

National Intelligence Council

Russia's Physical and Social Infrastructure: Implications for Future Development

Conference Report

December 2000

This seminar series was sponsored by the National Intelligence Council (NIC) and the Bureau of Intelligence and Research of the US Department of State. The NIC routinely sponsors unclassified conferences with outside experts to gain knowledge and insight and to sharpen the level of analysis and debate on critical issues. The views expressed are those of individuals and do not represent official US intelligence or policy positions.

Executive Summary

Introduction

During the past two years, the National Intelligence Council and the Bureau of Intelligence and Research of the US Department of State sponsored a working group and four seminars with experts from outside the Intelligence Community to examine the impact of societal and infrastructural factors on Russia's future over the next two decades. The factors identified--demography, health, intellectual capital, and physical infrastructure--all pose great challenges to Russia. The purpose of the project was to begin to think through in systematic fashion the difficulties and opportunities confronting Russia's leadership in these four specific areas.

Key questions with which participants grappled included: What is the extent of the challenge in each of these areas? What are the trends, and to what extent are the outcomes of these trends over the next 20 years already determined? What are the key drivers that can influence these trends? When could government policy intervention or outside assistance be expected to have payoff, and how costly would it be? Is there a logical sequence of priorities for attention? What are the implications of alternate paths?

This report consists of three substantive sections. This Executive Summary is the first; it captures the main findings of the presentations and discussions at the seminars. The second is an essay by Marcus Noland, Senior Fellow at the Institute of International Economics and project adviser, who explores these themes in greater detail. The third section contains brief summaries of the papers presented at the seminars. The agendas of the seminars and lists of speakers follow in the appendixes.

Key Findings

Most of the challenges confronting Russia in the spheres of social and physical infrastructure are not unique. It is the confluence of so many challenges all at once--initiated by the abnormal existence and then the breakup of the Soviet Union, intensified by the stormy transition in Russia over the past decade, and then exacerbated by the collapse of the ruble in August 1998--that makes the Russian case extreme.

Demographic Trends

Experts noted that demography is one of the most reliable factors that can be used to make projections about a specific country. Demographics can help answer some narrow questions--such as likely pension burdens--and can sometimes be helpful with "middle-gauge" questions, such as future health care costs or housing markets. Demographics generally are not reliable or insightful for other questions, such as homicide rates or generational conflict. In Russia's case the unique nature of the demise of the Soviet empire may place Russia outside the normal range of historical experience, moreover, and limit the predictive value of demographics.

Experts agreed that the combination of high Russian mortality rates and low birth rates will affect Russia profoundly in the coming decades.

- High mortality rates are affecting all segments of the population. Russian statistics show that by 1999 life expectancy for men had fallen to 59.8 years, from a high of 64.3 in 1966 and to 72.2, from 74.2 in 1990 for women. The current mortality figures do not yet reflect the impact of the spread of AIDS and the rise in number of cases of infectious disease, including those of multiple drug-resistant tuberculosis.
- The causes of early mortality are numerous, and include high rates of suicide, childhood injuries, alcoholism, infectious diseases, cardiovascular disease, and cancer. Some trends result from the reduction of the state's involvement and the absence of private structures to replace it, especially investment in medical technologies and drugs. Many health problems are the result of a health care focus on communicable diseases and nutrition without corresponding attention to prevention of chronic diseases. Experts disagreed as to whether economic improvement--which could bring enhanced nutrition, better water supply, and a reduction in crowded living conditions--would be sufficient to reverse negative health and demographic trends.
- Russia is following the general European downward trend with regard to fertility. Overall, Russia's total fertility rate stands at 1.17, and some believe that it can reach as low as 1.0--well below replacement level of 2.14. All agreed that it will not rise higher than 1.5 over the next 20 years. Russia's abortion rate remains extremely high, and noted demographer Murray Feshbach claims that thirty percent of Russian women of childbearing age are infertile.

Internally, population growth among Islamic peoples of Russia, many concentrated in Russia's south, continues to outpace that of ethnic Russians, while Northern and Far Eastern regions are slowly being depopulated as state-owned industries close and people move to European Russia. As a factor in population growth, immigration has outweighed emigration since the breakup of the former Soviet Union; barring civil wars or other disasters in the near abroad, it has probably peaked.

By 2020, Russia's population is most likely to be smaller--according to Feshbach, it is very likely to decline from 146 million to 130 million in this timeframe--and with a higher

median age than today's. Russia's State Committee for Statistics recently forecast that the population will shrink to 134 million by 2015. As Russia's population ages, an increase in the dependency ratio is certain: by 2015 the ratio will be just four workers for every three nonworkers, with a dramatic shift among the nonworking population toward the elderly. The aging of the population and the increase in the dependency ratio suggest that domestic public and private capital available to refinance new investments may decline over the next two decades, underscoring and increasing the importance of creating the necessary conditions to attract investment from abroad.

