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From the Editor-in-Chief

This volume of *World Health & Population* presents papers that have recently been published online by *WHP* and selected as particularly representative of the diversity and focus of the journal.

It is important to note first, however, that *WHP* recently achieved a milestone we set over two years ago when the journal took its present form and name. Early in January we were notified by the US National Library of Medicine that *WHP* has been selected to be indexed and included in MEDLINE and accessible through PubMed. This is a major accomplishment and will greatly increase the visibility of the articles we publish as well as the impact of our journal. Thanks to all who helped this goal become a reality, and we look forward to the continued growth and impact of *WHP*.

The papers in this volume fully represent the journal's worldwide scope; they include articles from South America (Peru), the Middle East (Jordan and Yemen), East Asia (Indonesia) and China, and two manuscripts from India.

In the first paper, a case study on local governance and resource allocation relating to healthcare in Indonesia, Abdullah and Stoelwinder show that decentralization of budgets and decision making to the district level has not resulted in a change in investment focus. Capital projects and "personal curative services" continue to be emphasized at the expense of health education and promotion, regardless of the administrative level at which allocative decisions are being made. Decentralization of budgets alone may not bring improvement in health system performance unless the decision-making processes also change.

Khawaja and Al-Nsour document in their paper the increasing prevalence of deliveries by Caesarean section in Jordan. The authors use Demographic and Health Survey (DHS) data from 1990 and 2002 to verify this phenomenon, which has also been noted worldwide in middle- and high-income countries. [(See also Matthews and Crowley, "Rising Caesarean section rates: A cause for concern?" (*BJOG*, 110(4): 346–349, 2003).] Although appropriate use of C-sections can be life-saving for the mother and baby, addressing Millennium Development Goals 4 and 5 to reduce maternal and infant mortality, the increasing trend is also seen as a "global epidemic," resulting in higher costs, increasing the perhaps unnecessary preference for delivery in advanced-level facilities, and increasing costs in resource-constrained environments around the world.

The sole article from Latin America in this volume is a political and economic critique of structural adjustment programs in Peru during the 1990s. Sonia Menon contends that externally-derived (e.g., OECD/World Bank) development criteria under the Fujimori period resulted in a rollback of consideration of reproductive health in a holistic sense to mere control of a few fertility rates. This is seen as a throwback to the early days of family planning and population control. Menon's article provides an excellent overview of the health reforms and socio-economic situation in Peru during this period, from a viewpoint outside "establishment" perspectives, and analyzes the failure of these initiatives to relieve poverty among the poorest of the poor.

In a second article utilizing Demographic and Health Survey data, Pillai and Sunil examine the impact of traditional religious values versus external forces of change around modern contraceptive use in Yemen. The authors conclude from their analysis that, despite a continuing conservative cultural milieu, the changing social and economic context in Yemen is, encouragingly, resulting in contraceptive practice adoption rates similar to those experienced elsewhere.

The first of two articles from India in this volume looks at aging, health and labour force participation. Researchers Uppal and Sarma, from Statistics Canada and Health Canada, respectively, use data from the Government of India National Sample Survey Organization (NSSO) to examine the role of health and employment among the elderly. Developing and expanding economies are beginning to see the impact of an aging population, as has been observed in the OECD economies for some time now. One such impact is increasing numbers of the elderly competing for and participating in the labour market. Uppal and Sarma demonstrate that chronic illness and disabilities restrict labour force participation, and that the impact is more extensively felt in rural than in urban areas of India. The article has an excellent literature review and summary of the issues, and applies robust econometric methods to the data.

The second article from India also uses NSSO data to examine for the state of Kerala the paradox of lower mortality rates but higher morbidity rates than reported in other states in India. T.R. Dilip of the Centre for Development Studies in Trivandrum points out that Kerala has not only one of the highest literacy rates in India, but is also well ahead of other states in terms of access to quality healthcare. Mortality rates in Kerala have responded favourably, but self-reported morbidity has remained high, perhaps due to increased health knowledge, awareness and expectations. Development and longer life expectancies are not necessarily indicators of good health overall.

The final article in the volume is by Li et al. and is a continuation of reporting of the research on the health and social impacts of rural–urban migration in China. [(See also *WHP* 8(2) 2006; *WHP* 9(4) 2007.)] In this article, also supported by the US National Institute of Mental Health and the Fogarty International Center, Li and colleagues look at the impacts of stigmatization experienced by rural–urban migrants, which include employment, mental health and access to healthcare, among many others. The data for this study were collected through focus group discussions and contain many informative anecdotes describing the negative impacts of stigmatization. In the worldwide context of increasing urbanization, particularly for developing countries, the ongoing insights of Li et al. in their series of articles are very useful. Recommendations and conclusions include suggested legislative responses, recognition of the contributions to the public good provided by the rural–urban migrants, the need for improved services and the need for better information on this critical and seemingly unavoidable phenomenon.

In summary, we hope that you find these articles of interest and value, and that you will also consult other papers released online at www.worldhealthandpopulation.com. *WHP* remains committed to its mission to provide a forum for researchers and policy makers worldwide to publish and disseminate health- and population-related research and to encourage applied research and policy analysis from diverse international settings. We are also excited that *WHP* will now be indexed on MEDLINE and feel our reach and impact will be greatly enhanced.

Finally, the editors and publishers of *WHP* are always interested in any comments or suggestions you might have on the articles or journal. Please feel free to write or email us.

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Decentralization and Health Resource Allocation: A Case Study at the District Level in Indonesia

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Abstract

Health resource allocation has been an issue of political debate in many health systems. However, the debate has tended to concentrate on vertical allocation from the national to regional level. Allocation within regions or institutions has been largely ignored. This study was conducted to contribute analysis to this gap. The objective was to investigate health resource allocation within District Health Offices (DHOs) and to compare the trends and patterns of several budget categories before and after decentralization. The study was conducted in three districts in the Province of Nanggroe Aceh Darussalam. Six fiscal year budgets, two before decentralization and four after, were studied. Data was collected from the Local Government Planning Office and DHOs. Results indicated that in the first year of implementing a decentralization policy, the local government budget rose sharply, particularly in the wealthiest district. In contrast, in relatively poor districts the budget was only boosted slightly. Increasing total local government budgets had a positive impact on increasing the health budget. The absolute amount of health budgets increased significantly, but by percentage did not change very much. Budgets for several projects and budget items increased significantly, but others, such as health promotion, monitoring and evaluation, and public-goods-related activities, decreased. This study concluded that decentralization in Indonesia had made a positive impact on district government fiscal capacity and had affected DHO budgets positively. However, an imbalanced budget allocation between projects and budget items was obvious, and this needs serious attention from policy makers. Otherwise, decentralization will not significantly improve the health system in Indonesia.

Background

Two momentous decentralization laws (number 22/1999 on the regional administration and number 25/1999 on the financial equilibrium between the central government and the regional administration) have transformed Indonesia from one of the most centralized countries in the world into one of the more decentralized ones (World Bank 2003). Two years later, Indonesia formally entered the era of devolution. As a result, district governments now have more autonomy and discretion in a number of areas, including planning and resource allocation.

New methods of budget allocation, from central government to districts or local governments, have also been introduced. Three popular types of budget allocation, called "decentralization budgets" (block grants), "special budgets" and "deconcentration budgets," have become fashionable. "Decentralization budgets" are transferred directly from the central government to autonomous regions both in districts and in provincial governments. The autonomous regions can then use the budgets according to their own priorities. "Deconcentration budgets" are transferred only to the governor as the representative of the central government at the provincial level. "Special budgets" are allocated by the central government to the district level for targeted programs with guidelines from the central government. The amount of these budgets is allocated according to a formula that is derived from a number of socio-economic variables.

Since then, the appropriateness of resource allocation between regions and districts has been an issue of political debate; however, as in other countries, the debate has focused overwhelmingly on vertical allocation from national to regional levels (World Bank 2003; Green et al. 2000; McIntyre et al. 2002; McIntyre and Gilson 2000; Hurley et al. 1995). Allocation of health resources within regions (Bell et al 2002; Green et al 2001), for instance among DHOs, has been virtually ignored.

Health policy makers at both the national and provincial level, and other stakeholders, need to know how local governments and DHOs allocated their budgets when they had more autonomy and discretion in planning and budgeting. However, as there is currently no information on horizontal budget allocation at the local level, we conducted this study. Its objective was to analyze health resource allocation within DHOs and compare the trends and patterns in several budget categories before and after decentralization. Study results would not only be useful to policy makers at the district level where the case studies took places, but also for policy makers in other parts of Indonesia and in similar countries.

Methods

The case studies were conducted in three districts in the Province of Nanggroe Aceh Darussalam: Aceh Utara, Banda Aceh and Sabang. The district of Aceh Utara represents a relatively wealthier district, particularly after decentralization; Banda Aceh represents municipalities and Sabang represents districts located in the islands. Sabang and Banda Aceh are both relatively poor districts compared with Aceh Utara. The category of poor or relatively wealthy districts was based on the fiscal capacity of the district government. Aceh Utara is a production zone of oil and natural gas in Indonesia. This district and other similar districts, under law number 25/1999, receive a certain percentage of profits from oil and gas production as revenue from the central government.

Six fiscal-year budgets from 1999 to 2004 were collected from the Local Government Planning Office (Bappeda) and from DHOs. Two fiscal years, 1999 and 2000, represent annual budgets in the period of centralization, and fiscal years from 2001 to 2004 represent annual budgets in the period of decentralization. In each fiscal year, the budgets are described in terms of "projects." Budget items from each project were imported to Microsoft Excel. These items of expenditure were then labelled and coded using the common budget item descriptors.

Data from Microsoft Excel then was converted to SPSS Version 10.0 software for analysis. First, analysis was conducted for each fiscal year and for each project to ensure that the total amount of each budget had been entered. Analysis was then performed on each project, by budget item for each fiscal year. Projects were grouped into eight similar project categories. Similar budget items within projects were grouped into 19 categories. For example, items related to activities of collecting,

processing, analysis and publishing data from different projects were grouped into the category "data and information." Items related to development, renovation, refurbishment and maintenance of offices, buildings, building community health centres, hospitals and other health infrastructure were grouped into the category "physical infrastructures." A similar approach was applied to create another 17 budget item categories: health and medical equipment; office equipment, environmental and sanitation facilities; scholarship; training; health planning; administration; operational; meeting; monitoring and evaluation; survey and research; accreditation; vaccine and drugs; basic health services; referral health services; targeted health services; health promotion and community empowerment; and ambulance and vehicles. These 19 budget item categories were further regrouped into eight final categories: equipment and vehicles, civil works, education and training, management cost, monitoring and evaluation, drugs, direct health services and health promotion. For example, categories for health planning, administration and operational costs were regrouped into a category of management costs. This method was also used in Uganda (Akin et al. 2001). In addition, budget item categories were grouped into several other categories such as public and private goods (Schwartz et al. 2002) and investment, operational or maintenance (IOM). Then, we analyzed patterns, compositions and trends for each category. For more information on how the 19 budget item categories were regrouped, please refer to Appendix I.

Results

Study results are described under three headings. First is resource allocation at the district government level, followed by district government budget allocations to "projects" in the health sector. Finally, we focus on how the DHO allocated the budget between budget item categories, between IOM and between private–public goods.

District Government Budget

Since decentralization, the central government has allocated budgets directly to districts based on a socio-economic formula. In general, decentralization has increased the fiscal capacity of district governments, particularly in some rich in natural resources (oil and natural gas). In the first year of implementing decentralization, the district of Aceh Utara received a significant budget increase from only US$ 18.9 million in 2000 to US$ 77.5 million in 2001. In contrast, in Banda Aceh and Sabang, the budget increased slightly from just below US$ 9.6 million to just over US$ 20 million. Trends and comparisons can be seen in Figure 1.

Figure 1. Trends in district government budgets before and after decentralization

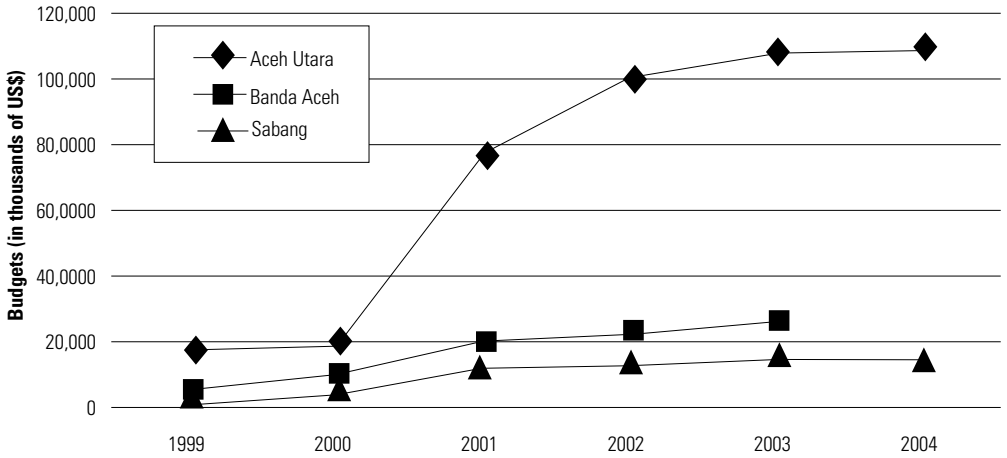


Figure 2. Trends in district health budgets before and after decentralization

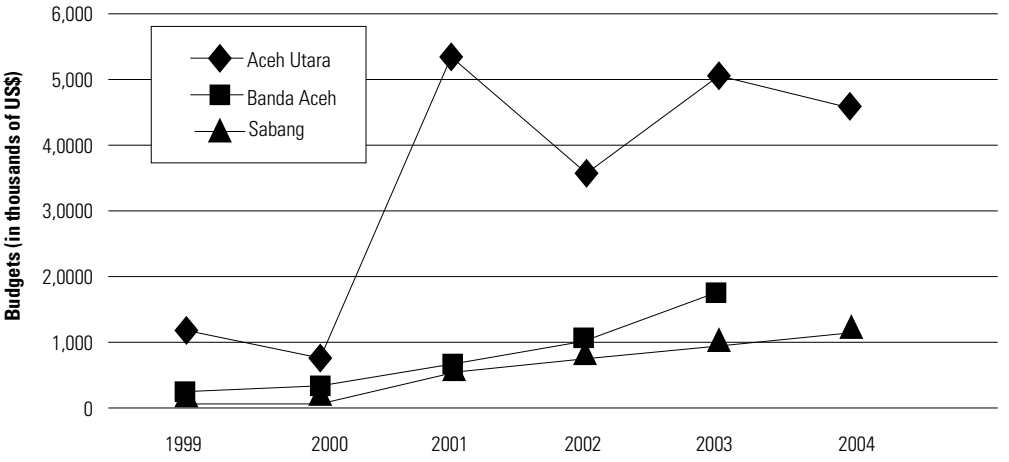
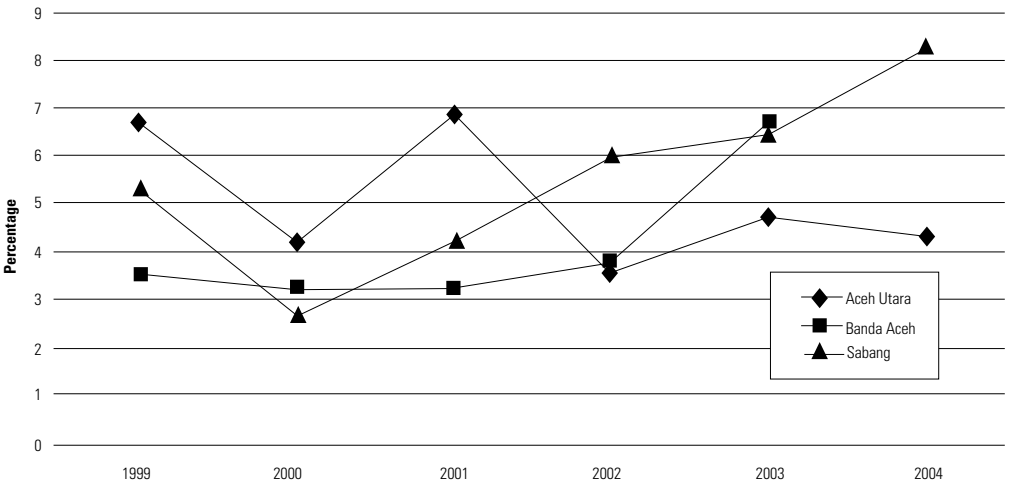


Figure 3. Proportion of district health budget compared with total district government budget from 1999 to 2004



District Health Budget

Increased district government fiscal capacity increased the absolute amount of the district health budget. A significant increase can be clearly seen in the wealthier district of Aceh Utara, where the health budget rose sharply from only US$ 0.8 million in 2000 to US$ 5.3 million in 2001. However, the budget fluctuated in the following years. It dropped to US$ 3.5 million in 2002, rose to US$ 5 million in 2003 and then fell again to US$ 4.6 million in 2004. In contrast, in the relatively poor districts of Banda Aceh and Sabang, the budgets increased only slightly in the first year of decentralization, but in the following years increased consistently. Trends and comparisons between districts can be seen in Figure 2.

Figure 3 shows the proportion of the district health budget compared with the total district government budget. In the first year of decentralization, Aceh Utara district's health budget reached almost 7%, but it dropped to 3.5% in 2002 and then increased slightly again in the following years. In contrast, in the relatively poorer local governments of Banda Aceh and Sabang, in the first year of decentralization the proportion of the district health budget increased only slightly, by less than 5%. However, in the following years percentages rose significantly in both districts, reaching 6.7% and 8.3%, respectively. Budget allocation per capita has increased in all districts since decentralization,

but most markedly in Sabang, from only US$ 5.9 in 2000 to almost US$ 50 per capita per year in 2004. More details on per-capita budget allocation can be seen in Table 1.

Table 1. District government budget spending on health per capita before and after decentralization (in US$)

Districts	Fiscal Years					
	Before		After Decentralization			
	1999	2000	2001	2002	2003	2004
Aceh Utara	1.2	1.2	10.4	6.9	9.7	8.8
Banda Aceh	1.0	1.7	3.6	6.0	9.8	n.a.
Sabang	5.4	5.9	23.7	33.6	40.2	48.5

The district hospital received about 30% of the total district health budget. More than 50% of the budget of both the DHO and the hospital was spent on staff salaries. The rest was allocated to budget item categories described in the following sections. Sabang was excluded from further analysis due to incomplete data.

District Resource Allocations Based on Project Categories

Projects recorded in the budgets were grouped into eight project categories, as shown in Table 2. In general, after decentralization, several categories such as equipment and physical infrastructure, drugs and pharmacies, and direct health services increased significantly. In contrast, health promotion, environmental health and sanitation, and communicable diseases control had a reduced proportion of the budget.

In Aceh Utara, in the first year of decentralization, 83% of the budget was allocated to two project categories: equipment and physical infrastructure, and direct health services, particularly to provide health services to the poor. In the following years these categories, together with drug procurement and pharmacies, received a quarter of the total DHO budget. In contrast, in the first years of decentralization, categories with more intangible outputs such as health promotion, communicable diseases, environmental health and sanitation, nutrition, maternal & child health (NM&CH), and communicable diseases control–related projects each received less than 3% of the total allocation. In 2002 and 2003, nothing was allocated to environmental health and sanitation. Similarly, nothing was allocated to NM&CH in 2004. Budgets were also allocated to health-planning-related projects, a new category that started after decentralization.

Table 2. Percentages of district health office budget allocation per project category

Project Categories	Aceh Utara					
	Before		After Decentralization			
	1999	2000	2001	2002	2003	2004
1. Nutrition, maternal & child health	16%	15%	2%	12%	19%	0%
2. Environmental health and sanitation	7%	8%	3%	0%	0%	1%
3. Drugs and pharmacies	55%	0%	9%	26%	43%	13%

Table 2. Continued

Project Categories	Aceh Utara					
	Before		After Decentralization			
	1999	2000	2001	2002	003	2004
4. Communicable diseases	16%	13%	2%	8%	10%	7%
5. Health planning–related projects	0%	0%	0%	2%	3%	2%
6. Health promotion	6%	49%	1%	3%	5%	7%
7. Direct health services	0%	0%	32%	23%	13%	14%
8. Equipment & physical infrastructures	0%	15%	51%	26%	7%	56%

Project Categories	Banda Aceh				
	Before		After Decentralization		
	1999	2000	2001	2002	2003
1. Nutrition, maternal & child health	7%	5%	16%	9%	6%
2. Environmental health and sanitation	12%	3%	2%	1%	2%
3. Drugs and pharmacies	0%	0%	32%	30%	16%
4. Communicable diseases	15%	5%	2%	3%	3%
5. Health planning–related projects	0%	0%	0%	1%	2%
6. Health promotion	0%	2%	0%	1%	1%
7. Direct health services	38%	83%	38%	55%	65%
8. Equipment & physical infrastructures	28%	2%	10%	0%	5%

In Banda Aceh, in the first year of decentralization, 70% of the budget was allocated to two project categories: basic health services to serve the poor, and drug procurement and pharmacies. This pattern was similar until 2004. As in Aceh Utara, the budget allocation for project categories related to health promotion, communicable diseases, and environmental health and sanitation was less than 4%. In fact, in the year following decentralization, nothing was allocated to health promotion and in subsequent years the budget allocated for health promotion was only 1–2%.

Districts Resource Allocations Based on Budget Items Categories

Resource allocation by budget item category indicated that a large proportion of DHO budgets were spent on civil works, drugs and health services delivery. Other items received only a small portion of the budget. Budget share for education and training–related activities dropped after decentralization in both Aceh Utara and Banda Aceh.

In Aceh Utara, in the first year of decentralization more than 50% of the DHO budget was allocated to civil works activities, followed by direct health services and procurement of drugs. In the following years of 2002 and 2003, the budget share for civil works dropped significantly to about 0.5% but increased again to 26.2% in 2004. The budget share for drugs and management costs increased considerably, altogether by about 30% to 75%. In contrast, in the first year of decentralization activities related to health promotion, monitoring and evaluation, and education and

training received a very small share, less than 2%. In the following years, the budget allocation for health promotion activities was 0.1– 1.9%. In 2003 and 2004, nothing was allocated to education and training activities.

In contrast, in Banda Aceh, in the first year of decentralization almost 50% of the DHO budget was allocated to procure drugs, followed by direct health service activities, purchase of equipment and vehicles, and civil works. The budget for management costs, monitoring and evaluation activities, education and training, and health promotion was no more than 6%. Indeed, in the first year of decentralization, nothing was allocated to health promotion. In the following years the budget for education and training dropped from 1.7% in 2001 to 0.6% in 2003. Similarly, activities related to the purchase of equipment and vehicles, drugs and providing direct health services fell in the years 2002 and 2003. Monitoring and evaluation remained constant at about 5%. In contrast, budgets for civil works increased from 12.4% in 2001 to 32% in 2003. Management-cost-related activities also increased, from 5.6% in 2001 to 10.5% in 2003. The budget for health promotion also increased, but only slightly, from 0% in 2001 to 0.4% in 2003.

Table 3. Percentages of District Health Office budget allocation per budget item categories

Budget Item Categories	Aceh Utara					
	Before		After Decentralization			
	1999	2000	2001	2002	2003	2004
1. Equipment and vehicles	46.4%	4.2%	8.9%	2.6%	8.5%	19.2%
2. Civil works	6%	20.7%	52.4%	0.5%	0%	26.2%
3. Education and training	6.1%	5.1%	1.4%	6.6%	0%	0%
4. Management costs	6.3%	7.9%	6.8%	29.2%	33.9%	14.8%
5. Monitoring and evaluations	6.4%	15.5%	2%	7.5%	3.9%	2.3%
6. Drugs	22.8%	31.2%	11.5%	32.9%	42.7%	12.5%
7. Direct health services	6%	13.9%	13.9%	14.7%	4.5%	12.9%
8. Health promotions	0%	1.5%	0.5%	0.1%	0.2%	1.9%

Budget Item Categories	Banda Aceh				
	Before		After Decentralization		
	1999	2000	2001	2002	2003
1. Equipment and vehicles	10.6%	21.5%	15.4%	23.7%	3.3%
2. Civil works	36.6%	27.6%	12.4%	25.5%	32.7%
3. Education and training	1.1%	2.9%	1.7%	1.8%	0.6%
4. Management costs	13.1%	29.8%	5.6%	5.7%	10.5%
5. Monitoring and evaluations	11.8%	7.5%	3.7%	5.2%	4.5%
6. Drugs	14.5%	2.4%	41.1%	28.8%	13.7%
7. Direct health services	9.6%	2.6%	19.6%	7.4%	6.1%
8. Health promotions	2.3%	1.7%	0%	0.1%	0.4%

Investment, Maintenance and Operational

The percentages of budget allocated for investment and operational activities fluctuated from year to year. In the first year of decentralization in Aceh Utara, the percentage of budgets for the investment and operational categories was 64% and 35%, with only 1% for maintenance. In the following years, 2002 and 2003, about 85% of the budget was allocated to operational activities. Conversely, in Banda Aceh in the first year of decentralization, only 27% of the budget was allocated for investment, but the allocation increased to 49% in 2002 and to 62% by 2003. For maintenance-related activities, it remained stable, between 1% and 9%.

Table 4. Percentages of District Health Office budget allocation per IOM categories

IOM Categories	Aceh Utara					
	Before		After Decentralization			
	1999	2000	2001	2002	2003	2004
Investment	51%	25%	64%	11%	6%	2%
Maintenance	7%	5%	1%	5%	9%	36%
Operational	42%	70%	35%	84%	85%	0%

IOM Categories	Banda Aceh				
	Before		After Decentralization		
	1999	2000	2001	2002	2003
Investment	47%	49%	27%	49%	55%
Maintenance	2%	7%	2%	4%	1%
Operational	51%	44%	70%	47%	44%

Table 5. Percentages of District Health Office budget allocation per private–public goods categories

Public–Private Goods Categories	Aceh Utara					
	Before		After Decentralization			
	1999	2000	2001	2002	2003	2004
Private goods	46%	7%	64%	10%	15%	29%
Public goods	35%	65%	26%	47%	47%	27%
Support system	19%	28%	10%	43%	38%	44%

Table 5. Continued

Public–Private Goods Categories	Banda Aceh				
	Before		After Decentralization		
	1999	2000	2001	2002	2003
Private goods	46%	53%	28%	51%	63%
Public goods	28%	7%	61%	37%	21%
Support system	26%	40%	11%	13%	16%

Private and Public Goods

Since decentralization, the pattern of budget allocation in both Aceh Utara and Banda Aceh shifted significantly to private goods. In Aceh Utara, the budget for private and public goods was 64% and 26%, respectively. Similar patterns occurred in Banda Aceh with decentralization, and budget allocation for private goods was significantly higher than for public goods.

Discussion

In recent years, there has been an increasing interest in resource allocation within healthcare organizations, particularly in devolving health systems. Policy makers both at the national and provincial levels have lacked information on how DHOs allocate budgets to different projects and budget items. Information on the trends and patterns of budget allocation at the district level will help decision makers at all levels in allocating and shifting their budgets to certain projects or activities, particularly budgets that operate at the district level.

This study has shown that the size of health budgets at the district level is closely related to government fiscal capacity. In some districts in Indonesia, such as Aceh Utara, decentralization has significantly increased the fiscal capacity of the district government, and this has resulted in a positive effect on the district health budget. In relatively poorer districts, decentralization has also brought an increase in budget allocation for the health sector. However, the proportion of the health budget compared with the total district government budget has remained between 3% and 8%, a percentage still far from the district government's espoused commitment of 15% from the total government budget. In addition, the budget increase fluctuated, and in certain fiscal years nothing was allocated for certain project categories. For example, in Aceh Utara in 2004 there was no budget allocation for nutrition, maternal and child health (NM&CH), a project category that might be highly associated with infant and maternal child health. This can result in demotivation of staff in the division of NM&CH and compromise its sustainability.

The annual fluctuation of district health budgets may be influenced by the ability of DHOs to absorb or to spend their budgets as related to their institutional capacity (Pavignani and Colombo 2006). In the first year of implementing decentralization, Aceh Utara DHO had about US$ 4.5 million per year. Its capacity to manage the budget in the previous year was only US$ 487,000. Not surprisingly, the DHO's inability to spend the budget in the first year led the local government to reduce the budget to US$ 2.4 million in the following year and increase it slightly to US$ 3.2 million in 2003, reaching a stable budget by 2004.

Increasing the DHO's budget following decentralization did not mean that this was automatically followed by a proportional increase in the budgets of all projects or budget items. The budget increased significantly for some projects or budget items, particularly for those with physical and tangible outputs. This may be related to the perception of policy makers about the scarcity of resources, the effectiveness of programs/services and the health needs of people (Corrigan and Watson 2003), by both internal stakeholders(head office and planners) and external DHO organization (local government) stakeholders. Some budget item categories such as physical infrastructure may be perceived as highly important by health policy makers compared to categories with less tangible outputs and public-goods-related activities. Even if an amount of the budget increased significantly, as

in Aceh Utara, the budgets for project categories such as environmental health and sanitation did not increase significantly. In fact, nothing was allocated for these categories in fiscal years 2002 and 2003. Similarly, nothing was allocated for nutrition, maternal and child health in 2004. This phenomenon had also been experienced in other similar countries. Studies conducted in Colombia (Bossert et al. 2003a), the Philippines (Schwartz et al. 2002), Uganda (Akin et al. 2001), Paraguay (Angeles 2001), Brazil (Atkinson et al. 2005) and Kerala, India (Varatharajan et al. 2004) have reported that decentralized health systems have a relative negative impact on public-goods activities. In Kerala, for example, after decentralization the budget allocation for primary healthcare (PHC) was only about 0.7%–2.7% of the total district government budget (Varatharajan et al. 2004).

There was a significant increase in the budget for investment activities, but this was not followed by an increasing budget for maintenance-related activities. The proportion of budget for IOM did not change following decentralization. Experience in the Philippines (Schwartz et al. 2002) and Uganda (Akin et al. 2001) has also indicated that decentralization was not able to find a balance in budget allocation between IOM activities.

The first author's own observation after almost 10 years in the Provincial Health Office in Indonesia is that lack of budgets for certain projects or activities was also highly determined by internal priority setting within the DHO itself, rather than by external organizational influences. Historical planning using the previous year's patterns and adjusting for the inflation rate, unwritten priority, "sudden instruction policy," lack of initiative and risk avoidance was the typical culture in many local health institutions. Until 2004, many DHOs did not have a formal long-term strategic planning document that could guide them to do better annual planning and better priority setting. In a number of districts, strategic planning was prepared only to comply with government regulation, not for the purpose of local planning and resource allocation. As a result, decentralization has brought positive effects on a number of projects or activities, but serious attention needs to be given to budget allocation for public goods programs.

Conclusion

This study suggests that decentralization has increased district government fiscal capacity, resulting in a positive impact on the amount of the health budget at a district level. However, the percentage of health budgets compared with the total district government budgets has not changed significantly, and there was an imbalance in resource allocation between projects or between budget item categories. Budget allocation for more tangible outputs, such as physical infrastructure, drug and "personal curative services," and private goods rose dramatically. In contrast, budgets for less tangible outputs such as health promotion, education and training, and public goods activities dropped significantly. Indeed, in certain fiscal years there was no budget for certain public goods. Inconsistencies and a lack of budgets for a number of projects or budget item categories might demotivate staff and compromise the sustainability of programs. This indicates that horizontal budget allocation within DHOs needs serious attention from health policy makers. Without any correction of these patterns, decentralized health systems may not bring much improvement in health system performance.

