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Health Consequences of Population Changes in Asia: What Are the Issues?

ASIAN METACENTRE
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The Asian MetaCentre for Population and Sustainable Development Analysis (The MetaCentre) was established on 3 February 2000 under an award from The Wellcome Trust as a Centre of Excellence in Asia within the Population Studies Programme. The MetaCentre operates through the collaborative efforts of the Asia Research Institute (ARI), National University of Singapore, Singapore; College of Population Studies (CPS), Chulalongkorn University, Thailand; the International Institute for Applied Systems Analysis (IIASA), Austria, and the National Centre for Epidemiology and Population Health, Australian National University, Australia.

In October 2001, the Trust merged the Population Studies Programme with their Noncommunicable Disease initiative under a new mantle, the Health Consequences of Population Change Programme, with the aim of supporting research that documents and furthers the understanding of large-scale changes in populations in the developing world, and assesses their impact on public health. The MetaCentre is considering how it can best support research around this new focus in the Asian context.

This report is part of an ongoing process that will help the MetaCentre and scholars of the region better understand the important research questions which address health and population change in the Asian context. It developed from discussions that took place during a two-day workshop, entitled "Health Consequences of Population Changes in Asia: What are the Issues," held in conjunction with the First IUSSP Southeast Asia Regional Conference, in Bangkok, Thailand, 13-14 June, 2002. The workshop was organized by the MetaCentre with support from the Wellcome Trust. The workshop brought together regional experts from a variety of disciplines to discuss the important issues related to population change and health and possible approaches toward addressing these issues.

Summary paper from an Asian MetaCentre workshop held in Bangkok, Thailand, 13-14 June 2002

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The programme was divided into two parts; the first, a half-day session devoted to brief presentations on specific aspects of the health consequences of population given by Drs Bencha Yoddumnern-Attig, Terence Hull, Mark VanLandingham, Shah Ebrahim, Harold Lentzner, Elsie Pamuk, Zheng Xiaoying, Gavin Jones, Bruce Caldwell, Anthony McMichael and Tim Dyson. The second part of the programme consisted of a full day of discussions divided into 4 roundtable sessions devoted to the topics of, "Population Growth and Changing Composition," "Urbanization and Health," "Migration and Health, and "Wrap Up-Identification of Major Issues." Drs Eleanor Preston-Whyte, Mercedes Concepcion, Shah Ebrahim, Gavin Jones, Bencha Yoddumnern-Attig, and Anthony McMichael ably chaired the Workshop sessions. Additional information on the workshop including the complete programme, abstracts of the formal presentations and a list of participants may be found in appendices at the back of this report.

This report is a collaborative effort of participants in the workshop. Harold Lentzner* and Elsie Pamuk**, Senior Research Fellows at the MetaCentre from April to July of 2002, are the primary authors and are responsible for the accuracy of the content. Other major contributors included Anthony McMichael, Graeme Hugo, Bruce Caldwell and Wolfgang Lutz. More than 80 other scholars and regional experts also shared their views at the two-day workshop. The authors wish to thank the following staff members at the MetaCentre for their assistance in preparing this report: Verene Koh, Evi Nurvidya Arifin, Leong Wai Kit and Theresa Wong.

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Section 1 Introduction

Population change has four main dimensions comprising changes in size, composition, mobility, and geographic distribution. As populations grow, age and move, various demographic and social characteristics change. These are accompanied by changes in levels and distribution of wealth. Historically, such changes have often been accompanied by changes in levels of literacy, social modernization, political liberalization and public health infrastructure – all of which influence patterns of health and disease.

Within Asia today there are great differentials in levels of, and trends in, wealth, fertility, life expectancy and national population size. There is also a spectrum of political ideologies and social systems. It is therefore difficult to generalize about how population change in Asia affects population health status. Further, the time-span connecting population change to health impact is very wide and elastic. Some demographic changes have immediate health consequences: for example, the increase in rural-urban-rural migration has contributed to the recent spread of HIV/AIDS. Other changes act indirectly and slowly: for example, the population-related increase in emission of greenhouse gases is changing global climatic conditions, which in turn will have various health consequences over coming decades.

Two of the main population drivers of health outcomes are urbanization and migration. The drift to the cities inevitably entails great changes – increases and decreases – in risks to health. Education and access to health care are increased; employment opportunities may be better (with potential benefits to family health). But slum-dwellers face various health risks (physical, microbial and other); the quality of air and water may be poor, especially in disadvantaged neighbourhoods; urban transport systems pose physical and chemical (air quality) hazards; changes in dietary patterns and physical activity patterns contribute to obesity, metabolic disturbances and chronic disease processes; and changes in family and community relations can introduce tensions, conflict and mental health problems. Cities – while they may achieve some economies of scale – also tend to have large "ecological footprints" that contribute to distant and eventual global environmental changes and their health consequences.

Migration within and between countries occurs for reasons of economic hardship, political oppression and environmental decline. There has been a rapid increase in the number of labour migrants in Asia over the past two decades. Refugees and other hard-pressed migrants are prone to nutritional deprivation, infectious diseases, poverty, and the mental and psychological hazards of displacement.

The main aim of the 2-day workshop and future research activities at the MetaCentre is to identify the most important issues relating to the health consequences of population change in Asia. What are the major population changes in the last few decades? What are the health impacts of these changes and where are they most keenly felt? Are these changes and impacts likely to be transient or deep-seated? Can we anticipate any other changes in the next few decades? What have been done to

cope with these changes and consequences? What resources are available and where are they most needed to meet the challenges posed by population change and their health consequences?

Section 2 Population Size and Growth

The health status of Asian populations is, in part, a reflection of modern demographic history. Over the course of roughly half a century many Asian countries passed through the demographic and epidemiologic transitions and now face challenges similar to those being faced in the industrialized Western world. In 1960, fertility was high, infant mortality rates and age-adjusted death rates were high, and life expectancy at birth relatively low across most of Asia. By 2000, mortality and fertility rates had dropped substantially and life expectancy had increased, often dramatically.

Asian populations have continued to grow; the region now has over 60 percent of the world's population and six of the 10 largest nations. India and China alone count for almost 38 percent of global population. Despite declining fertility, Asia is expected to add nearly 1 billion more people to its population by 2025 (PRB, 2001).

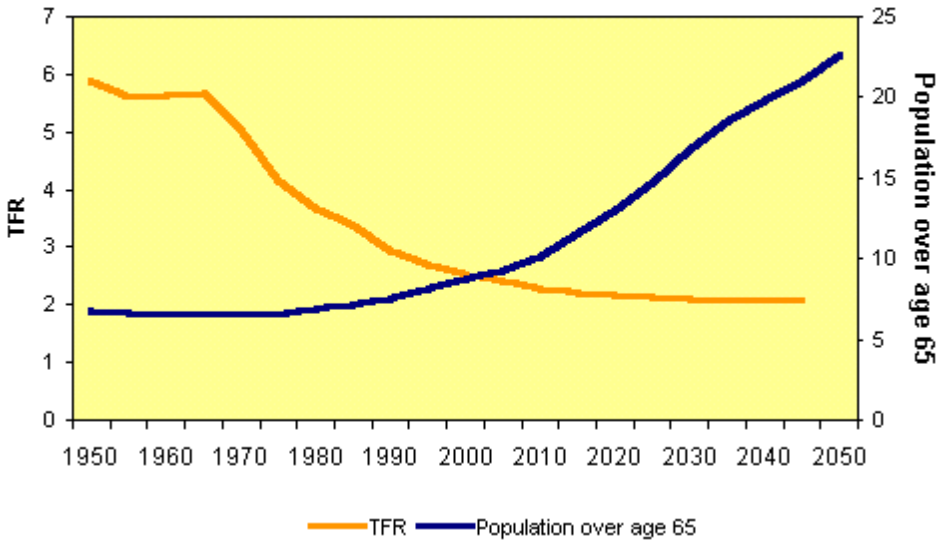
There are health consequences related to large, expanding populations, although the connections are often complex and mediated by social, economic, and technological factors, and considerably influenced by governmental policies. The most obvious connection between increasing population size and health relates to agricultural production and food security. The two decades between 1965 and 1985 saw large increases in per capita food consumption throughout most of Asia brought about by the "green revolution". But the 1990s witnessed a slowdown in the growth of staples yields. Between 1994 and 1998, the rate of change in food output was equivalent to or less than the population growth rate in Mongolia, Nepal, Bangladesh, Sri Lanka, Myanmar, Malaysia, Indonesia and the Philippines (FAO, 2000). Difficulties in maintaining the growth of agricultural output necessary to meet the demands of still growing populations threaten to result in rising numbers of rural poor with the consequent health burdens of malnutrition and infectious disease (Lipton, 2001).

