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By Nicholas Eberstadt

Few would contest the general proposition that the population factor bears directly on the course of the friendly — and sometimes unfriendly — competition between states in the world arena today. Problems arise, however, when we try to move from the general to the specific. How, exactly, do human numbers (population size, composition, and trends of change) affect the ability of governments to influence events beyond their borders — or affect the disposition of a country's interactions with outside actors? And this is no less important for the would-be strategist: How can we use population indicators to anticipate, with some reasonable hope of accuracy, the impact of yet-unfolding demographic forces on the balance of international power? This essay explores these questions for the world's largest strategic arena: the great Asian/Eurasian expanse.

Auguste Comte, the nineteenth-century French mathematician and sociologist, is widely credited with the dictum "Demography is destiny." It is a wonderful aphorism — but it promises too much and offers too little. A more operational formulation might suggest that demographic forces can alter the realm of the possible, both politically and economically, for regularly established population groupings. Demographic considerations can (but are not always required to) alter the complex strategic balance between, and within, countries.

By comparison with other contemporary forms of change — social, economic, political, technological — demographic changes are very slow and very regular. Over the past generation, for example, a 3 percent per annum rate of population growth would have been considered terribly high in Asia, while a 3 percent inflation rate would have been regarded as remarkably low. And demographic change is only sharp and discontinuous in times of utter upheaval and catastrophe (circumstances, to be sure, not unfamiliar to modern Russia, China, Cambodia, and Korea — and a number of other Asian or Eurasian populations). From the standpoint of strategic demography, momentous developments can and do occur from one generation to the next, but rather less of note can be expected to take place over the course of three to five years.

For our purposes here, we will try to peer into the Asian and Eurasian demographic future to the year 2025. To many readers, that may sound like an exercise in science fiction — but such a time horizon is by no means as fantastical as might be supposed. For one thing, contemporary Asia's population structure invites the longer view. Apart from a few outposts, most places in East Asia and Eurasia are rather far along on the notional "demographic transition" from high birth and death rates to low ones. In practical terms, this means — barring only horrendous catastrophe — that we can expect relatively little "turnover" within a given population from one year, or even one decade, to the next. Projections by the United Nations Population Division (unpd) make the point. According to the unpd's most recent medium variant figures, for example, in 2025 roughly four-fifths of the inhabitants of

East and Southeast Asia will have been alive in 2000, and 60 to 70 percent of these future East and Southeast Asian inhabitants will be people who were already living in those regions as of the year 2000.1

We can also talk with more confidence about Asia/Eurasia's demographic future today than we could in the relatively recent past because a great many blank spots in the region's demographic map have been filled in over the past generation. As recently as the late 1970s, Asia — a perennial land of mystery to the Western traveler — was also tremendously mysterious to the student of population trends: Huge portions of the Asian/Eurasian landmass qualified as a demographic terra incognita. China, Vietnam, and North Korea (among other countries in the region) had never conducted a modern national population count, had not done so for decades, or had not released such internally collected data for decades — and the ussr, well into its "era of stagnation," had taken to suppressing methodically those demographic data that Brezhnev luminaries took to be politically sensitive or ideologically embarrassing. Today, by contrast, practically every Asian or Eurasian country save Afghanistan and Burma has conducted a national census within the past decade — even reclusive North Korea. Though most countries in this expanse do not yet maintain comprehensive systems for the annual registration of births and deaths, we nevertheless have a fairly good picture of the demographic contours of the countries in the area — and of the trends that have created, and continue to form, the region's respective population profiles.

Population explosion: Yesterday's news

The asian/eurasian territory encompasses an extraordinary crush of humanity. Although the population patterns of the countries in question (we are deliberately excluding the Arabian peninsula and most of the "Asian" Middle East from consideration here) vary markedly, the absolute numbers under discussion are vast: As of mid-2000, over 3.6 billion, roughly three-fifths of the total population of the globe, resided in Asia. Seven of the world's 10 most populous countries — China, India, Indonesia, Russia, Pakistan, Bangladesh, and Japan — are located within the Asian/Eurasian perimeter.

Over the past half-century, the population of this region has grown on a scale and at a tempo without historical precedent. Between 1950 and 2000, according to the unpd's estimates, the population of the collectivity of countries in Table 1 (see next page) multiplied by a factor of 2.5 — rising by almost 2.2 billion in absolute numbers and at an average annual pace of over 1.8 percent per year. Perhaps not surprisingly, this extraordinary Asian "population explosion" captured the attention and aroused the foreboding of commentators, scholars, and policymakers around the world. (A small library of literature was generated over the course of two generations on the purported economic, political, and strategic implications of this vast population shift.) The vision of unrelenting and unprecedented increases in human numbers in Asia continues to inform much popular and policy discussion — thanks in no small part to official alarms regularly sounded by institutions and programs established over the past few decades with the express purpose of slowing population growth.

But that vision is by now outdated and increasingly misleading. The great twentieth-century demographic boom is essentially over in East Asia. It is winding down rapidly in Southeast Asia, and even in South Asia the situation has changed greatly. (Russia, for its part, has been recording negative natural increase — more deaths than births — every year over the past decade.)

TABLE 1

Country	Total Population 2000 (millions)	Projected Total Fertility Rate 2000-2005 (births per woman)	Projected Life Expectancy at Birth (1) 2000-2005 (years)	Projected Population Growth Rate 2000-2005 (percent)
Eastern Asia	*1,481.1*	*1.78*	*72.1*	*0.67*
China	1,253.1	1.83 (2)	71.0 (2)	0.73 (2)
China: Hong Kong SAR	6.8	1.00	79.9	1.07
China: Macao SAR	0.5	1.10	78.9	0.94
Taiwan (ROC) (3)	22.2	1.56 (4)	76.3 (4)	0.69 (4)
Japan	127.0	1.32	81.6	0.14
Mongolia	2.5	2.42	63.9	1.29
North Korea (DPRK)	22.3	2.02	63.1	0.54
South Korea (ROK)	46.8	1.41	75.5	0.5
Southeastern Asia	*520.4*	*2.55*	*66.7*	*1.40*
Brunei Darussalam	0.3	2.48	76.3	2.27
Cambodia	13.1	4.77	57.4	2.40
East Timor (D.R. Timor-Leste)	0.7	3.85	49.5	4.00
Indonesia	211.6	2.35	66.8	1.26
Laos (Lao PDR)	5.3	4.78	54.5	2.29
Malaysia	23.0	2.90	73.1	1.93
Myanmar	47.5	2.86	57.3	1.28
Philippines	75.7	3.18	70.0	1.79
Singapore	4.0	1.36	78.1	1.69
Thailand	60.9	1.93	69.3	1.01
Vietnam	78.1	2.30	69.2	1.35
South-Central Asia	*1,486.0*	*3.25*	*63.2*	*1.66*
Afghanistan	21.4	6.80	43.1	3.88
Bangladesh	138.0	3.46	61.4	2.02
Bhutan	2.1	5.02	63.2	2.96
India	1,016.9	3.01	63.9	1.51
Iran	66.4	2.33	70.3	1.24
Kazakhstan	15.6	1.95	66.3	-0.36
Kyrgyzstan	4.9	2.64	68.6	1.40
Maldives	0.3	5.33	67.4	2.98
Nepal	23.5	4.26	59.9	2.23
Pakistan	142.7	5.08	61.0	2.44
Sri Lanka	18.6	2.01	72.6	0.81
Tajikistan	6.1	3.06	68.8	0.86
Turkmenistan	4.6	2.70	67.1	1.54
Uzbekistan	24.9	2.44	69.7	1.51
Russian Federation	145.6	1.14	66.8	-0.57

(1) Both sexes combined. (2) Includes Taiwan. (3) Source: U.S. Bureau of the Census, International Database. (4) 2000.