Limitation and Recommendations

This study has demonstrated that there was a significant change in the pattern of budget allocation after decentralization. The study also indicated a serious imbalance in resource allocation between projects or activity categories. However, the study was not able to explore the underlying factors of this phenomenon or show correlation between resource allocation and performance of the health system. Further study, particularly using qualitative methods to explore the attitude and behaviour of planners in allocating health resources, both within the DHO organization and at the district government level, is essential. Theories such as principle agent theory (Smith and Bertozzi 1998), the rational choice model of bureaucratic behaviour (Cope 2000) and decision space theory (Bossert et al. 2003a, 2003b) might help to understand these patterns.

Conflict of Interest

We declare that there is no conflict of interest that might influence the results of this study.

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Appendix I. Budget Item Categories and Other Common Budgets Categories

	Item Categories	Investment, Operational, Maintenance	Private Goods Public Goods
1	Health and medical equipments	Investment	Private goods
2	Office equipments	Investment	Private goods
3	Physical infrastructures	Investment	Private goods
4	Environmental and sanitation facilities	Investment	Public goods
5	Scholarship	Investment	Support activities
6	Training	Maintenance	Support activities
7	Health planning	Operational	Support activities
8	Administration	Operational	Support activities
9	Operational	Operational	Support activities
10	Meeting, monitoring and evaluation	Operational	Support activities
11	Survey and research	Operational	Support activities
12	Data and information	Operational	Support activities
13	Accreditation	Operational	Support activities
14	Vaccine and drugs	Operational	Public goods
15	Basic health services	Operational	Public goods
16	Referral health services	Operational	Private goods
17	Targeted health Services	Operational	Private goods
18	Health promotion and community empowerment	Operational	Public goods
19	Ambulance and Vehicles	Operational	Private goods

Note:. Support activities are activities that cannot directly be categorized solely into one category – private or public goods. In fact support activity has contributed to both private or public goods.

Trends in the Prevalence and Determinants of Caesarean Section Delivery in Jordan: Evidence from Three Demographic and Health Surveys, 1990–2002

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Abstract

This paper explores recent levels and trends in the prevalence of Caesarean section (C-section) delivery in Jordan during the period 1990–2002 and examines the impact of socio-demographic, healthcare and spatial characteristics on C-sections there. The study used three national data sets from the Jordan Demographic and Health Survey (JDHS) program conducted in 1990, 1997 and 2002. The JDHS surveys were based on large, nationally representative samples of 16,296, 7335 and 7825 households. Rates of C-section delivery were calculated based on the last birth for each woman delivering in hospitals. Associations between C-section delivery and selected covariates were estimated using χ^2 tests and odds ratios from binary logistic regression models. Hospital-based C-sections increased consistently, from 8.5% in 1990, to 12.9% in 1997, to 17.8% in 2002. The rate of increase in C-section delivery was slightly higher in private hospitals than in public ones. Multiple births, child birth weight, old age at birth and antenatal visits were important determinants of C-section. Place of residence and place of delivery were not consistently associated with C-section. Unexpectedly, mother's education was also not associated with Caesarean section. The final model, based on the three merged data sets, showed a strong association between year of the survey and C-section, reflecting the substantial increase in C-section rates over time. Also, the odds ratio of C-section from multiple births was signifi-

cantly higher in 2002 compared with 1990. Halting the increase in C-section deliveries, especially in private hospitals, should become a priority for health professionals and policy makers in Jordan. Further in-depth studies are needed, however, to better monitor and analyze changes in C-section rates for identifying ways to reduce the prevalence of this surgical procedure.

Introduction

In recent years, Caesarean section (C-section) delivery has become increasingly common in developing countries (Dosa 2001; Lancet Editorial 2000; Stanton and Holtz 2006), owing largely to improved access to maternal health services. In many contexts, increased use of C-section is welcomed because the procedure can be life saving for mothers and their babies, reducing maternal mortality and ensuring a live birth without neurological complications (Shearer 1993). Ronsmans et al (2006) have recommended the use of this procedure as an indicator of maternal health, complementing skilled attendance rates, for the Millennium Development Goals. However, the recent rise of C-section delivery, especially in middle-income countries, has been widely debated (De Muylder 1993; Dosa 2001; Faundes and Cecatti 1993; Shearer 1993). Although sometimes necessary, C-section is not always medically indicated, and changes in the C-section delivery rate do not often correspond with mothers' medical risk profiles (Declercq et al 2006). Indeed, many countries have C-section rates exceeding the World Health Organization "threshold" (UNICEF, WHO, UNFPA 1997) of 15%, and prompting some to view the practice as an emerging global epidemic (Savage 2000). In addition to increased mortality and morbidity, the indiscriminate use of this surgical procedure may lead to women's discomfort after delivery, making it difficult for them to care for their newborns (Koc 2003).

Previous studies have identified various factors behind the worldwide increase in C-section delivery. First, advances in medical care made C-section delivery a fairly safe and easy procedure to perform, increasing the survival chances of the mother and newborn (Kumar 2006). Second, public campaigns and interventions to decrease maternal mortality may lead obstetricians to resort to C-section operations instead of normal delivery for difficult pregnancies. For example, some obstetricians automatically resort to this procedure instead of normal delivery for repeated C-section deliveries, despite the lack of evidence behind this practice. Third, the rapid decline of fertility during the past few decades has led couples and health policy makers to give greater attention to optimal pregnancy and infant outcomes (Sachs et al 1999). Fourth, demographic factors such as delayed age at marriage and hence advanced age at birth have became more important determinants of pregnancy outcomes during the course of fertility transition than before, increasing the pool of risky pregnancies. Fifth, convenience of delivery may figure prominently in some contexts, with obstetricians preferring to perform C-section operations in odd hours and weekends (De Muylder 1993; Dosa 2001). Sixth, the so-called defensive medicine, referring to obstetricians' fear of being sued for malpractice awards in case of pregnancy complications, may encourage clinicians to use C-section delivery (Dubay et al 1999; Murray 2000). Seventh, patient demand for this mode of delivery has increased, especially in some Latin American countries, due to, among other reasons, the belief that vaginal delivery is associated with future sexual dissatisfaction (Cotzias et al 2001; Minkoff et al 2004). Finally, with the increased availability of medical equipment, it may be more profitable for hospitals to do C-sections than natural childbirths. This may in turn lead to higher reimbursements for both physicians and hospitals. There is evidence that C-section deliveries are more common in private hospitals than in public ones (Khawaja et al 2004), and the gap between the private and public hospital C-section rates may be growing (Belizán et al 1999; Leung et al 2001; Padmadas et al 2000). Although women delivering by C-section in private hospitals tend to have different socio-economic and demographic characteristics than other women, C-section remains more common in private than in public hospitals after controlling for these characteristics (Khawaja et al 2004).

Limited research exists on levels and trends of Caesarean section delivery and their determinants for countries in the Middle East. Studies using population-based survey data are available only for

Egypt (Khawaja et al 2003; 2004) and Turkey (Koc 1999). Currently, Jordan has one of the highest C-section rates in the region; it has increased considerably since the early 1990s to 11.3% in 1996 (Jurdi and Khawaja 2004) and to nearly 18% in 2002. This paper examines recent levels and trends of Caesarean section rates and their determinants in Jordan, using comparable secondary survey data from three nationally representative samples of ever-married women aged 15–49. Survey data were comparable in that each survey used standardized instruments and similar sample designs and data collection procedures.

Materials and Methods

The study was based on three comparable data sets from the Jordan Demographic and Health Surveys (JDHS) conducted in 1990, 1997 and 2002. The Jordan Department of Statistics conducted the surveys in collaboration with Macro International. The JDHSs were based on nationally representative, random samples of 16,296, 7335 and 7825 households for 1990, 1997 and 2002, respectively. The three samples were stratified, and selected with probabilities proportional to estimated population size, using subsamples from master sampling frames maintained by the Department of Statistics. The sampling frame for the 1990 survey was based on estimated population size in 1989, and the last two surveys' sampling frames were based on the 1994 census of population and housing. All ever-married women aged 15–49 found in the selected households at the time of the surveys were eligible for interview. Face-to-face interviews with eligible respondents were carried out by trained female teams of interviewers, supervisors and data editors. Questionnaires were completed for 6461, 5548 and 6006 of those women, representing response rates of 89.2%, 96.2% and 97.6% for 1990, 1997 and 2002, respectively. Sampling design and data collection methodology used in the surveys have been described in detail elsewhere (Department of Statistics 1991, 1998, 2003). In each survey, women respondents were asked about the type of delivery, place of delivery, child birth weight and multiple births for their live births in the last 5 years preceding the survey. For example, in the 1997 survey, all women delivering a live birth between 1992 and 1997 were asked these delivery-related questions.

Because C-section in Jordan was performed only in hospitals, and in order to avoid over-representation of women who delivered more than once by C-section in the past 5 years, analyses were restricted to the last birth for each woman delivering in hospitals (Khawaja et al 2003; Mishra and Ramanathan 2002). According to Ronsmans et al (2006), including more than one birth to women delivering during a 3-year period may result in biased estimates, because women with short birth intervals tend to be poor. Limiting the analysis to the last birth also minimized possible recall problems, which are common in retrospective surveys, especially in developing countries (Cleland 1996). Restricting the analysis to the last birth in each survey reduced the size of the original samples considerably. The final samples consisted of 3585, 3446 and 3633 births from the 1990, 1997 and 2002 surveys.

The outcome variable of the study was the mode of delivery of last birth (1 = C-section; 0 = no C-section). A recent study showed that retrospective self-report data on this subject are valid and reliable (Stanton et al 2005). The main reason for this is that C-section delivery is a major surgical procedure that cannot be easily forgotten by women. Furthermore, the 5-year recall period for mode of delivery was short enough to prevent severe recall bias. Two variables indexing possible complications due to high-risk pregnancies were included as control variables: multiple births and birth weight. It is well known that twin births are more likely to undergo C-section than singleton births (Platt et al 2001). Here, we distinguished between singleton (0) and multiple births (1). Also, both very low and high birth weights were found to undergo C-section deliveries (Gomes et al 1999), so before analysis these were grouped into a "risk" category (1 = lowest to 2499 grams, and 4000 to highest grams) to distinguish them from "normal" (0 = 2500 to 3999 grams) birth weight.

Studies by Gomes et al (1999) and Ronsmans et al (2006) have indicated that the risk of undergoing a C-section depends on several non-medical factors. Hence, we included a set of socio-demographic, institutional and spatial measures as predictor variables.

Socio-demographic Variables

Age of mother at the time of childbirth is considered an important predictor variable for various reasons. Studies have shown that older mothers are more likely to have a C-section than younger mothers (Bell et al 2001; Peipert and Bracken 1993) because they are more likely to have bigger babies, thereby increasing the risk of complications during pregnancy and delivery (Mishra and Ramanathan 2002; Padmadas et al 2000; Webster 1992). Even in the absence of complications, some studies reported relatively high rates of C-section among older, especially primiparous, women (Khawaja et al 2004; Koc 2003; Peipert and Bracken 1993). Age of mother was therefore categorized into three groups (<20, 20–35 and >35 years), distinguishing high-risk age at birth (younger, teenage mothers and older mothers, aged >35) from low-risk ages (20–35 years). Mother's educational level (illiterate, primary, and secondary and above) was included as another predictor variable because educated women are more likely to delay motherhood, thereby increasing the potential for delivery by C-section (Padmadas et al 2000). Education is strongly associated with income, a variable known to influence health-service utilization, including emergency obstetric care.

Institutional Variables

The analysis included two institutional variables: antenatal care and place of delivery. Antenatal care was used to indicate greater utilization of services, perhaps due to high-risk pregnancies (Mishra and Ramanathan 2002; Padmadas et al 2000). It was measured by the number of antenatal care visits (0 = 0–6 visits; 1 = 7 or more visits). Place of delivery (1 = private, 0 = public hospital) was used because many studies reported a strong and positive association between delivering in private hospitals/clinics and C-section rates (Mishra and Ramanathan 2002; Padmadas et al 2000; Webster et al 1992). Reasons for this association include a selection effect in that near-birth complications induce women to seek better quality care in private hospitals rather than services provided at government hospitals. Other explanations include the greater availability of medical technology needed to carry out this surgical intervention in private than in public hospitals. Also, physicians in private hospitals may resort to using available technology for higher fees and hence profits.

Spatial Variables

A spatial variable, place of residence, was included in the analysis as it partly reflects differential access to healthcare facilities. Women residing in urban and socio-economically advantaged areas are more likely to have a C-section delivery than women living in disadvantaged rural communities (Mishra and Ramanathan 2002; Padmadas et al 2000; Ronsmans et al 2006).

For the first part of our analysis, we examined the characteristics of women delivering by C-section in 1990, 1997 and 2002. Our analysis was conducted using descriptive statistics and chi-square tests. Next, three multivariate binomial logistic regression models were run with the three groups of predictor variables (socio-demographic, institutional and spatial). We evaluated the associations using unadjusted and adjusted odds ratios in each of the three models. The adjusted odds ratios refer to the net effect of a given variable, controlling for the influence of all other variables included in the models. Finally, the three data sets were merged to test the time trends on C-section delivery in an inclusive regression model. All analyses were undertaken using the Stata 8.2 (2004) for MS Windows statistical program.

Results

Table 1 presents the sample characteristics of women and the proportions reporting C-section delivery by background variables for each survey year. While the indicators for high-risk pregnancies (multiple births and birth weight) remained relatively stable, the socio-demographic and institutional indicators changed over the years. The proportion of teenage mothers declined slightly, from 7.3% to 4.7%, and that of older mothers declined from 21.2% to 18.0%, during the 1990–2002 period. Significant changes were observed for education and antenatal care. The proportion of women with at least secondary education increased from 62.8% to 88.3%, with a corresponding

decrease in less-educated women. Similarly, the percentage of women making at least 7 antenatal-care visits increased substantially, from about 50% to 83%. The majority of women delivered in public hospital, but the proportion of women using private hospitals increased from about 30% to 35%. A similar change was observed for place of residence, the percentage of urban women increasing slightly from 74.6% in 1990 to 78.5% in 2002.

The hospital-based C-section rate increased from 8.5% in 1990 to12.9% in 1997 and to 17.8% in 2002. The C-section rate among women who had multiple births (22.2%) was significantly higher than for those who had singleton births (8.3%), (p = 0.003) in 1990. The rate for multiple births became much higher in 1990 (41.5%) and 2002 (60.0%), as compared with 12.4% and 16.9% for singleton births. The C-section rate was significantly higher among women who reported low (<2500 g) or heavy birth weights (>4000 g) (p = 0.000) compared with those with normal birth weights for all 3 survey years. The rate for high-risk pregnancies increased consistently over time from 12.5% in 1990 to 23.3% in 2002. The corresponding proportions for normal birth weights were 7.2% and 16.2%.

C-section rates for mothers aged 35 years or more increased from 12.6% in 1990 to 26.6% in 2002, and these are significantly higher than the corresponding rates for teenage mothers, 5.7% and 11.2%, respectively. For mother's education, there were small differences in the rates in any given year, increasing for all three educational groups. However, C-section was positively associated with the number of antenatal visits. The C-section rate for mothers who had seven or more antenatal visits increased from about 10% in 1990 to 18.7% in 2002, and the rates for those with six visits increased from 7.2% to 11.3%. The rate for deliveries in private hospitals nearly doubled during this period, increasing from 10.2% in 1990 to 20.2% in 2002, and were higher than those in public hospitals: 7.8% and 16.5%, respectively. Finally, C-section deliveries were more frequent in urban areas than in rural ones for the 3 survey years. It is interesting to note that the change in the rate was faster for rural areas, increasing from nearly 7% in 1990 to 17% in 2002, as compared with urban areas, where the rate doubled, increasing from about 9% to 18% during the same period.

Table 2 shows the odds ratios of C-section from logistic regressions for each survey separately. The table does not include education, because it was not statistically associated with C-section delivery at the bivariate level using a chi-square test (as reported in Table 1). The unadjusted odds ratios indicate that having multiple births, high-risk birth weight, older age at birth, seven or more antenatal-care visits, private hospital delivery and urban residence were all significant risk factors for C-section in the 3 survey years, with the exception of urban residence in 2002. The adjusted odds ratios remained highly significant for four variables, with place of delivery and residence being non-significant in 1990. The adjusted odds ratios for the remaining 2 years are fairly similar, with residence in 1997 and place of delivery in 2002 becoming statistically significant. In the 3 years, the strongest predictor of C-section was multiple births, the adjusted odds ratios for having multiple births increasing substantially from 2.72 in 1990 to 6.51 in 2002.

In order to uncover the effect of time period on the odds of having a C-section, the three data sets were merged before we computed the odds ratios from a combined regression model. As shown in Table 3, the odds ratios for all included covariates were statistically significant. The strong association between year and C-section reflects the substantial increase in C-section rates between 1990 and 2002. The adjusted odds ratios from Model 1 show that women were 2.17 times more likely to undertake a C-section in 2002 compared with 1990. With an odds ratio of 4.61, women having multiple births remained the strongest predictor of C-section delivery. Various interaction terms were included to explore possible interactions between the variables and time, but none of the terms was statistically significant, aside from multiple births. Model 2 shows the results of the combined model after including interaction terms for multiple births and year. The variable multiple births was statistically significant in the third time period (2002) compared with the first time period (1990) (OR = 2.36; p = 0.033). All other variables in the model retained their statistical significance after the addition of this interaction term. However, the odds ratio of the main effect of multiple births declined, but remained the largest at 2.7, in the final model.

Table 1. Sample characteristics and percent distribution of C-section by selected variables, Jordan, 1990–2002

Variable	1990			1997			2002		
	n	%	% C-section	*n*	%	% C-section	*n*	%	% C-section
Complications									
Multiple births									
No	3531	98.5	8.3	3393	98.4	12.4	3553	97.8	16.9
Yes	54	1.5	22.2	53	1.5	41.5	80	2.2	60.0
Child birth weight									
Normal	2672	74.5	7.2	2638	76.5	10.5	2801	77.1	16.2
High risk	913	25.5	12.5	807	23.4	20.4	832	22.9	23.3
Socio-demographic									
Mother's age									
<20	261	7.3	5.7	202	5.9	8.4	169	4.7	11.2
20–35	2565	71.5	7.6	2620	76.0	11.5	2810	77.3	16.2
>35	759	21.2	12.6	624	18.1	20.2	655	18.0	26.6
Mother's education									
Illiterate	587	16.4	11.1	191	5.5	11.5	135	3.7	21.5
Primary	748	20.9	9.6	414	12.0	15.2	291	8.0	22.7
Secondary+	2251	62.8	7.5	2841	82.4	12.6	3207	88.3	17.2
Institutional									
Antenatal care									
0–6	1803	50.3	7.2	1125	32.6	9.7	709	19.5	11.3
7+	1782	49.7	9.9	2321	67.3	14.4	3025	83.3	18.7
Place of delivery									
Public	2528	70.5	7.8	2099	60.9	11.9	2351	64.7	16.5
Private	1057	29.5	10.2	1347	39.1	14.4	1282	35.3	20.2
Spatial									
Region									
Rural	911	25.4	6.9	582	16.9	8.8	781	21.5	16.9
Urban	2674	74.6	9.1	2865	83.1	13.7	2852	78.5	18.1
Total	**3585**	**100.0**	**8.5**	**3447**	**100.0**	**12.9**	**3633**	**100.0**	**17.8**

Table 2. Logistic regression of the effects of selected characteristics on C-section, Jordan, 1990–2002

Variable	C-Section(1990)				C-Section(1997)				C-Section(2002)			
	Unadjusted OR	*P*-value	Adjusted OR	*P*-value	Unadjusted OR	*P*-value	Adjusted OR	*P*-value	Unadjusted OR	*P*-value	Adjusted OR	*P*-value
Complications												
Multiple births												
No	--		--		--		--		--		--	
Yes	3.13	0.001	2.72	0.003	4.98	0.000	4.23	0.000	7.28	0.000	6.51	0.000
Child birth weight												
Normal	1.00		1.00		1.00		1.00		1.00		--	
High risk	1.85	0.000	1.69	0.000	2.18	0.000	1.98	0.000	1.58	0.000	1.46	0.000
Socio-demographic												
Mother's age												
<20	--		--		--		--		--		--	
20–35	1.33	0.302	1.27	0.376	1.41	0.186	1.40	0.202	1.56	0.078	1.47	0.127
>35	2.34	0.003	2.24	0.005	2.78	0.000	2.68	0.000	2.92	0.000	2.84	0.000
Institutional												
Antenatal care visits												
0–6	--		--		--		--		--		--	
7+	1.43	0.003	1.41	0.006	1.56	0.000	1.51	0.001	1.74	0.000	1.60	0.000
Place of delivery												
Public	--		--		--		--		--		--	
Private	1.33	0.023	1.24	0.110	1.25	0.030	1.11	0.356	1.28	0.006	1.24	0.025
Spatial												
Region												
Rural	--		--		--		--		--		--	
Urban	1.34	0.044	1.26	0.138	1.66	0.001	1.56	0.007	0.93	0.466	1.04	0.763

OR = odds ratio.

Discussion and Conclusions

This study had the dual purpose of examining (1) recent trends in the prevalence of C-section and (2) changes in the determinants of C-section over time, using three nationally representative sample surveys conducted between 1990 and 2002 in Jordan. Results revealed a consistent increase in the prevalence rate of C-section from 8.5% in 1990 to 12.9% in 1997 and to 17.8% in 2002.

Findings from multivariate logistic regression showed that twin, child birth-weight, mother's age, antenatal care and place of delivery for both the second and third periods were important determinants of C-section. In order to examine the effect of time trend on rates of C-section adjusting for

other covariates, time of the survey was included in the final combined model as a covariate. The final model showed a substantial increase in the C-section rate over time, adjusting for all other covariates. Also in this model, the odds ratio for C-section from multiple births was significantly higher in 2002 compared with 1990.

Table 3. Combined logistic regression of the effects of selected characteristics on C-section, Jordan, 1990–2002

Variable	Unadjusted OR	P- value	Model 1		Model 2	
			Adjusted OR	*P*- value	Adjusted OR	*P*- value
Complications						
Multiple births						
No	--		--		--	
Yes	5.4	0.000	4.61	0.000	2.70	0.000
Child birth weight						
Normal	--		--		--	
High risk	1.78	0.000	1.68	0.000	1.68	0.000
Socio-demographic						
Mother's age						
<20	--		--		--	
20–35	1.54	0.004	1.40	0.030	1.39	0.030
>35	2.76	0.000	2.62	0.000	2.62	0.000
Institutional						
Antenatal care						
0–6	--		--		--	
7+	1.82	0.000	1.52	0.000	1.52	0.000
Place of delivery						
Public	--		--		--	
Private	1.32	0.000	1.20	0.005	1.19	0.005
Spatial						
Region						
Rural	--		--		--	
Urban	1.31	0.000	1.21	0.015	1.21	0.014
Trend						
Year						
1990	--		--		--	

Table 3. Continued

1997	1.58	0.000	1.49	0.000	1.46	0.000
2002	2.32	0.000	2.17	0.000	2.10	0.000
Multiple births * Year						
Multiple births * 1997	-	-	-	-	1.60	0.291
Multiple births * 2002	-	-	-	-	2.36	0.033

OR = odds ratio.

In general, this study clearly demonstrated a substantial increase in the prevalence of C-sections between 1990 and 2002 in Jordan. Although the appropriate C-section rate remains debatable (Lagrew and Adashek 1998), by 2002, Jordan had exceeded the recommended threshold of a population-based rate of 15% (Burns 1995). The increase in C-section rates was perhaps a reflection of improved access to maternal healthcare services. However, such an increase, and associated improvements in healthcare services, was uneven across socio-demographic and other characteristics.

In line with other studies (Khawaja et al 2004; Padmadas et al 2000; Signorelli et al 1995; Webster et al 1992), there was a positive association between the age of the mother at the time of childbirth and having a Caesarean section. This was an important result, since several delivery-related complications are associated with increased age. Moreover, older-age mothers, especially those more than 35 years, are more likely to have special situations due to being grand multiparas, having had a previous C-section or having had precious babies. These conditions are all considered very important indicators for undergoing a C-section.

Except for the second period survey (1997), there was no significant difference in C-section rates between urban and rural dwellings in Jordan. The reason could be that the boundaries between urban and rural are not well demarcated, with the majority of people who live in rural settings travelling and working in big cities. Furthermore, the connectedness of the country and the availability and affordability of health services both in rural and urban areas may be a suitable interpretation of this finding. In Jordan, almost all women deliver in hospitals, and home delivery is a very rare event. The incidence of twin births is increasing in many countries (Meredith et al 2003; WHO 1985), and consequently, the prevalence of C-section related to twin births also increased, since twins are usually associated with complications during pregnancy and around delivery, and are one of the relevant clinical indicators for C-section.

Consistent with previous studies, extreme birth weight is another determinant of Caesarean section. Both large and small births are associated with complicated pregnancies and were more likely to be delivered by C-section. The positive association between C-section and the number of antenatal care visits has been described before (Khawaja et al 2004). It is important to mention that all maternal and child healthcare services are free of charge in Jordan. This allows healthcare providers to capture the high-risk group of pregnant women and to continue to follow them until birth, enabling the establishment of an appropriate diagnosis. The association between age and education could be one of the reasons behind the lack of significant association between education and C-section, since more educated women tend to delay the time of pregnancy (Mishra and Ramanathan 2002).

Place of delivery (public/private hospital) was not a significant determinant of C-section in 1992 and 1997, but it became so in 2002. Recently, the private sector has grown rapidly in Jordan. Furthermore, and as a result of privatization, the insurance companies contract for care of their beneficiaries in private hospitals and thus access is not restricted to women from a high socio-economic class. Moreover, the profitability of the private hospital may also play a role in this situa-

tion, in addition to the public's perception that medical services in the private sector are better than public ones. Studies have shown that physicians' predisposition can also be an important determinant of the C-section (Gomes et al 1995; Padmadas et al 2000; Platt et al 2001); obstetricians may perform C-sections to manage their time (Padmadas et al 2000).

The main strength of this study was its use of data from three large population-based surveys from a middle-income country in the Middle East, enabling us to analyze trends of C-section delivery over time. The study had some limitations, however. First, our analyses were restricted to the last birth, and thus previous histories of C-section delivery were not included in the analysis. We know from other studies that repeat C-section is rather common, and hence previous history of C-section delivery is an important predictor of future delivery (Githerns et al 1993). Furthermore, the lack of these data prevented us from determining the primary Caesarean rate. Second, all data used in this study were self-reported, with associated problems of validity and social desirability during interviewing. Although the Demographic and Health Survey program implemented rigorous training for interviewers, and interviews were subjected to careful supervision and spot-checking to ensure validity and confidentiality of responses during fieldwork, we have no means to validate the self-reported responses. Various cross-checks with birth history data were performed to validate the responses on the last births, but the data could not be verified by facility-based medical records. We do, however, believe that self-reports of pregnancy-related items, such as mode of delivery, are usually reliable and valid (Githerns et al 1993; Stanton et al 2005).

Third, unlike other countries where the Demographic and Health Surveys were conducted, in Jordan, questions about near-birth complications were not included in any of the three surveys. We did not know, for example, if C-section was elective or not. Nor did we have data on major conditions associated with C-section delivery such as fetal distress. Finally, although we had information about mother's education and place of residence, data on household income were lacking in these surveys owing to the sensitivity of these questions in this particular context.

In conclusion, this study detected an increased trend of C-section rates in Jordan, and the rate exceeds limits recommended by the WHO. The excess in C-section rates suggests there may be some non-medical predictors of this surgical procedure. Studies to further explore these determinants are urgently needed in order to avoid unnecessary C-section, as such increases in rates may have serious economic consequences for the Jordanian health sector. Indiscriminate use of surgical procedures in delivery may increase morbidity, mortality and women's discomfort after birth, with clear consequences for the care and well-being of their children. Halting the increase in C-section deliveries should therefore become a priority for health professionals, reproductive health programs, and policy makers in Jordan. As the private sector of the Jordanian healthcare system has been growing, monitoring the prevalence of C-section deliveries, particularly in private hospitals, will be necessary. Also, many hospitals in Jordan, as elsewhere in the region, do not currently have written policy guidelines for the performance of C-section deliveries. Policies to halt the growing rates of C-section in Jordan can be enforced, including the conduct of vaginal births after C-section deliveries, labour induction and augmentation, and securing a second opinion to initiate a C-section. Such policies should be formulated and enacted if we are to prevent further increases in C-section deliveries and improve the overall quality of reproductive healthcare for mothers and their babies.

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Stigmatization Experienced by Rural-to-Urban Migrant Workers in China: Findings from a Qualitative Study

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Abstract

Global literature has suggested a potential negative impact of social stigma on both physical and mental health among those who are being stigmatized. However, limited data are available regarding the form of stigma and stigmatization against rural-to-urban migrant workers in developing countries, including China. This study, employing qualitative data collected from focus group discussions and in-depth individual interviews with rural-to-urban migrants in Beijing, China, was designed to understand the forms and context of stigmatization against rural migrant workers. The data in the current study show that rural-to-urban migrant workers in China had experienced various forms of stigmatization including labelling, stereotyping, separation, status loss and discrimination. Stigmatization occurred through different contexts of migrant workers' lives in urban destinations, including employment seeking, workplace benefits, and access to health and other public services. The current study is a necessary first step to assess the potential impact of stigmatization on both the physical and psychological well-being of rural-to-urban migrant workers.

Introduction

The global literature has suggested an association between population migration and risk for poor health in general and mental illness in particular (Williams 1989; Williams and Berry 1991). There are many situational and psychosocial factors that could contribute to such negative association. One factor is the stigmatization of migrants in urban destinations because of their migratory status (Li et al. 2006b). Previous research suggests that the experience of stigmatization may result in negative psychological and physiological changes among stigmatized individuals and lead to greater risk for depressive distress and anxiety, and higher rates of some psychiatric disorders (Mays and Cochran 2001; Krieger 1999; Carr and Gramling 2004; Link et al. 1997; Pavalko et al. 2003).

In a recent meta-analysis of 49 empirical studies, Mak and colleagues (2007) suggested a negative correlation between stigma and mental health status, after adjusting for sampling error, unreliability of measurement and other artifacts across various stigmatized conditions and mental health indicators. Previous studies have found that a stigmatized individual is devalued in the eyes of others and he/she may have depression (Finch et al. 2000; Noh et al. 1999) and low self-esteem (Crocker 1999). In addition, previous research has found that stigma has an adverse effect on psychological well-being and life satisfaction (Markowitz 1998).

Although the adverse effect of stigma and stigmatization on health is a universal phenomenon, the forms and nature of stigma and stigmatization may be culture and population specific. Developing an effective intervention or public policy to reduce the stigma and to mitigate the negative impact of stigmatization among a specific migratory population or in a particular cultural setting requires a good understanding of the forms and context of the stigmatization in that particular population or culture. However, our understanding of these issues is impaired by limited research in the field. The past decades have seen massive internal migrations in many developing countries, including China (Li et al. 2006a). Internal migrations in developing countries provide an excellent opportunity to study the forms and context of the stigmatization and its negative health consequences. Therefore, as the necessary first step, the current study explores the forms of social stigma and stigmatization against rural-to-urban migrants in China. We hope that a better understanding of stigma and stigmatization will help in developing effective interventions and public policies to reduce stigmatization and mitigate its negative impact on health and psychological well-being among rural-to-urban migrants in China and other developing countries.

