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From the Editor-in-Chief

This issue of *World Health & Population* presents papers that have been published online by *WHP* and are selected here as representative of recent outstanding contributions to the journal. The papers in this issue include research from South and Southeast Asia, Africa and Latin America.

Human resources in healthcare, which will be the focus of a theme issue of *WHP* later this year, are addressed through a focus on health manpower training in the first article in this issue, by Yanggratoke et al., "The Thai–Australian Alliance: Developing a Rural Health Management Curriculum by Participatory Action Research." Competency and skill-based education has become widespread across the public health curricula in North America; this article describes how competencies and skills were identified for a primary healthcare management curriculum in rural Thailand. The article also shows a very successful collaboration between an academic institution and governmental agencies.

The second article, "Social Marketing for Early Neonatal Care: Saving Newborn Lives in Pakistan" by Iram Ejaz and Babar Shaikh, presents a litany of struggles with regard to assuring better outcomes for neonates. Inappropriate practices on the part of both providers and mothers are ingrained in the rural and impoverished communities included in their study area. The authors propose a robust "social marketing" approach, much more extensive than typical health education and extending beyond just the health sector. Such actions are critical if there is to be any chance for the country to reach the ambitious target of Millennium Development Goal 4 (MDG 4), to reduce by two thirds the under-five mortality rate. Bangladesh has made substantial progress since 1990 but still has a distance to go. Many of the recent articles in *WHP* have had a direct relationship to the MDGs, a highly appropriate theme and focus for this journal. This paper is an additional and helpful example.

The next article is from South America, and takes a very different focus from direct healthcare delivery, looking instead at health disparities from a sociological and demographic perspective. In "Determinants of Gender Differences in Health among the Elderly in Latin America" Antonio Trujillo et al. present a study of health and socio-economic gender differences among the elderly in four Latin American settings. Through sponsorship of the Inter-American Development Bank, and using Pan-American Health Organization data, the authors apply multivariate techniques to adjust for differences in sampled populations in cities in Argentina, Brazil, Chile and Mexico. The "gender gap" favouring males is persistent, and the authors conclude that health policies aimed at increasing the health status of women need to be combined with income policies to reduce income differentials, if this gap is to be reduced.

The problem of hospital-acquired infections is well known and documented in North America and Western Europe[1] and is often discussed in terms of very simple inventions that could have a large impact, such as proper handwashing.[2] The problem appears less well documented in low- to middle-income country settings; however, we could easily hypothesize it would even be more severe. In "The Potential for Nosocomial Infection Transmission by White Coats Used by Physicians in Nigeria: Implications for Improved Patient-Safety Initiatives," C.J. Uneke and P.A. Ijeoma examine another relatively simple intervention beyond handwashing or antibiotic gels – that of using clean clinical garb. Microbiological analysis of cuffs and pockets of white coats in a teaching hospital in Ebonyi State, Nigeria, revealed a stunning bacterial contamination rate of over 91%. Variation in contamination rates was also identified by level of physician and area of the hospital. Implications for improved patient-safety initiatives are straightforward through improved clinician habits; however, behaviour change can be as difficult to realize on the part of providers as it is with patients.

The final article, "Safe Abortion Services in Nepal: Initial Years of Availability and Utilization" by Shyam Thapa, Kasturi Malla and Indira Basnett, documents what happened in Nepal with the

liberalization in 2002 of highly restrictive abortion laws. The legislative change was in recognition of the dangers of illegal abortions and was intended to improve maternal health and well-being. This policy change is highly consistent with MDG 5, to improve maternal health by reducing by three quarters the country's maternal mortality ratio and providing universal access to reproductive health services. Thapa et al. surveyed 672 clients at an urban maternity hospital and concluded that early results from legalizing abortion services have been successful in terms of access and satisfaction. This case study is particularly timely given the editorial that appeared last in *The Lancet*, "Unsafe Abortions: Eight Maternal Deaths Every Hour"[3] in response to the Guttmacher Institute report updating the status of abortion services and outcomes worldwide since 1999. Further follow-up on the experiences in Nepal will be interesting.

In conclusion, we hope that you find the papers in this issue interesting and valuable, and that you will also consult others recently 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 global settings. *WHP* is indexed on MEDLINE and is accessible through PubMed.

We look forward to continued enthusiastic submission of manuscripts for consideration, peer review and publication. Finally, the editors and publishers of *WHP* are always interested in any comments or suggestions you might have on the papers or the journal. Please feel free to write or e-mail us.

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End notes

[1] See, for example, Vincent, J.L, D.J. Bihari, P.M. Suter, H.A. Bruining, J. White, M.H. Nicolas-Chanoin, M. Wolff, R.C. Spencer and J. Hemmer. 1995. "The Prevalence of Nosocomial Infection in Intensive Care Units in Europe: Results of the European Prevalence of Infection in Intensive Care (EPIC) Study." *JAMA: the Journal of the American Medical Association* 274(8): 639–44; and Richards, M.J., J.R. Edwards, D.H. Culver, R.P. Gaynes and the National Nosocomial Infections surveillance System. 1999. "Nosocomial Infections in Pediatric Intensive Care Units in the United States." *Pediatrics* 103:(4): e39.

[2] Pittet, D., S. Hugonnet, S. Harbarth, P. Mourouga, V. Sauvan, S. Touveneau and T.V. Perneger. 2000. "Effectiveness of a Hospital-Wide Programme to Improve Compliance with Hand Hygiene." *The Lancet* 356(9238): 1307–12; and Pittet, D. 2003. "Hand Hygiene: Improved Standards and Practice for Hospital Care." *Current Opinion in Infectious Diseases* 16(4): 327–35.

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The Thai–Australian Alliance: Developing a Rural Health Management Curriculum by Participatory Action Research

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Abstract

In 2006, the Thai National Health Security Office and the Ministry of Public Health, through the Nakhonratchasima Provincial Health Office in Thailand, asked the Thai–Australian Health Alliance to identify competencies and skills for a health management curriculum for health professionals working in primary healthcare in rural Thailand. The study was conducted in Nakhonratchasima province, Thailand, utilizing questionnaires, focus group discussions and an intensive 3-day workshop involving a purposive sample of 35 participants drawn from various sectors in the health industry. Findings identified the core curriculum competencies and skills required by rural doctors, nurses and public health officers. Critical issues regarding continuing education for health professionals in primary healthcare were also examined. This study found that a primary healthcare approach should include the principles of sustainability and capacity building, and incorporate team-based, interprofessional and long-term continuous learning.

Introduction

In 2004, the Thai–Australian Alliance was developed between the University of New England, Australia, and Naresuan University and the Ministry of Public Health in Thailand. According to Taytiwat et al. (2006: 1), the purpose of the Alliance is to "improve rural medical workforce recruitment, retention, education and training." Since 2004, the partnership has been further established and broadened to focus not only on the medical workforce but on healthcare professionals in general. In addition, by 2006 three more Australian organizations had contributed to the Alliance's work: the Hunter New England Rural Training Unit, New England Area Training Services and the Australian College of Health Service Executives (Taytiwat et al. 2006). The Alliance conducted research studies between 2004 and 2006 to evaluate joint research education and training activities. Overall results indicated that a sustainable relationship between the participating organizations was being achieved. This paper presents another initiative of the Thai–Australian Alliance that was developed, implemented and evaluated in 2006.

In 2006, … the Thai–Australian Health Alliance [was asked] to identify competencies and skills for a health management curriculum for health professionals working in primary healthcare in rural Thailand.

Background to the Study

Wibulpolprasert et al. (2008: 1) stated that "the year 2008 marks the 60th anniversary of the World Health Organization and the 30th anniversary of the Alma-Ata Declaration advocating primary healthcare as the main strategy for achieving health for all by the year 2000." The primary healthcare approach was viewed as a practical, community-based and participatory model that could address chronic health problems (Tontisirin et al. 2001). According to Boerma (2006), primary healthcare (PHC) has important and global health functions despite its relative weakness politically and its unattractiveness to health professionals. PHC provides treatment for common illnesses and injuries, health promotion, disease prevention and control, and rehabilitation (Wibulpolprasert 2002). From an economic point of view, it can be expected to lower the costs of care (Starfield et al. 2005). PHC refers to first contact, and continuous, comprehensive and coordinated care (Starfield 1994), and it operates at an intersectoral level of healthcare for the individual and for the population. It is the first line of detection and defence for global health challenges such as avian influenza, SARS and HIV/AIDS (Beaglehole 2004; World Health Organization 2003). According to Hanucharurnkul (2007: 83), having a regular primary care provider "is one of the best predictors that a person will receive appropriate comprehensive care ranging from health promotion, disease prevention, early detection of illness, management of chronic illness/conditions, and rehabilitation."

Despite PHC being acknowledged as a key strategy for achieving health for all, its sustainability in developing countries is complex. This is due to the contradictions inherent in the health aid that has been the cornerstone of many programs offered by donor countries. Capacity building, self-reliance and continuity often take second place to immediate needs, dependency and effectiveness (LaFond 1995). However, there has been a call in recent years for renewing primary healthcare. According to the Pan American Health Organization/World Health Organization (PAHO/WHO; 2007), a renewed approach to PHC has been adopted for several major reasons:

- PHC must address the increase in new epidemiologic challenges;
- Widely diverse approaches to PHC that have weaknesses and inconsistencies need to be corrected;
- PHC can capitalize on new tools and best practices;
- PHC is being recognized as an approach to "strengthen society's ability to reduce inequities in health"; and
- PHC is increasingly being accepted as "a powerful approach to addressing the causes of poor health and inequality" (PAHO/WHO 2007: 1).

The WHO 2008 report (xi–xx) indicates that health systems have focused disproportionately on specialized curative care and that top-down command-and-control approaches have resulted in fragmented service delivery. This report calls for PHC reform based on reforms to universal coverage, service delivery, public policy and leadership.

Thailand is a developing country in the lower-middle income group of the East Asia and Pacific region (World Bank 2006). It has been a beneficiary of donor countries such as Japan and the United States for many decades (Accessible Information on Development Activities [AiDA] 2006). Thailand has seen improvement and continual growth in urban infrastructure development that has assisted national competitiveness and economic well-being. Furthermore, the country has made good progress in mortality and morbidity rates, including a decline in infant mortality rates. Many targets of the Millennium Development Goals are now being achieved (Thailand Human Development Report 2003 Review Board). However, rural development lags behind urban, with problems including roads, utilities, education, healthcare and housing (World Bank 2006).

In 2001 Thailand established universal health coverage (UHC) to provide primary healthcare through its network of more than 9000 primary care units so that healthcare would be accessible for uninsured Thais, including about 40 million rural people. Establishment of UHC meant that medical and hospital treatment cost only 30 baht (approximately $1 US dollars) per episode of care (Wibulpolprasert 2002). Five years later the Thai interim government abolished the 30 baht fee and made the healthcare program completely free.

The Thai health system has large public and private sectors that provide all levels of healthcare. Through health insurance arrangements attached to formal employment, urban, wealthier Thais have been advantaged over the marginalized rural poor, who rely on public health services. As part of market-driven healthcare developments in secondary and tertiary care, PHC in Thailand has not been able to attract medical practitioners to rural areas, in spite of a variety of strategies over the last 40 years (Wibulpolprasert and Pengpaibon 2003). Taytiwat et al. (2006: 1) believe that "the major emphasis has been on hospital-based care," with few Thai doctors developing programs to address community needs. According to Pachanee and Wibulpolprasert (2006), "one of the main problems of human resources for health in Thailand is the imbalanced distribution in terms of both geographical areas and specialisation," with an inequitable distribution of health facilities and health professionals, especially doctors, between rural and urban areas. The scope and diversity of rural health practice, and the level of responsibility and skills required, may be partly responsible for the unequal distribution.

Family medicine is poorly developed in Thailand, with an emphasis on hospital-based care (Towse et al. 2004; Williams et al. 2002). According to Williams et al. (2002), in Thailand general practitioners are considered junior doctors who have yet to undertake speciality training. Furthermore,

the present Thai health system lacks a gatekeeper to coordinate care and manage demand. There is scope to undertake speciality training in family medicine (Williams et al. 2002); however, far more doctors specialize in other disciplines. A study conducted by Thamarangsi (2003) found that one of the major factors contributing to the resignation of general practitioners was a lack of opportunity for continuing education; it was also the major reason for newly graduated general practitioners leaving to specialize. Educational programs should focus on the reality of rural healthcare practice and management within a primary healthcare framework, with an emphasis on cross-disciplinary consultation that is needed for PHC to function optimally in rural environments.

The nursing profession in Thailand has also weighed in to the PHC debate, with Hanucharurnkul (2007: 83) stating that "nurses are key providers of primary care services, particularly in remote areas and play an important role in improving the health and well-being of the Thai community." This author goes on to say that some health leaders in Thailand believe that nurses would be the most appropriate healthcare professionals to provide PHC to the community.

The purpose of this study therefore was to develop recommendations for the development of curriculum and continuing education as well as areas requiring further collaborative research for primary healthcare professionals in health management in a rural province of Thailand. The study objectives were to:

- Identify current approaches to the education, training and development of rural healthcare professionals and the relevance and applicability to the Thai health context;
- Engage with a range of Thai healthcare stakeholders to identify appropriate technology and education delivery approaches that would be relevant to the needs of the Thai health system; and
- Identify best practices for the continuing professional development of health managers in the Thai rural health context.

This research study was initiated and funded by the Ministry of Public Health and the National Health Security Office of Thailand in 2006. It was conducted by Australian researchers from the University of New England, Australia, and Thai researchers from Naresuan University and from the Nakhonratchasima Provincial Health Office in Thailand.

… health leaders in Thailand believe that nurses would be the most appropriate healthcare professionals to provide PHC to the community.

Methods

Research Design

This study utilized Participatory Action Research (PAR) as the research design. PAR is designed to facilitate improvement, evaluation and change within a framework of collaboration and cooperation between researchers, communities and professionals (Burns 1994). It is guided by the adult education theories of Paulo Freire, which seek to create an environment in which local communities are able to empower themselves by drawing on local knowledge and skills, while working in partnership with researchers who facilitate the process and organize external inputs in terms of knowledge and expertise. PAR is an iterative process, whereby the findings and analysis in one stage lead to the next stage, and so on. The research is also participatory in that researchers and participants share ownership of the project. It requires the research team and project participants to engage in ongoing dialogue about the problems under investigation, the data needed to answer them, the method of collecting data and the meaning to be reached through the data analysis (Spence et al. 2002; Spence and Chantrill 2001). According to the literature, PAR has been used effectively as the research design in other similar healthcare projects in developing countries (Julia and Kondrat 2005; Bradley and Igras 2005; Liu et al. 2006).

Setting

This study was conducted in the province of Nakhonratchasima, Thailand, in 2006. This is the largest province in the northeastern region of Thailand, with a population of 2.5 million. Major healthcare concerns in the province according to the Thailand Human Development Report 2003 Review Board (2003) include infant mortality and mortality and first-degree malnutrition under the age of five. Other health-related problems include drug-related crimes, HIV/AIDS and sexually transmitted disease.

Population and Sampling Method

The study population consisted of healthcare professionals from the senior health management ranks of the Nakhonratchasima Provincial Health Office, the Ministry of Public Health and the National Health Security Office. The 35 participants were purposefully selected by the project director in consultation with the research team because of their strategic role in the development and implementation of primary healthcare policy at the district rural level of health services in Thailand. The sample, who had various levels of management training and experience from the disciplines of medicine, nursing and allied health, participated in all stages of the study as discussed in the following section. Table 1 shows that the sample consisted of directors of community hospitals, chiefs of district health offices, heads of health centres or primary care units, academics from public universities, representatives from local government, representatives from the village health volunteers, senior nurse academics and practising nurses from the Thai Nursing Council, the Nakhonratchasima Boromarajonani College of Nursing and the Provincial Health Office.

Table 1. Participant attendance at the 3-day workshop in Nakhonratchasima province, Thailand

Number	Participants/organizations (N = 35)
9	District health services management group policy makers at the national level (Ministry of Public Health, National Security Office)
13	Directors of community hospitals, city and military regional hospitals in Nakhonratchasima province; representatives from the Thai Nursing Council and College of Nursing
5	Chief of district health offices, heads of health centres or primary care units
4	Representatives from local government and from village health volunteers
4	Academics and practitioners at primary care units

Data Collection Procedure

Stage One

When conducting such a study, it is important to establish the perceived needs of the participants in their specific context. Therefore, three months prior to the main study, a pre-workshop was conducted to assess participants' learning and healthcare training needs and to identify the level of training to meet those needs. Findings showed that participants were most interested in building capacity for primary care units, as well as improving patient care using a team-based approach. Participants identified the most important health needs and their most critical professional challenges as well as ways to overcome the challenges. For example, the major health issues they identified included chronic disease, accidents, and alcohol and drug use. The challenges included staff shortages and weaknesses in intersectoral collaboration; improvements in their communication and management skills would help overcome these challenges. Participants hoped that the 3-day workshop would provide knowledge transfer and ideas for developing an appropriate health management curriculum that would assist in building capacity in the primary healthcare environment.

Stage Two

The aims of the main qualitative study were explained at the beginning of the workshop and participants were asked to sign a consent form. Data collection consisted of both quantitative and qualitative aspects. The quantitative component consisted of a specifically designed battery of questionnaires utilized throughout the workshop to complement the qualitative data. The purpose of the questionnaires was to identify the critical issues for the health management practices of the Thai health managers that would help inform specific curriculum topics. The questionnaires were developed following the accreditation standards for health management programs of the Australian Council of Health Services Executives (ACHSE 2005). All information was presented in both Thai and English, and time was taken to ensure that participants understood the questions and concepts included in the questionnaires.

For the qualitative component, two focus group discussions were to be conducted. To facilitate them, a S.W.O.T analysis was conducted to identify strengths, weaknesses, opportunities and threats. Results are shown in Table 2.

Table 2. Results of S.W.O.T analysis

Strengths	• Primary care units (PCUs) in each district are a good asset • Primary Care is a national policy • Nurses in PCUs are close to the people • Nursing care in PCUs is of high standard
Weaknesses	• Patient preference for district hospital rather than PCU. • Poor collaboration /communication between district hospital and PCU • Poor security for PCU staff due to geographical isolation • Shortage of nurses in PCUs • Limited multidisciplinary collaboration in PCUs • Lack of instructors in education programs • Inefficient use of documented files in PCUs • Poor PCU facilities including building and infrastructure • Low salaries in the public health sector
Opportunities	• Continuing professional development • Capacity and willingness for improved collaborative communication between staff at district hospitals and PCUs • Greater recognition of the PCU role within the community • Identify skills/knowledge needed for medical and nursing primary healthcare curricula.
Threats	• Increased career choices for school leavers • Structural conflict between the hospital team, the district health team and the health centre team • Increasing growth in private health sector

The first focus group discussion consisted of an inter-professional group of all participants to discuss the overall results of the S.W.O.T analysis and to identify crucial points for discussion at the second focus group. The inter-professional group then broke into two discipline-based groups to explore the issues specifically facing their profession. Tables 3 and 4 show participants in each of the two main groups of health managers – rural doctors and registered nurses.

Table 3. Rural doctor attendance at focus group discussion

Number	Participants/organizations (*N* = 19)
2	Chief of district health officers
6	Community hospital directors
3	Head of health centres
8	General practitioners employed in primary care units in Nakhonratchasima province

Table 4. Registered Nurse attendance at focus group discussion

Number	Participants/organizations (*N* = 16)
2	Representatives from Thai nursing council
2	Nurse academics from Thai universities
7	Academics from nursing colleges, Ministry of Public Health
5	Nurse practitioners, head of primary care units, community hospital.

A semi-structured interview schedule was used for the two focus group discussions, and the 40 to 50 minute sessions were audiotaped with the participants' permission. Data-generating questions guided the focus groups, and a recursive interviewing approach was used to collect the data. Ethical approval to conduct this study was obtained from the University of New England Human Research Ethics Committee prior to data collection. Participants were provided with a participant information sheet and a consent form at the commencement of the study. A member of the Thai research team explained the purpose of the research project and participants' involvement to ensure that everyone understood, and all forms were printed in English and Thai. Participants were informed that any identifying names would be removed from study data prior to data analysis to maintain confidentiality.