Sources: United Nations Population Division, *World Population Prospects: The 2002 Revision.* Population Database accessed May 27, 2003, available online at http://esa.un.org/unpp.
U.S. Bureau of the Census, International Database. Accessed June 4, 2003, available online at http://www.census.gov/ipc/www/idbacc.html.

The Asian "population explosion" was actually a "health explosion" — it was fueled almost entirely by declining mortality due to dramatic improvements in life expectancy. That same "population explosion" has been defused by ongoing changes in childbearing patterns. Over the past three decades, Asia and Eurasia have witnessed pervasive and typically dramatic declines in local fertility levels. Since the early 1970s, the total fertility rate (or tfr — the synthetic measure of births per woman per lifetime under existing childbearing patterns) is believed to have dropped about three-fifths in East Asia and by over half in Southeast Asia; even in South Asia fertility rates are thought to have dropped by two-fifths. Thanks to these declines, sub-replacement fertility (i.e., a pattern of childbearing which, in the absence of migration, would eventually lead to a stabilization of total population and thereafter to an indefinite decrease) is increasingly emerging as the norm in Asia and Eurasia.

At this juncture, for example, sub-replacement fertility is thought to characterize every country and locale in East Asia save tiny Mongolia. In Southeast Asia, Singapore and Thailand are already sub-replacement societies, and Indonesia appears to be rapidly closing in on the replacement fertility level. As for South and Central Asia, Sri Lanka and Kazakhstan are outposts of sub-replacement fertility within the region. Elsewhere in that area, fertility change has been more pronounced than is often appreciated. With an estimated tfr of 3.0, for example, India's overall fertility level is still thought to be well above replacement — but it has also plunged by an estimated 45 percent nationwide since the 1950s, and major urban centers like Mumbai (Bombay), New Delhi, and Kolkata (Calcutta) are all believed to be sub-replacement now, as are some entire Indian states (e.g., Kerala, Tamil Nadu).2

Indeed, the rapid pace of fertility decline in some Asian countries seems already to have overtaken some of the unpd's most recent fertility projections: The latest information from such disparate locales as Iran and Vietnam suggest that both may currently be at replacement-level fertility — or even below.3 Only in uncharted Afghanistan are fertility rates guessed to be stubbornly stuck at essentially premodern elevations.

As a consequence of a generation and more of sweeping — and still continuing — fertility decline in Asia and Eurasia, it is no longer accurate to speak of "unprecedented population growth" either for the region as a whole or for its major components. For the collectivity of countries in Table 1, the current pace of population growth (a projected 1.1 percent per year) is actually distinctly lower than half a century ago (when it is thought to have exceeded 1.8 percent per annum). Even in

such places as Bangladesh, the perennial poster child for the "population explosion," demographic growth, though still rapid (about 2 percent per year), is notably slower than in recent decades — and perhaps ever so slightly slower today than in the early 1950s.

Absolute growth of the region's population also looks to have peaked. For Asia/Eurasia as a whole, the annual increment in population today is estimated at about 43 million persons a year — distinctly less than the estimated 52 million a year of the late 1980s, and indeed lower than the 46 million a year in the late 1960s. According to the unpd's latest medium variant projections, the absolute annual increase of population peaked in East Asia in the late 1960s and in Southeast Asia in the early 1990s, and, while there is less certainty on this final point, the projections also suggest that absolute population increments in South and Central Asia may be slightly lower today than they were in the early 1990s.

Is there strategic significance to this fertility decline and the population changes it is relentlessly, but unevenly, causing throughout Asia? Arguably so — but probably not in the ways we are most accustomed to hearing about.4 To get at the actual strategic constraints and opportunities presented by patterns of population change in Asia and Eurasia, we will have to look carefully into specific details.

Do shifts in relative size matter?

If we consider the two-generation sweep from 1975 to 2025 — in which we are currently more or less at midpoint — we will observe that relative population weight is poised to shift appreciably for various dyads — including several pairings of neighboring, and potentially rivalrous, states:

India/China. By the unpd's medium variant projections, between 1975 and 2025, China's population will grow by about half, from approximately 930 million to over 1.4 billion. India's, on the other hand, will more than double, jumping from around 620 million to over 1.3 billion. A generation ago, there were nearly 50 percent more people in China than in India; a generation hence, the projected differential will be a mere 5 percent.

Thailand/Vietnam. At the end of the Vietnam War, Vietnam's population was about one-sixth greater than Thailand's (48 million vs. 41 million). In 2025, due to differential population growth, Vietnam's population is projected to be over 40 percent greater than Thailand's (105 million vs. 74 million). In other words, where there were about seven Vietnamese for every six Thais a generation ago, there may be over seven Vietnamese for every five Thais a generation hence.

Japan/Korea. In 1975, the population of the Republic of Korea amounted to less than a third of Japan's (35 million vs. 111 million). In 2025, under medium variant projections, the rok's population will be over two-fifths of Japan's (50 million vs. 123 million). If we imagine a Korean unification under Seoul's leadership sometime before 2025, the population balance would shift all the more sharply, with the united peninsular rok population equaling three-fifths of Japan's own (75 million vs. 123 million).

Pakistan/Russia. The most radical and dramatic shift in the relative population weight between major countries in the region, however, involves Pakistan and Russia. In 1975, Russia's population was nearly twice as large as Pakistan's (134 million vs. 70 million). By 2025, under medium variant projections, the situation will be virtually reversed: Pakistan will be just over twice as populous as Russia (250 million vs. 124 million).5

These relative demographic shifts are certainly vivid, but are they meaningful? Unfortunately, the answer is not self-evident. In the decades

ahead, will Pakistan's leadership find its strategic situation vis-à-vis Russia transformed, or even significantly altered, by overtaking and decisively surpassing Russia demographically? One can of course write a story line to that effect, but such a tale would be guided, and indeed dominated, by a host of additional and hardly trivial political and economic assumptions, all introduced precisely to lead to the desired outcome.

To be sure, there are historical instances in which the shift of demographic weight between national actors seems to have been invested with real strategic significance. In the "struggle for mastery" in modern Europe, one thinks of the role of population in the ascendance of Germany over France during the nineteenth century. (The nineteenth century commenced with 11 French for every 10 Germans and ended with about 15 Germans for every 10 French.) Nearer to home, there is the case of the United States — the current and unrivaled global superpower, with a population larger than all but two contemporary states — where total population is roughly 50 times greater today than it was two centuries ago.