Among Russia's labor force, unemployment as a result of economic decline has hit the female work force disproportionately. This increasingly unused resource could compensate for Russia's dwindling number of males, should a Russian economic recovery require additional labor.

Seminar participants saw both positive and negative implications of Russia's declining population.

- A smaller, younger population means fewer nonworkers to support and a reduced demand for daycare and health care. At the same time, however, Russia will have to go through its structural transition in the context of an aging, and likely less productive, population. A smaller work force could result in a labor shortage, even if the potential female labor force were fully employed.
- From a military manpower perspective, Russia--which already lost much of its mobilization base with the independence of the former Soviet republics--will find it increasingly difficult to generate and deploy the large conventional forces it has historically relied upon to defend its borders. The manpower shortage will contribute to Russia's increasing reliance on its nuclear deterrent.
- Internal migration will result in changing regional dynamics and possibly in the concentration of the Russian population into a smaller number of regions. The population of some regions, such as the Far North, will most likely decline further as the Russian Government no longer continues to bear the high cost of maintaining infrastructure in areas where the economic base is not largely self sustaining. In the increasingly depopulated Far East, Moscow's concern about the security implications of Chinese in-migration will heighten.

Health Trends

Another factor influencing Russia's future demographic path for the worse--possibly making today's grim predictions appear optimistic--is the Russian health crisis. Seminar participants agreed that the list of Russia's health woes is extensive: continuing high rates of alcohol abuse with a resulting abundance of new fetal alcohol syndrome cases; pharmaceutical shortages; poor reproductive health and continuing high rates of abortion; rising rates of infertility; high rates of sexually transmitted diseases; cardiovascular diseases; anemia; poisoning from heavy metals and other toxic materials; environmentally associated cancers; high rates of injury; and malnutrition. One speaker pointed to the toll on health resulting from growing inequality in Russian

society and associated stress, deprivation, and breakdown in social cohesion; another, however, warned of the methodological difficulty of differentiating causality from correlation in assessing the root of some health problems.

Experts noted that infectious diseases with the potential to spread beyond Russia's borders are growing rapidly.

- The rate of infection of tuberculosis has grown from 24 new cases per 100,000 in 1990 to 83 in 1998--as compared to 6.8 per 100,000 in the United States. Shortage of medicines and inadequate or outmoded standards of care result in antibiotic treatments of shorter-than-necessary duration and the increasing incidence of multiple drug-resistant strains.
- While registered cases of HIV have grown to some 53,000, estimates by Russian experts of the real incidence range from 10 to 100 times as many.

Russia's medical establishment is badly positioned to cope with the challenges it faces. It is still overcentralized, overspecialized, hierarchical, and strongly shaped by the beliefs and practices of the Soviet era. Health expenditures are treated as a residual claimant on the Russian budget, a problem compounded by the inefficiency of Russian health care delivery. "Therapeutic anarchy" and a reliance on what one speaker euphemistically called "non-evidentiary-based medicine" are widespread. Most key decisionmakers in Russian medicine have strongly resisted change and Western advice, even when practitioners accepted such advice, they have lacked the organizational capacity and resources to carry through on treatments, as in the case of tuberculosis.

Russia's economic crisis has exacerbated many of the health problems. Shortage of resources has led to cuts in health spending and low salaries only irregularly paid to health-care workers, whose morale has plummeted. Russia's experiment with a medical insurance scheme has met with uneven success to date, although it has succeeded in keeping the decline in health expenditures to a lower rate than that experienced by other sectors such as education and culture. In addition, frequent bureaucratic shakeups have resulted in eight different health ministers since 1995, making consistent policy difficult to sustain.

A few seminar participants thought that a new generation of medical leaders will be more open to change. The majority, however, appeared unconvinced that an attitudinal shift could take place with sufficient magnitude and speed to prevent a serious deterioration in Russia's already abysmal health picture.

Finally, experts agreed that the trends in Russian health are of significance not simply for their negative demographic ramifications, but also for their probable strong negative impact on the future productivity of Russia's work force and its overall quality of life.

Trends in Intellectual Capital

Experts agreed that Russian intellectual capital is under a high degree of stress.

- Many contended that the bureaucracies responsible for its promotion--the Academy of Sciences, the Ministry of Education, etc.--are highly resistant to much-needed reform.
- Russia's schools have deteriorated significantly, and many lack teachers in basic subject areas, especially in the poorer regions.
- Russia's science and technology base--greatly shrunken from the oversized Soviet complex but not disproportionate to Russia's present size--is inadequately funded and not attracting sufficient new talent.
- Russia has been losing significant expertise to a "brain drain" for over a decade.

Significant recent growth in some forms of education will prove critical to Russia's emerging market economy. Enrollment in newly created business schools and management training courses is thriving and could result in significant future payoff. In addition, the growth of the Internet and global communications has provided new opportunities for more effectively organizing education across Russia's wide expanses as well as for absorbing knowledge from abroad. Recent tightening of controls over information flows--such as media, publications, and computer mail--raise questions, however, about Russia's future ability to benefit from greater interchange with other countries.