Conceptual Framework of Stigma and Stigmatization

Stigma is "the identification of a bad or negative characteristic in a person or group of persons and treating them as not deserving of respect or less worthy than others." (Gilmore and Somerville 1994: 1341) Goffman describes stigma as a quality that significantly discredits an individual in the eyes of others (Goffman 1963). Although there is great variation in conceptualizing stigma (Stafford and Scott 1986), stigma is the recognition of social differences in some groups of people from most other

"normal" groups from which the stigmatized persons are separated (Dovidio 2000). This separation implies a process of devaluation and discrimination against the stigmatized group (Gilmore and Somerville 1994).

Link and Phelan (2001) have proposed a conceptual framework of stigma. In their model, stigma is a process during which five interrelated components converge. These five components include "Labelling" (people identify and label human differences), "Stereotyping" (link labelled individuals to undesirable characteristics or negative stereotypes), "Separation" (place labelled individuals in distinct categories, separating "us" from "them"), "Status loss" (labelled individuals experience devaluation that leads to unequal outcomes) and "Discrimination" (systematic disapproval, rejection and exclusion of labelled individuals).

According to Link and Phelan's model, stigmatization is "entirely contingent on access to social, economic, and political power that allows the identification of differences, the construction of stereotypes, the separation of labelled persons into distinct categories, and the full execution of disapproval, rejection, exclusion, and discrimination." (Link and Phelan 2001: 367) Stigmatization is linked to power and cultural beliefs that dominate society and to the norms and values that govern much of everyday life. It creates, and in turn is reinforced by, social inequality. It causes labelled individuals to be devalued and shamed, and others to feel that they are superior. In addition, as a cyclical process, stigmatization against labelled individuals not only builds upon, but also reinforces earlier negative stereotyping.

Rural-to-Urban Migration in China

Since the late 1970s, economic reforms have trigged internal migration on a large scale within China (Chan and Zhang 1999). Migration has increased dramatically since 1978, with most migrants moving from rural to urban areas (Liang and White 1996). "Rural-to-urban migrants" refers to individuals who move from rural to urban areas for jobs and better lives, without obtaining permanent urban household registration (Li et al. 2006). These migrants are often referred to as the "floating population," regardless of the duration of their stay at their urban destination (Goodkind and West 2002).

The number of rural-to-urban migrants increased from 58.4 million in 1996 to 88 million in 2000 (Goodkind and West 2002). According to the recent China National Population 1% Sample Survey, there were approximately 147 million migrants in China in 2005, of whom two thirds were rural-to-urban migrants (National Bureau of Statistics of China 2006). A variety of reasons motivate rural residents to move to urban areas. The main "push" factors for migration include shortage of arable land and surplus labourers in rural areas, and the "pull" factors include the large rural–urban income disparity and demand for labourers in the urban construction and private business sectors (Li 1996; Liu 1991). Modernization and rapid development in agricultural technology mean that fewer labourers are needed in rural areas. In addition, demand for labourers has increased in urban areas following the development of a market economy (Li 1996).

Since 1955, the Chinese government has used the household registration system (hukou) to identify rural and urban residents (Liu 2005). Under this system, rural migrants are required to apply for a temporary residence permit at their destination site, along with an official permit for out-migration from their point of origin (Woon 1999). Since the beginning of economic reform in the late 1970s, control of population movement has been relaxed. Many local city governments have made efforts to reform the hukou system to accommodate rural-to-urban migrants in the cities, but the effect of this reform has been limited (Chang and Brada 2006; Zhu 2007). In 2003, the Chinese government proposed some major changes to the household registration system by easing travel restrictions and protecting migrants' rights. However, some large cities, including Beijing, still tightly regulate and manage the migration of rural-to-urban migrant workers into the cities (Li and Piachaud 2006). Rural-to-urban migrant workers are not able to obtain the same benefits (e.g., government subsidized housing, healthcare, employment and child education) as local residents (Goodkind and West 2002) because of their household registration (hukou) status. At the urban

destinations, migrants can frequently only find jobs that are dirty, difficult and dangerous (e.g., "3-D jobs"), requiring minimal skills and with low pay (Yang and Guo 1996). Migrants' living conditions in cities are usually very poor, with about 12% living in underground storage spaces and 8% in work sheds/shelters (Li et al. 2006a).

In addition to the difficulties they encounter at the destination, rural-to-urban migrants often face stigmatization, which includes discrimination in their daily life as well as in the workplace (Li et al. 2006b). For example, they are often blamed for increased delays and overcrowding at train stations during the Chinese holidays. According to the findings of one study conducted in six cities in Jiangsu province, approximately 62% of urban local residents believed that migrant workers were responsible for unemployment, overcrowding, and security and hygiene problems in the city (Nielsen et al. 2006).

While it is believed that rural-to-urban migrants are strongly stigmatized in Chinese society (Li et al. 2006b), there is a paucity of research to examine the forms and contexts of stigma and stigmatization against rural-to-urban migrant workers in China. Therefore, this study was designed to explore stigmatization experienced by migrant workers in China, using the conceptual framework developed by Link and Phelan (2001). We anticipate that the findings of the current study will contribute to improving the life of rural-to-urban migrant workers in their urban destinations.

Methods

Participants

The current study was conducted in Beijing in 2003–2004. Beijing, the capital city of China, has a population of 13.82 million, with more than 3 million rural-to-urban migrant workers (National Bureau of Statistics of China 2002). Qualitative data were collected using six focus group discussions among 30 migrants (16 men and 14 women) and 10 in-depth individual interviews (five men and five women). The mean age was 25.3 years (SD=1.50) for participants in the focus group discussions and 30.9 years (SD=2.65) for those interviewed individually. Participants for focus group discussions and in-depth interviews were recruited from workplaces or the community through network sampling. Local community leaders (both formal and informal) in migrant settlements and workplaces served as facilitators for the recruitment process. Researchers contacted community leaders or local business owners/managers for permission to conduct the interview in their premises and for information on potential eligible participants. Migrants were eligible to participate in the study if they were at least 18 years of age, came from rural areas and lived in Beijing without permanent Beijing household registration. Participants were informed of the study's purpose and design and were assured of the confidentiality of their responses.

Interview Procedure

Interview guides were developed for the focus group discussions and for the in-depth interviews; they included 20 open-ended questions related to reasons for migration, life experience at the destination, problems encountered at the destination and coping strategies, as well as their own perspectives on life. Themes developed were based on theory of stigma and mental health and findings from previous studies. Focus group discussions were conducted in community settings (e.g., meeting rooms at local resident associations or classrooms at local schools), which were relatively private and convenient for migrant participants. The in-depth individual interviews were conducted at the migrants' workplace or at their homes, based on convenience to the participants. Six focus group discussions and 10 in-depth individual interviews were conducted by trained interviewers. All group discussions and individual interviews were audiotaped and transcribed verbatim. Focus group discussions took approximately one and a half hours each, while individual interviews took approximately one hour each.

Coding and Data Analysis

Data analysis was guided by grounded theory (Bernard 2006) to explore the different forms and

contents of stigma perceived or experienced by the migrant workers. The grounded-theory approach is based primarily on inductive coding and focuses on the discovery of hypotheses. Initial interview transcripts were read line by line. Analysis was performed by reading and re-reading the transcripts, identifying the themes and coding the texts. This process helped researchers understand the forms and content of stigma experienced by migrants. Coding themes were developed based on constructs from the conceptual frameworks of stigma, domains from the interview guide and on the text of transcripts. New themes were identified and added during the coding process. Transcripts were recoded if either a new code was developed or an existing code was revised. Following the coding steps described by Miles and Huberman (1994), five master codes were yielded (labelling, stereotyping, separation, status loss and discrimination) and 49 subcodes were used to code all transcripts.

Results

Labelling – "You come here to pick up gold in Beijing"

According to Link and Phelan (2001), the first step in the process of stigmatization is the labeling in which people identify and label human differences. Rural-to-urban migrants in China move to cities mainly for job opportunities and a better life (Zhao 1999). Therefore, most participants interviewed felt that the common image most urban residents hold of them is "poor." As one participant stated,

> I heard from some Beijing residents. They said to me: "You moved to Beijing because you could not find a job in your hometown, or you could not make enough money at your hometown. You come here to pick up gold in Beijing." —Female, 26 years, domestic servant

The majority of migrants often experienced stigmatization because they were from rural areas, which are less developed than urban ones. In the words of one participant,

> Not every Beijing resident treats migrants badly, but some are really not good. They look down upon people coming from other places…they feel that you come here to work because you are poor. —Female, 25 years, library worker

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Government officers treat people differently based on their accents… . Their way of treating you differs depending on whether you are a local resident or a migrant. If they know you are a migrant, they discount you. They will not deal with you in an easy manner. But if they know by your accent that you are a local resident, they will pay more attention to you.

"We are treated differently because of our accent"

Migrants in the city were labelled not only by their appearance or by being poor; they were also often labelled because of where they came from and how they spoke. The Chinese language has a variety of dialects, and it varies from region to region. Regional identity is strong in spoken Chinese. One 19-year-old male interviewee mentioned that when migrants conduct business or go shopping, "they are treated badly because local people can identify them as migrants by their accents." Some migrants thought that this way of "identification" was used not only by ordinary residents in the city, but also used by officials:

> Government officers treat people differently based on their accents…. Their way of treating you differs depending on whether you are a local resident or a migrant. If they know you are a migrant, they discount you. They will not deal with you in an easy manner. But if they know by your accent that you are a local resident, they will pay more attention to you. —Female, 20 years, waitress

One migrant shared a story involving the police and his fellow workers. He mentioned that Beijing police consider people from Henan and the northeastern provinces prone to committing crimes. Thus, they pay more attention to migrants from these provinces. They think that migrants from the northeastern provinces are more likely to fight and kill people, whereas Henan migrants are more likely to steal. Policemen treat migrants differently depending on where the migrants are from, as the following story shows:

> Once, my co-workers (one from Henan and one from Jiangxi) went out playing. They were caught by the police. The guy from Henan was sent back to his hometown but the Jiangxi guy was sent back to our company. —Male, 19 years, printing house worker

Stereotyping – "They treat me as a discredited person"

Stigmatization occurs when people link labelled individuals to undesirable characteristics or negative stereotypes (Link and Phelan, 2001). The common images of rural-to-urban migrants created by the media are "dirty," "ignorant," "distrustful" and "violent." During our interviews, some migrants felt they were often distrusted by local people just because of their migratory status. One female migrant shared her experience in working with an urban family as a servant:

> They have the vigilance [in their family]. They were always scared that I would steal something from them.... I felt that they treated me as a discredited person. They said that they did not feel this way, but I could feel it. —Female, 26 years, family maid

Further, some migrant workers felt that local people suspected them of being thieves:

> Beijing residents always act as if we will steal something from them. They act as if migrants may hurt them; they always suspect that they will be robbed. That is how they feel [when they see migrants]. Some even call 110 [local police line]. —Male, 22 years, seller

One 27-year-old male migrant who worked as a barber in Beijing was still very angry when he talked about his experience of being suspected as a thief:

> My boss lost 5000 Yuan. There were only three employees in the store on the night that happened: his nephew, his "nominal daughter," and me.... He suspected only me for stealing his money. I told him that I did not take his money.... But he did not believe me.... He called the police and I was arrested. I told the police that I did not steal the money, but I was questioned many times and kept in the police station for about 12 hours. Later on, it was found that the boss's nominal daughter had taken the money. I was so depressed by this experience.

This distrust even happened at the very early stage of employment:

> When one finds a job, there is no security deposit for local people, but migrants need to pay a deposit of several hundred Yuan in order to ensure that we will not steal anything from them and run away with the stolen goods. But for local people, no deposit is needed. —Female, 26 years, nanny

Some participants mentioned that migrants were not only suspected of stealing, but also of other things that happened in the community:

> In the place we live, whenever something bad happened, local people often said that the migrants had done it. It seemed that every bad thing in society was done by migrants. —Female, 36 years, barbershop worker

Separation – "Expression of eyes"

According to Link and Phelan (2001), "separation" is a process of placing labelled individuals in distinct categories and separating "us" from "them." Almost all migrants interviewed reported an experience of being distinct from local residents through many means. For example, many reported being "looked at" with a different "expression of eyes" by the local residents. As one male migrant said,

> You can tell from the expression of their eyes [local people]. Being construction workers, wherever we go, people always look at us with that kind of expression in their eyes. You cannot avoid it. —Male, 38 years, construction worker

Another migrant echoed that view:

> It does not matter which city you are going to; the expression of the eyes with which those people look at you is always different [from how they look at local people]. —Male, 37 years, construction worker

Some migrants even experienced this kind of "expression of eyes" among their relatives. One male migrant worker said,

> My uncle introduced me to work in Beijing.... My aunt [my uncle's wife] grew up in Beijing.... I only visited their home once. My aunt looked at me with [a] different expression in her eyes. At that time, I had just started working and only earned 300 Yuan monthly. I brought a box of soft drinks with me when I visited them.... My aunt looked at me with that kind of expression in her eyes.... I could not bear it! After that, I did not go to see them for 4 years. During this period, I only called my uncle but did not go to his home. —Male, 24 years, factory worker

From the expression of eyes of Beijing residents, migrants can sense that they are being "looked down upon." One migrant worker related,

> Some of them [local residents], look at us and talk to us as though they are really looking down on us. —Male, 40 years, repairman

A female migrant worker explained,

> Sometimes, it seems that Beijing residents look down upon our rural people, because they believe that rural people may be of lower quality and that we don't have enough education. —Female, 30 years, nanny

"They speak to us in a different tone"

Some migrants interviewed also felt that local residents, including government officials, were speaking to them in an unfriendly and different way, as one migrant described during our in-depth interview:

They [government officers] speak to local people politely, but speak to us migrants impolitely, and do not give the same treatment [to migrants]. —Male, 38 years, delivery worker

Another migrant offered his experience in an encounter with a local child:

I moved here for one year and I found that local people are rich but not good. They always say something to scare you. Yesterday afternoon we were selling our watermelons. A boy about 13 years old asked whether the melon was sweet. I told him, "It is sweet; I can cut it for you. If it is sweet, you can buy it; if it is not, you can just leave it here." He replied, "No need to leave it here; if it is not sweet, I will smash your stall." His parents did not say anything when they heard these words. —Male, 22 years, street vendor

Some migrants had similar experiences at their workplaces:

Sometimes when the boss was unhappy or if we might have done something wrong, he shouted at us. It was too harsh for girls to accept; and [girls are] uncomfortable, and cry since they did not have anyone to help them. —Female, 30 years, nanny

When we work together, the local people speak [to us] with too much pride and arrogance; but we cannot do that. —Female, 19 years, waitress

I moved here for one year and I found that local people are rich but not good. They always say something to scare you. Yesterday afternoon we were selling our watermelons. A boy about 13 years old asked whether the melon was sweet. I told him, "It is sweet; I can cut it for you. If it is sweet, you can buy it; if it is not, you can just leave it here." He replied, "No need to leave it here; if it is not sweet, I will smash your stall." His parents did not say anything when they heard these words. —Male, 22 years, street vendor

"For everything, local people come first"

Almost all rural-to-urban migrant workers we interviewed felt that they were separated by local residents as the "outsiders." When migrants sought help or services, they felt that the treatment they received was totally different from the one for local people. For instance, in many job advertisements, it was often noted that only people with local hukou status could apply. One participant explained,

Some jobs, such as supermarket stockman, are only open to local people. Some governmental institutions have limitations for jobs that migrants can apply [for]. They have the hukou requirement. I feel unequal. —Male, 19 years, factory worker

Apart from differences in job requirements, local unemployed workers can receive free skills trainings for re-employment. However, migrant workers were not eligible for such services. One migrant stated during the interview:

There are many free job-training programs in the city for local laid-off workers. But for migrants, it is not free. We have to pay for these programs. Many local people come to us and tell us that they can enjoy the benefits of free job training, but outsiders cannot. —Male, 19 years, printing house worker

Most participants stated that migrants experienced unfair treatment even when they sought help in an emergency. One migrant worker offered his view:

> If local people call [the] police, the police will come within 20 minutes; but for migrants, even if you are in an accident, they will not come right away…. For everything, local people come first. I have experienced this myself. For the same thing, they will take care of it for local people, not for us migrant workers. I felt so bad about this unequal treatment. —Male, 25 years, printing house worker

Moreover, migrants might receive differential treatment even in situations of medical care. A 22-year-old male stall owner shared his experience in a hospital:

> If a doctor realizes that you are a person from outside of Beijing, a migrant worker, he will let you wait. I had a fever[of] about 40 degrees, I felt very ill and I was too weak even to speak. The doctor did not treat me until I waited there for about two hours.

"Nobody wants to be close to you"

Many migrants had the experience of being rejected by local residents because of their appearance, their clothes, and because of the public image of migrants being "dirty." One example of such rejection often occurs on buses:

> The thing that made me most angry is that on the bus nobody wants to sit in the place where the migrants sit. Drivers will often say to the migrants, "You are dirty, don't push others." The beautiful girl standing nearby says, "Why do you push (others), you are dirty." —Female, 20 years, typist

> When we migrant workers sit on the bus, nobody wants to sit close to us. —Male 37 years, construction worker

One of the reasons that local residents keep a distance from migrants might be the dirty working clothes that the migrants wear. However, sometimes the migrants felt that they were treated in this way for reasons other than just the dirty clothes:

> When we go back home from the construction site, we need to take the bus. We may be a little bit dirty, but we are not all that dirty. But when people see us, they dodge as far away from us as possible. —Male, 26 years, construction worker

Status loss – "Migrant workers do not have a choice"

Rural-to-urban migrants moving to urban destinations face difficulties in many aspects of their lives (e.g., housing, transportation, employment, leisure time). They usually have limited options. Most participants in our focus group discussion said that one of the main problems they encountered in Beijing was finding a place to stay, especially newly arrived migrants. Years after migrants had moved to the new place, living conditions were still bad. As one migrant stated:

> At present, our living condition has been improved. We have one bed for each person, and there are seven to eight people in one room. But before this, there were many workers sleeping in one room [in one huge bed]. —Male, 38 years, construction worker

To save money, some employers provide substandard housing for migrants. Even worse is the situation in which migrants of both genders have to share the same room. One 19-year-old male interviewee who worked in a factory told a story about a female migrant who was raped because of

the crowded housing, with male and female migrants sleeping together in one room:

> She worked in a hotel in Beijing as a waitress. She was raped by one of her co-workers. The owner of the hotel wanted to save money and had male and female employees sleep in the same room. Migrant workers did not have any other choice. If you were raped, you had to accept it [because they were sleeping in the same room]. She could not bear it. She left Beijing and went back to her hometown.

Because of the expense, renting a house is often not a feasible or affordable option for most migrants. Thus, most migrants and their families live in housing with bad sanitation. As one migrant described it,

> We (my husband and I) have stayed in an underground space. There are many mice at the place we are living in now; mice run around all over the ground.... I am not satisfied with this place, but I cannot rent a house, it is too expensive. I cannot afford it. —Female, 30 years, nanny

Deception by employment agencies

Looking for a job at the destination is the biggest challenge for migrants, especially for those who have newly moved into cities. These challenges include lack of knowledge about the job market in cities, not being familiar with the geographic setting or local transportation, and lack of knowledge about employment requirements or hiring procedures. As reported by some migrants, some employment agencies or individuals take advantage of migrants by either deceiving them or providing them with poor quality of service. Many migrants interviewed had experienced being deceived by urban agents (or zhongjie in Chinese, meaning "the middle men" or "middle agency") or individuals who claimed to help people finding jobs. A girl from Shandong province told the interviewer what happened one month after her arrival in Beijing:

> I bought a newspaper.... It said that a hotel is hiring a waitress.... I went there and paid 50 Yuan for the application fee along with my resume. After 2 hours of waiting outside, I was told that I needed to submit an additional 500 Yuan....Then, the agent wrote some notes on a piece of paper saying that this would work as a recommendation letter for me. Then he directed me to an address far away. I changed several buses and still could not find the hotel. I finally realized that I was cheated, but I could not get my money back. —Female, 26 years, nanny

A male migrant from Jiangsu province had a similar experience when he searched for a job in Beijing:

> In Xuanwu district, there was a company claimed being affiliated with the "China Women's Federation." I thought that this must be a government organization and that it would not cheat people, even though I had heard about many cases of cheating by zhongjie. I was asked to submit 200 Yuan for the application fees before I was recommended for a job working for a cell phone repair place. When I went to the place, I was told that the job required a Beijing hukou, or a Beijing guarantor. I did not have a Beijing hukou and nor did I have Beijing guarantor. I was cheated by the agency. —Male, 19 years, factory worker

Discrimination – Unfair Treatment at Work

Almost all participants we interviewed reported that even when migrants were able to find work, the type of job, working condition and the salary paid was often below their expectations and needs. Many jobs that migrants are able to find are dangerous and dirty, and are generally jobs that local people are not willing to do. A female migrant who worked as a babysitter related,

> …if you are migrants, you must do the hardest work, the most tiring work, and your payment is the lowest. Everyone believes this to be true. For this reason, I don't want to say anything. However, we can eat and live. This is better than nothing; you have to survive. —Female, 30 years, nanny

Some migrants perceived that they had limited freedom in the workplace and felt less empowered to argue with the employers. One participant told the interviewer,

> I cannot come down or leave this building. From this area, I can not make a telephone call to my family. I felt the time passed slowly during the days.... At their home, they are the masters, I am the maid. It is difficult to communicate with them. —Female, 26 years, family maid

Some participants mentioned that they were given bad meals (not fresh or food that had been sitting around for a long time) by their employers. The most serious issues faced by migrants in the workplace were less pay, overwork without additional pay, or late salary payments, deduction of wages and sometimes even complete withholding of salaries.

> [The employer] deducted my pay, he said he would pay me the next year when I return to this job. —Male, 40 years, construction worker

Although migrant workers often work overtime and are generally overworked, they do not obtain the same benefits as local workers. One female migrant provided a typical account of the situation during the in-depth interview:

> During the New Year and other holidays, Beijing resident employees receive extra money, but we don't receive those. During the holidays, Beijing resident employees who work can receive triple pay, but we do not; we never receive this kind of treatment. —Female, 20 years, waitress

Some participants addressed the issue that migrants in the same work unit as local workers receive unequal treatment. Local employees receive some social benefits, but migrant workers do not. Because companies or businesses offer medical benefits/insurance based on hukou status, migrants who lack this registration are unable to receive those medical benefits. As one migrant reported,

> We, outsiders, only have accident insurance, but Beijing local people have three insurances, including social security insurance, elderly social insurance and health insurance. In addition, the salary of local people is higher and stable. —Male, 19 years, factory worker

Unfair treatment by law enforcement officers

Migrants were often asked to show their temporary residence permit by the local police. Sometimes, the manner in which the policemen dealt with them appeared to be inappropriate and resulted in the perception of discrimination among the migrant workers. The majority of migrants we interviewed reported having been asked by policemen to show the "card." As one migrant worker described it,

> Once, I was asked by the policeman, "Do you have the temporary residence permit card?".... I did not bring the card with me. He did not listen to my explanation. He arrested me.... I stayed there [in the police station] for half the night. [The policemen] were fierce. Had I said anything, they would have shouted at me. —Female, 24, hairdresser

Some migrants perceived that police harassed them for no apparent reason. As one explained,

> I was working in Gong Zhu Fen [in Beijing]. When I went back to work taking bus no. 21, I was arrested at the last bus stop by the police [for no reason]. They pushed me into a car and took

> me to the police station. I was kept there until the middle night [before my boss came to pick me up]. —Male, 47 years, construction worker

During focus group discussions, one 37-year-old male migrant angrily expressed,

> They [policemen] came to our construction site.... Construction workers don't dress well at the construction site, and [sometimes] we work extra hours until 11 pm or 12 pm. When the police see us, they arrest us. If you see the police and run, they beat you when they catch you. [Otherwise] you have to give money [bribe] to the police.

Migrants were afraid of being checked for the temporary residence permit card and were even afraid to see a police because of past experience or perceived consequences of an encounter with police. One woman related,

> Often when I see a policeman, I feel that I am seeing a monster; it is so scary. —Female, 27 years, barbershop worker

Discussion and Conclusion

The qualitative data in the present study suggest migrant workers in China felt that they were strongly stigmatized. Stigmatization against rural-to-urban migrants is common at both the individual and societal levels. Rural-to-urban migrant workers experienced stigmatization in their daily life, including employment, at the workplace, and in healthcare and access to other public services. The most common components of stigma experienced by migrant workers were separation and discrimination. Stigmatization against migrants may be attributable to several social and cultural factors, including the household registration system, socio-economic inequality between local residents and migrants, lack of legislation to protect the rights of rural-to-urban migrant workers and lack of public recognition of the contributions that migrants make to urban development.

<TX2>The hukou system in China has created a clear social identity that labels rural migrants differently from local urban people. The Chinese government has employed the hukou system mainly to control population movement. Hukou registration provided "the principal basis for establishing identity, citizenship and proof of official status" (Cheng and Selden 1994:644) that creates a social hierarchy of urban over rural. The hukou system is the most important contributing factor to the inequality of rural–urban status, since it deprives the rural population's access to equal education and employment opportunities (Liu 2005). Rural residents are unable to obtain government-subsided social benefits, healthcare and other services to which city residents are entitled. When migrating to cities, rural migrants, because of their "rural identity," are not entitled to benefit from the social services and social benefits at their urban destinations, since these services and benefits are provided on the basis of hukou (Li et al. 2006b). The hukou system also engenders a feeling of superiority among urban residents, making them feel more powerful. It also leads to further distrust and separation between the two groups, allowing stigmatization against migrant workers to become even more extensive.

The other potential cause of stigmatization against rural-to-urban migrants is based on the socio-economic inequality between the local population and rural migrants at their urban destinations. There is a larger disparity in economic development between rural and urban areas in China and the main factors contributing to urban–rural disparities are income and education. The low income levels in the rural population compared with the urban population probably account for the inequality that exists between these two populations (Du et al. 2005; Li and Piachaud 2006; Lu and Son 2006: Raa and Pan 2005). Moreover, the average educational level of the rural population is 3 years less than that of the urban population (Li and Piachaud 2006). Therefore, during economic reform in China, the movement of migrants to the cities "has given rise to significant social stratification within cities" (Chan and Zhang 1999:843). Furthermore, due to the absence of empowerment programs for them, migrant workers usually lack the opportunities to advance their education and

job skills at their destinations. This forces migrants to remain at a lower social hierarchy level, further adding to the list of undesirable characteristics that evoke stigmatization (Link and Phelan 2001). Therefore, the social power of migrants at their destination is weaker because of their hukou status and lower socioeconomic status (Curran 2002).

Lack of legislation to protect the rights of rural-to-urban migrant workers is another cause of stigmatization. Unequal pay is a very serious problem for migrants. However, there are no legal policies to protect them and ensure that they receive equal and timely pay. Even though some policies related to payment for migrants exist on paper, in practice most have not been successfully enforced, and in many instances, some migrants themselves were not aware of the existence of such policies (Goodkind and West 2002). Unfair treatment can be observed in many areas, such as in employment, job security, work compensation, overtime work, and bad working and housing conditions. Lack of appropriate legislative protection for migrants further creates an environment tolerating or permitting stigmatization against the workers.

Finally, lack of public recognition of contributions migrants make to urban development serves to increase resentment and further stigmatization against rural-to-urban migrants. Rural labour migrants not only contribute to urban development, but also contribute to rural development (Zhan 2005). However, some urban residents believe that migrants come to the city to compete with them for job opportunities and to share social welfare. They also believe that migrants impose an economic cost on cities for the possible need for additional public services, housing and infrastructure (Chang and Brada 2006). Appropriate public education among urban residents about the contribution that migrant workers have made toward urban development in past decades and the advantages of having rural-to-urban-migrants in cities would help to reduce stigmatization.

There is some potential limitation in the current study. Results are based on six of focus group sessions and 10 in-depth interviews conducted in Beijing. As such, these results may not be generalizable to migrants in other cities in China. Nevertheless, they shed light on understanding the stigmatization that experienced rural-to-urban migrant workers experience. As the first step in understanding the negative effects of stigma on health, the current study provides important information on the prevalence, forms and context of stigmatization against rural-to-urban migrants in China. Findings have some important public health and policy implications.

First, the findings suggest that the existing hukou system should be reformed, so that hukou registration serves merely as an indicator of residence rather than as a permanent status that is inherited from generation to generation. Furthermore, the reform should break the linkage between hukou status and eligibility for jobs, schooling, housing and other social services. Migrant workers and urban residents should have equal opportunities for employment, housing, healthcare, schooling for children, and other social services at urban destinations.

Second, the findings underscore the importance of public health education campaigns to reduce and eliminate the stigma against migrants. It is important to educate the public to recognize that stigmatization is detrimental to the migrants' life and social well-being, and to build social norms against stigmatization. It is necessary to establish social norms to respect migrant workers' rights. Stigmatization should be of concern not only to policy makers but also to society as a whole. Policies such as equal and affordable housing, adequate working conditions and equal pay are necessary to protect the rights of migrant workers.

Third, health promotion and prevention efforts among rural-to-urban migrant workers should consider the potential impact of stigma and stigmatization against migrants. Stigmatized migrants may suffer from health problems that are attributed to stigmatization (Markowitz 1998). However, data regarding potential mediators or moderators for the effect of stigma on health are limited (Li et al. 2006; Mak et al. 2007). Therefore, further research is needed to examine the association between stigma and health among rural-to-urban migrants and the potential factors that will mediate or moderate the association.

Fourth, well-designed comparative studies are needed to explore the different effects of migration-related stigmatization and other forms of social discrimination against temporary rural-to-

urban migrants and other populations (e.g., the urban poor or permanent registered migrants). The migration-related stigmatization may be confounded by other forms of social discrimination against the poor or other economically marginalized social groups (such as unemployed urban residents). Likewise, future studies also need to examine the role of acculturation and various migratory experiences (e.g., length of migration, social capital at both rural origin and urban destinations) among rural migrants in their perceived or experienced stigmatization. Findings from these studies will be useful in understanding the roots and forms of migration-related stigma and stigmatization, formulating policies to improve migrants' access to healthcare at urban destinations and mitigating the potential negative effects of stigma on physical and psychological well-being among the migrant workers in China and other developing countries.

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Structural Adjustment Programs and the Trickle-Down Effect: A Case Study of the Fujimori Period in Peru, Using Reproductive Health as an Indicator for Levels of Poverty

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Abstract

The purpose of this analysis is to investigate whether the Organisation for Economic Co-operation and Development/United Nations/World Bank (OECD/UN/WB) poverty reduction objectives are compatible with the neo-liberal development model, using Peru as a case study. Three OECD/UN reproductive health indicators were selected to assess poverty: female literacy, infant mortality and maternal mortality. Fertility rates were also analyzed to explore the impact that neo-Malthusian policies have wielded.

Shortly after his ascendance to power in 1990, President Fujimori undertook health finance reforms to promote cost-effectiveness and efficiency under political guidance from international financial institutions (IFIs). Internationally, Peru was portrayed as a neo-liberal success story. However, maternal mortality rates throw into contention claims that economic growth has a trickle-down effect. From the fertility rates, it can be deduced that the advent of structural adjustment has led to a resurgence of a neo-Malthusianism approach, putting family planning on the front burner, to the detriment of reproductive health.

Introduction

The main objective of this study is to assess the hypothesis that growth in gross domestic product (GDP), generated in the framework of neo-liberal structural adjustment programs (SAPs), leads to a "trickle down" effect, benefiting the poorest sectors of society. According to the trickle-down theory, there is no need for active and progressive redistribution measures, as wealth will redistribute itself.

The study has the twofold objective of exploring the liberalization of the Peruvian economy during the Fujimori period and the concomitant structural adjustment policies that curb social-sector spending, particularly affecting reproductive healthcare in Peru. It will subsequently point

out how neo-Malthusian and neo-liberal discourses, although distinct ideological influences, are intricately intertwined in this context.