Population growth impacts heavily on the environment and natural resources, particularly when combined with increases in consumption brought about by economic development and rising incomes. In addition to the depletion and degradation of water supply, agricultural land and fish stocks, impacting on food production, pollution – in all of its various forms – poses serious health risks. Illnesses closely linked to water and air pollution – infectious, parasitic, and respiratory diseases – form a significant proportion of the disease burden in many countries in Asia.

2.1 Changing Age Composition

A major consequence of the rapid and sustained fertility decline and increasing life expectancy in Asia has been an unprecedented transformation in the age-composition of the population. This transformation in many Asian populations is striking, with projections showing a significant and continued shift from young to older ages (see Figure 1).

Figure 1 Total Fertility Rate and Percentage of Population Over Age 65 in Asia, 1950-2050



Source: United Nations Population Division (2001), *World Population Prospects: The 2000 Revision*, New York.

For example, in Thailand in 1980, 40 percent of the population was under the age of 15 and only 3.5 percent was 65 years of age or older. In 2000, only 25 percent of the population was less than 15, while those 65 years and older had risen to 6.4 percent. The statistics for Thailand reflect a transformation common to a number of countries in the region. With respect to the social and economic implications, the changes in these proportions point to a remarkable evolution in the dependency ratio, the number of persons under 15 and those 65 and over divided by the "working age population". Between 1980 and 2000, the dependency ratio in Thailand was reduced from .77 to .46. The era of "low dependency" which many Asian countries are now entering, characterized by a young, energetic workforce, has been viewed by some as a "window of opportunity", a time period when solutions to problems related to ageing societies – support during retirement, health and health care, and living and care arrangements for the dependent elderly – should begin to be addressed.

However, this "window of opportunity" is likely to be relatively short-lived. By 2030, children and the elderly will constitute nearly equal proportions of Thailand's population, 16.3 percent and 16.4 percent respectively. While this translates into a dependency ratio only slightly higher than that for 2000 (.49 versus .46), many observers have voiced concern that the rising fraction of elderly in this ratio implies a heavier financial and social support burden on families and society. Health care costs in particular are likely to be much higher, reflecting the high costs of providing continued treatment and support for elderly persons with chronic diseases. The rising proportion elderly is of even greater concern since it is predicted that a number of countries in the region will display a U-shaped curve in their dependency ratio over time, with ratios continuing to rise as their population ages. In Japan, where the transformation in the age-distribution is already well underway, the dependency ratio is projected to increase from .61 in 2000 to .78 by 2015 and .82 by 2030 (Kinsella and Velkoff, 2001).

In recent years, much attention has been focused on the importance of understanding the consequences of population ageing particularly in countries such as China, Japan, Singapore, and Thailand that already have a sizeable proportion of their population in their 60's and older. The concern is not with ageing per se — a rather abstract concept — but with the health consequences at older ages. With ageing comes an increase in chronic disease morbidity, reduced levels of functioning, and disability, leading to increased medical care and health care expenditures. In addition to reduced quality of life, there is increased pressure on health insurance programs and formal health care delivery systems, and a possible increase in numbers denied health care.

Family and community-based support mechanisms for caring for the elderly may be severely challenged as the number of infirmed elderly grow, particularly in situations where younger family caregivers may be migrating away from home, or have been forced to take up the additional role of breadwinner, or when reduced family size results in a situation where family caregivers have multiple care-giving responsibilities. Moreover, as the number of extremely old and frail grow, even strong, functioning traditional support systems may be strained and in need of special assistance.

There is a need to better understand what happens at the individual or micro level as one ages, in part because public policy decisions to be meaningful and successful need to be at least partially grounded in individual and family behaviours and their responsiveness to changing life circumstances. One approach is by mounting representative sample surveys of the population. Longitudinal surveys, which monitor life-cycle change by reinterviewing the same respondents two or more times, have already been fielded in a number of countries including Malaysia, Singapore, Taiwan, Indonesia, and Japan, and more appear to be coming. Surveys such as these can provide insight into the dynamic of ageing, by obtaining information on transitions health and lifetime changes in such important areas as income or wealth, in household residence, and family care-giving.

The rise in the proportion elderly requires that special attention be focused on the impact of this demographic shift on women. Because of sex differences in life expectancy, the elderly are disproportionately female, particularly in those countries with large and rapidly increasing numbers of older individuals. In the Philippines, for example, the number of widows aged 60 and over increased by 88 percent between 1975 and 1990 (Kinsella and Gist, 1998). The rising number of widows and never-married older women in many Asian countries constitutes a growing vulnerable population, particularly since many of these women are poor and have limited education. And if morbidity and disability patterns continue to emulate those in aging Western societies and Japan, elderly women will experience greater disability than men at every age. In addition, traditional gender roles may well mean that the burden of caring for frail and disabled family members will fall disproportionately on female members of younger generations, with potential consequences for their own physical and mental well-being.

It is worth noting that Asia is a vast, heterogeneous region and that not all countries are similarly placed along the path of the demographic transition. It is true that all populations are increasing and that, partly as a consequence of near universal increases in life expectancy, the number of older persons is also increasing, often at

the fastest rate. However, in a number of countries, both fertility and mortality remain relatively high. In the year 2000, the Total Fertility Rate was 3.3 or higher and the Infant Mortality Rate was above 90 in Cambodia, Laos, Myanmar and Pakistan (Population Reference Bureau, 2001). In these countries, and in areas of countries such as Bangladesh, India, and the Philippines, the proportion of elderly is relatively low and will remain so for the foreseeable future. The challenges here are very different and require continued or renewed commitment to reducing communicable diseases and deaths in infancy and early childhood brought about by malnutrition, lack of clean water, poor sanitation and high levels of illiteracy and poverty.

Table 1 Elderly as a Proportion of Total Population, 1975, 2000 and 2030

	Aged 65 and Older			Aged 80 and Older		
	1975	2000	2030	1975	2000	2030
Japan	7.9	17.0	28.3	1.1	3.7	11.1
China	4.4	7.0	16.0	0.6	0.9	2.9
Singapore	4.1	6.8	14.8	0.4	1.5	3.0
Sri Lanka	4.1	6.5	15.2	0.5	1.0	3.1
India	3.8	4.6	9.0	0.3	0.6	1.4
Malaysia	3.7	4.1	9.4	0.5	0.5	1.6
Republic of Korea	3.6	7.0	19.5	0.4	1.0	4.2
Indonesia	3.2	4.5	10.9	0.3	0.4	1.7
Thailand	3.0	6.4	16.4	0.3	0.9	3.1
Philippines	2.7	3.6	7.7	0.4	0.5	1.2

Source: Kinsella and Velkoff, *An Aging World: 2001*.

Section 3 International Migration and Mobility

Migration is a critical component of population dynamics. This section summarizes issues related to international migration – both voluntary and involuntary – and health. In addition, this section addresses the more general issue of mobile populations and the role they play in the transmission of disease, particularly HIV/AIDS. Internal migration, particularly rural-urban migration is covered in a later section.

Migratory movements across borders change the size and composition of the host and receiving populations and have the potential to alter fertility and mortality patterns. The health of migrants is often shaped by their relocation and their health, in turn, may have an impact on the receiving population. If migration is large or sustained, health care delivery in both sending and receiving countries may be affected. For example, the Philippines is the world's largest exporter of registered nurses to foreign countries. Philippine observers worry that this outflow of qualified health professionals has weakened the Philippine health care system (Sison, 2002).

3.1 Voluntary Migration

The major cross-border migratory movements in contemporary Asia have been economic in nature, satisfying the labour demands of countries such as Singapore, South Korea and Japan by drawing upon largely unskilled workers from Indonesia, the Philippines, Myanmar and the Indian sub-continent. Some countries, such as Malaysia and Thailand, both send and receive workers. Host countries have attempted to eliminate illegal migration and control the flow of foreign with varying success. In Malaysia and Thailand, enforcement of legal restrictions to migration is hampered by borders that are difficult, if not impossible, to control.