Russia's ability to recover from the damage to its intellectual capital during the last decade will play a key role in its ability to compete in future world markets. Given that the majority of Russians who will be in the labor force for the next two decades have already received their formal education or will soon do so, many changes in educational policy today are likely to bear fruit only at a later date. Some experts argue, however, that the educational system is not a leading indicator of change and not the place to start. Globalization presents other paths to technological success through adaptation rather than innovation, and improvements in education tend to follow naturally upon economic growth.

Trends in Physical Infrastructure

Russia's physical infrastructure reflects the legacy of Soviet-era priorities and relative Soviet autarky, ensuring that the transition to a new, more globalized economy will be difficult. Although assessments vary, many experts believe that a large proportion of Russian capital stock will have to be written off over the next decade. Investments have been made in industries in which Russia is unlikely to ever be internationally competitive, either because of poor quality or because the capital stock embodies technologies incompatible with international standards. Considerable capital has been invested in remote regions where neither the government nor private industry is likely to provide funds for upkeep or modernization. Demonetization, lack of institutional capacity, and inadequate property rights protection discourage investment in both public and private spheres.

The picture is mixed, however. In industry, some studies, such as that by McKinsey Associates, have found the potential for productivity improvement in many sectors. In housing, privatization appears to have given a boost to new construction, although the 1998 financial crisis interrupted this trend. In the transport sector, the extensive shakeout of Soviet-era bureaucracies, enterprises, and infrastructure that has taken place and is still occurring was necessary, but the potential for new companies to find new niches also seems high, if economic recovery continues.

Conclusions

Participants found that while the impact of certain trends, such as worsening demographics, is largely unavoidable for the next two decades, the Russian Government does have the capability, if not yet the demonstrated determination, to reverse or slow other negative trends in this timeframe. In some cases, timely action is required to prevent long-term adverse consequences. For instance, public policy decisions and directed resource flows could make a difference in education and health. Regional policy--from the center or decided locally--can also have great impact, and, together with other factors such as geography and resource wealth, could serve as a magnet to concentrate Russia's population into a smaller number of "winner" regions. And as with most other problems in Russia, the new leadership's ability to establish a predictable legal and fiscal environment--essential for ensuring economic stability, attracting private investment, and ultimately, stimulating economic growth--would increase Russia's ability to reverse many of these negative trends.

Overview Essay

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Russia's Physical and Social Infrastructure: Implications for Future Development⁽¹⁾

While much has been made of adverse trends in the health and size of Russia's population, even by Russian President Putin himself in his first State of the Union address, the implication of these and other trends in Russia's physical and social infrastructure--its human capital and physical infrastructure--is less well understood. This paper draws upon lessons learned from the recently concluded seminar series to draw some preliminary conclusions about how these factors and their interactions will affect Russia's future economic and political development.

Demographic Trends

Although Russia has been below zero population growth for over 30 years, its population has been in a decline so steep over the past decade that it is outside the range of its previous historical experience except for wartime.

The Total Fertility Rate (TFR)--the average number of children a woman would have over her lifetime if she reflected the age-cohort adjusted fertility rates for a specific year--is considered the best indicator of the birthrate, with simple population replacement--or zero population growth--equating to a TFR of just over 2.14. Russia's TFR dropped sharply between the late 1950s and the early 1960s, then began to fall precipitously in 1991, reaching 1.17 in 1999. In the core ethnic Russian areas of the country, TFR is even lower, standing at just above 1.0 with some major urban areas reporting TFR below 1.0. The TFR in non-Russian ethnic areas, by contrast, exceeds replacement, sometimes by a wide margin. It should be noted, however, that infant mortality rates in these areas (in the 30-35 per 1,000 range) also exceed the already-high rates in ethnic Russian areas (17 per 1,000 in 1998 for Russia as a whole), so the differences in TFR across ethnic groups may overstate effective differences in population growth rates.

Continuation of TFR differentials across ethnic groups implies long-run shifts in the ethnic composition of the population. Between now and 2015, of Russia's 89 federal regions, only 12 areas--with substantial non-Russian populations--are projected to show population growth, though actually observed growth may be reduced by regional outmigration.⁽²⁾ Given the relatively small percentage of total population that ethnic minorities represent in today's Russia, however, the impact will not be very large over the twenty-year horizon of this paper.

The causes of the decline in Russia's TFR, especially over the past decade, have been the subject of considerable argument.

- Some demographers argue that the precipitous decline that began in 1991 is a response to declining economic conditions and political uncertainty, suggesting the possibility of a strong rebound once underlying economic and political conditions change. In support of this argument, they point to the reduced level of economic support for working mothers and the disproportionate impact on women of labor market adjustments during the 1990s. They also cite the brief uptick in births as a result of the pronatalist policies of the mid 1980s.
- Others argue that the decline is part of a long-term trend toward smaller families. The history of the Russian TFR demonstrates the presence of a long-term trend that pre-dates the collapse the Soviet Union, and recent sociological research--which shows only a small gap between the number of children people "wish to have," the number they "expect to have," and the actual number they do have--suggests that the pro-natalist policies of the 1980s merely advanced the timetable on which people had children without affecting the number of children they wished to have. Russia's TFR, although low by Russian standards, is comparable to current rates in some Western countries.