Data Analysis

The focus group discussions were recorded and transcribed, and content and thematic analyses were used to identify the key concepts and themes in the data. Rigour and trustworthiness of the data was achieved in several ways. First, major findings of the surveys and focus groups were electronically filed and projected on a screen during the workshop for participant validation. Participants were given the opportunity to change, clarify or expand any of the discussion points. Second, the transcribed focus group discussions were translated into English and approved by the Thai participants. Third, two of the researchers conducted separate content analysis of the quantitative data and compared and contrasted their findings to establish inter-rater reliability. This inter-rater reliability process was also followed for the qualitative data, which was then coded and thematically analyzed. The thematic analysis utilized a highlighting approach, as described by van Manen (1997). Significant statements and commonalities were identified and organized into themes that represented important aspects of the participants' experience of management practices in rural health settings.

Finally, quality and trustworthiness in this participatory action research study was further achieved by utilizing methodological triangulation, whereby both quantitative and qualitative methods were used to collect the data. The qualitative component consisted of data obtained through the focus group discussions, while the questionnaires were used to obtain the quantitative data. According to

Minichiello et al. (1999), triangulation is the process by which the same issue is investigated in a variety of ways so that different types of evidence are produced to support a particular finding. The different results are combined to complement each other and enable a deeper understanding of the complex phenomenon being studied. Our results were also interpreted in relation to the relevant literature.

Results

Overall, the questionnaires showed that participants had a good understanding of the Thai health system, and the policy and planning processes. Not surprisingly, the vast majority (83%) agreed that Thai rural health needs and practices are different from metropolitan health services and therefore require a different understanding and practice. While 52% of participants said they understood information management systems, less than half (45%) said they understood the research process or how to conduct research within the healthcare setting.

A survey instrument was used to assess the importance that participating health managers gave to the standard curriculum content. These content areas cover healthcare systems/policy, health services management, research and evaluation, financial management, law/ethics and information management. Tables 5 and 6 present the results of the questionnaire. As participants were asked not to rank issues they did not deem relevant in the Thai context, the average ranking score is presented. For example, participants perceived "system design and operational issues" as low priority. The score represents that given to each item divided by the number of participants who scored the item. As the highest ranking was coded "1," topics with the lowest aggregate scores are those that participants nominated as most important. Table 5 shows that the four most important items relating to the curriculum area healthcare systems/policy were the Thai healthcare system (3.5), health systems evaluation and improvement (4.3), priority planning (4.5) and workforce planning and policy development (4.8).

Table 5. Curriculum content area: healthcare systems/policy

Ranking	Curriculum content area	Average score
1	Thai healthcare system	3.5
2	Health systems evaluation and improvement	4.3
3	Priority planning	4.5
4	Workforce planning and policy development	4.8
5	Social analysis of public policy development	5.8
6	Essential issues identification and ordering	5.9
7	Economic framework and health	6.1
7	System design and operational issues	6.1
8	International healthcare systems	6.5
9	Epidemiological analysis	7.2

The most important curriculum content areas in health services management were leadership (2.6), change management (3.7), human resources management (4.4) and emotional intelligence (6.0) (see Table 6).

Table 6. Curriculum content area: health services management

Ranking	Curriculum content area	Average score
1	Leadership	2.6
2	Change management	3.7
3	Human resources management	4.4
4	Emotional intelligence	6.0
5	Organizational theory	6.3
6	Judgment	6.6
6	Organizational behaviour	6.6
7	Healthcare delivery mechanisms	7.2
8	Continuous quality and safety improvements	7.7
9	Negotiation	8.5
10	Influencing	8.7
10	Strategic marketing	8.7
11	Industrial relations	11.7

The most important management competencies identified were leadership, strategic decision making, communication and interpersonal skills. Participants also identified a number of critical management skills. The two most important were system and strategic thinking, followed by analytical and problem-solving skills.

Survey results showed that a number of financial management topics were identified as important for everyday health-management practice. Between 69% and 100% of health managers used a number of critical financial management tools, while other financial management aides, such as monitoring budget performance (77%) and key performance indicators (79%), were used less frequently.

Participants were also asked to nominate their preferred learning styles and learning format. Survey results found that all participants preferred to learn in an inter-professional context, that 86% preferred a team-based learning environment and that 69% would like such learning to be based on a long-term strategy.

Focus group respondents identified a variety of reasons for wanting to work in a rural area, including having had good, enthusiastic teachers who taught them well and who inspired them to work in a rural setting. A number of respondents referred to senior health managers as role models, health professionals whom they could work with and learn from in a rural environment. Other factors that affected recruitment and retention in rural areas related to a government's initiative that mandates rural placements, and having to fulfill family obligations. Factors that contributed to their remaining in rural practice included being valued as a health professional by patients and colleagues, being a member of a professional team, having strong links to the community, and being satisfied with the nature of their work.

Inter-professional focus group respondents all agreed on what health management programs should cover, including health systems management, information management, financial management, human resources, leadership and the change process. They also believed that the outcome of such programs should result in competencies in leadership, strategic decision making, and effective communication and interpersonal skills. These topics, competencies and skills are congruent with those identified in the survey results.

In the nurses' focus group discussion, there was consensus that they should have equal access with the other professions to health management education. In addition, respondents raised numerous issues affecting their scope of practice. These included limited scope for effective communication with all stakeholders, a lack of recognition by medical officers and little opportunity for inter-professional education. Respondents emphasized the need to promote the role of primary care nurses (PCNs) at the community level, and they also discussed the workforce shortage, specifically the insufficient number of nurses to undertake home visits. Overall, the group concluded that these factors had the potential to affect the sustainability of PCNs in primary care units.

Discussion

As far as health management issues are concerned, participants in this study indicated that their knowledge of information management and research was rather poor and that improvements in financial management, especially developing financial measures, key performance indicators and monitoring budget performance, are required to meet best practice financial accountability and transparency. These health managers were very much aware that they could profit from improving their management competencies in the areas of leadership, strategic decision making and communication and that, in particular, healthcare policy, health service management, information management, research and evaluation are high priority learning areas.

The major challenges respondents face in their role as primary healthcare professionals are developing effective teamwork, having a clear vision, managing the PCU services and personnel effectively, continuing professional development, and recruiting competent and skilled nurses for PHC work. The respondents collectively agreed that these challenges can be overcome by strengthening team-building efforts through inter-professional collaboration, and capacity building at all levels through professional development. The findings in this study in terms of primary healthcare sustainability in rural Thailand are consistent with those of Pachanee and Wibulpolprasert (2006).

The inter-professional focus group sessions throughout the 3-day workshop highlighted several factors in relation to primary care nurses. First, the majority of PCNs prefer to work in rural areas for the job satisfaction, challenges and flexibility that the role offers them. Second, PCNs provide an invaluable contribution to patient-centred care in PCUs and are eager to foster multidisciplinary collaboration to improve patient care outcomes.

Third, they prefer to work in PCUs rather than undertaking home visits, and they would like inter-professional recognition for their scope of practice. Finally, there needs to be flexibility in healthcare delivery, such as different models of care in different PCUs. Participants' preferred learning context was summarized as inter-professional, team based, long-term, and action oriented. Overall, nurse respondents emphasized the need to acquire management and competency skills in order to build a sustainable and capacity-building environment for primary care units.

Management approaches underpinning an effective implementation of health reforms can be summarized as change management and performance management based on effective leadership. Such leadership requires managers to draw on a number of competencies, including conceptual, participatory and interpersonal competencies. These must, in turn, emanate from a manager's drive, motivation, integrity, self-confidence and emotional intelligence based on people, communication and hands-on skills. In addition, these management competencies need to be based on the principle of aiming to develop capabilities, that is, a lifelong process of engaging in continuous learning in order to operate effectively and efficiently in an ever-changing and increasingly complex multifaceted health environment. Therefore, the paradigm shift required from health managers and staff comprises three major considerations – moving from managed care to an organized system of care, becoming a high-reliability organization and setting up high-reliability teams (Yanggratoke 2006).

Several recommendations arose from our study findings. First, an integrated strategic direction to ongoing learning and development was proposed, starting with short-course seminar-based learning while formal curriculum was developed and implemented. These initiatives would require greater academic and research capacity in order to develop and deliver the curriculum. A further major

recommendation was that in the development of primary care nursing programs, health management topic areas should be included. Respondents in the nurses' focus group also believed that skills in effective intersectoral collaboration and stakeholder communication should be included in programs to further develop the primary care nurse's role.

The authors acknowledge that there were limitations to the study. This qualitative study consisting of a purposive sample of 35 health professionals was limited to one province in Thailand; therefore results cannot be generalized. However, using in-depth interviews and focus groups with a diverse range of health professionals provided rich, valuable data that will greatly assist the Thai–Australian Health Alliance in developing an inter-professional health management curriculum. In addition, the questionnaires used in the quantitative stage of this study were developed specifically for the Thai context but were not pilot tested prior to data collection. Therefore, reliability will need to be established with further use of the questionnaires.

Conclusion

The main challenges in this research study were the inter-cultural nature of the project, the inter-professional group of participants and the need to influence health-professional policy to understand the issues and problems in primary healthcare delivery in rural Thailand. The latter challenge has also been described in the literature by Taytiwat (2008) and Fraser et al. (2008:3 3), who stated that "a barrier to the implementation of many proposed changes was the lack of authority and/or organizational support to influence the development of new policy."

According to respondents, the most valuable component of the workshop was the space created by the researchers where dialogue that allowed for multiple perspectives was encouraged. Respondents were exposed to a range of critical workforce issues, including recruitment and retention and the need for a health-management curriculum, and they were able to express opinions with each other and the research team.

In an increasingly complex and ever-changing world where healthcare needs must be managed effectively and efficiently, PHC delivery needs to be based on the principles of sustainability. PHC health professionals need to increasingly embrace teamwork, advocate capacity-building strategies, shift from the dominance of curative care to a focus on preventative, promotive and rehabilitative care, and embrace best practice, evidence-based population health and public health principles in order to effectively deal with the complexities of healthcare today and in the future.

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"Social Marketing" for Early Neonatal Care: Saving Newborn Lives in Pakistan

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Abstract

According to the World Health Organization and the United Nations Children's Fund, developing countries carry a large share of neonatal mortality in the world. According to UNICEF, almost 450 newborn children die every hour, mostly from preventable causes. Restricted access to quality and hygienic delivery services and limited knowledge about handling the newborn aggravate the situation. South Asia, and Pakistan in particular, have reduced their child and infant mortality during the last decade; however, neonatal mortality still remains unacceptably high. There are multiple reasons, mainly related to practices and behaviours of communities and traditional birth attendants. Rural and poor populations suffer most in Pakistan, where three out of five deliveries still occur at home. Traditional community practices and conservative norms drastically affect neonatal health outcomes. Preventing sepsis at the umbilical cord, keeping the baby at the correct temperature after birth and early initiation of exclusive breastfeeding are three simple strategies or messages that need to be disseminated widely to prevent many neonatal mortalities and morbidities. Since inappropriate practices in handling newborns are directly linked with persistent and unremitting behaviours among health providers and the community at large, we suggest doing robust "social marketing" for saving newborn lives. The objective of the paper is to present a social-marketing strategy and a marketing mix that will help address and surmount actual barriers and promote alternative behaviours in early neonatal care.

Introduction

Pregnancy, childbirth and motherhood can be made safer in an enabling and health promoting environment ensured jointly by family household members, healthcare providers and the community. Among other challenges to maternal and child health, the most daunting has been the proportion of unsafe deliveries followed by inadequate postnatal follow-up services. This has contributed grossly to the high rates of neonatal mortality around the globe, particularly in poor and developing countries. According to the World Health Organization (WHO), an estimated 298,000 neonatal deaths occur annually in Pakistan (WHO 2005). Neonatal mortality is the probability of dying within the first month of life, and the latest statistics show that nearly four million newborns die within that period around the globe. These deaths are far greater in number in developing countries than in industrialized ones. Almost 40% of under-five deaths occur in the first 28 days of life, and three quarters of neonatal deaths take place in the first 7 days. Maternal complications in labour predispose neonates to a greater risk of death, compounded by poverty, in developing countries. Almost 450 newborns die every hour, mostly from preventable causes. Two thirds of the world's neonatal deaths occur in just 10 countries, mostly in Asia (United Nations Children's Fund [UNICEF] 2009). Limited understanding of the urgency attached to newborn illnesses, traditions of seclusion of mother and newborn, belief in evil spirits and the family's inability pay for care and transport can delay the decision to seek care (UNICEF 2004). Although childhood and infant mortality in South Asia has been reduced substantially during the last decade, the rate of neonatal mortality is still high (Lawn et al. 2005). Pakistan is ranked third among these 10 countries and accounts for 7% of global neonatal deaths.

This paper focuses on the importance of safe delivery and, even more importantly, on the significance of early neonatal care in this critical time for reducing neonatal mortalities, by presenting a social marketing strategy and a workable marketing mix. Neonatal mortalities are a major public health problem and should be addressed by a multi-pronged strategy. Among the various causes and determinants of neonatal mortality, most emerge from behaviours and inappropriate practices of women and caregivers. Therefore, this paper attempts to make a case for social marketing as the most versatile strategy for addressing this intricate issue and promoting some key practices vital for neonate survival.

Postnatal Care and Neonatal Mortality in Pakistan: Findings from PDHS 06-07

According to the Pakistan Demographic and Health Survey of 2006–07 (National Institute of Population Studies and Macro International[NIPS/MI] 2008), 61% of expectant mothers received prenatal care; however, only 34% delivered at a facility (11% at a public and 23% at a private facility). Among these, 25% received postnatal care within 4 hours of delivery, 6% within the first 4 to 23 hours, 7% received care 1 to 2 days after delivery, and 3% between 3 and 41 days. Three of every five women reported not having a postnatal visit. Twenty-seven percent of those who did have postnatal visits received care from a skilled health provider, while 16% received care from a traditional birth attendant. Three out of five deliveries took place at home, attended by a relative or unskilled birth attendant. The Pakistan Demographic and Health Survey of 2006–07 quotes neonatal mortality as 54 deaths per 1000 live births. This rate has remained unchanged since the survey of 1992–96 which was 56 deaths per 1000 live births (Hakim et al. 1998). When viewed by socioeconomic characteristics, newborn death rates are highest for mothers who have no education and are in the lowest wealth quintile. Thirty-two percent of women whose last child was not delivered in a health facility used a safe delivery kit. The urban–rural differential is quite high, with 42% of urban women using safe delivery kits compared with 29% of rural women. Around 79% of those who did not deliver in a health facility used non-boiled thread to tie the cord. Among these, 82% of rural women were more likely to use non-boiled thread than women in urban settings (NIPS/MI 2008). Newborn deaths resulted from a combination of medical causes, social factors and health system failures that varied by context and culture. Not complying with standard practices and continuing with traditional modes of handling newborns has shown the dire need to introduce behaviour-change strategies among the vulnerable communities in Pakistan, both in rural and urban settings.

The use of health services is known to depend on the physical, economic and social accessibility of the offered services, as well as on the perceived benefit compared with other opportunity costs (Shaikh and Hatcher 2005). Among factors related to health systems, studies indicate that substandard care, inadequate training, low staff competence and lack of resources – including equipment and medication – all contribute to neonatal death (Hasan and Khanum 2000; Korejo et al. 2007). Low attendance of women at the postpartum visit could be attributed to the fact that most of our primary healthcare facilities are not responsive enough to women's healthcare needs. These facilities lack female healthcare staff as well as adequate privacy and a socio-culturally acceptable environment for women clients (Shaikh et al. 2008).

Lessons from the Region

Studies have reported on successful interventions in a number of countries in the region. In India, female village health workers with 5 to 10 years of schooling learned to deliver a package of home-based newborn-care services. By the third year of the program, neonatal mortality was 62% lower than in control villages (Bang et al. 1999). Another study showed remarkable results for home visits by community health workers in increasing mothers' knowledge of maternal and newborn care and in reducing neonatal mortality (Baqui et al. 2008). In Bangladesh, mothers' knowledge of essential newborn-care practices such as drying and wrapping the baby immediately after birth, initiating breast milk within 1 hour of birth and having early postnatal newborn checkups improved neonatal health outcomes (Syed et al. 2006).

Traditionally, the cord is usually cut with a razor blade, knife, sickle or even a piece of wood, none of which is generally sterile. In some cultures, the cord is not cut until the placenta is delivered, and then only after cord pulsation stops upon delivery of the placenta (Sreeramareddy et al. 2006). In Nepal and Turkey, health education aimed at behaviour has worked through changing mothers' postpartum practices and beliefs (El-Mouelhy et al. 1994; Turan and Say 2003). In Pakistan, pre-lacteal feeding is quite common (Fikree et al. 2005). Other practices would not be so different from those cited above; therefore similar interventions would work. An effective postnatal care package for mothers and newborns would necessitate a continuum of preventive and curative care to improve maternal health and child survival, from home, to a first-level care facility, to hospital (Kerber et al. 2007).

Early Neonatal Care: The Crucial Time

The first two days are crucial for monitoring complications arising from the delivery. As defined by the WHO (2009), the standard time of early neonatal care is within 24 hours of childbirth. Essential newborn care must include the following:

- Hygiene during delivery, including cord care
- Keeping the newborn warm
- Early initiation of breastfeeding and exclusive breastfeeding
- Immunization
- Care of the eyes
- Care during illness
- Care of low-birth-weight newborns

Barriers in Seeking Postnatal and Early Neonatal Care

Access to quality, convenient and responsive care encourages healthcare seeking and utilization among women. However, access is limited by a number of factors:

- The cost (monetary and non-monetary) attached to seeking quality care is an important determinant in making the decision to do so;
- Physical distance matters, because it involves the transportation fare to the health facility;

- Access for the woman is defined by societal norms and most of the time is constrained because of family objections and cultural embargoes on seeking the healthcare of her own choice;
- The gender of the healthcare provider is a long-standing issue; there are not enough female practitioners, particularly in rural areas (Shaikh and Hatcher 2005; Shaikh et al. 2008).

Access to healthcare is further complicated and quite often delayed because of the prevailing traditional practices and home remedies of the conservative communities that compete strongly with health promotion and education.

"Social Marketing": Changing Behaviours for Early Neonatal Care

It is important to understand that people do not change behaviours easily. In fact, people are more likely to take on a new idea quickly if it exhibits characteristics such as the following: the proposed behaviour has a relative advantage over what exists; it is compatible with social norms; it is not too complex; it can be tried out; and, more importantly, others are doing or using it. The key concepts of "social marketing" include bringing about voluntary behaviour change, prioritizing a specific audience and focusing on personal welfare and that of society. The ultimate goal is to bring about shifts in social norms. Social marketing is critical because it looks at the provision of health services from the viewpoint of the consumer (Kotler et al. 2002). It is not a new phenomenon in Pakistan; promotion of contraceptive use for furthering family planning, increased utilization of safe delivery kits, use of oral rehydration salt to reduce childhood mortality from diarrhea and use of iodized salts in goitre-endemic areas are some of the successful campaigns in which the government and the private sector have been involved (Greenstar Social Marketing 2000; Khan 2008).

Social marketing has not yet been tried on a mass scale to improve early neonatal care by creating a demand for postnatal services by pregnant women and their families (including mothers-in-law and husbands) in Pakistan. Newborn lives can be saved through increasing the practice and promotion of healthy behaviours at home and in the community. Reasons for not going for early neonatal and postnatal checkups have not necessarily been related to cost; instead, husband's opposition and distance to the facility were more frequently cited in studies (Lawn et al. 2005). Health education, communication strategies for behavioural change, social marketing of safe delivery kits and promoting the importance of postnatal care will eventually deliver better health outcomes for neonates. However, all these interventions ought to be fine-tuned, considering the contextual factors of the communities in focus. This would include looking at health service utilization patterns, availability of health personnel, cultural norms, traditional practices, status of women, and so forth (Victora et al. 2005). Social marketing is not only about communication and advocacy; it must ensure that products deemed necessary for promoting desired behaviours are accessible and available to the priority population. Another opportunity, therefore, would be to maximize the in-facility and outreach services for postnatal care for mothers and newborns. Behaviour-change interventions start at the family level and, as funds allow, work their way up to health-belief systems, symptom recognition and care seeking, provider preferences, perception and utilization of services, and household decision making (Seidel 2005).