Malaysia has the largest concentration of foreign workers in Southeast Asia (see Table 2). These workers are drawn largely from Indonesia, supplemented by migrants from Bangladesh, the Philippines, Pakistan and Thailand. It has been estimated that there are roughly 790,000 legal migrant workers and an additional 450,000 illegal workers in Malaysia (although some sources place the estimate of illegal migrant workers at closer to 1 million). Together they constitute 13 percent of the national labour force. The majority of migrant labourers are men hired primarily for construction or plantation work; migrant women are largely domestics. Migration policy in Malaysia reflects conflicting concerns; the economy needs foreign workers but there is apprehension over the long-term economic and social consequences of large immigrant populations.

There are an estimated 1 million foreign migrant workers in Thailand. A large proportion of these are irregular workers from the neighboring country of Myanmar entering without work permits. Many of these migrants are employed in rice mills and plantations, and on fishing boats. With the downturn of the economy in recent years,

the government began to crack down on illegal foreign workers; large numbers of Myanmar workers have been forcefully repatriated.

Of all Asian nations, Singapore is most dependent on foreign workers, although the number of migrant workers in Singapore is estimated to be less than in Malaysia and Thailand. The 960,000 foreign workers resident in Singapore in 2000 constituted 44 percent of the national labour force. Government policy with respect to foreign migrants varies considerably depending on the skill level of migrant. The largely unskilled short-term workers and domestics come from the Philippines, Indonesia, Malaysia, Thailand and the Indian subcontinent.

Table 2 Migrants in Labour-Importing Countries in Asia, 2000

	National Labour Force	Foreign Population	Total Migrant Workers	Legal Migrant Workers	Migrant Worker Share of Labour Force	Migrant Workers with Legal Status
		(Thousands)			(Percent)	
Total	149,170	6,550	4,824	3,508	3	73
Malaysia	9,600	1,500	1,239	789	13	64
Thailand	34,000	1,250	1,000	700	3	70
Singapore	2,190	1,000	960	940	44	98
Japan	68,000	1,700	670	420	1	63
Province of Taiwan	10,000	350	345	329	3	96
South Korea	22,000	350	310	95	1	31
Hong Kong, SAR	3,380	400	300	235	9	78

Note: Legal migrant workers are foreign workers (1) with work permits and (2) considered to be workers under labour law. Total migrant workers are legal migrants plus students and trainees and unauthorized workers.

Source: Martin and Widgren, 2002

Health issues related to international migration vary considerably depending on the country of destination and characteristics of the immigrants – their race and ethnicity, legal status, skill level, gender, distance from home country and culture, and other factors, such as mode of transport. Economic migrants have been portrayed as either victims or potential vectors of disease transmission, depending on perspective and context.

An ambivalent attitude on the part of host governments towards unskilled migrants often has direct health consequences, the most obvious being failure to enforce adequate standards of treatment for foreign workers in employment conditions and housing. Many of the concerns about immigrant health arise from migrants taking the types of heavy, often dangerous, manual jobs that citizens are reluctant to take. The

inherently adverse nature of these jobs is often exacerbated by a lack of regulatory enforcement of health and safety standards. Domestic workers, in particular, often find governments unwilling to address complaints about mistreatment from employers and poor living and working conditions (Gurowitz, 2000).

Adverse health effects resulting from racial bias and discrimination are amplified by migration. The most direct effect is, of course, physical violence against migrants. But the psychological stress of separation and discrimination can poses other serious health risks. Psychological stress can result in the adoption of unhealthy and risky behaviours, such as drug and alcohol use and unprotected sex with multiple partners (Tan, 1999). The sense of separation and isolation are enhanced when unskilled are prohibited from bringing family members with them, or even having them come for visits. The health concerns related to settled immigrants in developed Western countries such as the United States, Canada, and the Netherlands, tend to revolve around long-term psychological effects of isolation and racism and the consequent problems of violence and substance abuse occurring at levels not found in the source population. In addition, attention has been focused on assimilation and the adaptation of lifestyles leading to increases in chronic illnesses such as cardiovascular disease and diabetes. In many respects, tight government supervision and enforcement of short-term visas insure that many immigrant health problems – both short and longer term physical and mental problems – are shifted from the host to the sending country, and the health problems of return migrants have so far gone largely unstudied.

All of the problems associated with unskilled migration are amplified when the migration is illegal. Recruiters are unregulated and often unscrupulous, resulting in unsafe and unhealthy conditions during transport. Approximately 5,000 undocumented Indonesian migrants were reported to have drowned in the Straits of Malacca between 1990 and 1995 (Gurowitz, 2000). Detention camps are often overcrowded and unhygienic, with instances of reported ill-treatment of detainees not uncommon. Illegal migrants that arrive safely and escape detention still face hazardous working conditions, the additional stress of avoiding detection, and very limited access to medical care.

In the end, understanding the relationship between migration and health requires a framework that relates the characteristics of the migrant population to the reasons for moving, their origin and destination, and the nature of the migration, including whether they travel alone or in groups and the mode of travel. Other factors to consider include the substance of migrants' lives before migrating and the changes that occur during and after the move. A framework that assists in understanding the complex relationship between migration and disease has particular relevance and urgency with respect to the spread of HIV/AIDS. Understanding the interaction between migration and the risk of HIV infection in countries where the disease has not reached epidemic proportions is of the highest priority and may provide health workers with the information necessary to effectively combat the disease.

3.2 Mobility and Disease

An oft-cited source of the desire to tightly control and restrict immigration is the concern over migrants as potential carriers of infectious disease, particularly HIV/AIDS. In a number of countries, documented workers are subjected to regular, mandatory physical examinations and usually deported if found to have a communicable disease, evidence of drug use, certain types of chronic diseases, or are found to be pregnant. Although legitimate concern exists over illegal migrants that escaped official surveillance, the problem of humans as vectors of disease has as much to do with the broader notion of population mobility as it does with cross-border migration per se.

We live in a highly mobile world; borders are often gateways for international commerce and tourism and pathways of infection. International tourists (Quinn, 1994) and commercial fisherman (Entz *et.al*., 2001) contributed to HIV transmission in Thailand. Persons involved in the transport of goods and services often do not change their home or nation of residence but travel regularly within and across borders. In India, HIV transmission has followed a pattern evident in parts of sub-Saharan Africa, contracted mainly by heterosexual intercourse with commercial sex workers, long distance truck drivers and migrant labour then serve as vehicles of transmission to other areas (Pais, 1996). In countries such as Thailand where borders with poorer neighbours are long and porous and movement back and forth in rural regions quite common, concern has often focused on the migrant as a carrier of infectious and parasitic diseases (Triteeraprapab and Sungtrus, 1999).

3.3 Involuntary Migration

In recent years, Asia has not experienced large waves of refugees or forced migrants. During the 1990s, dislocated persons from Afghanistan constituted the major refugee community in Asia. Although the situation in 2002 is fluid, it has been estimated that over 3.5 million Afghans have resided in Iran and Pakistan. There are approximately 110,000 refugees from Myanmar in 11 camps along the Thai-Burmese border (University of California, Davis, 2002). Forced migrants or refugees have a unique set of health issues: the move is usually unexpected and traumatic; refugees usually carry little with them, go in groups, often in bad weather and over long distances, and are often preyed upon during their journey. They reach their destination in critical need of food, water, and medical care. Their health needs are immediate and desperate, and historically these needs have been met with the assistance of the international community. Beyond their immediate needs there is a complex set of health and social needs, ranging from reproductive health, child health, to mental health, violence.

Section 4 Urbanization and Urbanism

Urbanization, the shift of population from rural to urban settings, is changing the face of Asia. In 1975, roughly one-quarter of Asians lived in areas defined as urban by the UN Population Division; 25 years later, the proportion had risen to 37 percent and is expected to rise to 53 percent by 2030. An important component of urbanization is the emergence of mega-cities; today 12 of the world's 20 largest urban agglomerations are in Asia. Perhaps equally important to the understanding of the urbanization phenomenon is the growth in secondary cities. In India and China alone, there are more than 170 urban areas with populations of over 750,000 inhabitants (United Nations Population Division, 2001). The issues related to urbanization, urbanism and health in the 21st century are numerous and complex. While it is still important to examine urban-rural differentials in mortality, morbidity, and their causes, it is becoming increasing imperative to recognize and understand the ongoing interaction between cities and rural areas. The influence of urbanization and urbanism extends beyond city boundaries and impacts living conditions, behaviours and values, and political, social and economic processes for the population generally.

