The Real Population Problem

Too Few Working, Too Many Retired

BY WILLIAM POOLE AND DAVID C. WHEELOCK

For much of the last half century, public discussion of population issues has focused on the proposition that the world faced a population explosion. Many predicted dire consequences as population growth rapidly used up supplies of exhaustible resources such as metals and petroleum. The standard of living would decline as certain essential resources became ever more scarce and costly.

This pessimistic view was not new. In 1798, Thomas Malthus, in his famous *Essay on the Principle of Population*, argued, "The power of population is indefinitely greater than the power in the earth to produce subsistence for man. Population, when unchecked, increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio. A slight acquaintance with numbers will show the immensity of the first power in comparison of the second."

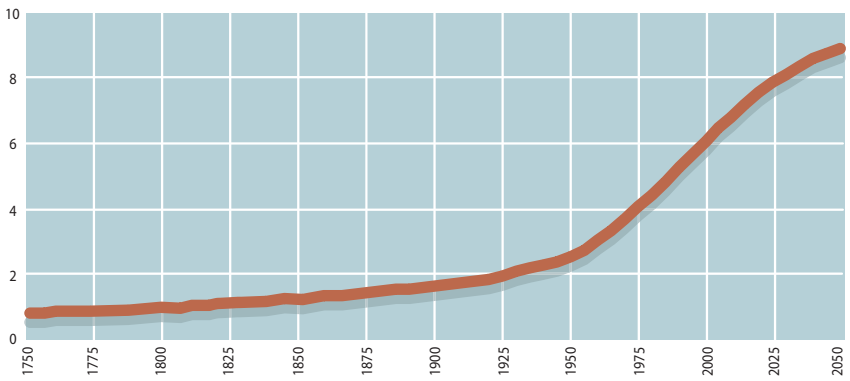
Thus, in Malthus' view, population growth will inevitably outstrip the earth's capacity to produce food, resulting in widespread famine, disease and poverty.

Modern concern over population growth shares with Malthus the view that population pressures will have dire consequences. However, the Malthus view that these consequences are inevitable —the view that earned economics the label "dismal science"—is not shared by informed observers today. For some, advocacy of rigorous methods of population control has replaced resigned pessimism. For others, a worldwide decline in the birth rate seems to be solving the problem without further government action.

If you ask people whether we must continue to be concerned about a population explosion, it is likely that many would respond that the problem will become extremely important in coming years. Yet, experts who study these issues say that the odds that population growth will cause real difficulty in the foreseeable future have receded. We do, however, face *with certainty* another population problem that will be at hand very soon—a rapidly aging population. This article focuses on one implication of this problem—namely, the consequences of an aging population for government pension systems, such as the U.S. Social Security system, that rely on taxes paid by current workers to fund payments to retirees. The strain on such systems will grow as the number of persons receiving benefits increases relative to those in the labor force and paying taxes.

FIGURE 1

World Population (billions)



SOURCE: United Nations

Population Projections

When Malthus wrote his treatise in 1798, the world's population totaled some 900 million persons. Today, world population is roughly 6.4 billion persons, and about 100 million persons are added to the total every year. Figure 1 plots estimates of total world population from 1750 to 2000, including projections of world population to 2050 made by the United Nations.[1]

For centuries, the world's population grew slowly, as high rates of mortality largely offset high birth rates. Wars, famines and epidemic diseases caused many people to die young; consequently, average life expectancy was low. In Europe, conditions began to improve by the 17th and 18th centuries, with increased food supplies and improvements in personal hygiene and public sanitation. People began to live longer while birth rates remained high; therefore, Europe's population began to increase rapidly.

By the end of the 19th century, many other parts of the world had begun to experience increases in life span, and population growth increased throughout the world in the 20th century. World population more than doubled between 1950 and 2000 and has nearly quadrupled since 1900. Currently, world population is growing at a rate of 1.35 percent per year.

Dire Malthusian predictions have not come true, however. Although we do witness famine, disease and poverty, as Malthus predicted, these events are usually isolated and reflect temporary problems, often created by civil war. Across the world, food is generally more abundant and less expensive, measured in terms of the amount of labor that must be expended to obtain a given level of nutrition, than it ever has been. Agricultural productivity continues to rise rapidly, and it seems unlikely that world food supply will be a constraint on population growth for years to come, if ever.

