



The Power of Demography and the Fate of East Asia

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Introduction

“Compound interest is the eighth wonder of the world....He who doesn’t [understand]...pays...”²

The famous aphorism is attributed to the great physicist Albert Einstein: but students of demography will resonate to it as well. On the human canvas, geometric change, if sustained, has the power to reconfigure national populations and geopolitical balances—radically. This holds true for both the exponential growth of populations, and for exponential decline. The power of compound interest in demography goes into action quietly at first, as if on tiptoes—but over a generation or two, it can change the face of the world—altering the realm of the possible for affected states unforgivingly.

In this paper we examine just one of the many cases of the exponential power of demography at work on the global stage today. This is the manner in which the fate of East Asia stands to be recast in the coming decades by *negative* compound interest—that is, by sustained depopulation. International prospects for the region promise to shift all the more rapidly because negative population growth in East Asia will juxtapose with continuing positive population growth in the USA—the most important state with which the countries of East Asia must contend.

In an era of remarkable improvements in human potential, to be sure, the power of demography in world affairs lies not in human numbers alone. In a world where per capita productivity can differ by as much as a factor of 100 between countries (for example Singapore vs. Burundi or Switzerland vs. Central African Republic),³ political demography must move “beyond the headcount approach” to apprise the full role of human resources in power politics. But the brute role of sheer numbers still matters, too—and as we shall see, the aging and shrinking of East Asia, in conjunction with continuing demographic rise of America, has major economic and political implications over the coming generation: most immediately for the countries in question, but arguably also for the world as a whole.

² <https://www.goodreads.com/quotes/76863-compound-interest-is-the-eighth-wonder-of-the-world-he>

³ Cf. <https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2023>

East Asia and Its Populations: Definitions and Data

In this note we will be mainly relying of demographic estimates and projections from the UN Population Division (UNPD), drawing on its most recent 2024 revisions of its World Population Prospects series.

We will also use the UNPD's geographic taxonomy as the basis for our discussion of the "East Asia" region (my formulation, not UNPD's) and its component states and territories.

According to UNPD, "Eastern Asia" is comprised (in order of current estimated total population) of:

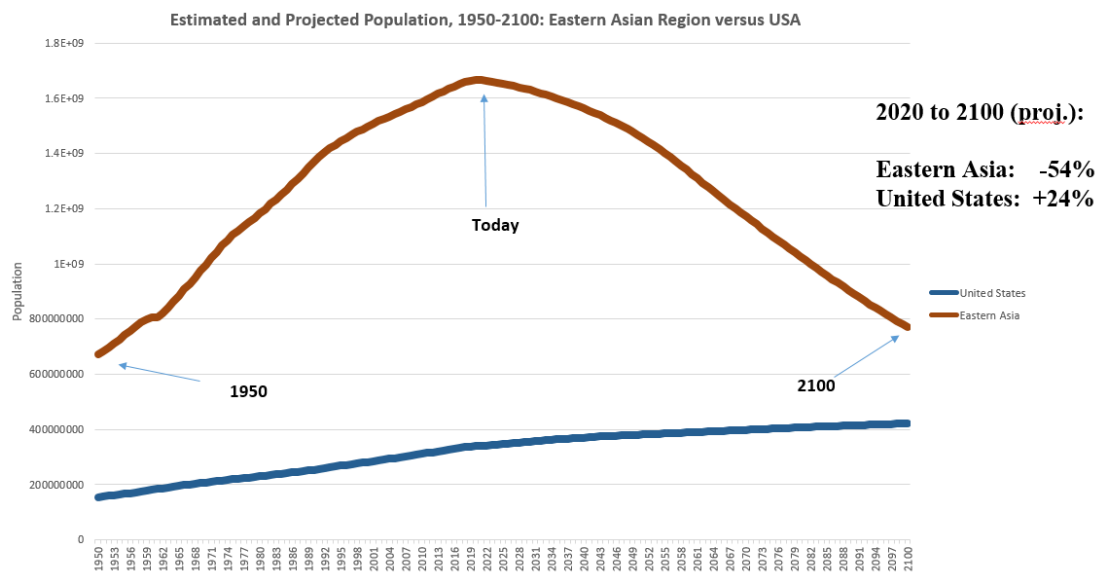
- the People's Republic of China (China);
- Japan;
- the Republic of Korea (South Korea);
- the Democratic People's Republic of Korea (North Korea);
- the Republic of China (Taiwan); and
- Mongolia.

We omit tiny Mongolia from the following discussion because its total population accounts for less than two-tenths of a percent of the regional total. So too North Korea, whose population information is so very unreliable, at least for now.

UNPD does not include the Russian Far East in "Eastern Asia"—instead it defines all of the Russian Federation to be part of "Europe." But since Russia is a Great Power, with considerable interests, presence, and "reach" in the East Asia region, common sense suggests we should include this "European" country in our examination as well, at least as far as warranted.

East Asia at a Demographic Inflection Point

Figure 1: The Shape of Things To Come



Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

East Asia is at a demographic inflection point, as may be seen in Figure 1.

Over the postwar era, East Asia's population has surged. By 2020, the region (as UNPD defines it) had almost two and a half times as many inhabitants as in 1950, from under 700 million to almost 1.7 billion. That was not only a much greater absolute population increase than the USA experienced over those same decades, but a markedly larger relative increase as well.

But East Asia's total population has just peaked. Now it is set on a course for decline: a decline extending as far as the demographer's eye can see—and likely gaining speed with each with each coming decade for at least a generation, perhaps longer.

In America, by contrast, population increase is still the order of the day, and demographic projections suggest that the US population will continue growing for decades, if not generations.

We are thus entering a new demographic period, very different from our own lived experience, at least to date. In years and decades ahead, the absolute demographic balance between East Asia and the United States promises to be tilting toward America's favor—and to be tilting in America's direction at a steadily quickening tempo. This coming relative demographic decline, in relation to the USA, obtains not only for the East Asian region as a whole, but for all East Asia's countries too: China; Japan; South Korea; Taiwan. And the same pattern also holds for

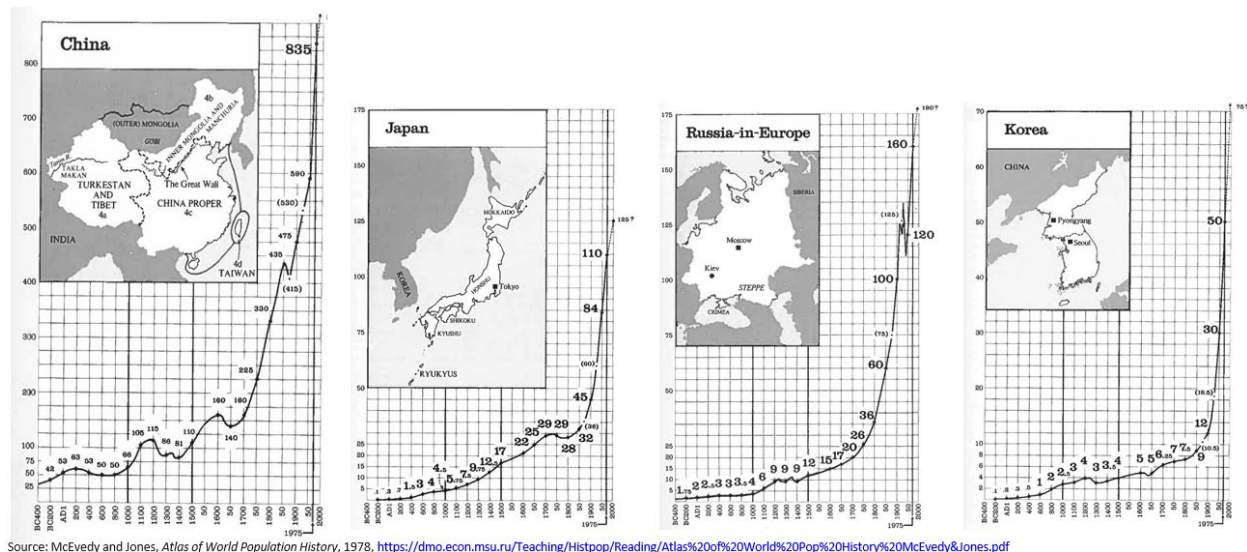
Russia and America: the former faces a long-term population decline, and an increasingly disadvantageous demographic imbalance vis-à-vis the USA—different in particulars from the East Asian trends, but perhaps not in overall import.

East Asian Depopulation: An All Too Familiar Historical Problem

The impending long-term decline in human numbers is not East Asia's first depopulation.

As Figure 2 underscores, historical records suggest that depopulations have befallen the region and all its countries—repeatedly.

Figure 2: Not Their First Time At This Rodeo



In China—the East Asian historical population perhaps most studied and best quantified—at least four long-term depopulations appear to have taken place over the past two millennia; some of these bouts of depopulation lasted for centuries. Modern estimates, for example, suggest that simply recovering to the population level it had achieved around 1200 may have taken China over 300 years.

Japan and the Korean Peninsula likewise endured long-term depopulations—maybe multiple ones—before they entered into modernization. The same is true for “European” Russia—arguably the relevant historical comparator here (insofar as Moscow did not consolidate its control of the

Russian Far East until the late 18th Century, and that vast expanse has always been extremely sparsely populated).

East Asian Depopulation: This Time Is Different

But while East Asian countries have experienced depopulation many times before, the coming depopulation is different from all that preceded it in two crucial respects.

First: the depopulation now underway is systemic, not episodic.

It encompasses all of East Asia, not just parts of it. And it is part of a greater global process of prospective long-term depopulations, in which one region after another is now expected to enter into long term population decline. East Asian depopulation, in other words, is not an aberration—but rather a herald of things to come elsewhere a little later in the 21st Century. In this sense, East Asia is the world's demographic vanguard.

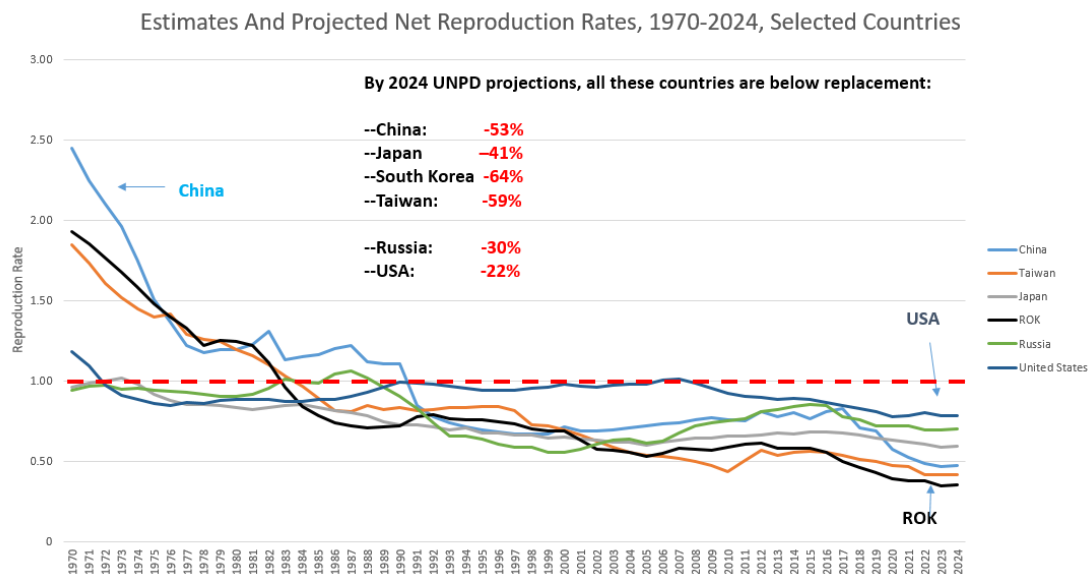
Second, East Asia's coming depopulation is intrinsically, characteristically, different from any that preceded it.

In the past, in East Asia and everywhere else, prolonged depopulations were always a consequence of grievous catastrophe: of calamities so dreadful that they drove human numbers down through unnatural mortality crises. Depopulations were spawned by the Four Horsemen of the Apocalypse. War, famine, pestilence, upheaval and the breakdown of basic order were the terrible agents of all previous depopulations. Depopulation attested to rampant social misery and as such was always an unwanted occurrence.