Table 3 Percent Urban, 1975, 2000, 2030

	1975	2000	2030
Asia	24.7	36.7	53.4
Republic of Korea	48.0	81.9	90.5
Japan	75.7	78.8	84.8
Philippines	35.6	58.6	73.8
Malaysia	37.7	57.4	72.7
Indonesia	19.4	40.9	63.5
Pakistan	26.4	37.0	55.9
China	17.4	32.1	50.3
India	21.3	28.4	45.8
Bangladesh	9.8	24.5	43.8
Myanmar	23.9	27.7	46.6
Sri Lanka	22.0	27.5	39.3
Lao PDR	11.4	23.5	42.6
Thailand	15.1	21.6	39.1
Viet Nam	18.8	19.7	33.7
Cambodia	10.3	15.9	31.9

Source: UN Population Division, 2001

Factors associated with public health infrastructure, such as the provision of clean water and sanitation measures, and with access to health services have had a profound effect on urban-rural health differentials. In the late 19th century, before the

epidemiologic transition – that is, before the public health revolution based on the germ theory of disease – cities in Western Europe and North America had very high mortality rates and their population had to be renewed by in-migration from rural areas. By the beginning of the 20th century however, cities began to show a health advantage over rural areas, as measured by lower mortality rates. When data became available in the second half of the 20th century, this urban advantage was also evident in the developing world. There is some evidence that cities in Africa and Latin America have lost their advantage (as measured by infant mortality rates) in recent years (Brockerhoff and Brennan, 1998), but data from Asian countries generally continue to show cities having better measures of health than rural areas. However, the sheer size of Asia's mega-cities and the rapid increase in urban populations due to the migration of the poor out of rural areas has generated concern that many Asian cities may not be able to cope effectively in the years and decades to come (McGee, 2001) and the traditional urban advantage in health may evaporate or reverse.

The traditional advantage in health enjoyed by urban residents is viewed as a product of the combined effects of higher average education and income levels among city residents, the concentration of health services, and selection effects – rural migrants to cities are healthier than their non-migrating counterparts and some rural residents return home when ill and disabled. This may be changing in rapidly growing cities that are increasingly less enclaves of the rich and well-educated and more catchments of the deprived who migrate to escape rural poverty (Mutatkar, 1995).

Moreover, there are a variety of specific hazards in large cities, some of which have cumulative impacts that are not yet completely understood and may hence be under-appreciated. These hazards – air and water pollution, poor drainage and solid waste disposal, traffic congestion and crowding more generally – are all accentuated in slum areas (Mutatkar, 1995). Poor water quality and inadequate waste disposal systems increase the incidence of diarrheal diseases. Air pollution, both outdoor and indoor, is linked to asthma and other respiratory diseases. Urban area pollution has been estimated to result in loss of productivity and health costs exceeding 10 percent of GDP in some countries (Asian Development Bank, 2000). Vehicular traffic may enhance risk of injury and urban transport systems pose air quality hazards; crime, substance abuse, and sexually transmitted diseases, including HIV, are usually higher in the cities. Urban lifestyle also enhances the risk of chronic physical or mental illness. For example, changes in dietary patterns and physical activity patterns contribute to obesity, which in turn increases the risk of chronic diseases such as coronary heart disease and diabetes (Ruel *et.al.*, 1999). Changes in family structure, traditional support systems and community relations can introduce tensions, conflict and mental health problems.

The challenge to researchers is to better understand the dynamic nature of urbanization and its impact on the health of urban residents as well as different patterns of illness and death in urban and rural areas. One important issue relates to the heterogeneity of urban health. While urban residents as a whole appear to be healthier than their rural counterparts, this generalization obscures the differential risks experienced by urban sub-populations. Within Asian cities there are large variations in general health and disease profiles by area and socio-economic conditions. It has increasingly been noted that infectious diseases among the urban poor coexist with chronic disease among the more affluent (Mutatkar, 1995).

Effectively addressing this double disease burden requires much better information than currently exists on death and morbidity rates within urban agglomerations. Mortality and morbidity indicators need to be disaggregated by locale within the metropolitan area and subdivided into socio-economic groups to identify sub-populations at greater risk for specific diseases. Other important issues relate to access to health care in cities, particularly in poorer areas. Information is needed on barriers to obtaining both treatment and preventive services, including costs (both direct and indirect), quality of services and attitudes of patients and providers. At a more general level, information on sub-populations is required to examine the role of health promotion activities, their appropriateness and barriers to their acceptance, and the role of local community action in promoting better health among urban residents.

One approach toward gaining a better understanding of the multifaceted process of the impact of urbanization and urbanism on health is to focus on one component or aspect of the experience. As an example, McMichael (2001) has suggested examining the balance of health gains and losses associated with the evolution of urban transport systems and then modeling the range of expected health impacts from future projected urban transport developments. The risk of injury and death from vehicular crashes might be expected to increase as well as respiratory problems resulting from increased air pollution. Other health consequences not readily apparent might include an increase in obesity associated with a decline in physical activity.

It is important to remember that urbanization and urbanism have footprints that reach beyond their physical boundaries. Large metropolitan areas exert profound environmental pressures through their heightened consumption patterns and resource use. They grow more dependent on a resource base that overtime may become more physically remote and disconnected. Cities – while they may achieve some economies of scale – also tend to have large "ecological footprints" that contribute to distant and eventual global environmental changes and their health consequences (McMichael, 2001). Urbanism impinges on the health of rural areas in other ways as well. Values and lifestyles are transported back to the countryside via mobile populations, return migrants and mass media, substantively altering rural ways of life and blurring the traditional distinction between urban and rural health profiles.

Most of the profound demographic changes experienced by Asian societies were first evident in the major cities before spreading to smaller cities and rural areas. The changes in lifestyle that both produce and are produced by these demographic shifts also tend to appear in cities first. For example, the dramatic fertility declines in most Asian countries have been partially produced by an increasing age at marriage. In almost all Asian countries, the mean age at marriage has been rising for both men and women, although the increase has been greater for women, rising by 1.5 to 3 years since the 1970s (Xenos and Kabamalan, 1998). The mean age at marriage is now greater than 22 for women and greater than 25 for men in all Asian Countries except Nepal, India and Bangladesh. But even in India, the mean age at marriage rose by 3.6 years between 1961 and the early 1990s, and the increase was the same in both urban and rural areas (Das and Dey, 1998).

The postponement of marriage and the changing social environment and behavioural norms has generated concern over the health consequences of increased out-of-wedlock sexual activity in many Asian counties. The most obvious concern is the

spread of sexually transmitted diseases, including HIV/AIDs. The World Health Organization estimates that one-half of all HIV infections world-wide occur among young people aged 15 to 24, and one-third of the 333 million new cases of sexually transmitted diseases each year occur in young people under the age of 25 (World Health Organization Information Office, 2001). But the consequences of sexually activity outside of marriage also extend to unintended and unwanted pregnancy, pregnancies that often result in illegal and unsafe abortions. Information on the extent and characteristics of sexual activity among unmarried persons is sparse for most Asian countries. This lack of information presents an obstacle to planning and implementing prevention programs to address the health consequences of activities that are likely to become more prevalent over time.

Section 5 Conclusion

In many respects the population of Asia today looks vastly different than it did a few short decades ago; it is much larger, more urban, more global in outlook, and growing older. A review of critical vital rates shows a dramatic increase in average life expectancy and declines in infant mortality and total fertility rates. But behind the averages and beyond the modern landscape there is much that remains the same; in many of the largest countries, the countryside is still home to the majority, and birth and death rates, especially child mortality, remains high. Traditional ways of life may have been touched by lifestyle changes associated with "urbanism," but the grinding poverty that had been a characteristic of rural life in the 20th century still endures in many places in the new millennium.

Thus, the most compelling and influential change is a move toward heterogeneity and contrast. Asia is now home to countries with very different population profiles, and within countries there are vast differences between regions, ethnic groups, city, town and village populations, rich and poor. While there is much to celebrate in diversity, this heterogeneity is partly responsible for a variety of profound public health challenges.

Many Asian countries now, or will soon, confront what has come to be termed the "double burden" of disease. Chronic illnesses such as cardiovascular diseases, respiratory diseases, diabetes mellitus are increasing and will continue to increase as the population grows and ages, the urban environment becomes more polluted and risk-enhancing lifestyles proliferate. At the same time, in a number of the largest countries, the poverty of the countryside and the migrant slums of the cities generate the conditions — hunger, inadequate water and poor sanitation — in which infectious and parasitic diseases proliferate. Added to this is the growing spectre of HIV/AIDS. HIV/AIDS has the potential of being both cause and effect as it relates to population change, its spread being enhanced by the forces of urbanization and migration, its deadly impact on young adults changing the age-structure of the population. These developments pose challenges to both formal health care systems, many of which are underdeveloped or undergoing major structural reforms, and to traditional family support structures that have been a hallmark of Asian societies.