The Audience

In promoting early neonatal care services, the primary audience will be pregnant women, as they are the prime caregiver to the newborn. Future mothers must be sensitized to the need for a postnatal checkup for themselves and the newborn. However, the picture in our setting is quite complex because of the people involved. Since most deliveries are conducted by traditional or non-skilled birth attendants (three out of five) (NIPS/MI 2008), these individuals should be engaged and informed about the importance of clean delivery, cord care and thermal regulation of the newborn. Furthermore, the social marketing campaign must recognize and involve a secondary audience – the key decision makers at the household level – mothers-in-law and husbands, who hold the finances as well. Involving and training traditional birth attendants to promote key practices for improved

peri-natal care has already been documented (Jokhio et al. 2005). Last but not least, skilled birth attendants would need refresher training to reinforce the concepts of early neonatal care.

Goal and Objectives

The ultimate goal is to reduce neonatal mortality resulting from lack of proper care during and soon after delivery. The objectives, however, are manifold:

Knowledge Objective

Since we have identified a primary as well as an equally important secondary audience, for the knowledge objective the social marketing campaign or program must focus on:

- Informing prospective mothers that delivery in the presence of a skilled birth attendant will increase the healthy well-being of their newborn;
- Sensitizing husbands and mothers-in-law to the need for early neonatal care as instructed by the skilled birth attendant will not only prevent the child's morbidity and mortality, it will also be cost-effective in the long run.

Belief Objective

The message promoting the importance of early neonatal care must strengthen the belief of the pregnant women, their husbands and mothers-in-law that all such instructions for care of the newborn are beneficial and necessary for his or her health outcomes later in life.

Behaviour Objective

After having created a reasonable demand on the subject, the social marketing campaign and program should make safe delivery kits available from the area's health providers and birth attendants, who should facilitate the sensitized mothers' use of them.

Marketing Mix

In order to achieve the goal and objectives of the social marketing program for early neonatal care, the marketing mix must be conceptualized with utmost care and understanding. A watchfully designed marketing mix will help in addressing and surmounting the actual barriers and promoting alternative behaviours in early neonatal care seeking.

- Product: In this scenario, the product would be a safe delivery kit containing a sterilized blade for cord cutting, a blanket for preventing hypothermia and other items such as soap (for emphasis on hand-washing), antiseptic bandages, cotton and a plastic sheet for delivery. As well, health messages for highlighting the importance of early initiation of and exclusive breastfeeding must be reinforced in the family and during the visit to the health centre for immunization.
- Place: The safe delivery kit can either be made available at the nearest health centre or distributed through women health workers to local birth attendants or pregnant women during household visits. This strategy would address the issue of how to acquire such kits.
- Price: Ideally, the safe delivery kit would be free; otherwise, a nominal subsidized cost could be charged to the community as a token of their contribution to the program.
- Promotion: Through use of social anthropology, behavioural psychology and the educational status of the priority audience, ways and means of promoting use of safe delivery kits and postnatal care can be worked out. Creating strong demand for such services can be accomplished through our vast network of local health workers. Behaviour-change messages should be delivered to the primary and secondary audiences in person. Moreover, mass media (electronic and print) can play a vital role in this context. Health education messages must aim to improve home care practices, creating demand for skilled care at time of delivery, and overall care-seeking behaviours, especially in the postnatal period (Darmstadt et al. 2005).

Conclusion

Research on health-seeking behaviours seems complex at times, requiring special expertise, time and money. But translating the results into practical program decisions would be worthwhile and fruitful, particularly in interventions that aim to eliminate myths among the communities and promote appropriate behaviours and practices (Qureshi and Shaikh 2006). Social marketing is a very useful approach if integrated with other strategies for bringing about change in community behaviours. Promoting safe delivery practices and the importance of early neonatal care could be instrumental in reducing the early neonatal mortality due to improper cord care and hypothermia, in initiating early breastfeeding and in going for routine immunization.

In diverse societies such as Pakistan, social marketing through a profound understanding and an intelligently designed program can affect the circumstances that facilitate adoption of health-oriented behaviours and practices, particularly for saving newborn lives. This paper will serve as a guide for policy makers and program mangers in formulating action plans for promoting key practices to save neonatal lives. It will be encouraging to see such plans implemented and research studies published as a result.

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Determinants of Gender Differences in Health among the Elderly in Latin America

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Abstract

This paper identifies the main gender differences in health and socio-economic characteristics of the elderly in four Latin American cities. Using locally weighted regressions as well as a flexible model specification that treats age non-parametrically, we investigate whether these unadjusted gender gaps in health are due to gender differences in the distribution of age and other explanatory variables. Interestingly, for all cities, the analyses show a gender gap in health in favour of males at each age. The gaps are larger when one uses functional impairment in mobility and personal self-care as indicators of an individual's health instead of self-reported health. Furthermore, controlling for demographic characteristics, baseline health and the availability of family support do little to change the disadvantage for women in measured health outcomes. Controlling for socio-economic variables does, however, reduce most of the gender differences in health.

I. Introduction

As the Latin American public becomes more aware of the economic, financial and social implications of the rapid demographic transition occurring in these economies, there is increased pressure to reform the network of health and social services that provide support to seniors. Available evidence suggests that the populations of Latin American countries are aging at a faster rate than those of many developed countries (Shrestha 2000). Regional trends track global ones, but some important differences are worth noting. The percentage of the population that is elderly in Latin America is projected to increase to 6.5% by the year 2010 and to 8.5% by 2020, growing much faster than the average for the rest of the globe. The expected growth in the proportion of the region's population over the age of 80, the "very elderly," also exceeds the global trend (Arriagada 2003). Rapid improvements in survival rates within this age group will have a tremendous impact on medical care expenditures, which in time will pressure governments to develop policies to meet this future demand.

The needs of these rapidly growing elderly populations, and in particular the health needs of the very elderly, may force these nations to develop new systems geared toward providing seniors with financial support, formal and informal social support, and healthcare. How the governments in Latin American countries decide to distribute the costs associated with their rapidly aging populations among different members of society will introduce fundamental economic and social challenges in the future. To effectively implement policy initiatives for the elderly, a necessary first step is to better understand the economic and non-economic determinants of health status among this group. To do this, special attention must be paid to how life histories and current demographic and socio-economic conditions affect the onset of illness and the speed at which health deteriorates among elderly males and females.

Policies aimed at improving the health status of the elderly have been justified on the grounds that they are part of a global strategy to reduce poverty and gender inequalities. Gender equity with respect to health and well-being among the elderly has become a crucial element in recent political reforms in Latin America (Saith and Harriss-White 1999). Assessment of well-being is measured with a set of social indicators; health measures such as mortality and morbidity rates are among the many dimensions used to construct more comprehensive indices usually referred as the functionings framework (Sen 1998).[1] Under this approach, directly reducing genders gaps in health status among the elderly is one way to increase the overall well-being of a country's population.

… special attention must be paid to how life histories and current demographic and socio-economic conditions affect the onset of illness and the speed at which health deteriorates among elderly males

It is a well-known fact that females live longer than males, but they also experience lower overall health status. Nathason's (1975) seminal piece and more recently the work by Knodel and Ofstedal (2003) review in detail the issues of gender differences in the aging experience. Although little empirical evidence exists for developing countries (see Strauss et al. 1993; Sen 1998; Buvinic et al. 2006), the results so far are consistent with the following paradoxical finding: Women in developing economies report worse health status and higher morbidity than males, in spite of longer life expectancies.

The size and composition of gender differentials in mortality, morbidity rates, self-reported health and medical care use vary over the course of life (Verbrugge 1985; Ross and Bird 1994 Valanis 1999; Arber and Cooper 1999). Statistics about morbidity and self-reported health status over the course of life indicate lower self-reported health status, higher morbidity from nonfatal chronic conditions, more frequent acute diseases and higher prevalence of mental problems and short-term disability for females, while males report a higher frequency of life-threatening condi-

tions. The excess mortality in males seems to be the result of higher morbidity from life-threatening conditions rather than an overall excess morbidity. Women also report a higher use of heath services and therapeutic drugs than males.[2] Lastly, in rankings of health problems that lead to medical care consumption and possible death, males and females are highly similar (Verbrugge 1985). However, the frequency, intensity and path to death of these illnesses differ substantially across gender.

A closer look at the gender gaps in health among the elderly indicates that gender differentials in mortality and morbidity diminish over the course of life (Verbrugge 1985). Later in life, females report lower self-reported health and greater functional limitations than males, due to disability. Females are also more prone to report nonfatal chronic conditions (e.g., hemorrhoids, constipation, dermatitis, thyroid conditions, anemia and arthritis) than males. Furthermore, females experience acute conditions and short-term infectious diseases more frequently than males. In contrast, elderly males are more likely to suffer from life-threatening chronic conditions, including coronary heart disease, malignant neoplasm, cerebrovascular disease, kidney disease and cirrhosis than females. Finally, in the later stages of life, as elderly males tend to increase their use of health services as their medical problems become more severe, the gender gap in the use of medical procedures and therapeutic drugs declines (Ross and Bird 1999; Valanis 1999).

Five different hypotheses have been postulated to explain the gender gaps in health (for an excellent review, see Verbrugge 1985): (1) biological risk of disease, (2) risk of disease and injury, (3) aspects of therapeutic actions, (4) health reporting behaviour and (5) prior healthcare use. The relevance of these factors may vary over the course of life. Males may undertake more risky behaviour than females (e.g., smoking and drinking) during adult life. Nevertheless, one might expect males would put their health at risk less often as they become older. Likewise, living arrangements may become more relevant later in life. Gender differences in education, earnings and occupation could influence one's health during adult life, and they may have a significant impact on health later in life. Biological differences that may favour females have been linked to childbearing years and are less important during later stages of life. Essentially, women have been found to exhibit a stronger resistance to illnesses during adult years since they need to be healthy to give birth (Ross and Bird 1999; Sen 1985.

In addition to these explanations, gender differences in health status and morbidity rates among the elderly could be due to the problem of selection. Since men have a greater mortality rate than females over the course of life, self-reported health status observed in the data for elderly males may be the residual result of the survival of the healthiest males. Accounting for gender differentials in mortality selection could explain the observed gender gap in health among the elderly.

In our analysis, we will develop a model that examines the following four central questions:

1. What are the main differences in self-reported health and life-threatening and disabling conditions between elderly males and females in the four cities in our sample?
2. What are the main differences between elderly males and females with respect to income, asset holdings and composition, education, marital status, present occupation, age of retirement and insurance status?
3. Are gender differentials in health due to differences in age composition?
4. What factors explain the patterns in gender differentials in self-reported health and functional disability among the elderly?

II. Methods and Data Description

A. Methods

Our first step will be to focus on describing the gender gaps in health among the elderly. This descriptive analysis is conducted using the SABE dataset for the following four cities: Buenos Aires (Argentina), Sao Paolo (Brazil), Santiago (Chile) and Ciudad de Mexico (Mexico). In the forthcoming sections, we use the country name to refer to each of these cities.

The analysis incorporates several dimensions of individual health, including cognitive evaluation, self-reported health status (SRHS), the prevalence of chronic and acute conditions, and functional health – Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) indices – reported in the SABE project data.

SRHS has been widely recognized as a simple but very comprehensive indicator of an individual's health, and it is a good predictor of an individual's future mortality (Deeg and Kriegsman 2003). Additionally, self-reported physical functioning and the ability to perform personal care (ADL and IADL) have been widely used to study the health of populations in developed and developing societies (Strauss et al. 1993).

After describing elderly health, we will examine the demographic and socio-economic conditions facing the elderly. This analysis provides a clear picture of the main differences between male and female elderly seniors, with a focus on those factors that may affect their health.

Once an understanding of the gender differentials in health among the elderly has been provided, we will undertake an analysis to determine if these health gaps are the consequence of gender differences in age composition. The existence of differences in age composition implies, on one hand, that the unadjusted gender differences in health observed in the data may be the result of the higher proportion of females relative to males who reach old age, but who also report lower health. The average male's health may be the result of fewer healthier men who similarly reach old age. Therefore, the comparison of the unadjusted gender differences in health may be biased in favour of males because, on average, they will be younger than females.

Using cross sectional data,[3] one could test this hypothesis by evaluating the effect of gender on health at each age. Essentially, after controlling for age, the remaining differences in health between males and females will not be the consequence of gender differences in age composition.

To test this hypothesis, the model we use will follow Grossman (1972), where health is treated as a stock of human capital. In particular, we implement two empirical approaches to explore the existence of gender differentials on health. First, we estimate a model where the age effects are unrestricted, and the female effect is assumed constant across all ages. Second, we estimate a more flexible model, where the female effect varies by age. In both cases, we undertake multiple regression analyses using sampling weights to account for having low numbers of elderly above 80 years of age.

The reduced-form equation we use to model the age-related effect of gender on health is the following:

$$Y_i = a(60) + a(61)d(61)_i + a(62)d(62)_i + \ldots + a(98)d(98)_i + b(F)F_i + \mu_i \quad (1)$$

where Y_i measures an individual's health. In our analysis, we use three different measures of health: SRHS, ADL and IADL. In addition, $d61$, $d62$, $d63$ … $d98$ are a vector of dummy variables for each age. In this case, we are assuming that the lowest age in the data is 60 and the highest is 98. F_i is a dummy variable for female. Lastly, μ_i represents a vector of the unobserved characteristics that influence an individual's health. One should notice that this model treats age non-parametrically and assumes a constant female effect for all ages. In particular, testing the hypothesis that the female coefficient is significant and negative will imply that elderly females report lower health, holding constant an individual's age. We estimate this model separately for each country in the sample.

Since this model may be too restrictive, in the sense that it assumes a constant effect of gender on health at each age, we also estimate the following more flexible model:

$$Y_i = a(60) + a(61)d(61)_i + a(62)d(62)_i + \ldots + a(98)d(98)_i + b(F)F_i + b(61)[F_i d61_i] + b(62)[F_i d62_i] + \ldots + b(98)[F_i d98_i] + \varepsilon_i \quad (2)$$

Since this model assumes a different gender effect on health at each age, testing the joint hypothesis that the female interaction effects are significantly different from zero will shed light on the gender effect on health after controlling for age.

Using the model presented in Equation 1, we also estimate a locally weighted regression using linear probability models.[4] The idea behind this approach is to estimate a regression at each age using only a subset of the sample, weighting points close to each age more heavily than points farther away. In this way, we can reduce the influence of the distribution tails in the average calculation of health at each age. These estimated regressions are then used to predict a smoothed health value for each age. We undertake this analysis for each country. The results of this method are graphed for each measure of health used in the analysis.

Given the dependent variable in the analysis (health status), we had to choose between using a linear probability specification (ordinary least squares; OLS) or an alternative method to handle categorical dummies with more than two choices (e.g., ordinal logit, ordinal probit, count models, etc.). Since one of the main objectives of the research was to find out whether females at each age (instead of average health) report lower health than males, we decided to implement a non-parametric specification model in age. This implies including a dummy variable for each age and additional computational effort to estimate the average standard error of the age/sex variable. Given the complicated specification and, more importantly, the limited sample size in our database, it was not feasible to run models such as ordinal logit or probit. Yet, the model results are similar for the linear probability model, logit and probit specifications when one implements a standard parametric approach controlling for a single age variable and a dummy variable for gender.

Lastly, using the model presented in Equation 1, we attempt to explain the gender differences in health after controlling for relevant covariates in a sequential order. In our analysis, we divide the set of variables into four vectors: (1) a vector of demographic characteristics, (2) a vector of socio-economic conditions, (3) a vector of family support characteristics and (4) a vector of baseline health.[5]

For each country, we estimate the basic model (which only includes a separate dummy for each age and a dummy for female) and add to it each of the vectors separately. After including each vector of covariates, we test the individual hypothesis that b(F) is negative and statistically significant. By comparing the magnitude of the coefficients, we may evaluate which vector has the greatest effect on reducing the gender differentials in health status. This approach allows us to test if eliminating differences in current socio-economic conditions is sufficient to eliminate the gender gaps in health, and to test if these differences are more important in explaining the gender gaps in health than the other gender differences in demographic, family support and baseline health conditions.

B. Data Source, Relevance of the Data and Variable Description

The SABE database is a cross-sectional survey that collects information from 1999 and 2000 about the health status and health conditions of the elderly population in seven representative cities in Argentina, Barbados, Brazil, Chile, Cuba, Mexico and Uruguay.[6] The survey instruments were consistent across countries, which gives a unique opportunity to compare the health status of the elderly in these cities. The survey includes representative samples of individuals older than 60 years of age living in urban areas. Furthermore, the sampling design accounts for potential problems of under-representation in the final sample of individuals over 80 years of age, as well as institutionalized individuals. The information included in the survey is similar to that provided by the Health and Retirement Survey (HRS) in the United States.

Table 1 describes all the dependent variables (SRHS, ADL and IADL), the independent variable (gender) and several of the control variables used in our statistical analyses.[7] The vector of control variables includes the societal, cultural, environmental and biological risk factors affecting gender differentials in health outcomes. For convenience, the vector of control variables is categorized as demographic, socio-economic characteristics, family support characteristics and baseline health status.

Table 1. Description of variables in the SABE database

Variables	Description
Dependent variables	
SRHS	A question that includes the following options: excellent, very good, good, fair and poor
ADL/IADL scores	Variables to measure current ADL and IADL scores. This excludes any difficulties that an individual expects to last more than 3 months
Other health-related variables	
Cognitive evaluation	A vector of 10 different variables (e.g., memory at the present time, able to manage money, shopping alone, remember family events, etc.)
Existence of chronic and acute conditions	Different questions about the existence of hypertension, diabetes, cancer, lung disease, heart attack, coronary heart disease, angina or other heart problems, cerebral embolism, arthritis, rheumatism or osteoarthritis
Mental health	Variables to measure emotional, nervous or psychiatric problems in the last 12 months
Health risk factors	Smoking, drinking and eating behaviours
Independent variable	
Gender	Sex
Control variables	
Vector of current socio-economic characteristics	Level of schooling, illiteracy, age when started to work, current work status, age at retirement, type of occupation, total income from different sources (pension, family transfers, banking income, welfare subsidy), home ownership, list of household assets (e.g., refrigerator, washer, water heater, microwave, television, telephone, VCR, radio player, heating, air conditioning, fan) Availability of health insurance, includes the following categories: social security, private and public insurance
Vector of family support characteristics	Number of household members, number of brothers and sisters
Vector of baseline health status	Father or mother alive, father or mother's age at death, living in rural areas first 5 years of life, age when first diagnosed with cancer, past smoker, current smoker, family economic condition during the first 15 years of life, self-assessment of individual's health in the first 15 years of life, existence of any of the following illnesses during the first 15 years of life: kidney disease, hepatitis, measles, tuberculosis, rheumatic fever, asthma, bronchitis

III. Results

In this section, we answer the four key questions we posed at the beginning of the paper. For the first two sections, we discuss the results for all the countries included in the analysis; however, we present only the results for Sao Paulo (Brazil). The rest of the findings are available from the authors upon request. For the last two sections, we show the results for all cities.