Another factor that should be considered in assessing the likelihood of a rebound in Russia's TFR is the apparent increase in both reproductive health problems and infertility, which affect an estimated 15 percent of Russian couples. The broader

scientific community is conducting research to gain a better understanding of the extent of reproductive health problems in Russia and their causes.

Russian TFR Relative to Other Countries^a

Country	TFR in 1998
Uzbekistan	2.9
Kazakhstan	2.1
Austria	1.5
Belgium	1.5
France	1.6
United Kingdom	1.6
Ukraine	1.4
Germany	1.3
Russia	1.23^b
Italy	1.2

^aBrian Carnell, "Total Fertility Rates for Europe and the NIS," www.carnell.com.population/tft_europe

^bRussia's TFR in 1999 fell to 1.17

The consensus among experts consulted is that Russia's TFR is likely to remain in the range of 1.5 (roughly equivalent to today's Western European levels) to 1.0, but it must be conceded that demographers do not have particularly good models of the social determinants of fertility. Thus, barring a large influx of population from elsewhere, the Russian population is expected to continue its numeric decline over the next 20 years. Moreover, given current mortality rates (see below), by 2030 the median age of the Russian population will be over 40, with half the population having been born before the year 2000.

Mortality Rates and Public Health. While fertility rates have been declining, mortality rates have been rising. As with the fall in fertility, the fall in Russian life expectancy began in the Soviet period and accelerated after 1989. The period through 1993 saw a steep rise in age-specific death rates for both genders and for all age groups with the increase among working-age males particularly dramatic. By 1999, Russian statistics show life expectancy for men at 59.3 years and for women at 71.7 years.

As with fertility rates, regions vary considerably with respect to mortality rates, with death rates among the working-age populations of Siberia and the Far East 20 to 30 percent higher than the national average. Moreover, across Russia rising mortality rates are statistically correlated with relative economic inequality, not just with absolute declines in real income. The leading causes of death among Russia's working-age males are accidents, other trauma, and poisonings, including those associated with the consumption of alcohol and alcohol substitutes.

More broadly, deteriorating living standards--declining water quality and other environmental degradation, a worsening diet, less accessible health care--along with unhealthy lifestyle choices such as smoking, abusing alcohol, and practicing unsafe sex, have had a profound impact on the health of both males and females in Russia and have contributed to growing rates of infectious diseases. Only scientific research can determine whether the population's exposure to environmental pollution has weakened their immune systems.

Four Models of Russia's Population to 2010^a

In 1995-96, Russia's State Statistical Agency (GOSKOMSTAT) developed four alternative models of Russia's population through 2010. Each of the four models made different assumptions regarding fertility and mortality rates and migration, and the estimated range of their 2010 populations ranged from 134.7 million to 143.7 million. Comparing the intermediate forecast produced by each model for the end of the year 2000 with actual population as of February 2000 reveals that actual population development over the period 1995-2000 lies somewhere between the most pessimistic and the next-most-pessimistic model. Of the four models, only the most pessimistic correctly postulated that TFR would continue to fall rather than rise over the period. The other three models postulated increases in TFR beginning in 1995 and running through 2000.

^a "A Prognosis of Population Size for the Russian Federation Through 2010," published in *Voprosy Statistiki*, October 1997.

Tuberculosis and sexually transmitted diseases are especially worrisome. TB is well above epidemic proportions with both the very large prison population and medical personnel exhibiting extremely high infection rates. The apparent inability of the Russian health care establishment to handle the TB problem has contributed to the widespread fear that Russia is emerging as the prime incubator of drug-resistant strains of the disease. The number of reported cases of sexually transmitted diseases, including HIV/AIDS, is growing rapidly, and Russian authorities admit that the number of reported cases is but a fraction of the actual number. Even regions far from metropolitan centers report rapidly growing rates of infection. In Irkutsk, for example, reported cases jumped from 68 to more than 2,000 during the course of 1999.

The interaction between TB and HIV/AIDS, the flourishing sex trade in Russia and certain other NIS countries, and the growing rates of IV drug use all magnify the rate at which these diseases may spread. With an estimated 1.75 million children abandoned by their families in recent years, large numbers of very young females engaged in the sex trade, and IV drug use concentrated among younger people, the impact of these twin epidemics will fall most heavily on Russia's relatively small cohort of young people, further narrowing the demographic base.