Beyond the more immediate concerns, the sheer size of populations, particularly in the region's fast-growing mega-cities places pressure on the environment's carrying capacity – for clean air, water, and fertile soil. Environmental deterioration poses as yet poorly understood risks to the health of populations throughout the region.

Addressing the issues related to the health consequences of population change calls for renewed commitment to understanding underlying forces. To be effective programmes need to be multidisciplinary in nature, be proactive, move beyond what is already known, and have a policy perspective. Above all, the ultimate goal of research needs to be directed at improving the health of those in greatest need and maintaining the health of the planet. To do this a variety of research strategies are required ranging from the assessment of macro-level interactions between population,

social and economic development, to more focused micro-level studies of the relationship between life-course events, exposures, health status and health care utilization. A pre-requisite to much of the work is information, high quality data efficiently collected, compiled and made available to all.

References

Asian Development Bank (2000) *Asian Environment Outlook 2001*, 2nd Discussion Draft: Manila, Philippines.

Brockerhoff, M. and Brennan, E. (1998) 'The poverty of cities in developing regions', *Population and Development Review*, 24(1), pp. 75-114.

Das, N.P. and Dey, D. (1998) 'Age at marriage in India: trends and determinants', *Demography India*, 27(1), pp. 91-115.

Entz, A., Prachuabmoh, V., van Griensven, F. and Saskolne, V. (2001) 'STD history, self-treatment and health care behaviors among fisherman in the Gulf of Thailand and the Andaman Sea', *Sexually Transmitted Infections*, 77(6), pp. 436-440.

FAO (Food and Agriculture Organization of the United Nations) (2000) *The State of Food and Agriculture*, FAO: Rome.

Gurowitz, A. (2000) 'Migrant rights and activism in Malaysia: opportunities and constraints', *The Journal of Asian Studies*, 59(4), pp. 863-888.

Kinsella, K. and Gist, Y.J. (1998) *International Brief: Gender and Aging, Mortality and Health*, U.S. Census Bureau, IB98-2, U.S. Government Printing Office: Washington, DC.

Kinsella, K. and Velkoff, V. (2001) *An Aging World: 2001*, US Census Bureau, Series P95/01-1, U.S. Government Printing Office: Washington, DC.

Lipton, M. (2001) 'Challenges to meet: food and nutrition security in the new millennium', *Proceedings of the Nutrition Society*, 60, pp. 203-214.

Martin, P. and Widgren, J. (2002) 'International migration: facing the challenge', *Population Bulletin*, 57(1).

McGee,T. (2001) 'Urbanization takes on new dimensions in Asia's population giants', *Population Today*, October 2001.

McMichael, T. (2001) *Human Frontiers, Environments and Disease: Past Patterns, Uncertain Futures*, Cambridge: Cambridge University Press.

Mutatkar, R. K. (1995) 'Public health problems of urbanization', *Social Science and Medicine,* 41(7), pp. 977-981.

Pais, P. (1996) 'HIV and India: looking into the abyss', *Tropical Medicine & International Health*, 1(3):295-304.

Population Reference Bureau (PRB) (2001) *2001 World Population Data Sheet*, PRB: Washington, D.C.

Quinn, T.C. (1994) 'Population migration and the spread of types 1 and 2 human immunodeficiency viruses', *Proceedings of the National Academy of Sciences*, 91, pp.2407-2414.

Ruel, M.T., Haddad, L. and Garrett, J.L. (1999) 'Some urban facts of life: implications for research and policy', *World Development, 27*(11), pp.1917-1938.

Sison, M. (2002) 'Exodus of nurses grows, health system feels effect', Inter Press Service at http:www.cyberdyaryo.com, (May 8, 2002).

Tan, M. (1999) 'Migration and risk', *The Act*, Issue 21 at http://www.afa.org.sg.

Triteeraprapab, S. and Sungtrus, J. (1999) 'High prevalence of bancroftian filariasis in Myanmar migrant workers: a study in Mae Sot district, Tah Province, Thailand', *Journal of the Medical Association of Thailand*, 82(7), pp. 735-739.

University of California, Davis (2002) 'Southeast Asia', *Migration News*, 9(5).

United Nations Population Division (2001) *World Urbanization Prospects: The 2001 Revision*, United Nations: New York.

World Health Organization Information Office (2001) 'Note for the press, 7 March 2001' at http://www.who.int/inf-pr-2001/en/note2001-03.html.

Xenos, P. and Kabamalan, M. (1998) 'The changing demographic and social profile of youth in Asia', *Asia-Pacific Population Research Reports*, No.12, East-West Center: Honolulu, Hawaii.

Appendices

Appendix 1 Final Programme

13 JUNE 2002 (THURSDAY)

01.00pm – 02.00pm **Registration**

02.00pm – 02.10pm **Opening and Introduction**

02.10pm – 03.00pm **PRESENTATION SESSION 1**
Chairperson:
Professor Eleanor Preston-Whyte, University of Princeton, USA; and University of Natal, South Africa

Adolescent Gender Perspectives: Implications for Preventing STDs and HIV/AIDS
Bencha Yoddumnern-Attig, Mahidol University, Thailand

Sexuality and Gender in Southeast Asia: Steps to Advance Research
Terence H. Hull, Australian National University, Australia

Migration and Health Among Vietnamese Working-Age Immigrants: Assimilation and Selection Effects
Mark VanLandingham, Tulane University, USA

Health Consequences of Population Ageing
Shah Ebrahim, University of Bristol, UK

Ageing, Health Status, and Cost of Care: Understanding Relationships in Heterogeneous Populations
Harold Lentzner, Asian MetaCentre for Population and Sustainable Development Analysis, Singapore
Nutritional Consequences of Population Change
Elsie Pamuk, Asian MetaCentre for Population and Sustainable Development Analysis, Singapore

03.00pm – 03.30pm **Discussion**

03.30pm – 04.00pm **Coffee Break**

04.00pm – 04.50pm **PRESENTATION SESSION 2**
Chairperson: Dr Mercedes B. Concepcion, Commissioner, Commission on Population, Philippines

Population-Based Studies on Genetic and Environmental Determinants of Birth Defect Prevention in China
Zheng Xiaoying, Peking University, China

Some Thoughts on Mortality and Morbidity in Asian Cities
Gavin Jones, Australian National University, Australia

The Health Consequences of Rapid Urban Growth: Evidence From Dhaka, Bangladesh
Bruce Caldwell, Australian National University, Australia

Urbanization, Urbanism, Environmental Change and Health
Anthony McMichael, Australian National University, Australia

Further thoughts on population change and health (no title)
Tim Dyson, London School of Economics, UK

04.50pm – 05.30pm **Discussion**

14 JUNE 2002 (FRIDAY) – CLOSED DOOR ROUND-TABLE DISCUSSIONS

09.00am – 10.10am **ROUND-TABLE SESSION 1:**
Population Growth and Changing Composition (including Ageing)
Chairperson:
Professor Shah Ebrahim, University of Bristol, UK

10.10am – 10.40am **Coffee Break**

10.40am – 11.50am **ROUND-TABLE SESSION 2:**
Urbanization and Health
Chairperson:
Professor Gavin Jones, Australian National University, Australia

11.50am – 01.00pm **Lunch**

01.00pm – 02.10pm **ROUND-TABLE SESSION 3:**
Migration and Health
Chairperson:
Dr Bencha Yoddumnern-Attig, Mahidol University, Thailand

02.10pm – 03.20pm **ROUND-TABLE SESSION 4:**
Wrap up – Identification of Major Issues

	Chairperson: Professor Anthony McMichael, Australian National University, Australia
03.20pm – 03.50pm	**Coffee Break**
03.50pm	**End of Workshop**

Appendix 2 Abstracts and Topic Statements

Sexuality and Gender in Southeast Asia: Steps to Advance Research

Terence H. HULL
Demography and Sociology Program, Australian National University, Australia

In 2001, the Australian National University, with funding from the Ford Foundation, embarked on an exploratory project to investigate the social dimensions of a variety of sexual behaviours known to be found in one or more of the countries of Southeast Asia. These behaviours include use of herbal and medicinal preparations to influence sexual relations, genital cutting (circumcision) of males and females, penis modifications (implants, adornments, and injections), and the use of various sexual stimulants and astringents (eg. *Tongkat putih* in Indonesia). Analysis of the social context and cultural content of these behaviours has been guided by questions about current and potential gender relationships in each society and their impact on reproductive health.