It will be argued that the neo-liberal model of development imposed by international financial institutions on less-developed countries, with its health finance reforms aiming principally at improving cost-effectiveness and efficiency of healthcare spending, is not compatible with the OECD/WB/UN goals of improving reproductive health by 2015, as outlined in *Shaping the 21st Century* (OECD 1999).[1] The neo-liberal principles that sought to promote economic growth in the long run have not led to a trickle-down[2] effect. This result is highlighted by consistently poor reproductive health in women in economically disadvantaged areas of the country, with mortality rates increasing in these regions. Furthermore, it will be argued that this neo-liberal model of development, with its strong focus on neo-Malthusian population control policies that favour family planning programs over reproductive health, is detrimental to women's reproductive health.

The reproductive health status of a country is a good indicator of how gender has been affected by health sector reforms. In this study, reproductive health has been selected as a good gauge of women's position in society, while reflecting changes to the socio-economic situation of a country. Another reason for choosing reproductive health as an indicator for poverty is that the neo-liberal model of development used as a basis for structural adjustment also encompasses a strong focus on neo-Malthusian population control policies, emphasizing population control through family planning.

The following indicators – maternal and infant mortality rates and female literacy rates – are assessed in this study. With respect to these indicators, the 2015 goal aimed at achieving a two-thirds reduction in infant mortality rates and a three-quarters reduction in maternal mortality rates (OECD 1999). Also, disparity in literacy rates between men and women was to be reduced by increasing female literacy rates. In this study, it will be shown how the rise in maternal mortality rates throws into contention claims that economic growth leads to a trickle-down effect.

A fourth indicator assessed in the study, fertility rates, not specified in the OECD/UN/WB initiative, has been included to illustrate how neo-Malthusian population control policies have affected fertility rates.

In assessing the main hypotheses of the study, Latin America was chosen because most countries in the region have undergone a series of harsh SAPs due to their indebtedness, following the failure of the import substitution development[3] model. Within this region, Peru was selected because its complex socio-economic reality constitutes an optimal case study. Peru is among the countries in Latin America with extremely high disparities in regional income levels, disparities that can be translated to a divide on ethnic grounds, affecting particularly the indigenous non–Spanish-speaking population.

This article outlines the linkage of Peru's economy to the global market economy within the context of SAPs launched by President Fujimori following his election in 1990, the implementation of SAPs in Latin America, the growing salience of the World Bank in the health sector; the "populationist" versus "developmentalist" debate in population control and a socio-economic overview of Peru with highlighted regional and ethnic disparities. The four key indicators mentioned above are also analyzed.

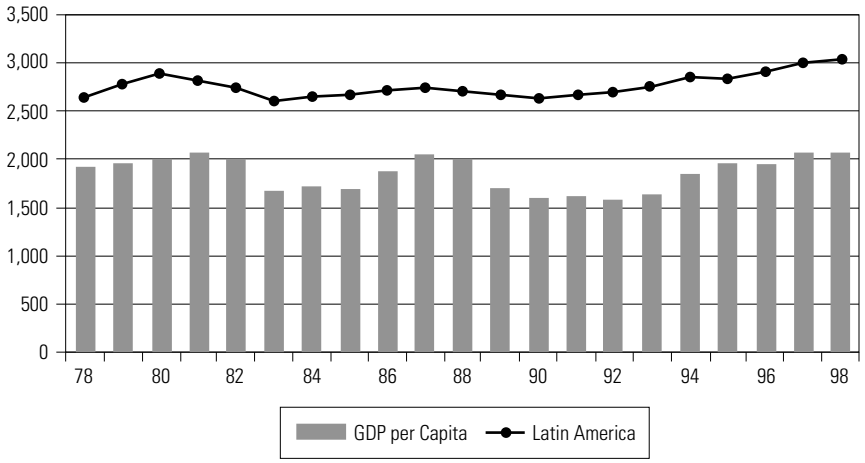
The Linkage of Peru to the Global Market: The Advent of Structural Adjustment under President Fujimori

Alberto Fujimori came to power at an extremely difficult and complex moment in Peru's history. In 1985, the Social-Democrat president, Alan García, had refused to dedicate more than 10% of Peruvian export revenues to foreign debt repayment on the grounds that further increasing repayments would impede economic development. In response, Peru was "excommunicated" from the international economic community and denied any new loans by the International Monetary Fund (IMF) and the WB. Consequently, Peru fell into dire economic straits. Total GDP fell by 8% in 1988 and by another 11.9% in 1989. Hyperinflation soared from 1722% in 1988 to 2775% in 1989 and 7650% in 1990 (Rochabrún 1996).

The ideological charge toward neo-liberalism was provoked by the IFIs' disapproval of former President Alan Garcia's economic policy, which was incapable of containing inflation or dealing with his moratorium debts. Fujimori returned Peru to good credit standing by restarting debt payments. The success of his economic shock program cemented the ideological shift in society, more generally, toward market-oriented solutions to economic and social problems.

President Fujimori's extreme austerity package or, as it is referred to in Peru, *paquetazo* (big package), consisted essentially of "shocks" aimed at reducing inflation by drastically cutting public expenditure, thus increasing the State's revenue (Guillermoprieto 1990). Reforms carried out by President Fujimori's government changed all central aspects of economic management in Peru by applying policies that formed part of the so-called Washington Consensus. Since 1992, Peru had negotiated a series of Extended Facility Programs with the IMF. The main tenet of these programs was the strict application of free-market policies to cure hyperinflation and spur economic growth. The objectives were to promote outward-oriented growth, expand the role of the private sector as the driving force of growth, remove barriers to international capital flows and diminish the economic role of the State (Rojas 1997). The programs, of 3 years' duration, aimed at consolidating the gains made in each successive program.

Figure 1. Peruvian GDP per Capita (1990)



IADB (1999). Graph reproduced with the permission of the Inter-American Development Bank.

The SAPs carried out in Peru in the 1990s did accomplish some significant results. The most notable successes were the reduction of the general fiscal imbalance and the decrease in inflation. The government managed to reduce the rate of inflation drastically, from 10.2 % in 1990 to 7.65% in 1995 (International Planned Parenthood Federation n.d.). Total annual GDP levels rose steadily throughout that period. As shown in Figure 1, Peruvian GDP per Capita (1990) by the Inter-American Bank of Development (IADB 1999) the per capita GDP in Peru rose from $1600 in 1990 to $2100 in 1998. These high growth rates have been lauded internationally as an indicator of Peru's economic recovery. Whereas Latin American economies had been stagnating during these years, Peru was touted as a model success story in the international financial community. However, although President Fujimori's economic program has been very successful in controlling inflation, it has not been able to translate short-term economic gains into progress in development. The impact of structural adjustment on the social inequalities that abound in Peru is assessed later.

Implementation of Structural Adjustment in Latin America

Throughout the 1980s, a large number of less-developed countries (LDCs), particularly in Latin America, underwent SAPs due to entanglement with an excessive debt burden, declining revenues from primary commodities and overall stagnation. Programs aimed to address protracted balance of payment problems, which had resulted in high rates of inflation and a dire economic situation. The primary objective of structural adjustment is reorienting the economies of LDCs to market-centred ones, following three components or principles liberalization (L), privatization (P) and globalization (G). These components are collectively referred to as the "LPG" model (Webb and Shariff 1992) and are overseen by the WB and the IMF. A main tenet of the model of neo-liberal development advocated by OECD countries is that, with active integration into the global market, LDCs would in due course experience economic growth. In many respects, the IMF–Mexico rescue package became a standard model applied to countries facing similar balance of payment problems, with little consideration or adjustment to the specific socio-economic/cultural situation of the country.

As a remedy, several Latin American countries, including Brazil, Mexico and Chile, were prescribed the standard structural adjustment treatment during the 1980s. Peru did not begin until the 1990s. The SAPs, subsequently implemented, reflected a strong endorsement of liberal development assumptions. Their main aims were to restore balance to the government's domestic and international accounts and, thereby, put development on a sustainable footing by devaluing the currency, liberalizing prices, reducing trade barriers, eliminating subsidies and limiting public sector employment and expenditure. The IMF stepped into the breach to prevent the debt crisis, and financial packages were offered with the stipulation that the debtor nation sign a binding agreement to modify its macroeconomic policies.

Structural adjustment has been particularly intense in the economies of Latin America, where the average annual growth plummeted to 5.5% in the 1970s (UN Commission on the Status of Women 1995). In Latin America, as part of the transition to the new development model based on the free play of market forces and liberalization of foreign trade, the State was reformed and its role in social policy redefined. In the 1990s, Latin America countries achieved greater macroeconomic stability and returned to the path of growth, correcting the severe imbalances in macroeconomic fundamentals that had arisen during the 1980s, a period widely referred to as "the lost decade." In the region, GDP grew at an average annual rate of 3.5% between 1990 and 1997 (Economic Commission on Latin America and the Caribbean [ECLAC] 1998). For proponents of market-oriented globalization, this was a succinct illustration of the triumph of the market over the nation-state. For critics of globalization, however, the victory of the market also meant the end of the State as the protector of the economically weak against the economically strong. In Latin America, economic growth did not alleviate high rates of poverty and disparity in income distribution. It became apparent that not all sectors of the population would benefit, either directly or indirectly through a trickle-down effect. This poverty afflicted particularly harshly indigenous populations living in rural areas in Bolivia, Guatemala and Peru.

The 1987 UNICEF report *Adjustment with a Human Face* (WHO n.d.) gave rise to programs with a more moderate stance that adhere to SAPs and their tenets, while extolling the need to provide safety nets for the poor, foster a participatory approach in the decision-making, and create pro-poor policies that can facilitate structural adjustment. An example of a more moderate concept is ECLAC's "productive transformation with equity," from 1991. The objectives of the ECLAC proposal are to produce, within the neo-liberal pattern, an efficient, durable and international competitive economy, and to establish democratic structures and equity at the same time.

While neo-liberalists give priority to deregulation and liberalization of markets and advocate a passive role for the State, the ECLAC proposes a selective action by the State, such as compensatory programs to combat extreme poverty, retaining the view that growth can be attained with equity (Ramos 1995). It was within this pro-poor economic growth framework that President Alejandro Toledo, elected in 2001, pledged to fulfil an ambitious campaign to lift Peru's impoverished masses

from a historical cycle of social inequity and inadequate education and healthcare. The following section shows the evolving and more salient role of the WB and IMF in health and population.

Health Reforms

The inefficiencies of Latin American health systems had been known for many decades. Despite pronounced inequality, however, sustained high levels of public investment in social programs had ensured that a relatively large group was eligible for healthcare provided by the government. The inefficiencies were only accentuated by the economic crisis of the 1980s, culminating in the IMF and WB taking advantage of the crisis and pressing for health reforms as a condition for borrowing. The IMF required structural adjustments to reduce the huge public debt that governments had contracted in previous years. Because a large part of public expenditure was allocated to social services, the IMF and WB required the government to reduce those services. It was at that juncture that the WB began to play a prominent role in international health policy. By the end of the 1980s, the WB had become the major international health lender and started to assist countries to prepare health reforms based on neo-liberal economic principles.

One objective of the reforms was to free central government funds to pay for the huge public debt. In 1993, the WB devoted the *World Development Report* to the health sector, highlighting the ideological shift toward neo-liberalism and its focus on efficiency, not only in economic but also in social reform areas (Ewig 2002). In this document, in addition to reinforcing privatization strategies, the WB included the need to improve equity and efficiency in allocations through guaranteeing universal access to a basic package of services determined according to what each country could afford and based on cost-effectiveness principles. Governments would remain responsible for no more than a basic health package, components of which could vary, depending on a country's level of development.

In the following section, it will be shown how the neo-Malthusian approach links population growth to poverty and how IFIs influence health and population through the conditions of their loans.

Neo-Malthusian Population Control in the Context of Neo-Liberal Structural Adjustment Programs

Controversies surrounding population and development are not new. However, Malthusian premises of population control have never been so fundamentally challenged, and by such diverse actors, as during the 1970s. Ever since 1789, when the Reverend Thomas Malthus first published calculations to demonstrate the impact of population growth on food production, his theories have been regularly revived and reformulated.

The mid-1970s were a period of considerable rethinking in international development policy. The belief in economic growth as a panacea for development problems had been largely discredited. This led to a fresh approach to issues on population control, especially in southern countries, and gained ascendancy over the neo-Malthusian model. Proponents of this view recognized that population growth was linked firmly to development and that a rise in average income levels did not, in itself, suffice. Instead, improvements in general health and education, especially women's education, were viewed as essential to reducing infant and child mortality rates, thus laying the basis for a lower "demand" for children and raising awareness of contraceptive practices.

In the 1980s, however, economic realities provided a harsh counterpoint to the progress achieved at the 1974 Bucharest Conference and prompted the return to neo-Malthusian approaches in development programs. In the 1990s, high population growth in the developing world was viewed mainly as a threat to environmental sustainability. This emphasis had been a main factor in the revival of neo-Malthusian population control policies that often fail to recognize the true cause of high fertility rates in LDCs, which, usually, correlate high levels of poverty with illiteracy. The United Nations Fund for Population Activities (UNFPA) *State of World Population 2002*, for example, contends

that "poverty, poor health and fertility remain highest in the LDCs where population tripled since 1955 and is expected to nearly triple again over the next 50 years" and concludes that "promoting Reproductive Health and Rights is indispensable for economic growth and poverty reduction." This ideology is also reflected in the aggressive population control policies of IFIs in the South. In Peru, for example, in a 1993 project USAID provided $30 million to expand family planning services to "rural and marginal urban areas." In 1996 and 1997, it made several loans to the Peruvian government. The WB made a $150 million social development loan, which included assistance for birth control and institutional capacity building (Human Rights Internet 2000).

The United Nations International Conference on Population and Development (UN-ICPD) held in Cairo in 1994 was heralded as a "paradigm shift in the discourse about population and development" (Presser and Sen 2000: 3). Its *Programme of Action* was the first and most comprehensive international policy document to promote the concepts of reproductive rights and health. It came into existence largely because of the organizing and lobbying efforts of various women's health groups. It promoted the common ground between women's groups, population organizations, donor agencies and governments by articulating a neo-Malthusian agenda to reduce fertility rates combined with a reproductive rights agenda. It accepted the neo-liberal economic approach to the detriment of its rights agenda and encouraged governments to promote the role of the private sector in the delivery of high-quality reproductive health and family planning services to communities. It also urged countries to review legal issues and import policies that unnecessarily prevent or restrict the greater involvement of the private sector (UN-ICPD 1994).

Neo-liberal social-economic restructuring supported by the IFIs financed many pro-health initiatives. In view of the increasing salience of the population and development agenda in UN conferences, the WB started the Safe Motherhood Initiative to reduce the burden of disease related to pregnancy and childbearing. Between 1993 and 1998, it lent $383.5 million to Latin America for this initiative (WB 1999a). Then, in 1999, its Executive Board approved an $80 million loan to finance reforms to the health system, aimed at improving maternal and child health as well as reducing illness and premature death among poor people. Pierre Werbrouck, the WB resident representative in Peru, stated that the loan would support the Peruvian government's effort to design and implement new policies seeking to guarantee access to a wide range of healthcare services for Peru's poorest population groups (WB 1999b).

Initiatives such as Safe Motherhood were the result of the increasing salience of reproductive health on the UN forum, which has led to a more holistic approach and increased interest of the IFIs in the issue of reproductive rights.

On the fifth anniversary of the Cairo Conference, 1999, a formal ICPD +5 review was undertaken to assess how far countries had come in implementing the ICPD Programme of Action. Although it is too early to assess 5 years' progress into the 20-year life span of the program, in most regions of the world, ideas and realities are changing with respect to sexual and reproductive health standards. For example, laws and policies are being revised and new partnerships formed at international, national, district and local levels. The next section will provide an overview of health reforms undertaken by the Fujimori government. This will be followed by an outline of the steps taken to comply with the recommendations of the Cairo Conference.

Health Reforms in Peru

In Peru, health sector reforms began in 1991 with the introduction of fee for service in most Peruvian public health establishments and hospitals in particular. These reforms, rather than arising through a change in socio-economic philosophy, were a reaction to a critical financial situation.

Fujimori took little interest in social policy in his first two years in office, and during this time the already weak state of the health system rapidly collapsed under the stress of the economic crisis and civil war. In 1990, spending on social programs such as health was just less than one quarter of that spent in 1980 (Portocarrero Suarez and Aguirre Guardia 1992). Fujimori's economic shock

therapy, set into motion in August 1990, hit health institutions harshly, and the introduction of fee for service in 1991 was a stop-gap measure to help desperate health establishments self-finance until economic stabilization was achieved. By 1993, the economy had begun to stabilize and the State apparatus was restructured. The Ministry of Health (MoH) established reform policies in the public health sector to improve equity in healthcare by optimizing the allocation and utilization of resources through restructured healthcare financing. A basic package of health services was developed as a way of controlling health spending and regulating health services, and it was decided that the focus should be on family planning rather than primary healthcare services.

After the advent of SAPs, the Population Law enacted in 1985, which required the government to give priority to "basic maternal and child healthcare" free of charge, lost currency. The budget squeeze that led to the closure or emasculation of public hospitals in favour of an increased number of health centres affected women particularly, because these public hospitals were the only institutions that provided qualified staff and adequate equipment for obstetrical–gynaecological services. At the same time, a *de facto* fee system was imposed in all healthcare facilities, making services less accessible to low-income women. Thus, medical care for childbirth in public hospitals remained subject to fees established by each institution, whereas contraceptive methods including surgical contraception were the only reproductive healthcare services free of change.

The Follow-up of the ICPD in Peru

Since the end of 1994, diverse public and private institutions in Peru have worked to disseminate the ICPD recommendations. Non-governmental organizations (NGOs), particularly women's groups, are also monitoring the implementation of the ICPD Programme of Action in order to hold governments accountable for the progress made.

In the 1990s, the field of reproductive health and family planning in Peru underwent significant changes. The enactment of the Population Law in 1985, which had been a major advance in increasing recognition of the right to sexual and reproductive health in terms of determining the number of one's children and access basic healthcare, lost momentum. In the 1990s, the government's interpretation of the concept of reproductive health contributed to its decision to implement more aggressive family planning programs. This phase was initiated with the launch of the National Population Program 1991–1995, which was supported by Fujimori who declared 1991 the "Year of Austerity and Family Planning." The objectives of the National Population Program 1991–1995 were in part to reduce the rate of national population growth to more than 2% annually, by promoting a decrease in the fertility rate conducive to improving maternal and child health (The Center for Reproductive Law and Policy 2001).

In 1995, family planning programs implemented by the MoH at national level were given fresh impetus. The National Population Law was modified to include sterilization as one of the methods of family planning to be provided in government programs. Pursuant to this law, the MoH began an intensive campaign to raise awareness to induce women to make use of irreversible contraceptive methods in an effort to control the birth rate, especially in peasant women (Inter-American Commission on Human Rights 2000a). That same year, a regulation established that "the widest range of contraception methods" would be available completely free of charge at public health establishments (Center for Reproductive Law and Policy 1998).

In 1996, the Program of Reproductive Health and Family Planning (PRHFP) 1996–2000 proposed to consider family planning a priority of reproductive health. Its aim was to ensure for men and women the capacity and freedom to decide on the number of their offspring. Among its priority problem areas, the PRHFP identified high levels of unsatisfied demand for contraception and the increase of high-risk reproductive behaviour among adolescents. One of the program's goals was to reach a total contraceptive prevalence rate of no less than 50% of women of childbearing age. The PRHFP emphasized free services along with the provision of contraceptives including surgical sterilization. However, free medical services in the event of complications resulting from surgical sterilization were not expressly included.

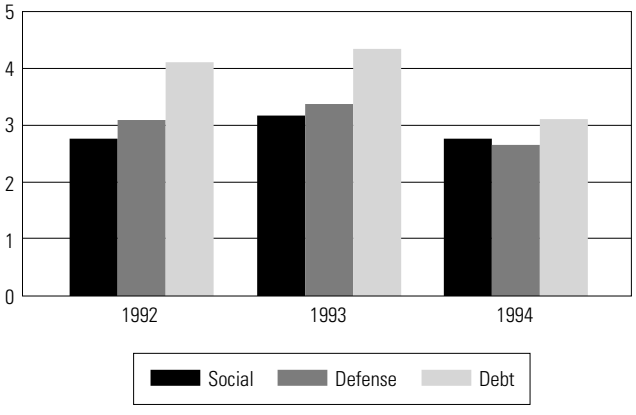
Recent media reports concerning the scandal of a program of forced sterilization, which has affected 300,000 women in Peru, have provoked widespread condemnation both domestically and internationally (Population Research Institute [PRI] 2000). According to the Population Research Institute, there is evidence that coercive family planning practices with a view to reducing poverty have occurred in the framework of a $36 million family planning program established in Peru and funded by USAID (PRI 2000). This illustrates Malthusian thinking in donor agencies and the government. It has also been reported that the government had fixed a quota of sterilizations to be performed per month and gave incentives to doctors to carry out these interventions. In addition, many women claimed to have been threatened with denial of access to public health services if they did not consent to sterilization.

A Socio-economic Overview of Peru

The Impact of Structural Reforms on Poverty Levels

Despite the publication of official figures showing a spectacular growth of GDP in Peru from 1990 to 1997, foreign debt repayments continued to be an important priority, diverting increases in GDP away from development programs aimed at raising standards of living. In 2000, Peru's total foreign debt was equivalent to 50% of GDP, well above the 19% regional average in Latin America (Social Watch 2000). Debt repayments represented 30% of the budget in 2000 and approximately 20% in the period 1995 to 1999. As shown in Figure 2, produced by Social Watch, budget allocations for the repayment of foreign debt continued to exceed social spending during the 1992–1994 period. Social spending was equivalent to approximately 3% of GDP during that same period. By 2000, official figures claimed that social spending had been increased to 6% of the GDP, equivalent to 40% of the national budget. However, it is very difficult to obtain accurate data on how much was actually spent on basic social services, as budgetary information is inadequate, a fact already noted in the 1994 report of the technical mission of the IMF's Public Finance Department (Social Watch 1996).

Figure 2. Types of spending in Peru



Social Watch (1996). Graph reproduced with the permission of Social Watch.

In accordance with the program negotiated with the IMF, the Peruvian government agreed to dedicate 1% of total GDP to social expenditure in order to alleviate the effects of the structural adjustment programs. Therefore, in 1991 the Fujimori administration implemented a National Fund for Compensation and Social Development. This project focused on social programs, social

development and reproductive health for the most vulnerable sector of the population, those living in absolute poverty. Throughout the 1990s, there was little evidence of a significant reduction in overall poverty levels that had resulted from SAPs. According to a living-standards survey in 1991, half of all households surveyed were poor and one in five was extremely poor. In 1997, the majority of Peruvians continued to live in conditions of relative poverty, with 54% of households unable to generate sufficient income to pay for the basic family market basket (Pan American Health Organization [PAHO] 1999). The Inter-American Commission on Human Rights (2000b) stipulates that the minimum wage should be sufficient to cover the cost of the basic family market basket.

According to official government figures, levels of absolute poverty were reduced from 26.8% to 14% of the population from 1991 to 1997. However, despite an overall trend for levels of absolute poverty to drop slightly, levels of relative poverty have remained constant. In *Poverty, Growth and Inequality: Peru 1991–1994*, Andrés Medina Ayala showed that the richest 20% of Peruvian society consumes nearly 50% of national expenditure, while the poorest 20% barely takes 6% of total spending, with women being particularly affected by poverty (Social Watch 1997). In 1996, according to the National Institute of Statistics and Information on Peru (INEI), 50% of women lived in conditions of relative poverty and 25% in absolute poverty (Social Watch 1997). Contributing to this increase in poverty among women had been the abolishing of the Convention 100 of the International Labour Organization. Signed in 1959, this Convention should have guaranteed equal salaries between men and women for equal work. Its abolishment was a direct consequence of neo-liberal SAPs (Social Watch 1997), as women were disproportionately represented in part-time jobs and in the economy of the informal sector, in occupations usually not covered by social security and health insurance. Social security coverage was reduced from 40.7% of the economically active population in 1987 to 23.4% in 1995 (Ministerio de Salud del Peru [MINSA] 1996). In 1994, the year in which major reforms began to be implemented, the large majority of the population (73.8%) had no insurance at all and depended on the network of public health posts, clinics and hospitals overseen by the MoH (MINSA 1996). About 25% of those without medical insurance did not use any formal means of health services (MINSA 1996), relying instead on pharmacies, market vendors, traditional healers and homemade herbal remedies (MINSA 2003).

In many respects, structural adjustment has also intensified the marginalization of the indigenous population. In Peru, indigenous populations can be classified according to language or place of residence, with a significant disparity of wealth between Spanish-speaking indigenous and non–Spanish-speaking indigenous persons. Based on native language (Quechua, Aymara or other indigenous language), a 1993 census identified 4,035,300 indigenous persons, or 17% of the population (PAHO 1999). Of this population, 75% resided in the Highlands, 9% in the Jungle and 17% in Coastal regions, including the Lima Metropolitan area. Then, 42% of this indigenous population lived in conditions of absolute poverty, double the national average. As most of the indigenous population lives in the regions, this leads to a significant discrepancy in standards of living and poverty levels between the capital, Lima, and the rest of the country.

Analyses of Reproductive Health Indicator Tendencies in Peru

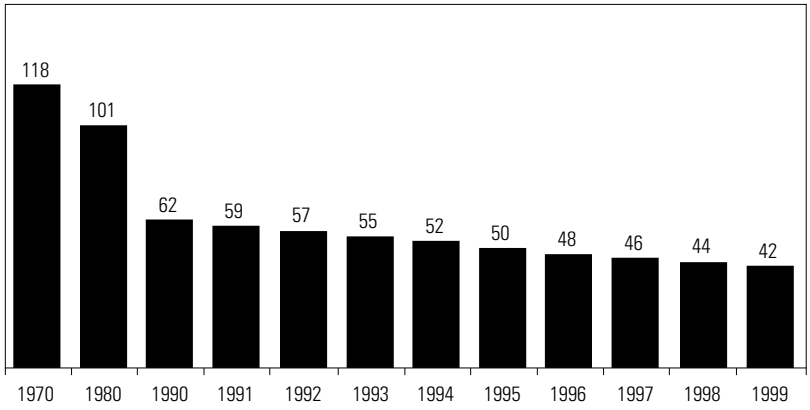
The following UN/OECD indicators – fertility, infant mortality, maternal mortality and female literacy – have been selected and analyzed in order to assess whether economic growth is the primary vehicle for poverty reduction. The importance placed on family planning to reduce fertility rates is indicative of the impact of the neo-Malthusian approach promulgated by the IFIs. Female fertility rates were, therefore, selected as a good indicator of the impact of this approach. Infant and maternal mortality rates have been selected as the most representative and important indicators for reproductive health in order to assess whether economic growth entails a corresponding improvement in the overall reproductive health situation. Female illiteracy was also included in the analysis because this indicator is widely recognized as providing the most important correlation between poor reproductive health with high fertility rates. The graphs included in this section were all produced by INEI.

However, in order to establish an accurate overview of these indicators, additional statistical information on these indicators from other sources was also assessed and summarized in the Appendix in tabular form.

Indicator 1: Infant mortality rates (See also Table 1 in the Appendix.)

As shown in Figure 3, infant mortality has generally shown a decreasing trend in the decades prior to the implementation of structural adjustment, falling from 118 per 1000 live births in 1970 to 101 in 1980 and 62 in 1990. Following the implementation of structural adjustment, there has been a further steady decrease in national infant mortality rates, from 62 in 1990 to 42 per 1000 in 1999.

Figure 3. Peru: Infant mortality rates, 1970–1979



Number of children under one for every 1000 live births.
INEI (n.d.). Graph reproduced with the permission of the National Institute of Statistics. (Note. Site available in Spanish only.)

It is important to note, however, that this trend is not evenly distributed over the entire country. The 1993 ENDES data in Table 1 of the Appendix illustrates this disparity very well, with mortality rates of 22.9 per 1000 in Lima compared to 113.9 in the Highlands. Efforts to meet immunization targets set out by the Extended Immunization Program were hampered by economic barriers as, according to INEI, only 25% of those living in absolute poverty had access to health services in 2000 (Social Watch 2000).

Indicator 2: Female fertility rates (See also Table 2 in the Appendix.)

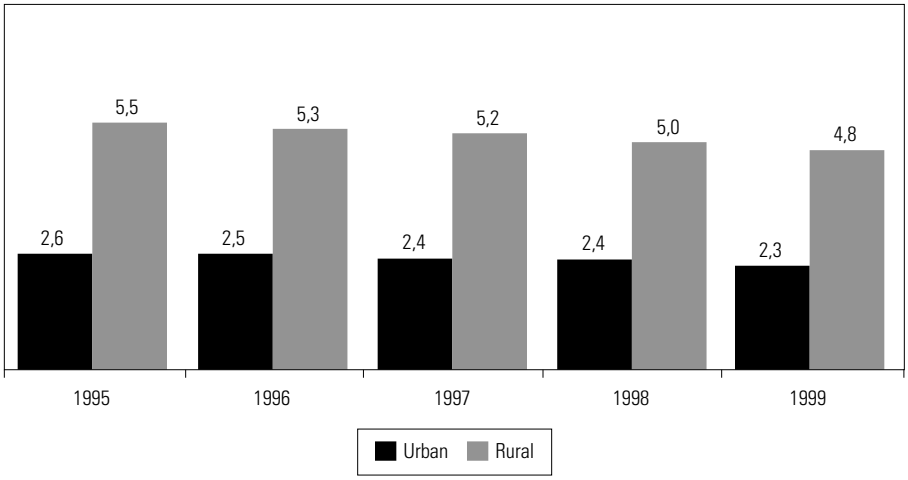
According to the US Bureau of Censuses International Data Base in Table 2 of the Appendix, overall female fertility rates have displayed a steadily decreasing trend from 4.24 in 1986 to 3.04 in 2000.

From 1995 to 1999, with an average of 5.16 children per rural woman versus 2.44 per urban woman, we observe an unprecedented reduction of 0.70 child per rural woman versus 0.30 per urban woman (Figure 4). The disparity between rural and urban fertility rates remained steady, as in previous years, with fertility rates in rural areas double those of urban areas.

Comparing Figure 4 with Table 5 in the Appendix, the official data from the Ministry for Women's Promotion and Human Development (PROMUDEH n.d.) shows a very late and sudden reduction in the number of children in rural areas versus an earlier and steadier one in urban areas. Thus, we observe a reduction of 1.50 children per rural woman versus 0.54 per urban woman within two 5-year periods, 1985–1990 and 1995–2000, whereas the reduction in the periods 1975–1980 and 1985–1990 was 0.75 child per rural woman versus 1.22 per urban woman. It is noteworthy

that this unprecedented reduction in the rural fertility rate, culminating in the period 1995–2000 (5 years after President Fujimori's ascendance to power) in a reduction of one child per rural woman versus 0.28 per urban woman, was more likely the result of an aggressive Neo-Malthusian approach than of a long educational process.

Figure 4. Peru: Global fertility rate, 1995–1999



Average number of children per woman.
INEI (n.d.). Graph reproduced with the permission of the National Institute of Statistics. (Note. Site available in Spanish only.)