East Asia's present depopulation, by contrast, is taking place under conditions of orderly progress, steady general improvements in health conditions, and (by any historical measure) widespread prosperity. This time, depopulation is voluntary in nature. The current depopulation is being caused by steep and sustained declines in fertility rates. Childbearing throughout East Asia has fallen far below the level necessary for local population stability i.e., (in the absence of compensatory immigration). Prolonged sub-replacement fertility in East Asia and all of its countries is setting the stage for indefinite depopulation there.

Figure 3 illustrates the fertility trends behind East Asia's current population declines. Fertility fell below the replacement first in Japan back in the early 1970s, and then in Taiwan and South Korea in the 1980s, followed by China in the early 1990s.

Figure 3: This Time, Depopulation Is Voluntary



Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

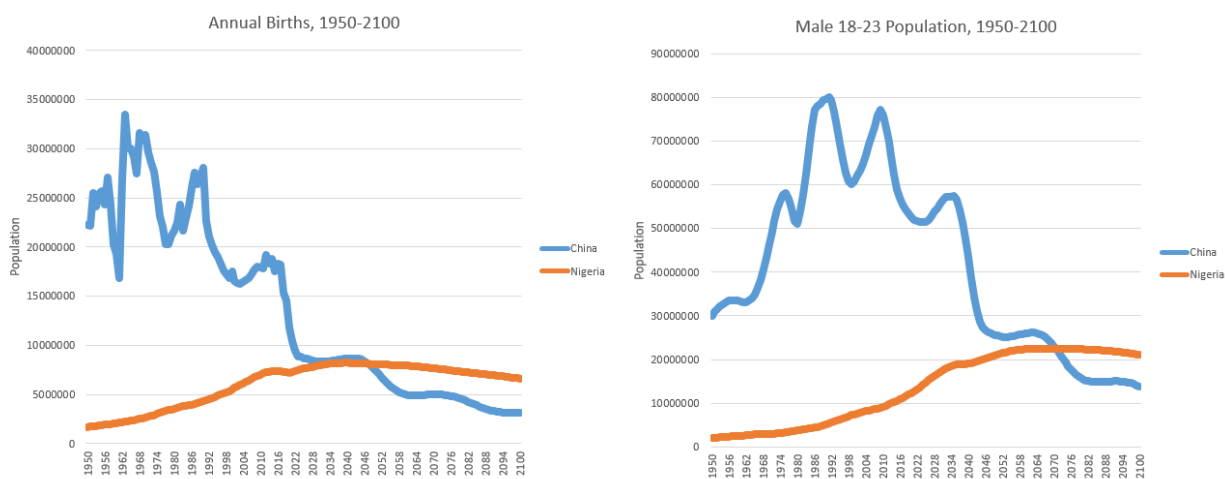
While Beijing's brutal One Child Policy occasioned monstrous human right violations, its actual demographic role in bringing China to sub-replacement fertility remains unclear. What is readily apparent, though, is that no other country in the region—or for that matter, the world—required coercive birth control programs to become a sub-replacement society. In a bitter irony, fertility levels have plunged steadily in China since 2016—the year after the PRC suspended its draconian population control policy.

By the year 2024 extreme sub-replacement fertility was the norm in East Asia. Japan was the most fertile country in the region, with childbearing levels “only” 41 percent below the replacement rate. Taiwan was an estimated 59 percent below replacement, and China and estimated 53 percent. If that tempo were to continue, each rising generation in China would be barely half as large as the one before it. As for South Korea, its anemic fertility level was estimated to be almost 65 percent below replacement as of 2024—the lowest ever reached by a national population in peacetime. Were that pace to continue for two generations, it would mean just 13 women of childbearing age for every 100 in the country today.

But the fact of the matter is that long-term fertility trends are fraught with uncertainty. Simply put, demography lacks any reliable method for predicting fertility far into the future, and is unlikely to develop one so long as birth trends are a matter of human agency and unpredictable human volition. Catering to inquiries from its national sponsors and to a curious public, the UNPD routinely offers population projections out to the year 2100. But such long range projections implicitly demand the UNPD to guess about how many grandchildren the currently unborn are going to have—a plainly impossible task.

Extrapolating out three or more generations can generate some startling charts, as we see in Figure 4, where UNPD envisions Nigeria overtaking China in total births by the middle of the 21st Century, and surpassing China in military age manpower (men 18-23 years of age) half a century hence.

Figure 4: Sorry, not the Chinese century after all...



Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

In this note we will not encourage credence in such ultra-long-term population projections. Instead, we will set the limits for our demographic horizon at the year 2050, just over a quarter century from now. The reason for 2050 is not just that it is a nice round number—which it does happen to be. As a practical matter, given the region's low levels of births, deaths, and migration, the overwhelming majority of people who are projected to live in East Asia in 2050 are already born and living there today.

In fact, given East Asia’s low annual pace of what we might call “demographic turnover”, just about three quarters of the region’s current inhabitants are projected to still be living there in the year 2050.⁴ Only a catastrophe of Biblical proportion would be capable of changing that result. This remarkable degree of “demographic continuity” allows us to discuss an inherently unforeseeable future with a little more confidence, at least as far as population matters are concerned.

Milestones and Dynamics in East Asia’s Depopulation

As a progressive modern depopulation unfolds, a society will pass a succession of “landmarks”. At a certain point, the population of working age (conventionally designated by demographers as the 15-64 years) hits an apogee and begins to shrink. At another point, deaths begin to surpass births and then regularly exceed them as the population in question becomes a “net mortality society”. And of course at some point overall population totals enter into steady decline, as formal “depopulation” sets in.

Usually depopulating societies enter into long-term population decline by passing those milestones in the sequence we have just indicated. But not always, as we see below in Table 1.

Table 1: Milestones For The New Depopulation

	Working Age Population (15-64) Peaks	Deaths Exceed Births	Depopulation Commences
<u>Country</u>	<u>Year</u>	<u>Year</u>	<u>Year</u>
Russia	2010	1992*	1992*
Japan	1995	2005	2010
China	2015	2021	2021
Taiwan	2013	2019	2020
ROK	2017	2019	2021
DPRK	???	???	???
Eastern Asia	2015	2021	2021
USA	N/A	N/A	N/A

Notes: * = Russian Birth rates very slightly exceeded deaths in the mid 2010s, and total population rose slightly but temporarily as well.
Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition,
<https://population.un.org/wpp/Download/Standard/MostUsed/>.

⁴ Somewhat higher for ROK and ROC, somewhat lower for Japan

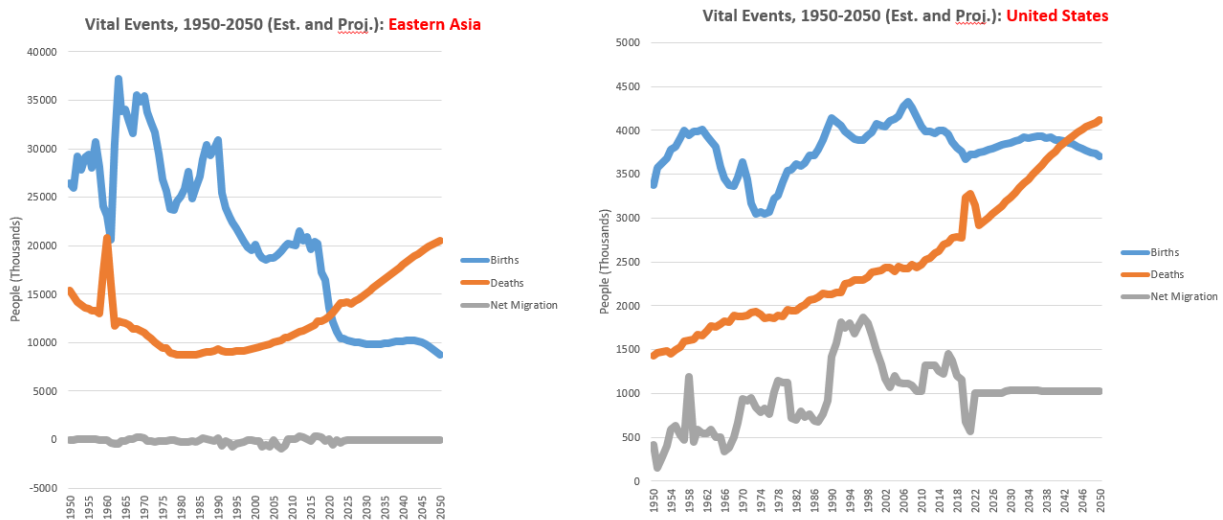
Japan's depopulation rites of passage began first; it has been shrinking for nearly a decade and a half and commemorating more funerals than births for almost two decades; working age manpower has been in steady decline for three decades. But the rest of East Asia caught up—all at once. China, Taiwan and South Korea all marked the peaking of their working age populations between 2013 and 2017. Between 2019 and 2021, they all became net mortality societies. They all entered into depopulation between 2020 and 2022 as well. By 2021 the entirety of East Asia was a net mortality zone, and that same year the region is thought to have entered into a general depopulation.

The timing of East Asia's tilt into full depopulation in 2021 may have been slightly affected by the COVID shock—but only slightly. Births declined in East Asia during the 2020-21 pandemic, but they have continued to decline after mass vaccinations with the breakthrough vaccines and the return to “normal”, such as it is. Japan, Taiwan and South Korea were largely spared from excess COVID mortality. China's seemingly capricious U-turn from ruthless lockdowns to insouciant full opening may have cost many lives, but that took place at the very end of 2022—and thus had little to do with the nation's first annual population drop since 1961 (a gruesome but temporary perturbation due to Mao's disastrous Great Leap Forward and the famine that ensued).

The Russian Federation, an East Asian presence albeit one unrecognized in UNPD categorizations, has also “ticked all the boxes” on its own idiosyncratic depopulation trajectory; although it has a war in Ukraine on its hands, the Russian Federation also had fallen into prolonged labor force decline, net mortality, and depopulation years before the Kremlin's 2022 decision to invade its neighbor.

Demographic trends in the USA stand in sharp structural contrast to those of East Asia and Russia. America is still enjoying growth its 15-64 cohort; more births than deaths (despite all America's notorious current health maladies); and overall population increase.

Figure 5: The Arithmetic Of Decline vs. The Arithmetic of Growth



Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

Figure 5 contraposes the arithmetic of population decline in East Asia with the arithmetic of population growth in the USA. (The scales are different, since East Asia is so much larger than America; the patterns and trends here are the heart of the matter.) The canvas covers the century 1950-2050: events that have already taken place, and projections for the coming quarter century.

For East Asia, depopulation today and tomorrow are explained by three facts. First: birth totals have plunged, despite a postwar population explosion—thanks to the new norm of extreme sub-replacement fertility. Second: deaths rise despite improvements in health: this paradox due to pronounced population aging. Third: international migration has almost no impact on overall population trends in East Asia—depopulation and population explosions in the region still remain basically a race between births and deaths.

American patterns are profoundly different. For one thing, there was no postwar birth collapse, at least in absolute numbers—and UNPD projections do not anticipate one over the coming generation. Second, death totals in America have been rising steadily over the postwar era, due to population aging and too all sluggish health progress.

But the crossover between deaths and births is not projected in the UNPD medium variant to take place until the early-2040s—two decades after East Asia’s. And while migration has basically had zero influence on East Asia’s overall population totals, in-migration has been a major component of US postwar population growth to this writing. There is no accurate way to forecast international

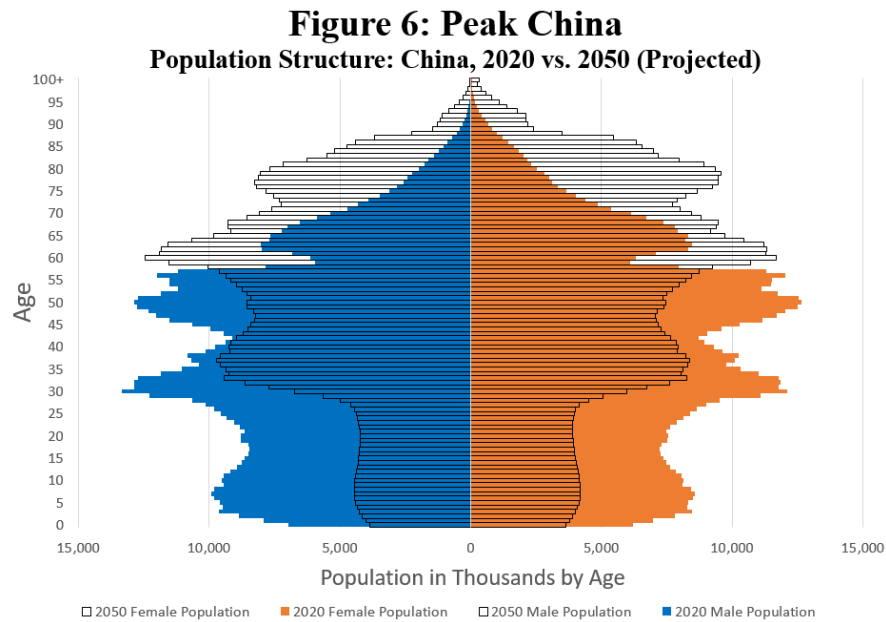
migration trends, for all the obvious reasons. If UNPD assumptions about the coming generation prove roughly accurate, however, America's population (and its labor force) will continue to grow for decades to come—even if the US becomes a net mortality society.