The behaviours addressed here are of very different levels of social acceptability, frequency, and medical consequences. Male circumcision is virtually universal in Indonesia and the Philippines, but varies according to age of boy, style and riskiness of procedure. Penis implants appear to be minority behaviours, concentrated among lower classes, and sometimes among criminal groups of men, and seldom involving formal medical intervention or assistance. Use of herbal preparations for sexual enhancement is widespread, but of unknown efficacy and safety. Practices related to 'dry' sex are common in Indonesia, Thailand and Cambodia, though of uncertain motivation and impact. All of these behaviours are related to traditional practices going back centuries but in their modern manifestations they involve changes in the technologies used and the motivations underlying the actions. From early 2002 local teams of researchers in four countries have been involved in the collection of information on the types of behaviour that may be found in their countries, and the motivations cited by men and women for pursuing such behaviour.

First, they consider the importance of the practices as components of socially and culturally defined **gender roles**. To what degree do the behaviours reveal unhealthy or inequitable sexual relationships between women and men? Are there grounds for social actions to modify the practices through information or regulation?

Second, they consider the **clinical importance** of the behaviours, and determine the degree to which there are risks of physical harm to the people carrying out the behaviour or their sexual partners. Does their behaviour cause direct harm in the form of infections, irritation or dysfunction? Is there increased risk of spread of infectious diseases such as HIV?

Third, they consider the **impact of these behaviours on sexual pleasure** of partners in sexual relations. Where the behaviour is motivated by a desire to increase personal pleasure, or to give pleasure to others, is it successful

The major aim of this project is the accumulation and interpretation of information, but the defining dimension of success will be the establishment of a new framework

of thinking and debate on issues of gender and reproductive health in Southeast Asia. On the basis of the various country reports it will be possible to design research projects combining quantitative and qualitative focusing on behaviours with serious clinical or social consequences.

Migration and Health Among Vietnamese Working Age Immigrants: Assimilation and Selection Effects

Mark VANLANDINGHAM
School of Public Health and Tropical Medicine, Tulane University, USA

An extensive literature on the effects of migration on health has documented strong impacts. The classic view holds that health outcomes and health concepts among migrants are thought to be affected over time by adaptation and assimilation processes in the new location, eventually leading to increasing differences over time between migrating and nonmigrating (resident) groups in the sending country, and increasing similarity over time between immigrant and native populations in the receiving country. More recent theoretical perspectives have attempted to incorporate empirical evidence that has not substantiated this classic view. Advances in empirical approaches have occurred as well, but serious problems remain. Attributing reported effects of migration on health to specific causes are complicated by the inherent difficulties of separating the effects of migration *per se* from selection factors. If migrants are not representative of sending populations, then differences between immigrants and the native born in the receiving country, as well as differences between nonmigrants and emigrants in the sending countries, are difficult to interpret.

This study examines a number of health outcomes among Vietnamese living both in the United States and in Vietnam. A major substantive focus will be the investigation of overall health status and core health beliefs among young Vietnamese adults who have recently immigrated to the United States. While there is an extensive literature on the health of other major immigrant groups, we know much less about the health of Vietnamese Americans, who constitute one of the largest waves of immigration to the United States in recent history. A major methodological focus involves the development of new techniques to better explain health differences between emigrants and comparable nonmigrant groups living in Vietnam; and between immigrants and the non-Vietnamese native born in the United States. This methodological focus has as its goal the better separation of the effects of selection factors from adaptation and assimilation factors on the health outcomes of interest.

This separation is made possible by a "natural experiment" involving the comparison of three groups: Vietnamese immigrants in the United States; Vietnamese who have never left Vietnam (hereafter referred to as never migrants); and Vietnamese returnees in Vietnam. The study is funded by NICHD, and will begin during the summer of 2002.

Health Consequences of Population Ageing

Shah EBRAHIM
Department of Social Medicine, University of Bristol, UK

The rapid ageing of populations in Asia presents a unique circumstance which has not been experienced before. The very rapid declines in fertility and in mortality, particularly in infancy, are responsible for population ageing. Furthermore, rapid urbanisation with migration of younger people is creating an increased rate of ageing in rural areas of many low to middle income countries. The issues involved are as follows:

- Possible increased burdens of chronic disease
- Appropriate and affordable health care and social support
- Inter-generational transfers of resources
- Pensions and income security for older people
- Urbanisation and modernisation: older people left behind?
- Maintaining extended family lifestyles
- The childless older people

Ageing, Health Status, and Cost of Care: Understanding Relationships in Heterogenuous Population

Harold LENTZNER
Asian MetaCentre for Population and Sustainable Development Analysis, National University of Singapore, Singapore

A number of societies in Asia are ageing at a relatively rapid rate. There is concern that, at a population level, this will result in higher levels of morbidity and disability, and greater demands placed upon the health care system and on the traditional forms of caregiving. It is argued that longitudinal studies of the elderly provide important information on the process of ageing and its relationship to intergenerational transfers, health and the cost of care that can be used in developing health policy in Asia. An example is provided that shows the potential of this approach as it relates to initial health status, active life expectancy, and the cost of care.

Nutritional Consequences of Population Change

Elsie PAMUK
Asian MetaCentre for Population and Sustainable Development Analysis, National University of Singapore, Singapore

Demographic transitions are accompanied by and intrinsically combined with epidemiologic and nutrition transitions. The nutrition transition occurs as populations move from reliance on staple-based diets, often in chronic under-supply and undergoing periods of acute shortage, to more varied diets that eventually become meat- or dairy-based, energy-intense, and rely heavily on processed foods. This transition is reflected in a shift from the health consequences of under-nutrition (low birthweight, low body weights and failure to grow in children, underweight adults) to problems of over-nutrition in the context of reduced physical activity (overweight and obesity). Particular difficulties arise in countries where the transition is incomplete and unequal, so that large segments of the population still experience health problems

associated with nutrition deficiencies while another, growing segment experiences the health consequences of "over-nutrition". Recent evidence suggests that in areas undergoing particularly rapid transitions, problems of under- and over-nutrition can affect members of the same household and even the same individuals over their lifetimes.

Population-Based Studies on Genetic and Environmental Determinants of Birth Defect Prevention in China

Xiaoying ZHENG
Institute of Population Research, Peking University, China

In the process of demographic transition and health transition, the interactions between population, health and development has attracted great attention from scholars, policy-makers and common people. In particular, it is the case in China. In the past 30 years since the introduction of family planning program in the early 1970s, Population regulation has been achieved great progress, and also reached lower fertility level, China began to strengthen the works of health improvement further more. A national program of population-based health has been initiated by Chinese government and academic society, among which birth defect and genetic disease is one of the focuses. The effective prevention and /or avoidance of birth defects largely depend on the understandings of pathogenic mechanism, which is not only a medical issue but also important social concerns. Therefore, Chinese government and academic arena jointly launched a interdisciplinary research project which aims at studying the problems of birth defects and its determinants.

The study consists of four major parts:

(1) To identify and characterize the genes responsible for major birth defects and genetic diseases. There are large amount of information on pedigrees with genetic diseases in China. We will take this advantage and apply the information provided by the Human Genome Project combined with the ever-burgeoning bank of known expressed sequences in the nucleotide and protein databases to map, clon, and characterize the disease genes.

(2) To Analyze the genetic and environmental factors which induce birth defects. Population analysis method, epidemiological trial, GIS and relevant methods will be used. Based on the knowledge of the etiology, the prevention and management protocols will be established and carried out.

(3) To promote and set up a national network with highly accurate and reliable diagnostic techniques and screening tests, by using high-tech methods such DNA chips and molecular radar.

(4) To establish an extensive databank which contains Chinese pedigrees of birth defects, and other information for the diagnosis and intervention of birth defects.

Some Thoughts on Mortality and Morbidity in Asian Cities

Gavin JONES
Research School of Social Sciences, Australian National University, Australia

Of the many population changes taking place in Asia, an important one is the emergence of giant megacity regions. Just how many of these there are, and how large

they are, depends on definitions. But according to the UN Population Division's latest study, 12 of the world's 20 largest urban agglomerations are in Asia, and 23 of the world's 40 largest agglomerations. Actually, however, a much larger proportion of Asia's population is living in cities in the 1 to 5 million range than in the megacities. Both deserve our attention.

