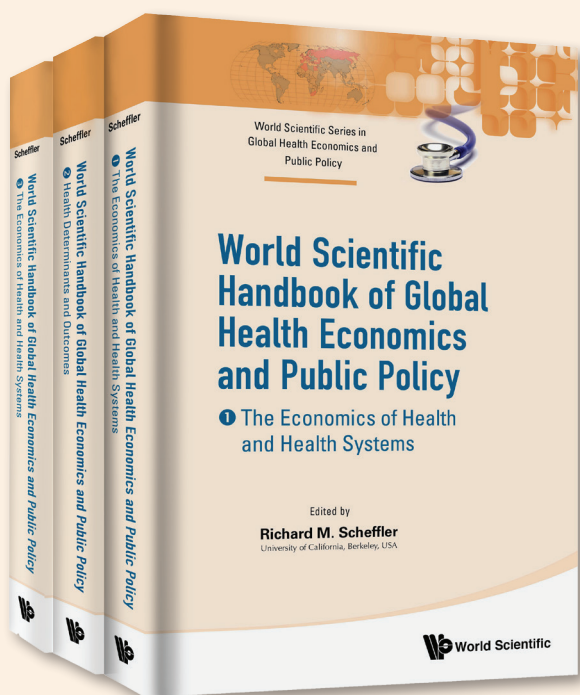


World Scientific Handbook of Global Health Economics and Public Policy

Edited by

Richard M. Scheffler

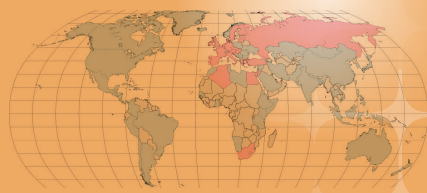
University of California, Berkeley, USA



This Handbook covers major topics in global health economics and public policy and provides a timely, systematic review of the field. Edited by Richard M. Scheffler, Distinguished Professor of Health Economics and Public Policy and Director of the Global Center for Health Economics and Policy Research at the University of California, Berkeley, the Handbook features academics and practitioners from more than a dozen countries. Contributors are from the London School of Economics and Political Science, Catolica University in Chile, Pompeu Fabra University in Barcelona, University of York, University of Oslo, London School of Hygiene and Tropical Medicine, University of California – Berkeley, University of California – San Francisco, Stanford University, John Hopkins University, University of Toronto, University of Oxford, Harvard Medical School, OECD, and the World Bank, many of whom have also acted as economic and policy advisors to government and non-governmental organizations across the world.

The Handbook spans across three volumes. The chapters deal with key global issues in health economics, are evidence-based, and offer innovative policy alternatives and solutions. The Handbook's approach toward global health economics and public policy will make it a useful resource for health economists, policymakers, private sector companies, NGOs, government decision-makers and those who manage healthcare systems.

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World Scientific Handbook of Global Health Economics and Public Policy

Volume 1 – The Economics of Health and Health Systems

Editor

Richard M. Scheffler

Distinguished Professor of Health
Economics and Public Policy Director of
the Global Center for Health Economics
and Policy Research
University of California, Berkeley

VOLUME 1 The Economics of Health and Health Systems

covers topics such as the financing of health systems, measuring and forecasting health care costs, resource allocation and health system performance

Introduction by Richard M. Scheffler (Editor)

1. Healthcare Spending and Economic Growth (*Edit V Velényi*)
2. Macroeconomics, Trade and Health (*Richard Smith, Marcus Keogh-Brown and Johanna Hanefeld*)
3. Measuring and Forecasting Global Health Expenditures (*Thomas Getzen*)
4. Economics of Financing Health Care (*Alexander S Preker, Sherry Glied, Dov Chernichovsky and Marisa Gil Lapetra*)
5. Alternative Strategies for Universal Health Care Coverage (*Joseph Kutzin, Cheryl Cashin and Winnie Yip*)
6. Global Risk-Adjusted Payment Models (*Camilo Cid, Randall P Ellis, Verónica Vargas, Juergen Wasem and Lorena Prieto*)
7. Resource Allocation and Priority Setting in Health Care Systems (*Guillem Lopez-Casasnovas and Laura Pellisé-Urquiza*)
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9. Incentivizing Health Care Utilization and Health Outcomes (*William H Dow, Justin White and Stefano M Bertozzi*)
10. Economic Evaluation of Healthcare Programs and Interventions: Applications to Low- and Middle-Income Countries (*Paul Revill, Beth Woods and Mark J Sculpher*)
11. Inequalities and Inequities in Health and Health Care (*Marisol Rodríguez and Rosa Urbanos-Garrido*)

Introduction to Volume 1: The Economics of Health and Health Systems

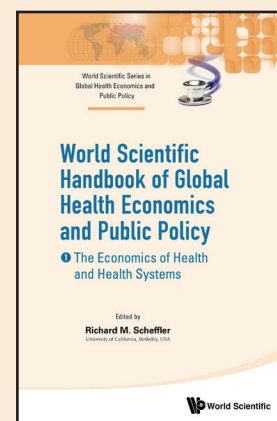
By Richard M. Scheffler (Editor)

Chapters 1–3 in this volume address macroeconomic issues, which include economic growth and health care spending, the link between trade and health care, and lastly, techniques and methods for forecasting country-by-country macro health care expenditures. Chapter 1, *Health Care Spending and Economic Growth*, explores the complex relationship between health expenditures and economic growth, and demonstrates that the researchers have shifted their attention towards economic growth in a way that looks at the impact health spending on economic growth as well as its broader impact on the economy. The authors look at health investments and various health care strategies that combat epidemics such as Ebola. Chapter 2, *Macroeconomics, Trade, and Health*, looks at the interaction between health and the wider macro-economy, and analyzes the macroeconomic implications for the economy as a whole. Additionally, the authors suggest a framework for looking at and weighing the spending of health compared to other non-health expenditures. Chapter 3, *Measuring and Forecasting Global Health Expenditures*, looks at health care spending over several decades, especially the rapid growth since the middle of the 20th century. It shows that the tracking of health care expenditures as forecasting can be clearly understood by relating its growth to that of the overall economy. The chapter further examines a series of data on health care spending over multiple decades. Forecasting models are described and applied to various countries throughout the chapter. Special attention is paid to the sustainability of current spending trends and the boundaries between long-term care, retirement, and medical expenditures.

Chapters 4–9 look at financing methods for health care (especially financing health care in a way to move us towards universal coverage), examines risk adjustment methodologies needed to implement payment and financing strategies, and the issue of priority setting in health care systems that are single payer, non-market driven systems. Chapter 4, *Economics of Financing Health Care*, uses an economic framework to explain the design of optimal financing strategies and reviews empirical evidence under different health care systems. Specifically, it looks at the impact of financing on patients, doctors, and hospitals. Applications of financing strategies are discussed in relationship to the structure of global health care financing and the role of third-party payers, both public and private. Three case studies on financing are discussed, in the U.S. The Netherlands, and Singapore. Chapter 5, *Alternative Financing Strategies for Universal Health Coverage*, takes on the critical issue of how financing impacts universal health care coverage. The chapter notes that there is no one best way to finance — in theory or in practice — but it discusses conceptual underpinnings regarding how we think about this key issue. The chapter examines the role of government and provides a synthesis of coverage in low- and middle-income countries. Chapter 6, *Global Risk-Adjusted Payment Models*, discusses the need for financing systems to risk-adjust for the underlying heterogeneity of both the patients and plans in order to reduce the incentive for risk selection. This chapter presents a practical, theoretical, and statistical set of risk adjustment models that are applied to a wide variety of countries' financing and payment systems. More than 30 countries, including those in high- and middle-income countries, are analyzed according to this risk-adjustment methodology. Chapter 7, *Resource Allocation and Priority Setting in Health Care Systems*, the authors discuss issues in single payer systems that do not use prices, and how to set priorities for pricing and spending. The chapter discusses practical problems, implications, and methodology of priority setting. Chapter 8, *Estimating Health Care Treatment Costs: Problems and Solutions*, considers the conceptual and empirical problems with estimating health care costs. The authors examine the estimation of such costs at different levels of aggregation. They argue that more attention needs to be given to this area of research because of the importance of health care cost estimation in helping to risk-adjust and predict future health care expenditure levels as well as reimbursement levels. Chapter 9, *Incentivizing Health Care Utilization and Health Outcomes*, looks at the evidence of using incentives to increase the use of health care services and improve health outcomes. In some instances, they have been a controversial tool, but there is great interest in how it can be used in an ethical and cost-effective manner. This chapter further examines these concerns as well as an important social protection program in Mexico, but also summarizes the impact of incentives on family planning, prenatal care, immunizations, HIV and medication, and adherence to promoting non-medical behavior such as smoking cessation and STD prevention.

Chapters 10–11 in this volume look at how to evaluate interventions, and the crucial problem of inequities in the health sector. Chapter 10, *Economic Evaluation of Health Care Programmes and Interventions: Applications to Low- and Middle-Income Countries*, presents the tools of economic evaluation, such as cost-effectiveness, and shows how key policymakers have used them in economic evaluations. Specific examples are taken from the UK, Australia, and Canada, which demonstrates the usefulness of these evaluation methods. The chapter also looks at the policy challenges and evaluation methodology in low- and middle-income countries. The authors provide guidance on suitable methods that can be used to improve population health in these countries.