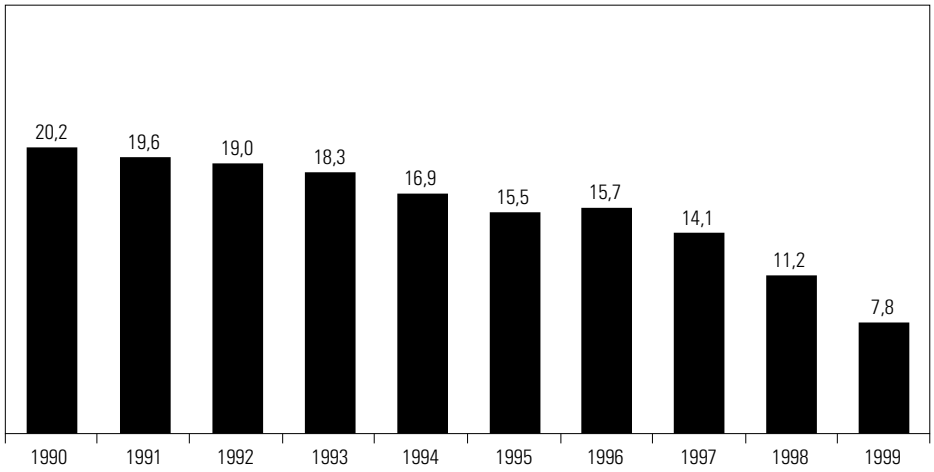
It was not possible to find precise data assessing the extent to which fertility rates had decreased in the late 1990s, possibly due in part to the increased prevalence of a contraception program that resorted unofficially to forced sterilizations on poor uneducated women. Now, Health Ministry officials estimate that the 110,000 sterilizations performed on women would have resulted in 26,000 fewer births in 1998 (The Shawnee News-Star 1998) affecting infant mortality as well as maternal mortality in the following years.

Indicator 3: Female illiteracy rates (See also Table 3 in the Appendix.)

As shown in Figure 5, official sources indicate that at the national level, female illiteracy was reduced from 20.2% in 1990 to 7.8% in 1999. However, as with indicators mentioned earlier, a reduction in female literacy rates had already taken place prior to the implementation of SAPs. According to the US Bureau of Censuses, International Data Base in Table 3 of the Appendix, rates fell from 51.7% in 1961 to 35.6% in 1972, then to 16.9% in 1981 and 15.7% in 1996. Again, this database also shows that improvements in female literacy occurred at a disproportionate rate in the Lima Metropolitan area compared with other regions. From 1981 to 1996, female illiteracy in rural areas fell only from 51.6% to 36%, whereas it fell from 14.3% to 6.9% in urban areas.

Investment in sexual health education programs with a view to complying with the ICPD objectives has limited effect on demand for reproductive healthcare. Improvements in women's status through education and economic opportunity have a strong influence on demand for reproductive health services, including family planning and delivery care. Female literacy studies have shown a strong relationship between literacy and health. Even when mothers have attended school for only 1 year, infant mortality rates decline because the women can take better care of their babies (Oxfam n.d.).

Figure 5. Peru: Evolution of female illiteracy rates, 1990–1999 (%)



INEI (n.d.). Graph reproduced with the permission of the National Institute of Statistics. (Note. Site available in Spanish only.)

Indicator 4: Maternal mortality rates (See also Table 4 in the Appendix)

Whereas the three other indicators have continued to decrease in the 1990s, the fourth, maternal mortality, shows a slight increase if anything. According to ENDES in Table 4 of the Appendix, maternal mortality rates rose from 260 in 1992 to 265 per 100,000 in 1996. However, reliable data on maternal mortality does not exist in Peru, with under-reporting of deaths at the national level estimated at 508 per 100,000 in 1992 (PAHO 1999). In some regions, for example, in the Jungle areas, under-reporting is as high as 805 per 100,000, or 990 per 100,000 in Ayacucho in the Highlands and the in Amazonas (PAHO 1999). Data shown in Figure 6 and collated in Table 4 do, however, illustrate to some degree the high disparity of maternal mortality rates between the Lima Metropolitan area and the rest of the country. For example, for 1996, INEI shows a disparity of 114 per 100,000 in urban areas versus 448 in rural areas. Also indicative of this disparity are statistics collected in 1996 in Huancavelica, the poorest province of Peru (a Highland region with a mainly indigenous population), showing a staggering rate of 713 maternal deaths per 100,000 births (Portillo n.d.).

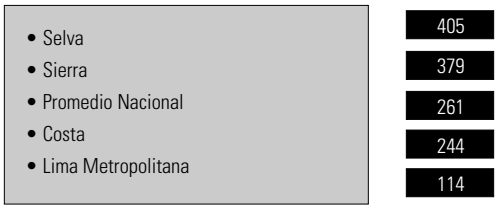
In Peru, high rates of maternal mortality were unusually predominant in rural populations and marginalized urban zones, where vulnerable groups lacked health insurance (Oxfam n.d.). According to the Demographic Health Survey 1996, rural women were twice as likely to die from childbirth complications as their urban counterparts. In 1996, 73% of births occurred at a healthcare establishment in urban areas, versus only 15% in rural areas (Center for Reproductive Rights 2003). This highlights the inadequacy of the basic package, which did not emphasize obstetrical needs.

One can also identify regional inequities in spending patterns. Paradoxically, state health expenditure was concentrated in the Lima area, where incidence of poverty in 1994 was globally less prevalent than in rural areas, which were not able to self-finance their health expenditures (Gonazalo and Francke 1997). Consequently, healthcare centres in these locales had a low capacity for addressing obstetrical complications and emergencies.

Of note is that Peru has one of the highest abortion rates in Latin America. Since most abortions are performed clandestinely, it is difficult to accurately calculate the extent of this practice. Nevertheless, the results of the study "Clandestine Abortion in Peru" indicate that for every two pregnancies that end in birth, at least one is terminated (Ferrando 2002). The cases of hospitalization for abortion complications in Peru are estimated to represent only one woman of every seven who have abortions, as data available on hospitalization, cause of deaths and other health statistics are inaccurate, incomplete and outdated. In 1998, the death rate for illegal abortion was estimated

at 400 to 600 per 100,000 procedures. In the ICPD+10 review, fewer deaths from illegal abortions can be expected as a result of voluntary or forced sterilization.

Figure 6. Peru: Maternity mortality rates, 1996



Average number of women who died per 100,000 live births, according to regions: Selva (Jungle), Sierra (Highlands), Costa (Coast), Lima Metropolitana (Lima Metropolitan area) and Promedio Nacional (national average) (INEI n.d.). Graph reproduced with the permission of the National Institute of Statistics. (Note. Site available in Spanish only.)

Important impediments in reducing maternal mortality stem also from cultural misunderstandings and estrangement between healthcare providers, who perceive themselves as being westernized, and indigenous women from isolated areas. As one NGO respondent described, indigenous women generally prefer to give birth at home because healthcare providers do not follow traditional practices, which include giving soup to the mother after childbirth and returning the placenta to them to be buried in the field. By "designing projects and fitting women into them," development programs at both the international and national levels fail to incorporate local cultural elements that are of utmost importance for indigenous women (Hardee et al. 1998: 51). Moreover, reproductive health and family planning programs of the MoH, such as the Emergency Plan for the Reduction of Maternal Mortality, which fail to address the linguistic needs of non–Spanish-speaking women, tend to reinforce the ethnic division prevailing throughout the country.

Overall Conclusions on the Analyses of These Indicators

Although a common feature worldwide, an important overall trend shown in the analyses of these reproductive health indicators is that national averages mask a marked difference between social groupings and geographical areas within the country. Analyses of fertility, maternal mortality, infant mortality and female illiteracy rates by social class and region demonstrate a distinct reality. Although there was a continuing trend of reductions in infant mortality and female illiteracy, from these statistics it is shown that the situation in Peru at that time was far from meeting the 2015 OECD/UN/WB reproductive health objectives of achieving a two-thirds reduction in infant mortality rates and a three-quarters reduction in maternal mortality rates (OECD 1999). Disparity in literacy rates between men and women was to be reduced by increasing female literacy rates.

In Peru, maternal mortality rates had, if anything, increased during the Fujimori government, illustrating the emphasis placed on reducing fertility rates to the detriment of comprehensive reproductive healthcare.

Economic reorientation, together with the ensuing social repercussions, does not appear to have had an overall effect on the course of demographic transition processes. Declining fertility rates have been the distinguishing feature of demographic trends and patterns among the populations of Peru and the Latin America and Caribbean regions over the last 30 years (ECLAC 1998). Infant mortality has also continued to decline, yet the improvements shown in the statistics were no greater in the 1990s when neo-liberalism gained dominance than in the 1980s.

However, the increase in maternal mortality rates is the indicator that throws into contention most significantly claims that economic growth entails "trickle down." Unlike the other indicators, which have demonstrated downward trends since the implementation of SAPs, maternal mortality

rates have continued to increase under the Fujimori government. This is likely the result of cutting health services and adding fee for services. In Latin America, it was calculated that the lifetime risk of dying from pregnancy- or childbirth-related causes was 1 in 130, a ratio almost 14 times higher than that of developed countries (ECLAC n.d.b.). Peru remained, along with Bolivia and Haiti, one of the countries that could be identified as having the highest maternal mortality rates in the region as a whole, at over 250 maternal deaths per 100,000 births (ECLAC n.d.b.). Due to an under-reporting of mortality in Peru, one can only partially observe the magnitude of the problem. From the data provided, it would seem that Lima and its metropolitan area benefited from neo-liberal policies to the detriment of other regions. Given Lima's economic and cultural heterogeneity, the impact of neo-liberal policies on reproductive health will need to be disaggregated according to socio-economic status.

In line with the ICPD and the IFIs' neo-liberal tenets, the bulk of available resources were allocated to family planning within publicly supported services, and the market relied on promoting efficiency for everything else. Analyses of the selected reproductive health indicators highlight the disastrous health effects that the imposition of user fees for basic reproductive services has wielded over women. They also highlight the inadequacy of the basic package of health services, which were much narrower than the essential services outlined in the Programme of Action and that public health systems now attempt to provide.

Contrary to the WB's guidelines that collected fees stay in local health facilities to improve services, health services had deteriorated in quality due to the scant ability to self-finance, which hampered efforts to meet immunization targets and obstetrical aid. This situation had contributed to the widening of the gap between affluent and destitute areas. In light of this widening gap, the central government should have determined the total state health expenditure according to the population's characteristics and capacity to self-finance.

Socio-economic factors affecting reproductive health in Peru, such as income, educational levels, ethnic and cultural backgrounds, should each be considered. Extreme poverty and lack of economic power resulting from lack of education constrain women's ability to seek and receive maternal healthcare throughout pregnancy and birth. Educated mothers are not only more open to receive information about health matters and nutrition; they are also far more likely to resort to preventive healthcare services and demand timely treatment. Also, the scope of psychological violence, especially against Andean and low-income women in public health facilities, including maternity wards, has been well documented and found to considerably deter these women from seeking healthcare.

Conclusion

In Peru, it was premised that economic growth would eventually trickle down to all sectors of society if neo-liberal programs were not interfered with. Through the '90s, Fujimori implemented reforms, designed by the WB and other donors, aimed at improving the cost-effectiveness of public health systems. Market principles of efficiency and viability in the vital social sector were introduced in the health sector.

A decade later, it is possible to assess the impact of the SAPs, which were implemented between 1990 and 2001 when President Fujimori was in office, a period that coincided with the ICPD+5 review. This paper has sought, in particular, to address the question of whether the development model is compatible with the UN/OECD/WB objectives for ameliorating reproductive health. From this study, it appears that the socio-economic consequences of political–economic restructuring have been felt most keenly by the weakest members of society, such as rural indigenous Quechua-speaking women from the Huancavelica Highland area, where persistently high infant-mortality rates and increasing maternal mortality rates have been registered.

Compounding this cultural alienation has been the top-down approach of national reproductive healthcare policies, which, by failing to consider Peru's social, cultural and linguistic needs, has led to further alienation of the indigenous communities in Highland and Jungle areas from the wealthier, more Western-oriented areas of metropolitan Lima.

This study has highlighted the incompatibility of campaigning for reproductive and sexual rights within both a neo-Malthusian and a neo-liberal framework. As illustrated in the case of Peru, placing reproductive health in a family planning rather than in a development context has had the effect of relegating maternal and infant health to the background, with "reproductive health" used as an euphemism for "fertility control." The sterilization scandal in Peru demonstrated, in particular, how sinister the neo-Malthusian model could be when applied in its extreme form.

From this analysis, it appears that strategies for achieving objectives of equity and quality have been poorly formulated. It would be valuable to explore the effectiveness of the Program of Integrated Care in Sexual and Reproductive Health, embraced by former President Toledo, within the "growth with equity" framework, focusing on promoting private investment to stimulate job creation to reduce poverty, while freezing public spending, and that of his successor, the reformed neo-liberalist, Alan García. In this respect, the upcoming ICPD+15 will undoubtedly reveal the true ability of the State to overcome the inequalities of the market.

Notes

1 The objective of the *Frameworks to Measure Sustainable Development* report was to focus on the key long-term goals of significantly reducing levels of poverty in LDCs by year 2015, and contributing to a "stable, sustainable future for this planet."

2 The term "trickle-down effect" was used by Ronald Reagan in January 1981 when he announced huge tax-cuts for the wealthy, to benefit the poor

3 The import-substitution path taken by Latin American countries was characterized by a series of stages during which these countries moved from the export of primary commodities toward developing an indigenous industrial base.

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Acronyms

Economic Commission for Latin America and the Caribbean	ECLAC
Gross Domestic Product	GDP
Instituto Nacional de Estadística e Informatica del Peru, (National Institute of Statistics and Information on Peru)	INEI
International Conference on Population and Development	ICPD
International Financial Institutions	IFIs
International Monetary Fund	IMF
Less-Developed Country	LDC
Ministerio of Salud	MINSA
or (Ministry of Health)	MoH
Non-governmental Organization	NGO
Organisation for Economic Co-operation and Development	OECD
Pan American Health Organization	PAHO
(Ministerio de) Promoción de la Mujer y del Desarrollo Humano (Ministry for the Advancement of Women and Human Development)	PROMUDEH
Structural Adjustment Program	SAP
United Nations	UN
United Nations Fund for Population Activities	UNFPA
United Nations International Conference on Population and Development	UN-ICPD
World Bank	WB

Appendix

The Appendix shows diverse official tables of statistics on four core reproductive indicators for Peru.

Sources of these statistics:

A INEI: Instituto Nacional de Estadistica e Informatica del Peru
B BUCEN: US Bureau of Censuses, International Data Base (projections)
C CIHI: Centre for International Health Information (based on BUCEN and UN date)
D CHILDINFO: UNESCO: Childinfo Data Base
E PAHO: Pan American Health Organization. A regional Interagency Coordinating Committee (RICC) Task Force (coordinating IDB, UNFPA, USAID, UNICEF, ZB)
F ENDES: National Demographic and Health Survey (1986, 1991-2, 1995)
G UNICEF: United Nations Children Fund

H WB: World Bank
I PROMUDEH Peruvian Ministry for Advancement of Women
J CID: Celade Boletin Demografico
L FE: Fuentes' source

Table 1. Peru: Infant Mortality Rates, 1960–2000

	Source							
Year	**A**	**B**	**C**	**D**	**E**	**F**		
1960				142				
1970				115				
1980				89				
1988								
1989								
1990				58				
1991								
1992							Urban	Rural
1993	55	51				59[a]	22.9[a]	113.9[a]
1994								
1995	50	48	52	46				
1996						42.8		
1997								
1998								
1999								
2000		41	43	43		45a		

[a]Results are also provided for rural and urban areas.
Infant mortality rate is defined as the estimated number of deaths in infants (children under one) in a given year per 1000 live births. This rate may be calculated by direct methods (counting births or deaths) or by indirect methods (applying demographic models).

Table 2. Peru: Fertility Rates, 1978–2000

	Source												
Year	**A**	**B**	**C**	**E**	**G**	**H**	**J**	**I**			**F**	*Urban*	*Rural*
1978												4.5[a]	7.4[a]
1986		4.24	4.2									3.1[a]	6.3[a]
1988		4.16											
1989		1.13											
1990		4.09	3.6			3.7	4[b]						
1991		3.98										*Urban*	*Rural*
1992		3.88										2.8[a]	6.2[a]
1993		3.77											
1994		3.66											
1995		3.53	3.3				3.6		*Urban*	*Rural*			
1996		3.43						3.5[a]	2.5[a]	5.6[a]			
1997		3.33			3								
1998		3.24		3		3.1							
1999		3.14											
2000		3.04	3										

[a]Results also provided for rural and urban areas.
[b]Averaged over 5 years (i.e., 1990 = 1985–1990.)
Fertility rate is an estimate of the average number of children a woman would bear during the given age-specific fertility rates.

Table 3. Peru: Female illiteracy rates, 1961–2000

	Source													
Year	**A**	**B**	***Urban***	***Rural***	**E**			**H**	**I**			**L**		
1961		51.7[a]	15.9[a]	76.3[a]										
1972		35.6[a]		64.1[a]										
1981		16.9[a]	14.3	51.6[a]										
1988														
1989														
1990	20.2							21					*Urban*	*Rural*
1991	19.6											17.4[a]	6.3[a]	45.6[a]
1992	19				*Urban*	*Rural*								
1993	18.3				13.3[a]		42.9[a]							
1994	16.9													
1995	15.5		*Urban*	*Rural*						*Urban*	*Rural*			
1996	15.7	15.7[a]	6.9[a]	36[a]					15.7[a]	6.9[a]	36[a]			
1997	14.1													
1998	11.2							16						
1999	7.8													
2000														

[a]Results also provided for rural and urban areas.
Female literacy rate is defined as the percentage of adult women (aged 15 or over) possessing basic reading skills.

Table 4. Peru: Maternal mortality rates, 1988–2000

	Source						
Year	**E**		**H**	**G**	**A**		
1988							
1989							
1990							
1991							
1992		261					
1993							
1994							
1995						*Urban*	*Rural*
1996					261[a]	114[a]	405[a]
1997				260[b]			
1998	265		270				
1999							
2000							

[a]Results also provided for rural and urban areas.
[b]UNICEF Average for 1980–1987.
Maternal mortality rate is defined as the estimated number of deaths during childbirth in a given year per 100.000 live births. This rate may be calculated by direct methods (counting births or deaths) or by indirect methods (applying demographic models).

Other data from INEI

Table 5. Peru: Fertility rates, INEI (cuadro 1)

5-Year Periods	National	Urban	Rural
1970–1975	6.00	5.09	7.55
1975–1980	5.38	4.36	7.45
1980–1985	4.65	3.64	7.08
1985–1990	4.10	3.14	6.70
1990–1995	3.70	2.88	6.20
1995–2000	3.20	2.60	5.20

Average number of children per woman.

Contraceptive Use in Yemen: A Component Analysis

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Abstract
The objective of this paper is to examine the role of modernization on current use of modern contraception in the Republic of Yemen. We used modernization theory as well as Ryder's cohort-historical model to investigate the change in fertility variables across cohorts. Data from Demographic and Health Surveys conducted in 1991 and 1997 in Yemen are used. It has been argued that in Islamic societies such as Yemen, the extent of contraceptive use is more likely to be determined by religious values than by external forces of change. However, our findings suggest that the social context of contraceptive use in Yemen is similar to the preconditions attained in societies that have experienced improvements in contraceptive use during the stage of fertility decline. We have discussed in detail the policy implications of our findings.

Introduction

Contrary to widespread predictions that natural fertility regimes in the Middle Eastern countries will persist, almost all countries in the region, apart from Yemen, have experienced fertility declines in recent decades (Rashad 1999, 2000). Fertility rates in Yemen, closely followed by the Sultanate of Oman, are higher than those in the Middle Eastern and North African states (Demographic and Health Survey [DHS] 1997), with the exception of the Gaza strip (Khawaja 2000).

In Yemen, marriage is nearly universal, and the age at first birth is low, with a high tempo of fertility during the early years of marriage (Eltigani 2001a). The 1991/1992 and 1997 DHSs report total fertility rates (TFR) of 7.6 and 6.7, respectively. One component of this low fertility decline

in Yemen is a reduction in marital fertility (Eltigani 2001a). In particular, women over 35 years of age appear to have lower fertility levels. This provides some indication that the process of fertility decline in Yemen may follow the experiences of many Western nations, where the fertility transition was heralded by a decline in marital fertility (Knodel and van de Walle 1986) during the course of modernization. Use of modern contraception within marriage was found to be a major factor in this decline.

Research on fertility in Yemen has several limitations. First, available studies are primarily descriptive (Eltigani 2001a; 2001b). They provide little empirical explanation for the prevailing fertility levels in Yemen. Second, current explanations of fertility decline in the Middle East and North African (MENA) countries tend to focus on the role of period factors such as occurrence of war, the state's subsidizing the cost of children, women's low socio-economic status and economic recessions on fertility trends (Eltigani 2000; Rashad 1999, 2000). However, very few studies have examined the effect of modernization on Yemenis' fertility. Third, little is known about the effects of modernization variables on fertility changes in Yemen.

The purpose of this paper is to examine the role of modernization on current use of modern contraception. More specifically, we propose a model based on the modernization explanation to examine the current use of modern contraception in a sample of married 15- to 49-year-old Yemeni women in the 1990s.

Current Use of Modern Contraceptives in Yemen: Toward an Explanation

One of the explanations of fertility decline, the modernization hypothesis (Haghighat 2002), suggests that modernization brings about socio-economic development and improvements in human capital, as well as changes in people's physical environment. With socio-economic development, households perceive a number of opportunities for social mobility (Petras and Veltmeyer 2003). The perception and pursuit of some of these opportunities tend to encourage the use of modern contraception for either spacing or stopping fertility. The onset of fertility decline, then, is characterized by a number of well-known strategies of family limitation. First, fertility declines within the state of marital union. Second, a large proportion of married women in high parities tend to use birth control to avert further births. Finally, the decline in fertility is seldom accompanied by reversals (Kirk 1996; Szreter 1993). Bongaarts (2001) suggests that once the fertility transition starts, family size drops rapidly. However, once fertility drops below about four births per woman, additional reductions occur, on average, at a substantially slower pace.

Over a period, the intensity as well as the spread of modernization may considerably improve the use of modern contraceptive methods. Ryder (1965) proposes a useful theoretical model, the cohort-historical, for examining the components of change in fertility determinants and their effect on fertility over time. Social change is seen as stemming from the fresh contacts new cohort members make with the contemporary social heritage (Ryder 1965). Interaction between the new cohort members and the existing social system makes it possible for the social system to influence members' characteristics. Conversely, the cohort members may bring about new rules of behaviour or alter the environment to fulfill social and economic needs. Such normative and environmental changes can bring about inter-cohort differences.

The cohort-historical model provides two explanations for differences in fertility variables across cohorts. The first is called the compositional explanation, and the second, the processual explanation. The compositional explanation assumes that the independent effect of determinants on fertility-related variables remains stable across cohorts. Given this, the changes in fertility-related variables are due to changes in the mean or aggregate levels of the determinants across cohorts. The second, the processual explanation, suggests that even if the cohort composition with respect to the determinants remains stable across cohorts, changes in fertility would result from changes in the effects of the determinants. Therefore, changes in the proportion of the predictors as well as their effects may contribute to growth in current use of modern contraceptives. These growth components are called compositional and processual.

The modernization hypothesis suggests that in Yemen, as the proportion of population with access to modern physical infrastructure (Weinstein 1979) and investment in human capital increases over time, the proportion of those who currently use contraception is likely to increase. As educational levels increase, socio-economic mobility is likely to increase over time. Furthermore, the value of education in modernizing economies for acquiring desirable positions, goods and services is also improving over time (Sperandio 2000; Finkel 2002). Therefore, the impact of the modernization variables, education in particular, on current use of family planning may vary over time.

Modernization has been closely associated with availability of basic needs such as water and electricity. Modernization has ushered into developing countries flexible water delivery service systems, including the provision of piped water (Replogle 1999). With the availability of piped water, the risk of morbidity, especially from water-borne communicable diseases, decreases considerably. Time and energy saved by the availability of water near homes, especially for women, will be diverted to other tasks. In particular, mothers are more likely to focus on tasks that improve their own health as well as the health of their children (Halberstein and Davies 1979). A shift toward improving children's health and well-being is likely to reduce the demand for a large number of children (United Nations Population Fund 2002). Therefore, those with piped water are more likely to use modern contraception.

The returns of education are many. Education is positively associated with job status. More importantly, education provides key access to the world of information and knowledge necessary to improve personal well-being in an increasingly global economy. The quality and quantity of accessible information is rapidly increasing due to technological innovations. Even if educational levels do not change, the quantity and quality of information that can be obtained, processed and utilized has improved considerably over time. Therefore, the importance of education for personal well-being is rapidly increasing. Women's perception of opportunities for participation in extra-familial activities is likely to compete with fertility goals. As a result, over time, the effects of education on family size preferences and the odds of using contraception to avert births tend to become stronger. Therefore, we expect changes in the proportion of educated women as well as an increase in the effect of education over time on modern contraceptive use.

Finally, women's labour force participation is an important determinant of fertility. Women who hold jobs outside their homes are very likely to have smaller family size preferences and are also more likely to use modern contraception than those who are not working (Bogue 1990; Pritchett 1994; Al-Gallaf et al. 1995). In Yemen, there is small but steadily growing proportion of women who are engaged in work outside their homes. Vocational training programs have been set up in the main cities of Al-Hudaydah, Tai'z and Sana'a to train para medical health professionals such as birth attendants, nurse assistants and midwives. These women gain employment in the health sector soon after completion of the training program (Noman 1995).

Methods

Data

This study uses data from Demographic and Health Surveys conducted in Yemen. Two national surveys were conducted, one in 1991/1992 and one in 1997. The 1997 Yemen Demographic and Maternal and Child Health Survey (YDMCHS) is the second national survey since the unification of the country. The YDMCHS (1997) was designed to collect data on households and ever-married women of reproductive age (15–49). The survey interviewed 10,414 of the 11,158 eligible ever-married women in this age group (Central Statistical Organization [CSO, Yemen] and Macro International Inc. [MI] 1998). The first survey, conducted during 1991/1992, interviewed 5687 eligible women (CSO, Pan Arab Project for Child Development [Egypt] and MI 1994). Responses from the "Maternal and Child Health Questionnaire" module are used in the present study. Descriptions and coding of variables are given in Table 1.

Table 1. Background characteristics of population in Yemen

Variable	Variable Name and Value	Percentage (Survey)		Variable vs. Survey
		1997	1991	Chi-sq./df
Place of residence	PLACE			
Rural	0	71.7	74.5	15.3/1*
Urban	1	28.3	25.5	
Electricity	ELECT			
No	0	49.0	44.9	46.6/1*
Yes	1	51.0	55.1	
Source of drinking water	WATER			
Non-pipe	0	57.6	57.3	6.0/1*
Piped	1	42.4	42.7	
Occupation of woman	OCCUPW			
No work/regular work	0	73.4	86.9	531.9/1*
Agri. Self-employed/ Professional/Service	1	26.6	13.1	
Education of woman	EDUCN			
No education	0	78.9	85.3	102.4/1*
Some education	1	21.1	14.7	
Number of children ever born	CEB			
Less than 4 children	0	51.3	48.5	11.64/1*
More than 4 children	1	48.7	51.5	
Age groups – respondent				
15–19	AGE15			
20– 24	AGE20			
25–29	AGE25			
30–34	AGE30			
35–39	AGE35			
40–45	AGE40			
45–49	AGE45			
Current FP use	CURRFP			
No	0	89.9	92.9	42.3/1*
Yes	1	10.1	7.1	
Region	REGION			
North Yemen	0	80.8	79.0	8.29/1*
South Yemen	1	19.2	21.0	
Husband's occupation	HUSJOB			
Agri./Household/ Unskilled/No work	0	42.2	36.1	58.66/1*
All the rest	1	57.8	63.9	
Husband's education	HUSED			
No education	0	47.1	61.1	200/1*
All the rest	1	52.9	38.9	
Excess sons over daughters	MORESON	.109(Mean)	.103 (Mean)	

*$p < .05$.

Variables

Those who had ever used modern contraceptives such as the pill, Norplant, injections, condoms, sterilization and intra uterine devices were coded 1, and the rest were assigned to the reference group, coded 0. Water and electricity, among the six independent variables, indicate the quality

of modern basic physical infrastructure. Households with a piped water supply were coded 1 and the rest 0. Similarly, those with an electricity supply were coded 1, the rest 0. Place of residence is a dichotomous variable, with urban coded 1 and the rest 0. The remaining two variables, level of education and extent of female participation in the labour force, are demographic variables. Women with some education (they had attended school) were coded 1, the rest 0. Women who work outside their homes were coded 1, the rest 0. A variable SURVEY was created to distinguish the 1991 sample survey from the 1997 survey. Six control variables, children ever born, region, husband's educational level, husband's job status, age of the mother and the number of excess sons over daughters, have been included. The control variable, children ever born (CEB),was measured from responses to the question, "Total number of children you have had during your life." Those who had had more than four children were coded 1 and the rest 0. In many developing countries with high fertility, women in general consider families with fewer than 4 children as small (Sahleyesus 2005).

The second control variable, region (REGION), is binary, with those residing at the time of interview in South Yemen coded 1 and in North Yemen coded 0. There are 19 governorates and one municipality. The governorates are Abyan, Adan, Al-Bayda', Al-Dali', Al-Hudaydah, Al-Jawf, Al-Mahrah, Al-Mahwit, Amran, Dhamar, Hadramawt, Hajjah, Ibb, Lahij, Ma'rib, Sa`dah, San`a, San`a' (city, municipality), Shabwah and Ta`izz. Of these, Abyan, Adan, Hadramawt, Lahij, Al-Mahrah and Shabwah are in South Yemen. Prior to unification of South and North Yemen in 1990, the South was a communist state for nearly two decades and was far less developed than the North. This economic development differential may influence contraceptive use.

Husband's characteristics may also influence use of family planning methods (Pillai 1993). In particular, education and the husband's job status may influence family planning use. Husband's current job status (HUSJOB) is a dichotomous variable with categories such as agricultural employee, self-employed in agriculture, household and domestic sector employment, and working as an unskilled labourer coded 0 and the rest coded 1. If the husband had no education, he was assigned a code of 0; the rest were coded 1. To control for son preference in Arab societies such as Yemen, a new variable, MORESON, was created. It is measured as the difference between the number of sons and number of daughters. Respondent's age was grouped into seven 5-year intervals: 15–19, 20–24, 25–29, 30–34, 35–39, 40–45 and 45–50. The last age group, 45–50 years, was marked as the reference category.

Analysis and Results

The proposed model of contraceptive use is presented in Figure 1.

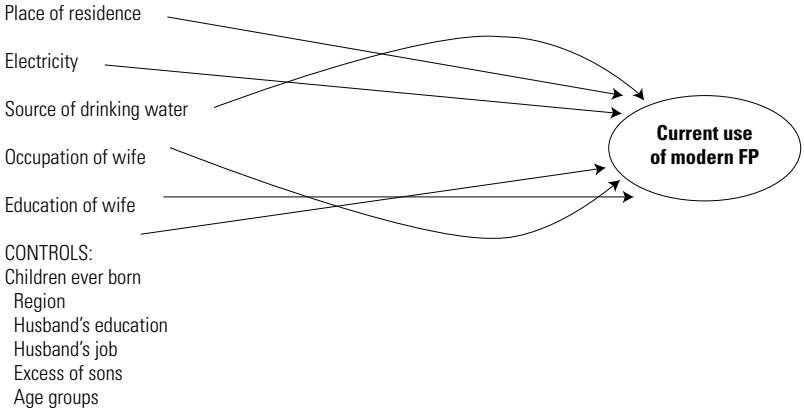
This model was tested separately for each of the two samples: 1991 and 1997 Yemen DHS. Table 1 presents descriptive characteristics of all the 1991 and 1997 survey variables used in this study.