A. What Are the Main Differences in Health Between the Male and Female Elderly in These Four Cities?

In Brazil, for both genders, all measures of self-reported functional health status from the sample decline with age. Males have better indicators of functional mobility, ADL and IADL, than females across all age groups (see Table 2). As Hurd et al. (1999) have shown, this result may suggest that help from spouses obfuscates ADL limitations among males. Females have higher prevalence rates for all life-threatening conditions in all age groups, with the exception of chronic lung disease. Observe that the prevalence of some life-threatening conditions declines with age. This may indicate

Table 2. Brazil – elderly health: gender comparison by age group, weighted summary statistics

Health indicators	Males (881)						Females (1262)					
	(311)		(472)		(98)		(494)		(643)		(125)	
	Young old (60 < X < 70)		Old (71 < 85)		Old old (> 85)		Young old (60 < X < 70)		Old (71 < 85)		Old old (>85)	
	Mean	Std err	Mean	Std err	Mean	Std err	Mean	Std err	Mean	Std err	Mean	Std err
Health functional status												
SRHS	2.592	(0.052)	2.543	(0.054)	2.395	(0.096)	2.521	(0.046)	2.502	(0.044)	2.432	(0.088)
ADL index	7.923	(0.146)	7.132	(0.145)	5.530	(0.271)	6.723	(0.137)	5.930	(0.133)	4.364	(0.252)
IADL index	14.469	(0.122)	13.449	(0.217)	10.6	(0.605)	13.97	(0.118)	12.942	(0.122)	9.378	(0.502)
Life-threatening conditions												
Hypertension	0.489	(0.029)	0.516	(0.028)	0.392	(0.055)	0.546	(0.025)	0.593	(0.024)	0.588	(0.043)
Diabetes	0.174	(0.023)	0.173	(0.023)	0.081	(0.028)	0.194	(0.018)	0.182	(0.017)	0.151	(0.033)
Cancer	0.015	(0.006)	0.061	(0.016)	0.022	(0.015)	0.031	(0.008)	0.038	(0.007)	0.046	(0.021)
Chronic lung disease	0.132	(0.018)	0.161	(0.020)	0.184	(0.051)	0.107	(0.013)	0.108	(0.015)	0.106	(0.035)
Heart disease	0.173	(0.017)	0.262	(0.024)	0.215	(0.048)	0.158	(0.018)	0.223	(0.016)	0.285	(0.045)
Stroke	0.071	(0.002)	0.122	(0.021)	0.098	(0.036)	0.051	(0.010)	0.071	(0.012)	0.082	(0.029)
Disabling conditions												
Arthritis, rheumatism or osteoarthritis	0.196	(0.023)	0.223	(0.022)	0.267	(0.046)	0.390	(0.019)	0.423	(0.021)	0.420	(0.049)
Fall in the last 12 months	0.203	(0.024)	0.236	(0.028)	0.436	(0.060)	0.307	(0.024)	0.348	(0.018)	0.454	(0.045)
Incontinence	0.079	(0.015)	0.165	(0.020)	0.325	(0.050)	0.223	(0.021)	0.297	(0.021)	0.441	(0.046)
Cognitive scores	0.959	(0.013)	0.911	(0.014)	0.816	(0.055)	0.970	(0.009)	0.884	(0.015)	0.623	(0.057)
Psychiatric problems	0.124	(0.017)	0.127	(0.018)	0.119	(0.045)	0.198	(0.019)	0.160	(0.017)	0.074	(0.026)
Anthropometry measures												
Height (cm)	165.5	(0.491)	164.10	(0.42)	161.7	(0.845)	152.8	(0.322)	150.9	(0.305)	147.6	(0.685)
Weight (kg)	70.8	(0.847)	67.50	(0.68)	59.8	(1.393)	64.8	(0.796)	62.0	(0.635)	55.7	(1.689)

Note. (1) SRHS was coded 5 = excellent; 4 = very good; 3 = good; 2 = fair; 1 = poor. (2) ADL is an indicator from 0 to 10 (0 = worst condition). (3) IADL is an indicator from 0 to 15 (0 = worst condition). (4) Each health condition refers to whether a doctor or nurse ever told the individual that he or she had the condition. A dummy indicator was constructed where 1= existence of the condition; 0 = otherwise. (5) Cognitive score represents the percentage of individuals with a score higher than 13 (that is, in good cognitive condition).

that individuals have died from the disease, but it could also be the result of the incidence of the disease by birth cohort. Diabetes displays this pattern across all age groups. The decline in diabetes prevalence between the age groups of 60 to 70 years and older than 85 years is more dramatic for males than for females: 17.4% to 8.1% and 19.4% to 15.1% for males and females, respectively.

As shown in Table 2, the prevalence of physically disabling conditions (arthritis, rheumatism, osteoarthritis, falling and incontinence) increases with age for both males and females. The prevalence of physically disabling conditions is higher for females than males. For instance, while 26.7% of very elderly males report having arthritis, rheumatism or osteoarthritis, 42% of very elderly

females report having these same conditions. Lastly, females are significantly more likely to suffer from incontinence than males – more than 10 percentage points higher than males. The cognitive capabilities of the elderly less than 85 years of age are very similar for both genders. However, female cognitive abilities decline drastically, and are comparatively lower than those of males, after 85 years of age.

In Argentina, males report better indicators of functional health status. Yet, males report higher instances of chronic lung disease, heart disease and stroke than females. As expected, for both genders, all measures of functional health status decline with age. The lower health functional indicators reported for females may reflect the severity of disabling conditions. For example, females are more likely to report arthritis, rheumatism or osteoarthritis, and falling in the last 12 months than males. Interestingly, both males and females in Argentina report the highest rates of arthritis, rheumatism or osteoarthritis among all countries in the study. The cognitive capabilities of the elderly less than 85 years of age are very similar for males and females. However, males' cognitive abilities decline considerably and are comparatively lower than those of females after 85 years of age (opposite of the pattern in Brazil).

In Chile, the gradient of health deterioration with age is less pronounced for males than females when one looks at health functional status measures. This faster decline in functional health status among females may be caused by the higher rates of hypertension, diabetes, cancer, heart disease and stroke. Chilean males and females report the lowest rates of diabetes in all age groups, compared to Brazil, Argentina and Mexico. As expected for both genders, the likelihood of all disabling conditions increases with age. As with previous results, disabling conditions are more prevalent for females. At any age, females are more likely to report a lower cognitive score than males.

Lastly, in Mexico, indicators of functional mobility are higher for males than for females in all age groups, despite the fact that the self-reported health status for males and females is very similar. Interestingly, ADL and IADL decline more precipitously with age in Mexico for both males and females than they do in other countries. There is no clear evidence to suggest that females are more likely than males to suffer from life-threatening conditions, which was the case in other countries. Females were also less likely to report diabetes, heart disease and stroke compared to males in all age groups, while males were less likely to report hypertension and cancer. Hypertension rates for males are significantly lower in Mexico than in other countries and slightly lower for females. Mexican males report the highest rates of diabetes in all age groups compared to Brazil, Argentina and Chile.

Regarding disabling conditions, as expected, females are more likely to report disabling condition than males. The cognitive scores declined with age, but the level of the cognitive scores for males and females older than 85 were the lowest in Mexico, when compared to the other countries: 0.560 for males and 0.493 for females.

In sum, females reported lower functional health status and higher prevalence of all disabling conditions than males. Cognitive functions showed a similar pattern. Saad (2002) and Bos and Bos (2005) have also reported an observed better health status of elderly males. A sample selection factor could provide one tentative explanation for these results. In particular, fewer males than females surpass the age of 60. Consequently, males who survive are, on average, healthier than surviving females. Regarding life-threatening conditions in all countries, females are more likely to report hypertension and cancer than males.

B. What Are the Main Differences between Male and Female Elderly in Income, Asset Level and Composition, Education, Marital Status, Present Occupation, Age of Retirement and Insurance Status?

In Brazil (see Table 3), males show a higher functional health status than females. However, females tend to have a similar number of children alive and similar family networks to males. This social network may have a positive effect on health. The better socio-economic conditions that males report may also indicate that males have more resources than females to protect their health. Specifically, males report higher rates of literacy and education and are more likely to be employed, to own

their own home and to maintain private health insurance than females. Surprisingly, females report higher total wealth in all age groups, even though males report higher incomes. This may be the consequence of females living with other household members. These results are not consistent with the results reported by Hurd et al. (1999) in the case of the United States, where males show higher average wealth than females. In all age groups, males are more likely to report they are smokers, which may explain why males report higher instances of chronic lung disease.

Like Brazil, in Argentina, males are more likely to be married at all ages than females, and they are also more likely to have a higher income level than females in all age groups. The higher functional health status of males compared to females, and the lower rate of life-threatening conditions like cancer and hypertension, may be a result of these differences. The literacy, education and years of education rates for this cohort are similar for both males and females in all age groups.

In Chile, total income is higher for males than for females in all age groups, which may explain the higher health functional status and lower rates of life-threatening conditions for males. There is not a large discrepancy between the education rates of males and females. In particular, for the elderly older than 85, a larger percentage of females have attended school than males. Males are more likely to be married than females in all age groups.

In Mexico, as in all countries, the rate of males currently married is higher in all age groups than for females. The level of total income is also higher for males, with the exception of the very elderly group. Males' literacy, education and years of education are higher than those of females. However, males' socio-economic advantages are not reflected in the distribution of life-threatening conditions.

In sum, in all countries included in the study, males are more likely to be married and show a more modest decline in the rate of marriage than females. Iacovou (2000) has reported that elderly European males are also more likely to be married than females, and there is little decline in the percentage of married males until age 80, when the proportion drops off more significantly. Males report higher education, are more likely to own their home, and report higher income than females.

Table 3. Brazil – elderly characteristics of demographics, socio-economic status, family support and baseline health by age group, weighted summary statistics of selected variables

Social indicators	Males (881)						Females (1262)					
	(311)		(472)		(98)		(494)		(643)		(125)	
	Young old (60 < X < 70)		Old (71 < 85)		Old old (> 85)		Young old (60 < X < 70)		Old (71 < 85)		Old old (> 85)	
	Mean	Std err	Mean	Std err	Mean	Std err	Mean	Std err	Mean	Std err	Mean	Std err
Total children alive	2.74	(0.102)	2.752	(0.089)	2.834	(0.163)	2.599	(0.093)	2.559	(0.084)	2.399	(0.158)
Currently married	0.821	(0.023)	0.771	(0.022)	0.537	(0.049)	0.508	(0.024)	0.321	(0.018)	0.052	(0.021)
Number of marriages	1.084	(0.028)	1.059	(0.026)	1.218	(0.070)	1.053	(0.017)	1.058	(0.020)	1.025	(0.024)
Socio-economic conditions												
Literacy	0.888	(0.022)	0.789	(0.027)	0.619	(0.060)	0.802	(0.023)	0.671	(0.032)	0.553	(0.053)
Education	0.866	(0.026)	0.765	(0.028)	0.568	(0.053)	0.823	(0.022)	0.709	(0.026)	0.612	(0.054)
Years of education	1.511	(0.102)	1.472	(0.103)	1.417	(0.218)	1.353	(0.059)	1.232	(0.066)	1.192	(0.070)
Occupation	1.780	(0.055)	1.687	(0.051)	1.605	(0.102)	1.558	(0.062)	1.433	(0.056)	1.346	(0.112)
Retired	0.497	(0.031)	0.238	(0.024)	0.013	(0.008)	0.211	(0.018)	0.096	(0.012)	0.021	(0.013)
Age of retirement	56.748	(0.592)	63.494	(0.373)	67.997	(1.332)	45.308	(0.909)	48.643	(0.987)	53.757	(2.584)

Table 3. Continued

Home ownership	0.855	(0.025)	0.871	(0.016)	0.901	(0.031)	0.832	(0.023)	0.790	(0.021)	0.821	(0.044)
Total wealth in dollars ($1 = 1.80 real)	362.27	(11.09)	420.85	(14.63)	421.02	(28.82)	434.62	(13.46)	475.67	(15.48)	428.49	(29.45)
Total income in dollars ($1 = 1.80 real)	2132.36	(244.66)	2792.64	(450.10)	1299.42	(225.66)	1329.80	(173.64)	1405.07	(156.98)	1697.15	(492.02)
Private health insurance	0.058	(0.014)	0.073	(0.014)	0.114	(0.044)	0.044	(0.009)	0.048	(0.011)	0.011	(0.007)
Family support												
Number of household members	2.759	(0.049)	2.485	(0.049)	2.477	(0.114)	2.524	(0.041)	2.284	(0.039)	2.348	(0.098)
Number of brothers and sisters	3.553	(0.072)	3.155	(0.077)	2.115	(0.156)	3.356	(0.061)	2.833	(0.061)	1.919	(0.101)
Baseline health status												
Living in rural areas first 5 years of life	0.682	(0.036)	0.693	(0.037)	0.845	(0.038)	0.564	(0.030)	0.605	(0.029)	0.589	(0.050)
Smoking	0.268	(0.024)	0.160	(0.019)	0.112	(0.031)	0.120	(0.020)	0.103	(0.014)	0.060	(0.025)
Initial family economic condition	0.893	(0.040)	0.994	(0.045)	1.043	(0.094)	1.019	(0.041)	1.087	(0.046)	1.098	(0.090)
Initial self-assessment of individual's health	1.45	(0.036)	1.465	(0.036)	1.479	(0.076)	1.425	(0.034)	1.396	(0.035)	1.517	(0.065)
Initial starvation	0.248	(0.026)	0.168	(0.018)	0.161	(0.037)	0.211	(0.019)	0.154	(0.016)	0.112	(0.029)

Note. (1) Total children included biological children, step-children and adopted children. (2) Education was coded 0 = no school; 1 = schooling. (3) Occupation was coded 1 = employee; 2 = manager; 3 = self-employed; 4 = other. (4) Years of education was coded 1 = elementary; 2 = secondary; 3 = technical; 4 = college. (5) Retired was coded 0 = retired; 1 = non-retired. (6) Home ownership was coded 1 = own; 0 = does not own. (7) Wealth is based on price index of assets in the household adjusted by household size. (8) Income includes working and non-working income adjusted by household size. (9) Initial family economic condition, self-assessment of individual's health and starvation refer to the first 15 years of life. (10) Smoking was coded 0 = not current smoker; 1 = current smoker. (11) Economic condition during the first 15 years of life was coded 0 = poor; 1 = average; 2 = above average. (12) Initial self-assessment of health refers to the first 15 years of life and was coded 0 = poor; 1 = good, 2 = excellent.

C. Are Gender Differentials in Health Due to Differences in Age Composition?

In this section, we investigate whether the unadjusted gender differences in health reported in Section II. A are a consequence of gender differentials in mortality selection.

To explore this issue, we conduct two separate analyses: an unrestricted regression of age and gender on health, and a locally weighted regression. Table 4 summarizes the results for the first exploratory analysis. Figure 1 shows the results for the second analysis.

The regression results from a model specification that includes a dummy variable for each age and assumes a constant female effect (see Equation 1) are very robust and show similar patterns for each country (Table 4). In all countries, after controlling for an individual's age, females show lower self-reported health, ADL and IADL. These results are statistically significant at the .05 level for all measures of an individual's health used in the analysis, with the exception of the finding for the self-reported health indicator in Brazil (ADL and IADL are statistically significant for all countries). Moreover, the fact that the vast majority of coefficients on the age dummy variables have a negative sign indicates that, as expected, health deteriorates with respect to the initial health status reported at 60 years of age. This initial analysis shows that at all ages, elderly females tend to report a lower quality of life (measured by indicators of mobility, ability to perform self-care activities and self-assessment of their own health) than males.

Table 4. OLS unrestricted regression analysis of the effect of gender and age on the elderly's health; dependent variables – SRHS, ADL, IADL; weighted statistics

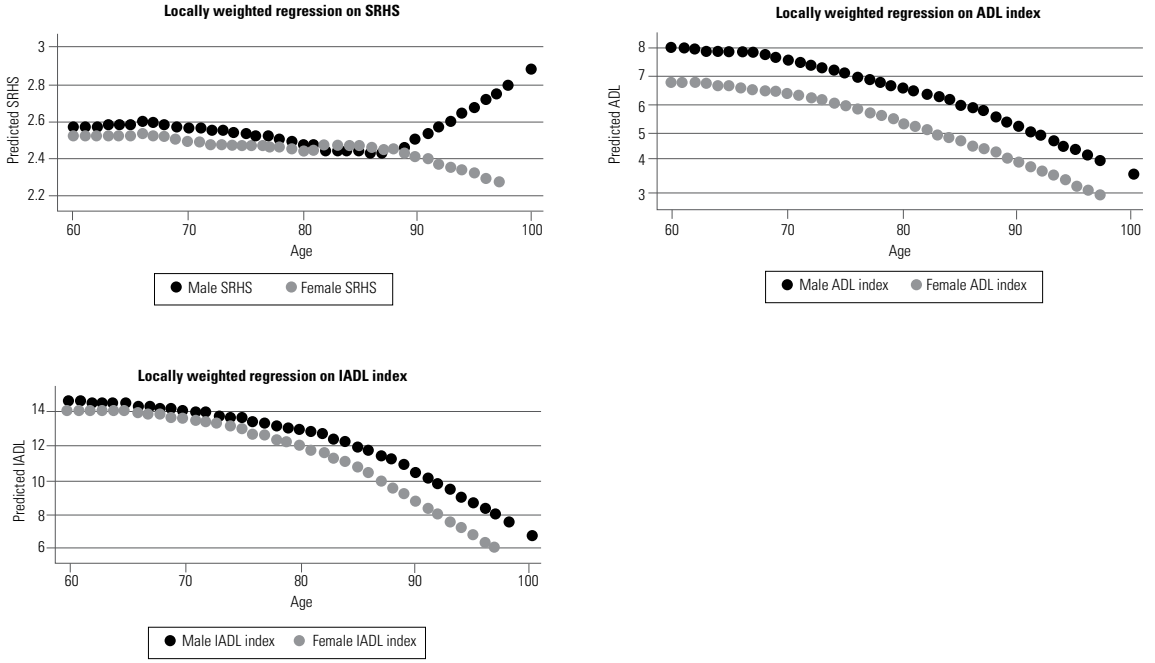
OLS unrestricted regressions	Brazil		Argentina		Chile		Mexico	
I. Model includes a dummy for each age and assumes a constant female effect								
1.a. SRHS								
Female coefficient	-0.058	(0.041)	**-0.259**	**(0.068)**	**-0.245**	**(0.078)**	**-0.159**	**(0.052)**
Fraction of negative age coefficients (min. age 61)a	53.8%		91.2%		80.6%		57.9%	
I.b. ADL								
Female coefficient	**-1.205**	**(0.116)**	**-0.968**	**(0.158)**	**-1.445**	**(0.154)**	**-1.135**	**(0.143)**
Fraction of negative age coefficients (min. age 61)a	87.2%		97.1%		91.7%		94.7%	
I.c. IADL								
Female coefficient	**-0.535**	**(0.114)**	**-0.546**	**(0.151)**	**-0.648**	**(0.128)**	**-0.594**	**(0.135)**
Fraction of negative age coefficients (min. age 61)a	92.3%		97.1%		83.3%		97.4%	
II. Model includes a dummy for each age and assumes a variable female effect for each age								
II.a. SRHS								
Average value of the female coefficientsb	0.069	(0.151)	-0.531	(0.372)	0.342	(0.241)	0.101	0.197
Wald joint test age – female coefficients	**4.13**	**p < .0001**	**2.20**	**p < .0006**	**79.62**	**p < .0125**	**1.44**	**p < .0770**
II.b. ADL								
Average value of the female coefficientsb	-0.974	(0.552)	**-1.441**	(0.717)	-1.412	**(0.544)**	-0.537	(0.512)
Wald joint test age – female coefficients	**47.65**	**p < .0000**	**5.44**	**p < .0000**	3.92	*p* < .1428	**18.02**	**p < .0001**
II.c. IADL								
Average value of the female coefficientsb	-0.331	(0.389)	-0.782	(0.279)	-0.306	(0.545)	-1.066	(0.345)
Wald joint test age – female coefficients	**6.75**	**p < .0001**	**4.38**	**p < .0001**	**8.98**	**p < .0487**	**308.03**	**p < .0000**

Note. (1) Estimates in bold are significant at the p < .05 level. (2) SRHS was coded 5 = excellent; 4 = very good; 3 = good; 2 = fair; 1= poor. (3) ADL is an indicator from 0 to 10 (0 = worst condition). (4) IADL is an indicator from 0 to 15 (0 = worst condition).
OLS = ordinary least squares; SRHS = self-reported health status; ADL = activities of daily living; IADL = instrumental activities of daily living.
a Indicates the percentage of age coefficients out of the total with negative sign. b Indicates the average value for the age – female coefficients and standard error.