No issue can be more important than the inequalities in health and health care throughout the globe. Inequities and the social gradient in health persist and have widened over time. Chapter 11, *Inequalities and Inequities in Health and Health Care*, looks at socioeconomic and geographic disparities within the framework of moving towards universal coverage. It provides direction on ways of thinking about how these inequities should be addressed in economic systems and the development of health care policies.



The Author Biographies are listed in order by chapter in the TOC.

Edit V Velényi is a Health Economist with the Health, Nutrition, and Population (HNP) Global Practice of the World Bank, where she focuses on applied economic analysis and impact evaluation of health sector projects to improve operational and development effectiveness. Previously, she worked at the HNP Anchor, where she focused on the relationship between the macro economy and health financing. Between 2007 and 2011 she coordinated the health portfolio of the Development Impact Evaluation Initiative of the World Bank's Development Research Group. During earlier assignments with the World Bank's Africa Region and the HNP Anchor, she co-authored *Learning from Economic Downturns — How to Better Assess, Track, and Mitigate the Impact on the Health Sector* (2013); co-edited *Public Ends, Private Means — Strategic Purchasing of Health Services* (2007); and co-authored book chapters on health insurance. Edit received a PhD in Economics from the University of York, an MA from the Johns Hopkins University, School of Advanced International Studies, and an MA from the Budapest Business School.

Richard Smith is Professor of Health System Economics and Dean of the Faculty of Public Health and Policy at the London School of Hygiene & Tropical Medicine. Following undergraduate and postgraduate studies in economics at the University of York, Richard worked in Sydney, Cambridge, Bristol, Melbourne and Norwich, before joining the School in 2007. Richard has held various other appointments, including honorary posts at the Universities of Hong Kong and East Anglia, Associate Fellow at The Royal Institute of International Affairs, and editorial roles for journals including *Health Economics*, the *Journal of Public Health and Globalization and Health*. He has also acted as an expert advisor for a number of international bodies, as well as several national government departments. Richard's research has covered a number of areas of health economics, in recent years focusing upon developing the methods for macro-economic analysis of health, the economics of globalization and health, and aspects of trade in health goods, services, people and ideas. Richard has received over £30 million in grant income, published five books, more than 100 journal papers, and dozens of other works.

Marcus Keogh-Brown is Lecturer in Economic Modeling at the London School of Hygiene and Tropical Medicine. His research interests are mainly focused on the application of macroeconomic modeling to health. Previous applications of these models include infectious disease outbreaks, particularly SARS and Pandemic influenza, antibiotic resistance, dietary change, greenhouse gas reduction strategies with health co-benefits, Alzheimer's disease and malaria. In addition to various country simulations for policy analysis, Marcus has also been involved in pioneering methodological development of macroeconomic models to integrate health, demographic and epidemiological models in a single framework.

Johanna Hanefeld is Lecturer in Health Systems Economics in the department of Global Health and Development focusing on trade and health, health systems, governance, and quantitative and qualitative policy analysis mainly in low- and middle-income countries. Together with Professor Richard Smith and colleagues at the University of York, UK, she recently completed a large research project examining the impact of medical tourism on the UK NHS. She is co-editor of the forthcoming Edward Elgar Handbook on Medical Tourism and Patient Mobility.

Thomas E Getzen is emeritus Professor of Risk, Insurance and Health Management at Temple University and Executive Director of iHEA, the International Health Economics Association. His textbook *Health Economics: Fundamentals and Flow of Funds* (Wiley; 5th ed., 2013) is used in graduate and undergraduate programs throughout the world and he has been visiting professor at the Woodrow Wilson School of Public Policy at Princeton University, the Wharton School of the University of Pennsylvania, the University of Toronto, and the Centre for Health Economics at the University of York. His research and consulting focus on the macroeconomics of health, forecasting medical expenditures, physician supply, price indexes, financing and public health economics. He is the editor-in-chief for the "HEN-Health Economics Network" in collaboration with SSRN and associate editor for *Health Economics*. Professor Getzen periodically updates the forecasting model of "Long Run Medical Cost Trends" for the Society of Actuaries, and served on the National Academy of Sciences IOM Committee on Public Health Strategies.

Alexander S Preker is the President and CEO of the Health Investment & Financing Corporation in New York. He is an active investor and member of the board of several health care companies. Mr. Preker also serves as one of the Commissioners for the Global Commission on Pollution, Health and Development and as the Chair of the External Advisory Committee for the WHHSJ of the International Hospital Federation. From 2007 to 2012, MrPreker was Head of the Health Industry Group and Investment Policy for the International Finance Corporation. Previously, he was Chief Economist for the health sector in the World Bank Group. MrPreker has published extensively, having written many scientific articles and authored over 15 books. MrPreker is an Executive Scholar and Adjunct Associate Professor at the Icahn School of Medicine at Mount Sinai in New York, an Adjunct Associate Professor of public policy at New York University's Robert F Wagner Graduate School of Public Policy and an Adjunct Associate Professor for Health Care Management at the Mailman School of Public Health at Columbia University. His training includes a PhD in Economics from the London School of Economics and Political Science, a Fellowship in Medicine from University College London, a Diploma in Medical Law and Ethics from King's College London, and a MD from University of British Columbia/McGill.

Sherry Glied became Dean of New York University's Robert F. Wagner Graduate School of Public Service in August 2013. From 1989-2013, she was Professor of Health Policy and Management at Columbia University's Mailman School of Public Health. She was Chair of the department from 1998-2009. On June 22, 2010, Glied was confirmed by the U.S. Senate as Assistant Secretary for Planning and Evaluation at the Department of Health and Human Services, and served in that capacity from July 2010 through August 2012. She had previously served as Senior Economist for health care and labor market policy on the President's Council of Economic Advisers in 1992-1993, under Presidents Bush and Clinton. Glied's principal areas of research are in health policy reform and mental health care policy.

Dov Chernichovsky is professor emeritus of health economics and policy of Ben-Gurion University of the Negev, Israel. He currently the Dean of the School of Health and Welfare Professions at the The Max Stern Academic College of EmekYezreel in Israel, is a Research Associate with the National Bureau of Economic Research (NBER) in the USA, coordinates research at the Taub Center for Social Policy in Israel, and chairs the Israeli National Nutrition Security Council. Dov has been consulting for the World Bank, serves on the board of the Israeli Cancer Society, the Israeli Family Planning Association, and the Association for the Advancement of Education in Israel. Dov was a member Israeli State Commission of Inquiry into the Israeli Health Care System between 1998-1990 that led to the national health insurance legislation that was enacted in Israel in 1995. He served on other national commissions an adviser to the Israeli parliament. Dov worked for the US and German international aid agencies and the Australian government. On behalf of the World Bank, he worked in Botswana, India, Indonesia, and played roles in health system reform in Rumania, Russia, and now in Mexico, Colombia and Costa Rica.

Marisa Gil Lapetra is a Statistical Editor at OECD. Since beginning her professional career assisting the Chief Economist of the Commercial Office of the Spanish Embassy to Belgium, she has held positions as a Business Analyst at KNOEMA, as an Environmental Policy Group Communications Officer at the World Bank Family Network, and as the founder of Renewable Energy Advisory Services. Her focus is on examining social policy issues related to health and environment through an international development lens, with a mindfully incorporation of the fundamental principles and creative approach to sourcing, compiling, analyzing and displaying data to support change-agents and policymakers in their dialogue for making meaningful decisions for progress in health care access, quality and delivery for targeted populations. Marisa is a member of the National Association for Business Economics (NABE), DC. She received her Master's Degree in Econometrics and Quantitative Economics from the Universidad Complutense de Madrid and a post-graduate degree from Universite Paris X Nanterre.

Joseph Kutzin is Coordinator for Health Financing Policy at the World Health Organization, leading a team responsible for informing national policy dialog and global debates on health financing reforms to move towards Universal Health Coverage. He obtained his Master's Degree in Development Economics from Boston University, has been a visiting Fellow at Imperial College London, and in 2012 was awarded an Honorary Doctorate from Semmelweis University in Budapest, Hungary. He has 30 years' experience in health financing policy and health system reform, working in Africa, Asia, the Caribbean, Europe, and the United States. He was formerly Senior Policy Advisor to Kyrgyzstan's Ministry of Health and lead advisor on health financing for the WHO European Region, including in his role as Head of the WHO Barcelona Office for Health System Strengthening. Prior to joining WHO, he worked for both the World Bank and the Project HOPE Center for Health Affairs. He has published numerous conceptual and empirical articles on health financing and universal coverage. Highlights include his role as lead editor and main author of *Implementing Health Financing Reform: Lessons from Countries in Transition*, and as a contributor to the *World Health Report 2010: Health Financing: the Path to Universal Coverage*.

Winnie Yip is Professor of Health Policy and Economics at the Blavatnik School of Government, University of Oxford, and Senior Research Fellow of Green Templeton College, Oxford, where she co-directs the Global Health Policy Program. She is also Adjunct Professor of International Health Policy and Economics at Harvard School of Public Health. Professor Yip received her PhD in Economics from the Massachusetts Institute of Technology. Her research focuses on the design, implementation and impact evaluation of national health care systems, especially in China and Asia. Her research is funded by the National Science Foundation, Bill and Melinda Gates Foundation, the European Union Commission, the Economics and Social Science Research Council. She is a member of the Sustainable Development Solutions Network Thematic Group on Health, the Expert Group on Provider Payment of the Joint Learning Network for Universal Health Coverage, the Institute of Medicine's Standing Committee to support USAID's Engagement in Health Systems Strengthening in Response to the Economic Transition of Health and the Lancet Commission for Global Surgery. She is Associate Editor of *Health Economics, Journal of the Economics of Ageing*, and editorial board member of *Health Policy, Health Economics, Policy and Law*, and *Health Economics Review*.