In addition to the rise in infectious diseases, Russia faces other serious health problems:

- Public health authorities report alarming rates of increase in the number of children born with serious medical conditions, handicaps, and mental retardation.
- Russian military officials routinely complain about the declining physical condition of young people in general and of draftees in particular and are currently reporting that one in three draftees is seriously underweight because of malnutrition. The military's reports of widespread malnutrition are given credence by the fact that per capita caloric intake dropped from 3300 to 3400 kilocalories per day in 1991 to 2400 to 2500 in 1997 and by reports of vitamin deficiencies of 20 to 50 percent depending upon the specific vitamin.

The multiple and complex causes of Russia's increased mortality rates suggest that it would be exceedingly difficult to design public policy interventions to reverse these trends. Nonetheless, there are grounds for guarded optimism. In Russia, the antialcohol campaign of the late 1980s appears to have had a demographically significant effect on health status and mortality. Examples from other countries--the United States' experience with tobacco or successful government-backed anti-AIDS campaigns in some countries, some of which have lower incomes and social capacities than Russia--demonstrate the positive impact that public policy intervention can have. Today's high rates of infant and maternal mortality, for example, are problems that could be addressed by concerted government policies.

Increased Dependency Ratios. As Russia's population ages, statistics show a likely increase in the dependency ratio (the ratio of the noneconomically active to economically active population) beginning around 2010. By 2015 there will be just four workers for every three nonworkers, with a dramatic shift among the non-working-age population toward the elderly. Indeed, the net increase to the working-age population will continue only until just after 2005, at which point, barring a very large net gain of working-age people through immigration, the size of that population will begin to decline. Given the declines in births over the past decade (from 2.1 million in 1989 to 1.2 million in 1999), the decline in the working-age population is unlikely to bottom out before 2017 at the earliest.

However, for a bottoming out to occur, a very large and rapid increase in the number of births and/or significant immigration from abroad would have to occur. Ironically, a rapid rise in the number of births would exacerbate the dependency ratios over the short term, as both the below-working-age and the above-working-age populations grow. The rising dependency ratio under either scenario may depress the national savings rate and reduce future domestic resources available for investment. Moreover, increasing cross-regional variation in the dependency ratio is likely as a result of economic restructuring and internal migration. This increased variability in the dependency ratio in various locales could intensify internal political tensions.

Migration. Cross-border population movement could offset or exacerbate demographic trends in Russia. During the period immediately following the breakup of the Soviet Union, Russia experienced relatively high levels of both legal and illegal immigration and emigration, with net immigration peaking at nearly 900,000 in 1994. A majority of outward-bound migrants were ethnic Germans or Jews joining communities abroad. Inward-bound migrants, who tended to be somewhat older than the Russian population as a whole, were largely ethnic Russians leaving parts of the former Soviet Union, often fleeing civil strife. This ethnicity-based cross-border population movement appears to have largely played itself out, and since a spike following the ruble crisis of August 1998, Russia has experienced reduced levels of both immigration and emigration, with annual in-migration running below 400,000--a contributor to population size, but not enough to offset the decline in the natural population.

That said, a very large Russian diaspora remains in the other countries of the former Soviet Union, and political instability in those countries or the appearance of a large and growing gap in economic well-being in Russia's favor could generate considerably higher levels of immigration. Conversely, a worsening of political or economic conditions in Russia could lead to increased emigration, especially of the highly skilled.

One other demographic factor that will have an impact on the shape of Russia in 2020 is internal migration. Since the end of the Soviet Union and its system of heavy subsidies to encourage people to move to otherwise undesirable regions, there has been a large and continuing out-migration from climatically harsh or economically depressed regions, especially from the Far North, the Far East, and Siberia. This out-migration is expected to continue over the next 20 years: from 1995 to 2010 the majority of administrative regions in the Far East and Siberia is expected to suffer major population loss, some as much as 30 percent. In the case of the geopolitically sensitive Far East, the fact that the exodus is heavily weighted toward young adult males and young families has potentially serious economic and security consequences. Increasing concentrations of the elderly in these regions will place additional economic stress on local governments.

The exodus of young males and young families from the Russian Far East also means that the region would soon encounter a labor shortage that probably would have to be overcome through the importation of labor from Asia, especially from China and North Korea. There is already some use of Korean labor in the region, and even today's modest Chinese presence has stirred up anti-Chinese sentiments, which have been exploited by local politicians. A much larger foreign presence would be fraught with social consequences. The sizable population losses that are projected for the Far East, and especially the loss of young males, also will have an impact on Russian military planners. The shortage of mobilizable manpower in this vast and strategically important region will mean that, if required, military manpower will have to be mobilized well to the West and transported into the Far East.

Labor Force and Human Capital

For a decade we have observed the decline of the Soviet economic system without the

creation of a robust alternative. The ongoing transformation of the Russian economy has had profound effects. Overall employment has declined, though Soviet-era practices encouraged some overemployment. The regional, sectoral, and occupational pattern of employment has changed considerably. As discussed above, outmigration from the Russian Far East and North have left those regions either dependent on foreign workers or forced to accept labor shrinkage. Industrial employment has declined while service sector employment, especially in business and finance, has increased. Women's employment has fallen disproportionately, even though the sectors of greatest employment reduction--industry and construction--were the sectors where women were most underrepresented relative to their overall labor force participation. New entrants to the labor force are far more likely to seek careers in business than in public-sector occupations or in science or industry. Not surprisingly, changes in the demand for labor have also been manifested in changes in wage rates.

