

POLICY CHALLENGES FROM  
DEMOGRAPHIC CHANGE  
IN CHINA AND INDIA

Edited by  
Karen Eggleston

Stanford | APARC Walter H. Shorenstein  
Asia-Pacific  
Research Center

FSI Freeman Spogli  
Institute for  
International Studies

THE WALTER H. SHORENSTEIN ASIA-PACIFIC RESEARCH CENTER

(Shorenstein APARC) is a unique Stanford University institution focused on the interdisciplinary study of contemporary Asia. Shorenstein APARC's mission is to produce and publish outstanding interdisciplinary, Asia-Pacific-focused research; to educate students, scholars, and corporate and governmental affiliates; to promote constructive interaction to influence U.S. policy toward the Asia-Pacific; and to guide Asian nations on key issues of societal transition, development, U.S.-Asia relations, and regional cooperation.

The Walter H. Shorenstein Asia-Pacific Research Center  
Freeman Spogli Institute for International Studies  
Stanford University  
Encina Hall  
Stanford, CA 94305-6055  
tel. 650-723-9741 | fax 650-723-6530 | <http://aparc.fsi.stanford.edu>

*Policy Challenges from Demographic Change  
in China and India* may be ordered from:

The Brookings Institution  
c/o DFS, P.O. Box 50370, Baltimore, MD, USA  
tel. 1-800-537-5487 or 410-516-6956  
fax 410-516-6998  
<http://www.brookings.edu/press>

Walter H. Shorenstein Asia-Pacific Research Center Books, 2016.

Copyright © 2016 by the Board of Trustees of the Leland Stanford Junior University.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission of the publisher.

Library of Congress Cataloging-in-Publication Data

Names: Eggleston, Karen, editor.

Title: Policy challenges from demographic change in China and India / edited by Karen Eggleston.

Description: Stanford, CA : Shorenstein Asia-Pacific Research Center, 2016. | Includes bibliographical references and index.

Identifiers: LCCN 2016014731 | ISBN 9781931368407 (paperback)

Subjects: LCSH: Demographic transition--China. | Demographic transition--India. | China--Social policy--21st century. | India--Social policy--21st century. | Human capital--China. | Human capital--India. | China--Economic conditions--21st century. | India--Economic conditions--21st century. | BISAC: MEDICAL / Health Policy. | SOCIAL SCIENCE / Demography. | POLITICAL SCIENCE / International Relations / General.

Classification: LCC HB887 .P65 2016 | DDC 363.90951--dc23

LC record available at <https://lccn.loc.gov/2016014731>

First printing, 2016

ISBN 978-1-931368-40-7

Contents

Tables and Figures	vii
Abbreviations	xi
Contributors	xiii
Preface and Acknowledgements	xix
<b>POLICY CHALLENGES AND ECONOMIC IMPACT</b>	
1 Policy Challenges from Demographic Change in China and India <i>Karen Eggleston</i>	1
2 The Economic Impact of Demographic Change in China and India <i>Sang-Hyop Lee and Qiulin Chen</i>	11
<b>FERTILITY AND SEX IMBALANCE</b>	
3 Fertility, Sex Ratio, and Family Planning Policies in China <i>Zijuan Shang, Shuzhuo Li, and Marcus W. Feldman</i>	33
4 Economic Incentives and the Fertility–Sex Ratio Trade-off <i>S Anukriti</i>	53

## HUMAN CAPITAL AND URBANIZATION

- 5 The Returns to Education in China:  
Evidence from the 1986 Compulsory Education Law 69  
*Hai Fang, Karen N. Eggleston, John A. Rizzo,  
Scott Rozelle, and Richard J. Zeckhauser*  
**Appendix A: Descriptive statistics by subpopulations**
- 6 Urban Concerns and Their Impact on Health in India 101  
*Indrani Gupta and Samik Chowdhury*

## POPULATION AGING

- 7 China's Rural Left-Behind Elderly:  
Senior Centers and Psychological Well-being 121  
*Karen Eggleston, Huijun Liu, Yan Min,  
and Bao Jia Tan*
- 8 Does Elderly Health Impact Poverty?  
Evidence from India 145  
*Indrani Gupta and Swadhin Mondal*  
**Appendix B: Adjusting poverty lines to take into account  
health expenditure (Wagstaff and Doorslaer [2003])**