Is it conceivable that the United States would exert anything like the economic, political, and military influence it enjoys today if its population, instead of surging over 50-fold, had simply doubled over those same two centuries — as actually happened for France? Very clearly not. But in demographic affairs, as in so many other areas, there may be such a thing as "American exceptionalism." Population, after all, is not the only strength that makes the United States today's sole superpower. And if we consider the race between Germany and France in nineteenth-century Europe, it is at once apparent that many other factors besides the demographic were weighing in Berlin's favor: political unification, technological innovation, industrial modernization, and a revolution in military affairs, to name just a few. Even if differential population growth did contribute to Germany's primacy over France, it seems safe to say this was neither a sufficient factor nor even a necessary one.

At first glance, we might assume that changes in raw population totals of potentially contending countries should tell us something meaningful about the strategic options available to those same governments — for there is something tribal, even elemental, in the impulse to keep tabs on the changing numbers of "them" and "us." On the modern global stage, however, data on decade-to-decade national shifts in relative population probably offer distinctly less relevant information than many strategically inclined thinkers would assume — and such limited information as these totals do convey depends critically on context. Until we arrive at a happy political millennium akin to the one envisioned in Kant's "Perpetual Peace," wherein international disputes will be amicably settled on the basis of "one person-one vote" global plebiscites, strategic demography will be better served by focusing on the population changes within countries and the constraints or advantages these present to national directorates.

Aging Asia: An uneven burden

One immediate and obvious example of an internal demographic change fraught with possible economic and political significance is the wave of population aging that is sweeping the Asian/Eurasian region. The current and impending "graying" of Asia and Eurasia is an all but irrevocable force, since it is propelled by the basic arithmetic of longer lives and smaller families — trends, we will recall, that have already been developing in the region for decades if not generations. Only a catastrophe of biblical proportions could forestall the tendency for Asia's populations to age substantially between now and 2025.

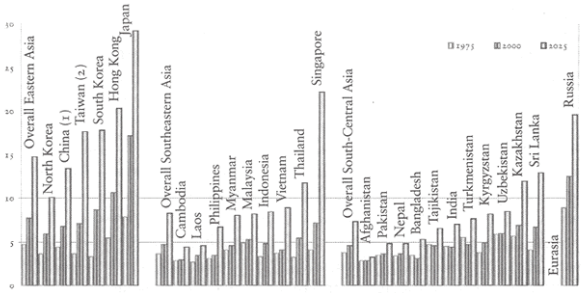
Age patterns in Asia/Eurasia vary enormously

today. In such places as Afghanistan, Pakistan, Laos, and Cambodia, the "median person" as of the year 2000 was a teenager: Over half the population in those countries was probably under 20 years of age. By contrast, Japan's median age in 2000 was over 41 years. By that particular criterion, in fact, Japan is now probably the "grayest" country on earth. Similarly, in 2000 the proportion of total population 65 years of age and older ranged from under 3 percent in Afghanistan to over 17 percent in Japan. Over the coming generation, however, every single population center in Asia/Eurasia is anticipated to age appreciably — some of them at a pace or to an extreme never before witnessed in any ordinary human society.

Although all of Asia/Eurasia is set to age markedly over the 2000-2025 period, most of the region will nonetheless remain relatively youthful. In South and Central Asia, for example, median age is poised to rise by well over six years during this quarter-century (actually a somewhat greater absolute increase than envisioned for the world's "more developed regions" between 2000 and 2025). But even the most "elderly" country in this Asian grouping (Sri Lanka in 2025) is projected to have a somewhat younger profile than did Europe in the year 2000, and in 2025 South and Central Asia together will have a population younger than the Europe of 1950. So, too, in Southeast Asia, where despite a prospective increase in median age from roughly 24 to about 32 between 2000 and 2025, only two countries (Thailand and Singapore) will be as "gray" in 2025 as America today — and the area as a whole will still be younger than the Europe of 1975.

The part of Asia/Eurasia that stands to age most rapidly, and most profoundly, is Eastern Asia — and here we enter uncharted territory. Between 2000 and 2025, East Asia's median age is projected to jump by nine years, to just under 40. By that metric, East Asia in 2025 will be "grayer" than Europe today, where median age in 2000 was under 38. Throughout East Asia, many populations will be more elderly than any yet known, and some will be aging at velocities not yet recorded in national populations. Between 2000 and 2025, for example, the roc (Taiwan) is set to experience a leap in median age of almost 11 years, to just under 43.6 South Korea's median age, in these projections, would soar by almost 12 and a half years, to over 44. Absent an unexpected influx of young immigrants, Hong Kong's projected median age in 2025 will be 46 — and one in five residents will be 65 or older.

FIGURE 1
Proportion of Population Ages 65+ 1975, 2000, 2025



(1) Includes Taiwan. (2) Source: U.S. Bureau of the Census, International Database.

Sources: United Nations Population Division, *World Population Prospects: The 2002 Revision.* Population Database accessed May 27, 2003, available online at http://esa.un.org/unpp.
U.S. Bureau of the Census, International Database. Accessed June 4, 2003, available online at http://www.census.gov/ipc/www/idbacc.html.

But the most extreme and extraordinary instance of population aging will be witnessed in Japan. By 2025, in unpd medium variant calculations, Japan will have a median age of just over 50. Less than a quarter-century hence, by those same projections, almost 30 percent of Japan's populace will be 65 or older, and almost every ninth Japanese will be 80 or older. This future Japan would have very nearly as many octogenarians, nonagenarians, and centenarians as children under 15 — and would have barely two persons of traditional "working age" (as the 15–64 cohort is often, not unreasonably, construed) for every person of notional "retirement age" (65 and over).

Some of the implications of such extreme and rapid population aging have already been widely discussed and analyzed. To begin, there

are the fiscal implications of Japan's version of "graying": Under current rules of the budgetary game, these look unambiguously bleak. A 1996 study by oecd researchers, for example, estimated the net present value of the unfunded liabilities in the Japanese national pension system at 70 percent of 1994 gdp. Unless radical changes in that pay-as-you-go system were implemented, they warned, Japan's annual deficit would approach 7 percent of gdp by 2025, and the total "pure aging effect" on public finances for 2000 to 2030 could be a debt equal to 190 percent of 2000 gdp.7

Given the fact that gross public debt in Japan rose from about 60 percent of gdp to nearly 150 percent of gdp from 1992 to 20028 — in a context of relatively limited population aging — those numbers may sound ominous indeed. And other analysts have offered still darker assessments, with some prophesying that an extended "aging recession" would visit Japan and perhaps never depart.9
Without denying the seriousness of the challenges that aging will pose to Japan's society and economy over the decades ahead, it is still possible to suggest that the economic dangers inherent in population aging for Japan (and, by extension, East Asia's smaller prosperous, but graying, tigers) may be exaggerated in some of the contemporary commentary.