The results from our less-restrictive regression model (see Equation 2) that estimates the effect of gender and age on health status (second part of the results on Table 4) are less robust, but they do suggest that females report lower health than males at each age. First, we report both the average female effect (we calculate the mean value of all the age/female coefficients) as well as its standard error. A t-test was conducted to test the null hypothesis that the average female effect is equal to zero. In almost every instance, we fail to reject this hypothesis. We suspect that this result is due to small sample sizes at each age resulting in female coefficients that are imprecisely measured. Interestingly, in all cases where the average female coefficient value is significant at p < .05, the mean value is negative, indicating that females have lower health on average than males.

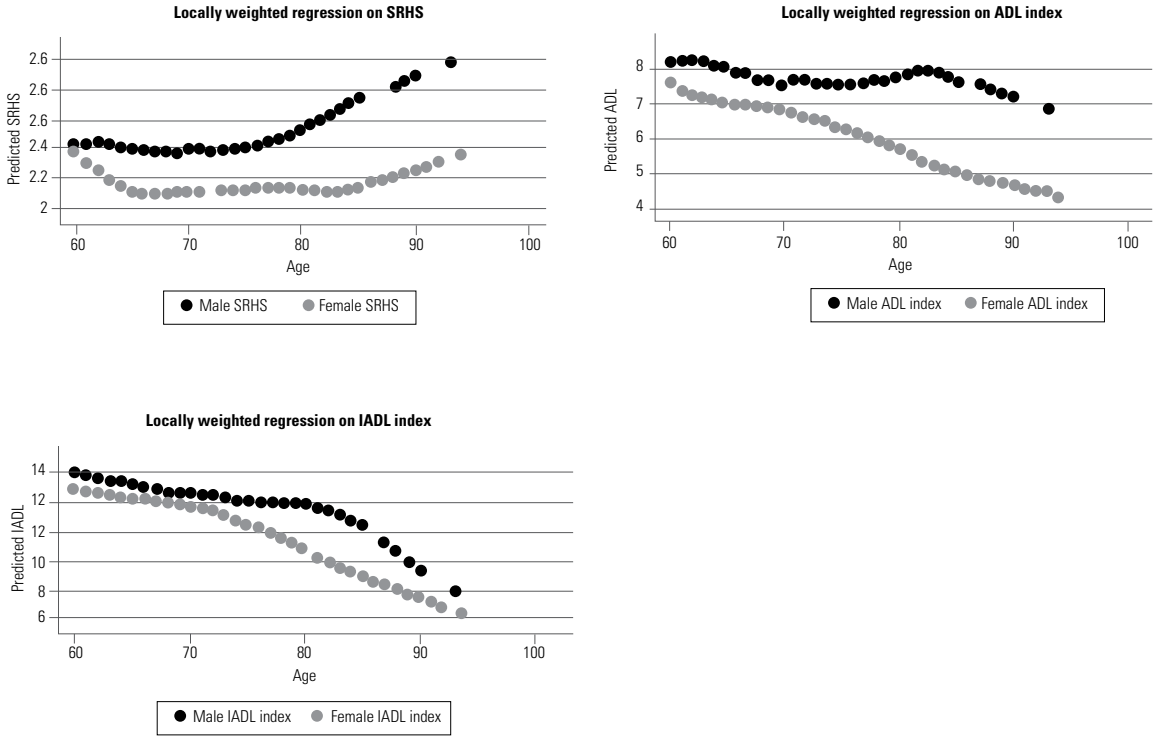
Figure 1. Locally weighted regression of the gender and age effect on health of the elderly

1.1 Brazil: male and female health during senior years



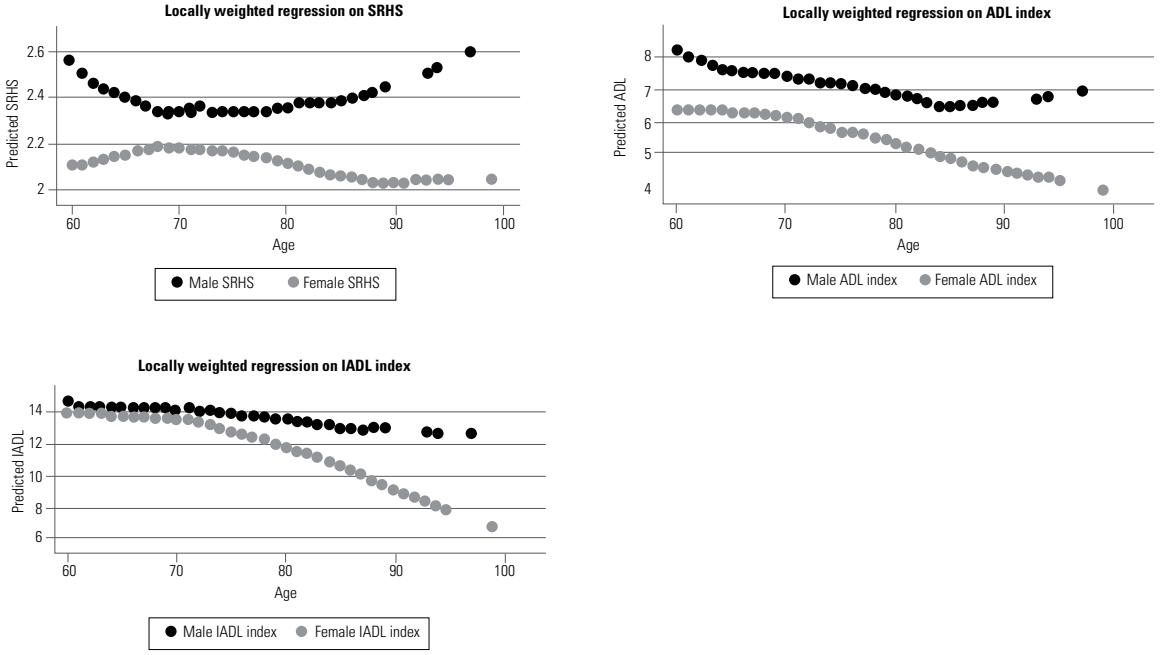
SRHS = self-reported health status; ADL = activities of daily living; IADL = instrumental activities of daily living.
Source: SABE database.

1.2 Argentina: male and female health during senior years



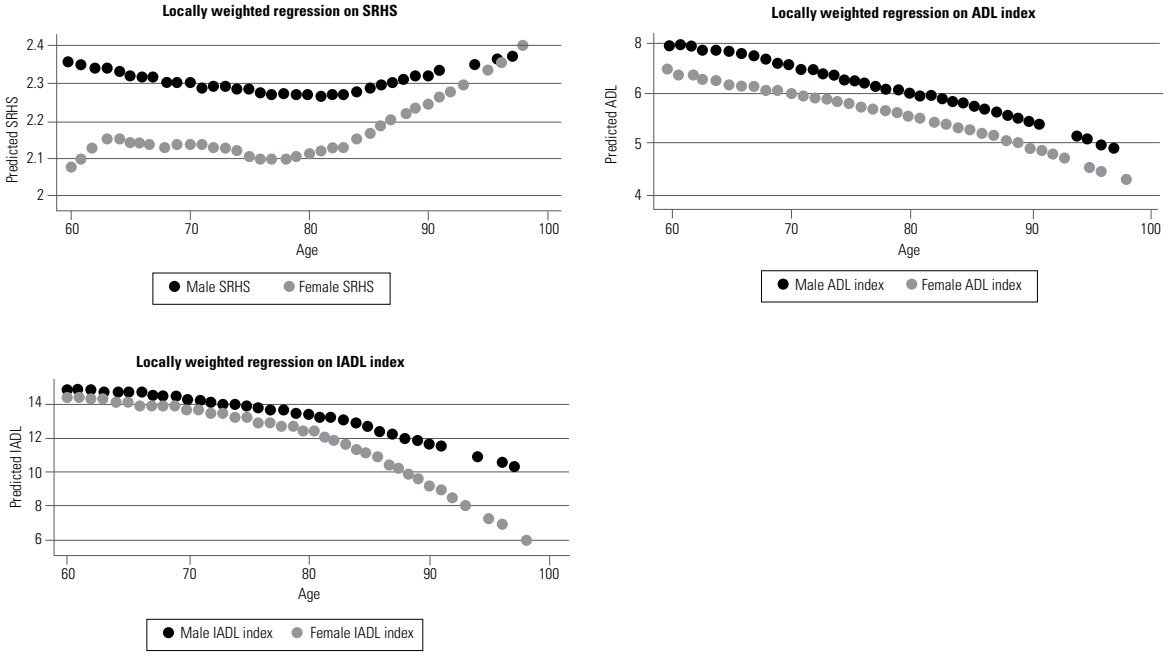
SRHS = self-reported health status; ADL = activities of daily living; IADL = instrumental activities of daily living.
Source: SABE database.

1.3 Chile: male and female health during senior years



SRHS = self-reported health status; ADL = activities of daily living; IADL = instrumental activities of daily living.
Source: SABE database.

1.4 Mexico: male and female health during senior years



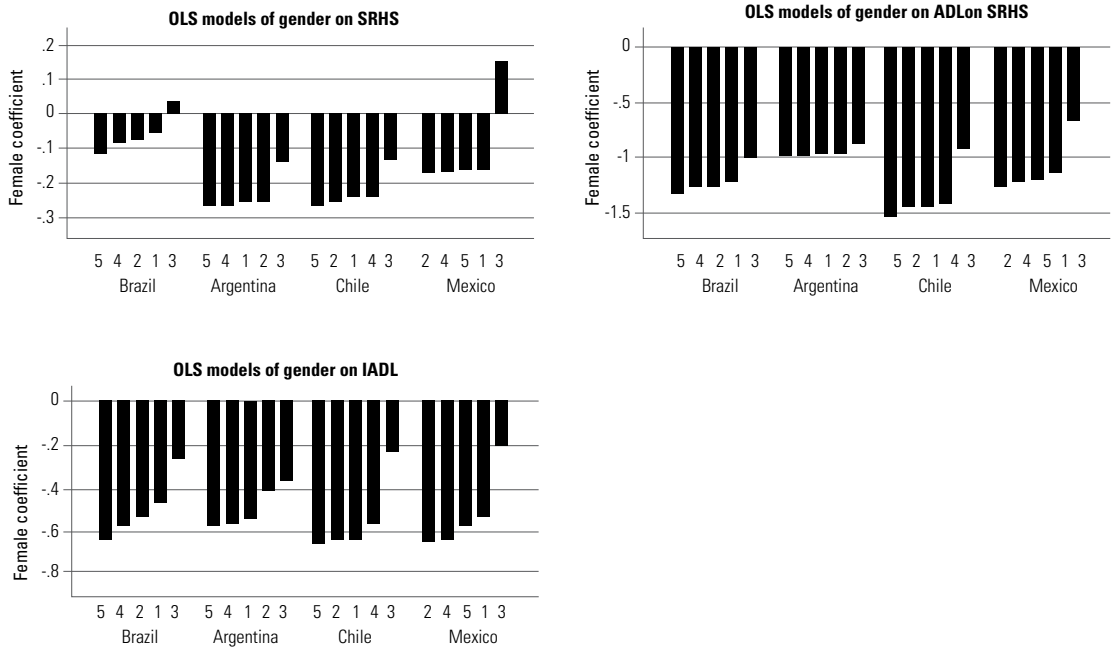
SRHS = self-reported health status; ADL = activities of daily living; IADL = instrumental activities of daily living.
Source: SABE database.

Using this specification, we also test the significance of the joint Wald test for the age and gender coefficients. This test could be interpreted as an indication of any of the female effects being different from zero. In the case of self-reported health status, evaluating the joint Wald test is statistically significant at .05 (i.e., suggesting lower health for females for most ages) in the case of Brazil, Argentina and Chile. Yet, for the elderly population in Mexico, this conclusion does not hold. The results using ADL suggest a significant test for the elderly in Brazil, Argentina and Mexico, but not in the case of Chile, while the test using IADL outcomes are insignificant only in Brazil.

Figure 1 summarizes the results of the locally weighted regression analysis for each measure of an individual's health. These findings may be summarized as follows: At almost every age, women report lower self-reported health status than men. Additionally, they also have more problems with ADL and IADL than men, at each age. This is the case for each of the four countries we examined. There is not a single instance in any of the countries, as may be seen in Figure 2, that would lead one to conclude that women, at any elderly age, are in better health than men.

Figure 2. Changes in the estimates of female coefficients

OLS sequential models of gender on health



Note. Model I includes only the variables gender and age. Model II includes the variables gender and age, and a vector of demographic variables. Model III includes the variables gender and age, and a vector of socio-economic variables. Model IV includes the variables gender and age, and a vector of family support variables. Model V includes the variables gender and age, and a vector of baseline health variables.
OLS = ordinary least squares; SRHS = self-reported health status; ADL = activities of daily living; IADL = instrumental activities of daily living.
Source: SABE database.

In the case of Brazil, females show lower self-reported health than males at every age; interestingly, the gap in health increases significantly for the elderly above 90 years of age. When one uses ADL as indicator of an individual's health, both males' and females' health status declines with age; however, at all ages females report lower health than males. The gap is virtually constant over all ages. IADL results show a very similar pattern: Males report better outcomes than females at each age, yet, the gap increases with age.

In the case of Argentina, the results for ADL and IADL are similar to the ones in Brazil. Females have lower indicators of mobility and self-care activities than males at all ages. In both cases, the differentials in health are larger for the elderly above 80 years of age than for those younger than 80. When one uses self-reported health, males also show better health than females at all ages. The gender gaps are larger after 80 years of age than they are at younger ages. In Chile, males show better SRHS, ADL and IADL than females at all ages. A woman's health deteriorates with age more rapidly than a man's health for all indicators of an individual's health. Gender differentials in health for the "old old" are bigger than for elderly younger than 85 years of age for all three indicators of health. Lastly, in Mexico, females also show lower health than males at each age. For both males and females, ADL and IADL indicators decline with age. Unlike in the other countries, males' and females' indicator gaps close with age in terms of self-reported health status.

It is important to notice, however, that the lower overall health of females, as shown in Figure 1, could be due to the existence of long-term chronic health conditions that are more likely to exist for females than males. On the other hand, males could be more likely to suffer from more complicated life-threatening conditions, and report higher mortality associated with them despite the fact that they report better ADL and IADL indicators. Furthermore, the existence of better indicators of mobility and self-care could be the consequence of males receiving better support from spouses, and/or other family members. It is plausible that females self-report lower health at each age because they are more likely to visit doctors, and as a result have better knowledge about their health than males. Females could also be less willing to declare themselves in ill-health than males; if so, the results shown in the data could understate the true gender gaps in health. Finally, in addition to gender gaps in health, there could also be gender differences in access to care and the duration and intensity of treatment.

D. What Factors Explain the Patterns of Gender Differentials in Self-Reported Health and Functional Disability among the Elderly?

Biological factors, differences in behavioural choices and differences in reporting symptoms and illnesses have been suggested as explanations for gender differences in health (Verbrugge 1985; Strauss et al. 1993). Using a multivariate analysis, we now turn to the task of evaluating to what extent observable differences explain the gender gaps in health.

For instance, in Section III.B we reported that in all countries included in the study, males are more likely to be married and have lower declines in the rate of marriage than females; males report having higher education levels, are more likely to own their home and report higher incomes than females. All these gender differences could explain why, at all ages, females report lower health than males.

The aim of the ordinary least squares (OLS) sequential analysis described in this section is to identify the individual characteristics that have the greatest impact on reducing these gender gaps in health. The results of this analysis are presented in Table 5 and are illustrated graphically in Figure 2.

As shown in Table 5, for the basic model the results are consistent with a gender gap in health in favour of males, after controlling for an individual's age. For all measures of health, females report lower health than males, and these results are significant at the .05 level with the only exception being the model that uses the SRHS in the case of Brazil.

Table 5. OLS sequential regression analysis of the effect of gender and age on the elderly's health; dependent variables – SRHS, ADL, IADL; weighted statistics

Female coefficient	Brazil		Argentina		Chile		Mexico	
I. Model includes only gender and age								
I.a. SRHS	-0.058	(0.040)	**-0.259**	**(0.068)**	**-0.245**	**(0.078)**	**-0.159**	**(0.052)**
I.b. ADL	**-1.205**	**(0.116)**	**-0.968**	**(0.158)**	**-1.445**	**(0.154)**	**-1.135**	**(0.143)**
I.c. IADL	**-0.535**	**(0.114)**	**-0.546**	**(0.151)**	**-0.648**	**(0.128)**	**-0.594**	**(0.135)**
II. Model includes only a vector of demographic variables								
II.a. SRHS	-0.073	(0.044)	**-0.256**	**(0.068)**	**-0.263**	**(0.072)**	**-0.173**	**(0.061)**
II.b. ADL	**-1.249**	**(0.121)**	**-0.891**	**(0.167)**	**-1.398**	**(0.163)**	**-1.251**	**(0.154)**
II.c. IADL	**-0.485**	**(0.108)**	**-0.368**	**(0.155)**	**-0.575**	**(0.131)**	**-0.651**	**(0.145)**
III. Model includes only a vector of socio-economic variables								
III.a. SRHS	0.038	(0.051)	**-0.145**	**(0.073)**	**-0.132**	**(0.096)**	**0.156**	**(0.092)**
III.b. ADL	**-0.9967**	**(0.138)**	**-0.965**	**(0.178)**	**-0.924**	**(0.225)**	**-0.669**	**(0.268)**
III.c. IADL	**-0.265**	**(0.112)**	**-0.416**	**(0.181)**	**-0.237**	**0.248**	**-0.205**	**(0.275)**
IV. Model includes only a vector of family support variables								
IV.a. SRHS	-0.083	(0.040)	**-0.265**	**(0.066)**	**-0.243**	**(0.090)**	**-0.166**	**(0.052)**
IV.b. ADL	**-1.249**	**(0.117)**	**-0.969**	**(0.156)**	**-1.432**	**(0.160)**	**-1.189**	**(0.139)**
IV.c. IADL	**-0.581**	**(0.113)**	**-0.571**	**(0.148)**	**-0.662**	**(0.129)**	**-0.639**	**(0.133)**
V. Model includes only a vector of baseline health variables								
V.a. SRHS	**-0.115**	(0.041)	-0.275	(0.070)	-0.269	(0.078)	-0.161	**(0.056)**
V.b. ADL	**-1.317**	(0.121)	-0.976	(0.154)	-1.529	(0.157)	-1.217	**(0.144)**
V.c. IADL	**-0.651**	(0.114)	-0.581	(0.147)	-0.649	(0.137)	-0.534	**(0.139)**
VI. Model includes all variables								
VI.a. SRHS	-0.018	(0.057)	**-0.171**	**(0.076)**	-0.125	(0.095)	0.063	(0.105)
VI.b. ADL	**-1.099**	**(0.141)**	**-0.951**	**(0.185)**	**-0.897**	**(0.218)**	**-0.635**	**(0.262)**
VI.c. IADL	**-0.292**	**(0.139)**	-0.224	(0.182)	-0.254	(0.251)	-0.012	(0.322)

Note. (1) Estimates in bold are significant at the $p < .05$ level. (2) Standard errors in parenthesis. (3) The vector of demographic variables includes total children alive, currently married and number of marriages. (4) The vector of socio-economic variables includes literacy, education, years of education, home ownership, wealth and total income. (5) The vector of family support variables includes number of household member and number of siblings. (6) The vector of baseline health variables includes living in rural areas <5 years, smoking, initial family economic condition, initial self-assessment of health and initial starvation. (7) All models included a separate dummy for each age and assumed a constant female effect.
OLS = ordinary least squares; SRHS = self-reported health status; ADL = activities of daily living; IADL = instrumental activities of daily living.