Cheryl Cashin is Senior Program Director at Results for Development Institute (R4D) where she leads a health financing portfolio focused on global and country-level efforts to support universal health coverage in low- and middle-income countries. She received her Ph.D. in economics from the University of Washington and M.S. from Cornell University. She has worked in more than 20 countries on health financing policy development and implementation, with a particular focus on purchasing and provider payment, including capitation payment models to strengthen primary health care and improve equity within sustainable financing for UHC. She currently leads the Provider Payment Initiative of the Joint Learning Network for Universal Health Coverage (JLN). Previously, she has held academic positions at Boston University's School of Public Health and University of California, Berkeley's Nicholas C Petris Center on Health Care Markets and Consumer Welfare and has served as a health financing consultant for the World Bank, WHO, OECD and other international technical partners. She is the lead author of the recent book *Paying for performance in health care: implications for health system performance and accountability* and is a co-author of several other books and publications.

Camilo Cid Pedraza is a Professor of Health Economics in the Department of Public Health of the Catholic University of Chile. Last year he was Head of the Presidential Commission for Health Insurance Reform in Chile. Currently he is on loan as the coordinator for Health Economics and Financing at the Pan American Health Organization in Washington DC. His areas of focus include health economics and public policy, financing and expenditure, health insurance and its regulation, payment mechanisms and risk adjustment. Dr Cid has served as an international advisor for several international organizations where he has worked on projects for public institutions in LAC. Previously, Dr Cid worked for over 15 years in the public sector of health, becoming the Head of the Department of Studies of the Ministry of Health of Chile. Later, he was the founder of the Department of Health Economics of the same Ministry. He was President of the Health Economics Association of Latin America and the Caribbean and is part of the Directory of the Health Economics Association of Chile. Dr Cid obtained his MA in Economics from Georgetown University and PhD in Economics from the Department of Economics of the Universität Duisburg-Essen of Germany.

Randall P Ellis is a Professor in the Department of Economics at Boston University, with research interests in both US and international health economics topics. Dr Ellis is a past President of the American Society of Health Economists and an associate editor of both the *Journal of Health Economics* and the *American Journal of Health Economics*. Dr Ellis was one of the developers of the DCG/HCC risk adjustment models currently used by the US Medicare program for risk adjusting Part C and Part D payments, and for the Health Insurance Marketplaces. Dr Ellis serves as a consultant to VeriskHealth which supports the DCG/HCC risk adjustment framework, developing models for all ages and all payer and plan types. His current and recent research is funded by the National Institute of Mental Health, The Commonwealth Fund, The Australian Research Council, and Verisk Health. This recent work focuses on risk adjustment, reimbursement systems, optimal insurance, mental health, health plan competition and in primary care payment reform.

Veronica Vargas is an economist specialized in health and has been active in global health for over 20 years. In addition to teaching Health Economics at the University Alberto Hurtado-Georgetown in Chile, Dr Vargas was an advisor to the Chilean Health Reform Commission in 2003-2004, has consulted for the World Bank, DFID, and the European Union in Latin America, the Caribbean, Asia, Africa, Eastern Europe, and the Middle East. Dr Vargas' many years of research experience have produced peer-reviewed publications on setting health priorities, payment methods for providers, risk adjustment, human resources, budgeting for results, and reproductive health and AIDS. Her other areas of expertise include health care reform, health insurance, economic evaluation, and cost of illness. Dr Vargas is an invited member of International Health Economics Association (iHEA) Scientific Committee (2009–2014).

Juergen Wasem has studied economics and political science at Pennsylvania State University, University of Sussex and Cologne University (1978–1983). He got a PhD in economics at Cologne University (1986) and a PhD in public health at Bielefeld University (1996). He has worked in the Federal Ministry of Labor and Social Politics (1985–1989). He was project leader at the Max Planck Institute for the Study of Societies (1991–1994). He was professor for health insurance at the University of Applied Sciences Cologne (1989–1991 and 1994–1997), professor for health economics in the School of Public Health at LMU Munich University (1997–1999) and professor for health care management at School of Law and Business EMAU Greifswald University (1999–2003). Since 2003 he is the Alfried Krupp von Bohlen and Halbach Foundation-Professor and director of the Institute for Health Care Management and Research at University Duisburg-Essen, Germany. He is member of the board of directors of the German Society for Health Economics, where he was president in 2013–14. His research interests are in health insurance, risk adjustment, comparative health care systems and health economic evaluation.

A. Lorena Prieto is an economist specialized in health economics with over 15 years' experience. She specializes in health financing and economics with research in health interventions' cost-effectiveness, evaluation of health financing reform projects, the effects of health status on labor outcomes, accessibility to health services, health care markets, health services' costing and production, and analysis of equity, efficiency, and financial sustainability. While in Boston, she worked with the Center for Multicultural Mental Health Research in two major projects dealing with cost-effectiveness of depression treatment interventions and behavioral patterns in drug abuse treatment and social services. She has been a consultant on projects in Peru, Chile, Bolivia, Suriname, Paraguay, Argentina, Guyana, Honduras, Mexico, and Guatemala for international organizations including the World Bank, Inter-American Development Bank, UNICEF, WHO, and PAHO as well as various Ministries of Health and the Brookings Institution. She is also a part-time professor at the Graduate School of the Universidad del Pacifico in Lima, Peru. Her latest publications are on out-of-pocket payments and hospital performance, with earlier publications on equity analysis.

Guillem López-Casasnovas is Professor in Economics at Pompeu Fabra University in Barcelona, Catalonia, Spain, and Member of the Directors' Board of the Bank of Spain (2005–2017). He has a degree in Economics (1978), a degree in Law (1979) from the University of Barcelona, and a D. Phil. Economics (1984) from the University of York. In addition to other many academic commitments, he is member of the Royal Academy of Medicine and Honorary Member of The College of Economists of Catalonia, of the Advisory Council of the Spanish Health and Social Welfare Ministry and of the Advisory Council of the Catalan Health Ministry since 1984. He cofounded the Centre of Health and Economics and co-directed The Executive Program on Global Health Policy Leadership with the Public Health School at the University of Berkeley and The Barcelona Graduate School of Economics. He was also President of the International Health Economics Association (2007–2013), and a Senior Advisor (2010–2012) for the WHO Group on Health Inequalities in Europe. His research interests include public finance, fiscal policy and health economics.

Laura Pellisé is Senior Researcher at the Center for Research in Economics and health (CRES) at the Department of Economics and Business at Universitat Pompeu Fabra (UPF). She has a degree in Economics from Universitat de Barcelona, holds an MSc in Health Policy and Management from Harvard University and a Ph.D. in Economics from UPF. Prior to her current position, she was professor at the Department of Economics of Universidad Carlos III of Madrid (1992–1997), joining the Spanish Ministry of Health as a technical advisor in 1997. She held, since 2001, top management positions in the largest private hospital group in Spain, USP (now Grupo QuirónSalud), and then was managing director of the Vall d'Hebron Institute of Oncology. She joined the CRES at UPF in 2011 as its Director. She is member of the group of experts appointed by the European Commission for the evaluation of SME in health care. She co-directs the Master in Health Policy and Management (MADS) of UPF (Barcelona School of Management). Her research interests include health care innovation, pricing, financing and regulation in biopharmaceutical and devices industries, incentives and health care organization.

Alistair McGuire is the Professor of Health Economics at LSE Health and Social Care, within the Department of Social Policy at the London School of Economics and Political Science (LSE). Prior to this he was Professor of Economics at City University, London after being a Tutor in Economics at Pembroke College, University of Oxford. He has been a visiting Professor at Harvard University, the University of Sydney, the University of York and the Universitat Pompeu Fabra, Barcelona. He has been interested in the economics of health care for over 30 years, with extensive teaching experience and has written numerous books, articles and reports in this area on a wide range of subject matter. He has been involved in a number of major clinical trials as the lead health economist. He has also acted as an advisor to a number of governments and governmental bodies, as well as for a number of international bodies and pharmaceutical companies.

Maria Raikou is Assistant Professor at the Department of Economics, University of Piraeus, Athens, Greece. Prior to this she was a Research Fellow and Visiting Lecturer at LSE Health and Social Care, Department of Social Policy, London School of Economics and Political Science (LSE). She has a Degree in Electrical and Computer Engineering from the National Technical University of Athens (N.T.U.A.), Greece, and an MSc and PhD in Health Economics from City University, London. She has held research posts in the area of health economics at Oxford University (within the Health Economics Research Centre), City University (in the Department of Economics) and the LSE. She has published research articles in peer-reviewed journals such as Health Economics, Journal of Health Economics, British Medical Journal and economic reports, including reports for the UK Department of Health, the UK National Audit Office, and NICE, in the field of economic evaluation of health care programmes. She has also acted as a consultant to the UK Department of Health, to the UK National Audit Office, to the UK National Institute for Health and Clinical Excellence (NICE) and to a number of pharmaceutical companies.

William H Dow is Henry J Kaiser Professor of Health Economics at the University of California–Berkeley's School of Public Health. He also is Director of the UC Berkeley Center on the Economics and Demography of Aging. In addition he is a Research Associate at the National Bureau of Economic Research, and previously served as Senior Economist at the White House Council of Economic Advisers. He received his PhD in economics from Yale University. Dow's research analyzes economic aspects of health insurance, health behaviors, and health and demographic outcomes. Honors include the John D Thompson Prize for Young Investigators awarded by the Association of University Programs in Health Administration, and the Kenneth J Arrow Award given by the International Health Economics Association.