Today's writing on the negative effects of population aging in Japan focuses (sometimes to near exclusion of all other factors) on public finances and quite rightly points out the actuarially unviable state of the country's national pension system and the looming liabilities for its public health care sector. There is no concrete commandment, though, that a country must leave parlous budgetary imbalances uncorrected. Painful though such exertions would surely be, it is entirely within the purview of the Japanese policymakers and voters to set the country's pension and health systems on a financially secure course. (Sure enough, oecd calculations suggest that a number of relatively obvious changes could significantly improve the financial health of the national Japanese pension system.)

The budgetary balance, moreover, is only a single component of overall macroeconomics — and the implications of population aging for Japan's consumption, production, savings, investment, and international finance and trade performance are by no means unremittingly negative. The great social and structural shifts occasioned by population aging, recall, will create new economic opportunities in addition to all the new challenges. If gradual economic adjustments are made, if flexibility in factor markets can be achieved, and if relatively productive economic policies could be embraced and maintained, the drag imposed on Japanese economic growth by massive and rapid population aging in the decades immediately ahead need not be major. On balance it would probably remain a negative factor, but not necessarily a critical or even a major one.

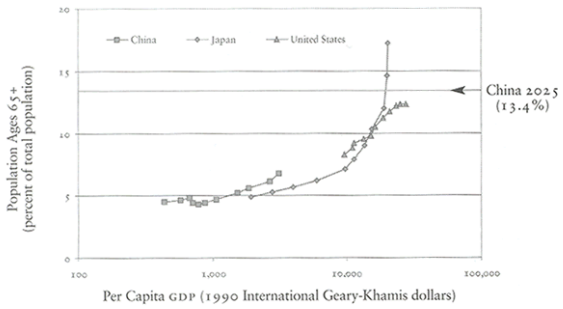
The key point here is that Japan's aging process has been stimulated materially by the country's great health revolution. And, thanks to this ongoing revolution, the Japanese are today the world's longest-lived people. It is counterintuitive, to say the least, to expect a health explosion to lead inexorably to national bankruptcy and economic ruin. Given Japan's patterns of "healthy aging" and the reduced physical rigors of employment in an affluent information-age economy, Japan's older cohorts can now realistically look forward to the real possibility of productive contribution to economic life at ever-later ages. Thus, while the population stagnation and decline that will almost surely attend Japan's particular aging process stand to reduce the overall pace of aggregate economic growth, aging need not thwart the continuing improvement of per capita income — and augmentation of economic

capacities — for Japan.

This qualified, perhaps cautiously optimistic, evaluation of the economic implications of rapid and pervasive population aging in Japan (and the smaller East Asian tigers) does not extend to the Chinese mainland. The People's Republic of China will also undergo dramatic aging in the decades immediately ahead, but there are reasons to expect the impact of the process to be more generally adverse both socially and economically.

FIGURE 2

Per Capita GDP vs. Population Ages 65+: China, Japan, and United States, 1950-2000



Sources: Angus Maddison, *The World Economy: A Millenial Perspective* (Paris: Development Centre Studies, Organization for Economic Cooperation and Development, 2001), Tables C1-c and C3-c. United Nations Population Division, *World Population Prospects: The 2002 Revision*. Accessed April 25, 2003, available online at http://esa.un.org/unpp.

Between 2000 and 2025 China's median age is set to rise very substantially: from about 30 to around 39. According to unpd projections for 2025, in fact, China's median age will be higher than America's. The impending tempo of population aging in China is very nearly as rapid as anything history has yet seen. It will be far faster than what was recorded in the more developed regions over the past three decades and is exceeded only by Japan. There is a crucial difference, however, between Japan's recent past and China's prospective future. To put the matter bluntly, Japan became rich before it became old; China will do things the other way around. When Japan had the same proportion of population 65 and older as does China today (2000), its level of per capita output was three times higher than China's is now. In 2025, 13.4 percent of China's population is projected to be 65-plus; when Japan crossed the 13.4 percent threshold, its per capita gdp was approaching $20,000 a year (constant 1990 ppp dollars). One need not be a "Sino-pessimist" to suggest that China will be nowhere near that same economic marker 22 years from now.

Although China's population will hardly be as elderly as Japan's by 2025, its impending aging process promises to generate problems of a sort that Japan does not have to face. The first relates to its national pension system: Japan's may be financially vulnerable, but China's is nonexistent. Government or enterprise-based retirement programs cover only about one-sixth of the contemporary Chinese work force — and nearly all of the pieces in this haphazard patchwork are amazingly unsound in actuarial terms.10 Although Chinese leadership has been committed since 1997 to establishing a sturdy and universal social security system, actions to date have lagged far behind words and the system remains only in the planning stage.

For most aging Chinese today, the pension system is the family, and even with continuing national economic progress, Chinese families are likely to be placed under mounting pressure by the swelling ranks of seniors. By 2025, there will be nearly 300 million members of China's 60-plus population, but, at the same time, the cohorts rising into that pool will be the same people who accounted for China's sub-replacement fertility patterns in the early 1990s and thereafter. Absent a functioning nationwide pension program, unforgiving arithmetic suggests there may be something approaching a one-to-one ratio emerging between elderly parents and the children obliged to support them. Even worse, from the perspective of a Confucian culture, a sizable fraction — perhaps nearly one-fourth — of these older Chinese will have no living son on whom to rely for sustenance. One need not be a novelist to imagine the intense social tensions such conditions could engender (to say nothing of the personal and humanitarian tragedies).

Second, and no less important, there is no particular reason to expect that older people in China will be able to make the same sort of contributions to economic life as their counterparts in Japan. In low-income economies, the daily demands of ordinary work are more arduous than in rich countries: The employment structure is weighted toward categories more likely to require intense manual labor, and even ostensibly non-manual positions may require considerable physical stamina. According to official Chinese statistics, nearly half of the country's current labor force toils in the fields, and another fifth is employed in mining and quarrying, manufacturing, construction, or transport — occupations generally not favoring the frail. Even with continuing structural transformations, regular work in 2025 is sure to be much more strenuous in China than in Japan. Moreover, China's older population may not be as hardy as peers from affluent societies — people likely to have been better fed, housed, and doctored than China's elderly throughout the course of their lives.

Data on the health status of older people in China and other countries tend to be spotty and problematic, and comparability of method can never be taken for granted. However, some of the survey data that are available through Réseau sur l'Espérance de Vie en Santé (reves), the international network of "health expectancy" researchers, are thought-provoking. According to a 1989–90 "health expectancy" study for Sichuan province, a person 60 years of age would spend less than half (48 percent) of his or her remaining years in passable health. By contrast, a study in West Germany for 1986 calculated that a 60-year-old woman could expect to spend 70 percent of her remaining time in "good health." For men the fraction was 75 percent.11 Although one probably should not push those findings too far, they are certainly consistent with the proposition that China's seniors are more brittle than older populations from more comfortable and prosperous locales.

Thus, China's rapidly graying population appears to face a triple bind. Without a broad-coverage national pension system, and with only limited filial resources to fall back on, paid work will of necessity loom large as an option for economic security for many older Chinese. But employment in China, today and tomorrow, will be more physically punishing than in oecd countries, and China's older cohorts are simply less likely to be up to the task. The aggregation of hundreds of millions of individual experiences with this triple bind over the coming generation will be a set of economic, social, and political constraints on Chinese development — and power augmentation — that have not as yet been fully appreciated in Beijing, much less overseas.