These gender differentials in health, observed in the basic models, could be the result of elderly females being less likely to be married than elderly males (as our previous analysis suggests), or because they have fewer children alive who could provide protective support for them. In Model II, however, we learn that controlling for these differences in demographic characteristics does little to

reduce these gender gaps in health. For most cases, the female coefficients are still very close to that found in the basic model; all are still negative and most are significant at the .05 level. A similar result occurs when we include the vector of family support variables (Model IV) and baseline health conditions (Model V). Essentially, comparing seniors with similar baseline conditions and family support characteristics does not eliminate the original gender differences between males and females. Although these are factors that influence an individual's health, and therefore could be the driving force behind the gender gaps in health as observed in the data, the findings suggest that eliminating demographic and baseline health differentials in health or equalizing family support conditions will not do much to reduce the health differentials between males and females.

While controlling for demographic characteristics, baseline health or the availability of family support does little to change the health disadvantage for women in measured health outcomes, controlling for socio-demographic variables (Table 5, Model III) in almost every instance reduces the gender difference for each of the three health outcome measures. Figure 2 graphs the estimated female coefficient for each model. For all measures of health, Model III, which includes socio-economic variables, yields the smallest gender effect on health. Results for Argentina, when one uses ADL or IADL, are the only exceptions.

Interestingly, in developed countries, gender gaps in socio-economic conditions among the elderly have been reported as having little relevance in explaining differences in health among elderly males and females (for example, in the case of the United States, see Strauss et al. 1993). Two alternative explanations have been suggested for this observation. First, the lack of relevance of socio-economic conditions to explain an individual's health is the consequence of a selection process. Second, the institutional design of the healthcare system may reduce the influence of socio-economic variables on an individual's health.

The selection argument implies that socio-economic differences matter less and less as we compare the health of older individuals, if sicker individuals, who die earlier, are also the ones with lower income, wealth and education. Second, the existence of a medical care system that provides access to care regardless an individual's economic status will make differences in socio-economic conditions less relevant in explaining gender gaps in health among the elderly. For example, in the case of the United States, the Medicare health insurance system is an entitlement public program that provides access to medical care to all individuals above 65 years of age. Clearly, within the context of this institutional setting, it is reasonable to expect that differentials in socio-economic conditions will exert less of an influence on the gender gaps in health than would be the case in an open-ended insurance scheme.

We presume that issues related to differentials in access to care and quality of medical care with respect to an individual's income may partially explain our findings. For instance, since males have a better financial situation, they may be more likely to use private healthcare providers than females. Further research is warranted, however, to gain a better understanding of the causal links between socio-economic conditions and the observed gender gaps in health.

IV. Concluding Remarks and Policy Implications

This study provides a detailed description of the health conditions by gender among the elderly population in four Latin American cities. Policies designed to increase the elderly females' overall quality of life and ability to function in these economies could benefit by using this information. Yet, one problem with the SABE data might be that it considers only individuals living in select urban areas, ignoring those living in rural areas. The generalizability of these findings should be tempered if considering the potential that the analysis has for informing policy.

The results of this study show that males report better health status than females in all four countries, and females suffer more frequently from disabling conditions, physical functioning, hypertension, diabetes and cancer. Females also report lower cognitive score than males. A cross-country comparison indicates that females in Argentina show the highest prevalence of disabling conditions. Chileans report the lowest rate of diabetes but the highest prevalence of heart diseases.

Lastly, Mexicans report the lowest rate of hypertension and show a high prevalence of diabetes.

Our findings regarding the gender gaps in health, however, must be interpreted with caution. In particular, the lower prevalence of life-threatening conditions among males could be the result of males having a lower tendency to visit the physician and/or a decreased awareness of their health status. One possible cost-effective intervention would involve targeting low-income males to improve their access to medical care.

The gender gaps in self-reported and functional health in this analysis could be biased for several reasons. First, it has been reported that in many developing countries females are less likely than males to report themselves in ill-health (see, for example, Saith and Harriss-White 1999). If this is the case, the gender gaps reported in our analysis underestimate the true differences in morbidity between the male and female elderly in these cities. Second, the data about prevalence of health conditions might reflect information about those who have received medical care. Thus, these data do not reflect the true incidence of diseases, but rather the availability of medical treatment. Lastly, gender differences in the duration and intensity of the medical condition, and the potential gaps in received treatment, are not reported in the data.

Our empirical analyses suggest that gender differentials in age composition are not the main reason behind these results. In particular, at almost every age, women have lower self-reported health status than men. In addition, they also have more problems with ADL and IADL than men at each age.

Controlling for socio-economic variables in almost every instance reduces the gender differences in health.

Controlling for demographic characteristics, baseline health or the availability of family support does little to change the disadvantage faced by women in measured health outcomes at each age. Controlling for socio-economic variables in almost every instance reduces the gender differences in health. The strength of the results suggests that socio-economic differences in literacy, education, income and wealth may be translated into affecting individual behaviours that improve seniors' health. Yet, using these data we could not identify the precise channels by which socio-economic differences translate into better health. One possible channel could be the differences in access to care and quality of care by socio-economic status. We could not identify how biological differences in reporting symptoms and following medical treatment play a role in explaining the gender gaps in health observed in the data. Future research could be directed in this area in an effort to gain a better understanding of these factors and their relationships with seniors' health in developing countries.

Integrating all of the aforementioned results suggests that health policies aimed at increasing the well-being (i.e., health status) of females and their access to medical care should be combined with income policies that reduce gender differentials in socio-economic status among seniors. Another policy implication of these results is that analysts should focus on policies that increase quality of life rather than just reduce gender gaps in mortality. The fact that our findings are very similar across different Latin American countries with different healthcare systems, economic situations and cultural backgrounds suggests that the gender gaps in health are the consequence of structural common gender differences across countries.

Analysts could develop primary prevention programs to reduce the prevalence of disabling conditions throughout the population, with special targeting toward females. Chronic disease management practices would also reduce prevalence and medical care costs associated with life-threatening conditions, such as cancer, diabetes, hypertension and others. Buvinic et al. (2006) propose a list of cost-effective interventions targeted at improving females' health. These practices could free up public resources to improve the efficiency with which medical care and services are delivered. The Chilean experience with diabetes and the Mexican experience with hypertension could provide an

initial framework for policy development in other countries. Additional policies that would improve the health status of seniors in these countries might include promoting healthy lifestyles, improving early-life conditions and nurturing interpersonal relationships within the family unit and within the community.

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Endnotes

1. Other indicators of well-being would be education and nutrition outcomes. For more details about this approach, the reader should consult Saith and Harriss-White (1999) and Sen (1998, 1985).
2. For a detail description of differences in health among males and females during childhood and adult life, the reader should review the articles by Verbrugge (1985), Strauss et al. (1993), Ross and Bird (1999) and Valanis (1999).
3. Using longitudinal data, one could explore this issue by evaluating the health of those males and females who die during the period of data collection.
4. For more detail about this procedure, the reader should review the Stata manual, Version 8 (Stata Corp 2003).
5. In the next section, we describe which variables are included in each vector.
6. The SABE web page (www.ssc.wisc.edu/sabe) lists complete information on the agencies and researchers who participated in this project.
7. Table 1 is a relevant, but partial, list of variables available from the long version of the SABE survey.

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The Potential for Nosocomial Infection Transmission by White Coats Used by Physicians in Nigeria: Implications for Improved Patient-Safety Initiatives

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Abstract

Microbiological analysis of swabs taken from the cuffs and pocket mouths of physicians' white coats in an acute care hospital showed that 91.3% of the coats had bacterial contamination. Specifically diphtheroids, *Staphylococcus aureus* and Gram-negative bacilli were isolated. In contrast, comparatively lower rates of bacterial contamination were observed on the white coats (1) of visiting physicians, (2) of the medical unit compared with the rest of the hospital, (3) that were less 1 year old, and (4) that were laundered daily. Further, the white coats of physicians who wore them only when seeing patients had significantly lower bacterial contamination than white coats of physicians who wore theirs during clinical and nonclinical duties ($\chi^2 = 4.99$, df = 1, $p < .05$). In particular, white-coat cuffs had a higher bacterial load than the mouths of the pockets. The bacterial isolates were resistant to nearly all of the antibiotics tested; the most effective, however, was ciproflox. Results suggest that physicians' white coats may increase nosocomial infection transmission. Proper handling of white coats by physicians and other healthcare workers could minimize cross-contamination and improve patient safety by potentially reducing nosocomial infections.

Introduction

Healthcare-associated infections (HAIs), also known as nosocomial infections, remain a significant hazard for patients and families visiting a hospital or healthcare facility. The World Health Organization (WHO) defines an HAI as an infection occurring in a patient in a hospital or other healthcare facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility (WHO 2002). At any one time, more than 1.4 million people worldwide are estimated to suffer from infections acquired in hospitals (Tikhomirov 1987; Vincent 2003). Although HAIs are a major public health problem in both developed and developing countries (Pittet 2005), the impact of HAIs is more severe in resource-poor settings, where the rate of infection is estimated to range from 25% to 40% (WHO 2005, 2008). HAIs have been reported to exact a tremendous toll on patients, families and systems of care, resulting in increased morbidity and mortality and increased healthcare costs (Pittet et al. 2005; WHO 2005).

Despite their best intentions, healthcare workers may be potential vectors of disease, disseminating virulent microorganisms among their patients (Saloojee and Steenhoff 2001). Because patients can shed infectious microorganisms into the healthcare environment, by the virtue of their constant contact with patients, healthcare workers are also at risk of transmitting microorganisms. Thus, both patients and healthcare workers can transmit infection through direct contact with patients, as well as through indirect contact with inanimate objects. Items such as stethoscopes (Uneke et al. 2009), masks (Tunevall 1991), neckties (Steinlechner et al. 2002), pens (French et al. 1998), badges and lanyards (Kotsans et al. 2008) and white coats (Treakle et al. 2009) all have the potential to transmit HAIs.

Of these items, the white coat is one of the more established symbols of the medical profession and is probably the item of clothing worn most by physicians (Kazory 2008). The symbolism of the white coat is often recognized by formal ceremonies at which medical school graduates are granted the distinction of wearing one to emphasize the humanistic values of medicine (Branch 1998; Harnett 2001; Wear 1998). The white coat was worn initially for the purpose of protection against cross-contamination, but also because it connotes life, purity, innocence and goodness (Van Der Weyden 2001; Wear 1998). There has been growing concern, however, that these coats may actually play a role in transmitting pathogenic microorganisms in a hospital setting (Loh et al. 2000; Srinivasan et al. 2007; Treakle et al. 2009; Wilson et al. 2007; Wong et al. 1991). This concern is yet to be fully appreciated in healthcare settings, particularly in developing countries, including Nigeria, despite increasing incidence of HAIs in these parts of the world and the dire need to introduce effective patient-safety initiatives. In 2005, WHO Patient Safety Initiative launched the First Global Patient Safety Challenge to galvanize international focus and action on the critical issue of HAIs (WHO 2005). In line with the WHO patient-safety initiative, any potential source of HAIs that could threaten the well-being of individuals within healthcare facilities merits consideration. Thus, investigating the potential of physicians' white coats to transmit HAIs is justified.

Although there are no studies that directly link white coats with infection transmission, the fact that they could be contaminated with nosocomial pathogens suggests the need for further research. Researchers have reported that the actual use of white coats and how often they are changed varies greatly among individual physicians and specialties (Wong et al. 1991). Therefore, health workers' attitudes to white-coat usage and handling could influence the potential of these coats to transmit nosocomial infections and are worth investigating. To the best of our knowledge, no studies have examined the contributory role of white coats in the transmission of nosocomial infection in healthcare settings in Africa. The hypothesis in this study is that the microbial assessment of physicians' white coats can provide valuable information that could help establish the potential for nosocomial infection transmission by these coats.

The objectives of the study therefore are threefold:

1. To assess the profile of microbial contamination of the white coats used by physicians,
2. To evaluate the relationship between white-coat contamination and white-coat usage and handling practices by doctors, and

3. To assess the susceptibility of microbial isolates to various antibiotics commonly used in acute practice.

Materials and Methods

Study Population/Sampling Technique

The study was conducted from September 2008 to February 2009 and involved the physicians of Ebonyi State University Teaching Hospital (EBSUTH) Abakaliki, in southeastern Nigeria. Participants were drawn from different medical specialties and units. The units and number of participants included Accident and Emergency (24), Medical (23), Obstetrics and Gynecology (14), the Out-patient department (9), Pediatrics (14) and Surgery (19) and included consultants, registrars, residents and house officers. The term "consultants" refers to the most senior physicians, most of whom are visiting; "registrars" refers to physicians undergoing training in their specialty who have yet to complete the first part of the training requirement for medical fellowship; "senior registrars" are physicians undergoing training in their specialty who have already completed the first part of the training requirement for medical fellowship; "house officers" are physicians who have completed their medical training and are undergoing an internship. The study was approved by the Infectious Diseases Research Division of the Department of Medical Microbiology of the Faculty of Clinical Medicine, Ebonyi State University Abakaliki. The authors met with the physicians in the hospital during working hours, told them about the research and solicited their participation. Those who volunteered to participate were enrolled into the study. Written informed consent was obtained from each participant prior to the start of the study. Each participant completed an anonymous study questionnaire soliciting information regarding his or her specialty/unit, cadre and white-coat usage practices (e.g., length of usage, frequency of washing, number of white coats possessed, type of cleaning agents used and frequency of usage in the hospital). The physicians had not previously been informed about the research in order to avoid the Hawthorne effect. All information collected from participants was treated with the utmost confidentiality, and data collection and analysis were designed in such a way that it is impossible to link responses to specific participants.

In Nigeria, physicians generally use long-sleeved, knee-length white coats. For this study, the usage of a white coat was defined as the approximate length of time the doctor wore the coat while on duty. Each doctor's white coat was sampled using two saline-moistened swab sticks. The first swab was taken from the cuff and second from the pocket mouth. These sites were chosen because they are where microbial contamination was thought to be greatest in concentration (Loh et al. 2000; Wong et al. 1991). The samples were labelled and transferred to the Medical Microbiology Laboratory of Ebonyi State University Abakaliki for analysis. All laboratory analyses were done within 1 hour of sample collection.

Laboratory Investigation

The swabs collected were directly inoculated on blood agar and nutrient agar. The pairs of inoculated media were incubated aerobically at 37 oC for 24 hours and then examined for bacteria growth according to standard protocol (Cheesbrough 2000). The authors isolated bacteria by assessing colony characteristics and Gram reaction, and the following five tests: (1) catalase and coagulase, (2) hemolysis, sugar fermentation and other biochemical tests including indole production, citrate utilization and urease activity, (3) triple sugar iron (TSI) agar tests (for glucose, sucrose and lactose fermentation), (4) gas and hydrogen sulphide production tests, and (5) oxidase tests, according to previously described protocols (Cheesbrough 2000). Three or more colony-forming units were considered before assigning species as contaminant. Bacterial isolates were subjected to antibiotic sensitivity analysis using the Kirby Bauer disc diffusion method (Cheesbrough 2000; WHO 2003). The disc used was commercially available (Optun Laboratories Nig Ltd., Lagos Nigeria) and contained several antibiotics – ciprofloxacin, norfloxacin, gentamycin, erythromycin, clindamycin, cephalexin, co-trimoxazole, ampiclox, floxapen, augmentin, nitrofurantoin, tetracyclin, amoxicillin,

tarvid, ampicillin, cefuroxine and chloramphenicol. These antibiotics are commonly used in Nigeria and are available at drug stores within the study area.

Statistical analysis

Differences between proportions were assessed by Chi-square analysis. Statistical significance was set at 0.05.

Results

A total of 103 physicians participated in this study. Of the 103 white coats screened, 94 (91.3%) were contaminated with bacteria. The various bacterial agents isolated are shown in Table 1. Most were diphtheroids (52.1%); no case of mixed contamination was observed. White coats from females were slightly more contaminated (93.9%) than those of their male counterparts (90.0%) (Table 2); however, this difference was not statistically significant ($\chi^2 = 0.44$, df = 1, $p > .05$). All the sampled white coats of physicians from the Pediatrics and Accident/Emergency units had bacterial contamination. In contrast, the white coats of physicians from the Medical unit had the lowest contamination. Again, this difference was not statistically significant ($\chi^2 = 8.69$, df = 5, $p > .05$). Among the different cadres of physicians, the consultants' white coats had the lowest rate of bacterial contamination. Once again this was a trend only and was not statistically significant ($\chi^2 = 2.18$, df = 4, $p > .05$). These results are summarized in Table 2.

Table 1. Bacterial isolates from white coats of physicians in Ebonyi State University Teaching Hospital, Abakaliki, Nigeria

Bacteria isolates	No. (%) isolates	95% confidence interval
Staphylococcus aureus	18 (19.1)	11.2–27.0
Pseudomonas aeruginosa	9 (9.6)	3.6–15.6
Diphtheroids	49 (52.1)	42.0–62.2
Gram-negative bacilli	18 (19.1)	11.2–27.0
Total	94 (91.3)	85.9–96.7

Table 2. Relationship between physician's sex, cadre and specialty and bacterial contamination of white coats

Parameter assessed	No. of white coats examined	No. (%) of white coats contaminated	95% confidence interval
Specialty/unit			
Male	70	63 (90.0)	83.8–96.2
Female	33	31 (93.9)	85.7–100.0
Total	103	94 (91.3)	85.9–96.7
Specialty/unit			
Surgery	19	17 (89.5)	75.6–100.0
Pediatrics	14	14 (100.0)	100.0–100.0
Medical	23	18 (78.3)	61.9–94.7

Table 2. Continued

O&G	14	13 (92.9)	79.0–100.0
A&E	24	24 (100.0)	100.0–100.0
OD	9	8 (88.9)	68.3–100.0
Total	103	94 (91.3)	85.9–96.7
Cadre			
House officers	62	58 (93.5)	87.3–99.7
Registrars	15	13 (86.7)	69.2–100.0
Snr. Registrars	15	13 (86.7)	69.2–100.0
Consultants	6	5 (83.3)	53.6–100.0
Others	5	5 (100.0)	100.0–100.0
Total	103	94 (91.3)	85.9–96.7

O&G = Obstetrics and Gynecology; A&E = Accident and Emergency; OD = Out-patient department.

The relationship between physicians' white-coat usage and handling practices and bacterial contamination is shown in Table 3. White coats in use for less than 1 year had the least contamination ($\chi^2 = 5.13$, df = 3, $p > .05$). Also, white coats belonging to physicians who had more than one had lower bacterial contamination ($\chi^2 = 2.42$, df = 3, $p > .05$).

Finally, white coats that were washed daily had a relatively lower rate of bacterial contamination ($\chi^2 = 1.88$, df = 3, $p > .05$). While these results showed promising trends, they were not significant. White coats of physicians who used them only during clinical duties had a significantly lower rate of bacterial contamination compared with those used during both clinical and nonclinical duties ($\chi^2 = 4.99$, df = 1, $p < .05$). These results are summarized in Table 3.

Table 3. Relationship between white-coat usage/handling practices and bacterial contamination of white coats

Parameter assessed	No. of white coats examined	No. (%) of white coats contaminated	95% confidence interval
Length of time of white coat is in use (yrs)			
<1	34	28 (82.4)	70.0–94.8
1–2	48	46 (95.8)	89.6–100.0
3–4	19	18 (94.7)	84.0–100.0
>4	2	2 (100.0)	100.0–100.0
Total	103	94 (91.3)	85.9–96.7
Number of white coats possessed			
1	19	19 (100.0)	100.0–100.0
2	51	45 (88.2)	79.4–97.0

Table 3. Continued

3	23	21 (91.3)	80.6–100.0
4	10	9 (90.0)	71.9–100.0
Total	103	94 (91.3)	85.9–96.7
Frequency of laundering of white coat per week			
Once	21	20 (95.2)	86.4–100.0
Twice	58	52 (89.7)	80.9–98.5
Thrice	9	9 (100.0)	100.0–100.0
Daily	15	13 (86.7)	69.2–100.0
Total	103	94 (91.3)	85.9–96.7
Frequency of use of white coat in the hospital			
At all times	85	80 (94.1)	88.9–99.5
OWSP	18	14 (77.8)	58.2–97.4
Total	103	94 (91.3)	85.9–96.7

OWSP = only when seeing patients.