These labor market trends reflect a combination of transition away from the Soviet-era economy and worldwide technological changes. To a certain extent, policy measures might be undertaken to offset these trends, for example, by subsidizing the consumption of products produced in Russian industrial enterprises or providing subsidies to enterprises in distant regions. Whether such measures could succeed in reversing such fundamental forces is doubtful, however. The relevant questions may be how much longer can this process--essentially driven by the decay of the old system--continue, and how rapidly can an effective alternative system be built?

Globally, technological change has increased the wage premium associated with educational attainment and the acquisition of economically relevant skills, which may or may not be narrowly "technical" in nature. Russia is no exception. Technological change and the transition from the Soviet-era economy have generated increased wage and wealth inequality, increasing income to those well placed to meet the new demands of the marketplace and reducing income in absolute terms to the low-skilled and those in declining sectors. Throughout Russia, unemployment is inversely correlated with educational attainment. Skill formation is absolutely essential to success in the 21st century economy at both the national and personal levels.

The existing Russian educational system provides high-quality education for the elite but mediocrity for the masses. State subsidies to elite education are quite large. In terms of indicators such as years of schooling and per-pupil expenditure, Russia is firmly among the ranks of middle-income countries such as the Philippines, Thailand, and Uruguay.

The Russian work force currently appears to have enough engineering talent to efficiently adapt technological innovations produced abroad--a hallmark of economic development among "follower" countries--but this may not continue to be true. School enrollment rates at all levels have trended downward since 1989, though there is some evidence of bottoming out or trend reversal since 1995. State expenditure on education has similarly fallen. Even for elites the quality of education has deteriorated, as skilled instructors have emigrated or left teaching for other pursuits. This phenomenon has

affected not only the universities but also other state-supported scientific institutions as well. At the same time, a reorientation of education toward more relevant skills--business and accounting, for example--has occurred as well as a growth in market-responsive private educational and training institutions. A small number of the elite is educated abroad.

That said, changes in educational policy may have a relatively limited impact on the labor force over the twenty-year horizon of this paper. The vast majority of Russians in the labor force of 2020 have already received their formal education or will soon do so. As a consequence, changes in the quality of schooling, for better or worse, may have only a marginal impact on the skills embodied in the work force of 2020.

Labor market and human capital development should not be viewed solely through the narrow prism of educational policy. Labor market outcomes can be affected by a range of policy interventions. For example:

- Foreign investment and deepening integration into the global economy could be critical to the development of manufacturing and service sectors over the next twenty years. These developments will directly affect the geographical, sectoral, and occupational structure of Russia's employment.
- An apparently unrelated policy, such as accession to the World Trade Organization (WTO), could have a significant impact on the returns to human capital development, for example by altering the composition of output and the demand for labor, and through protection of intellectual rights and the rewards to intellectual innovation.
- Reforms that improve access to safe drinking water and health care or reduce exposure to environmental pollution could contribute to improved health and greater capacity for learning and increased returns on public investment in education.

Physical Capital

Much of Russia's existing capital stock reflects the highly distorted economic incentives embodied in the Soviet system. Geographically, considerable investments have been undertaken in remote regions. Sectorally, investments have been made in industries in which Russia is unlikely ever to be internationally competitive. Technically, some of the capital stock either embodies technologies incompatible with international standards or is dominated by technology developed elsewhere. Indeed, some plants are "value-subtractors," and their decommissioning would actually contribute to economic output, especially if environmental degradation--or, alternatively, future cleanup costs--were assigned any value. Although the magnitude of this problem is subject to extensive debate, perhaps half of the Soviet-era capital stock is worthless under current market conditions.

Expenditures on infrastructure have trended downward, and as a consequence Russia's public infrastructure is in increasing disrepair. Financing problems reflect the underlying

irrationality of the fee structure. The use of public infrastructure, including housing, and public utilities, such as water, priced at rates well below their actual cost, encourages over-usage and generates little revenue for maintenance and expansion. Maintenance of existing plants is hampered by Russia's inability to collect taxes and fees as well as by demonetization and the tendency for in-kind payment by industrial users. Introduction of more appropriate incentive structures without generating social upheaval is an ongoing political-economic problem. Reform is hampered by inadequate management capacity at the local level. More innovative financing schemes, such as quasi-equity investment, have not been introduced widely, in part because of investor skepticism about the protection of property rights. Increasing differentiation is occurring between those localities which are able to deliver services on a relatively reliable basis and those that cannot. This differentiation will presumably reinforce the trend toward concentrating economic activity in certain regions such as Moscow, St. Petersburg, and Nizhniy Novgorod.