Nearly 7% of respondents in 1991 reported current use of modern contraceptive methods. This percentage increased to about 10% in 1997. There was nearly a 3 percent increase in CURRFP during 1991–1997. The percentage of households with electricity and water declined slightly, whilie the percentage of urban households increased by about 3 points in the period between the two surveys. There was a small increase, nearly 6 points, in the percentage of women with some education. Only a small proportion of women worked outside their home. In 1991 about 13% of women had worked outside the home. This percentage more than doubled in 1997. The average number of children declined slightly during 1991–1997.

We used multivariate regression to analyze the data. The dependent variable, CURRFP, is nominal. It is therefore necessary to choose from a number of regression techniques, such as logistic and probit, specifically designed for categorical dependent variables. The probit regression method is used here. Probit regression was preferred over logistic as the former offers coefficients that are more directly interpretable than the logistic coefficients. For a binary dependent variable, the probit model is $\phi^{-1}(p) = \beta' X$ where ϕ^{-1} is the inverse of the cumulative standard normal distribution function, referred to as probit or normit. The regression coefficient β is described as the amount of Z score change in the dependent variable for unit of change in the independent variable. The predicted

probability can be obtained from a Z table. A goodness-of-fit measure is the pseudo R square that is calculated as the –2 * log likelihood (-2LL plus the sample size). As the fit of the proposed model to the data increases, the pseudo R square values also increase.

Figure 1. Model of modern contraceptive use in Yemen



Results from probit regressions of CURRFP on the modernization variables for 1991 and 1997 survey data are presented in Table 2.

The four columns in the table present the results from four probit regressions. The first two regressions are for the 1991 and 1997 samples separately, and the third is for the interaction effect of each of the variables with the variable SURVEY. The coefficient in each cell is the net effect. Across the two samples, those who have an urban place of residence are more likely to have currently used modern contraceptives. A rural–urban differential in contraceptive use is found in most Arab societies during the early phase of fertility transition (Fargues 1997). This pattern is also observed in Yemen.

Those who had an electricity connection were more likely to have currently used modern contraception than the rest. The magnitude of the 1997 coefficient is almost thrice the size of the 1991 coefficient. Those who had piped water were more likely to have ever used modern contraceptives. This holds for the 1991 and 1997 samples.

A second set of modernization variables, education and occupation, are associated with an individual's capacity to participate in modern social and economic organizations. The net effects of occupation on current use of modern contraception are not significant but are positive across the two samples. Having some education considerably improves the likelihood of current use of family planning when compared with those who have no education at all. All net effects are positive and significant. Surprisingly, there is a decline in the magnitude of the effect from 1991 to the 1997 sample. This decline occurred alongside an increase in the proportion of women with some education from 1991 to 1997 (see Table 1).

An increase in the number of children ever born is associated with an increase in the likelihood of current use of modern contraception. The likelihood of contraceptive use is lower in South Yemen compared with the North. Of the remaining control variables, husband's education had no significant influence on current use of family planning. Husbands employed in a non-agricultural sector were more likely to use family planning in 1991. However, the effect is not significant in the 1997 sample. The effects of control variables, various 5-year age groups of the wife and the presence of excess sons on current family planning use were inconsistent across the two surveys.

Table 2. Probit regression of CURRFP on modernization variables, 1991 and 1997 Yemen DHS

Independent Variables	1991	1997	Interaction (Survey*Variable)
PLACE 0 = rural	0.401*	0.253*	-.148
ELECT 0 = no electricity	0.195*	0.520*	0.325*
WATER 0 = no piped water	0.370*	0.266*	-.104
OCCUPW 0 = no work	0.109	0.050	-.094
EDUCN 0 = no education	0.681*	0.484*	-.197*
CEB 0 = <4 children	0.486*	0.323*	-.162
REGION 0 = N. Yemen	-.148*	-.346*	-.202*
HUSED 0 = no education	.003	.012	.009
HUSJOB 0 = Agri., Household and Non-skilled	.241*	.056	-184*
MORESONS	.023	.037*	.014
AGE15[a] AGE20 AGE25 AGE30 AGE35 AGE40	-.229 .119 .448* .317* .440* .322*	-.569* -.192* .039 .093 .180* .120	-.340 -.311 -.409* -.223 -.260* -.201
LR Chi^2 (16) LR Chi^2 (33)	598.47*	1047.90*	 1688.21
Pseudo R^2	0.19	0.15	0.17

LR = likelihood ratio.
[a]The reference group is AGE45.
*p<0.05.

The probit regression results provide general support for the proposed modernization hypotheses in this study. The first set of modernization variables, PLACE, ELECT, WATER and EDUCN have significant positive influences on the likelihood of current use of modern contraception. The proportion of women with some education increased during 1991–1997 (see Table 1), while the education effect decreased during the same period.

We had proposed that there would likely be significant differences in the slopes of the education variable. These slopes are associated with the outcome variables such as CURRFP among sample respondents in the 1991 and 1997 surveys. To empirically test these propositions, a number of new interaction terms are obtained. Multiplying each of the seven independent variables with a dummy variable for survey membership generates these interactions. Respondents are coded 1 if they belong to the 1997 survey and 0 otherwise. The interaction effects are presented in the last column of Table

2. The interaction effects of electricity, wife's education, region, husband's job, age group 25–30 and age group 35–40 are significant.

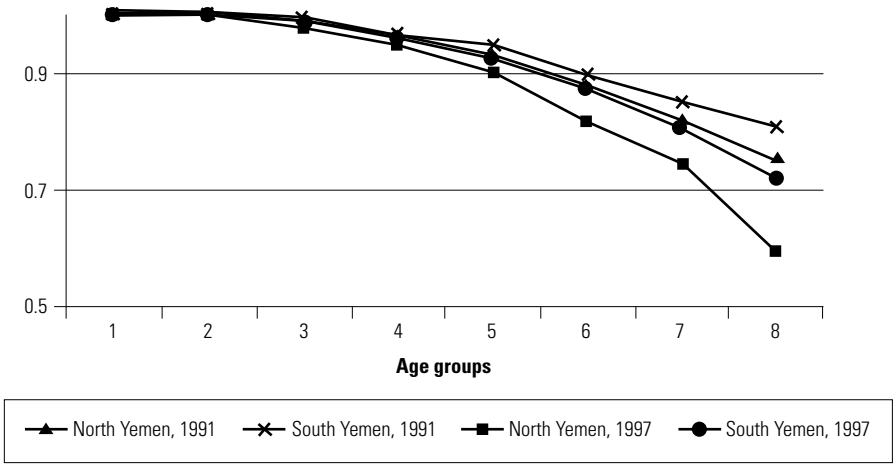
Table 3 presents the change in the proportion of modern contraceptive users between 1991 and 1997 across North and South Yemen. In 1991 the proportions using contraceptives in North and South Yemen were similar, with a small difference of 1.4 percentage points. This difference in contraceptive use increased to 3.5 percentage points in 1997. Contraceptive use was higher in the North in 1991 and 1997. The extent of current family planning use in South Yemen in 1997 is on par with the level of contraceptive use in North Yemen in 1991. Thus, regional differences in current use of family planning appear to have widened in favor of North Yemen. This regional difference is further highlighted by examining the proportion using birth control in 1991 and 1997 surveys for the two regions separately.

Table 3. Percent using modern contraception by region (South and North Yemen) and by survey (1991 and 1997)

	Use Modern Contraceptives	
Region	1991	1997
North	7.4	10.8
South	6.0	7.3

Figure 2 presents the cumulative proportions not using birth control in the 1991 and 1997 Demographic and Health Surveys separately for North and South Yemen. The 1991 and 1997 survival curves for North Yemen are much farther apart compared with the 1991 and 1997 survival curves for South Yemen. The likelihood of birth control use in the North improved much faster than in the South in the period between the 1991 and 1997 surveys.

Figure 2. Cumulative proportion not using birth control by region, 1991 and 1997 DHSs



To determine the sources of change in the likelihood of current use of modern contraception it is essential to examine the compositional and processual changes over time. The regression standardiza-

tion procedure can be used to decompose the difference in the mean level of the dependent variable (Iams and Thornton 1975; Teachman 1986). The model proposes that the differences in the mean level of the 1991 and 1997 current use of modern contraception can be decomposed into four parts. First are the differences due to different intercepts. Second are those due to different means of the covariates. Third are differences due to different effects of the covariates and fourth are the interactions between differences in the means and differences in the effects of the covariates.

Regression standardization methods are useful in assessing the extent of change in the likelihood of modern contraceptive use during 1991 and 1997. At the empirical level, these methods attempt to attribute the amount of change in modern contraceptive use to changes in slopes as well as averages of determinants that influence modern contraceptive use. Standard regression decomposition procedures such as the Oaxaca and Blinder method (Blinder 1973; Oaxaca 1973) are applicable only when the regression method used is linear. Nielsen (1998a, 1998b) suggests a method appropriate for decomposing parameter estimates from non-linear regression models such as logit and probit. Nielsen (1998a) presents three essential components of the decomposition method:

1. $\mu_{91} = \sum_{i=1}^{n} F[X_{91i}B]/N_{91}$

2. $\mu_{97} = \sum_{i=1}^{n} F[X_{97i}(B + \delta]/N_{97}$

3. $\mu_{97}^{0} = \sum_{i=1}^{n} F[X_{97i}B]/N_{97}$

where μ_{97} and μ_{91} are the average probits of modern contraceptive use. N_{97}, N_{91} are the 1997 and 1991 sample sizes. B is a vector of estimated parameters for the 1991 sample of households and δ is the estimated change for the 1997 sample households compared to the parameters for 1991 households. μ_{97}^{0} is the predicted probability of modern contraceptive use among 1997 households if they have the same parameters as the 1991 sample households. The difference in the likelihood of modern contraceptive use between 1997 and 1991 households ($\mu_{91} - \mu_{97}$) is divided into three components. One, the processual, represents the amount of change due to change in slope between 1991 and 1997. The second, the compositional, represents the amount of change in the mean levels of variables between 1991 and 1997. The third is related to all the rest, including the changes in the population intercepts.

The probit regressions of CURRFP presented in Table 2 provides crucial information with regard to the processual changes during the 1991 and 1997 surveys. The results of the decomposition are presented in Table 4. The total percentage difference between 1991 and 1997 current users of modern contraceptives is about 3%. (See Table 1). Approximately 18 percent of this difference is due to changes in composition of the sample, primarily due to changes in the composition of the modernization variables. Thus the increases in such characteristics as the proportion of respondents who had electricity at home, had piped water, lived in urban areas, resided in North Yemen at the time of the interview and had some education contributed to an improvement of the proportion currently using modern methods of family planning. A slightly smaller amount, about 17%t, is accounted for by processual changes. Consider the probit regression coefficients presented in Table 2. The 1991 and 1997 coefficients of occupation of woman are not significant at the .05 level. The rest of the coefficients, except for the coefficient for ELEC among the independent variables have declined in magnitude from their 1991 level. The ELEC coefficient increased almost threefold. The coefficients of the interaction of EDUCN and ELEC (among the variables that are not considered controls in this study) with SURVEY are significant . The 17% contribution by processual changes to the increase in proportion of current users of modern contraception is composed of significant changes in the coefficients of ELEC, EDUCN, REGION, HUSJOB and age group AGE25 and non-significant changes in the coefficients of the rest of the variables. The coefficient

of ELEC increased from 0.195 to 0.520, while the EDUCN slope decreased from 0.681 to 0.484. An increase in current use of modern contraception brought about by a strong magnitude change in the coefficient of ELEC and REGION was eroded by a decline in the magnitude of the coefficients of EDUCN and HUSJOB. The likelihood of contraceptive use in South Yemen compared with the North registered a significant decline, from -.148 to -.346.

Table 4. Decomposition of the 1991/1997 DHS survey respondents in the probability of current use of modern contraceptives in the Republic of Yemen[a]

	Contribution (Percentage Point)
Compositional (M)	18.71
Processual (S)	17.67
M + S	36.38
Intercept + Residual	63.62
Total	100

[a]Using Nielsen (1998) method.

In general, the compositional changes in the variables appear to be far more important than processual in improving the level of current use of modern contraception in Yemen. The interaction effects, except those of ELEC, EDUCN, REGION, HUSJOB, age 25–30 and age 35–40 are not significant (see Table 2). The slope changes in the two variables ELEC and EDUCN are in opposite directions, contributing very little to the improvement in current use of modern family planning. The only other significant source of contraceptive use decline is attributable to the southern regional context in Yemen. The residual, including the contribution of intercepts changes, accounts for about 64% of the changes in the level of current use of family planning. The shift in levels of current use of family planning may stem from several sources not accounted for in the proposed model of current use in this study.

Discussion and Conclusion

In this section we attempt to place the findings of our study in the broader social and economic context of modernization and development in Yemen. Prior studies on contraceptive use in the Middle East region observe that the levels of modern contraceptive use are considerably higher than they were a couple of decades ago (Allman and Hill 1978; Goldberg et al. 1983). Saxena and Jurdi (2002) claim that nearly 10.5% of the decline in fertility during the nineties is due to an increase in contraceptive utilization. They discount the role of other factors .

In the rural society of Yemen, the selected independent variables associated with current contraceptive use are wife's education, urban place of residence, region and availability of basic amenities such as electricity and piped water. Consumption of basic amenities is often a function of modern attitudes and socio-economic class membership. The above set of variables associated with current contraceptive use in Yemen are well known and often associated with the preconditions necessary for demographic transition. Therefore, the claim that in Islamic societies fertility regimes are immune from the process of modernization is not substantiated (Joseph 2004).

Several attributes of contraceptive use among Yemeni women are noticeable. First, the percentage of women currently using modern contraceptives in the 1997 sample is larger than the 1991 percentage. In addition, the likelihood of contraceptive use in North Yemen is significantly higher than in the South. This difference may be attributed to the past dissimilarities in socio-economic

and political conditions. The two decades prior to the unification of North and South Yemen in 1990 were a period of prosperity, particularly in North Yemen. Since unification there has been a decline in basic infrastructure due to deteriorating economic conditions..One component of the strength of basic infrastructure is the extent to which households have electricity supplies. The percentage of households in the 1991 and 1997 samples with piped water remained the same, while the percentage of households with electricity declined. This lack of improvement in basic infrastructure may be attributed to the economic decline that Yemen has experienced in recent years. Availability of electricity is strongly associated with contraceptive use. During 1990–1997, the strength of this net relationship increased.

Women's occupation had no effect on the likelihood of ever using contraception. However, the proportion of women who work is considerably greater among the women in the 1997 sample than in 1991 across all age groups. We can only speculate on the reasons for this. It may be a demographic response to the growing unemployment among men. Women may be involved in raising resources for household sustenance. Davis (1963) suggests that several demographic behaviours are merely responses to population pressure resulting from an improvement in life expectancy and a significant decline in infant mortality rates. Especially in agricultural societies, an increase in the number of dependent inhabitants per unit of land results in agricultural intensification, necessitating an increase in agricultural inputs such as labour (Boserup 1965). When new labour-saving agricultural technologies are not rapidly introduced, as in the case of Yemen, agriculture may become labour intensive. However, in Yemen between 1991 ad 1997 the percentage of agricultural labour in the total labour force decreased from 61% to 50%. It is likely that men who are not now able to find jobs in oil-producing countries such as Saudi Arabia will find low wage-earning (cash) jobs in non-agricultural sectors. As a large proportion of men shift from agriculture to other sectors, the agricultural sector may increasingly rely on women's labour. Women may participate more in the agricultural sector in exchange for returns in cash or kind, contributing to an improvement in the welfare of the family.

Yemeni women with some education are more likely to currently use modern contraceptive methods than women with no education. Although there has been an increase in female education, there is room for considerable improvement. Only 58% of 6- to 15-year-old children in Yemen were attending school in 1997. About 40% of those were girls. Children from middle- and upper-income families are almost twice as likely to attend school as children from poor households (El-Kogali and El-Daw 2001). The effect of education on modern contraceptive use was significantly lower in 1997 than in 1991. This decline may indicate some loss of ability among women with some education to make decisions about contraception. Traditional attitudes toward women's roles remain very strong (Bruck 1997). When economic conditions deteriorate, women's labour is likely to be more intensively used within the domestic sphere of production controlled by kin and extended family members. Under these conditions, women's education is devalued.

The results of this study suggest that modernization processes, which bring about economic development, are now inevitable for promoting modern contraceptive use in Yemen. The objectives of the national population strategy adopted in October 1991 (Bahobeshi and Zohry 1995), but revised in 1995, were to reduce the total fertility rate to 6 births per woman by the year 2000, to increase the current use of contraception by 22% among women of reproductive age and to make family planning a free choice for couples and a basic human right. These goals have not been achieved. Furthermore, the rate of contraceptive use in the southern region of Yemen is significantly lower than the rate in the North. Disparities in development between the North and South have to be addressed as a component of the overall national strategy to improve modern contraceptive use.

To achieve the national goals with respect to family planning, the government identified two strategies: to increase women's education and increase availability of contraceptives (CSO and MI 1998). The need to focus on girls' education is urgent. Currently, public expenditure on elementary level school education is low. Compared with other Arab countries such as Lebanon, the poorest quintile's share of public spending on basic education in Yemen is very low. Among the

poor in Yemen, females do not receive even half the benefits received by males from public spending on basic education (Yuki 2003). This study found that the effect of education on contraceptive use is declining. Therefore, it is necessary not only to improve educational facilities for girls and women, but also to improve their perception of opportunities for participating in the economy. In Bangladesh, such an approach focused on poverty alleviation targeting resources and services (rural credit services) to the poor and to women (Sajeda and Lloyd 1998). The current economic crisis facing the nation is of concern.

Future studies are needed to understand the social and economic constraints on modern contraceptive use among women. In this study, we have not considered the social context of marital union. Factors such as consanguineous marriage (Saxena and Jurdi 2003), ethnicity (Khattab 2002; Al-Gallaf et al. 1995) and risk of divorce may influence the likelihood of contraceptive use. Also, the costs and benefits of Yemeni women's participation in work outside the household have not been adequately examined. Very little is known about the role of education on women's status and power within the household in the predominantly rural Yemeni society. The opportunity cost and benefits that accrue to women upon improving educational levels should be further investigated.

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Aging, Health and Labour Market Activity: The Case of India

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Abstract
This paper explores the intricate relationship between the health status of the elderly and their labour market participation in rural and urban India. Data for the study are drawn from a nationally representative survey – the 1995/96 National Sample Survey. Using probit regression and propensity-score matching techniques, we found that chronic illnesses and disabilities negatively impact labour market participation across all model specifications and estimation techniques. The effect is stronger in rural than in urban areas.

1. Introduction

One important public policy aspect of population change in the world is population aging, something that has drawn a lot of attention from researchers in the West. The most important strategic concerns due to aging of the population are as follows. First, it will lead to increased demand for health, medical and personal/nursing-home care. Second, the demand for old-age income security will be higher. Third, given the extent of aging in the population, older people may be able to exert political influence on the nature and composition of publicly provided services. Fourth, it will affect the productive capacity of the economy due to an increase in the old-age dependency ratio (the ratio of the elderly to the working-age population) on one hand and an increase in the economic burden

of the aging generation on the other. Fifth, it may alter the pattern of consumption and investment activities of the economy. Understanding each of these concerns and formulating underlying public policy is crucial for the future economic well-being of any society, developed and developing countries alike. In this paper, we focus our attention on one of the key concerns – the labour market participation of elderly Indians.

In India, the elderly (aged 60 and above) comprised approximately 8% of the total population in 2001 (Shah 2004), but this percentage is expected to increase to 13% by 2025 (Rajan et al. 2003). Given falling fertility rates and increased life expectancy, the old-age dependency ratio will eventually be high. The birth rate is expected to decrease to 15 by 2021; for comparison, it was 45 in 1951 (Rajan et al. 2003). Life expectancy at age 60 has been improving and is projected to rise from its current level of 17 to 20 over the next three decades (World Bank 2001).

Mason, Lee and Russo (2000) provided estimates of both the total dependency and old-age dependency ratios for India under alternative fertility scenarios prepared by the United Nations Population Division and alternative mortality scenarios that the authors constructed themselves. Based on their projections for 2025, the total dependency ratio can fall between 0.381 (a low-fertility and high-mortality scenario) and 0.540 (a high-fertility and low-mortality scenario). The old-age dependency ratio can fall between 0.112 (a high-fertility and high-mortality scenario) and 0.133 (a low-fertility and low-mortality scenario). High fertility and low mortality produce the most rapid increase in total dependency, whereas low fertility and low mortality produce the most rapid increase in old-age dependency.

Experience from other Asian countries suggests increasing pressure on pension and healthcare systems due to increases in the dependency ratios. Since the 1950s, men's life expectancy has increased by 15 years in Japan, by 19 years in Taiwan and by 20 years or more in Indonesia, South Korea and Thailand (Westley 1998). For women, the gains have been even greater. At the same time, fertility rates in East Asia have fallen dramatically, from an average of 5.4 to about 2.3 per woman in 25 years (Westley 1998). This has led to an increase in the proportion of the elderly. In Japan, for example, individuals aged 65 and over are projected to make up 27% of the total population by 2025 (Westley 1998). This increase in dependency ratios has put the pension and healthcare systems under serious pressure in Japan, leading recently to major reforms. For instance, the minimum pensionable age in Japan will soon increase from 60 to 65 years (Westley 1998). In addition, the government has begun encouraging private enterprises to keep their workers on in some capacity after retirement, at a reduced wage. More than two thirds of employers with more than 30 employees had done so by the end of the last decade (Westley 1998). The pension system has also been reformed, with an increase in the contribution rate to 17% in 1995 and 30% by 2025 (Westley 1998). Similarly, pension systems have been reformed in Taiwan (Neumeyer 2005). A detailed discussion on the problems that these Asian countries face due to aging is beyond the scope of this paper. However, a good source of discussion on the impact of aging on fiscal policy and healthcare systems in China, Indonesia, Korea, Malaysia, the Philippines, Singapore, Thailand, Taiwan, Vietnam and Hong Kong can be found in Heller (1997). In addition, one can refer to Asher (2002) for a discussion on Singapore, and to Jitapunkul and Bunnag (1999) on Thailand.

Based on the experiences of other developing countries, India is likely to face similar problems in the foreseeable future. In the developed world, consumption by the elderly is financed primarily from their own savings or through social security programs. In India, less than 10% of the population is covered under a pension plan, largely because pensions are limited to the organized sector and a very small section of the population is employed by this sector (World Bank 2001).[1] Also, lifetime earnings are not high enough to facilitate significant savings for retirement. As a result, the elderly rely primarily on transfers, mostly from their children. In all likelihood, family support systems will come under increasing strain as fewer children support parents for a longer time. Hence, the elderly are likely to be more vulnerable to falling into the trap of a low level of economic well-being.

Over the years India has undergone a dramatic change with regard to urbanization, industrialization, migration and a growing sense of materialism, and this change has threatened the hallmarks of

the traditional family (Bhat and Dhruvarajan 2001; Jamuna 1998; Ramamurti and Jamuna 2004). A study of attitudes toward elder care showed that in 1984, 91% of adult children surveyed believed it their duty to care for their elderly parents (Jamuna 2003; Ramamurti and Jamuna, 2005). Repeat studies showed that in 1994 that number had declined sharply to 67% and in 2001 it had further declined to 51% (Jamuna 2003; Ramamurti and Jamuna 2005).Thus, the proportion of the elderly supported by their children is expected to continue its fall in the foreseeable future and beyond. Unless an appropriate social security system is developed, this would mean that the elderly will have to keep on working past what would have been their retirement age. In 1995, approximately 22% of the elderly living in urban areas and 39% of those living in rural areas were either working for an employer or were self-employed.[2] But in all likelihood, their ability to work will ultimately be hampered by adverse health shocks. It is in this context that we present the following paper. We look at how disabilities and chronic illnesses affect labour market participation of the elderly. Different types of disabilities and the number of chronic illnesses are included in a series of probit models to achieve this objective. To account for possible selection bias and to analyze the causal effect, we also adopt a propensity-score matching methodology. It is found that chronic illnesses and disabilities negatively impact labour market participation across all model specifications and estimation techniques.

The rest of the paper is organized as follows: Section 2 reviews some of the existing literature. Econometric techniques are discussed in Section 3. Section 4 includes a description of the data. Empirical results are contained in Section 5 and the conclusion in Section 6.

2. A Brief Review of the Existing Literature

A wide variety of literature deals with the early retirement decisions of individuals aged 55 and over in developed countries.[3] However, there is a paucity of research on the labour market behaviour of individuals past retirement age in developing countries. Friedman et al. (2001) examined the patterns of work and retirement in Vietnam. They found age to be negatively related to the probability of working. Also, those who reported poor health were half as likely to work as those who did not. The respondent's gender did not affect participation. Friedman and colleagues attributed this result to the "legacy of state socialism on female labor force participation." (Friedman et al. 2001: p. 220) Married individuals were more likely to work. Education, wealth and receipt of pension produced statistically insignificant results, which the authors found a bit surprising.

Another study that looked at the elderly labour supply in developing countries was by Cameron and Cobb-Clark (2002). They jointly estimated the determinants of financial transfers from children and the elderly labour supply in Indonesia using 1993 data. Their results showed that labour supply was largely unaffected by financial transfers from children. They found labour supply negatively related with age and education. Also, they concluded individuals with disabilities were likely to work less.[4]

Loew (1995) focused on hours worked by divorced women aged 55 and older in the U.S. She found wage negatively related to hours worked. Education also had a negative effect. A measure of health status was not included in the model for the reason that the survey asked a question on whether a health problem or disability prevented one from working or limited one's ability to work. The author points out that for a cohort of older women, especially those without any, or without recent, work experience, such a question would have led to an incorrect measure of health or disability.[5]

Mete and Schultz (2002) studied the impact of health on labour force participation in Taiwan, using panel data and an instrumental variable approach. The instruments were parent longevity, birthplace and childhood conditions. Results showed that better health led to an increase in labour force participation. Also, the authors found that the effect was about twice as much in the instrumental variables model as in models treating health as exogenous.

Benjamin, Brandt and Fan (2003) discussed methodological issues associated with health and labour supply and empirically estimated the effect using panel data for China. They concluded that

"ceaseless toil," meaning that the elderly have to work their entire lives due to insufficient means of support, described the work patterns. Failing health played only a small role (Benjamin et al. 2003: p. 35).

In their study, Kalwij and Vermeulen (2008 in press) used the Survey of Health, Ageing and Retirement in Europe to analyze the impact of health on labour force participation of individuals 55 to 64 years of age in 11 European countries. Both self-reported health status and objective measures were used. The authors concluded that whereas in some countries self-reported health performed well, in others it could have been endogenous and hence objective measures of health gained importance.

From this section, it is clear that though some work has been done in certain developing countries, there is no study to document the labour supply of the elderly in India. In our study, we attempt to fill this gap.

3. Model

The model used in this paper derives from the standard labour supply model. It can be written as

$$L = \alpha + \beta D + \gamma C + \delta X + \mu$$

where:

L is a measure of labour market response; it is equal to 1 if the individual is working for an employer or is self-employed, and to 0 otherwise;

D is a vector of the various types of disabilities;

C is the number of chronic illnesses;

X is a vector of various socioeconomic characteristics of the individual; and

μ is the error term.

The five types of disabilities considered are visual, speaking, hearing, locomotor and amnesia.[6] Also, individuals with more than one type of disability are considered as a separate category. Disabilities, unless accommodated in some way by an employer, for example, by the provision of assistive technology/employer accommodations, affect an individual's ability to perform tasks. In developing countries it is likely that a majority of disabled individuals have no access to assistive technology and hence are less "equipped" to work than the able bodied. Also, it is possible that individuals with disabilities face labour market discrimination. Based on these two factors, it is expected that the coefficients of various types of disabilities will be negative. Similarly, the number of chronic illnesses is expected to have a negative effect on labour market participation. However, as pointed out by Benjamin, Brandt and Fan (2003), who focus on the elderly in rural China, the relationship between health and labour supply is not that simple. They show that adverse health shocks have an ambiguous impact on labour supply. In their framework, wealth and income are important variables. The elderly in rural China are not well off and hence cannot afford to retire. This is also likely to be true for rural India. If so, we would expect the elderly to keep working until forced to retire due to bad health – disabilities or chronic illnesses. Thus for the relatively wealthy (whether from savings, assets or ample pension), financial security would be a factor in the retirement decision, whereas for the relatively poor, bad health would affect the retirement decision. Hence in countries like India, we would expect a significant negative effect of bad health on labour market participation. In addition, we would expect a stronger negative effect of disabilities and chronic illnesses on labour market participation in rural areas where people are relatively less well off.

Another issue that cannot be ignored is the time of onset of a disability or a chronic illness. If it happened during old age, it would reduce productivity and wages and hence provide a disincentive to work. On the other hand, if the disability had happened at a younger age, it would have reduced productivity and income in that period and would thus have led to lower levels of wealth accumulation, forcing the individual to work during old age. Unfortunately, our data set does not include

information on the onset of disability or chronic illness. Not being able to disentangle these effects has a consequence. If a lot of individuals experienced the onset at a younger age, then the effect of disabilities and chronic illnesses starting during old age is likely underestimated in our model. The focus of this paper, however, is to study the impact of disabilities/chronic illnesses regardless of time of onset.

In addition, our model includes a number of control variables representing the various socio-economic characteristics of an individual. The first set is predetermined controls and includes age, gender, education, marital status, caste and region.

Empirical labour supply literature dealing with the working-age population has found labour supply to have an inverted U-shaped relationship with age. Labour supply is the highest in the middle ages, after which there is a decline. In our paper we look at individuals aged 60 and above, hence we expect age to have a negative effect. In empirical literature dealing with elderly labour supply, two views are expressed about the role of education (Loew 1995). The first states that the more educated people would have accumulated more savings during their working lives due to higher incomes and hence would not feel the need to work during old age. The second states that it would be relatively easier for the more educated to obtain employment and so this category would be more likely to be working. Hence, the sign of the coefficient depends on the relative magnitude of these effects.

In addition, there are other controls which, while being important, can be endogenous. They include wealth, household expenditure (a proxy for household income), pension indicator, living arrangements and household size.

An individual's labour supply is a function of his or her own income and the income of other household members. Ideally, one would want information on an individual's wage rate but, unfortunately, as also pointed out by Benjamin, Brandt and Fan (2003), measurement of economic variables is problematic in developing countries. Wages are frequently not even observed in developed countries. Moreover, wages from self-employment are not reported, and the majority of the working elderly in India are self-employed (see Table 1). Our data set includes information on household expenditures. Such expenditures have routinely been used as a proxy for household income in many studies dealing with developing countries, where information is more readily available for expenditures than for income. As regards household income, Benjamin and colleagues (2003) point out that results need to be interpreted with caution, stating,

> … if health is endogenous to labor supply, it is even more so in an income regression. Most obviously, higher income households may be healthier, so the positive association between health and income may have nothing to do with the causality running from health to income (Benjamin et al. 2003: p. 32-33)

As regards wealth, our data set includes information on whether or not the individual owns property assets. Costa (1998) points out that *a priori* the effect of wealth or income on the response of labour supply to health is ambiguous. On one hand, at the onset of disability or chronic illness, wealth can facilitate withdrawal from work. On the other, the income effect of higher wealth is dominant and the retirement decision is less dependent on the health status.

We also have a dummy variable indicating whether an individual is drawing a pension. One was also included by Friedman et al. (2001). It is expected that receiving a pension is likely to decrease the probability of working.

In developing countries, children are an important source of support during old age. In our model we include a living-arrangement variable. It is expected that the elderly who live with their children are less likely to be working. However, as pointed out by Edmonds, Mammen and Miller (2005) and Hamoudi and Thomas (2005), living arrangements can be endogenous to a labour force participation decision.