Demographic Projections to 2050: Ghosts Of Christmas Future

Given the relatively large share of East Asia's prospective year 2050 population already alive and living in those same countries today, we can speak about the demographic outlook for those places a generation hence with a surprising degree of confidence. These projections could be upended of course—but it would take truly cataclysmic events to do so, in which case all bets would be off in any case.

The most straightforward way to visualize the demographic future for the countries under consideration is to superimpose a “population pyramid” (as they use to be called) for the age-sex structure of each country for the year 2050 onto a corresponding recent one for the same country—say, for the year 2020.

Figures 6 through 10 offer these national comparisons for the reader. As may be seen, there are some general similarities to the coming depopulations anticipated over the coming generation—but distinctive differences also lie in store. And the contrast between the outlook for the USA and all of the depopulating countries is most striking.

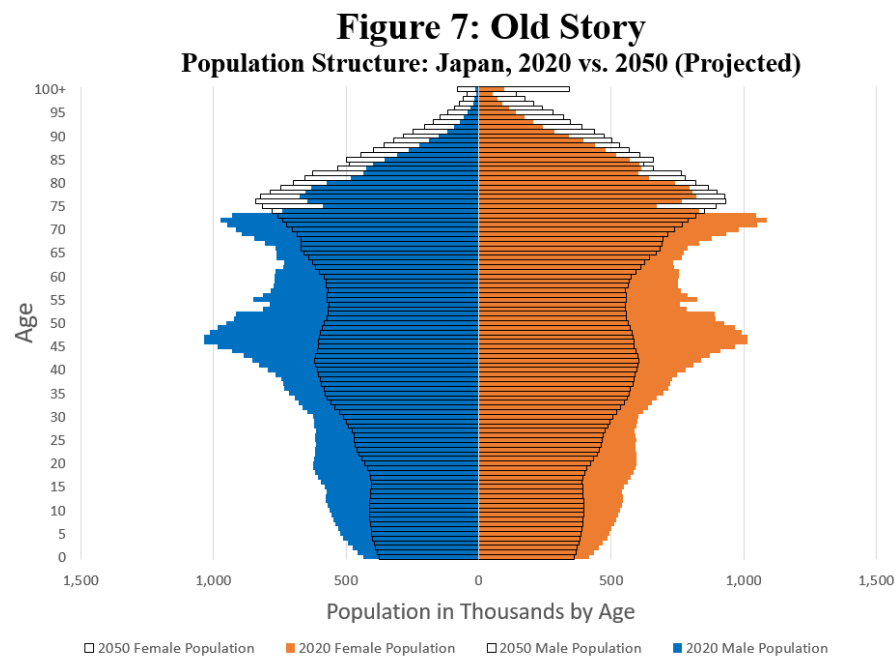


Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

Let's begin with China. This picture may be worth a thousand words, in that it conveys an immense amount of detail about the coming prospective demographic changes awaiting the PRC. In briefest summary: the China of 2050 will have many fewer people under 60 years of age than the China of today (i.e. 2020)—but it will also have a vastly larger population of senior citizens. China 2050 stands to have far more Septuagenarians, Octogenarians, and even Nonagenarians than today's China, even though total population (the area of the entire population structure visualized in Figure 6) will be smaller in 2050 than today.

Note that there is not much likelihood (immense disasters notwithstanding) of any appreciable changes in the population structure for the 25+ group in this future China—those men and women for China 2050 have already been born. That is already “baked into the cake”. If the eventual China 2050 population structure happens to differ from Figure 6, it will mainly be due to trends for the currently unborn. At the moment, the most likely divergent trajectory would look be *even lower* fertility the UNPD medium variant projected in 2024—in which case the China 2050 “population

pyramid would be even more “top heavy”, and overall depopulation over the coming generation would be even more dramatic.⁵



Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

While Figure 6 dramatizes a depopulation that is only just beginning, Figure 7—for Japan—shows us one that is already well underway. There would be fewer people in Japan 2050 than Japan 2020 for every age group under 70—yes, even the population of “younger” seniors in Japan is projected to be shrinking over the coming generation. And at the extremes of older age, for those in the 80s and 90s, this future Japan would only contain a few more elderly than it does today, since by 2050 Japan would have been subject to three full generations of continuous nonstop sub-replacement fertility (with almost no net immigration).

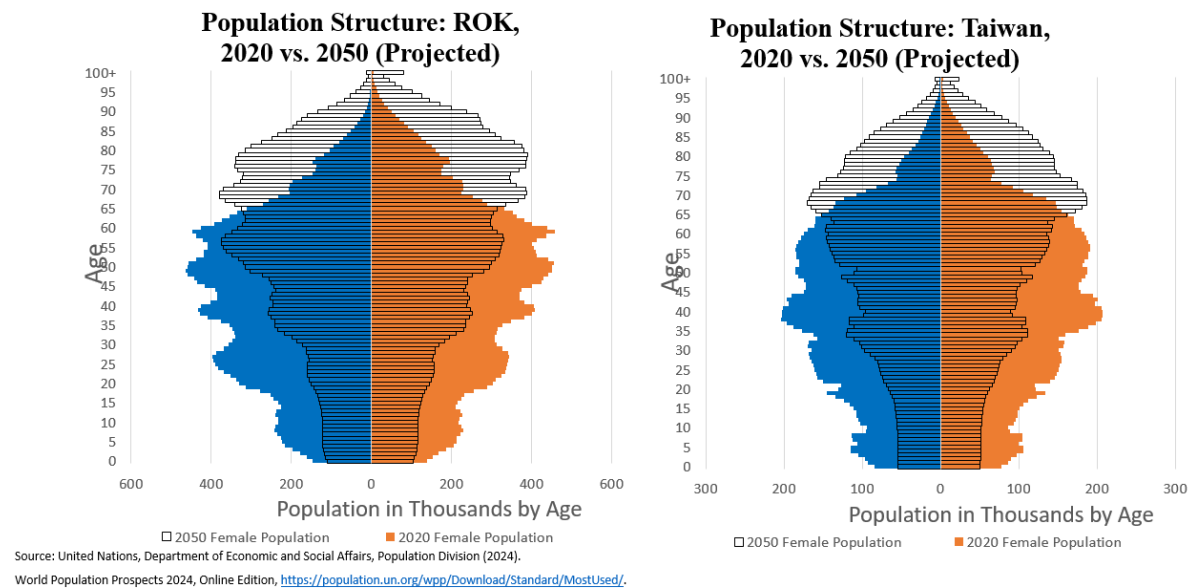
Figure 8 depicts the coming depopulations of Taiwan and South Korea in tandem—this because they stand to be so very similar. This is what a generation of ultra-low fertility can do to societies that are just now entering into depopulation, with high levels of life expectancy and negligible net immigration.

What these graphics highlight is the extraordinary shrinking and aging that await these two countries over the coming generation. These are countries that are going gray at breathtaking

⁵ Under UNDP ‘medium variant’ projections for 2050, for example, about 12% of China would be less than 18 years of age, while about 10% would be 80 or older. Under the ‘low variant’ projections, just 7% would be under 18, whereas over 11% would be 80+.

speed. It is in fact hard to comprehend fully just what these two countries will be like on the ground in the year 2050. Outside of contemporary retirement communities, there simply are no standing populations nowadays that are as aged as these entire nations promise to be a generation hence. By 2050, in these projections, Taiwan would have more people over 75 than under 25—and South Korea would have more 80 and older than under 20!

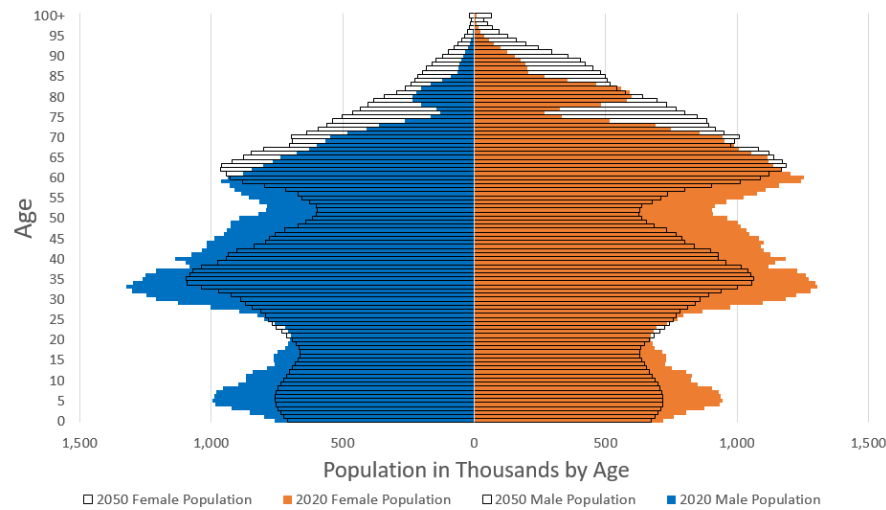
Figure 8: Diminished Expectations



Then there is Russia, depicted in Figure 9.

Figure 9: The Sick Man of Eurasia

Population Structure: Russia, 2020 vs. 2050 (Projected)



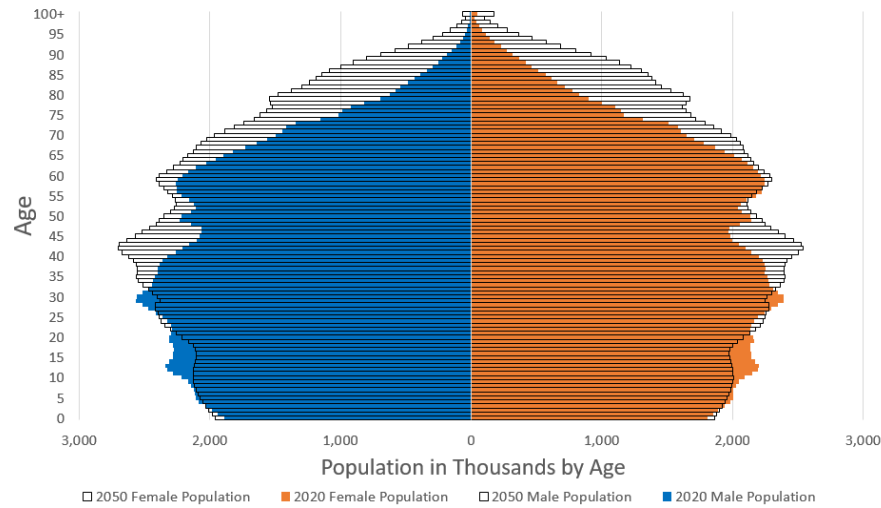
Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

Russia's prospective (ongoing) depopulation differs from those in the UNPD's East Asia in several respects. First, the magnitude of prospective depopulation is mitigated by the anticipated continuation of net in-migration, a factor that has cushioned the Russian Federation from greater population shrinkage in the decades since the shift to "net mortality" shortly after the collapse of the USSR. Second, Russia's "accordion-like" population structure, with more populous cohorts followed by smaller younger cohorts and then larger cohorts again, is an enduring legacy of two traumatic shocks—World War II and the Soviet collapse—which are still reverberating through Russia's demographic contours, and will likely continue to do so for generations. Third, Russia is set to experience a much more limited population aging than any of the "full" East Asian countries above. This is largely a consequence of Russia's dismal health profile, about which more later. Simply put: survival prospects for seniors is not all that good in Russia.