A comparative assessment of the level of bacterial contamination on cuffs and pocket mouths was also performed (Table 4). Results indicated that bacterial-colony-forming units per plate greater than 100 were more frequent from swabs obtained from cuffs (47.6%) than from pocket mouths (38.8%). In addition, swabs obtained from cuffs yielded bacterial-colony-forming units per plate ≥300 more frequently than swabs from pocket mouths (20.4% vs. 16.5%) (Table 4).

Table 4. Bacteria contamination of white-coat cuffs and pocket mouth

	Location on white coat	
	Cuffs	Pocket mouth
No. of colony-forming units per plate	**No. (%)**	**No. (%)**
0–99	54 (52.4)	63 (61.2)
100–199	24 (23.3)	16 (15.5)
200–299	4 (3.9)	7 (6.8)
≥300	21 (20.4)	17 (16.5)

Table 5 presents results of antibiotic sensitivity tests, which indicated that the bacterial isolates were resistant to nearly all of the antibiotics assessed. Isolates of *Pseudomonas aeruginosa* and Gram-negative bacilli exhibited the highest resistance to the antibiotics assessed. The most effective antibiotics were ciprofloxacin and clindamycin; however, norfloxacin, gentamycin, cephalexin and tarvid exhibited some measures of effectiveness against *Staphylococcus aureus* and diphtheroids.

Table 5. Antimicrobial susceptibility test of bacterial isolates from white coats

Antibiotics	Abbreviation	Concentration	Bacteria isolates			
			S. aureus	Diphtheroids	*P. aeruginosa*	GNB
Ciproflox	CIP	5 mcg	97.8	100	26.1	34.0
Norfloxacin	NB	10 mcg	28.3	33.5	R	R
Gentamycin	GN	10 mcg	32.6	45.3	R	R
Erythromycin	E	10 mcg	R	R	R	R
Clindamycin	CD	10 mcg	67.4	68.0	69.6	68.1
Cephalexin	CX	30 mcg	37.0	39.8	R	R
Co-trimoxazole	CO	50 mcg	R	R	R	R
Ampiclox	AP	30 mcg	R	R	R	R
Floxapen	FX	30 mcg	R	R	R	R
Augumentin	AU	30 mcg	R	R	R	R
Nitrofurantoin	N	10 mcg	R	R	R	R
Tetracyclin	TE	50 mcg	R	R	R	R
Amoxicillin	AX	20 mcg	R	R	R	R
Tarvid	OF	5 mcg	32.6	33.6	R	R
Chloramphenicol	C	10 mcg	R	R	R	R
Cefuroxine	CF	30 mcg	R	R	R	R
Ampicillin	AM	45 mcg	R	R	R	R

R = Resistant.; GNB=Gram negative bacteria

Discussion

The findings of this investigation clearly indicate that white coats used by physicians can harbour a very high load of bacterial agents and may play a contributory role in the transmission of nosocomial infections in healthcare settings. This study elaborates on earlier research that suggests that physicians' white coats may contribute to transmitting pathogenic microorganisms in a hospital environment (Loh et al. 2000; Srinivasan et al. 2007; Treakle et al. 2009; Wilson et al. 2007; Wong et al. 1991). In this study, up to 91.3% of the white coats screened were contaminated with bacteria. This is consistent with other studies in this area that showed white-coat contamination ranging from 23% to 95% (Pilonetto et al. 2004; Srinivasan et al. 2007; Treakle et al. 2009; Wong et al. 1991). The high rate of bacterial contamination of white coats may be associated with the following two facts: First, patients continuously shed infectious microorganisms in the hospital environment, and physicians are in constant contact with these patients. Therefore, there is a high probability of cross-contamination. Second, it has been demonstrated that microorganisms can survive between 10 and 98 days on fabrics found in hospitals, such as those used for white coats, including cotton, cotton and polyester, or polyester materials (Chacko et al. 2003).

Diphtheroids, *Staphylococcus aureus*, and Gram-negative bacilli were the most frequently isolated microorganisms from the white coats of physicians in this study. This is consistent with the spectrum

of bacterial agents isolated in similar investigations (Pilonetto et al. 2004; Srinivasan et al. 2007; Wong et al. 1991). These microorganisms are frequently found in the hospital environment and are mainly skin commensals, but they have also been implicated as causative agents of nosocomial infection (Loh et al. 2000; Nester et al. 2004). Thus, a patient's skin can be a source of contamination for the physician's white coat as he or she attends to patients. Boyce et al. (1997) reported that up to 65% of nurses who had performed patient care activities on patients with methicillin-resistant *Staphylococcus aureus* (MRSA) in a wound or urine had MRSA-contaminated nursing uniforms or gowns. Physicians' hands are another principal source of white-coat contamination with pathogens frequently found in the hospital environment. A number of earlier studies have demonstrated that compliance with hand-hygiene protocols among all healthcare workers, including physicians, is poor (Harris et al. 2000; Pittet et al. 2000). Lack of hand hygiene undoubtedly enhances contamination of white coats, since they are often touched by the physicians in the course of their work.

The white coats of physicians from the Pediatrics and Accident/Emergency specialties were more contaminated than those of physicians from the Medical specialty. Wong et al. (1991) reported that *Staphylococcus aureus* was less likely to be isolated from the white coat of a physician in a medical specialty than from a physician in a surgical or other specialty. A similar finding was also reported by Srinivasan et al. (2007). This may be connected with the lower patient contact in the medical specialty compared with other specialties. Consultants' white coats were the least contaminated compared with other cadres of physicians. Although the difference in the trend was not significant statistically, the fact that consultant physicians see fewest patients compared with other categories of physicians might explain this observation.

The results of this study suggest that there is a relationship between white-coat usage and handling practices and bacterial contamination. Lower rates of white-coat contamination were observed among physicians whose coats were less than 1 year old, among doctors who possessed up to four white coats and among those who laundered their coats daily. These results are consistent with previous work in this area (Pilonetto et al. 2004; Srinivasan et al. 2007; Treakle et al. 2009; Wong et al. 1991). Thus, the manner in which the white coat is used or handled by a physician can largely determine the likelihood of its harbouring and potentially transmitting pathogens. Wong et al. (1991) noted that the level of bacterial contamination did not vary with the length of time a coat had been in use, but it increased with the degree of usage by the individual physician. This is further demonstrated in our study, in which the white coats of physicians who used them only when seeing patients had a statistically significantly lower rate of bacterial contamination than the coats of their counterparts who used theirs during clinical and nonclinical duties. Consequently, there has been controversy over whether white coats should be worn in nonclinical areas such as the canteen and libraries.

The results of this study suggest that bacterial-colony-forming units per plate greater than 100 were more frequent on cuffs than on pocket mouths. This was not unexpected since cuffs are in constant contact with the skin of both patients and physicians. Of particular public health significance was the high level of antibiotic resistance exhibited by the bacterial isolates from the coats. These antibiotic-resistant microorganisms are particularly important because they are capable of initiating severe nosocomiasis in a hospital environment and often require contact isolation and aggressive treatment to prevent their spread (Nester et al. 2004; WHO 2000, 2003).

In conclusion, the transmission of HAIs through both patients and healthcare workers in developing countries remains an important patient-safety issue (WHO 2010). This is despite the resolution of the World Health Assembly WHA55.18, which urged member states to establish and strengthen science-based systems necessary for improving patient safety and the quality of healthcare (WHO 2006). Unfortunately, there are few patient-safety initiatives aimed at preventing nosocomial infection in many healthcare settings in developing countries. Where such programs exist, they usually focus on high-risk invasive diagnostic and therapeutic healthcare tools. The importance of less critical healthcare tools such as physicians' white coats tends to be underestimated (Schiff 2006). This study demonstrates that white coats are capable of harbouring pathogens. Another

critical issue highlighted in this study is the association between white-coat contamination and noncompliance with hand-hygiene guidelines. Limiting this contamination is the rationale behind the time-honoured advice for all to wash their hands before and after seeing each patient. There is substantial evidence that hand antisepsis reduces the incidence of HAIs (Lam et al. 2004; Pittet et al. 2000; Rosenthal et al. 2005). Hand hygiene is therefore a fundamental action for ensuring patient safety, and it should occur in a timely and effective manner in the process of care. Since most hospital-acquired pathogens are transmitted from patient to patient via the hands of healthcare workers, handwashing is the simplest and most effective, proven method to reduce the incidence of nosocomial infections (Pittet 2000). Therefore, a patient-safety initiative capable of reducing the incidence of HAIs in a low-income setting must incorporate hand hygiene and effective white-coat handling and maintenance guidelines.

Successful and sustained hand-hygiene improvement can be achieved by implementing multiple actions to tackle different obstacles and behavioural barriers associated with compliance. The WHO multimodal hand-hygiene improvement strategy has been proposed to translate into practice the WHO recommendations on hand hygiene (WHO 2009). The key components of the strategy are (1) system change: ensuring that the necessary infrastructure is in place to allow healthcare workers to practise hand hygiene, (2) training/education: providing regular training on the importance of hand hygiene based on the "My 5 Moments for Hand Hygiene" approach, (3) evaluation and feedback: monitoring hand-hygiene practices and infrastructure, along with related perceptions and knowledge among healthcare workers, (4) reminders in the workplace: prompting and reminding healthcare workers about the importance of hand hygiene and the appropriate indications and procedures for performing it, and (5) institutional safety climate: creating an environment and the perceptions that facilitate awareness-raising about patient-safety issues while guaranteeing consideration of hand-hygiene improvement.

Based on the findings of this study, a patient-safety initiative could consider incorporating the following as policy components for effective white-coat handling and maintenance: (1) make a yearly purchase of white coats mandatory, (2) make the possession of two or more white coats at any point in time compulsory, (3) make weekly washing of white coats mandatory, (4) ban the use of white coats during nonclinical duties, e.g., in libraries and cafeterias, (5) involve both hospital management and physician associations in promoting compliance, (6) establish an audit or feedback mechanism to monitor compliance, (7) institute incentives, including awards, to encourage adherence to effective white-coat handling and maintenance, (8) promote a white-coat-hygiene campaign, and (9) institute policy reforms on white-coat handling and maintenance.

Finally, this study was not without some limitations. It is pertinent to state that we have not been able to unequivocally demonstrate that the white coats could actually transmit pathogenic microorganisms. A more complex study design is required accomplish this. Future research in this area might focus on implementing the suggested patient-safety initiatives and evaluating their impact on white-coat contamination and reduction of HAIs.

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Safe Abortion Services in Nepal: Initial Years of Availability and Utilization

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Abstract

Introduction: Following the liberalization of the very strict Nepalese abortion law in 2002, the first services for safe induced abortion were introduced in 2004 at the nation's largest women's hospital. This paper examines the client profile, the context of demand for services, affordability and satisfaction with services.

Data and Methods: Data for the analysis came from a survey of women who presented themselves at the hospital for induced abortion services and subsequently received the services.

Results: Based on a survey of 672 clients, the median age was 26, and most women were married with an average of two living children. The majority reported being impregnated by the husband. Nearly three out of five gave their primary reason for termination as already having the number of children desired; another 42% cited finances. About two-thirds made the decision to abort jointly with the male partner. Most were satisfied with the services received and expenses incurred. About two-fifths reported having used a modern contraceptive method at the time the unwanted pregnancy occurred, while 22.6% reported practising either the safe-period or withdrawal methods.

Conclusion: The clinic has provided affordable, quality abortion services to women in need. Findings also suggest that many areas need services strengthened, including the continued role of the family planning program in preventing unintended pregnancies.

Introduction

In March 2002 the national parliament of Nepal passed a bill that amended various sections of the *Muluki Ain* (national Legal Code) of 1963, effectively liberalizing the very strict, decades-old abortion law. In September of that year, the bill became a law. The road to reform of the abortion law was a long one, spanning over three decades (Thapa 2004). The primary rationale for the liberalization of the law was to improve maternal health and well-being. The new law permitted termination of an unwanted pregnancy on all grounds, thus making Nepal one of the 55 countries in the world where abortion "on request" is permitted (United Nations 2007).

As amended, the Legal Code grants the right to voluntary termination of pregnancy to all women, without regard to their past or present marital status, on the following grounds (but with one important exception): the right to voluntarily terminate a pregnancy of up to 12 weeks; the right to terminate a pregnancy of up to 18 weeks if the pregnancy was due to rape or incest; the right to seek abortion upon the advice of a medical practitioner at any time during a pregnancy if the pregnancy posed a danger to the woman's life or her physical or mental health, or in cases of fetal abnormality or impairment. The important exception to the right to voluntary termination of pregnancy applies to cases where it is used for the purpose of sex selection. Amniocentesis is similarly prohibited for purposes of sex determination for abortion. Anyone found guilty of performing amniocentesis, or causing it to be performed, for such purposes is to be punished with imprisonment for three to six months. Anyone found guilty of performing or causing to be performed an abortion on the basis of sex selection is to be punished with one additional year of imprisonment. In addition to the above clauses, the law also specifies that the consent of the husband or guardian is not required if the woman seeking abortion is 16 years of age or older. For abortion-seeking women under 16, however, the "guardian" providing consent can include any adult friend or a family member.

Subsequent to the amendment of the Legal Code, the Ministry of Health took on the leadership role to develop both institutional and human capacities for providing services to those seeking abortions. It took several months for the Ministry to develop the guidelines and procedures for implementing the new law. In 2004, the government introduced abortion services at the Maternity Hospital, the nation's largest, quasi-public women's hospital in Kathmandu, the capital.

As of February 2005, over 61 clinics –representing both the public and private sectors – were expanded to provide the services (see Table 1). Nearly 7500 women obtained abortions during the 11 months following the introduction of the services in March 2004. Of the total, nearly 57% of the clients obtained the services from a government facility. The Maternity Hospital alone had 2874, or 68%, of the clients at the public facilities. This represented 39% of the clients of both the public and private/commercial sectors. Thus, among all the clients, two out of every five received services from the Maternity Hospital.

Table 1. Safe abortion service facilities, staff, and clients: March 2004 to February 2005, all Nepal

Facility type	Total no. of facilities	Total no. of facilities with services started	Median (average) time of establishment of services[a]	Total no. of physicians trained	Total no. of staff nurses trained	Total no. of clients
Public[b]	40	18	7.0 (6.8)	98	69	4245
Private/ commercial[c]	21	18	6.5 (5.7)	32	20	3217
All	61	36	7.0 (6.3)	130	89	7462

Note. Data on clients are based on 61 facilities for which records as of February 2005 were reported to the Ministry of Health in March 2005.
[a]Among the clinics (n = 39) that had services started as of February 2005.
[b]Includes District, Zonal and Teaching hospitals.
[c]Includes clinics run by the Family Planning Association, Marie Stopes and a few private teaching hospitals.

The establishment and strengthening of the service delivery system, including training of human resources, has been gradual (Shakya et al. 2004). The guiding principle has been to make services available and accessible throughout the country in accordance with a carefully formulated strategy that aims to put into practice lessons learned from programs in other countries (e.g., India or Bangladesh) and to provide effective as well as efficient services to clients. As of February 2005, 36 of the 61 clinics that were upgraded to provide services had started offering the safe abortion option. A total of 130 physicians and 89 nurse assistants were trained to provide the services. The majority of these trained providers – 75% and 78% of the physicians and nurses, respectively – represented the public sector facilities.

Most of the previous research about women seeking a termination or attempting to terminate an unplanned, unwanted pregnancy in Nepal was undertaken before abortion was legalized. A few of these studies focused on women coming to a hospital with incomplete or abortion-related complications (Thapa et al. 1992, 2004; Tamang et al. 1999); one study examined women seeking a termination from a trained provider at a private clinic (Thapa and Padhye 2001); and another aimed to understand the situation in several rural settings in the country (Thapa et al. 1994). One of the principal findings from these previous investigations was that the desire for a small family size had emerged in urban Nepal, and the primary reason for seeking to terminate an unwanted and unplanned pregnancy was to maintain a small family. The overwhelming majority of women seeking a termination were married (in contrast to out-of-wedlock pregnancies).

Very little information existed about clients seeking to terminate an unwanted pregnancy after abortion was legalized in the country. Accordingly, not much systematic information existed on the profile of the women who were coming to the abortion clinics for services, their context for seeking termination of the pregnancy, how the services that have been put in place were being received by the women and, more importantly, whether the services being established were meeting these women's needs. Information relating to these questions is essential for strengthening the quality of services being provided.

With increasing numbers of abortion service users turning to the Maternity Hospital, it was deemed important to understand the profile of the women who sought and obtained services during those initial years.

With increasing numbers of abortion service users turning to the Maternity Hospital, it was deemed important to understand the profile of the women who sought and obtained services during those initial years. Who is using the services? What are the context and reasons for seeking services? What are the clients' prior experiences with contraceptive use? What are their views on the cost of the services? And, finally, what are their perspectives on the quality of care and the services? These service-delivery-related questions provided motivation for undertaking a study among clients at the Maternity Hospital. It was hoped that the information would provide a basis for fine-tuning the delivery of services. This paper presents salient results from the study.

Data and Methods

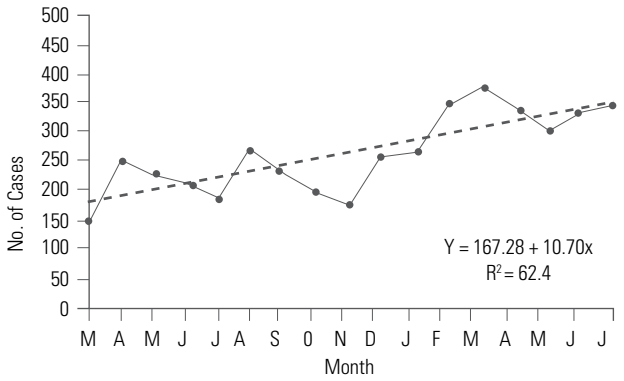
A survey was the primary data source for this analysis. The survey was conducted to examine the profile of clients who presented themselves for services at the abortion clinic in the hospital. Because the Maternity Hospital had a large share of all the clients who received abortion services and because it has been the main referral hospital in the country, we purposefully selected this hospital for the study. We also decided to undertake the survey several months after the services had been launched in order to allow the hospital to establish management and logistics and thereby minimize initial "noise" in the data collected.

Since the establishment of the services at the hospital, the main criterion for service eligibility has been women with an unwanted pregnancy under 12 weeks of gestational age. The client is treated

as an outpatient and, hence, does not need to be admitted to the hospital. For all clients 16 years of age or order, the only requirement is the woman's own consent. Once registered for the service, the client's history is taken and she undergoes physical examination (other investigations such as the hemoglobin test or grouping are not required), and she is also be provided with family planning counselling prior to the procedure. In all the cases, manual vacuum aspiration (MVA) is the procedure used. Following the procedure, the client is kept in the clinic for a one-hour recovery. The client is provided with a contraceptive method if she opted for one, based on the pre-procedure counselling. The total cost for the services at the time of this study was Rs900 (12.56 US dollars) per client.

Eligible respondents for the survey were defined as those who presented themselves at the hospital for induced abortion services and received the services. The objective of the survey was to understand the profile of the women who sought and received these services, including their preferences and perceptions regarding services. The survey was implemented over two months – June 1 through July 31, 2005. The two-months duration was considered adequate for collecting information from 650 to 700 respondents. As shown in Figure 1 below, the volume of cases in the survey period was neither too high nor too low; it fell within the average range.

