
Health Services Research

Series Editor

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Health services research is the study of the organization, uses and outcomes of health care. The societal value of health services research lies in identifying the ways in which health care can best be organized, financed, and delivered. This ambitious agenda brings together researchers from a wide range of disciplinary backgrounds that are required for evaluating the effectiveness of diagnostic technologies, treatment procedures, and managerial solutions. The series is envisaged as a collection that overviews the established knowledge and provides access to accepted information in the field. The content is grouped into six major areas.

1. Clinical evaluation of health care outcomes
2. Medical practice variations
3. Research methods
4. Health care systems and policies
5. Sources of data
6. Health economics in health services research.

The series will be of significant interest for healthcare professionals, program directors, service administrators, policy and decision makers, as well as for graduate students, educators, and researchers in healthcare evaluation.

More information about this series at <http://www.springer.com/series/13490>

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Editors

Health Services Evaluation

With 142 Figures and 137 Tables

 Springer Reference

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Series Preface

Health Services Research has experienced explosive growth in the past three decades. The new field was formed at the interface of a number of disciplines, including medicine, statistics, economics, management science, and the social and behavioral sciences, which came together around the study of health care practice, delivery and outcomes. The rich, multidisciplinary research enterprise that developed from this fusion has already produced a growing and sophisticated body of subject matter research and has also defined a body of methodology that is integral to the field. True to the multidisciplinary origins of the field, its methods continue to benefit from developments in diverse disciplines, while formulating and addressing scientific questions that are unique to health care and outcomes research.

The societal value of health services research lies in identifying the ways in which health care can best be organized, financed, and delivered. This ambitious agenda brings together researchers from a wide range of disciplinary backgrounds who are required for evaluating the effectiveness of diagnostic technologies, treatments, procedures, and health delivery systems as no single discipline provides a full perspective on how the health systems operate.

A fundamental discovery was the persistent variation in health care utilization across providers, regions and countries, variation that cannot be explained by population illness level, known benefit or patient preference. Another discovery was that treatments and procedures that are meant to benefit patients may produce adverse events and unintended consequences. We have learned that results of randomized clinical trials cannot always be generalized to clinical practice because patients enrolled in trials can be highly selective. Researchers have been able to identify patients who may benefit from a treatment but there are groups of patients for whom the optimal treatment is not well defined or may depend on their personal preferences. Learning what works in real life gave rise to comparative effectiveness research.

The Health Services Research series addresses the increasing need for a comprehensive reference in the field of inquiry that welcomes interdisciplinary collaborations. This major reference work aims to be a source of information for everyone who seeks to develop an understanding of health services and health systems, and learn about the historic, political, and economic factors

that influence health policies at global, national, regional and local levels. The intended readership includes graduate students, educators, researchers, healthcare professionals, policy makers and service administrators.

The main reason for public support of health services research is the common understanding that new knowledge will lead to more effective health care. Over the past decades, we have witnessed the increased prominence of health services and health policy research since the knowledge, skills and approaches required for ground-breaking work distinguish it from other specialties. An important step towards the formation of the profession is a comprehensive reference work of established knowledge. The Health Services Research series is intended to provide the health services researcher a home for the foundations of the profession.

The Health Services Research series is available in both printed and online formats. The online version will serve as a web-based conduit of information that evolves as knowledge content expands. This innovative depository of knowledge will offer various search tools, including cross-referencing across chapters and linking to supplement data, other Springer reference works and external articles.

July 2015

Boris Sobolev

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About the Series Editor



Boris Sobolev is a health services researcher from the University of British Columbia. He is author of *Analysis of Waiting-Time Data in Health Services Research and Health Care Evaluation Using Computer Simulation: Concepts, Methods and Applications*.

Dr. Sobolev started an academic career at the Radiation Epidemiology Institute in Kiev, studying the risk of cancer in relation to exposure resulting from the Chernobyl accident. In 1996, he came to Canada to work at Queen's University in Kingston, where he studied how people get access to health care, what services they use, and what happens to patients as a result. There, he pioneered the epidemiological approach to studying the risk of adverse events in relation to time of receiving medical services.

Later, Dr. Sobolev joined the University of British Columbia, Canada, where he is a Professor at the School of Population and Public Health. There, he has taught a variety of courses and introduced into the curriculum a new course on causal inferences in health sciences. He was awarded a Canada Research Chair in Statistics and Modelling of the Health Care System, a distinction he held through 2013. Currently, he serves as principal investigator for the Canadian Collaborative Study on Hip Fractures.