From this section, it is clear that the relationship between health and labour supply is not simple.

There are potential concerns of unobserved heterogeneity, and there are endogeneity concerns for some of the regressors discussed above. To address some of these, we produced a series of estimates by gradually increasing the number of controls. We also used more robust methods to control for potential self-selection, using propensity-score methods.[7] It should be noted, however, the endogeneity of health in our models should not be cause for concern because the measures of health that we use are "relatively more" objective, more so in the case of chronic illnesses. As pointed out by Bound (1991) and Kalwij and Vermeulen (2007), self-reported health can be endogenous in a labour supply model due to the justification hypothesis, which states that individuals justify their non-participation by claiming they are in ill health.

4. Data Source and Characteristics

Data for this empirical exercise are drawn from the 52nd round of the National Sample Survey (NSS), a nationally representative survey conducted by the National Sample Survey Organization (NSSO), Ministry of Statistics, Government of India, July 1995 – June 1996 (NSSO 1998). The NSSO adopted a two-stage stratified-sampling design. First-stage units were census villages in rural areas and NSSO urban blocks in urban areas; second-stage units were households in both rural and urban areas. Sample villages and urban blocks were selected with a probability proportional to population size in the form of two independent interpenetrating subsamples. For the selection of households, the frame consisted of three second-stage strata in which a total sample of 10 households was selected. The composition of second-stage stratum was two households reporting at least one child aged 0 years, two households reporting any case of hospitalization and six remaining households. The survey covered the whole of India except for the interior areas of Nagaland, Andaman and Nicobar Islands, and the Ladakh, Kargil and Dodha districts of Jammu and Kashmir. Data were collected separately for urban and rural areas.

The survey covered the problems of aged persons, utilization of maternity and child healthcare services, and morbidity and utilization of medical services. In this paper, we analyze household responses relating to the problems of aged persons. Numbers of persons aged 60 years and above interviewed in the survey in rural and urban areas were 20,949 and 13,032, respectively. NSS data are available in the form of responses pertaining to different segments of the questionnaire. Fortunately, it is possible to link different segments of individual and household responses (using information on state/region code, village/block serial number and second-stage stratum number) and an individual identifier (using household identity and the serial number of members of a household).

Characteristics of individuals included in the sample are shown in Table 1. The dependent variable in our model is labour market participation. All individuals working for an employer or self-employed were considered labour market participants. In urban areas 5.2% of the elderly were working for an employer and 15.7% were self-employed. In rural areas, 8.2% and 30.5% were working or self-employed, respectively.[8]

The majority of the rural elderly, 77.1%, were illiterate, and only 0.6% had higher secondary (high school) education or above. The urban elderly were relatively more educated, and approximately 58.5% were literate. Of these, 9.2% had completed higher secondary or had graduated from university.

Disabilities were more prevalent in rural than in urban areas. Of the urban elderly, 36.4% reported some type of disability, compared with 40.5% of the rural elderly . The most common type was visual. Twenty-five percent of urban and 27% of rural individuals were visually impaired. Hearing was the second most common disability, with 12% of urban and 16% of rural elderly hearing impaired. Seventeen percent of those in rural parts and 13.5% of those in urban parts had more than one type of disability (not shown). Chronic illnesses (not shown) were slightly more prevalent in urban than in rural India, with 55% of urban and 54% of rural residents reporting at least one chronic illness. Among those with at least one chronic illness, the mean number of illnesses was 1.6 in urban areas and 1.5 in rural areas. A chronic problem with joints was the most prevalent ailment, both in the urban (35%) and rural (40%) parts of the country.

Table 1. Characteristics of the sample (percentages in parentheses)

Variable	Urban n (%)	Rural n (%)
Total	12,432	19,906
Activity		
Working	643 (5.2)	1631 (8.2)
Self-employed	1957 (15.7)	6082 (30.5)
Disability type		
Visual	3096 (24.9)	5457 (27.4)
Locomotor	1159 (9.3)	2333 (11.7)
Amnesia	930 (7.5)	2184 (11.0)
Hearing	1548 (12.5)	3350 (16.8)
Speaking	391 (3.2)	847 (4.3)
Mean number of chronic illnesses	0.88	0.80
Age group		
60 to 69	7659 (61.6)	12397 (62.2)
70 to 79	3582 (28.8)	5635 (28.3)
80 and over	1191 (9.6)	1874 (9.4)
Gender		
Male	6147 (49.4)	10204 (51.2)
F emale	6285 (50.6)	9702 (48.7)
Marital status		
Widowed/divorced/separated/ single	5026 (40.4)	8193 (41.1)
Married	7406 (59.6)	11713 (58.8)
Education level		
Illiterate	5161 (41.5)	15350 (77.1)
Primary	3600 (29.0)	3507 (17.6)
Secondary	2527 (20.3)	931 (4.7)
Higher secondary and above	1154 (9.2)	118 (0.6)
Property assets	7547 (60.7)	13197 (66.3)
Pension	1801 (14.5)	1027 (5.2)
Living with child	4301 (34.6)	6808 (34.2)
Caste		
Scheduled caste/tribe	1675 (13.5)	5794 (29.1)
Per capita monthly expenditure(Rs)	564	359

Almost three times as many elderly in urban areas drew a pension or had made provisions for a regular income after retirement, as compared with those in rural areas (14.5% versus 5.2%). The mean per-capita household monthly expenditure in urban India, 564 rupees, was somewhat higher than that in rural parts of the country, 359 rupees. More than half of individuals stated that they owned property assets.

A large percentage of the elderly in both rural and urban parts were either themselves the household head (49%) or were the head's parent (30%) (not shown). Rural India had a higher percentage of elderly males, 51.2%, than urban India at 49.4 %. Approximately 59% of the elderly were married; close to 40% of the individuals in the sample were widowed.

In the following discussion we explore some relationships among the variables, a more formal analysis being presented in the next section. A much larger percentage of males reported participating in the labour market than females, 37% versus 7% in urban areas and 60% versus 16% in rural areas (not shown). Married individuals were more likely to be working. In urban areas, 29% of married and 11% of non-married individuals (i.e.. widowed, single, divorced or separated) participated in the labour market. Comparable numbers for rural areas were 50% and 23%, respectively.

Disability and chronic illnesses seem to decrease labour market participation. In urban areas, 14% of the disabled reported working,

compared with 26% of the able bodied. Corresponding numbers for rural areas were 25% and 48%. The difference in labour market participation between those with and without chronic illnesses was equally pronounced. Among urban (rural) elderly, 18% (32%) of the chronically ill and 26% (46%) of the healthy stated that they were working.

Labour market participation appears to decrease with age. Among those between 60 and 69 years, 27% in urban and 47% in rural areas reported working. Corresponding numbers for those aged 70 and above were 13% and 25%, respectively, in urban and rural parts of the country.

We see that the elderly who received no pension or those who had not made provisions for a regular income after retirement were more likely to be working (25% in urban and 41% in rural parts). Among those who received no pension or who had saved enough, 3% and 6% participated in the labour market in urban and rural areas, respectively. Individuals with property assets were almost three times as likely to be working as those without such assets. Lastly, the elderly belonging to scheduled castes/tribes (termed as "lower" castes) were slightly more likely to be labour market participants (25% versus 21% in urban areas and 43% versus 37% in rural areas).

5. Empirical Results

Since our dependent variable is binary, probit or logit models are appropriate. As is customary in labour supply models, a probit model is estimated. Separate models are estimated for urban and rural areas, given the differences in culture, lifestyles, economic activity and availability of goods and services. The probit model is estimated by maximum likelihood with a robust standard errors option, so the results are heteroscedastic-

Table 2a. Labour market participation probit results – coefficients for urban areas

	Model 1	Model 2	Model 3
Health			
Disability (base: non-disabled)			
Visual only	-0.249*** (0.039)	-0.240*** (0.044)	-0.216*** (0.048)
Locomotor only	-0.418*** (0.086)	-0.402*** (0.101)	-0.393*** (0.108)
Amnesia only	-0.189* (0.097)	-0.085 (0.109)	-0.066 (0.116)
Hearing/speaking only	-0.304*** (0.068)	-0.214*** (0.076)	-0.197** (0.084)
Multiple	-0.608*** (0.046)	-0.537*** (0.055)	-0.507*** (0.060)
Number of chronic illnesses	-0.118*** (0.014)	-0.128*** (0.016)	-0.104*** (0.017)
Age (base: 60–69)			
70–79		-0.451*** (0.034)	-0.439*** (0.037)
80 and over		-0.911*** (0.070)	-0.917*** (0.074)
Education (base: illiterate)			
Primary		-0.200*** (0.036)	-0.169*** (0.039)
Secondary		-0.457*** (0.041)	-0.248*** (0.045)
Higher secondary and above		-0.696*** (0.054)	-0.378*** (0.064)
Region (base: north)			
Central		-0.016 (0.064)	0.030 (0.070)
West		-0.072* (0.042)	0.052 (0.044)
Northeast		0.143** (0.066)	0.030 (0.073)
East		-0.019 (0.047)	0.019 (0.050)
South		0.021 (0.040)	0.106** (0.043)

Table 2a. Continued.

	Model 1	Model 2	Model 3
Other			
Male		1.399*** (0.036)	1.466*** (0.038)
Married		0.070** (0.034)	-0.152*** (0.052)
Scheduled caste/tribe		-0.001 (0.043)	0.035 (0.046)
Have property assets			0.563*** (0.036)
Retired with pension			-1.811*** (0.072)
Monthly expenditures			-0.00003*** (0.000)
Household size			-0.001 (0.006)
Living with child			-0.308*** (0.053)
Constant	-0.566*** (0.018)	-1.068*** (0.043)	-1.137*** (0.070)
Observations	12,432	12,432	12,432

Note. Robust standard errors in parentheses.
*Significant at 10%; **significant at 5%; ***significant at 1%.

Table 2b. Labour market participation probit results – marginal effects for urban areas

	Model 1	Model 2	Model 3
Health			
Disability (base: non-disabled)			
Visual only	-0.066*** (0.009)	-0.052*** (0.009)	-0.041*** (0.008)
Locomotor only	-0.100*** (0.016)	-0.078*** (0.015)	-0.065*** (0.014)
Amnesia only	-0.050** (0.024)	-0.020 (0.024)	-0.013 (0.022)
Hearing/speaking only	-0.077*** (0.015)	-0.046*** (0.015)	-0.037*** (0.014)
Multiple	-0.142*** (0.008)	-0.104*** (0.008)	-0.084*** (0.008)
Number of chronic illnesses	-0.034*** (0.004)	-0.031*** (0.004)	-0.021*** (0.004)

consistent estimates. Estimated results are presented in Tables 2 and 3 for urban and rural areas, respectively.[9]

Given the potential concerns of unobserved heterogeneity and endogeneity, we present a series of estimates. The first three sets are presented in Tables 2 and 3. Here we start from a specification with only specific disabilities and chronic illnesses as the regressors. It can be seen that bad health, measured either as the presence of a disability or as the number of chronic illnesses, has a negative influence on labour market participation in both rural and urban areas. The only exception is presence of amnesia among the urban elderly, the results for which are statistically insignificant. Apart from multiple disabilities, the disability with the strongest negative effect on labour market participation is locomotor for both rural and urban parts. Based on the marginal effects contained in Tables 2b and 3b, it can be said that compared to those without a disability, the probability of working for those with a locomotor disability is lower by 0.10 in urban areas and by 0.25 in rural areas. For those with multiple disabilities, the probabilities are lower by 0.14 and 0.24, respectively, in urban and rural areas. Also, as the number of chronic illnesses increases by one, the probability of being employed decreases by 0.03 and 0.05 in urban and rural areas, respectively. Overall, a comparison of results for the two areas reveals that the effect of bad health is much stronger in rural areas. A reason, mentioned in an earlier section, could be that people in rural India are relatively less well off and unlikely to be covered by a pension plan; hence they would likely keep working until an adverse health shock prevented them from

doing so. Another possible explanation could be that work in rural areas is physically much more demanding. Almost all the rural population is engaged in agriculture which, in India, is not as mechanized as in many other countries and hence is very labour intensive. Thus, physical disabilities and chronic illnesses are likely to have a stronger negative effect.

Next, the predetermined controls of age, gender, marital status, education, caste and region are introduced. Conclusions remain unchanged: Once again we see that bad health is a deterrent to work.

Regarding education, results show that in urban areas, the more educated elderly are less likely to work. As explained in an earlier section, education could have either a positive or negative effect. The positive effect could result from the ease of obtaining employment. On the other hand, the negative effect could result from higher incomes and hence higher savings during the working age. Thus, in urban areas it appears that the latter effect is stronger. Another reason for the negative effect could be that educated individuals are more likely to take wise financial decisions during the course of their lives or are better able to organize their available resources during retirement. Hence, they do not need to work after retirement. The result related to education for urban areas, however, is not the same as for the rural areas. Only one coefficient is statistically significant and reveals that compared to the illiterate, those with a primary level of education are more likely to be working.

Age appears to have a strong negative effect on labour market participation. The result holds both for urban and rural areas. Males and those who are married are more likely to be working. Caste has no effect in urban areas; however, in rural areas

Table 2b. Continued.

	Model 1	Model 2	Model 3
Age (base: 60 to 69)			
70–79		-0.097*** (0.007)	-0.081*** (0.006)
80 and over		-0.144*** (0.006)	-0.120*** (0.006)
Education (base: illiterate)			
Primary		-0.046*** (0.008)	-0.033*** (0.007)
Secondary		-0.094*** (0.007)	-0.047*** (0.008)
Higher secondary and above		-0.121*** (0.007)	-0.065*** (0.009)
Region (base: north)			
Central		-0.004 (0.015)	0.006 (0.015)
West		-0.017* (0.010)	0.011 (0.009)
Northeast		0.036** (0.018)	0.006 (0.015)
East		-0.004 (0.011)	0.004 (0.011)
South		0.005 (0.010)	0.022** (0.009)
Other			
Male		0.336*** (0.008)	0.311*** (0.008)
Married		0.017** (0.008)	-0.032*** (0.011)
Scheduled caste/tribe		-0.000 (0.010)	0.007 (0.010)
Have property assets			0.109*** (0.006)
Retired with pension			-0.184*** (0.005)
Monthly expenditures			-0.00001*** (0.000)
Household size			-0.0003 (0.001)
Living with child			-0.060*** (0.010)
Observations	12,432	12,432	12,432

Note. Robust standard errors in parentheses.
*Significant at 10%; **significant at 5%; ***significant at 1%.

Table 3a. Labour market participation probit results – coefficients for rural areas

	Model 1	Model 2	Model 3
Health			
Disability (base: non-disabled)			
Visual only	-0.402*** (0.028)	-0.347*** (0.033)	-0.335*** (0.035)
Locomotor only	-0.827*** (0.063)	-0.813*** (0.074)	-0.815*** (0.080)
Amnesia only	-0.451*** (0.059)	-0.317*** (0.066)	-0.314*** (0.069)
Hearing/speaking only	-0.326*** (0.042)	-0.258*** (0.049)	-0.259*** (0.051)
Multiple	-0.715*** (0.028)	-0.584*** (0.033)	-0.590*** (0.035)
Number of chronic illnesses	-0.132*** (0.011)	-0.177*** (0.013)	-0.181*** (0.013)
Age (base: 60–69)			
70–79		-0.484*** (0.024)	-0.462*** (0.025)
80 and over		-1.127*** (0.048)	-1.075*** (0.051)
Education (base: illiterate)			
Primary		0.099*** (0.028)	0.118*** (0.030)
Secondary and above		-0.075 (0.049)	0.174*** (0.053)
Region (base: north)			
Central		0.034 (0.045)	0.067 (0.048)
West		0.079** (0.032)	0.110*** (0.034)
Northeast		-0.006 (0.046)	-0.064 (0.048)
East		-0.024 (0.029)	-0.090*** (0.030)
South		-0.053* (0.031)	-0.032 (0.034)
Other			
Male		1.351*** (0.024)	1.291*** (0.025)
Married		0.233*** (0.023)	-0.001 (0.036)

those belonging to the "lower" castes are more likely to be working.

In the next specification, additional regressors such as wealth, pension indicator, household expenditure, living arrangements and household size are included. Once again, conclusions regarding health remain unchanged. Disabilities and chronic illnesses have a negative effect on the probability of working.

Three variables related to income and wealth are introduced in the model. Results show that the elderly who draw a pension are less likely to be working. We also find that the higher the household expenditure, which is a proxy for household income, the lower the probability of working, though the coefficient is extremely small. Individuals who have property assets are more likely to participate in the labour market. This last finding could be a result of the property not having been paid off by retirement age. Household size has no effect on the probability of working in rural areas; however, the elderly living with children are less likely to be working.

The results based on the probit models discussed above, however, have some obvious limitations. First, as in any cross-sectional study, causal relations may not be so straightforward. Second, there could be potential self-selection problems causing bias in the results. Third, disabilities and chronic illnesses may have short- and long-term effects on labour market outcomes. This is difficult to investigate, since

we have no data on the time of onset of disabilities and chronic illnesses. However, we adopted a more robust approach to control for potential self-selection using the propensity-score matching methodology to arrive at greater insights into causal effects. Measures of whether a person had "any disability" or "any chronic illness" are constructed and the propensity-score matching technique is used to estimate the relationship between "any disability" and labour market participation and "any chronic illness" and labour market participation.

Extensive discussion on propensity-score matching methods can be found in Rosenbaum and Rubin (1983, 1985), Heckman et al. (1997, 1998), Dehejia and Wabha (1999, 2002) and Smith and Todd (2005). The basic idea behind the methodology is to use a statistical matching technique to mimic randomization in control and treatment groups in experimental studies. In the present case, the control group is the one with no disability and the treatment group is the one with at least one disability. Groups are similarly defined for chronic illnesses. If all observations in the control and treatment groups are similar with respect to all observable characteristics, then having any disability or chronic illness may explain the labour market participation decision accurately. A number of authors emphasize that the validity of matching depends on the absence of unobserved effects. In order to satisfy this assump-

Table 3a. Continued.

	Model 1	Model 2	Model 3
Scheduled caste/tribe		0.193*** (0.023)	0.200*** (0.025)
Have property assets			0.662*** (0.026)
Retired with pension			-1.910*** (0.078)
Monthly expenditures			-0.0001*** (0.000)
Household size			-0.015*** (0.004)
Living with child			-0.320*** (0.038)
Constant	0.016 (0.013)	-0.747*** (0.028)	-0.663*** (0.047)
Observations	19,906	19,906	19,906

Note. Robust standard errors in parentheses.
*Significant at 10%; **significant at 5%; ***significant at 1%.

Table 3b. Labour market participation probit results - marginal effects for rural areas

	Model 1	Model 2	Model 3
Health			
Disability (base: non-disabled)			
Visual only	-0.143*** (0.009)	-0.118*** (0.010)	-0.110*** (0.010)
Locomotor only	-0.252*** (0.014)	-0.230*** (0.014)	-0.218*** (0.014)
Amnesia only	-0.155*** (0.018)	-0.106*** (0.020)	-0.101*** (0.020)
Hearing/speaking only	-0.116*** (0.014)	-0.088*** (0.016)	-0.085*** (0.015)
Multiple	-0.241*** (0.008)	-0.190*** (0.009)	-0.184*** (0.009)
Number of chronic illnesses	-0.050*** (0.004)	-0.064*** (0.005)	-0.064*** (0.005)
Age (base: 60–69)			
70–79		-0.166*** (0.008)	-0.153*** (0.008)
80 and over		-0.299*** (0.008)	-0.275*** (0.008)

Table 3b. Continued.

	Model 1	Model 2	Model 3
Education (base: illiterate)			
Primary		0.036*** (0.011)	0.042*** (0.011)
Secondary and above		-0.027 (0.017)	0.064*** (0.020)
Region (base: north)			
Central		0.013 (0.016)	0.024 (0.017)
West		0.029** (0.012)	0.039*** (0.012)
Northeast		-0.002 (0.017)	-0.022 (0.017)
East		-0.009 (0.010)	-0.031*** (0.010)
South		-0.019* (0.011)	-0.011 (0.012)
Other			
Male		0.459*** (0.007)	0.429*** (0.007)
Married		0.084*** (0.008)	-0.0001 (0.013)
Scheduled caste/tribe		0.071*** (0.009)	0.072*** (0.009)
Have property assets			0.217*** (0.008)
Retired with pension			-0.335*** (0.005)
Monthly expenditures			-0.00002*** (0.000)
Household size			-0.005*** (0.001)
Living with child			-0.109*** (0.012)
Observations	19,906	19,906	19,906

Note. Robust standard errors in parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%.

tion, we carefully selected the following variables to estimate the propensity score: age, gender, education, marital status and caste.

We followed the algorithm proposed by Dehejia and Wabha (2002) to estimate propensity scores.

1. Start with a probit model to estimate the propensity score.
2. Rank all observations by the estimated propensity score in ascending order.
3. Impose the Common Support Restriction (i.e., discard observations that are outside the intersection of the supports of the propensity score of treated and controls).
4. Split the sample into five blocks of equal score interval and test whether the average propensity scores of treated and control groups are the same in each block.
5. If the test fails in at least one interval, split the interval in halves and test again. Continue this step until the average propensity scores of treated and control groups do not differ.
6. Test that means of each covariate do not differ between the treated and controls in each block. This is a necessary requirement for Balancing Hypothesis (i.e., observations with the same propensity score have the same distribution independent of treatment).
7. If the means of one or more observable characteristics differ, use a less parsimonious specification.

Following this algorithm, we estimate a probit model to predict the probability of having "any disability" or "any chronic illness" and test for balancing hypothesis.[10] In all cases, the covariate means were equal at the 5% level of significance. Figures 1 and 2 present the final distribution of treated and control observations in rural areas. Starting with five blocks and then eight, we finally find that with nine blocks the average propensity scores of the treated and control groups do not differ. The corresponding results for urban areas are presented in Figures 3 and 4.

In order to compute the average treatment effect on the treated, it is necessary to match the treated and control groups on the basis of propensity score. In practice, it is almost impossible to match the scores precisely, however. Four alternative matching methods are commonly used: stratification, nearest neighbourhood, radius and kernel matching.[11] The radius method of matching was applied with two different specifications of radius.

Results of the estimation are presented in Tables 4 and 5 for rural and urban areas, respectively. They show that having "any disability" and "any chronic illness" affects labour market participation negatively in all specifications, and the effect is stronger in rural than in urban areas. This finding corroborates our earlier results that used a simple probit model.

Table 4. Labour market participation based on propensity score matching method: The effects of disability and chronic illness (urban areas)

Matching Method	Effect of Disability	Number of Observations		Effect of Chronic Illness	Number of Observations	
		Treatment	Control		Treatment	Control
Stratification	-0.086 (-11.5)	4522	7910	-0.066 (-9.5)	6905	5527
Nearest neighbourhood	-0.085 (-12.4)	4522	7902	-0.062 (-8.8)	6905	5526
Radius (r = 0.0001)	-0.116 (-17.5)	4518	7904	-0.102 (-9.9)	6896	5526
Radius (r = 0.0005)	-0.112 (-14.2)	4518	7904	-0.099 (-8.0)	6898	5527
Kernel	-0.095 (-14.4)	4522	7910	-0.078 (-11.0)	6905	5527

Notes.
Standard errors were calculated by bootstrap method (100 replications). t-statistics in parentheses. The control variables on which the propensity score is computed are age, gender, education, marital status and caste. N for any disability = 4522 and N for no disability = 7910. N for any chronic illness = 6905 and N for no chronic illness = 5527.

Table 5. Labour market participation based on propensity-score matching method: The effects of disability and chronic illness (rural areas)

Matching Method	Effect of Disability	Number of Observations		Effect of Chronic Illness	Number of Observations	
		Treatment	Control		Treatment	Control
Stratification	-0.145 (-22.2)	8311	11,595	-0.101 (-14.7)	10,792	9113
Nearest neighbourhood	-0.144 (-24.0)	8311	11,576	-0.101 (-16.8)	10,792	9110
Radius (r = 0.0001)	-0.179 (-25.0)	8302	11,576	-0.124 (-15.8)	10,771	9110
Radius (r = 0.0005)	-0.180 (-14.3)	8308	11,584	-0.119 (-13.0)	10,772	9110
Kernel	-0.158 (-24.3)	8311	11,595	-0.120 (-19.3)	10,792	9113

Notes.
Standard errors were calculated by bootstrap method (100 replications). t-statistics in parentheses. The control variables on which the propensity score is computed are age, gender, education, marital status and caste. N for any disability = 8311 and N for no disability = 11,595. N for any chronic illness = 10,792 and N for no chronic illness = 9114.

Figure 1. Distribution of propensity score (rural areas)

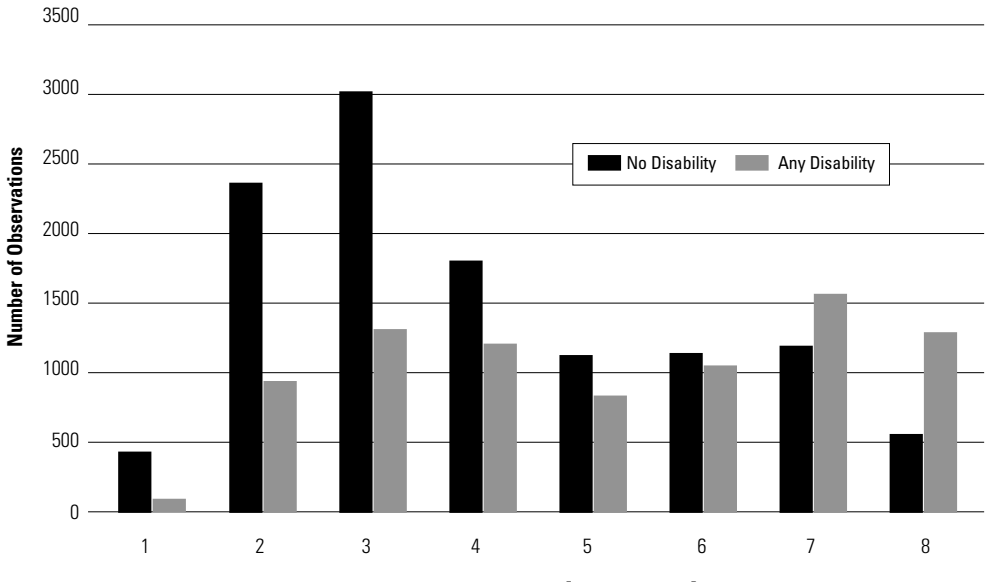


Figure 2. Distribution of propensity score (rural areas)

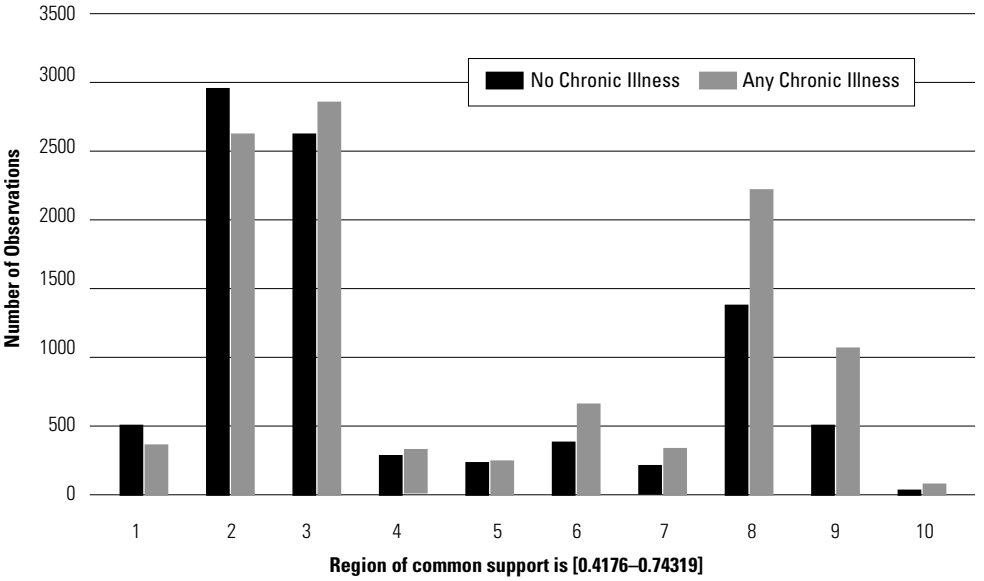


Figure 3. Distribution of estimated propensity score (urban areas)

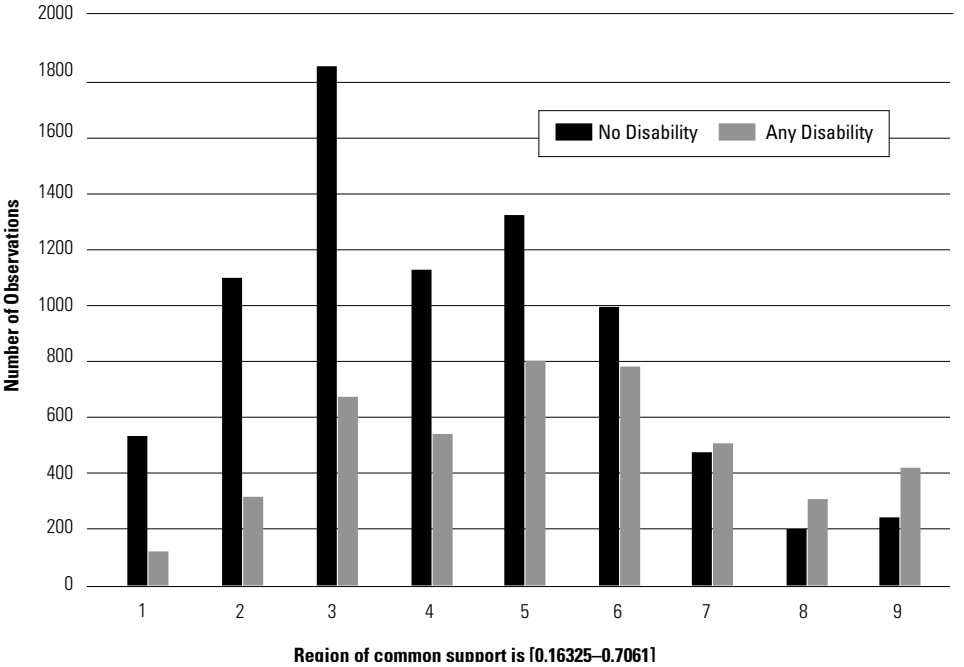
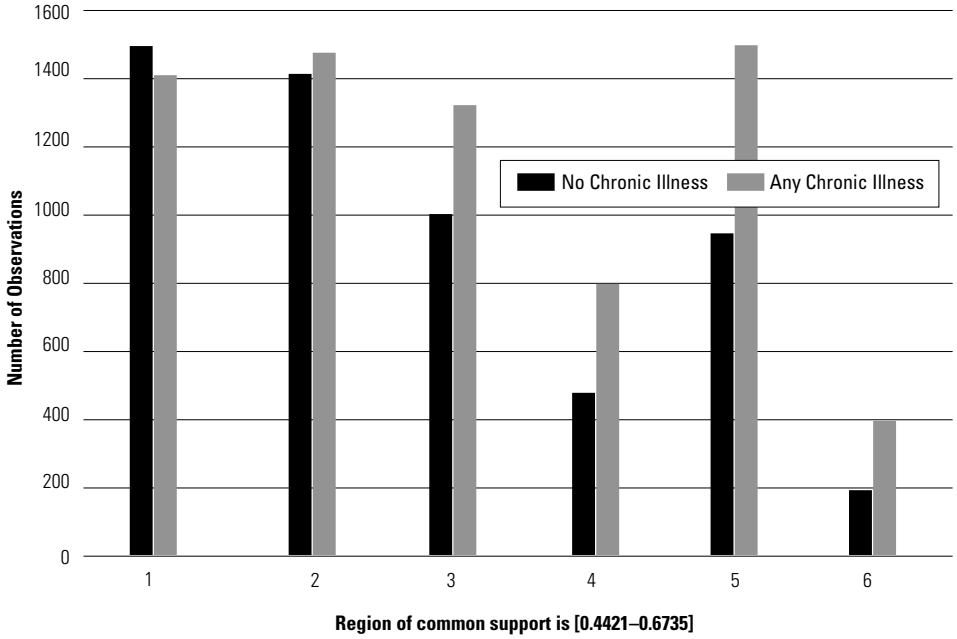


Figure 4. Distribution of propensity score (urban areas)



6. Conclusion

Research on the elderly has gained importance during recent years due to population aging. Most of the research is devoted to developed countries because old-age dependency ratios are higher relative to those of developing countries. However, in countries like India, this ratio will rise in the coming decades. Moreover, developing countries do not have a well-developed and comprehensive pension system. In addition, the joint family system is coming under strain. In light of these factors, a study of the labour market behaviour of the elderly gains importance.