Justin S White is Assistant Professor of Health Economics in the UCSF School of Medicine, with joint appointments in the Philip R. Lee Institute for Health Policy Studies and the Department of Epidemiology and Biostatistics. Dr. White applies theory from health economics and behavioral economics to understand the factors that motivate individuals to adopt healthy behaviors, with special emphasis on tobacco use. In doing so, he aims to identify individuals' decision errors related to health behavior and design interventions to address these errors. He is particularly interested in the use of monetary and social incentives for changing behavior. Much of his work focuses on chronic disease prevention in low- and middle-income countries. Prior to coming to UCSF, he completed a postdoctoral fellowship in cardiovascular disease prevention at Stanford University's Prevention Research Center. He holds a PhD in health policy and MA in economics from UC Berkeley and an MSPH in health policy from UNC Chapel Hill.

Stefano M Bertozzi is Dean and Professor of Health Policy and Management at the UC Berkeley School of Public Health. Previously, he directed the HIV and tuberculosis programs at the Bill and Melinda Gates Foundation. He serves on the scientific advisory boards for the President's Emergency Plan for AIDS Relief, the National Institute of Health's Office of AIDS Research, and the World Health Organization's HIV Program. DrBertozzi worked at the Mexican National Institute of Public Health as director of its Center for Evaluation Research and Surveys and has also held positions with UNAIDS and the World Bank. He holds a bachelor's degree in biology and a PhD in health policy and management from the Massachusetts Institute of Technology. He earned his medical degree at UC San Diego, and trained in internal medicine at UC San Francisco.

Paul Revill is a Research Fellow at the Centre for Health Economics (CHE) at the University of York. He works primarily on methodological and applied research in economic evaluation to inform resource allocation decisions in health sectors in low and middle income countries, particularly in sub-Saharan Africa and related to HIV/AIDS. He co-led reports for the HIV Modelling Consortium to directly inform the 2013 and 2015 WHO HIV Treatment Guidelines. Paul has previously worked as an economist in the Planning & Budgeting Department of the Ministry of Health in Malawi. He has a strong interest in ensuring the methods of modelling and health economics appropriately reflect the challenges and realities of resource constraints operating within programmes so that policy decisions are most likely to generate value and lead to health gains at a local level.

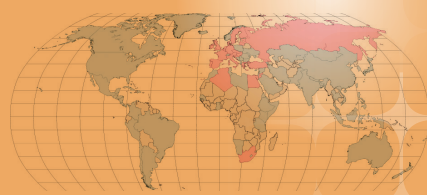
Beth Woods is a Research Fellow at the Centre for Health Economics, University of York. Her research interests include the application of statistical and decision analysis methods to health technology assessment and methods for prioritising health care resources and research. From 2006-2013, Beth was a Director in the Health Economics team at Oxford Outcomes, a private consulting firm, where she specialised in applied economic evaluation. During this time Beth contributed to numerous submissions to the National Institute for Health and Care Excellence and other agencies internationally. Beth holds a BA in Economics from the University of Cambridge and an MSc in Economic Evaluation in Healthcare from City University.

Mark Sculpher is Professor of Health Economics at the Centre for Health Economics, University of York, UK where he is Director of the Programme on Economic Evaluation and Health Technology Assessment. Mark has worked in the field of economic evaluation and health technology assessment for over 25 years. He has researched in a range of clinical areas including heart disease, cancer, diagnostics and public health. He has also contributed to methods in the field, in particular relating to decision analytic modelling and techniques to handle uncertainty, heterogeneity and generalisability. He chaired NICE's 2004 Task Group on methods guidance for economic evaluation and advised the Methods Working Party for the 2008 update of this guidance. He has over 220 peer-reviewed publications and is a co-author of two major text books in the area: *Methods for the Economic Evaluation of Health Care Programmes* (OUP, 2015 with Drummond, Claxton, Torrance and Stoddart) and *Decision Modelling for Health Economic Evaluation* (OUP, 2006 with Briggs and Claxton).

Marisol Rodríguez is Professor of Applied Economics at the School of Economics and Business of the University of Barcelona. She holds a MSc in Economics from the London School of Economics and Political Science and a Diploma in Health Systems Analysis from the School of Public Health of the Johns Hopkins University. In 1999 she was an invited fellow at the School of Public Health in the University of California, Berkeley. Between 1990 and 1998 she was the director of the Master's course in Health Economics and Health Care Management organized jointly by the University of Barcelona and the PompeuFabra University. She belonged to the ECUity international research group that for more than 12 years worked on successive EU projects analyzing equity in the financing and delivery of health care services in different European countries, where she was responsible for the Spanish team. She is the co-editor of the book *Social Inequalities in Health: Main Determinants and Elements for Action* [in Spanish] published by Elsevier/Masson in 2008. Recently, she has been awarded the JosepTrueta medal for her contributions to the Catalan health sector.

Rosa M Urbanos-Garrido is an Associate Professor of Public Finance at the School of Economics at the University Complutense of Madrid, Spain. Her PhD was awarded with Honors (2000) and her PhD Dissertation on equity in the delivery of health care was also awarded the 2000 Prize on Public Economics by the Spanish Institute for Fiscal Studies. She has been a visiting scholar at the Department of Economics at the University PompeuFabra in Barcelona and the Centre for Health Economics at the University of York, UK. First Director of the Spanish Observatory of the National Health System, DrUrbanos-Garrido has also worked as full-time advisor for the Spanish Health Minister from 2004 to 2007, and as Director General for Regional Cooperation at the Spanish Ministry for Public Administrations from 2007 to 2008. She has been a member of the Board of the Spanish Public Health and Health Care Administration Society and of the Spanish Health Economics Association. She is the co-editor of the book *Social Inequalities in Health: Main Determinants and Elements for Action* [in Spanish] published by Elsevier/Masson in 2008.

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Volume 2 – Health Determinants and Outcomes

Editor

Richard M. Scheffler

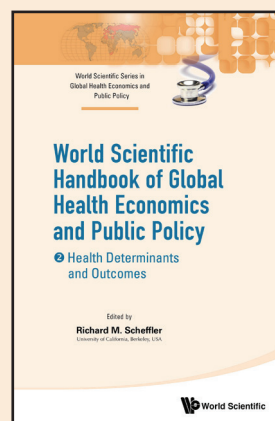
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VOLUME 2 Health Determinants and Outcomes

covers aging, mental health, obesity, smoking, as well as women's and children's health

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Introduction to Volume 2: Health Determinants and Outcomes

By Richard M. Scheffler (Editor)

Chapters 1–5 in this volume deal with five of the major inputs in determining health outcomes — the mental health sector, long-term care, dental care, personalized medicine, and social capital. There has been a dramatic increase in mental health problems around the globe. Depression now has the largest number of DALYs lost globally. Mental health problems are especially complex and move over the life-course, affecting not only individuals and families, but communities as well. Chapter 1, Mental Health, details the prevalence, mortality, and disability due to mental health problems and their economic implications. It lays out alternative financing strategies and methodologies of evaluating mental health use and spending.

The global aging of the population is one of the most significant trends and has obvious and important implications for the development of long-term care systems, which will be expanding rapidly in the decades ahead. Chapter 2, Aging and Long Term Care, looks at the increased demand for formal and informal caregivers, increased spending, and the impact on patients, families, and the health care system. It concludes with an evidence-based review to improve the efficiency of long-term care services. Like mental health and long-term care, oral health needs to be recognized as an input to the overall health of a population. There is evidence that healthy gums are associated with lower risk of heart disease and diabetes. Clearly, one of the most successful public health interventions was the fluoridation of the water supply. Chapter 3, Dental Care, discusses the notion that improved oral health can also be linked to increased earnings. The authors also discuss implications of dental care being financed separately from other types of care, which raises issues of coordination. The authors review barriers to dental care across different countries, and the need to improve delivery of dental care across the world. The dramatic and ever increasing growth of genomic technologies — often called personalized medicine — is a rapidly expanding global phenomenon. It requires the understanding of the impact on the health care system. Chapter 4, Personalized Medicine: Economic Evaluation and Evidence, summarizes the existing economic evaluation literature on genomic-based medicine; describes how economic evaluation of genomic-based medicine has emerged into practice using case studies of three countries; and describes challenges in defining and measuring the value of genomic-based medicine and synthesizing costs and benefits for use in economic evaluations. It concludes by discussing key challenges in moving and expanding the development of personalized medicine.

A key social determinant of health is social capital, whose role is receiving increased attention in health economics and public policy. There continues to be a debate about the exact definition of social capital, but for the most part, it includes supporting the trust and networks in communities and between individuals, which allows them to improve their health and the overall functioning of the health care system. Chapter 5, Social Capital and Health, reviews the debate on how to measure the impact of social and community networks on health, and provides new empirical estimates between social capital and health in 93 countries. Results suggest benefits in social capital and improved health are stronger in developed rather than developing countries.