- Index 167

## Tables and Figures

### Tables

2.1	Fiscal support ratios (percent), 1950–2050	25
3.1	Adjustment to China’s family planning policy, 2014 implementation dates, by province	38
3.2	Provincial variations on the 2013 Family Planning Policy Adjustment	38
3.3	The “5+1” working mechanism	45
4.1	Financial incentive schemes targeting both total fertility and sex ratio	63
5.1	Descriptive statistics	84
5.2	The impact of the compulsory schooling law on years of schooling: Selected results from the first stage of the 2-stage least squares estimation (2SLS)	85
5.3	The impact of the compulsory schooling law by gender and location: Selected results of the first stage estimation in 2SLS for various sub-populations	86
5.4	Returns to schooling results by OLS and 2SLS for CHNS respondents born after 1961 (the “All” sample)	88
5.5	Robustness check on instrument	89
5.6	Selected results by gender, urbanization, and province location (the “All” sample)	89
5.7	Selected results for the sensitivity analysis using “placebo” law years	91
A.1	Descriptive statistics by sub-populations	96

6.1	Slum conditions in India, 2012 (percent)	106
6.2	Determinants of illness, marginal effects from probit model	113
7.1	Psychological well-being of the widowed elderly	133
7.2	Psychological well-being of the widowed elderly versus married with spouse	135
7.3	Help received from siblings and worries about the future in respect to sibling proximity	137
7.4	Elderly well-being and proximity of first child	138
8.1	Percentage of poor in India	151
8.2	Estimated elderly ratios across poverty scenarios before and after health expenditure (percent of elderly to total household size)	151
8.3	Probit regression, reporting marginal effects	153
8.4	Elderly ratio in households and catastrophic expenditure	153
8.5	Reported morbidity rate by age group	154
8.6	Individuals not receiving treatment on medical advice (percent)	156
8.7	Medical treatment not sought due to financial reasons (percent)	156
8.8	Dependency, morbidity, hospitalization and expenditure on treatment for the elderly	158

## Figures

2.1	Labor income and consumption by age in China (2002) and India (2004–05)	12
2.2a	Number of consumers per worker in China, 1950–2050	14
2.2b	Number of consumers per worker in India, 1950–2050	14
2.3a	Age consumption profiles by component for China, 2002	16
2.3b	Age consumption profiles by component for India, 2004–05	16
2.4	Per capita consumption for children (0–19) vs. for the elderly (65 and older)	17
2.5a	Per capita private consumption vs. public consumption for children (0–19)	19
2.5b	Per capita private consumption vs. public consumption for elderly (65 and older)	19
2.6a	Per capita net flows by age in India	21

2.6b	Per capita net flows by age in China	21
2.7	Support systems for the 65 and older population	23
2.8:	Support systems for the 65 and older population in China (1995, 2002, 2007)	24
2.9	Projected and actual publicly funded health expenditures for China and India, 1995–2008	26
2.10	Simulation results for assets, pension wealth, life-cycle wealth, and child transfer wealth for China, 1950–2100.	28
3.1	China's family planning policy history and fertility transition, 1950–2012	35
3.2	China's SRB and TFR, 1980–2010	42
3.3	Three-wheel model of China's governance of gender imbalance	45
3.4	Comprehensive governance model	46
4.1	Trends in the total fertility rate and child sex ratio in India	54
4.2	Trends in the total fertility rate and child sex ratio in China	54
6.1	Urbanization trends in India, 1961–2011	103
6.2	India's slum population as a share of urban population, 2011	105
6.3	Change in conditions of Indian slums, 2007–12	107
6.4a	Comparison of selected health indicators: water and sanitation	109
6.4b	Comparison of selected health indicators: births and mothers	109
6.4c	Comparison of selected health indicators: children	110
6.4d	Comparison of selected health indicators: children and mortality	110
6.5	Infectious/parasitic diseases and share of urban population in select Indian states	112
6.6	Infectious/parasitic diseases and share of non-notified slum population in select Indian states	112
6.7	Select social sector expenditure by state governments as share of GDP	114
8.1:	Elderly morbidity and hospitalization rates by age and economic groups	155
8.2	Hospitalization rate and per day cost of treatment for hospitalization care	157