Finally, consider demographic prospects for the United States of America, visualized in Figure 10.

Figure 10: American Exceptionalism

Population Structure: United States, 2020 vs. 2050 (Projected)



Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

America's demographic outlook over the coming generation is fundamentally different from all the others. Between now and 2050, total US population is projected to grow, not shrink. Although America's under-30 population is projected to be very slightly smaller in 2050 than today, the overall working age population would be larger than it is now. And while the US population is set to gray, its aging would be much more modest than for any East Asian country. To the extent that these differences matter strategically, all of them stand in America's favor.

Demographic Differentials and their Strategic Implications

The divergence in demographic trends between the USA and all countries in the East Asian region is rife with strategic portent. A number of separate, subsidiary features of the impending population changes in East Asia and the USA merit examination for their own particular bearing on economic, military, or perhaps in some cases political capabilities for the countries in question.

1) Working Age Manpower and "Workers" per "Retiree"

Let's begin with some basic comparisons of manpower availability for the USA on the one hand and East Asian countries plus Russia on the other.

These are presented in Figures 11 through 15.

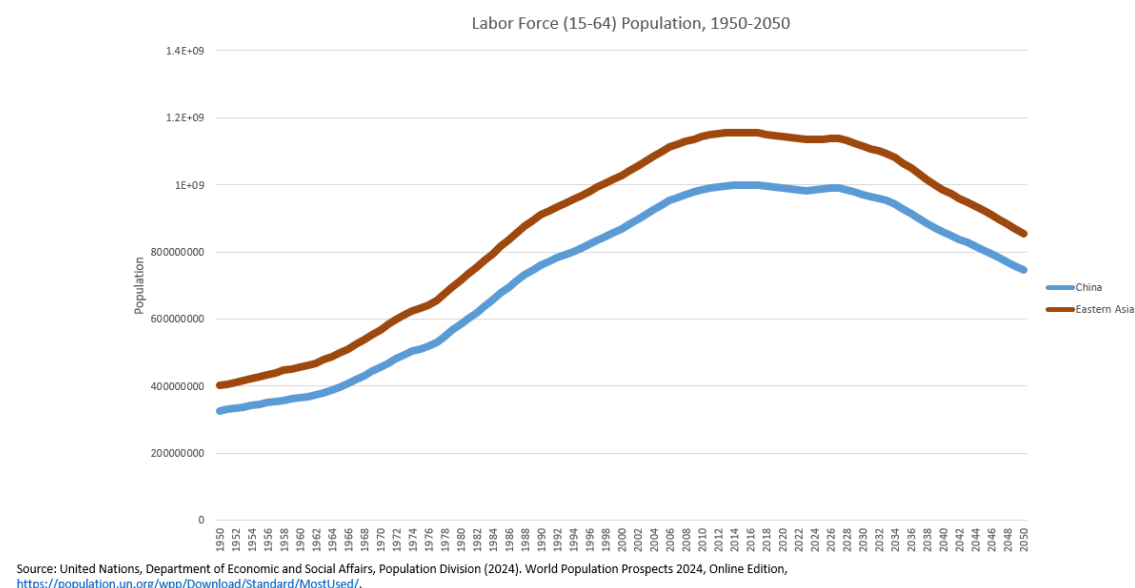
Our charts outline and contrast two sorts of indicators for labor potential.

The first is total working age population—of interest for reasons self-evident. The second are a calculated metric known as “population support ratios” (or PSRs, also known as “old age dependency ratios”).⁶

Both of these indicators convey important information about national economic capabilities. PSRs additionally speak to economic and social “burdens” for a population—demands that fall to an inescapable measure on its productive workforce.

Figure 11 depicts a century of estimated and projected working age population trends—1950 through 2050—for the East Asian region as a whole and for China. Since China accounts for the overwhelming majority of East Asia’s population—over 85 percent today—China’s trends dominate trajectories for the region as a whole.

Figure 11: Decline of the East

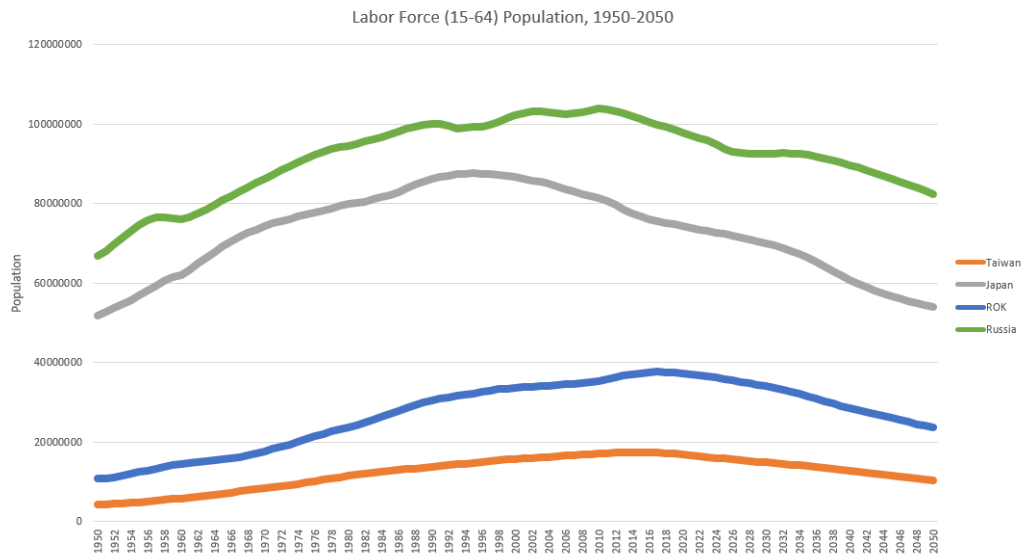


⁶ PSR is the quotient of conventionally defined working age population divided by conventionally defined retirement age population. Not everyone of working age is employed, of course, and not everyone of retirement age is out of the workforce—but as a crude indicator the PSR is nonetheless informative, especially when it comes to trends over time and differences between countries.

Between 1950 and 2010, China's 15-64 population—and thus also East Asia's—boomed, more than tripling. That upsurge in manpower availability was a major ingredient in the remarkable postwar economic transformation that took place in China, and East Asia over, during those decades. But around 2010 manpower totals stopped growing—and as we saw above, they have already begun to shrink for both China and East Asia overall. China's working age manpower is projected to fall by over 20 percent between now and the year 2050, picking up speed along the way. By 2040, China's available manpower is set to be shrinking by over 1 percent per annum—and since almost all of that prospective manpower is already born, there is little surmise in this estimate of decline.

Figure 12 details trends in working age population for the other East Asian countries—Japan, South Korea, and Taiwan—and also Russia. Japan and Russia are both decades into their long-term declines in manpower availability; 15-64 population has already fallen by about 5 percent in Russia and by over 15 percent in Japan from their respective peaks. Between 2020 and 2050, Russia is projected to see its manpower availability drop by another 16 percent; Japan by an additional 28 percent. By these projections, by 2050 Russian working age population would be 20 percent lower than at its earlier apex; Japan's would be down about 38 percent. Given the steepness of the coming depopulations in South Korea and Taiwan, their manpower availabilities are also set to decline radically between now and 2050, even though they are only just now entering into working age population contraction. Between 2020 and 2050, Taiwan can expect manpower availability to drop by 39 percent; South Korea, by 37 percent. Thus, though their manpower contractions commenced later than Japan's and Russia's, Taiwan and South Korea will nevertheless largely “catch up” with the “frontrunners” by 2050.

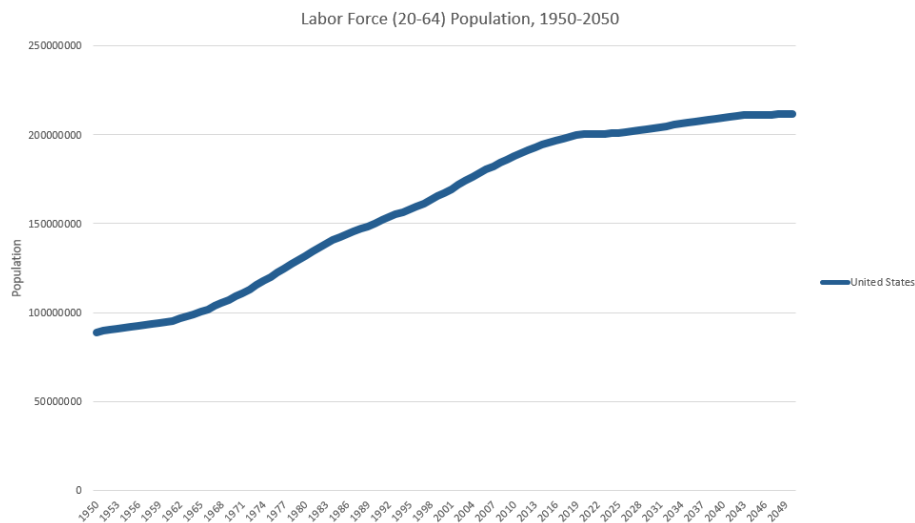
Figure 12: Everybody Get Down



Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

The United States stands as the major demographic exception to these trends in the Asia-Pacific region, as we see in Figure 13. Between 1950 and 2020 US working age population more than doubled, growing at a long term pace of over one percent a year. By UNPD projections, US manpower growth will be much slower between 2020 and 2050, with an anticipated increment of just 10 million, and a tempo of only 0.15 percent a year. This will mark a sharp deceleration—but it still positive population growth rather than population decline. And since manpower in East Asia (and perhaps Russia as well) stand to be shrinking geometrically in the decades ahead, Einstein’s “eighth wonder of the world” is still at play here: this time, with *negative* “compound interest”.

Figure 13: One of These Things Is Not Like The Others



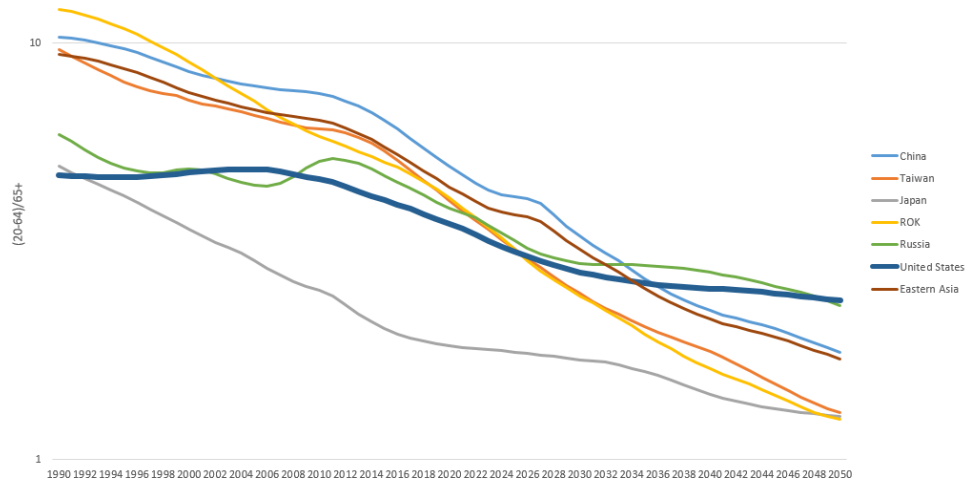
Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

While trends in manpower growth and decline are meaningful in and of themselves, we can also look at them in relation to the numbers of older (and by presumption no longer productive) persons the working age group must implicitly support. This is where PSRs come in. We outline PSR trends in Figures 14 and 15. These charts cover the period from 1990-2050—that is to say, from the end of the Cold War to the horizon of current demographic reliability

Figure 14 shows changes PSRs—actual and projected—for East Asian countries, Russia, and the USA. Over the course of just two generations—that is, between 1990 and 2050—East Asia’s plunge into severe sub-replacement fertility completely upends the figure’s initial ratios and rankings.