The health implications of the increasing proportion of Asian populations living in the million-plus cities urgently need further investigation. In 19th century Britain and Europe, cities were the locus of very high mortality rates, and their populations had to be renewed by in-migration from the countryside (United Nations, 1953:52-3; Glass, 1964; Preston and Haines, 1991). But in developing countries in recent decades, cities had a considerable health advantage over rural areas. Recently, Brockerhoff and Brennan (1998) have shown that the earlier advantage of lower infant mortality rates in the cities of Latin America and Africa has largely been lost. There has been a tendency to extrapolate such findings to Asia, despite the fact that the long-standing urban advantage in health and mortality indicators in Asia has been maintained. One problem is that some observers compare urban slum conditions with rural areas, and then suggest that rural health conditions are better than in urban areas. Yet done carefully, even this comparison usually shows that urban slums have a health advantage over rural areas (National Research Council, 2002). (In the majority of the 87 surveys assessed by the National Research Council, mortality risks facing the urban poor were lower than those faced by rural children, although in 25 of the surveys, the urban poor face significantly higher risks than the general rural population).

There are good reasons why Asian cities have long had lower mortality rates than the countryside: in particular, the higher concentration of health services there, and the higher average incomes than in small towns and rural areas. Nevertheless, there are specific health hazards in large cities, some of which may have cumulative impacts which are not yet fully understood. Problems such as air pollution, garbage and sewerage disposal issues, particularly in slum and squatter areas, hypertension and mental health problems resulting from the pace of urban life, come to mind. Instability in large cities can also lead to insurgency and revolution. Dependence on urban car and bus transport in many Asian cities has health implications, including traffic accidents, increased respiratory problems due to pollution, fragmentation of neighbourhoods, intrusive noise and restrictions on physical exercise.

Higher rates of cancer and coronary heart disease in urban places as compared with rural areas in the U.S. (Ford, 1976) could well be related to high levels of air pollution, higher incidence of risk factors for heart disease such as lack of exercise, diet high in saturated fat, obesity and cigarette smoking. Note also the sociological arguments for higher levels of alienation in cities. These hypotheses require further investigation in Asian cities.

It is also important to recognize that workers suffering health ailments resulting from the nature of their work in urban areas may frequently return to rural areas. (Examples – perhaps female electronics workers in Malaysia who migrate to urban areas, but suffer serious eyesight and other problems after working for a few years in the electronics industry). This group has to be taken into account in examining health problems in urban areas.

The continuing mortality rate differential in favour of large cities in Asia disguises wide areal differences and differences between socio-economic groups within these cities. Better information on death rates and morbidity rates for disaggregated areas within cities, and for the population subdivided into socio-economic groups will give a better indication of the extent of disadvantage of some groups, and provide a sharper focus for interventions. For example, air-borne diseases likely to be higher in crowded, poorly ventilated houses. Note winter peak in mortality in Mongolia for this reason (Neupert, 1996:59-60). Areas affected by salt-water intrusion as a result of excessive removal of groundwater through deep wells – for example, the Tanjung Priok area in Jakarta – have been shown to have much higher incidence of cholera, because potable water has to be purchased from vendors, and the poor living in these areas can ill afford it.

Even where overall mortality and morbidity is lower in cities than in rural areas, the patterns may differ considerably, and this requires different strategies of preventive and curative health care. Understanding the differentials is crucial to this.

Another important line of inquiry would be into health promotion measures in Asian cities. Can adequate provision of parks, playgrounds and sporting fields encourage higher levels of exercise? Or are the barriers to healthy life styles more cultural? (Note increased participation in fun runs and fitness activities in Bangkok over time). Scope for community action. What about children's level of physical activity? Problem of lack of safety for children to ride bicycles, play football or badminton in the street. Or is it more a matter of culture change – the attraction of watching TV, and the emphasis on academic performance above all else for children in many East Asian cities.

Some ideas for priority setting in public expenditures related to health in urban areas (see Wongboonsin and Indaratna, 2000):

Magnitude of problems
Severity
Technical capability and feasibility
Economic feasibility
Social concern and acceptability

And with regard to the areal concentration of effort:

Level of crowdedness
Relative magnitude of health problems
Access to clean water and sanitation
Level of exposure to risk factors, particularly related to the environment
Level of community action and initiatives
Access to health care

References

Brockerhoff, Martin and Ellen Brennan, 1998, "The poverty of cities in developing regions", *Population and Development Review*, 24(1): 75-114.

Ford, Amasa B., 1976, *Urban Health in America*, London: Oxford University Press.

Glass, D. V., 1964, "Some indicators of difference in urban and rural mortality in England and Wales and Scotland", *Population Studies*, 17: 263-267.

National Research Council, National Academy of Sciences, 2002, *Report of Panel on Urban Population Dynamics*, Washington: U.S. National Academy of Sciences.

Neupert, Ricardo, 1996, *Population Policies, Socioeconomic Development and Population Dynamics in Mongolia*, Canberra: Research School of Social Sciences, Australian National University: 59-60.

Preston, Samuel H. and Michael R. Haines, 1991, *Fatal Years: Child Mortality in Late Nineteenth Century America*, Princeton: Princeton University Press.

United Nations, 1953, *Determinants and Consequences of Population Trends*, New York: United Nations.

Wongboonsin, Kua and Kaemthong Indaratna, 2000, "Resource and financial management for cities and health", presented at the Global Meeting on Cities and Health, Kobe, Japan.

The Health Consequences of Rapid Urban Growth: Evidence from Dhaka, Bangladesh

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During the last fifty years the cities of the developing world have been characterized by their relatively low mortality levels in comparison to rural areas – in contrast to the situation of nineteenth century European cities. Continuing rapid urban growth may be changing this scenario. Concerns have risen that the urban advantage no longer holds especially among the poorer sections of the urban communities. This is a particular worry as the urban population is set to become the majority population in these countries in the next few years. Data is presented from a survey of slum-dwellers in Dhaka, Bangladesh to explore some of the factors that influence health status and health behavior. Dhaka is one of the world's most rapidly growing cities, a growth driven in large part by the influx of the very poor and those most likely to suffer from ill health and to be disadvantaged in gaining access to health services.

Urbanization, Urbanism, Environmental Change and Health

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Australian National University, Australia

Urbanisation refers to the shift of population from rural to urban setting. Urbanism is the associated set of living conditions, behaviours and values. Both processes are occurring widely in Asia. China, for example, has recently announced plans to create, de novo, ten or more cities of around 20-30 million people, in order to provide urban accommodation for its growing and urbanizing population. Urban living affects human health via several pathways. These comprise: (i) direct ways (e.g., via exposure to air pollution, the "heat-island" amplification of heatwaves, and the micro-environment of urban housing); (ii) less direct ways (e.g., via the change in physical activity patterns and, hence, in obesity and associated health disorders, and via the commercial, social and peer pressures to adopt urban dietary patterns); and (iii) more indirect ways (e.g., via the changes in family formation, social networking and individual mobility).

Urbanisation also has implications for local and regional environmental pressures. On the one hand, there are some economies of scale and service provision (especially with high-density housing) and opportunities for recycling. On the other hand, urbanism entails increases in consumption level and energy use, combined with an uncoupling of communities from engagement with their environmental life-supports; cities thus have "ecological footprints" that extend well beyond their physical boundaries, and this has present and future consequences for the wellbeing and health of adjoining and distant populations.

Since urbanization is a multifaceted process, it would be sensible to focus research on just several major aspects of the experience. One important topic is to elucidate the balance of health gains and losses associated with the evolution of urban transport systems – and to model the spectrum of health impacts and their DALYs burdens from future projected urban transport developments. While the obvious impacts refer to injuries, accidental deaths and the health detriments of air pollutants from automotive exhausts, there are many other impacts on health. One of the most notable is the rise in obesity associated with the decline in physical activity. Indeed, WHO (Geneva) is currently developing an international study of this question of the health impacts of urban transport in developing-country cities, and the Asian MetaCentre would provide a natural collaboration for this research within the Asian region. (Prof. McMichael is already assisting the development of this topic with WHO.) Motorised traffic is also a major source of greenhouse gas emissions, and therefore a contributor to global climate change and its impacts on human wellbeing and health.

A second important, but often overlooked, topic is to do with the quality of the residential micro-environment. There is, now, accruing evidence of the importance of the domestic environment as determinant of: (i) exposure to infectious agents in early life, with important "programming" effects on the developing immune system (and outcomes such as asthma – which tend to rise in many urban populations); (ii) exposure to extremes of heat and cold (hazardous to the old, the frail and the very young); (iii) in-door air quality – which may often, but not always, be better in urban than in rural settings. (Indoor air pollution accounts for a very great burden of disease

and premature death in developing countries, particularly in rural and poor urban households using solid fuels with poor ventilation.) NCEPH has related research activities and interests in these areas, and plans a close collaboration with colleagues in New Zealand.