In this paper, we studied the labour market participation decision of individuals aged 60 and above in India. In particular, we estimated the effect of disabilities and chronic illnesses on the probability of working. Our results show that disabilities and chronic illnesses have a negative effect on the probability of working, the effect being stronger in rural areas. This result holds across all model specifications and estimation techniques.

Data show that approximately 21% of the elderly in urban areas and 39% in rural areas were working. Most likely this is because they do not have sufficient means of support. Results from the models show that adverse health shocks – disabilities and chronic illnesses – have a negative impact on being employed. Not having adequate means of support or a job and having bad health would lead to much lower levels of well-being for the elderly. In the absence of a broad-based pension system, with only 10% being covered, this situation might be mitigated by providing assistive technology/employer accommodations to those with disabilities, this provision being likely to increase employment. Also, programs dealing with services such as old-age housing, healthcare and provision of subsidized food through a public distribution system may be a more effective way of serving the elderly.

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Notes

1. Broadly speaking, the organized sector refers to the public sector and that part of the private sector whose activities are regulated under some legal provision.
2. Based on data from the 52nd round of the National Sample Survey.
3. See, for example, Fehr, Sterkeby and Thogersen (2003); Blundell, Meghir and Smith (2002) and Johnson, Davidoff and Perese (2003).
4. The authors note that data on financial transfers were available only for individuals who were able to respond for themselves, hence leaving frail or disabled individuals to be under-represented. Also note that individuals were classified as disabled if they reported having difficulty standing from sitting, dressing or going to the bathroom by themselves. Thus, a majority of disabilities such as speech, hearing and visual were ignored.
5. Other studies have been done for the U.S., but as the focus of our study is developing countries, we do not discuss the other U.S. studies here. Some are Hayward and Grady (1990), Holden (1988) and Purcell (2000).
6. "Locomotor" means (a) an individual's loss or lack of ability to execute distinctive activities associated with the movement of "himself" and objects from place to place and (b) physical deformities other than those involving the hand or leg or both, regardless of whether the same caused loss or lack of normal movement of the body. NSSO(1998)
7. We thank an anonymous referee for advising us to adopt this approach.
8. Hereafter, the classification "working" will be used for labour market participants, i.e., those who were working for an employer or those who were self-employed.
9. The marginal effect for dummy variables is calculated as the discrete change in the probability of working as the dummy variable changes from 0 to 1 by holding all other variables at their means.
10. We use the STATA program developed by Becker and Ichino (2002) to estimate the propensity score and computation of the average treatment effect on treated.
11. See Becker and Ichino (2002) and Caliendo and Kopeinig (2005) about the strengths and weaknesses of each of the matching method.

Age-Specific Analysis of Reported Morbidity in Kerala, India

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Abstract

This paper attempts to provide a wider understanding of the differentials in reported health status in Kerala, while comparing morbidity in the state with other regions in the Indian subcontinent. Reported morbidity and the duration of life lived with a disease is higher in Kerala. Economic inequalities were found only in late-working ages and the elderly, primarily due to higher prevalence of life style–associated chronic conditions in these two age groups. Significant caste-wise differences among adolescents and prime working ages indicated potential for health problems induced by income deprivation in socially disadvantaged subgroups. Self-reported morbidity was 65% higher than proxy-reported morbidity. Regional differences were significant across all age groups, with high morbidity in the most developed region in the state. Results also suggested the need to factor for self- and proxy-reported status in any analysis of morbidity using similar survey data.

Introduction

Kerala is the most advanced state in India in terms of demographic transition, with mortality levels close to those of developed nations for the last two decades. However, morbidity levels are comparatively higher than elsewhere in India in this highly literate, densely populated and rapidly aging population. The picture continues, with the two recent national level surveys showing reported morbidity in Kerala well above that in the other Indian States, in both rural and urban areas and across all age groups (National Sample Survey Organization [NSSO] 2006; Registrar General of India [RGI] 2007). Here, morbidity information is based on reported morbidity data, which is often questioned for its reliability and accuracy (Murray and Chen 1992). Reported morbidity is associated with biases from various sources, depending on the individual reporting as well as on perceptions regarding good health. Despite the well-known discrepancy in subjective and objective measures of health status/morbidity status (Gumber and Berman 1997), the reported information on health and morbidity obtained in large-scale surveys at the community level continues to dominate the analysis of disparity and inequality in health status in developing counties.

Over the last three decades, a number of researchers have attempted to explain why morbidity is higher in Kerala than elsewhere in India. On one hand, many of the researchers attribute the phenomenon to a higher perception of illness and good health in Kerala society (Kannan et al. 1991; Gumber and Berman 1997; Michael and Singh 2003). Others argue that Kerala has the potential for higher real morbidity (Kumar 1993; Panikar and Soman 1984; Panikar 1999). However, most researchers agree that to some extent exposure to healthcare services has induced health consciousness and has affected perceived morbidity, leading to a higher reporting of illness (Kumar 1993; Dilip 2002).

Morbidity differences similar to those we observed while comparing Kerala with other Indian states are also found within the state. Systematic variations in perception about "good health" are found across different economic subgroups and geographic regions in this study area (Dilip 2002). Morbidity levels are relatively lower among the population residing in poorer households and in less-developed regions than among their counterparts in wealthier households and those residing in developed regions, respectively. This study also documents the widespread seasonal variation in morbidity. Mohindra et al. (2006) showed that the association between socio-economic status and health varied across social groups. They argued that the burden of low socio-economic position coupled with low caste could create a double deficit in reported health status.

However, the nature of the relationship between the risk of reporting as ill and an individual's economic status is still inconclusive. While national-level surveys (NSSO 1998; NSSO 2006) indicate a positive relationship between reported morbidity and economic status, the reverse is observed in state-specific health surveys by the Kerala Shasthra Sahithya Parishad (KSSP) (Kannan et al. 1991; Kunhikannan and Aravindan 2000; KSSP 2006). One probable reason is the methodological variation in measurement of economic status adopted by these two survey agencies. The national-level surveys use consumption–expenditure patterns or household monthly per-capita consumer expenditure to classify whether a household is rich or poor, while the state-specific surveys use (1) per-capita income, (2) per-capita expenditure, (3) housing conditions and (4) ownership of selected durable appliances and goods to classify and identify the household's socio-economic status. Further, researchers comparing or separately analyzing these data sets should note that neither agency accounts for differences in household size while classifying households as rich or poor. The sensitivity of household size to per-capita consumer expenditure and per-capita monthly income is well documented (Deaton and Paxson 1998) but is yet to be addressed while examining the rich–poor divide in morbidity in the state.

There is a clear age pattern in morbidity levels, with disease composition revealing the relatively higher prevalence of acute ailments in younger age groups and of chronic ailments in older ones (NSSO 1998; Dilip 2002; Navaneetham and Kabir 2006). In fact this age differential in morbidity is much greater than some of the most commonly studied gender/class inequalities in reported morbidity. Consequently, an age-group disaggregated analysis is essential for a closer understanding of differential morbidity, but this has not yet been attempted in Kerala.

Methods

As a prologue, we examined how far the age pattern in reported morbidity in Kerala deviates from the national scenario. We contrasted the morbidity pattern in Kerala with that in all India and in Bihar, a state characterized by a low level of literacy and the lowest self-reported morbidity among the major states in India (NSSO 2006). Accounting for the magnitude of variation between self- and proxy-reported morbidity data is another unique feature in this analysis. Self-reporting by all individuals is impossible in surveys of this scale and coverage, and it is important to recognize and factor the deviation between self-reported and proxy-reported information.

In this study, we used an age-wise analysis of differentials in reported morbidity in Kerala based on the National Sample Survey Organisations' (NSSO) 60th round survey *Morbidity and Health Care*, carried out in 2004. The survey took place between January and June, and covered 2829 households in Kerala. Information on whether an individual was ailing during the last 15 days is

available for 13,333 persons residing in these households. For the purpose of the survey, people self-reported a feeling of being ill, or of ailing. As already known, morbidity data obtained through similar health interview surveys are often incomplete due to proxy reporting (Murray and Chen 199; Gumber and Berman 1997). To factor this aspect, our analysis included a variable on whether information on ailment status was self- or proxy-reported.

Reported morbidity levels are assessed on the basis of proportion of persons reported as ailing during the 15-day recall period used in the survey. Hence co-morbidity reported during the survey is not accounted for in this analysis. The study population has been categorized into five age groups to examine the relative effect of certain background variables capable of influencing morbidity levels across these ages. The age groups are: (1) children (0–9 years), (2) adolescents (10–19 years), (3) prime working ages (20–49 years), (4) late working ages (50–59 years) and (5) elderly (60 years and above). Unlike the international criteria of 65 years, a person aged 60 years and above is included in the aged/elderly category at the public policy level in the Indian context (Rajan et al 2003).

First, morbidity in Kerala is compared with the all-India and Bihar scenarios in terms of (1) proportion of population ailing in the reference period, (2) disease composition in terms of the broad acute and chronic ailment classification and (3) median duration of ailment. The acute and chronic ailment classification is based on the general duration of the ailment. Ailments of less than 30 days' duration are treated as acute and those of more than 30 days' duration as chronic (NSSO 1998). Here, duration refers to the period from the commencement of the ailment – whether it started before or during the reference period – to its termination, or to the end of the reference period if the ailment continued. Then, a bivariate analysis was performed for Kerala to examine the relationship between the various independent variables and risk of reporting as ill in the reference period, across these broad age groups. Since the dependent variable – whether ill during the last 15 days (1 – Yes, 2 – No) – is dichotomous, logistic regression analysis was performed for predicting the likelihood of reporting as ill in the reference period.

Due to limitations in collecting reliable income data through household surveys, the NSSO collects data on consumption expenditure in its surveys. The monthly per-capita consumer expenditure (MPCE) information thus available for each sample household is used as a proxy for the household's income level. Monthly per-capita consumer expenditure for a household is the total consumer expenditure over all items (in 30 days) divided by the number of members in the household. A person's MPCE is understood as the economic status of the household to which he or she belongs. Here, in the multivariate analysis, the variable "household size" has been included as a covariate to factor for the impact of household size in measuring the household's monthly per-capita consumer expenditure.

Results

Comparing Reported Morbidity in Kerala and India

The proportion reported as ailing in the 15-day reference period in the survey was about 25% in Kerala, 9% at the all-India level and a low of 5% in Bihar (Table 1). More disaggregated data presented in Figure 1 showed that the risk of ailing in each of the 10-year age groups was several times higher in Kerala than in India or Bihar. The expected J-shaped relation between age and self-reported morbidity was visible only in Kerala. This could be due to differences in composition of ailments between these three populations.

Further details of the above observation can be inferred from the part of Table 1 on composition of ailments and median duration of the ailment. Data show that Kerala was at a relatively higher risk of chronic ailments, accounting for 43% of total reported ailments, than India at 35% and Bihar at 21%.

Compared with those in Bihar and all India, chronic ailments were much higher in Kerala in age groups starting from prime working ages. It should be noted that chronic diseases can remain undiagnosed, but the diagnosed ailment is less likely to be under-reported. Although the chance of

early diagnosis is higher in Kerala, the gap between share of chronic and acute ailments shows that the state's population was still at higher risk of chronic ailments. Ailment composition shows that share of acute ailments was higher in Bihar than in Kerala for all age groups. But when we consider

Table 1. Composition and median duration of ailments reported in the survey, Kerala, Bihar and India, 2004

Age Group	Percentage Ailing in Last 15 Days	Composition of Ailments (in %)				Median Duration of Ailments (in Days)[a]			
		Acute	Chronic	Others[b]	Total	Acute	Chronic	Others[b]	Total
Children									
Kerala	23.3	78	5	17	100	6	180	7	7
Bihar	7.3	86	4	10	100	5	6	4	5
India	8.9	78	5	17	100	5	20	6	5
Adolescents									
Kerala	16.0	60	17	23	100	5	510	10	7
Bihar	2.9	68	9	23	100	6	250	6	7
India	4.5	65	15	20	100	5	65	6	6
Prime working ages									
Kerala	18.6	40	37	23	100	7	465	15	15
Bihar	2.9	54	23	23	100	5	20	5	6
India	7.1	47	30	23	100	6	145	10	12
Late working ages									
Kerala	37.9	24	60	16	100	12	730	135	365
Bihar	7.5	45	33	22	100	5	180	60	6
India	13.9	35	48	17	100	8	365	20	33
Old age									
Kerala	58.4	14	71	15	100	30	999	415	730
Bihar	18.3	30	55	15	100	13	182	14	75
India	31.0	20	66	14	100	15	590	109	360
All Ages									
Kerala	25.1	38	43	19	100	7	730	30	30
Bihar	5.4	63	21	16	100	5	90	5	6
India	9.1	47	35	18	100	6	365	10	15

Note: The classification of acute and chronic ailments based on all ailments reported in the survey including cases where a person has reported multiple ailments.

[a] In the survey, 999 was recorded in cases where the total duration of the ailment was 1000 days or more; hence median duration will have exorbitantly high values in the case of chronic ailments.

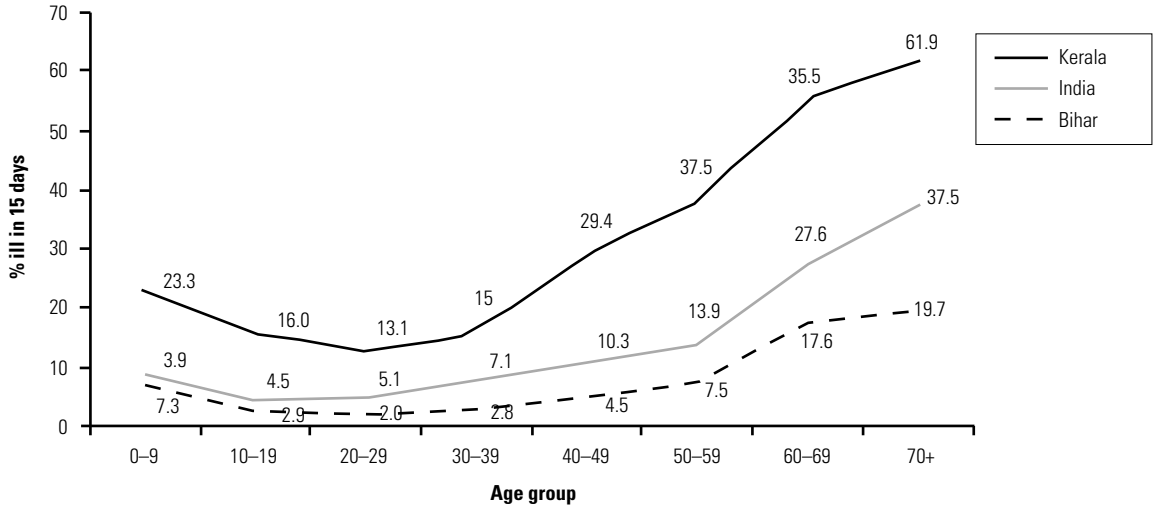
[b] Includes undiagnosed ailments and cases where the respondent was unable to report the nature of the ailment in the survey.

the magnitude of variation in proportion ailing between Bihar and Kerala, it is evident that the reported vulnerability toward acute ailments was also on the higher side in Kerala.

Median duration of an ailment was also reported to be higher in Kerala. Median duration of acute ailments was 7 days in Kerala, while only 5 days and 6 days in Bihar and India, respectively. Similarly, median duration of chronic ailments varied from 730 days in Kerala to 365 days in India and 90 days in Bihar. In addition, the table shows that a large proportion of the elderly in Kerala had been suffering from at least one chronic disease for more than 3 years. Hence, duration lived with a disease was very high in the state compared with elsewhere in India.

With the exception of adolescents, median duration of acute illness was highest in Kerala for all age groups. This finding corroborates the earlier explanation that high morbidity is not due to healthcare consciousness alone. Better healthcare consciousness would be expected to pave the way for wider reporting of minor ailments of shorter duration. In this case, average duration would be low, which is not observed here. Hence there is reason to believe that along with real morbidity, the duration of illness/treatment is also high in Kerala. Further research is necessary to verify reasons for the existence of longer duration of illness/treatment in the highly medicalized Kerala society, where chance of early diagnosis and detection of disease is higher than elsewhere in India.

Figure 1. Age pattern in morbidity in Kerala, India and Bihar, 2004



Reported Morbidity Differentials in Kerala

Having compared the reported morbidity in Kerala with the overall national scenario, the next step is to gain an in-depth understanding of the intra-state variation. Proportion ailing in the 15-day reference period varied from 16% in adolescents to 58% in the elderly. The risk of reporting as ill is was only marginally higher in females (26%) than in males (24%; Table 2). Age-wise analysis showed clearly that a larger proportion of male than female children was falling sick. Greater vulnerability to illness in women began with the early-working-age group, peaked in the late working ages and diminished in older ages. It was evident that health in females deteriorated earlier than in males. A rural–urban differential in reported morbidity was marginal. The only notable rural–urban differential across age groups was the relatively low level of illness among people of prime working age in urban areas compared with those in rural areas.

Caste-wise differences in the proportion reported as ill were visible in all age groups. Among children, adolescents and prime working ages, the reported level of ailing was higher in the scheduled

Table 2. Percentage reported to be ill during the 15-day reference period by selected background characteristics, Kerala 2004

Characteristics	Age Group in Years					All Ages
	0-9	10-19	20-49	50-59	60+	
Sex						
Male	25.5	15.9	17.2	32.7	57.0	24.1
Female	20.9	16.0	19.8	42.7	59.5	26.1
Place of Residence						
Rural	22.9	16.4	19.3	37.7	58.8	25.5
Urban	24.5	14.5	16.6	38.2	57.2	24.1
Social/Caste Group						
Schedules castes/tribes (SC/ST)	27.6	18.1	24.3	25.8	52.5	26.5
Other backward castes (OBC)	22.5	14.7	17.8	41.5	58.8	24.3
Others	23.2	17.7	17.7	35.3	59.5	26.2
Religion						
Hindus	22.4	16.7	18.4	34.7	55.0	24.7
Muslims	20.2	8.9	15.5	46.4	63.5	21.2
Christians	30.5	24.5	22.5	40.7	65.0	31.0
Type of Reporting in the Survey[a]						
Self-reported cases	--	--	23.5	43.2	63.0	28.2
Proxy-reported cases	--	--	14.7	31.5	50.5	20.4
MPCE Quintile[b]						
0–20	19.7	10.3	15.1	27.6	54.8	20.1
20–40	23.9	15.9	17.3	38.8	52.2	24.2
40–60	25.4	15.0	17.4	36.5	58.8	24.0
60–80	26.5	22.5	23.4	43.8	62.3	30.5
80–100	24.1	20.4	22.0	40.4	67.1	30.3
Period of Survey						
January–March	24.8	16.8	18.1	38.4	58.8	25.7
April–June	21.7	15.0	19.1	37.2	58.0	24.6
Region						
Northern Kerala	14.8	8.3	12.4	32.7	53.1	17.7
Southern Kerala	29.8	22.3	22.6	41.0	61.3	30.2
Total	23.3	16.0	18.6	37.9	58.4	25.1

[a] To obtain aggregate figures for all ages, all children below 16 years here included in the self-reported category as in the survey; the data on their illness status was reported by their mother or any other adults in the household in her absence.
[b] MPCE is monthly per-capita consumer-expenditure quintile

castes/schedules tribes (SC/STs) than in other caste groups. However, this SC/ST population was shown to be in an advantageous position in terms of risk of illness among late working ages and the elderly. Vulnerability to illness was highest among "other backward castes" (OBCs) and "others" with respect to those in late working ages and among the elderly population, respectively. Here, "others" refers to the "top" layer in the social group classification in India, characterized by historical advantage in terms of social and economic status in comparison with the OBC and SC/ST populations At the aggregate level, the proportion reported as ailing was highest among Christians, followed by Hindus and then by Muslims. The pattern was the same in the three initial age groups. In the late working ages, however, higher morbidity was reported among Muslims, while in the 60+ population, risk of ailing was reported to be much higher in Christians and Muslims than in Hindus.

There were large-scale differences in morbidity levels between self-reported and proxy-reported cases in the survey. Among those who reported on their own status, about 28% described themselves as ill, while only 20% of individuals reported on by other household members, due to absence during interviewer visits, were described as ill. As specified by the survey guidelines, information on the health of children was reported by the mother or any other adult household member. The proxy-reported morbidity level was lower than the self-reported morbidity level for all three adult age groups studied, emphasizing the need to account for this reporting-related variation in any morbidity analysis using this data set.

Differentials by economic status of the study population showed an increase in percent ill from 20% in the lowest MPCE quintile group to over 30% in the highest two MPCE quintile groups. Similar rich–poor differences in reported morbidity were visible in all age groups, with the exception of late working ages. At the aggregate level, seasonal differences were negligible, but for children, the risk of illness was higher between January and March than from April to June. The proportion ailing was only 18% in Northern Kerala, while it was 30% in Southern Kerala. This regional picture remained the same for all age groups examined.

Multivariate Analysis

Results of binomial logistic regression analysis, with risk of reporting as ill in the last 15 days as the dependent variable and selected independent variables, are presented in Table 3. Analysis is performed for all age groups under study as well as for all ages combined. The odds ratio presented in Table 3 indicates the variation in likelihood of reporting as ill within each independent variable, when the effect of all other independent variables in the model are kept constant.

All Ages

The regression analysis confirms the J-shaped relationship between age and reported morbidity level in the population. Odds ratio indicates that the likelihood of illness was 3.6 times more among the elderly than among children. Gender differences were insignificant. The likelihood of reporting as ill was 17% higher in rural populations than in their urban counterparts. Caste-wise differences became pronounced while controlling for other factors. Compared with the socially advantaged "other" castes, the SC/STs' and OBCs' risk of reporting as ill was 47% and 23% higher, respectively. Significant religious differences were noted, with reported risk of being ill highest among Christians, followed by Muslims and Hindus.

The other important observation in this analysis is that the likelihood of reporting as ill is 65% higher in self-reported than in proxy-reported cases. Little difference was observed in the risk of reporting as ill between the lowest three MPCE quintile groups, but the 60–80 MPCE quintile groups reported experiencing a higher risk of illness compared with the lowest MPCE quintile groups. Again, the differential risk of reporting as ill between the richest and poorest quintiles was insignificant. Seasonal variations were significant, with reported morbidity marginally higher during January to March than between April and June. Multivariate analysis also confirmed the regional divide in proportion reported to be ill, with this risk in Southern Kerala nearly double that in Northern Kerala.

Table 3. Odds ratio from logistic regression analysis for risk of reporting as ill in last 15 days prior to the survey for different age groups, Kerala 2004

Independent Variables[a]	Odds of Reporting as Ill by Age (Exp (B))					
	0–9	10–19	20–49	50–59	60+	All Ages
Age Group (in Years)						
0-9	--	--	--	--	--	1
10-19	--	--	--	--	--	0.512**
20-49	--	--	--	--	--	0.520**
50-59	--	--	--	--	--	1.531**
60+	--	--	--	--	--	3.585**
Sex						
Male	1	1	1	1	1	1
Female	0.834	0.109	0.976	1.198	1.165	1.024
Place of Residence						
Rural	1.190	1.350*	1.264**	0.977	1.009	1.166*
Urban	1	1	1	1	1	1
Social/Caste Group						
Schedules Caste/Tribe (SC/ST)	1.469	1.643*	1.912**	0.969	1.003	1.486**
Other backward castes (OBC)	1.304	1.390**	1.279*	1.457*	0.992	1.227**
Others	1	1	1	1	1	1
Religion						
Hindus	1	1	1	1	1	1
Muslims	1.208	0.906	1.217	1.760**	1.464**	1.243**
Christians	1.413*	1.802**	1.206	1.261	1.250	1.300**
Type of Reporting in the Survey[b]						
Self-reported cases	--	--	1.699**	1.646**	1.606**	1.645**
Proxy-reported cases	--	--	1	1	1	1
MPCE Quintile[c]						
0–20	1	1	1	1	1	1
20–40	1.260	1.112	0.977	1.472	0.897	1.064
40–60	1.088	0.951	0.869	1.264	0.991	0.984
60–80	1.074	1.348	1.116	1.935**	1.201	1.232**
80–100	0.851	1.026	0.881	1.694*	1.571**	1.163

Table 3. Continued

Period of Survey						
January–March	1.316**	1.194	1.042	1.082	1.022	1.107*
April–June	1	1	1	1	1	1
Region						
Northern Kerala	1	1	1	1	1	1
Southern Kerala	2.44**	2.376**	1.940**	1.928**	1.474**	1.943**
Household Size	0.961	0.910**	0.866**	0.982	1.1001	0.935**
Constant	0.121	0.017	0.141	0.141	0.622	.175
Sample Size (N)	2394	2072	5927	1179	1766	13327

** $p < .01$, * $p < .05$

[a] Subgroups with an odds ratio of 1 are the reference category within each independent variable.

[b] All children below 16 years were included in the self-reported category in the regression analysis as in the survey; the data on their illness status was reported by their mother or any other adults in the household in her absence.

[c] MPCE is the monthly per-capita consumer-expenditure quintile.

Age-Wise Differentials in Morbidity

Among children in the 0–9 age group, religious, seasonal and regional differences were significant. Christian children were reported at significantly higher risk of illness than their counterparts from other religious groups. It is to be emphasized that seasonal variations were significant only in the case of children, where the likelihood of illness was 32% higher between January and March than from April to June. Odds of reporting as ill was nearly 2.4 times more in Southern than in Northern Kerala. As already known, the majority of reported illnesses in the 0–9 age group were short-duration acute ailments, which is the reason for finding the environment-sensitive variable, seasonality, significant in the model.

Multivariate analysis for the adolescent population shows that the variables place of residence, caste, religion and region have a significant effect on risk of illness. The likelihood of reported illness is 35% higher among adolescents in rural areas than among their counterparts in urban areas. As in the case of children, SC/STs and OBCs are reported to have higher morbidity than other castes. Similarly, Christian children were 80% more likely to be reported as ill than those from other religious groups. As expected, the differential in risk of illness between Northern and Southern Kerala is highly significant.

For the population in the prime-working-age group, the risk of illness was reported as 26% higher in rural than in urban areas. Socially and financially upward "other castes" were at lower risk of illness when compared with the OBC and SC/ST categories. In fact this caste-wise deprivation in health status is a serious issue capable of offsetting livelihood opportunities. The other significant predictor of reported illness in this age group is the self- and proxy-reported dimension, where odds of reporting as ill were 70% greater in self-reported cases than in proxy-reported ones. Regional patterns – whether the household was in Northern or Southern Kerala – were highly significant.

In the late working ages (40–59 years), the period that generally marks the onset of chronic conditions, the risk of illness was 46% higher among OBCs than SC/STs or other castes. Muslims were reported to be at higher risk of illness when compared with both Hindus and Christians. MPCE category–wise, risk of illness also become prominent from this age group onwards. As compared with the 0–20 MPCE quintile, the likelihood of reporting as ill was 94% and 69% more in the 60–80 and 80–100 MPCE quintile groups, respectively. Risk of reporting as ill was 93% higher in the population residing in Southern Kerala than those in Northern Kerala.

Analysis of the elderly population, aged 60 years and above, showed no gender, caste or rural–urban differences. However, the observation that Muslims had higher morbidity was significant in this age group. MPCE-wise differences were notable, with the highest MPCE quintile reported to be at higher risk than lower quintiles. This is due to the higher risk of communicable diseases among the top quintile groups compared with their lower-quintile counterparts. As noted in other age groups, morbidity among the elderly was reported as higher in Southern than in Northern Kerala.

Discussion

Analysis of reported morbidity, its composition and duration indicates that the potential risk of short-duration acute ailments and long-duration chronic ailments is much higher in Kerala than in other states. Number of days lived with a chronic disease is higher at all ages examined, which makes us rethink whether the Kerala population really enjoys a "good health" status compared with their counterparts elsewhere in India. Other secondary data sets show the prevalence of diabetes, hypertension, cancer and coronary heart disease to be greater in Kerala than in other states (RGI 2007). Similarly, the National Family Health Survey–II shows the prevalence of minor ailments like fever and cough to be greatest in Kerala. (International Institute for Population Sciences and ORC Macro 2000). The population of this state has gained considerably through mortality transition in terms longer life but appears to be more fragile than their counterparts in other parts of India. The other critical observation is the longer duration and treatment of acute ailments reported in Kerala, the reasons for which are unknown. The role of medical and nonmedical factors in prolonging the duration of ailment/treatment needs to be investigated separately. Kerala is well ahead of other states in physical access to private and public healthcare facilities (NCMH 2005). This, along with universal literacy, should have facilitated early diagnosis and detection of disease, leading to a shorter duration for acute ailments. But the reverse scenario noted here remains unexplained.

Some of the anomalies noted during aggregate-level analysis of reported morbidity are resolved through age-wise disaggregated analysis. If one factors for household-size-related bias in monthly per-capita consumer-expenditure quintile classification, the rich–poor differential narrows. Reported morbidity among children, adolescents and prime working ages is not associated with their economic status. At the same time, economic background becomes a significant predictor for population in late working ages and the elderly, due mainly to higher prevalence of chronic conditions noted among these subgroups. Significant caste-wise differences in adolescents and working ages indicates that health problems induced by income deprivation is a severe issue in socially disadvantaged subgroups. In the late working ages, the risk of ailing is higher among OBCs. The present study shows that the reported health status of Hindus is better than that of Christians and Muslims. It is encouraging to note that inequalities along religious lines do not exist in the prime-working-age groups. But relative risks are highest among Christians in age groups that are more vulnerable to acute ailments, and among Muslims in age groups where vulnerability to chronic ailments is high.

Another notable observation is that only children are vulnerable to ailments associated with seasonal variations. The health system should be equipped to meet this varying demand for preventive and curative healthcare services across seasons. Regional differences have not declined from the levels noted in the 1990s and are found across all age groups. The historical lag in exposure to both public and private health facilities between Northern and Southern districts in Kerala (Kutty 2000; Sadanandan 2001) could partly explain this divide. However, factors such as population density and a larger share of habitats along rivers or coastal areas expose the population in Southern Kerala to ailments in greater number than their counterparts in Northern Kerala. Furthermore, from a methodological point of view, analysis confirms that use of proxy respondents in these kinds of health-interview surveys has contributed to an underestimation of morbidity. Since insisting on self-reporting criteria is not feasible in this type of large-scale survey, self/proxy reported status should be used as a control variable in any analysis based on this data set, considered the only large-scale survey data on reported morbidity in India.

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