Dr. Sobolev also leads the Health Services and Outcomes Research Program at the Centre for Clinical Epidemiology and Evaluation at the Vancouver

General Hospital. The program's mission is closing the gap between health care that is possible and health care that is delivered. This ambitious agenda brings together researchers from a wide range of disciplinary backgrounds that are required for evaluating the effectiveness of diagnostic technologies, treatment procedures, and managerial solutions. The program's investigators empirically assess the benefits and harms of therapeutic and health care interventions in the acute and primary care setting, using patient registries and data from routine medical care. By learning what works in everyday clinical practice the program generates knowledge that helps physicians and patients to make shared decisions about the best approach to treatment.

Dr. Sobolev promotes and advances the causality perspective in health services research for informing policy and decision-making. In particular, his recent work helped to estimate the reduction in postoperative mortality expected from providing timely cardiac surgical care; the health effects of receiving hip fracture surgery within the government benchmark; the proportion of hospital readmissions that could be avoided had patients undergone medication review in emergency departments rather than in hospital wards; and the expected reduction of mortality had all coronary obstructive pulmonary disease patients had their second exacerbation prevented.

About the Editors



Adrian Levy is professor of epidemiology and health services research working at Dalhousie University in Halifax, Nova Scotia. Dr. Levy commenced his academic career working for the Quebec Council for Health Technology Assessment doing applied health research on real-world use of health technologies such as extracorporeal shock wave lithotripsy and complex operations. His doctoral dissertation in epidemiology was completed at McGill University (1998) followed by postgraduate training in economic evaluation at McMaster University (2000). In 2000, Dr. Levy joined the faculty in the School of Population and Public Health at the University of British Columbia and was awarded British Columbia Michael Smith Foundation for Health Research Scholar (2001) and Senior Scholar (2006) awards and a New Investigator Award from the Canadian Institutes of Health Research (2004). There, he linked administrative health databases with patient and treatment registries to study access, quality, and cost of care in cardiac surgery, HIV, and transplant.

In 2009, Dr. Levy joined Dalhousie University in Halifax, Nova Scotia, Canada, to serve as head of the Department of Community Health and Epidemiology. As an integral part of the Medical School of the Maritimes, the Department's collective purpose is to enhance the capacity to improve the health of individuals, patients, communities, populations, and systems, by

serving as leaders who generate evidence and apply critical thinking to the health challenges of today and tomorrow. The Department's faculty generate evidence and engage in knowledge exchange that advances effective and sustainable systems for health services access and delivery.

As nominated principal investigator, Dr. Levy led the development and implementation of the Maritime Strategy for Patient-Oriented Research SUPPORT Unit. This initiative, co-funded by the Canadian Institutes of Health Research, offers research infrastructure designed to promote patient-centered outcomes and health services research in Canada's three Maritime provinces. The Unit's mission is to lead the development and application of patient-centered outcomes research, and the vision is to enhance the health and well-being of individuals and populations in the Maritimes and across Canada. The central goals include advancing research on health systems, knowledge translation and implementation of healthcare transformation, and implementing research at the point of care.



Sarah Goring has an M.Sc. in healthcare and epidemiology from the University of British Columbia and more than 10 years of experience consulting in the private sector, where she focuses on pharmacoepidemiology, evidence synthesis methods, and health services research.



Constantine Gatsonis is Henry Ledyard Goddard University Professor and founding chair of the Department of Biostatistics and the Center for Statistical Sciences at the Brown University School of Public Health. Dr. Gatsonis is a

leading authority on the evaluation of diagnostic and screening tests and has made major contributions to statistical methods for medical technology assessment and health services and outcomes research. His current research activity spans the spectrum of evidence-based diagnostic medicine, addresses both methodology and subject matter, and has a major focus on the comparative effectiveness of screening and diagnostic modalities. As the founding network statistician of the American College of Radiology Imaging Network (ACRIN) and a group statistician for the ECOG-ACRIN collaborative group, he has decades-long experience in the clinical evaluation of modalities for diagnosis and prediction in cancer and other chronic diseases. Dr. Gatsonis has served on numerous review and advisory panels. He chaired the NAS Committee on Applied and Theoretical Statistics and is a member of the NAS Committee on National Statistics. He served on the IOM Committee on Comparative Effectiveness Research Prioritization and the NAS Committee on Reproducibility and Replicability in Science and was the founding editor-in-chief of *Health Services and Outcomes Research Methodology*. Dr. Gatsonis was educated at Princeton and Cornell, was elected fellow of the American Statistical Association, and received a Long-Term Excellence Award from the Health Policy Statistics Section of ASA.