Globally, tobacco use is the number one preventable cause of death, and is projected to cause over 1 billion deaths in the 21st century with a major impact being on low- and middle-income countries. Chapter 6, Economics of Tobacco Control and Health, looks at the emerging issues of tobacco use and methods to control its growth. It reviews evidence on the reduction and harm caused by tobacco and highlights the most successful public policy intervention — the tobacco tax. The authors describe how this tax is implemented, collected, and its economic impact on the health care sector. Other innovative solutions to control the use and spread of tobacco consumption are also evaluated. Another major health care consideration is alcohol. Alcohol has been consumed throughout history in all cultures, countries, and societies and is a major consumption item throughout the globe. Small or moderate use of alcohol has been shown to have positive impacts on health, but large consumption has the opposite effect on health, mental health, and negative economic activity. Chapter 7, Health Effects of Alcohol Consumption, reviews the spending on alcohol around the globe, its economic impact, its impact on the health care system, and the health of the population. Chapter 8, Obesity, on the obesity epidemic discusses this phenomenon that has been spreading to all countries at all different income levels. It has been generally due to dietary habits and sedentary ways of life, both of which lead to chronic conditions and premature mortality; 1 out of 5 children are overweight or obese in OECD countries. Obesity leads to increased use of medical care and losses in productivity in the economy. The proper role of government and its intervention is discussed, and policy solutions are evaluated with a clear sense that prevention is one of the most cost-effective methods.

Women's health is a particular challenge at every stage in the life course, especially in LMICs. Unfortunately, discrimination against women still exists, leading to ill health and disability across the life span. Chapter 9, The Economics of Women's Health in Low- and Middle-Income Countries: A Life Cycle Approach, looks at impacts in infancy and early childhood, including poor access to health care, nutrition, and education. In adolescence, risks for women include: Gender-based violence, early pregnancy, STDs, and early marriages. Challenges include: Obesity, injury, intimate partner violence, and mental health problems. Women have the burden of disease in old age, reflecting a lack of financial security, neglect, and abuse. Although there are still many problems for women's health, there has been much progress in improving the health of women and children in the last 20 years. Chapter 10, The Role of Policymaking for Investing in Women's and Children's Health, looks at specific policies, improvements in women's health, and investments and the impact they have had on women and children and the health care system. Specific examples of investments are examined in LMICs, and their successes and failures are examined in a policy framework.

Behavioral economics (U.S.) is a new and important development in health economics. It is used as a framework, which can better explain the behavior of patients and providers in the health care sector than neoclassical economics. Chapter 11, Behavioral Economics: Health Applications in the US, lays out some of the most important and fundamental concepts, such as loss aversion, the endowment effect, framing, the power of default, hyperbolic discounting, and System 1 and System 2 theories of thinking. These new tools and concepts are applied to a variety of decision-making and policy objectives in the U.S. including smoking cessation, weight loss, and substance abuse. Behavioral economics is also important in the UK, which has focused on using nudge policy. Chapter 12, Behavioral Economics: Health Applications in the UK, describes what nudge policy is, how it is used in the UK, and its concern that nudge policy may not be optimally used by the government. The chapter lays out an alternative use of behavioral economics and policy that will produce and improve results in the development and implementation of health policy.

The Author Biographies are listed in order by chapter in the TOC.

Martin Knapp is a researcher in the areas of health and social care policy and practice. He has been Professor of Social Policy and Director of the Personal Social Services Research Unit at the London School of Economics and Political Science since 1996. Since 2009, Martin has also been Director of the School for Social Care Research funded by the National Institute of Health Research. Martin's research emphases in recent years have primarily been child and adult mental health, dementia, autism and long-term social care, with much of his work having an economic focus. He has published his research widely, including in more than 500 peer-review articles and 15 books, and his work has impacted policy and practice in the UK and elsewhere.

Valentina Iemmi obtained the title of clinical psychologist at the University of Paris (France) in 2006, graduating in health policy, planning and financing at the LSE and the London School of Hygiene & Tropical Medicine in 2009. Since 2006 she has worked in mental health policy for the WHO Collaborating Centre for Research and Training in Mental Health at the King's College London, the LSE Health, the International Centre for Evidence in Disability at the London School of Hygiene & Tropical Medicine, and the National Institute of Health and Medical Research at the University of Paris V. In 2012 she joined the Personal Social Services Research Unit at the LSE, where her work focuses on economic aspects of policy and practice in the mental health and mental disabilities areas.

Audrey Laporte is Associate Professor of Health Economics in the Institute of Health Policy, Management and Evaluation at the University of Toronto and the Director of the Canadian Centre for Health Economics. For over a decade she has served as Chair of the Canadian Health Economics Study Group annual workshop meetings, the leading national meeting of health economists in the country.

Her work has considered a number of issues related to aging and long-term care including, modeling the impact of informal care networks in the form of social capital on health and health care utilization, the impact of caregiving on the health and labor market experiences of informal care providers, factors that influence the use of formal home based health services and their relation to informal care as well as performance evaluation of institutions within the long-term care sector.

Meghan McMahon is Associate Director with the Canadian Institutes of Health Research's Institute of Health Services and Policy Research. She is completing her PhD in the Institute of Health Policy, Management and Evaluation at the University of Toronto and is a Fellow with the Canadian Centre for Health Economics. Meghan previously worked at the UBC Centre for Health Services and Policy Research and completed an internship with the Organization for Economic Cooperation and Development, both in the area of pharmaceutical policy. Meghan has a MSc in Health Services Research from the University of Toronto.

Marko Vujicic is Chief Economist & Vice Presidents, Health Policy Institute at the American Dental Association, responsible for overseeing all of the Association's policy research activities. Previously, he was Senior Economist with The World Bank in Washington DC, directing the global health workforce policy program. He was also Health Economist with the World Health Organization in Geneva, Switzerland. He is the lead author of the book, *Working in Health*, which examines the effect of fiscal policy on the health workforce. He has worked extensively on broader health policy reform in Africa, East Asia, the Caribbean and Eastern Europe. Dr Vujicic obtained his PhD in Economics from the University of British Columbia and a Bachelor's degree in Business from McGill University in Montreal.

Eduardo Bernabé is Senior Lecturer in Dental Public Health and Programme Director for the Master of Science in Dental Public Health at King's College London. He qualified as a dentist in Peru, where he worked as Associate Professor in Universidad Peruana Cayetano Heredia until 2006. In 2009, he earned his PhD from University College London. He received the Aubrey Sheiham Award for Distinguished Research in Dental Public Health at the IADR in 2015. His primary research interests are on the social determinants of oral health and measuring the burden of oral diseases on individuals and societies. Dr Bernabé is the co-lead of the Expert Group on Oral Diseases for the Global Burden of Disease Study and work as Associate Editor for BMC Public Health and Health and Quality of Life Outcomes. He has over hundred publications in prestigious medical journals such as *The Lancet*, *American Journal of Public Health* and *Rheumatology* (Oxford) as well as in the top two dental journals, namely the *Journal of Dental Research* and the *Journal of Clinical Periodontology*. He has developed strong collaborations links with research teams from South and North America, East Asia and Europe.

Daniela Garbin Neumannis is a dental public health specialist. She concluded her PhD studies at the Federal University of Santa Catarina, Brazil, and as a visiting graduate student at the Faculty of Dentistry, University of Toronto, she developed a strong project in comparative public policy. Her research area includes comparative studies on dental care systems, and public policies for dental care in Brazil.

Carlos Quiñonez is a dental public health specialist and researcher. He is an Associate Professor and the Director of the Specialty Training Program in Dental Public Health at the Faculty of Dentistry, University of Toronto. His research program centers on the politics and economics of dentistry, with a special focus on issues of equity in oral health and oral health care.

Elizabeth Mertz is an assistant professor at the University of California, San Francisco, School of Dentistry where she conducts research on dental health services, workforce, and policy. She has a joint appointment in the School of Nursing's department of Social and Behavioral Sciences, and is affiliate faculty at UCSF's Healthforce Center, the Center to Address Disparities in Children's Oral Health (CANDO) and the Philip R. Lee Institute for Health Policy Studies.

Dr. Mertz's work covers a broad range of health professions workforce issues, primarily focused on dental care, including supply and demand of providers; health care regulation; state and federal workforce policy; delivery system design and finance; access to care; and evolving professional practice models. She has served on numerous of advisory and planning committees for federal & state agencies, and non-profit and philanthropic organizations. Dr. Mertz holds a BA from the University of Southern California, an MA from the University of Minnesota, and a PhD in Medical Sociology from the University of California, San Francisco.

Kathryn A Phillips is Professor of Health Economics and Health Services Research at the University of California, San Francisco and Founder/Director of the UCSF Center for Translational and Policy Research on Personalized Medicine (TRANSPERS), UCSF Department of Clinical Pharmacy, Philip R. Lee Institute for Health Policy Studies, and Helen Diller Family Comprehensive Cancer Center.

Kathryn focuses on the translation of new technologies into improved patient outcomes, particularly personalized/precision medicine and its impact on clinical care, health economics, and health policy. Kathryn has had continuous funding from the NIH as a Principal Investigator for almost 25 years and has published more than 100 peer-reviewed articles in journals. She serves on the editorial board for seven journals, including *Health Affairs*, two scientific advisory boards for Genome Canada, and has worked with numerous international organizations in Canada, Australia, Spain, UK, Netherlands, and Luxembourg.

Katherine Payne was awarded a personal chair in health economics at The University of Manchester in August 2010 and is based in the Manchester Centre for Health Economics. Katherine is also a registered pharmacist. She holds honorary positions with: the School of Pharmacy, University of Nottingham; PHG Foundation, Cambridge; Central Manchester University Hospitals NHS Foundation Trust; and Nowgen, Manchester. Katherine has

an interest in the economics of genomic technologies and services and the application to stratified medicine using model and trial-based methods of economic evaluation and stated preference methods such as discrete choice experiments. Katherine is a member of a National Institute for Health Research funding panel and has also served on panels for funding organisations in Canada, France, The Netherlands, and Luxembourg.