Figure 14: Fewer Visible Means Of Support For East Asia's Seniors

Annual Potential Support Ratio (20-64/65+), 1990-2050



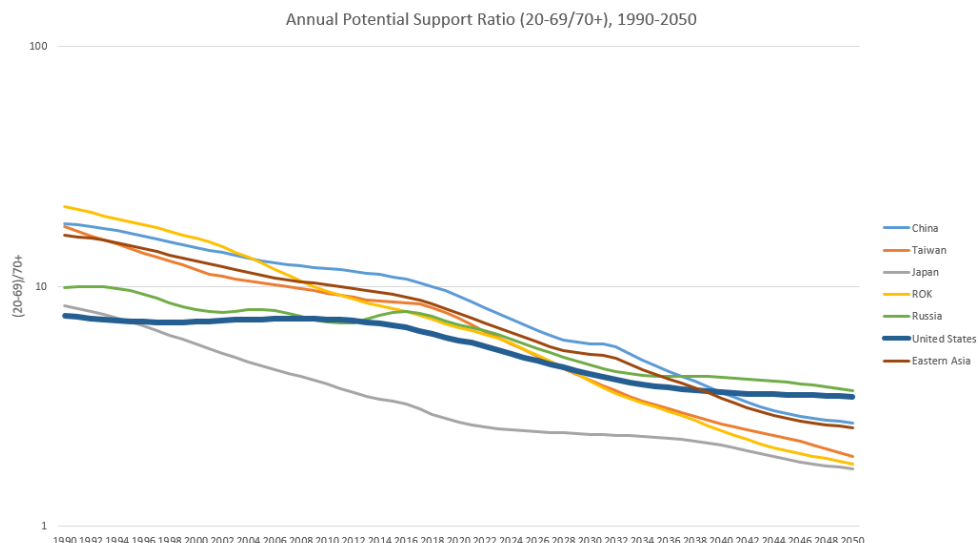
Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Ratios Table
[World Population Prospects - Population Division - United Nations](#)

Back in 1990, for every senior citizen 65 and older, China had about 10 men and women between the ages of 20 and 64; Taiwan had almost that number, and South Korea had even more. At 6.0 nominal working age persons per nominal senior citizen, the USA had the lowest PSR of any East Asian country—lower even than Japan’s. (Back then America’s PSR was below Russia’s, too.)

Since then, America’s PSR has declined somewhat, but PSRs have plummeted in East Asia—and by 2050, despite some projected further decline for the USA, America would have the *highest* old age dependency ratio in Figure 11—prospectively higher than for any East Asian country; higher than Russia’s too.

By 2050, there would be a projected 2.4 Americans of notional working age (20-64) for every notional senior citizen 65 and older. If that sounds low, consider: the corresponding ratio for China 2050 would be 1.8 to 1; for Taiwan, 1.3 to one; for South Korea and Japan, a mere 1.25 to one. (Russia’s 2050 ratio would be slightly lower than America’s as well—but given the health problems of its working age population, about which more below, this is not an apples to apples comparison.)

Figure 15: The East Asian Post-Cold War Race To The Bottom



Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Ratios Table
[World Population Prospects - Population Division - United Nations](#)

One might argue, plausibly to some, that the goalposts in Figure 11 are too “conservative”: that in a time of generally improving health the notional retirement age should be higher—say 70 rather than 65. We recalculate PSRs in Figure 12 to envision a working age population encompassing those 20-69 and a retiree population 70 and above. Despite this meaningful adjustment, there is no change in the overall read-back. Same story: USA enters the post-Cold War era with the lowest “worker” to “senior” ratio; ends up in 2050 with the highest of any East Asian country. (Russia’s would be slightly higher than America’s in 2050 by this metric, but this may not be a meaningful comparison for reasons we will see.) In these projections there would be just 3.5 Americans 20-69 for every American 70 or older—a sobering ratio from our vantage point today. But for China 2050 the ratio would be 2.7 to one; 2.0 to one for Taiwan 2050; and a currently mind-bending mere 1.8 to one for South Korea 2050 and 1.7 for Japan 2050.

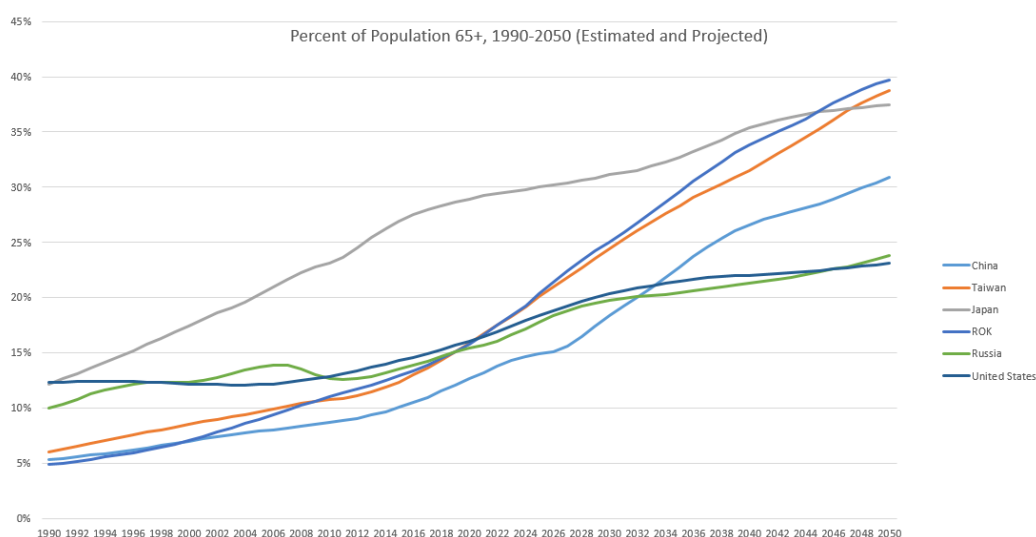
2) Population Aging and East Asia’s Coming Tsunami of Seniors

As a matter of practical population mathematics, and perhaps counterintuitively, societal graying turn out to be mainly due to the impact of smaller families, not longer lives. In contemporary

countries, prolonged sub-replacement fertility always has a far larger influence on the process of population aging than improvements in life expectancy. Sub replacement fertility shrinks the base of the “population pyramid”, eventually turning it upside down—lower the childbearing level, the faster the coming process of population graying. In societies where previously high levels of fertility fall far below replacement relatively suddenly—as in postwar the East Asia—population aging is particularly dramatic, and swift. Since rapid health improvement also attended East Asia’s sharp and speedy fertility declines, many more babies from the era of high fertility survived to adulthood, and old age, than would have done so in the past.

Taken together, these forces have created a sort of perfect demographic storm in East Asia, paradoxically generating what we might call a Senior Tsunami in the midst of a general regional depopulation. The basic dimensions of East Asia’s Senior Tsunami can be seen in Figures 16-18.

Figure 16: East Asia’s Post-Cold War Population Explosion: Senior Citizens



Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

In just two generations, super-low fertility (with near-zero net immigration) is effecting truly stunning transformations in East Asian national age structures. In 1990—around the time of the Tiananmen massacre—barely 5 percent of Chinese were 65 years of age or older. Today over 14 percent are, and by 2050 the share will be over 30 percent. But other East Asian countries are on path to an even grayer future. Taiwan, where just over 18 percent of population is currently 65+, is

projected to be almost 40 percent Senior by 2050, with South Korea and Japan also approaching the threshold of 40 percent by 2050.

It is easy to write the words “40 percent of the population will be 65 years of age or older”—but almost impossible actually to envision such a society, what it would look like or how it would operate, given our own universe of experiences. Yet this new world is only a generation away.

Not so long ago, the OECD defined an “aged” society as one where 7 percent to 14 percent of population was 65+—and a “super-aged” society as one where seniors accounted for 14 percent of total population. In reality, East Asia is on the road to societies where two times, two and a half times, or even three times as many people will be senior citizens as in the OECD’s now almost quaint definition of “super-aged”.

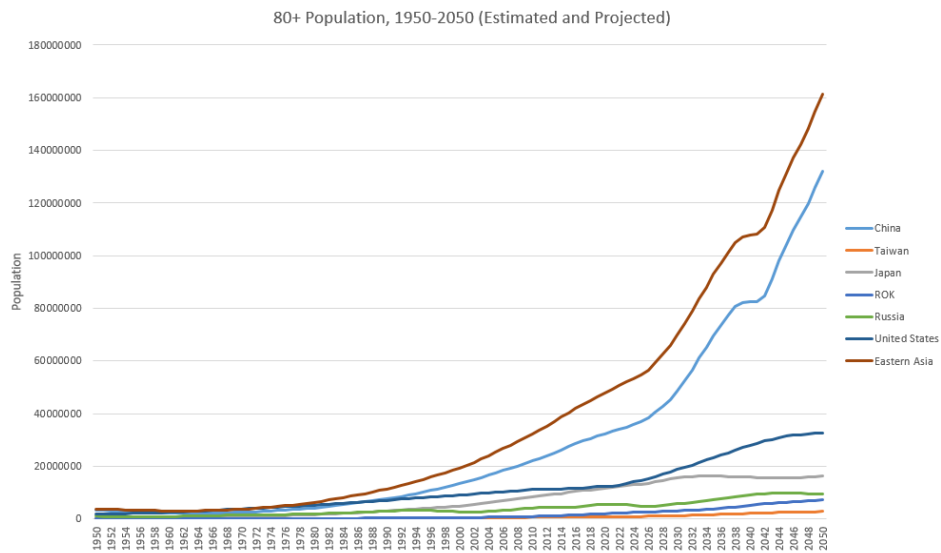
The United States of course is also an aging society—as may be seen in Figure 16, but a critical demographic reversal is underway. A generation ago, in 1990, the US was practically the grayest country in the Asia-Pacific area; by 2050, it will be practically the youngest. To be sure: with nearly 25 percent of its people 65 or older, America 2050 will most certainly be a “super-aged” society. But the only country nearly as youthful in the greater East Asian region would be Russia—and as we shall see, Russia’s age profile does not offer an “apples to apples” comparison with other countries under consideration.

As East Asia’s roster of children, working age people, and total population shrinks over the coming generation, the ranks of its elderly will be booming. Between 2020 and 2050, the region’s 65+ population stands to nearly double, from roughly 260 million to roughly 460 million. That would be a tempo of 2.2 percent a year, for thirty years. (That would be a faster annual rate faster than global population at the very peak of the world population explosion in the 1960s.) China’s senior population will be growing even more rapidly than for East Asia as a whole, expanding at something like 2.4 percent per annum—with an implied doubling time of 29 years.

Swift as the growth of East Asia’s total senior population stands to be, the very fastest growing cohort will be the 80-plus group. Their prospective leap in numbers is shown in Figure 17. East Asia’s cohort of Octogenarians, Nonagenarians and Centenarians is on path to soar; by 2050 they will account for 11 percent of the region’s total population. About 10 percent of China’s population will be over 80 as well: this “oldest-old” contingent will more than quadruple for China in just 30

years. And an even higher share will be 80+ in other East Asian locales: by 2050, nearly one in six people will be 80 or older in both Japan and South Korea.

Figure 17: Guess What Will Be Growing Growing Faster Than The Chinese Economy

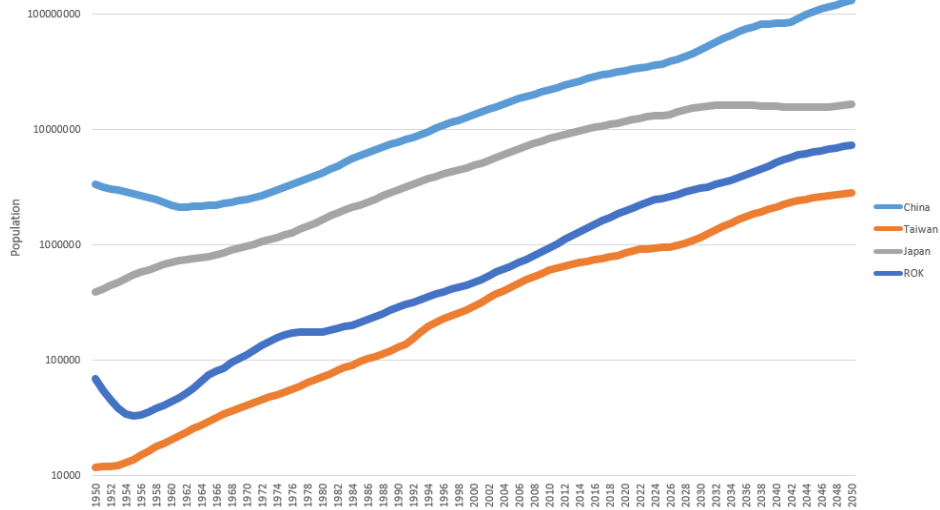


Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

The China of 2050 will have roughly the same number of children under 15 and super-seniors 80 and above. In Taiwan, South Korea, and Japan, super-seniors will far outnumber children by 2050. As Figure 18 underscores, East Asia's 80+ cohorts have been growing exponentially since 1950—and as Einstein would have readily understood, over a century compound interest can change the face of the world.