Further Thoughts on Population Change and Health (no title)

Tim DYSON
Department of Social Policy, London, School of Economics, UK

1. I was invited to give a brief talk, addressing the above topic – 'in your area of specialisation'. I am not sure if I have a particular area of specialisation, but with several others, I am currently concluding a research project on the Future of India, funded by the Wellcome Trust, and it therefore seemed reasonable to consider the invitation in that light.

The project touches on health issues in many ways, both more and less direct – e.g. mortality trends, childhood diseases, malaria, HIV/AIDS, food, nutrition, income levels, poverty trends, education, employment, common property resources, urbanisation, energy provision, pollution etc. As well as my own, other team members on whose work I draw here are Leela Visaria (on mortality), Bhaskar Vira (the urban environment), Dennis Anderson (environment), Robert Cassen (income levels and poverty) and Amresh Hanchate (food and nutrition).

2. That said, the topic of this workshop is not on mortality and morbidity per se (which are obviously topics which require study). Rather, it is much more specific. To quote, it relates to the 'health consequences of population changes'.

This phrase conjures up cause and effect. The population change(s) comes first, the health consequence(s) follow. Accordingly, one presumably has to consider (i) how populations change, and then (ii) the health consequences which follow.

3. For reasons sketched below, I am a trifle uneasy with this formulation. The essence of the difficulty is that if 'population change' is defined in conventional ways (e.g. changes in the composition and size of the population) then what can be done is sometimes (not always) rather limited. Moreover 'population change' often turns out to be only a part of the matter anyway (sometimes a small part). So why be so restrictive by introducing the term?

If, however, 'population change' is broadened to include, say life-style alterations – like changes in food consumption, then it can perhaps become rather meaningless. For example, one can consider the nutritional effects of changing food consumption patterns with very little mention of population change. Likewise, do 'globalisation' or 'increasing commercialisation' come under the expression, and if so why?

Another problem is that number and complexity of the steps which may be involved in designing a study on the health consequences of population change – from the change itself right through to the consequence – may be extremely challenging. There may be benefit, therefore, in being more much circumscribed in what one does e.g.

tackling ‘head on’ only a part of the causal chain. Again, the term ‘population change’ may be unnecessarily restrictive.

4. Now to some specifics, beginning with population ageing, because any demographer knows that older populations tend to suffer more from chronic diseases (e.g. cancers, circulatory diseases). Of course, population ageing effects operate over the long-run (because ageing is usually a relatively slow population process) and they can be studied in fairly routine – frankly, in my view often rather dull – ways (e.g. change the age structure and see how the composition of overall mortality changes for assumed sets of cause and age specific death rates). In India data indicate that between 1970 and 1995 the share of non-communicable diseases in overall mortality increased from 48 to 54 percent. Of course, this reflects population ageing a little, but it also reflects the decline of communicable diseases.

Another compositional change relates to the marital status distribution of the population (which again tend to be relatively slow). The problems posed by widowhood are often considerable in older populations. This will be true in India in the future. But widowhood is a problem now. One can, of course, say that the scale of widowhood becomes greater with mortality decline – and call mortality decline – ‘population change’. But to me that seems a little contrived (after all, mortality decline brings about ‘population change’ e.g. alterations in age structure and population size). Again, the topic – i.e. the problems faced by widows – is very important, has strong health dimensions, and is relatively neglected in India (although I am aware of important work on the topic by Jean Drèze. It deserves study. It can be linked to ‘population change’, but only in a way which might be considered unnecessary.

5. This brings me to population size. Our project work suggests that India's population will grow by at least another 500 million people before the middle of the twenty-first century. Indeed, another six hundred million is perhaps more likely. The consequences of this change are considerable – e.g. for issues of governance (perhaps as much as any), education, employment, food, water, solid waste management etc. These and other factors certainly impinge upon health, although they are also influenced by a host of other considerations.

Let me illustrate how we have gone about things with examples. On food we have asked: How will levels of demand develop? And what are the prospects for meeting these demand levels? It turns out that some aspects of the evolution of future food demand growth (e.g. for coarse cereals and pulses, both of which are nutritionally relatively ‘good’) are likely to be almost entirely determined by demographic growth. However, other aspects of demand growth (e.g. for vegetables and fruits) will be much more influenced by changes in incomes and tastes. When it comes to the supply-side, while population growth is certainly relevant in some respects (e.g. apropos water resources, and sometimes the division of landholdings) the ‘solutions’ lie largely in the realm of existing or sometimes new technologies (e.g. pumps) and institutional reform (e.g. reductions in farm input subsidies, probably coupled with increased targeting).

What certainly does not arise is a simple model in which, say, population growth has straightforward consequences for the numbers undernourished – although, other

things equal, it does mean that these numbers will rise (however the economic projections envisage that levels of poverty in India – and hence command over food – will decline, in both percentage and absolute terms).

Another approach used in the context of various forms of environmental problems – many germane to health matters – is to run simulations with and without the introduction of feasible policy packages. The comparisons generally conclude that the demographic dimension (i.e. the influence of population growth) is only significant in the absence of policies, but it can be virtually eliminated if polices are put in place. Equally important, most environmental improvement practices not only improve the environment, but they also more than pay for themselves (so benefiting economic growth) and tend to benefit the living conditions of the poor more than those of the rich i.e. they have significant positive distributional effects. Also, the sooner the policies are introduced the greater are the savings.

In so many different matters the crucial importance of technologies and institutional changes (the latter admittedly, often very difficult to bring about) are underlined in terms of what must be done. In general the task of looking at how population growth may affect levels of, say, poverty or under-nutrition is difficult enough. It is left as obvious that neither poverty nor under-nutrition are good for population health.

If one is looking for the health consequences of changes in population size then the urban sector is probably a more fruitful place to look – largely because consequences are concentrated and urban growth rates are usually much higher than rural rates. However, that said, so much else tends to be complicating things in urban areas.

6. Anyhow, the final type of 'population change' I will briefly address is urbanisation (and urban growth). India's population is urbanising. About 28 per cent of the population is urban (on the present rather restrictive definition), a figure which may rise to around 36 per cent by 2026 (more, if the definition is amended etc). By 2026 there may well be seventy cities with one million people or more. And massive urban agglomerations like Delhi and Mumbai could each contain around thirty million people.

It is obvious that there are major health and related problems in urban areas. Rapid urban growth can overload urban infrastructures. How the lives of urban dwellers can be improved is a vitally important question. So urban health problems certainly merit study – and in addressing them technologies and institutional changes (e.g. in areas such as water, sewage, solid waste management, air pollution, transport) again, are usually key.

Of course, urban population growth is a pervasive force i.e. it is operating almost everywhere in urban India. Therefore study of differentials in environmental indices between cities of different sizes falls short of isolating all relevant effects. Nevertheless such indices (e.g. levels of air pollution) are often weakly associated with city size because of the influence of other factors (e.g. availability of public transport, drainage, physical layout, differences in emissions standards etc). Certainly population growth is only part of the picture, for example it explains only a relatively small part of traffic growth trends. There is no simple relationship between the size of a city and its environmental quality.

What about the health effects? Well, of course, despite the many problems, urban dwellers in India still live appreciably longer than their rural counterparts. At the all-India level the current differential is about 7 years (down from about 11 years in the early 1970s). But life expectation is rising in both urban and rural areas and, in general, we anticipate that this trend will continue.

Study of the health consequences of urban growth (and urbanisation) would need to look into the positive – as well as the negative - effects of such growth. And there clearly can be positive effects (gains in the efficiency of health service provision). Also, as has been intimated several times above, there may be difficulties in isolating the 'population change' effect – because so much else is operating to influence overall levels of population health in urban areas.

7. To conclude, this note has not questioned the importance of enquiring into the determinants of mortality and health. On the contrary. But it does see difficulties if enquiry is too closely tied into 'population change' as a specific causal force – as opposed to context. The health consequences of population change may often be too hard to isolate – because so many considerations are operating. An easier, and I suspect more fruitful, approach is to focus on a particular health problem, put it in its general ‘population’ context (often easy enough in a few pages), and then proceed to analyse it and the many different factors which impinge upon it (and which can help reduce it). At the very least, the concept of ‘population change’ needs to be given some elastic.

Further general information on the present project, which is almost entirely at the aggregate level is available at www.lse.ac.uk/depts/spa/india-project/

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