## Abbreviations

<b>2SLS</b>	two-stage least squares
<b>CHNS</b>	China Health and Nutrition Survey
<b>DLHS</b>	District-Level Household Survey
<b>GDP</b>	gross domestic product
<b>HP</b>	Health Post
<b>HPEC</b>	High Powered Expert Committee
<b>IEC</b>	information, education, and communication
<b>JNNURM</b>	Jawaharlal Nehru National Urban Renewal Mission
<b>MOSPI</b>	Ministry of Statistics and Programme Implementation
<b>MCCD</b>	Medically Certified Causes of Death
<b>NSS</b>	National Sample Survey
<b>NSSO</b>	National Sample Survey Organization
<b>NTA</b>	National Transfer Accounts
<b>OBC</b>	other backward class
<b>OCp</b>	one-child policy
<b>OLS</b>	ordinary least squares
<b>OOPS</b>	out-of-pocket spending
<b>PPP</b>	purchasing power parity
<b>RCH</b>	Reproductive and Child Health
<b>SAGE</b>	Study on Global Ageing and Adult Health
<b>SC</b>	scheduled caste
<b>SRB</b>	sex ratio at birth

<b>ST</b>	scheduled tribe
<b>TFR</b>	total fertility rate
<b>UA</b>	urban agglomeration
<b>UFWC</b>	Urban Family Welfare Center
<b>WHO</b>	World Health Organization
<b>VBD</b>	vector-borne disease

## Contributors

**S ANUKRITI** is an assistant professor in the Economics Department at Boston College, a research affiliate of the Institute of the Study of Labor (IZA, Bonn), and a fellow at the Center for Development Economics and Policy (Columbia University). Her research focuses on topics in development economics, demography, and the economics of gender. In recent work, she has examined the effects of trade liberalization, fertility limits on local politicians, and financial incentive programs on fertility and sex-selection in India. Anukriti holds a PhD in economics from Columbia University, an MA in economics from the Delhi School of Economics, and a BA (Honors) in economics from St. Stephen's College, Delhi.

**QIULIN CHEN** is an associate professor at the Institute of Population and Labor Economics, deputy director of the Editorial Office for the Almanac of China's Population, and deputy secretary-general of the Research Center for Labor and Social Security at the Chinese Academy of Social Sciences. He is also the secretary-general for the Committee of Health Economic Theory and Policy of the China Health Economics Association. His current research interests are health economics and health policy, and the economics of aging and development, all focusing on China.

Chen received his PhD in economics from Peking University and BA in business administration from Nanjing University.

**SAMIK CHOWDHURY** is an assistant professor at the Institute of Economic Growth, Delhi. His primary area of research is health policy in India with

particular focus on health equity, financing, universal health coverage, and urban health. In addition, he has worked on the health systems of Nepal and Bhutan in collaboration with the World Health Organization's South-East Asian Regional Office (SEARO). His other areas of interest include governance and urban poverty. He has been previously associated with the Birla Institute of Technology and Science (BITS), Pilani, and the National Institute of Public Finance and Policy (NIPFP), New Delhi. He holds a PhD in economics from Jawaharlal Nehru University, New Delhi.

**KAREN EGGLESTON** is a senior fellow at the Freeman Spogli Institute for International Studies (FSI) at Stanford University, and director of the Stanford Asia Health Policy Program at the Walter H. Shorenstein Asia-Pacific Research Center at FSI. She is also a senior fellow with the Center for Innovation in Global Health at the Stanford University School of Medicine, and a faculty research fellow of the National Bureau of Economic Research. Eggleston earned her PhD in public policy from Harvard University, MA degrees in economics and Asian studies from the University of Hawaii, and BA in Asian studies *summa cum laude* (as valedictorian) from Dartmouth College. Eggleston studied in China for two years and was a Fulbright scholar in Korea. Her research focuses on comparative healthcare systems and health reform in Asia, especially China; government and market roles in the health sector; payment incentives; healthcare productivity; and the economics of the demographic transition. She was a consultant to the World Bank/WHO/Government of China 2015 study on China's health service delivery system, and is a member of the Strategic Technical Advisory Committee for the Asia Pacific Observatory on Health Systems and Policies.

**HAI FANG** is professor of health economics at Peking University. He received his master's degree in public health and his PhD in economics from the State University of New York at Stony Brook in 2006. Prior to teaching at Peking University, Fang taught at the University of California, Davis; the University of Miami; and the University of Colorado, Denver. Fang's research areas include health economics, labor economics, and applied econometrics; he has published more than fifty peer-reviewed articles in English.