Inadequate property rights discourage new investment at the aggregate level. Moreover, the aging of the population and the increase in the dependency ratio suggest that domestic public and private capital available to refinance new investments may decline over the next two decades. Lack of property rights also can distort investment incentives at the macroeconomic level. The lack of a real market for land hinders restructuring of existing investments and discourages new development, for example, the construction of new housing in regions that would naturally attract more residents and greater economic vitality.

Much of the useful capital stock and new investment are concentrated in extractive industries. In the oil and gas industries, the capital stock was designed primarily to facilitate domestic consumption, not export. In this regard, Russia faces two problems: first, the need to address bottlenecks in the export pipeline system, and second, the extraction of rents by intermediaries, such as Ukraine, which lie between Russia and the ultimate consumers of these exports. Russia will need to make significant investments over the next two decades to maintain the existing network, to relieve physical bottlenecks, and to develop alternative routes of export supply. Russian extractive industries are relatively well placed to do this for two reasons. First, they earn hard currency directly. Second, the import content of the pipeline maintenance and expansion is low and can be self-financed through ruble earnings domestically.

Ironically, the relative vitality of the extractive sector may pose problems for the manufacturing sector. The existence of a functioning extractive sector contributes to putting a floor under wage rates. As a consequence, real wages in Russia are unlikely to ever drop to, say, Indian subcontinent levels and thus discourage the development of highly labor-intensive manufacturing. But even the prospects of medium-tech manufacturing could be discouraged by the extractive sector due to what is known as "Dutch Disease"--the process whereby commodity booms tend to lead to exchange rate appreciations that price other economic activities out of world markets. It must be noted here, however, that the recent sharp increase in world oil prices and the consequent

increase in Russia's hard-currency earnings have not caused the ruble to appreciate, perhaps because of offsetting capital flight.

Falling expenditures have led to a "hollowing out" of the Russian transportation system. Given the underlying economic irrationality of the geographic distribution of economic activity in the Soviet era, however, a certain withering away or redeployment of the existing capital stock may actually be desirable, at least from a market perspective. The Soviet-era transport system devoted excessive resources to servicing remote areas, and a decline in service to these areas is not necessarily an undesirable development--abstracting from geostrategic considerations. Like the extractive resource sector, much of the maintenance of the transportation network, largely rail, could be financed internally through tariffs and fees.

Improvement of the telecommunications infrastructure and the spread of the Internet in Russia could greatly facilitate the development of a market economy in Russia. Virtual connections across Russia's eleven time zones could create new connections previously impossible or impractical. The potential positive impact of the new technologies, however, will be mitigated if central or local authorities exercise too heavy a hand in attempting to control them.

Conclusions

A number of factors will influence the speed at which Russia converges with the West economically, if at all. Assuming that Russia's political development does not undercut continuing engagement with the West, it should be able to exploit what Alexander Gerschenkron called the "advantages of backwardness," or the ability to adopt technological innovations developed abroad without the costly and risky investments in discovery that innovation entails. This is related to the modern notion of income or productivity convergence--the tendency for relatively poor countries to experience more rapid increases in productivity and income than relatively rich countries.

In terms of innovation, the most obvious issue is the degree to which intellectual property rights (IPR) are protected, inasmuch as the rents conveyed to the innovator are a fundamental incentive for innovative activity. Moreover, the degree to which IPR are respected will affect the form and content of technological transfer that foreigners will be willing to undertake. In this regard, Russia's prospective accession to the WTO could affect how its IPR regime evolves, educational incentives, and its rate of productivity and income growth.

Since Russia is a "follower" country, technological diffusion is likely to be more important than innovation per se in boosting productivity. Efficient markets for labor and capital are critical in this regard, and Russia's markets for these factors are not very efficient. Progress in developing land markets and, hence, better housing markets could facilitate the movement of workers and improve the functioning of the labor market. Creating conditions conducive to foreign direct investment, especially outside the natural resources sector, could play a major role in encouraging technological diffusion. Again, accession to WTO is one development that could encourage such diffusion.

Finally, technological innovation and diffusion elsewhere in the world have been encouraged by the concentration of economic activities in particular locales, Silicon Valley being perhaps the most prominent example. The Soviet-era pattern of dispersing economic activities frustrated this process. Moreover, it endowed Russia with a number of one-factory towns that understandably form a locale of political opposition to restructuring. To a certain extent, Russia's economic activity is becoming concentrated. The regions around Moscow and St. Petersburg, in particular, have displayed increasing growth of new activities such as "finance."

A key issue for the next twenty years is how far Russia is willing to go to facilitate this process of concentrating economic activities. The process would be encouraged by the development of better housing markets and better provision of local services on the one hand and by the closure of noneconomic enterprises on the other. Such developments would spur the reallocation of resources by increasing the capacity of receiving areas while pushing resources out of sending areas. Conversely, continued subsidies for non-economic activities and suppression of factor markets would discourage mobility and the efficient allocation of resources.