Furthermore, there are reasons to believe that world population growth will slow during the next 50 years, as the U.N. projections plotted in Figure 1 indicate. Population growth has already slowed markedly in much of the developed world because fertility rates have declined. Increased educational and employment opportunities for women, as well as more widespread use of contraceptives, have contributed to an increase in the average age at which women begin to have children and to a decline in the total number of children they have.

Most European and North American countries have already experienced a substantial decline in fertility rates; they completed their "demographic transition" from high rates of fertility and mortality to low rates by the 19th and early 20th centuries. Many lesser-developed countries are now at the intermediate stage of low mortality, but still high fertility rates; consequently, their population growth is rapid. Although still well above average, fertility rates have declined substantially in many of these countries during the past 20 years, which will lead to declining population growth in coming decades. U.N. forecasters expect world population growth to slow to about 0.33 percent per year by 2050, at which time forecasters are predicting that world population will total some 8.9 billion persons.

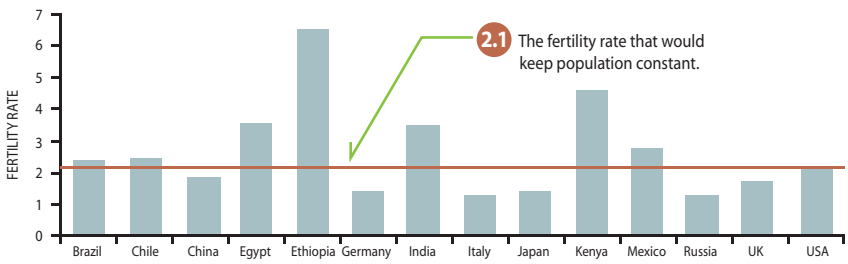
A Graying Population

A decline in the birth rate obviously means that population growth will slow. But no fancy calculations are required to understand that a sharp decline in the birth rate will also create an imbalance in a population; the decline in the number of young people inevitably means that the *proportion* of older people in the population will rise.

A good summary measure of a population's age is the median age—the age such that half the population is older and half is younger. Over the past half century, the median age of the world's population has increased by 2.8 years, from 23.6 in 1950 to 26.4 in 2000. The United Nations forecasts median age to rise to 36.8 years in 2050. More-developed countries are expected to have an increase in median age from 37.3 years to 45.2 years, and

FIGURE 2

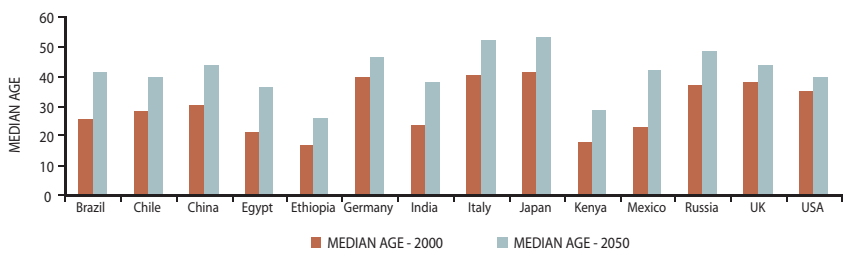
Total Fertility—Selected Countries 1995-2000
(average number of children per woman)



SOURCE: United Nations

FIGURE 3

Median Age of the Population—Selected Countries



SOURCE: United Nations

Interestingly, by mid-century, U.N. forecasters predict a world average fertility rate—that is, the average number of children a woman will bear in her lifetime—of 1.85. At that rate, fertility will be *below* the level necessary for population to stay constant—about 2.1 children per woman. Consequently, world population is expected to begin declining sometime toward the end of this century. As Figure 2 shows, fertility rates are already below the replacement rate in many economically advanced countries. As of 2000, the United States was the only large, economically developed country with a fertility rate above 2 children per woman.

lesser-developed countries from 24.1 years to 35.7 years. Japan is today the country with the oldest population, having a median age of 41.3 years. Japan is projected to have a median age of 53.2 years in 2050. The median age of the U.S. population, by contrast, is 35.2 years and is forecast to be 39.7 years in 2050. Data on median age, as of 2000 and forecasts for 2050, for selected countries are plotted in Figure 3.