Unfavorable mortality trends

The positive and normative implications of a change in a society's fertility level cannot be described unambiguously in advance. Not so for changes in mortality levels: In any setting or context, people will prefer longer lives to shorter ones. In addition to the incalculable personal benefits of life itself, rising life expectancy and the improvements in health that typically accompany it materially affect economic potential by increasing the capability of populations to work and learn, extending the period of economically active life, and tilting the calculus of education and training toward increased investment in "human capital."

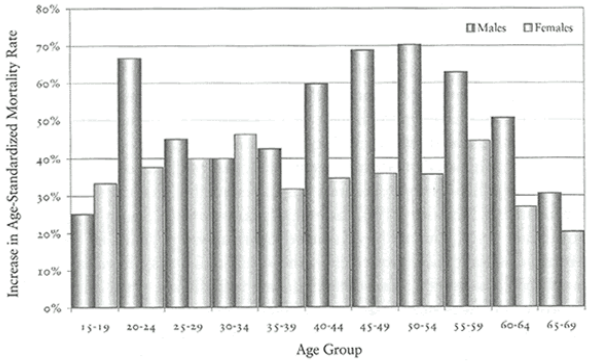
As already noted, the Asia Pacific region has enjoyed a sweeping and completely unprecedented improvement in survival chances over the past half-century. Between the early 1950s and now, life expectancy at birth is estimated to have leapt by about 25 years in both South-Central and Southeast Asia, and to have soared by nearly 30 years in East Asia. Moreover, infant mortality rates in those territories may have fallen by as much as two-thirds, three-fourths, and four-fifths, respectively. That improvement was neither

entirely universal nor uninterrupted. In locales across the Asian/Eurasian expanse, it was episodically halted or temporarily reversed by terrible spikes of mortality. On the whole, however, these spasms of death were due to man-made (or, more accurately, state-made) disasters — the Great Leap Forward, the Khmer Rouge apocalypse, and the like — and they ceased when the afflicting interventions abated. Given the surge of health that coursed over postwar Asia, the general expectation not unreasonably prevailed that steady improvements in health and mortality were now the natural order of things for humanity and could be subverted only by purposeful, malign political agency.

At the dawn of the twenty-first century, that happy expectation no longer squares with basic facts about mortality in the Asian/Eurasian region. By the estimates of the U.S. Census Bureau, for example, all five former Soviet Central Asian republics began the year 2000 with distinctly lower life expectancies than they had enjoyed in 1990 — all this in peacetime and in the absence of any obvious political catastrophe. Other, arguably more politically consequential, mortality setbacks have also struck the Eurasian stage — and still more are poised to unfold.

The most conspicuous — indeed, startling — health and mortality setback in contemporary Eurasia is, of course, the one currently underway in the Russian Federation. Modern Russia has given the lie to the ameliorative presumption that literate, industrialized societies cannot suffer long-term health declines during times of peace. According to Moscow's official calculations, the country's life expectancy was lower in 2001 than it had been in 1961-62, four decades earlier. For Russia's men, life expectancy had dropped by almost five years over that interim — but female life expectancy was also slightly down over that period. This anomalous circumstance could not be entirely attributed to the deformities of communist rule, for both male and female life expectancy were lower in 2001 than in 1991, the last year of Soviet power.

FIGURE 3
Russia: Rise in Mortality, 1970-71 to 2001



Sources: The Demographic Yearbook of Russia: 2002 Statistical Handbook (Moscow: State Committee of the Russian Federation on Statistics [Goskomstat of Russia], 2002), Table 2.6.
Russian Statistical Yearbook (Moscow: State Committee of the Russian Federation on Statistics [Goskomstat of Russia], 1997), Table 2.17.

In absolute arithmetic terms, this Russian mortality crisis qualifies as a catastrophe of historic proportions. Over the extended period between 1965 and 2001, age-standardized mortality for Russia's men rose by over 40 percent. Perhaps even more surprising, it also increased for Russia's women by over 15 percent. Against the hardly exemplary health patterns of Gorbachev-era Soviet socialism, Russia has suffered a surfeit of "excess male mortality" since 1991 on the order of 3.5 million deaths — the equivalent, for Russia, of twice the deaths suffered in World War i. (Add "excess female mortality" and the post-1991 death toll rises by almost another million.)
Russia's mortality crisis is concentrated on the population traditionally construed as "of working age." For Russian men in every age grouping within the 20–64 spectrum, age-specific death rates in 2001 were at least 40 percent higher than they had been three decades before. In some cases (viz., men 45–54), they were over 60 percent higher. As for women between the ages of 20 and 59, their death rates were at least 30 percent higher in 2001 than in 1970-71. Russia's cause-of-death statistics are far from perfect, but if overall

reports can be trusted, the proximate explanations for these dismal trends were an explosion of deaths from cardiovascular disease (cvd) and injuries.

Reversing Russia's long-term deterioration in public health will be a more difficult task than might at first be supposed. Throughout low-income Asia after World War ii, significant health advances were achieved through new, inexpensive, and relatively easy interventions to control infectious disease (e.g., sulfa drugs, ddt). Russia's burden of illness today, however, is not primarily communicable and infectious, but instead overwhelmingly chronic and/or behavioral — the sorts of problems that are seldom susceptible to quick, cheap medical fixes. Moreover, death from such chronic illnesses as cvd tends to be due to an accumulation of offenses against the physiological system over the course of decades — and, to judge by mortality statistics, today's Russian adults have been more assiduous than their parents in accumulating those offenses. Indeed, in 2001 Russian men in their late 20s had higher death rates than did men in their early 30s three decades earlier; men in their late 30s suffered nearly the same mortality rates as men in their late 40s from that earlier generation; and so on. At any given age, in other words, today's Russians are more likely to succumb to fatal risk than their parents.

For broad segments of the current Russian population, simply returning to the health patterns of the early 1970s would be a formidable public health challenge. If Russian men in their early 40s were to reattain, by their late 40s, the same survival chances their fathers faced at that age, they would have to improve on the mortality rates of today's 45–49 year olds by over 40 percent — and they would have to reduce their own future mortality rates to just five-sixths the level they currently experience. From today's vantage point, that is a pretty imposing task. Success in that quest, moreover, should be evaluated in context: Male life expectancy in the Russian Federation in the early 1970s, after all, was just over 63 years — about the same as in India today.

According to unpd estimates, male life expectancy is lower today for the Russian Federation than for the world's less developed regions. The unpd envisions that Russian male life expectancy will catch up with the less developed world's levels by 2020-2025 — but for reasons just reviewed, such projections may prove too optimistic. It is hard to see how Russia can hope to develop a First World economy on the backs of a work force with a Third World health profile, and a Third World health profile is almost certainly Russia's lot for the foreseeable demographic future. Consequently, it may not be too much to suggest that unfavorable mortality trends constitute a tangible factor that will constantly impede Russia's recovery of economic potential, and restoration of influence on the world stage, in the decades just ahead.