Ken Redekop is an associate professor at the Institute for Medical Technology Assessment, Erasmus University, Rotterdam, The Netherlands. He is a clinical epidemiologist with more than 20 years of experience in observational research, clinical trial analysis, and medical technology assessment and has co-authored over 150 papers in the healthcare field. Recent studies include preclinical cost-effectiveness analyses of medical devices and tests (including personalized therapy), RCT-based economic evaluations, economic evaluations in the Diagnostics Assessment programme of the National Institute for Health and Clinical Excellence (NICE, UK) and studies to assess the real-world effectiveness and cost-effectiveness of expensive medicines.

Lorenzo Rocco attained a PhD in economics at the University of Toulouse I, France, in 2005 before moving back in Italy, where he currently is an Associate Professor of Economics at the University of Padova. An empirical economist, his fields of research include the socio-economic determinants of health, the influence of health on the labor market outcomes and several aspects of the economics of education. His research has been published by *The Economic Journal*, *Health Economics*, *Journal of Public Economics*, *Public Choice* among others. He has also contributed to several reports commissioned by the World Bank, World Health Organization and The European Commission.

Eline Aas is Associate Professor in Health Economics at the Department of Health Management and Health Economics at the University of Oslo, and has an honorary contract with the University of York. Aas' research is related to inequalities in health, social capital on health, estimation of health care costs and economic evaluation.

Ayda Yurekli is a Visiting Senior Research Scientist at University of Illinois, at Chicago. She holds a PhD in economics (1996) from Cornell University, Ithaca, NY. She has nearly 18 years' experience on the economics of tobacco and taxation issues. During her tenure at World Bank and World Health Organization, she initiated and developed multisectoral collaboration with Ministries of Finance (MoF) and Treasuries of about 65 countries worldwide, and has advised MoFs from over 45 countries on tobacco tax policies and administration. She initiated and developed the WHO TaXSiM simulation model that has been used by many MoFs on developing tax policies. She has been collaborating with a number of researchers internationally on areas of economics of tobacco taxation, including the tax burden on poor smokers, excise tax systems and their impacts on public health, government and manufacturers' interest, global illicit trade and its evolvments.

Nigar Nargis is the Director of Economic and Health Policy Research in American Cancer Society. Prior to this position, she served as an Economist in the Tobacco Control Economics Unit, Department of Prevention of Noncommunicable Diseases in the World Health Organization (WHO), Geneva. She also holds the position of an Assistant Professor at the Department of Economics, University of Dhaka, Bangladesh. She obtained her Bachelor's and Master's degree in Economics from the University of Dhaka, Bangladesh, PhD in Economics from Cornell University, USA, and Post Doctorate in Tobacco Control Economics from the University of Waterloo, Canada with fellowship from the Canadian Institutes of Health Research Strategic Training Program on Tobacco Research. She has widely published and serves as a reviewer in various tobacco control research and development economics journals.

Mark Goodchild is a Senior Economist for the Tobacco Control Economics team within the Prevention of Noncommunicable Diseases department of the World Health Organization, Geneva, Switzerland. Mark's primary role is to provide guidance to Ministries of Finance on how to strengthen their tobacco tax policy and administration systems in order to better achieve revenue and public health objectives. In this capacity, Mark has worked closely with over thirty Member States from across Southeast Asia, the Western Pacific, and Eastern Europe. Mark holds an Honors Degree in International and Applied Economics from Massey University of New Zealand.

Chonlathan Visaruthvong is currently a tax economist in Tobacco Control Economics Unit, Prevention of Noncommunicable Diseases in World Health Organization (WHO). Dr Chonlathan is a secondment from Ministry of Finance Thailand to work with WHO for one year on global tobacco tax policies. She obtained her Masters Degree and PhD in Economics from the University of Chicago and BA in Economics from Thammasat University, Thailand. She has 15 years' experience in studying and implementing excise tax policy and excise tax administration in tobacco taxation. She has provided technical support international organizations, civil society, and a number of governments, including Laos, Cambodia and Vietnam.

He served as a consultant in health care reform and tobacco control to the World Bank, the World Health Organization, and Hong Kong and Taiwan governments and was a senior policy advisor to the Ministry of Health in China. Currently, he serves as the Director for International Tobacco Control Policy Research and Evaluation at the Public Health Institute, Oakland, California. In 2010, he was a recipient of the American Public Health Association's Carl Taube Award for his contribution towards mental health services research.

Sophia Delipalla is an Associate Professor at the Department of Balkan, Slavic and Oriental Studies, School of Economics and Regional Studies at the University of Macedonia (Thessaloniki, Greece). She is a graduate from the Economics Department at University of Macedonia (1985), with an MA in Economics (1985) and a PhD in Economics (1994) from the University of Essex. Her research interests are Applied Microeconomics, especially Public Economics and Industrial Economics. As her research on commodity taxation (specific versus ad valorem) in oligopolistic markets applies to tobacco taxation, she worked as a senior economist at the TFI at World Health Organization (Geneva), continuing her collaboration today with the Tobacco Control Economics Team at WHO as a consultant. She is a co-author in the forthcoming NCI Monograph on the Economics of Tobacco Control.

Evan Blecher is a Director and Senior Economist in the Health and Economic Policy Research Program at the American Cancer Society and an Affiliate in the Southern Africa Labor and Development Research Unit at the University of Cape Town. Evan is based in South Africa as a visiting academic at the University of Cape Town. He received his bachelor's degree in Economics and Business Strategy from the University of Cape Town, an MA in Economics with Distinction from the University of the West of England, Bristol and a PhD in Economics from the University of Cape Town. Evan was a member of the expert group for the IARC Handbook on the Effectiveness of Tax and Price Policies for Tobacco Control and is a co-author for the forthcoming NCI monograph, *Economics of Tobacco Control*. Evan's research focuses on the economics of tobacco control, particularly in low- and middle-income countries, and covers issues including cigarette affordability, tax and price policy, illicit trade, smoke free areas and advertising bans. His research has been an influence on policy globally, providing expert input to parliamentary committees and international forums in several countries.

Anne-Marie Perucic has been working since 2001 with WHO on the economics of tobacco control. She works in the department Prevention of Noncommunicable Diseases in the World Health Organization (WHO) in Geneva, Switzerland. Her work focusses on tobacco taxation and she has been providing technical support since 2009 to a number of countries' Ministry of Finance officials in Africa, Asia, Europe and the Middle East in the revision of their tobacco tax policy. She also provided trainings on tobacco taxation in a number of multi-country workshops aimed at Ministry of Health and Finance officials. Additionally, she has been the focal point for the collection and analysis of global price and tax data that are an integral part of the WHO Reports on the Global Tobacco Epidemic (2009, 2011, 2013 and 2015). Ms Perucic holds an M. Sc. in Economics from the University of Montreal with a focus on econometrics as well as an M. Sc. in Public Health from the London School of Hygiene and Tropical Medicine.

Ms Perucic has also gained a deep knowledge of the international regulatory framework of tobacco control through her close involvement in the development and negotiation of the WHO Framework Convention on Tobacco Control. In addition, she has a good understanding of the United Nations system and inter-agency collaboration working between 2001 and 2013 as the focal point for the activities of the United Nations ad hoc Inter-Agency Task Force on Tobacco Control (now integrated into the United Nations Interagency Task Force on the Prevention and Control of NCDs) chaired by WHO.

Teh-wei Hu is a Professor Emeritus of Health Economics. He has served as Associate Dean and Department Chair in the School of Public Health, and Professor in the Graduate School at the University of California, Berkeley. He was the founding president of the North America Chinese Economics Association and has been appointed by the US Government as a member of the Interagency Committee on Smoking and Health.

Anita H Lee is Research Scientist at the Center for International Tobacco Control of the Public Health Institute. She has been involved in tobacco control research, doing health promotion research and intervention studies in various provinces in China as well as tobacco economics research in countries including China, Taiwan, Indonesia and a number of African countries.

Frank J Chaloupka is a Distinguished Professor at the University of Illinois at Chicago, where he has been on the faculty since 1988. He is Director of the UIC Health Policy Center and Director of the WHO Collaborating Centre on the Economics of Tobacco and Tobacco Control. Dr Chaloupka holds appointments in the College of Liberal Arts and Sciences' Department of Economics and the School of Public Health's Division of Health Policy and Administration. He is a Fellow at the University of Illinois' Institute for Government and Public Affairs, and is a Research Associate in the National Bureau of Economic Research's Health Economics Program and Children's Program. Dr Chaloupka is Co-Director of Bridging the Gap: Research Informing Policy and Practice for Healthy Youth Behavior and Director of BTG's ImpacTeen Project. He is also Co-Director of the International Tobacco Evidence Network. Hundreds of publications and presentations have resulted from Dr Chaloupka's research on the effects of economic, policy, and environmental factors on health behavior, including tobacco use, drinking, drug use, diet, physical activity, and related outcomes.