The world's fastest growing age group is comprised of those aged 80 and older. In 2000, 69 million persons, or 1.1 percent of world population, were this old. By 2050, the number aged 80 or older is

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expected to more than quintuple to 377 million and be 4.2 percent of world population. In that year, 21 countries or areas are projected to have at least 10 percent of their population aged 80 or over. Japan is forecast to have 15.5 percent of its population aged 80 or older—the highest of any country—and have almost 1 percent of its population comprised of persons aged 100 or more. The United States is projected to have 7.2 percent of its population made up of those 80 and older.

To understand the implications of the graying population, think about a family living on the U.S. frontier 150 years ago. The family was largely self-sufficient, growing its own food, making its candles and building its own house with some assistance from neighbors. The working members of the family had to grow the food for the entire family, including children and elderly grandparents. The children went to work at a young age, and the grandparents worked in the fields as long as they could. The larger the number of children too young to work and the larger the number of disabled elderly, the greater the burden on those in their prime working years.

The fact that we live in a high-income industrial society does not change the fact that those working must produce all the goods and services consumed by the entire population. Non-working dependents are dependents just as surely today as they were on the farm 150 years ago. Those in the working population will have to support themselves and the dependent population of children and elderly.

The United States and other high-income countries have public pension systems, such as our Social Security system, to support the elderly. But the Social Security system sets the retirement date by the calendar and not by capacity to work. Thus, today, many and perhaps most people retire while physically able to work productively.

The graying of the population poses a serious fiscal problem as the dependency ratio—that is, the ratio of persons out of the labor force to the number of persons in the labor force—rises. Government pension systems—Social Security in the United States—are where a rising dependency ratio has its most obvious impact. Social Security, like the public systems of most countries, is a pay-as-you-go system, meaning that taxes paid by current workers are used to fund payments to today's benefit recipients, rather than invested in accounts or otherwise set aside to finance the benefits of those currently paying taxes when they retire.

To be sure, under current law, one's Social Security benefits are related to the taxes he or she paid while working, but that link relies on the ability of government to levy taxes on one generation of workers to finance benefits promised to another generation. Obviously, as the number of persons receiving benefits rises relative to the number paying taxes, the average taxpayer must shoulder a larger and larger burden or, alternatively, benefits must be cut.

One way to think about Social Security taxes today is that they are like the food grown by frontier farmers that they do not get to consume because the food goes to their parents and children—their dependents. Some of the income earned by those working today has to be diverted to provide benefits for retired dependents. The burden will rise substantially in coming years because the number of retirees will rise relative to those at work.

Projections by the Organization for Economic Cooperation and Development (OECD) indicate that public transfers to retired persons for pensions and health care will increase in the average OECD country by some 6 percentage points of GDP, from 21 percent to 27 percent, between now and 2050.[2] Unless promised future benefits are cut significantly, substantial tax increases will be necessary to effect such transfers. However, as a recent OECD report concludes, drastic tax increases could make matters worse by reducing the incentives for market work and for saving.[3] The OECD concludes that in many countries it may be necessary both to reduce promised benefits and to *increase* the incentives for work.

In recent decades, there has been a tendency for people to enter the labor force at a higher age while retiring at an earlier age. Consequently, the proportion of life spent working has declined. This phenomenon reflects a number of factors, including increasing returns to education and increasingly generous transfer programs that encourage early retirement. In countries that experienced a post-World War II baby boom, large increases in the labor force in the 1960s and 1970s reduced the dependency ratio and enabled increasingly generous transfer payments to retired persons. However, if life expectancy continues to increase, as demographers project, the dependency ratio will rise and such transfers will constitute an increasing burden on those working.

This discussion should make clear that the fundamental problem our society—and all aging societies—faces is one of an increasing number of retired people relative to working people. To avoid substantial tax increases on future workers, some combination of only two possible solutions must be chosen. One is to reduce

the annual payments to Social Security beneficiaries, and the other is to reduce the number of retirement years by raising the retirement age.