**INDRANI GUPTA** is a professor and the head of the Health Policy Research Unit of the Institute of Economic Growth, Delhi, India. Gupta received her PhD in economics from the University of Maryland. She has been instrumental in setting up a center for health economics and policy research at the Institute; the center remains one of the few places in India that undertakes

policy-oriented research on the health sector. Her varied experience includes teaching and working at academic institutes, the World Bank, and for the government of India. Her wide-ranging areas of interest include the demand for health and healthcare, health insurance and financing, poverty and health, costing and cost-effectiveness, the economics of diseases, and international agreements and their impact on public health.

**SANG-HYOP LEE** is the director of the Center for Korean Studies and professor in the Department of Economics at the University of Hawaii at Manoa, and an adjunct senior fellow at the East-West Center. He is also the Asian Team Leader of the Global National Transfer Accounts project. His studies focus on population and social welfare issues. In particular, he has focused on the links between population aging and the labor market, with emphasis on Asian economies.

Lee has co-edited ten books on population aging, social policies, and the Korean economy, and has published over fifty articles in journals and books. His recent books include *Demographic Transition and Inclusive Growth in Asia*; *Fiscal Policy, Inequality, and Inclusive Growth in Asia*; and *Social Policies in an Age of Austerity*. Lee received his PhD in economics from Michigan State University and MA and BA in economics from Seoul National University.

**SHUZHUO LI** is Changjiang Professor of Population and Social Policy Studies, and director of the Institute for Population and Development Studies, School of Public Policy and Administration, Xi'an Jiaotong University. He received his PhD in system engineering from Xi'an Jiaotong University. Li's research is focused on contemporary transitional China, including population policy and social change, aging and old-age support, rural-urban migration and social integration, gender imbalance and sustainable social development, ecosystem services, and human well-being. He is a member of the Public Policy Committee of the National Health and Family Planning Commission of China, and a member of the Social Sciences Committee of the Ministry of Education. He has published numerous papers and books, both in English and in Chinese.

**HUIJUN LIU** obtained her PhD in management science and engineering from Xi'an Jiaotong University's School of Management. She currently holds positions as a professor in the School of Public Policy and Administration and as a researcher in the Research Center of Aging and Health at Xi'an Jiaotong University. Her research addresses vulnerability, health, and social support,

with a special focus on the assessment of elderly support and health risk under the context of social and demographic transition in rural China. She has published several books and more than fifty papers in academic journals such as the *Journal of Social Indicators Research*, *Aging and Social Policy*, and the *Asia-Pacific Journal of Public Health*. Liu has received grants and awards for her professional work, including from the China National Social Science Foundation.

**SWADHIN MONDAL** is a health economist. He presently is a faculty member in economics at the Institute for Studies in Industrial Development (ISID), New Delhi. He was awarded a PhD in health economics from Vidyasagar University, India. His current research interests include health financing, health equity, health system research, the economics of aging, pharmaceutical economics, and the economic aspects of clinical trials. Mondal has published or presented several papers on health economics and policy in international journals and conferences.

**JOHN A. RIZZO** is professor of economics and preventive medicine in the Program in Public Health at the State University of New York at Stony Brook. He received his BA in economics from the University of New Hampshire, and MA and PhD in economics from Brown University. Rizzo's interests include health economics and cost-benefit analysis. He is one of thirty health economists to place on top fifty lists in world rankings for both numbers of articles published and for total pages published in the field of health economics from 1991 to 2000; he is also ranked fifteenth in total pages published, according to rankings in *Health Economics* (May 2003).

**SCOTT ROZELLE** holds the Helen Farnsworth Endowed Professorship at Stanford University and is a senior fellow in the Food Security and Environment Program and the Shorenstein Asia-Pacific Research Center, Freeman Spogli Institute for International Studies. For the past thirty years, he has worked on the economics of poverty reduction. Currently, his work on poverty has its full focus on human capital, including issues of rural health, nutrition, and education. For the past twenty years, he has been the chair of the International Advisory Board of the Center for Chinese Agricultural Policy, Chinese Academy of Sciences. In recent years Rozelle has spent most of his time co-directing the Rural Education Action Project (REAP). In recognition of this work, Rozelle has received numerous honors and awards. Among them, he became a Yangtse Scholar (Changjiang Xuezhe) at China's Renmin University in 2008. That year he also was awarded the Friendship

Award by Premiere Wen Jiabao, the highest honor that can be bestowed on a foreigner.