**Figure 18: Do Something Exponentially For A Century,
And You Change The World...**

80+ Population, 1950-2050 (Estimated and Projected)

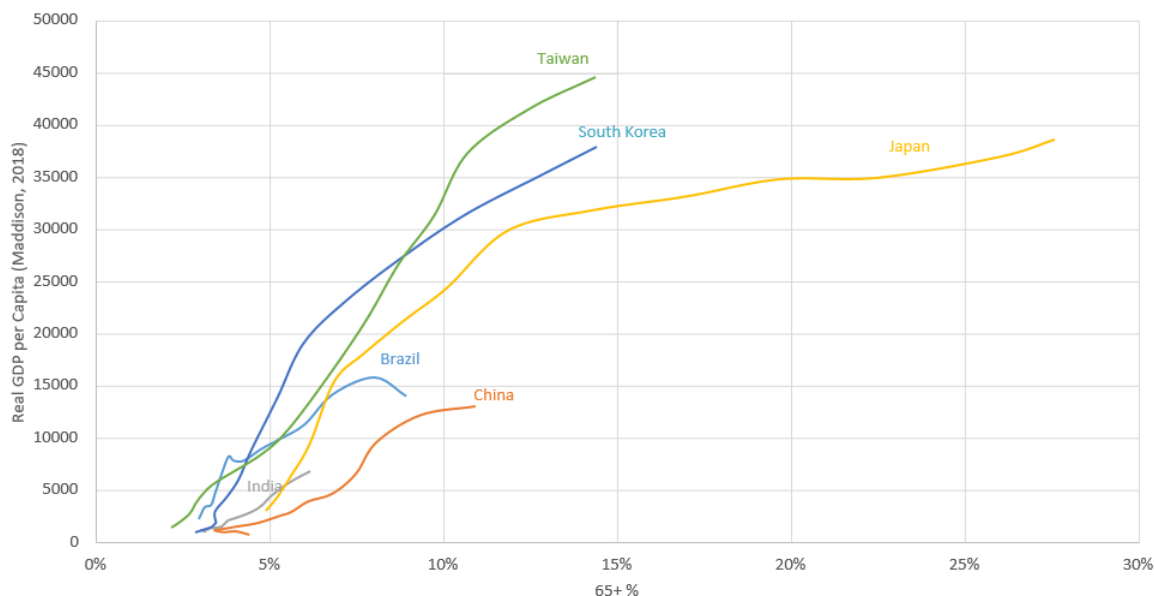


Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

East Asia’s tsunami of population graying will surely impose severe and (as yet) unfamiliar social and economic stresses on all the countries of the region. And China stands to be especially disadvantaged by its coming old-age burdens.

Despite China’s unique burst of hyper-rapid economic growth since the death of Mao, China confronts an almost uniquely unfavorably aging trajectory in relation to its income level. As Figure 19 underscores, per capita incomes in China have been dramatically lower than in other East Asian societies at every step to date in its progression toward “super-aged” status. (China was also poorer than Brazil or India when they are at comparable stages of population aging.)

Figure 19 :Growing Old The Hard Way
Percent of population 65+ vs. Per capita GDP (PPP): China and Selected
Other Countries, 1950-2018

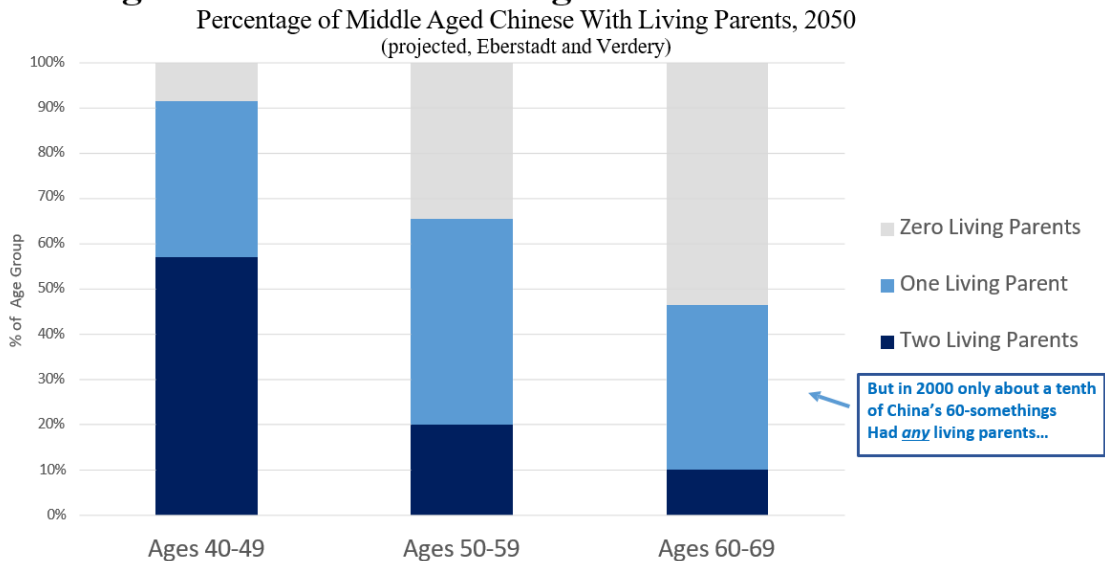


Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2019 Revision, <https://population.un.org/wpp/>, accessed June 14, 2021; "Real Per Capita GDP," <https://www.rug.nl/gedc/historicaldevelopment/maddison/releases/maddison-project-database-2020?lang=en> (accessed June 14, 2021).

Future economic and social options for China will be increasingly constrained by its high aging burden relative to national income levels. And the pressures from China's coming aging crush may be even more difficult to bear than a simple "headcount" overview would suggest. For most of the burden of population aging will have to be shouldered by families—society's first responders for human needs—precisely at the time when the Chinese family is atrophying, or even withering away, under prolonged sub-replacement fertility.

Figures 20 and 21 illustrate two of many still generally unrecognized strains to society and economy in China from the coming collision of pervasive population aging and the family decline. First: China's extreme and pervasive aging means relatively elderly people will have to contend with care needs for ancient parents. By 2050—barely a generation from now—almost half of China's Sixties-somethings will have at least one living parent, meaning that most married Chinese in their Sixties will have one, two or even three parents and in-laws to think about.

Figure 20: China's Coming Confucian Burden



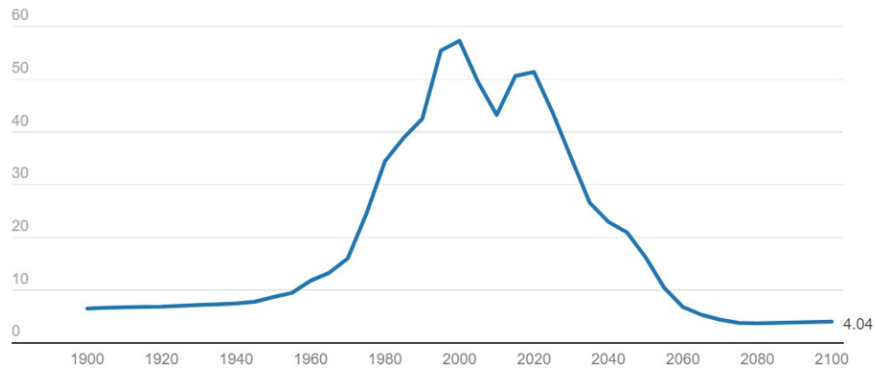
Source: Nicholas Eberstadt and Ashton Verdery, *China's Revolution in Family Structure: A Huge Demographic Blind Spot with Surprises Ahead*, <https://www.aei.org/wp-content/uploads/2023/02/Chinas-Revolution-in-Family-Structure.pdf?x91208>.

Second, China's extended family networks—to which overtaxed nuclear families have traditionally turned—will become progressively smaller and thereby less resilient in the decades ahead. Between 2020 and 2050, for example, the mean number of living cousins for Chinese in their 30s stands to plummet a startling 80 percent. With far more elder need within families, and far less family to supply it, it is all but inevitable that the Chinese state will be called upon to provide government resources to fill this gap—this as shrinking manpower numbers contribute to slowdown of the nation's economic engine.

Figure 21: The Withering Away of the Chinese Family

Mean Number of Living Cousins for People 30–39 Years of Age

China, 1900–2100 (Simulated and Projected)



Source: Nicholas Eberstadt and Ashton Verderly.

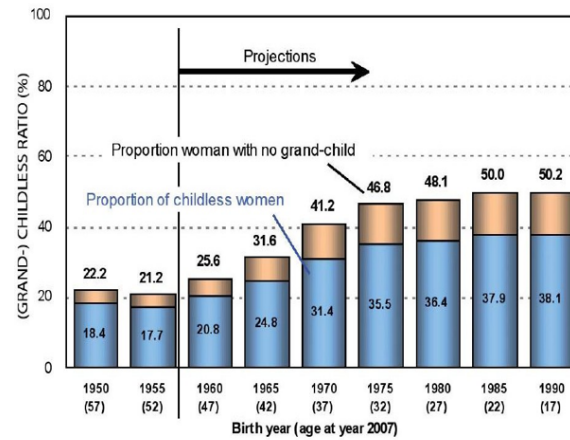
Source: Nicholas Eberstadt and Ashton Verderly, "China's shrinking families," *Foreign Affairs*, April 7, 2021, <https://www.foreignaffairs.com/articles/china/2021-04-07/chinas-shrinking-families>.

Taiwan, South Korea and Japan are much more affluent societies than China today: by the reckoning of the UBS Global Wealth Databook 2023, private wealth per adult is about three times greater in Japan and South Korea than in China, and almost four times greater in Taiwan.⁷ All else equal, this financial cushion provides these societies with more options for coping with their coming senior tsunamis. But all else is not equal. In addition to even more extreme degrees of “super-aging” and even lower PSRs, these three countries are already in the midst of a revolutionary shift: a move toward mass childlessness.

Projections in Figure 22 contemplate some consequences of that revolution. By this reckoning, a Japanese woman born in 1990—i.e., a woman who would be 60 in 2050—stands almost a 40 percent chance of having no children of her own, and a slightly better than even chance of ending up with no biological grandchildren. Exactly how old age support would actually work in a society so bereft of descendants is a question that has, until now, only been addressed in dystopian science fiction treatises. And remember: as yet there is no cure for dementia or Alzheimer’s, and some significant fraction of Japan’s 2050 one-in-six over 80 years of age could be stricken by that affliction.

⁷ UBS, Global Wealth Databook 2023. Available online at <https://rev01ution.red/wp-content/uploads/2024/03/global-wealth-databook-2023-ubs.pdf>. Estimates are for the year 2022.

Figure 22: Sayonara
Japan: Childless and Non-grandchild Ratio among Women
Medium Projections, Cohorts born 1935-1990



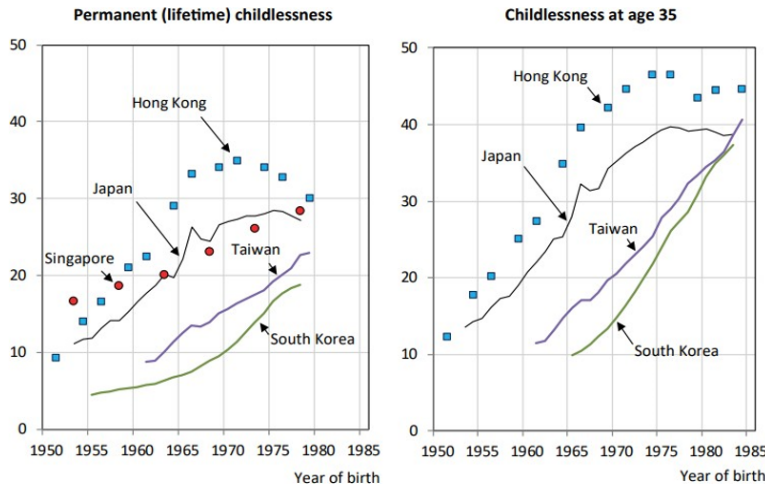
Source: From the projection 2006, medium-fertility and medium-mortality variant. Proportions are calculated by the author from the assumption of the projection 2006, medium-fertility and medium-mortality variant.