Not surprisingly, many analysts conclude that reform must start by reducing incentives in the public pension systems of many countries that encourage early retirement. Often, public pension systems offer generous benefit payments to early retirees. Although early retirees typically receive a smaller annual pension than persons who wait until they are older to retire, the difference in many countries is insufficient to discourage large numbers of people from retiring early. The United States is something of an exception. For a man with average income, our Social Security system is roughly neutral between ages 62 and 70 —Social Security neither encourages nor discourages continued employment. Beyond that age, however, the incentive to remain in the labor force is low. Put another way, the implicit tax of remaining in the labor force—forgone benefits—is relatively high. At a technical design level, there are a number of possible ways to create a more neutral system with respect to retirement age so that at a minimum, those who want to work longer are not penalized for doing so. The idea is that annual benefits need to be higher by an actuarially fair amount when retirement is delayed.

A recent OECD study found a close correlation between incentives to retire and retirement behavior—not surprisingly, people do respond to incentives! The implication of this research, according to its authors, is that labor force participation in the 55-64 age group would be increased substantially by reforms that abolished policy-induced incentives to retire early. Indeed, the report goes on to suggest that policy-makers should consider skewing incentives against retirement, at least up to some age, in recognition that people who work provide a net positive impact on public budgets.[4] By continuing to work past normal retirement age, people support themselves *and* pay taxes that help to reduce the tax burden that would otherwise fall on others.

Several countries have begun to rein in their public pension systems by instituting reforms that reduce incentives to retire early. Although an important first step, many analysts conclude that the age at which persons are eligible for benefits will also have to increase in order to avoid substantial reductions in benefit payments. The United States has in place a gradual increase in the retirement age for full Social Security benefits from age 65 to age 67 by 2025. Our Social Security system was begun in the 1930s when the average 65-year-old person could expect to live about 13 more years. By 2000, those additional years at age 65 had increased to about 18. The increase in normal retirement age from 65 to 67 by 2025 that is in current law obviously does not go far enough to offset this increase in life expectancy. Indeed, the trustees of the U.S. Social Security and Medicare trust funds project that, under current law, Social Security outlays will begin to exceed payroll tax revenue in 2018 and that the Social Security trust fund will be completely exhausted by 2042.[5]

The OECD has recommended a number of other reforms to its member countries to encourage older persons to remain active participants in the labor force. These include removing labor market rigidities that discourage part-time employment and implementing reforms that would increase the share of retirement income from private sources relative to public pay-as-you-go systems. Such policy reforms could help alleviate the fiscal challenges posed by aging populations both by lowering dependency ratios and by favoring economic growth.

Conclusion

Demographic change in the United States and elsewhere in the world presents enormous challenges. In much of the world, the combination of increased life expectancy and a reduced birth rate has created a situation in which median age is rising rapidly. As a result, government transfer programs, such as Social Security, that rely on taxes born by those currently working to fund benefits for those who are out of the labor force will come under increasing strain. Policymakers will face difficult decisions because fiscal balance can be restored in such programs only by reducing promised benefits, raising taxes or through some combination of the two. Two of the more palatable and often discussed options are the removal of incentives that encourage early retirement and a gradual increase in the age of eligibility for retirement benefits to reflect increased life expectancy. Whether such reforms will be sufficient will depend, of course, on how quickly they are implemented and how far they go.

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ENDNOTES

1 All population data presented in this article are from the United Nations Population Division. *World Population Prospects: The 2002 Revision.*

For the fertility and median age data, see www.un.org/esa/population/publications/wpp2002/wpp2002annextables.PDF (tables 3 and 8, respectively).

The world population data have since been updated in the 2004 revision, and the 2002 data are not readily available. For the 2004 data, see http://esa.un.org/unpp.

2 The OECD is an international organization of 30 countries headquartered in Paris.

3 "Strengthening Growth and Public Finances in an Era of Demographic Change." Organization for Economic Cooperation and Development, May 7, 2004. See www.oecd.org/eco.

4 This research is summarized in "Strengthening Growth and Public Finances in an Era of Demographic Change." OECD, May 2004.

5 *2004 Annual Report of the Social Security and Medicare Boards of Trustees.* The U.S. Social Security program comprises two parts. The Old-Age and Survivors Insurance (OASI) program pays retirement and survivor benefits, and the Disability Insurance (DI) program pays disability benefits. The years in which benefit payments exceed revenues and the Social Security trust fund will be exhausted refer to the combined OASDI programs. See the report at www.socialsecurity.gov/OACT/TR/TR04/index.html.