Catherine R. Lau is Assistant Professor of Economics and Finance at Carthage College in Kenosha, WI. She was a Visiting Professor in the Department of Finance at Western Connecticut State University, and has taught at the University of Shanghai for Science and Technology, for the Taiwan Representative Office of Baruch's Zicklin School of Business Executive Education Program, at Hunter College and Pace University. Prior to turning to academia, Cassie held various positions in financial services firms on Wall Street. She was a Vice President at Credit Lyonnais, a Senior Director at Fitch Ratings, and a Managing Director and Group Head at XL Capital Assurance Inc. She also served as a consultant for Paloma Capital, a hedge fund in Greenwich, Connecticut and as a consultant and credit analyst for Deutsche Bank, AG, in New York. Cassie Lau earned her Ph.D. in economics from the City University of New York Graduate Center in June 2012, and holds an M.Phil. in economics from the City University of New York Graduate Center and an M.B.A. in finance from New York University.

Alex Lau is an adjunct professor in the Business Division at Carthage College. He holds an MBA degree in finance and international business from the Stern School of Business at New York University, and a MA-IR degree in international economics and European studies from the School of Advanced International Studies at Johns Hopkins University. His professional career has been primarily in the world of finance in New York, previously working in commercial banking at Citigroup, management consulting at McKinsey and Company, and as a software engineer specializing in applications for trading desks. He worked at Blackstone Alternative Assets Management of the Blackstone Group, where he managed the Event Driven Fund and the Distressed Fund.

Franco Sassi is a senior health economist at the Organization for Economic Co-operation and Development (OECD). He is Head of OECD's Public Health Programme, aimed at supporting public policies to tackle major chronic diseases and associated risk factors, especially poor nutrition, physical inactivity, alcohol and tobacco use. He is the author of numerous publications on economic aspects of prevention, including the book *Obesity and the Economics of Prevention: Fit not Fat*, in 2010, and editor of *Tackling Harmful Alcohol Use: Economics and Public Health Policy*, 2015. Previously, Franco was a senior lecturer in health policy at the London School of Economics and Political Science, and director of the graduate programme in Health Policy, Planning and Financing. Franco obtained his doctorate in health economics from the University of London. He held an adjunct professor position at the Université de Montréal, as well as visiting positions at a number of universities in the United States, including University of California, Berkeley, Harvard University, University of California, San Francisco, Duke University, and the Catholic University of Rome. He was awarded a 2000–2001 Harkness Fellowship in Health Care Policy by the Commonwealth Fund.

Marion Devaux is a Health Policy Analyst and a statistician at the OECD. Over the past seven years, she has worked on the prevention of chronic diseases and their risk-factors as part of the OECD Public Health Programme. In particular, she contributed to the analysis of trends and disparities of various behavioral risk-factors, the relationship between education and obesity, and the social multiplier effects on the spread of obesity, using population-based survey data. She holds a master's degree in statistics from the French National School for Statistics and Information Analysis and a PhD in health economics from Paris Dauphine University. Before joining the OECD, Marion worked on social health inequalities and on intergenerational transmissions of health inequalities at the Institute for Research and Information in Health Economics.

Michele Cecchini is a health economist/policy analyst in the OECD Health Division, working in the Public Health Programme since 2007. His major research interests include priority setting and programme evaluation in the health sector, in particular with regards to the health and economic assessment of policies influencing non-medical determinants of health as, nutrition, physical activity and alcohol consumption. Michele is an adjunct professor in applied health economics at the School of Public Health of the University of Siena and held a visiting position at the Health Services & Systems Research Centre of the Duke-NUS Graduate Medical School in Singapore. After obtaining a degree in Medicine and Surgery at the University of Genoa, Michele completed his specialist training in Public Health at the University of Siena. He holds a master's degree in Health Policy, Planning and Financing from the London School of Economics and Political Science, and the London School of Hygiene & Tropical Medicine. **Marcella Alsan** is a physician-economist and Assistant Professor at the Center for Health Policy and Primary Health Outcomes at Stanford University Medical School, board-certified in both internal medicine and infectious disease. Her research concerns the social determinants of health and wellbeing and the influence of infectious disease on child mortality and human capital formation. She completed her graduate training at Harvard University in Economics (PhD) in 2012, her fellowship in Infectious Diseases at Massachusetts General Hospital in 2013, her MPH and MD in 2005 at Harvard and Loyola University, respectively. She currently is on staff as an infectious disease specialist attending at the Palo Alto Veteran's Administration Hospital and an assistant professor of medicine at Stanford University.

Afsan Bhadelia is a Visiting Scientist within the Global Health Systems Cluster in the Department of Global Health and Population at the Harvard T.H. Chan School of Public Health. She conducts health systems analysis on chronic diseases, particularly cancer. She manages the Lancet Commission on Global Access to Pain Control and Palliative Care and co-coordinates the Commission's Scientific Advisory Committee. She is concurrently a PhD Candidate in the health systems program in the Department of International Health at the Johns Hopkins School of Public Health, focusing on bioethics and health economics. She has held various research roles at the Harvard Global Equity Initiative, including Research Director and Research Associate. She previously coordinated the Global Task Force on Expanded Access to Cancer Care and Control.

She has been selected by the Union for International Cancer Control as a Young Leader in 2015 for her on-going contributions to cancer disparities. She is co-editor of the book "Closing the Cancer Divide," distributed by Harvard University Press. She holds a MS from the Friedman School of Nutrition Science and Policy and a BS in Biology and International Relations from Tufts University, as well as a certificate in Humanitarian Studies from the Humanitarian Studies Initiative.

Patricia Foo is an MD-PhD candidate at Stanford University. Her research focuses on incentives, regulation and organizational structure in US health care. She studies how these factors affect each other and how they affect the cost and delivery of medical care. She completed her doctorate in Economics in 2014 and is currently completing her MD degree (expected 2015) at Stanford University School of Medicine. She received her BA in Biochemical Sciences from Harvard University in 2005 where she graduated summa cum laude.

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Felicia Marie Knaul is Director of the Miami Institute for the Americas and Professor at the Miller School of Medicine at the University of Miami. Previously, she was Associate Professor at Harvard Medical School and Director of the Harvard Global Equity Initiative (HGEI). She is also Honorary Research Professor of Medical Sciences, National Institute of Public Health of Mexico; and, Senior Economist at the Mexican Health Foundation. As a result of her breast cancer experience, in 2008 Dr. Knaul founded Cáncer de Mama: Tómatelo a Pecho, a Mexico-based non-profit agency. She founded and directs the Global Task Force on Expanded Access to Cancer Care and Control. Dr. Knaul is also Chair of the Pan American Health Organization Task Force on Universal Health Coverage and since 2014, of the Lancet Commission on Global Access to Palliative Care and Pain Control. She was a member and lead author of the Lancet Commission on Women and Health. Dr. Knaul has produced over 170 academic and policy publications. Her research is focused on global health, cancer and especially breast cancer in low-and-middle- income countries, women and health, health systems and reform, health financing, and access to pain control and palliative care.

Dr Flavia Bustreo was appointed Assistant Director-General for Family, Women's and Children's Health on 1 October 2010. At WHO, she served as Deputy Director, then Director, of The Partnership for Maternal, Newborn & Child Health from 2006 to 2010. Dr Bustreo's work has focused on policy development concerning child and maternal health, policy implementation and partnership-building with a wide range of stakeholders. In 2015, she led the development of the United Nations Global Strategy for Women's, Children's and Adolescents' Health. Dr Bustreo has worked in several countries, including assignments for WHO country and regional offices in Bangladesh, Brazil, China, Egypt, India, Morocco, Peru, the Philippines, Senegal, Sudan and Uganda. She has also served at the World Bank and as a special advisor to the Norwegian Prime Minister's Initiative for MDGs 4 & 5. She has published numerous academic and popular articles in the field of public health, women's and children's health. Dr Bustreo earned a degree in medicine with honours and a postgraduate qualification in rehabilitation medicine from Padua University, Italy, and later obtained a M.Sc. in Communicable Disease Epidemiology from the London School of Hygiene and Tropical Medicine.

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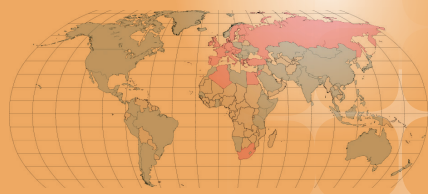
Blerta Maliqi is a Senior Technical Officer in the WHO Department of Maternal, Newborn, Child and Adolescent Health in the areas of policy and strategy development, planning and health systems management. She has over fifteen years of experience in leading development and implementation of large public health programmes related to maternal and child survival, HIV, TB and malaria. Her focus is technical assistance to governments and other stakeholders in development and implementation of national health policies, strategies and systems' response to public health concerns. She has worked in different organizational settings from civil society organizations in Central and Eastern Europe, to global technical agencies and funding organizations. Trained as a medical doctor, she holds a PhD in health systems management development and a Masters Degree in health management, planning and policy.