Figure 1. Monthly number of induced abortions performed at the Maternity Hospital, March 2004 to July 2005 (N = 4481)



Note. The letters on the X-axis refer to month, starting in March 2004 and ending in July 2005. The services started on March 18, 2004. The trend (dotted) line is based on a linear regression. Monthly average = 264 (SD = 68.4).
Data source: Maternity Hospital.

The study protocol was reviewed and approved by the Nepal Health Research Council, the local Institutional Review Board. Four nurses conducted the interviews under the supervision of a senior member of staff; all were given training on the survey contents and the techniques of interviewing with the sensitivity required for clients seeking abortion counselling and services. Many of the questions in the survey instruments were partially open-ended and some were fully open-ended. Responses to these questions were coded later.

A written informed consent was read to each potential respondent, and a verbal consent from each was sought before the interview began. Only a few women refused to participate in an interview. The interview was conducted with the client only, and information pertaining to families or husbands was obtained from the clients themselves. The interview took place either preceding or following the abortion, depending on convenience and time availability. In the case of interviews that took place before the procedure, questions regarding satisfaction with services and immediate complications, if any, were recorded after the procedure was completed. In the paper, descriptive statistics are presented. Multivariate analysis was considered, but not applied.

Results

During the survey period, a total of 680 women who came to the Maternity Hospital seeking induced abortion services were provided with the services. This implied an average of about 14 cases per day, excluding public and other holidays when the clinic remained closed. Of the 680 women, 672 consented to be interviewed. The data in this analysis is, therefore, based on these 672 women.

As shown in Table 2, the overwhelming majority (87.2%) of the women came from within the Kathmandu Valley and the remaining (12.8%) were from outside. Among those from the valley, 40% had travelled less than 5 km. Only a few (n = 15, or 2.2%) came alone; about three-fourths were accompanied by their husband (among the married), and either a friend or family member accompanied the rest.

Table 2. Background characteristics of women who sought and received abortion services at the Maternity Hospital, 2005

Characteristic	Percent	N
Distance travelled (km.)		
<5	33.9	228
5-10	45.4	305
11-14	7.9	53
15 or more (outside the capital valley)	12.8	86
Total (N)	100.0	672
Person accompanying the woman (multiple response)		
None	2.2	15
Accompanied by a friend	7.4	50
Accompanied by husband	76.3	513
Accompanied by other family members	15.8	106
Total (N)	-	672
Age group		
16–19	5.8	39
20–24	29.9	201
25–29	34.4	231
30–34	19.2	129
35–46	10.7	72
Mean ±SD 26.9 ± 5.5		
Median 26.0		
Total (N)	100.0	672

Table 2. Continued.

Education		
Illiterate	28.4	191
Up to primary (Grades 1–5)	9.8	66
Some secondary (Grades 6–10)	43.9	295
College or higher	17.9	120
Total (N)	100.0	672
Profession		
Housewife/not working	70.5	474
Service (government/private)	9.2	62
Business	7.6	51
Farming/manual work/daily wage	7.3	49
Student/not working	5.4	36
Total (N)	100.0	672

SD = standard deviation.

Approximately two-thirds (64.3%) of respondents were in the 20 to 29 age range. Respondents' ages ranged from 16 through 46 years, with a median age of 26. A little over one quarter (28.4%) of respondents could not read or write, and 43.9% had some secondary level schooling (corresponding to Grades 6–10). Over 70% of respondents reported not working outside the home. A little over 5% were students, while the others were office employees (9.2%), or engaged in business (7.6%) or farming or manual work (7.3%).

Nearly one in ten respondents reported themselves as the primary source of income for their livelihoods. For over 80% of respondents, the husband/partner was the primary source of income. About three-fourths (76%) reported living with their respective spouse/partner; the others were either living with friends or relatives, or with their in-laws (not shown on the table).

Table 3. Marital status and the childbearing profile of women who sought and received abortion services at the Maternity Hospital, 2005

Variable	Percent	N
Martial status		
Unmarried, not engaged	1.8	12
Unmarried, engaged	0.7	5
Married	96.7	650
Divorced/separated	0.7	5
Total (N)	100.0	672

Table 3. Continued.

Whether first pregnancy		
Yes	11.9	80
No	88.1	592
Total (N)	100.0	672
Average number of living children (SD) 1.97 (1.03)		592
Average number of living sons (SD) 1.06 (0.77)		592
Average number of living daughters (SD) 0.91 (0.89)		592
Among those pregnant before, no. of living children by sex		
None alive	10.2	67
One son	17.6	115
One daughter	13.4	88
One son, one daughter	11.9	78
Two sons	4.3	28
Two daughters	23.5	154
Three sons	1.1	7
Three daughters	1.5	10
Two sons, one daughter	4.7	31
Two daughters, one son	4.7	31
All other	7.0	46
Total (N)	100.0	655
Intention to have (a) another child in future		
Yes	28.9	194
No	57.4	386
Not sure	13.7	92
Total (N)	100.0	672

SD = standard deviation.

Table 3 shows respondents' marital status and childbearing profile. Only a small percentage (2.5%) were single/unmarried women, less than 1% were divorced/separated, and the overwhelming majority (96.7%) were married and living with their spouse. (Information on marital status was verified by using multiple questions such as the source of financial support, living situation and the person accompanying them to the hospital.) The majority of women had been pregnant before; the first pregnancy was being aborted for only 11.9%.

We analyzed data on the number of living children by their gender composition to see if a client's decision to seek an abortion was influenced by the gender of living children. Among those who had been pregnant before, the average number of living children was two, with slightly more boys than

girls. About 10% had no children, 17.6% had one son and nearly one-fourth (23.5%) had two living daughters and no sons. Although the average number of children was only two, the majority (57.4%) of women did not want another child. Only 28.9% did want another child in the future, and 14% were unsure about their intention.

Table 4. Circumstances resulting in an unwanted pregnancy and attitude toward it among women who sought and received abortion services at the Maternity Hospital, 2005

Variable	Percent	N
Whether sex was consensual		
Mutual consent	98.4	661
Forced	1.5	10
Not sure	0.1	1
Total (N)	100.0	672
Situation/circumstances resulting in unwanted pregnancy (multiple response)		
Did not think that I would become pregnant	35.1	236
Did not plan to have intercourse at all	4.5	30
Took a chance, knowing that pregnancy might happen	27.4	184
Family planning method used failed	40.9	275
Other	1.0	7
Total (N)	–	672
Primary reason for pregnancy termination (multiple response)		
Unmarried (social stigma)	2.5	17
Do not want any more children	56.1	377
Not now but may be in future	42.1	283
Current child too young	17.3	116
Not the right time due to other reasons	9.2	62
Rape	0.4	3
Other	7.9	53
Total (N)	–	672
What would the woman have done if abortion were still illegal		
Would have sought it through private provider	81.1	545
Would have planned to have the child	15.3	103
Unsure	3.6	24
Total (N)	100.0	672

As shown in Table 4, ten women (1.5%) reported that sex resulting in the current pregnancy had been "forced." Of the women, 30 (4.5%) reported that they did not plan to have intercourse at all; just over one-third (35.1%) had thought that they would not become pregnant; 27.4% had taken a chance, even though they were aware of the risk of becoming pregnant; and 40.9% reported contraceptive failure, including periodic abstinence and withdrawal.

Only 2.5% (n = 17) of the women in the sample reported their unmarried status as the primary reason for seeking to terminate the pregnancy. For the majority (56.1%), the main reason was the desire not to have more children. About two out of five reported that they were currently unable to afford a child, although they might want to have another in the future. About 17% said that they did not want another child right away, as the current child was too young.

When clients were asked what they would have done if abortion was still illegal in the country and the services were not offered at the hospital, 81% said that they would have gone to a private doctor or nurse for the abortion. Only 15.3% would have kept the pregnancy. In response to an open-ended question about perceived consequences if they carried the pregnancy to full term and had the baby, the majority (over 73%) reported that they would not have been able to afford education, nutrition, adequate care and attention, and that another child would have been a "burden" on the woman and her family. Still others said they would not be able to complete their own education, while a few (unmarried ones) said that it would be a social disgrace to have a child before marriage (not shown in a table).

Nearly half of the pregnant women had reached the decision to terminate the pregnancy within the past week and another 44% within the last one to two weeks. Very few had been contemplating the action for more than two weeks. Except for three women (0.4%), all had discussed terminating the pregnancy with another person. About one in ten said they made the decision themselves, and about one-fourth said the decision was made by the person who made them pregnant. For 64%, the decision was made jointly by the woman and her husband/partner (data not shown in a table).

In the survey, we purposely avoided asking direct questions regarding income. We felt many who would be staying in a family or with a spouse may not be able to provide accurate information. However, we inquired about costs associated with the services and price elasticity. The median cost of the travel to the hospital was the modest sum of Rs170 ($2.39), although there were wide variations (mean = Rs456.3 ± 745.5). The average hospital charge/fee was Rs1000 ± 67 ($14.00).

We also included in the survey a few questions aimed at assessing price elasticity for the services provided and received. The overwhelming majority (97%) said the service charge/fee they had to pay was about right. Only 6 (0.9%) thought it was too high, and these women thought that about one-half of what they actually paid would have been the right amount. Among the 15 (2.2%) who thought the charge/fee was too low, the majority would have been willing to pay up to Rs100 more than what they actually paid.

The majority of women (87.5%) reported that the impregnating person gave them money to pay the hospital charge/fee for the abortion, while 15.8% said they paid most of it on their own. Some reported that they also got financial help from friends or relatives. (The percentages exceed 100 due to multiple responses.)

More than half (56%) of the women had visited the Maternity Hospital before; for the remaining 44%, it was their first time at this particular hospital. As to the source of information for the availability of abortion services, slightly over half (51%) reported "friends who have utilized/obtained services" as their primary source and another 22% said they heard it on the radio or read it in the newspaper. The primary reasons (based on multiple response) for choosing this hospital for the services were "less expensive than other places" (60%), "close proximity to their home" (45%) and "known to be a safe and good place" (19%).

Three out of five women in the survey rated the services being provided "very satisfying, better than expected," 31% ranked them "mostly satisfying" and 10% ranked them "okay, neither very good nor very bad." With specific reference to counselling, 63% reported it "very satisfying," 31% reported it "somewhat satisfying" and only 6% reported it "little or not satisfying at all."

When asked what the women would have done if the abortion services were not available at this particular hospital, just over half (52%) said they would have gone to another hospital and an additional 42% said they most probably would have gone to a private doctor. The majority (56.4%) reported that before coming to the hospital they had had a pregnancy test or a PV (peripheral vascular) examination to determine that they were pregnant, and 9% suspected that they were pregnant based on their knowledge of signs and symptoms of pregnancy.

As to who made them pregnant, 97.5% reported that it was their husband, 12 (1.2%) reported their regular boyfriend and two (0.3%) reported their casual male friend. Three women (0.4%) reported a rape by army/police and a taxi driver (data not shown in a table).

If the situation had been different, 43.6% would have definitely liked to have the baby, 20.4% were unsure about it and 36% said that they would not have liked to have the baby at all.

The women were asked if they had been using any method of contraception to space or limit their pregnancies and, if so, what the method was. Some women reported having used the "safe period" (periodic abstinence), while a larger proportion of those using the safe-period method also classified themselves as not using any method. This may have been partly due to their lack of understanding of what the interviewers meant by a "modern" method, or it could also have been because they did not consider the safe period a method at all. Similarly, most women who reported using "withdrawal" as a method for preventing pregnancy did not consider it a contraceptive method like birth control pills or condoms. In tabulating the data, we classified those who reported having practised the safe period and withdrawal methods as contraception users, since these women had used both methods – however ineffectively – to space or prevent unwanted pregnancies.

About three out of five women (61.5%) reported using a method to space or prevent their unwanted pregnancy (Table 5). We asked those not using a contraceptive method to specify the main reason for non-use. Responses showed that close to half (45.9%) reported the reason as breastfeeding (duration of breastfeeding was not ascertained). This was followed by ailments and concern for side effects (20.1%), and forgetting to use a method or a delay in getting the supplies (17.4%).

Among users, the largest proportion (38.3%) constituted condom users, followed by withdrawal (24.5%), pills (18.2%) and safe period (10.7%). Other users cited other, more effective methods, including sterilization.

Table 5. Past and future use of contraception among women who sought and received abortion services at the Maternity Hospital, 2005

Variable	Percent	N
Whether contraceptive was used when pregnancy occurred		
Yes	61.5	413
No	38.5	259
Total (N)	100.0	672
Among women who did not use a contraceptive method, reason for non-use		
Forgot to use/delay in obtaining the method	17.4	45
Ill-health/concern for side effects	20.1	52
Breastfeeding	45.9	119
Rape	1.2	3
Other (husband planned to be away, husband's objection, planned to be married, felt too old to be using contraceptives)	15.4	40
Total (N)	100.0	259

Table 5. Continued.

Among women who used a contraceptive method, method used		
Safe period	10.7	44
Withdrawal	24.5	101
Condom	38.3	158
Pills	18.2	75
Injectable	6.3	26
IUD (Copper T)	0.5	2
Norplant	0.2	1
Minilap	0.2	1
Vasectomy	1.2	5
Total (N)	100.0	413
Contraceptive method dispensed at the time of discharge		
Condom	4.0	27
Pills	7.4	50
Injectable	60.3	405
IUD (Copper T)	26.2	176
Not dispensed	2.1	14
Total (N)	100.0	672

IUD = intrauterine device.

Nearly all (97.5%) clients reported having received information about contraceptive methods during the pre-service counselling. At the time of discharge from the hospital, 60.3% of the women left the hospital having had the 3-monthly injectables (Depo-Provera®/Sangini®), an additional 26.2% had had an intrauterine device (Copper T) inserted, and condoms and pills were dispensed to 4.0% and 7.4% of the women, respectively. Fourteen women were not dispensed any contraceptives (Table 5).

Quality of services was assessed by asking the respondents about their experiences and perceptions and by the number and type of complications immediately following the procedure. (This study protocol did not include any follow-up; hence, we have no information on complications that might have occurred after hospital discharge.)

As part of the quality assessment, we asked about information provided by the clinic counsellor. The counsellor's primary tasks are to make sure the client is fully informed about the procedure, is in a mentally stable condition to undergo the procedure, was not forced into undergoing the procedure and is informed of contraceptive choices and options (Ministry of Health & Population 2007). As to the clients' degree of satisfaction with the counsellor, 63.2% reported that they were "very satisfied," 30.5% were "somewhat satisfied" and 6.3% (n = 42) reported "little or no satisfaction at all."

For overall quality of services received, 59.1% reported "very satisfied" (i.e., better than expected), 31.3% were "mostly satisfied" (certain things could have been done better) and 9.5% thought it was "okay" (neither very good nor very bad). Only a very few were "not satisfied at all" with services received. Nearly all (99.6%) expressed that based on their own experiences they would be willing to recommend the hospital to their friends for the services (not shown in a table).

Of all the clients, 14 (2.1%) cases had complications that resulted in delayed hospital discharge (data not shown in a table). Clinical records showed that six cases experienced hemorrhage, two excessive bleeding (>300 ml), two cervical injury and two shock (neurogenic). One case resulted in perforation, and one had an incomplete induced abortion that needed to be repeated. Of these various complications, hemorrhage, perforation and shock may be considered relatively more serious, and together they represented a 1.3% complications rate.

Discussion and Conclusion

At the time induced abortion services were being set up, one of the main concerns raised in the policy and program circles in Kathmandu was whether such a service would encourage premarital or unprotected sexual activity, leading some to seek induced abortion services. While this issue cannot be adequately examined with the current data, the results do show that those who sought services were overwhelmingly married women, most of whom wanted to stop having children. The profile of the women seeking abortion services is similar to that found in previous research (Thapa and Padhye 2001).

Another policy concern was whether introduction of induced abortion services would adversely affect the practice of contraception. The data analyzed here show that two fifths (39.9%) of women reported they had been using a modern method of contraception, and just over one fifth (21.6%) of women reported practising the safe-period (periodic abstinence) or withdrawal methods. Clearly, 61.5% of women intended to avoid pregnancy by using a modern method of contraception or by practising other pregnancy-avoidance methods; however, the method failed to protect them against pregnancy. This could be due to three reasons. First, a pregnancy may have occurred before the woman underwent sterilization or started to use a spacing method. Second, some women may have resorted to a method in the hope that it would help abort the unwanted pregnancy. Third, the method used may genuinely have failed. That the safe-period and withdrawal methods are considerably less effective than other methods is well known (WHO/RHR and CCP 2007). Further, it is not clear from the data if those who reported practising periodic abstinence were doing so in full knowledge of their spouse or on their own. It is possible that some women attempted to avoid pregnancy without full co-operation from their husband/partner. Similarly, the real-life effectiveness of the pill or condoms is also known to be much lower than their clinical effectiveness. In regards to highly effective methods such as vasectomy, data from Nepal and elsewhere have found that the actual failure rates are much higher than the reported standard failure rate (Nazerali et al. 2003; Sokal and Labrecque 2009). At the same time it should be emphasized that those seeking induced abortions due to contraceptive failures most probably represent extreme cases. The first two possible scenarios underscore the need to pay special attention at the time of counselling. The percentage of women using contraception could reach nearly 70% if we included those who had been users of contraception, but were not in compliance.

The data also make it unequivocally clear that the preference for smaller family size (about two children) is now the norm.

Among the non-users of contraception, the single most common reason for an unwanted pregnancy, which affected 45.9% of women, was breastfeeding of their current child. These data point to the need for effective mass media campaigns to inform women of the potential for pregnancy during breastfeeding and to advise them of safe contraceptive methods. That both the prevalence of breastfeeding is high and the duration is relatively long (MoH, New ERA and ORC Macro 2002) also reinforces the need to make this a priority item for communication and behaviour change. The other important reasons for not using contraception were concern for side effects and noncompli-

ance or delay in obtaining the method. The former underscores the need for strengthening counselling and education through family planning programs.

The data also make it unequivocally clear that the preference for smaller family size (about two children) is now the norm among the clients, most of whom reside in the capital Kathmandu. This is also consistent with previous research (Thapa and Padhye 2001). Many clients perceived additional children to be a burden on their living conditions, probably because the majority of women reported living in nuclear families. This is most probably a different situation from the recent past, when a joint household used to be the norm, even in urban areas. It is also worth noting that the gender of the child is most probably less influential in the urban setting, as evidenced by the finding that the number of children living was more important than their sex.

The data on the clients' intention to have a (or another) child in the future, contraceptive practice at the time of the unwanted pregnancy, or future intention to use contraceptives clearly indicate the need for a stronger and larger role for a quality family planning program. The program would also need to focus on convincing users of less effective methods (principally, withdrawal and periodic abstinence) to use more effective methods.

These challenges aside, the data from the 672 women who sought and received induced abortion services at the Maternity Hospital suggest that the newly introduced program has provided quality services at an affordable price and in a generally satisfactory manner to women, many of whom could have turned to more expensive or less-qualified providers. If the experiences of other countries are evidence (WHO 2004), the safe abortion program has most likely averted some deaths resulting from unsafe abortion practices and has reduced the cost compared with services from the private sector. At the same time, while some women (usually a small percentage) in special circumstances will certainly need induced abortion services, a large number not need to resort to abortion if effective contraceptives are utilized.

The findings suggest that the family planning program will need to pay greater attention to breastfeeding women (so that unwanted pregnancies among them can be avoided) and especially to those who reported using withdrawal, periodic abstinence, condoms or pills. Hence, the family planning program must play a dual role – first, it must try to motivate new users (such as by educating breastfeeding women), and second, it must try to convince the users of less-effective birth control methods to switch to more effective ones. Unless the family planning program becomes more effective, as more women become aware of the availability of induced abortion services, and as preference for smaller family size becomes more widespread, the demand for services is likely to gradually increase. To this end, the Maternity Hospital is poised to continue playing a critical role in meeting the increasing demand for both training providers and service delivery in helping individuals achieve their fertility goal by terminating an unwanted pregnancy.

The data presented here provide the basis for comparative analysis among the clients at the same clinic in the future. The tools and methodology developed in the course of the study can also be applied to other clinics in the country where such services are being established and provided.

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