"Work Session on Demographic Projections." Figure 7. Pg. 188. Eurostat. Methodologies and Working Papers. 2007. epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-07-021/EN/KS-RA-07-021-EN.PDF (Accessed: Jan 15, 2013)

The epidemic of childlessness that has arrived in Japan will soon be landing in South Korea and Taiwan, as we see in Figure 23. It may be only a matter of time until those East Asian societies also have to deal with the vital questions of how to deploy technology, or government policy, to substitute for the family that will increasingly be missing for growing numbers of seniors in need.

Figure 23: East Asia's Epidemic of Childlessness

Permanent childlessness at age 50 and childlessness at age 35 by cohort in Japan and 4 East Asian territories

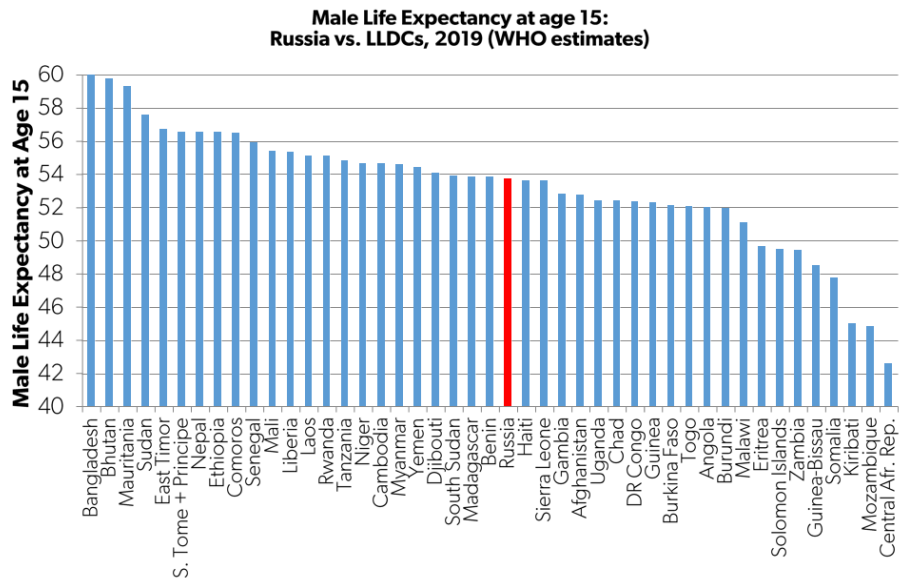


And China's epidemic is coming next...

Tomáš Sobotka, "World's Highest Childlessness Levels in East Asia," *Population and Societies*, No. 595, December 2021, <https://doi.org/10.3917/popsoc.595.0001>.

On its face, Russia would appear to be less subject to the coming old age burden than China or other East Asian societies—but basic statistical comparisons could be deceiving. We have to bear in mind Russia's continuing health crisis, and how that affects the fragility not only of Russia's senior, but also Russia's middle-aged population. As we see in Figure 24, the health outlook for males in Russia is dismal—basically “Fourth World”. According to WHO estimates, life expectancy for Russian males at age 15 in 2019—on the eve of the COVID pandemic—was identical to Haiti's, and lower than many of the countries the UN designates as “least developed”. (Life expectancy at age 15 for Russian females looks better, but only slightly—they too fit all too comfortably on a chart with “least developed country” counterparts.)

Figure 24: Is the UN Missing a “Least Developed Country” ?



Source: World Health Organization, Global Health Observatory Data Repository, "Life Expectancy: Life tables by country," <http://apps.who.int/gho/data/view.main.60600?lang=en> (Date Accessed: March 9, 2022).

Grimly elevated levels of adult mortality in Russia mean that the country’s men and women are significantly less healthy and more brittle at any year of calendar age than modernized populations abroad.

On the eve of the COVID pandemic, death rates for Japanese men at age 65 were equivalent to those of Russian men at age 48; for 65 year old South Korean women they were the same as Russian women at 49. American men at 80 had the death rates of Russian men at 72; Taiwanese women at 80 likewise had the death rates of Russian women years younger.⁸

If these differences in age-specific mortality accurately reflect underlying differences in population health, we ought to regard Russia’s adult population as aged far beyond its years. In 2020, for example, 29 percent of Japanese men were 65 or older—but nearly 48 percent of Russian men were over 48 (and facing roughly the same risk of death as Japanese 65 year olds). Health corrected age structures would likely show that Russia is far less youthful in any genuine sense than its population numbers superficially suggest.

⁸ Cf. <https://mortality.org> and <https://www.lifetable.de> Estimates are for the year 2017.

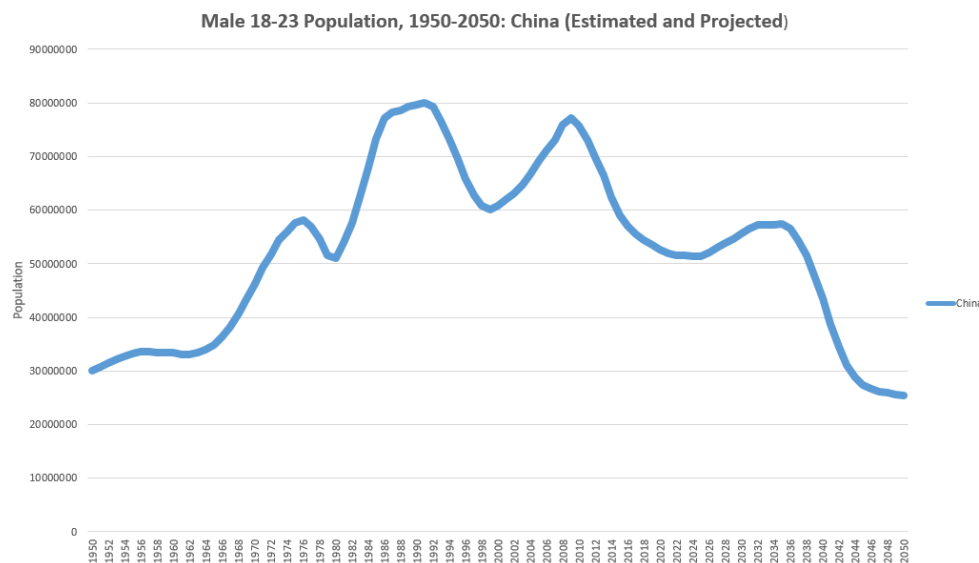
3) Military Age Manpower

Younger adults are the most highly educated and tech-savvy segments of national populations. They may also be the most mobile and least risk averse actors in the national economy. And they provide the military manpower indispensable for national security.

In this section we examine male population 18-23, the population group most directly relevant to conventional military planning capabilities. In Figures 25-27 we can see estimated and projected trends for the countries under consideration for the full sweep of the postwar century 1950-2050.

Military age manpower is the obvious tip of the sphere for any country from a demographic standpoint—but it is also the tip of the sphere in another demographic sense as well, insofar as this contingent of young adults is the first to represent new demographic trends that will eventually rise through the entire population structure. The postwar population explosion registered in the ranks of military age men before it inflated working age manpower or contingents of seniors. So to the collapse of childbearing pinches military-age manpower before the rest of the adult population.

Figure 25: The Harder They Fall

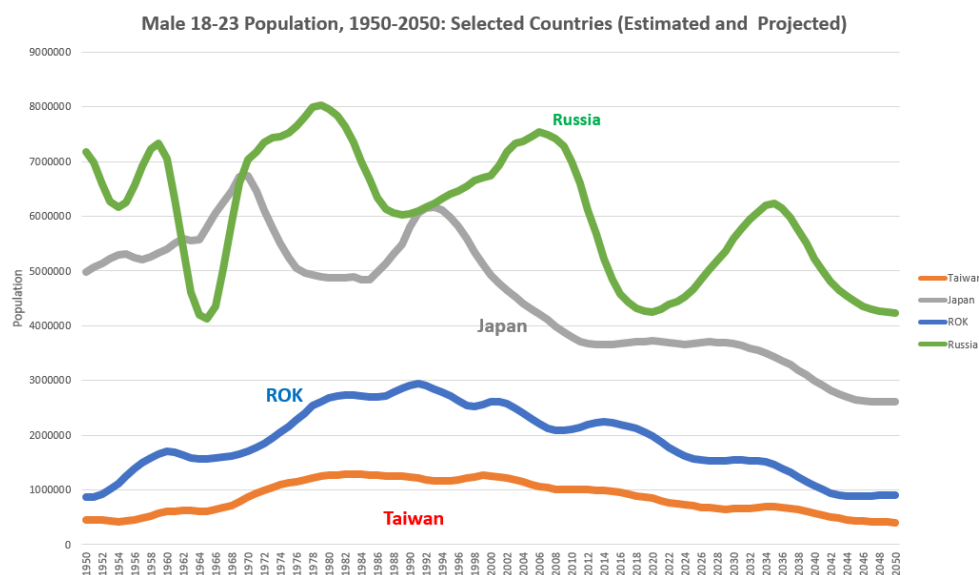


Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

Thus China's military age male manpower shot up from 30 million to 80 million between 1950 and 1990. But 1990 was its zenith; since then it has oscillated down to about 50 million—and it is on track to fall still further by 2050, back to roughly 30 million again—almost exactly its level 100 years earlier.

Similar stories may be seen for the other East Asian countries, and for Russia as well. For Japan, military age manpower peaked in 1970; it dropped by almost half over the following half century, and is on track to fall another 30 percent between 2020 and 2050. For Taiwan, the peak was in the mid-1980s, with military age male manpower dropping by almost a third by 2020, and falling by another 52 percent by 2050. In South Korea, the peak was around 1990, with a 32 percent slump between then and 2020, and a further 54 percent drop in store by 2050. Russia's military age manpower, like China, swings over time in waves conditioned by past tragedies. But the Russian 18-23 male population reached its maximum around 1980; was over 50 percent smaller than that by 2020; and is on track to be slightly smaller in 2050 than it is today.

Figure 26: Where The Boys Aren't

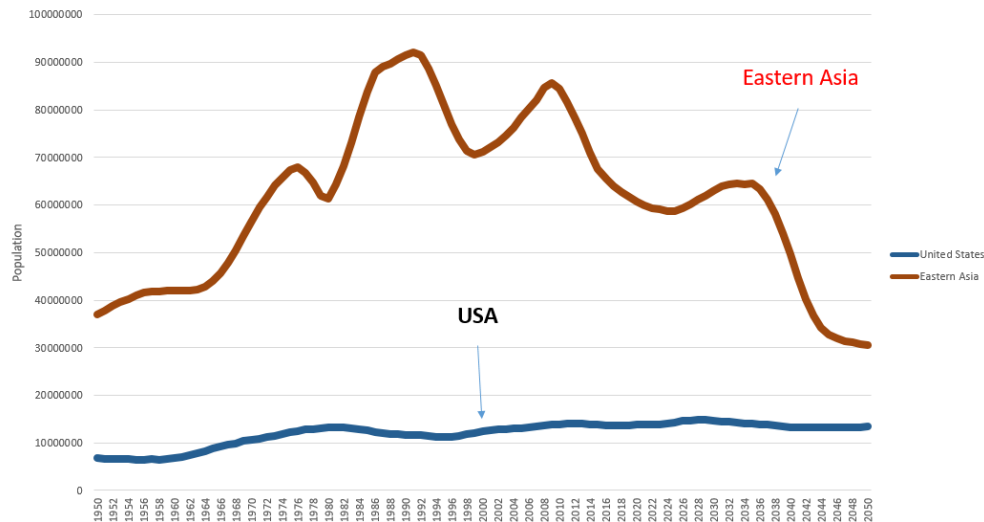


Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

The United States follows a meaningfully different pattern. America's estimated and projected 18-23 male population does not rise continually. UNPD numbers currently suggest US military age male manpower will also peak, and in the near future: perhaps as soon as 2028.

Figure 27: Can You Spot A Trend Here?