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Volume 3 – Health System Characteristics and Performance

Editor

Richard M. Scheffler

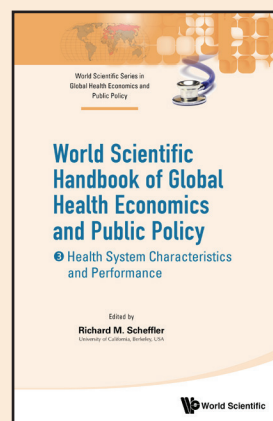
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VOLUME 3 Health System Characteristics and Performance

covers primary care, hospital performance and quality, global human resources for health, and the education and training of health professionals, medical technology, and innovation in health care

Introduction by Richard M. Scheffler (Editor)

1. Hospital Quality and Performance Around the Globe (*Barbara McPake*)
2. Global Human Resources for Health (*Joanne Spetz, Michelle S Téllez and Brent D Fulton*)
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4. Technological Innovation in Health Care: A Global Perspective (*Sheila Smith*)
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Introduction to Volume 3: Health System Characteristics and Performance

By Richard M. Scheffler (Editor)

Chapter 1 in this volume, Hospital Quality and Performance Around the Globe, looks at the issues of hospital quality and performance globally. There is vast evidence that shows that there is a huge variation between cost and quality around the globe, and little reliable empirical evidence of why this is the case. This chapter carefully examines new empirical evidence and economic indicators. Specifically, it addresses the issue of the performance of hospitals in LMICs and the factors that improved quality and performance. Chapter 2 explains why human resources are a key factor in the performance of health care systems. The shortages of health care workers globally, and especially in LMICs, is a major problem. Chapter 2, Global Human Resources for Health, lays out an economic framework of supply and demand and the factors that impact them. It then looks on the role of the public, private sector, and donor organizations in planning to eliminate the shortage of human resources and its misdistribution. Pharmaceutical expenditures around the globe range from one-third to one sixth of the health care spending in OECD and emerging countries, which is the second largest part of health budgets after salaries. Pharmaceutical markets are complicated and have a multiple stakeholders, oligopolistic structure, as well as imperfect information and agency problems, which lead to inefficiencies in the cost of and access to drugs. Chapter 3, Impact and Costs of Pharmaceuticals and Biotechnology, looks at the role of governments and insurers and their role in the pharmaceutical market. The chapter demonstrates a mix of public and private policies that can be used to limit the increase in pharmaceutical prices and expenditures. Like pharmaceuticals, technology is understood to be a major input in the improvement of health and has a major impact on global spending on health.

Chapter 4, Technological Innovation in Health Care: A Global Perspective, describes the relationship between health policy, medical innovation, and health care spending from a global perspective. Recent impact of medical technology on health spending across a broad range of countries and time periods has been declining. A causal link is difficult to explicitly demonstrate, but it does show that it has important implications on health care spending and coverage. A key ingredient in all health care systems is the organization and payment of primary care. Chapter 5, Primary Care: Effectiveness and Costs, looks at two constructs of the financing of primary care — one in countries that have a low density of physicians. In this framework, the payment system does not greatly influence the volume of health services provided to each patient. In another framework with a high density of primary care physicians, it asserts that fee-for-service is a better measure to encourage a more service-oriented practice style than capitation. Empirical examples are given to assess this policy. Chapters 6–7 deal with the issues of health system performance and methods to improve it. Chapter 6, Health Systems Performance, discusses the conceptual and empirical issues and developments in examining the health systems performance.

It addresses the key issue of what determines performance in health systems and differences in performance between and within countries. The authors look at key elements impacting performance as well as the role of consumers and providers. Chapter 7, Pay for Performance in Health Systems: Theory, Evidence, and Case Studies, examines the expanded use of the pay for performance (P4P) payment system. Pay for performance is the fastest growing new payment system being used throughout the globe. It is used to increase efficiency and quality of health care systems. They are generally designed with the following elements in mind: measurement, performance, form of reward, and the basis of the reward (financial and non-financial). P4P systems are quite prevalent in OECD countries, as detailed in this chapter, though the evidence on their impact is still emerging. The chapter also looks at selected low-income countries where P4P is used to strengthen the health care system.

Chapters 8–10 begins by looking at the rising trend of medical tourism, where patients travel long distances to receive medical care. Chapter 8, Medical Tourism, looks at the issue of medical tourism, specific patterns, and the rise of south-to-south medical tourism, along with the mechanism that is causing it. The authors point out that there are no regulations or accepted standards, and the data that examines the impact on health outcomes is extremely limited. The authors use Thailand and the UK as case examples of countries with large amounts of medical tourism. Chapter 9 goes on to discuss limited resources in the health care sector, particularly for the building of new facilities. This has led hospitals, as well as other parts of the health care delivery system, to turn to the use of public–private partnerships. Many of these partnerships are controversial and have risks and challenges. These are carefully explained in Chapter 9, Public–Private Partnerships, which details the use of optimal incentives and the transfer of risk from the public sector to the private sector. It lays out specific policies and programs to improve the functioning and use of public–private partnerships in health care. The volume concludes with Chapter 10 on Translational Medicine (Translational Health Economics). Translational Medicine is a new field in health economics, which uses theoretical concepts and empirical methods to bridge the gap between the decision to fund and use a health technology in clinical practice and the decision to invest in its development. It seeks to analyze how to value medical technology and its eventual use in the health care sector. It confronts the issue of uncertainty, motivation and cooperation, in institutions that seek to implement new technologies.

The integrated approach to Translational Medicine provides a linkage between the health care business perspective and the translation of new technologies in the health care system.

The Author Biographies are listed in order by chapter in the TOC.

Barbara McPake is a health economist specializing in health policy and health systems research. She has 25 years of experience in these areas based in three UK university departments. She is currently Director, Institute for International Health and Development, Queen Margaret University, Edinburgh and one of two Research Directors of 'REBUILD' a UK Department for International Development funded Research Programme Consortium on health systems development. She was formerly (2001–2006) Programme Director, Health Systems Development Knowledge Programme. She has extensive research degree supervision and other postgraduate teaching experience and extensive international experience in health systems research and policy analysis and advice to UN agencies and low- and middle-income country governments.

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Ms Smith also led the original process of development of the CMS National Health Expenditures (NHE) 10-Year Projections Model. Her current research addresses issues of long-term structural change in international markets for health care, and interaction effects between technological change and demographic change for long-term growth in health spending.

Prior to joining CMS in 1998, Ms Smith was the senior health economist for the Cost Information Service of Standard and Poors'/DRI (now Global Insights). She holds an MA in Economics from the University of Virginia.

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Richard Smith is Professor of Health System Economics and Dean of the Faculty of Public Health and Policy at the London School of Hygiene & Tropical Medicine. Following undergraduate and postgraduate studies in economics at the University of York, Richard worked in Sydney, Cambridge, Bristol, Melbourne and Norwich, before joining the School in 2007. Richard has held various other appointments, including honorary posts at the Universities of Hong Kong and East Anglia, Associate Fellow at The Royal Institute of International Affairs, and editorial roles for journals including Health Economics, the Journal of Public Health and Globalization and Health. He has also acted as an expert advisor for a number of international bodies, including the World Health Organization, World Trade Organization, World Economic Forum and OECD, as well as several national government departments.

Richard's research has covered a number of areas of health economics, in recent years focusing upon developing the methods for macro-economic analysis of health, the economics of globalization and health, and aspects of trade in health goods, services, people and ideas. Richard has received over £30 million in grant income, published five books, more than 100 journal papers, and dozens of other works.

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The following experts and their colleagues provide critical analyses and relevant data for further exploration and research.

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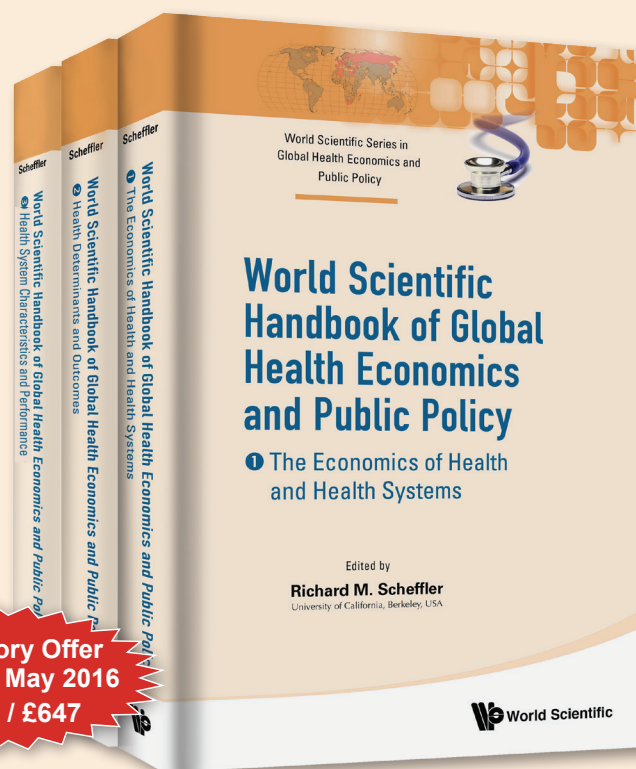
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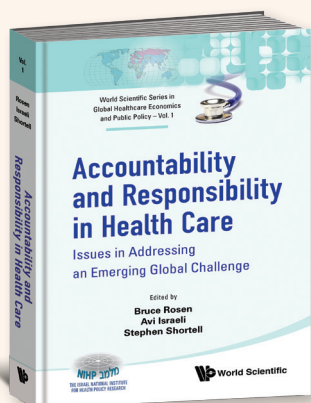
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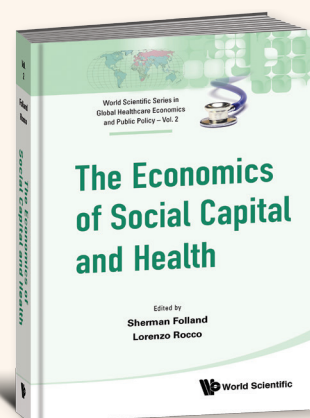


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A Conceptual and Empirical Roadmap

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