Ewout van Ginneken is coordinator of the Berlin office of the European Observatory on Health Systems and Policies at the Berlin University of Technology. He holds a master's degree in health policy and administration from Maastricht University in the Netherlands and a Ph.D. in public health from the Berlin University of Technology. His expertise is in comparative international health systems research and health policy research. His main interests include health financing, insurance competition, care purchasing, integrated care, cross-border care, and migrants' access to care. He has edited several Health Systems in Transition (HiT) reviews including on the healthcare systems of Bulgaria, the Czech Republic, Estonia, Lithuania, the Netherlands, Slovakia, Slovenia, and the United States. He has published widely on these topics in international peer-reviewed literature and the wider literature. Before joining the Observatory, Ewout was a senior researcher at the Berlin University of Technology and a 2011–2012 Commonwealth Fund Harkness Fellow in Health Care Policy and Practice at the Harvard School of Public Health.



Reinhard Busse is department head for healthcare management in the Faculty of Economics and Management at Technische Universität Berlin, Germany. He is also a faculty member of Charité, Berlin's medical faculty, co-director and head of the Berlin hub of the European Observatory on Health Systems and Policies, member of several scientific advisory boards, as well as regular consultant for the WHO, the EU Commission, the World Bank, the OECD, and other international organizations within Europe and beyond as well as national health and research institutions. From 2006 to 2009, he served as dean of his faculty.

His research focuses on methods and contents of comparative health system analysis and assessment as well as health services research (with emphasis on hospitals, human resources, cross-border care, health reforms in Germany, role of the EU, financing and payment mechanisms, as well as disease management), health economics, and health technology assessment (HTA).

His regular master-level teaching courses at TU Berlin include “Managing and Researching Health Care Systems”; “Health Technology Assessment” (blended learning, i.e., mainly online); “Health Care Management I, Insurance Management”; “Health Care Management II, Provider Management”; “Health Care Management III, Industry Management” (pharmaceuticals and medical devices); and “Health Care Management IV, Health Economic Evaluation.” He is the principal editor of the German textbook on healthcare management (published with Springer, fourth edition 2017), author of a book on the German health system (fourth edition 2017), as well as co-editor of German textbooks on public health (third edition 2012) and on HTA (second edition 2014). Since 2015, he is speaker of the board of the newly founded inter-university Berlin School of Public Health.

Professor Busse is the director of the annual Observatory Summer School in Venice, which is directed at policy-makers and has covered a wide range of topics: human resources for health; hospital reengineering; innovation and health technology assessment; EU integration and health systems; the aging crisis; performance assessment for health system improvement; innovative ways of improving population health; integrated care – moving beyond the rhetoric; primary care – innovating for integrated, more effective care; and quality of care – improving effectiveness, safety, and responsiveness.

He was the PI/coordinator of the EU-funded project “EuroDRG: Diagnosis-Related Groups in Europe: Towards Efficiency and Quality” (Seventh Framework; 2009–2011). He has been and is also involved in several other

EU-funded projects under the Seventh Framework, e.g., on the relationship between nursing and patient outcome (RN4Cast; 2009–2011), mobility of health professionals (PROMeTHEUS; 2009–2011), evaluating care across borders (ECAB; 2009–2013), on healthcare data for cross-country comparisons of efficiency and quality (*EuroREACH*; 2010–2013), on the impact of new roles for health professionals (Munros; 2012–2016), and on advancing and strengthening HTA (Advance HTA; 2013–2015). Previously, he was PI/scientific coordinator of the EU-funded project “Health Benefits and Service Costs in Europe” (*HealthBASKET*; 2004–2007).

Since 2011, he is editor-in-chief of the international peer-reviewed journal *Health Policy*. Since 2012, he is the director of the Berlin Health Economics Research Centre (BerlinHECOR, overarching topic “Towards a Performance Assessment of the German Health Care System”), one of four centers in Germany funded by the Federal Ministry of Research. In 2016–2017, he was president of the German Health Economics Association (DGGÖ).

Professor Busse studied medicine in Marburg, Germany; Boston, USA; and London, UK, as well as public health in Hannover, Germany. Prior to his appointment at TU Berlin in 2002, he was head of the Observatory’s hub in Madrid, Spain (1999–2002); a senior research fellow in the Department of Epidemiology, Social Medicine and Health Systems Research (1994–1999, finishing with his “*habilitation*”/second Ph.D.) and a resident physician in the Department of Rheumatology (1992–1994), both at the Hannover Medical School; and a researcher in the Planning Group for a Problem-Based Medical Curriculum at the Freie Universität Berlin (1991–1992). In 1993, he earned a “*Dr. med.*” (Ph.D. in medicine) from Philipps-Universität in Marburg.

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