Furthermore, Russia's health future may look rather worse than we have so far suggested, for our analysis has as yet taken no measure of the possible impact of hiv/aids. hiv/aids has already made major inroads in Russia and could turn out to be a major cause of death nationwide in the years to come. Reliable estimates of hiv prevalence in Russia today are lacking — but in October 2002 a study by the U.S. National Intelligence Council (nic) suggested that as many as 1 million to 2 million Russians might be hiv-positive, and in May 2003, Dr. Vadim Pokrovsky, head of the Russian Federal aids Center, indicated that Russia's hiv population might be as large as 1.5 million. By such figures, as many as 2 to 3 percent of Russian adults aged 15–49 could already be infected with hiv. Our limited understanding of hiv/aids means that we have no terribly accurate methods for predicting the future trajectories of the pandemic — but for what it is worth, the nic study suggested that adult hiv prevalence

might reach 6 to 11 percent by the year 2010. Even presuming a less virulent spread of hiv through Russia, however, the impact of aids would be utterly devastating. A demographic-epidemiological modeling exercise for hiv in Russia undertaken by the author indicated that even with an epidemic stabilized by 2025 at 2 percent adult prevalence — a level possibly lower than Russia's actual existing burden of hiv infection — life expectancy progress in Russia might be cancelled for the next decade. If hiv prevalence ends up closer to 6 percent, Russia's life expectancy in 2025 would be a decade lower than otherwise anticipated — meaning it would be distinctly lower than today — lower even than at the time of Stalin's death. And a 10 percent hiv prevalence rate would knock 16 years off Russia's prospective 2025 life expectancy, pushing it into essentially sub-Saharan coordinates.

Russia, of course, is not the only Eurasian country with a gathering hiv problem. India and China are two others. The aforementioned nic study ventures to place China's and India's current hiv-positive populations at 1-2 million and 5-8 million, respectively — and suggests hiv populations in 2010 of 10-15 million for China and 20-25 million for India. Despite the horrific absolute totals, these figures imply lower levels of adult hiv prevalence than in Russia (1.3-2 percent in China, 3-4 percent in India.)12 But even these more moderated hiv trajectories would have terrible consequences for national health. With 1.5 percent adult hiv prevalence in 2025, projected life expectancy would be depressed by about four years for both China and India; with 3.5 percent prevalence in China and 5 percent prevalence in India, life expectancy progress over the coming generation could be cancelled altogether.

Given the fairly tight correspondence between life expectancy and economic productivity across countries or within countries over time, it is reasonable to surmise that major health setbacks imposed by hiv/aids would have economic repercussions for the Asian and Eurasian countries affected. The notion of a major economic impact from hiv seems all the more plausible when one considers that 1) hiv/aids is a lingering and debilitating disease; 2) it tends to hit individuals in the prime of their economically productive lives; 3) widespread hiv prevalence could alter individual calculations about investment in training and higher education; and 4) it could equally affect international business confidence in severely impacted areas. Thus, although we cannot yet foresee the course that hiv/aids may run in Asia/Eurasia, it is not premature to suggest that it could turn out to be a wild card, impairing the strategic options in coming decades of one or more major actors on the Asian/Eurasian scene.

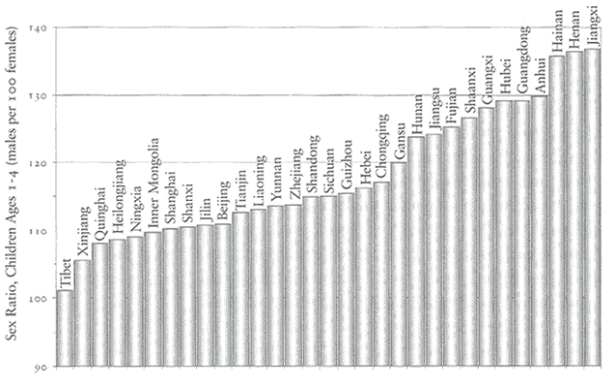
Sex ratio imbalances

For ordinary human populations, irrespective of era or locale, there is a pronounced and unyielding biological regularity to the balance at birth between males and females: Slightly — but only slightly — more boys than girls can be expected at delivery. Broadly speaking, this observed sex ratio at birth has tended to fall in the range of 103 to 105 baby boys for every 100 baby girls. This stable, seemingly fixed relationship was among the first facets of human population structure that the earliest students of demography noticed and speculated about.

In contemporary Asia, however, this age-old balance is coming undone. In large parts of the expanse, the sex ratio at birth has risen to unnatural and historically unprecedented levels over the past two decades — and in many spots this tendency appears to be continuing unabated, or even to be intensifying further. The growing surfeit, in various Asian locales, of "excess boys" today may have far-reaching implications for social life — and possibly even political affairs — tomorrow.

The most dramatic departure from historic biological norms seems to have occurred in the People's Republic of China. In China's 1953 and 1964 censuses, unexceptional infant sex ratios (104 to 105 for babies under 1 year of age) were reported. In the 1982 census, however, a sex ratio of almost 108 was recorded — and subsequently it became clear that this apparent anomaly was not a temporary aberration. In the subsequent national population counts, China's reported sex ratio at birth rose inexorably — to almost 112 in 1990, then nearly 116 in 1995, and most recently to just under 118 in the November 2000 census.

FIGURE 4
China: Sex Ratio Among Children Ages 1-4 by Province, 2000



Source: Tabulation on the 2000 Population Census of the People's Republic of China, Vols. 1 and III, Population Census Office, State Council and Department of Population, Science and Technology Statistics, National Bureau of Statistics of China (Hong Kong: China Statistics Press, 2001), Table 1.7.

There are, to be sure, reasons to question the accuracy of these numbers: Reported birth totals in the 2000 Chinese census, for example, are implausibly low, leaving open the possibility that baby girls are disproportionately undercounted, while Chinese hospital data record a less extreme (albeit still unnatural) trend in sex ratios at birth for the charges on their premises.13 But the result itself cannot be dismissed as a statistical artifact. For one thing, there is a striking consistency between the results of successive population counts. The same imbalance that is reported in the 1990 census between baby boys and girls shows up for 5-year-olds in the 1995 census, 10-year-olds in the 2000 census, and so on. For another, the reported imbalance for the sex ratio of young children is even higher than that reported for infants. Indeed, in China's 2000 population count, the recorded sex ratio for children aged 1–4 was over 120. Only two provinces in the entire country — the non-Han regions of Tibet and Xinjiang — reported sex ratios within the biologically normal human range. At the other end, three provinces (Hubei, Guangdong, and Anhui) tabulated child sex ratios of almost 130 — while three others (Hainan, Hunan, and Jiangxi) returned with ratios of over 130.