**ZIJUAN SHANG** is an assistant professor in the Department of Public Administration, School of Politics and Administration, at Chang'an University. She received her PhD in public administration from Xi'an Jiaotong University in 2014. Her research is mainly focused on the public governance of gender imbalance in China and on sustainable social development. She has taken part in more than ten major national research projects, in research projects with international organizations, and in provincial-level government cooperation projects. Shang has published a number of papers both in English and in Chinese.

**BAO JIA TAN** is a graduate student at the Ford Dorsey International Policy Studies Program at Stanford University. She holds a BA in economics from Peking University, and was awarded the President's Scholarship from the Government of Singapore in 2009. From 2012 to 2013, she published research articles on Chinese capital markets and local government financing with Gavekal Dragonomics, a Beijing-based macroeconomic research firm. Her main research interests include rural-urban migration, social security provision, urbanization, local government financing, and financial sector reforms in China. At present, Tan is working with the World Bank on a study of health system reform in China, with a focus on the strengthening of primary care and care integration. She is also engaged in the establishment of a China Health Co-laboratory at the Stanford Center of International Development, an initiative that seeks to facilitate cross-institutional and cross-border research on China's health policies.

**YAN MIN** obtained her MB from Peking University's Health Science Center and MA in health policy from Stanford University. Her previous research mainly concentrated on health inequity, population aging, and long-term care in developing countries. Yan has worked at the World Health Organization's Department of Healthcare System Financing. Her research there included investigations of long-term care insurance programs, and analysis of healthcare system efficiencies within eight East Asian countries. As a visiting researcher, Yan participated in fieldwork conducted by National Taiwan University's School of Public Health, with a focus on elderly living arrangements in Taipei. Last September, she joined the Stanford Prevention Research Center at Stanford University's School of Medicine as a full-time researcher working on the Wellness Living Laboratory (WELL) project.

**RICHARD ZECKHAUSER** is the Frank P. Ramsey Professor of Political Economy, Kennedy School, Harvard University. He graduated *summa cum laude* from Harvard College and received his PhD there. He is an elected fellow of the Econometric Society, the Institute of Medicine (National Academy of Sciences), and the American Academy of Arts and Sciences. In 2014, he was named a Distinguished Fellow of the American Economic Association. His contributions to decision theory and behavioral economics include the concepts of quality-adjusted life years (QALYs), status quo bias, betrayal aversion, and ignorance (states of the world unknown) as a complement to the categories of risk and uncertainty. Many of his policy investigations explore ways to promote the health of human beings, to help markets work more effectively, and to foster informed and appropriate choices by individuals and government agencies. Zeckhauser has published over three hundred articles. His recent co-authored books are *The Patron's Payoff: Conspicuous Commissions in Italian Renaissance Art* (2008), and *Collaborative Governance: Private Roles for Public Goals* (2011). In conjunction with John Donahue and Karen Eggleston, he is writing a book on collaborative governance in China and the United States. Apart from academics, Zeckhauser is a senior principal at Equity Resource Investments, a real estate private equity firm. He has won multiple national championships in contract bridge.



## Preface and Acknowledgements

Most of the chapters in this book are updated versions of papers presented at “Challenges in the Process of Urbanization: China in Comparative Perspective,” a conference held at the Stanford Center at Peking University (SCP KU) on May 25, 2014. I am grateful to my co-organizers, Professor Jean Oi of Stanford University’s Department of Political Science and the Walter H. Shorenstein Asia-Pacific Research Center (Shorenstein APARC), and Yiming Wang of the National Development and Reform Commission, with whom I have also co-edited a book on urbanization in China. This volume would not have been possible without the impetus of that collaboration as well as the generous support of all the authors who grace these pages with their work. While no single volume could possibly provide a comprehensive analysis of all the policy challenges facing India and China from demographic change, we highlight several salient aspects of those challenges and hazard some suggestions. As with many pieces of research, our contribution may be as much in raising additional questions as it is in any specific policy recommendations.

The following individuals have my deepest gratitude for their contributions that made this volume possible: Dr. Gi-Wook Shin, director of Shorenstein APARC at Stanford University, for supporting this project; Lisa Lee of Shorenstein APARC and the staff at SCP KU, for their assistance in organizing the conference and subsequent Asia Health Policy Program activities supporting this research; Bao Jia Tan and Jinan Zhang for excellent research assistance in preparing several chapters of this book; and George Krompacky for meticulous editing and professional shepherding of this

manuscript through the publication process. Finally, I thank my husband, Chris Kesi Lee, and children, Adrian and Alanna, for their love and support.

Karen Eggleston  
Stanford, California