Male 18-23 Population, 1950-2050 (Estimated and Projected)



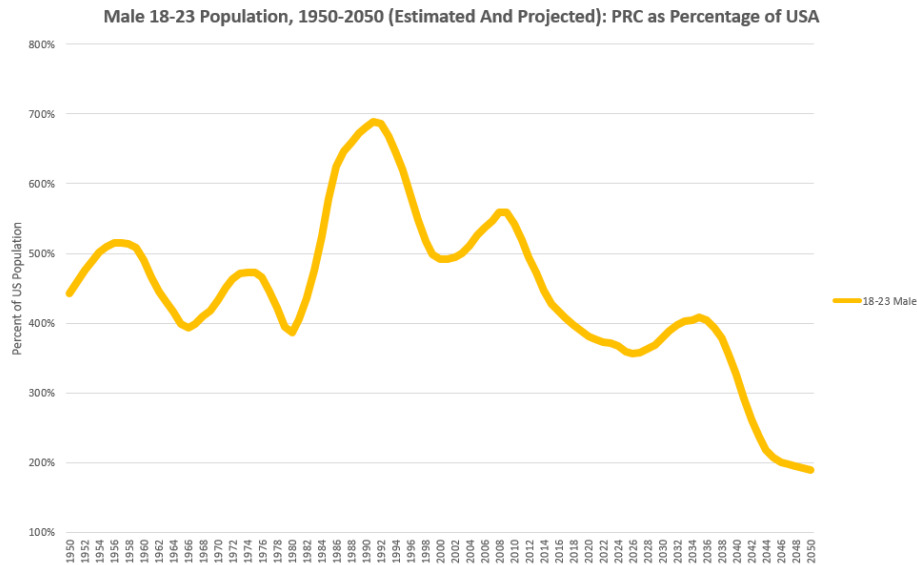
Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

But the US drop in military age men is projected to be marginal between then and 2050: just under 10 percent. Unlike any of the other countries under consideration, the United States would have more men of military age available in the year 2050 than it did half a century earlier, at the end of the Cold War.

Military Manpower in East Asia and Russia in Relation to the US: 1950-2050

The data in Figures 27-29 provide the basis for a summary “demographic net assessment” of the male 18-23 population in East Asia and Russia in relation to the USA, and the changes in relative military manpower numbers over time. These trends do not reflect the entirety of the military balance by any means—but they represent an important part of it.

Figure 28: 2049 Might Not Be As Much Fun As We Thought



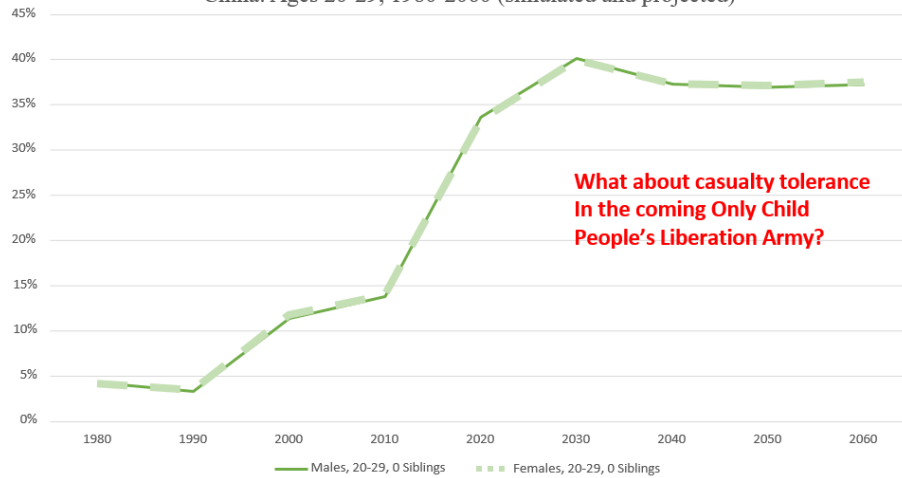
Let's begin with the US-China military manpower balance. China is vastly more populous than the United States, so it is no surprise that its male population 18-23 years of age vastly and continuously outnumbers America's. What may interest, and surprise, are the changes over time in the China-US ratio. Between the Korean War and the end of the Cold War, China's numerical advantage over the USA rose sharply. Where there were roughly 450 Chinese 18-23 men for every 100 Americans in 1950, there were about 700 by 1990. Since then, however, the trend has reversed. By 2020 there were fewer than 400 men of military age in China for every 100 in the USA—and on current projections, there would be fewer than 200 by 2050.

China's numerical edge over the USA in recruitment-age men, in other words, eroded significantly over the past generation, and stands to erode much further over the coming generation. China's remaining numerical advantages, furthermore, are qualified by a quiet but potentially critical change in the quality of male manpower. In China, prolonged and steep sub-replacement fertility has led to the rise of only-child families—and the rise of only child families leads quickly to a recruiting pool in which only children are predominant. By 2050, half or more of China's 18-23 men may be only children.⁹

⁹ Cf. <https://www.aei.org/research-products/report/chinas-revolution-in-family-structure-a-huge-demographic-blind-spot-with-surprises-ahead/>

Figure 29: The Rise of an Only-Child PLA

Percentage of Men and Women with No Living Siblings
China: Ages 20-29, 1980-2060 (simulated and projected)

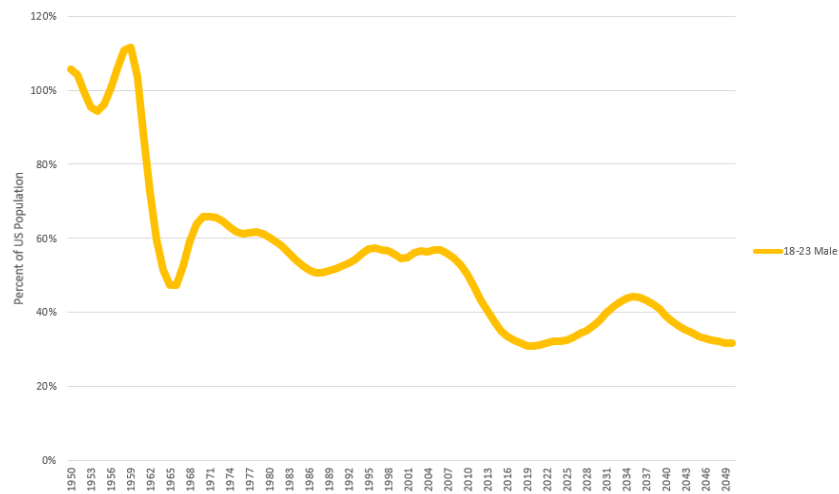


Source: Ashton Verderer, "Modeling the Future of China's Changing Family Structure to 2100," in *China's Changing Family Structure*, ed. Nicholas Eberstadt (Washington, DC: AEI, 2019).

Unless Beijing consciously and strictly discriminates against them, China is on course to an Only Child PLA. The rise of an Only Child military in China, for its part, unavoidably raises as yet unanswerable questions about casualty aversion in future PRC defense and security policy. In any future military engagement, mass casualties for the PLA will also mean a mass extinction of family lineages in China's subject population—an event viewed with metaphysical dread by those steeped in the Confucian tradition. To be sure: China is a "People's Democracy", not an actual one—but popular sentiment may still have to be factored into account by the CCP dictatorship in matters of grave popular concern—or ignored at the regime's peril. We cannot yet know whether, or how, casualty aversion will figure into PRC military policy for a largely one child army in the decades ahead. But we should be intently interested in the answer to that question.

Figure 30: Lose-Hold-Lose

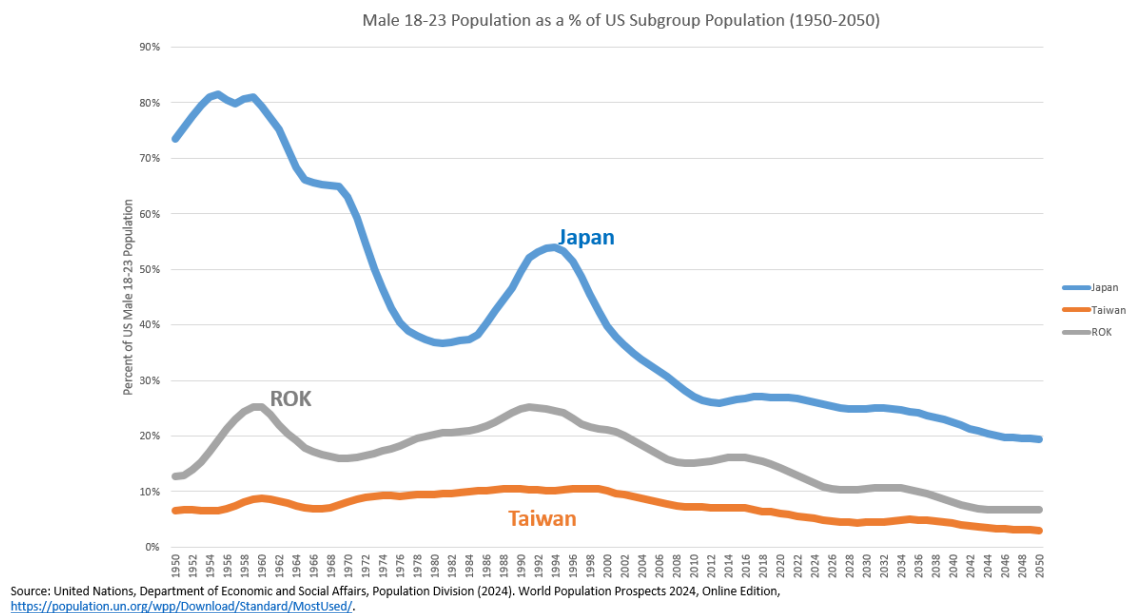
Male 18-23 Population, 1950-2050 (Estimated And Projected):
Russia as Percentage of USA



Source: United Nations, Department of Economic and Social Affairs, Population Division (2024). World Population Prospects 2024, Online Edition, <https://population.un.org/wpp/Download/Standard/MostUsed/>.

Then there is the Russia-US military manpower balance. Hard as this may be to remember now, in the wake of the Soviet Union's grand failure, American recruit-aged men were outnumbered by their Russian counterparts during the early Cold War years—and not just by overall Soviet contingents, but by the Russian Federation, all by itself. But by 1990 there were just 50 percent as many Russian men 18-23 of age as in America—and today there are only 30 percent as many. That US-Russia ratio stands to tilt still further in the US favor by 2050.

Figure 31: Shifting Terms Of Trade For America’s Security Partners And Friends



Finally, there is the shifting balance in male military manpower availability between the USA and its allies and friends in East Asia. Back in the late 1950s, there were almost as many 18-23 men in Japan as in America: this is not the only reason Japan was a key US ally in the early Cold War era, but it was an important one. By 2020, Japan had less than a third as many 18-23 men as America—and by 2050, it may have barely a fifth as many. In South Korea long term fertility decline has meant that ROK’s recruit pool, which stood at about 25 percent of America’s in the 1990s, will be under 10 percent by 2050. Taiwan’s balance in relation to the USA is also falling sharply, from 11 percent in 1990 to a projected 3 percent in 2050.

Sharp and steady relative decline of available military manpower from America’s friends and allies in the East Asian region will unavoidably change the tenor of Washington’s ties with these states. All else equal, the USA will be growing ever more important for these countries in their security calculations. But all else equal, these countries will be less able—and given the demands of aging and depopulation on their domestic resources, perhaps also less willing—to contribute in security partnerships with the USA. Such imbalances stand to place “cost bearing” strains on US relations with allies and friends in East Asia—and may invite an unending re-examination by Americans of “terms of trade” with East Asian partners over the coming generation.

Concluding Comments

As Americans know all too well, United States is beset with problems these days. Declining confidence in domestic institutions; faltering health and educational progress; and a long list of domestic social problems would figure in the long list of such maladies.

But sometimes it is important to put problems in international comparison. We have attempted to do just that in our review of comparative demographic trends for the US on the one hand and states from the East Asia area on the other. There is much more to the changing demographic balance between the Asian region and the USA than can be revealed by our simple “head count approach”, of course. But sometimes simple comparisons are telling—and this is one such time.

Exponential decay of population numbers over long period of time can transform the international stage and shift the global balance, It looks as if the US and East Asia are witnessing one of these transformations now. Einstein’s adage about compound interest is at work in the US-East Asia is underscored by what we have seen in this paper. Compound interest can work its long term wonders with negative long term rates, too.