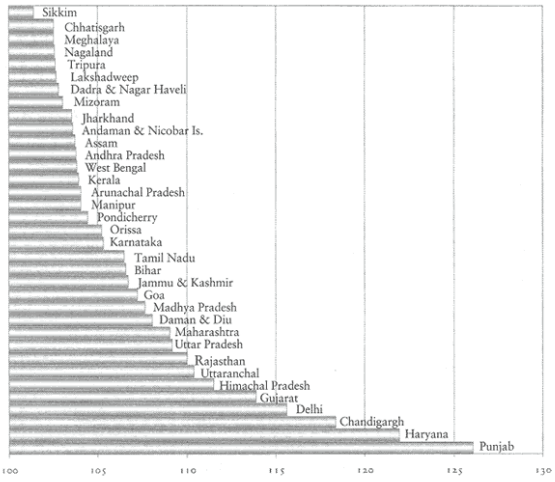
What accounts for China's extraordinary new patterns in sex ratio at birth and in infancy? Closer examination suggests the outcome can be explained as a consequence of three colliding forces: 1) strong and enduring cultural preference for sons; 2) low or sub-replacement fertility; and 3) the advent of widespread technology for prenatal sex determination and gender-based abortion. To judge by the data on sex ratio by birth parity, Chinese parents today are typically willing to let nature take its course in the sex of their firstborn child but have become increasingly disposed to intervene themselves to assure that a second or third child is a boy. Indeed, according to the 2000 China census, over two-thirds of all "higher order" infants born in the previous year were male.

China's tilt toward biologically impossible sex ratios at birth seems to have coincided with the inauguration of its coercive antenatal "one child policy," which was unveiled in 1979. Is Beijing's population control program responsible for these amazing distortions? A tentative answer would be yes — but not entirely. In other Chinese or Confucian-heritage populations where oppressive population control strictures were not in force — Hong Kong, Taiwan, Singapore, South Korea — unnatural sex ratios at birth also emerged in

the 1980s and 1990s. In these other spots, the confluence of son preference, low fertility, and sex-selective abortion likewise have distorted the sex ratio at birth — although nowhere so much as in China today. In most of those other locales, moreover, recent data suggest that sex ratios at birth are lower than they were in the early 1990s (Taiwan, South Korea) or even the 1980s (Singapore), while China's rise shows no signs of reversing.

"Missing girls," to be sure, is not an entirely new feature of the Chinese population profile. Quite to the contrary, available demographic data strongly suggest that China suffered a surfeit of "excess men" in more traditional, pre-communist times.14 That earlier pattern, however, spoke to unfavorable survival prospects for infants, girls, and women, not to gender imbalances at birth. Traditional China, moreover, was characterized by relatively high levels of fertility and over many long stretches experienced sustained population growth. In that dynamic, ever-larger numbers of women were rising through the nation's population pyramid. The situation promises to be very different in the coming decades. Thanks to China's tilt below replacement fertility in the early 1990s, from about 2010 onward each cohort of women in their early 20s will be smaller than the one before. Between 2010 and 2025, this cohort will in fact shrink appreciably — by almost one-fourth, according to unpd projections. (Not much guesswork is involved here, incidentally. Nearly all of the women in question have already been born.)

FIGURE 5
India: Sex Ratio Among Children Under Age 7 by State, 2001



Source: Census of India, 2001. Accessed October 15, 2002, available electronically at http://www.censusindia.net/results/provindia2.html.

The prospect of steadily diminishing absolute numbers of women of marriageable age, in conjunction with a steadily increasing surfeit of young men in each new class of prospective bachelors, sets the stage for an historically unprecedented "marriage squeeze" in China in the decades immediately ahead. Simple, back-of-the-envelope arithmetic suggests that some very large proportion of tomorrow's young Chinese men — certainly over 10 percent, perhaps 15 percent or more — may find themselves essentially "unmarriageable" on the mainland in the coming decades.

In other places and at other times, significant proportions of the male population completed their lives without ever marrying. In Western Europe in the pre-industrial and early industrial periods, for example, it was not uncommon for 15 or 20 percent of a male cohort to remain unmarried.15 But that Western European pattern was built on a complex and delicate foundation: a mesh of ethical precepts and social arrangements that supported and ratified the institution of honorable bachelorhood.
No similar cultural foundations can be said to exist today in China, where until now the expectation of universal male marriage has prevailed and where Confucian tradition

stresses the son's obligation to marry and honor one's ancestors by continuing the family line. A shift to the embrace of honorable bachelorhood would mark a radical departure for Chinese society — and important new cultural traditions, in China or elsewhere, are seldom successfully established on short notice. The world has never before seen the likes of the bride shortage that will be unfolding in China in the decades ahead, so it is difficult to imagine its many reverberations. Some commentators have warned that this "surplus of males" will make for a "deficit of peace," pushing China toward a more martial international posture.16 That assessment may rather overstate the actual case for demographically induced risks of international conflict in Asia (just as slightly earlier literature's predictions of a pacifistic, casualty-averse turn in the disposition of graying, low-fertility Europe did not anticipate or account for the savage international policy of aging, sub-replacement Serbia in the 1990s).17

It does not seem wild, however, to propose that the emergence and rise of the phenomenon of the "unmarriageable male" may occasion an increase of social tensions in China — and perhaps social turbulence as well. Exactly how China's future cohorts of young men are to be socialized with no prospect of settled family life and no tradition of honorable bachelorhood is a question that can be asked today, but not answered. (Questions may equally be raised, without any good answers, about the bearing of China's rising and not necessarily celibate bachelor class on the risks of hiv transmission in the decades ahead.) And it is hard to see how Beijing will be able to mitigate China's escalating "bride deficit" through any deliberate policy actions for at least a generation (unless of course Beijing stumbles upon a method of manufacturing full-grown Chinese women on demand).

China will be the first great power in Asia to suffer from a twenty-first century "bride shortage," but it may not be the last. Unsettling trends of a similar nature are already evident in India.18 Son preference in India remains extremely strong; according to national survey results, women venturing a preference for their next birth voted for boys over girls by a ratio of four to one. With declining fertility and the spread of ultrasound, India's sex ratio is already on the rise. In the 2001 census, India counted almost 108 boys under age 6 for every 100 girls. In Uttar Pradesh, India's most populous state, that ratio was over 110; in Delhi, it was over 115; and in Punjab it was reportedly 126.19

It would be cheering to think that the gender imbalances emerging in Asia's major population centers were a vestige of backward ideas and will consequently pass away with increasing modernization. The facts to date, unfortunately, do not support such an interpretation. In both India and China over the past two decades, the nationwide sex ratio at birth has increased along with per capita income, female literacy rates, and urbanization. In China today, the more literate provinces tend in fact to have somewhat higher, not lower, sex ratios at birth; and in India it is urban, not rural, areas in which the disproportion between boys and girls is greatest. For the time being, we must live with the disturbing possibility that continuing "development" and "globalization" will heighten rather than reduce nascent gender imbalances in these two enormous countries — and the knowledge that these particular expressions of "Asian values" will have unpredictable but perhaps not inconsequential repercussions on society and politics in these ostensibly rising powers for decades to come.

Across the Pacific

If some countries in our conspectus appear to face especially disadvantageous demographic constraints, others enjoy relative strategic advantages from their own population

circumstances. Interestingly enough, the Asian Pacific power with the most strategically favorable profile may be one that we have not yet discussed: the United States.

By the unpd's medium variant projections, the United States is envisioned to grow from 285 million in 2000 to 358 million in 2025. In absolute terms, this would be by far the greatest increase projected for any industrialized society; in relative terms, this projected 26 percent increment would almost exactly match the proportional growth of the Asia/Eurasia region as a whole. Under these trajectories, the United States would remain the world's third most populous country in 2025, and by the early 2020s, the U.S. population growth rate — a projected 0.7 percent per year — would in this scenario actually be higher than that of Indonesia, Thailand, or virtually any country in East Asia, China included.

In these projections, U.S. population growth accrues from two by no means implausible assumptions: 1) continued receptivity to newcomers and immigrants and 2) continuing "exceptionalism" in U.S. fertility patterns. (The United States today reports about 2.0 births per woman, as against about 1.5 in Western Europe, roughly 1.4 in Eastern Europe, and about 1.3 in Japan.) Given its sources, such population growth would tend, quite literally, to have a rejuvenating effect on the U.S. population profile — that is to say, it would slow down the process of population aging. Between 2000 and 2025, in these unpd projections, median age in the United States would rise by just two years (from 35.6 to 37.6). By 2025, the U.S. population would be more youthful, and aging more slowly, than that of China or any of today's "tigers." (Furthermore, to state the obvious, neither a resurgence of hiv/aids nor an eruption of imbalanced sex ratios at birth look to be part of the U.S. prospect over the decades immediately ahead.)

One may of course debate the magnitude of the impact of such relative demographic advantages. For the time being, however, it would appear that demographic trends may, in some limited but tangible measure, contribute to the calculus of American strategic preeminence — in the Asia Pacific region, and indeed around the world.

Nicholas Eberstadt adapted this article from a study in Strategic Asia, 2003–2004 (National Bureau of Asian Research).

Notes

1 See United Nations Population Division, World Population Prospects: The 2002 Revision Population Database, from which most of the data used in this essay are taken.
2 Christophe Z. Guilmoto and S. Irudaya Rajan, "District Level Estimates of Fertility for India's 2001 Census," Economic and Political Weekly (February 16, 2002).
3 Iran's latest Demographic and Health Survey placed the country's TFR at 2.17 in 2000. (Mohammad Jalal Abbasi-Shavazi, "Recent Changes and the Future of Fertility in Iran," paper prepared for UNPD Expert Group Meeting on Completing the Fertility Transition, New York, March 11-14, 2002.) Vietnam's 2002 Demographic and Health Survey indicated that the country's TFR had dropped to 1.9. ("Vietnam Demographic and Health Survey 2002," Hanoi: National Committee for Population, Family, and Children, September 2003.)
4 The "old" literature on the social, economic, and political consequences of rapid population growth in low-income areas often betrayed a hardened Malthusian cast of mind. To cite one such study to exemplify the many: National Academy of Sciences, Office of the Foreign Secretary, Rapid Population Growth: Consequences and Policy Implications (Johns Hopkins University Press, 1971).
In retrospect, it is apparent that such thinking was highly alert to the possible stresses and

problems presented by the demographic boom but exceedingly inattentive to the potential benefits and opportunities it might confer (not the least of these emanating from the health revolution that prompted these population explosions in the first place).

A new literature on the economic implications of population change in Asia is now beginning to emerge, one characterized by a more optimistic assessment of the influence of the region's demographic trends on prospects for material development. To exemplify the many with a single study once again: David Bloom, David Canning, and Jaypee Sevilla, The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change (RAND, 2002). Unfortunately, it is not yet clear that this new tendency, though different in flavor, is free of the stifling idées fixes so characteristic of the literature it means to replace.

Newly fashionable arguments about the glowing possibilities of "demographic dividends" apparent in East Asian — or future South and Southeast Asian — trends in domestic "dependency ratios" (the proportion of older and younger citizens in relation to persons "of working age") would seem, on their very face, to exaggerate the contribution of crude demographic structure to actual economic performance. The new "dividendism," for example, proposes to credit much or even most of East Asia's dazzling growth record over the past several decades to its purportedly felicitous "dependency ratios" during the years in question — but neglects to explain why economic performance over that same period should have been so very disappointing for the countries of the Caribbean, even though the two areas exhibited quite similar levels and trends in the evolution of their "dependency ratios" from the mid-1960s to the present.

5 In 1975, of course, the Russian republic was embedded in the larger construct of the Soviet Union. Correspondingly, comparing population totals for Russia and Pakistan for that particular year is an exercise fraught with implicitly ahistorical assumptions. Nevertheless, these projections suggest that Russia's population total, which slightly exceeded Pakistan's as recently as 2000, will come to be only half as great as Pakistan's in just a quarter-century.

6 These projections are taken from the U.S. Census Bureau's International Database. The UNPD does not recognize the sovereignty of the Republic of China and does not offer estimates or projections for it.

7 Deborah Roseveare, Willi Liebfritz, Douglas Fore, and Eckhard Wurzel, "Ageing Populations, Pension Systems and Government Budgets: Simulations for 20 OECD Countries," OECD Economics Working Papers No. 168 (1996).

8 OECD, OECD Country Survey: Japan 2002, Supplement 2 (Paris: oecd, 2002), 42, 52. Japan now has the highest ratio of public debt to GDP of any OECD country.

9 See, for example, Robert Stowe England, The Macroeconomic Impact of Global Aging: A New Era of Economic Frailty? (Center for Strategic and International Studies, 2002); and Paul S. Hewitt, "The Grey Roots of Japan's Crisis," in The Demographic Dilemma: Japan's Aging Society, (Smithsonian Institution, Woodrow Wilson Center, Asia Special Report 107, January 2003), 4-9.

10 According to estimates by the U.S. Census Bureau's International Programs Center, in fact, this limited social security network has managed to generate unfunded liabilities with a net present value equal to 125 percent to 150 percent of China's current GDP! (Personal communication, Dr. Loraine A. West, U.S. Census Bureau, May 2003.)

11 Results taken from the reves database, available at http://euroreves.ined.fr/reves.

12 By accepted convention, HIV prevalence refers to the prevalence rate among the adult population 15–49 years of age — an arbitrary but not entirely unreasonable metric.

13 This latter point comes from Daniel M. Goodkind, "Recent Trends in the Sex Ratio at Birth in East Asia," U.S. Census Bureau

International Programs Center, unpublished paper (June 2002).
14 Ansley J. Coale and Judith Banister, "Five Decades of Missing Females in China," Demography (July 1994).
15 The classic exposition here is J. Hajnal, "European Marriage Patterns in Perspective," in D.V. Glass and D.E.C. Eversley, eds., Population in History (Aldine Publishing Company, 1965).
16 Valerie Hudson and Andrea Den Boer, "A Surplus of Men, A Deficit of Peace: Security and Sex Ratios in Asia's Largest States," International Security (Spring 2002).
17 Edward N. Luttwak, "Where Are the Great Powers? Home With the Kids," Foreign Affairs (July-August 1994).
18 See Fred Arnold, Sunita Kishor, and T.K. Roy, "Sex-Selective Abortions in India," Population and Development Review (December 2002).
19 Part of these local, biologically impossible disparities could perhaps be attributed to differential migration or mortality patterns, but the numerical imbalance between boys and girls is too substantial to be explained away altogether.