As noted previously, such a reallocation would promote greater variability among sub-national jurisdictions in income levels and demographic characteristics, contributing to divergence between areas with concentrations of relatively young and rich populations and those with relatively old and poor populations. Such developments would presumably pose political issues with regard to equitable sharing of social welfare burdens, for example.

The existence of a large natural-resource-based extractive sector ensures that Russia will inevitably have the characteristics of a rent-seeking society in which considerable resources are devoted to allocating rents generated by the extractive sector. The state remains an essential mechanism for distributing wealth. The highly interventionist character of Soviet and post-Soviet economic policy and the relatively weak and underdeveloped nature of Russian political institutions reinforce the importance of rent-seeking over more socially productive forms of innovative or entrepreneurial activity.

The broad issue of the state's relationship to the private sector and issues such as transparency and corruption are fundamental to Russia's development over the next twenty years. Lack of progress in establishing a more rules-based economic system would discourage the development of an indigenous entrepreneurial class. This, in turn, would slow the rate of innovation and diffusion internally and forestall the possibility of exploiting emigre technological assets or engineering a reverse brain drain.

Likewise, ill-gotten gains on the one hand and concerns about expropriation of legitimately accumulated wealth on the other contribute to capital flight. Regularization of economic relations in Russia would reduce incentives for capital flight and indeed could encourage repatriation of capital currently invested abroad. Were this to occur, it would create greater domestic capacity to finance infrastructure investments. Ironically, the elimination of capital flight could contribute to "Dutch Disease" by encouraging ruble

appreciation and making the exchange rate movements more susceptible to terms of trade shocks. This could actually present an additional challenge to Russia's industrial sector.

Presentation Summaries

John Haaga

Population Reference Bureau

The Predictive Value of Demographics

Russian Demographic Trends and Their Implications

One needs to distinguish between two questions when discussing the predictive value of demographics: 1) Can demographers forecast the size and composition of populations? and 2) Would knowing the demographic future help us know the social, economic, or political future?

Population Projections

Demographers are excessively modest about their abilities--the purists insist on the term "projections" rather than "forecasts." When they prepare a projection, they are working out the algebraic consequences of various possible combinations of birth, death, and net migration rates. If you want to test some other combination you consider more plausible, then you do the math--put in some other combination and see what happens. The key idea in projections is the "cohort components" method, which has been in common use since the 1930s: Take a base-year population with a known age/sex structure, apply a set of age-specific fertility and mortality rates to it, and move it forward through time to any arbitrary future year. (For most countries, migration is not a major component of population change.) Population growth rates are calculated after you have finished adding up the separate age categories in a year; you don't try to forecast growth rates directly. The schedule of age-specific fertility and mortality rates need not be constant into the future, but one typically assumes gradual changes--a continued decline of fertility at all ages, for example, or a slowdown in the rate of improvement of mortality.

The usual practice for those making the projections is to present high-, medium-, and low-variants, which differ in the assumptions on one key component of population change. The usual practice for those using the projections is to toss out the high and low ones and use the medium-variant as a set of point estimates, the most likely forecast. In a way they are acting correctly, since other variables (growth rates of GNP per capita, per capita emissions of carbon dioxide or whatever) are usually forecast with greater uncertainty, so it is more important to test alternate scenarios in which they, rather than the population projections, vary. But in another way, they are setting themselves up for false conclusions, particularly if they take the medium variant to mean "what will happen utterly spontaneously, as a force of nature, without any further policy intervention." The more proper interpretation of the medium variant in most cases is

"what will happen if trends, including policy trends, continue"--no change in policy, rather than no policy.

There is not a lot of theory underlying the commonly used projections. Users of projections of the Russian population ought to be aware that for the two fundamental processes, fertility and mortality, recent Russian trends are outside the range of historical experience. The columns and columns of numbers printed out on the Russian Federation page of the biennial UN volumes are misleadingly precise, and the people who produce them are the first to warn us about that.

Fertility Trends

First, let's look at fertility. The total fertility rate (TFR) is a kind of hypothetical average of age-specific fertility rates--the average number of children a woman would have if she went through life subject to the fertility rates for each age that prevailed in this particular year. Replacement-level fertility, allowing for some deaths of children before they themselves reach average childbearing ages, is just above two.

Russia and the Baltic Republics, during the last decades of the Soviet Union, were following a European trend, dropping below replacement-level fertility by about 1970.

Until the release of the most recent set of biennial projections prepared by the United Nations, the medium variant projections for every country assumed that there is something especially attractive about replacement-level fertility--fertility rates would converge on 2.1 or so within a few decades, no matter where they were starting from. The 1998 projections, for the first time, allowed medium variant projections to stay below replacement level for an indefinite future, including Russia. This represents an acceptance of a proposition that most European demographers think is correct, that below-replacement fertility will continue in Russia for a long time to come and cannot be easily reversed by policy.

How low can the TFR get? The lowest recorded value for the period TFR in a sizable, "free-range" population was 0.8 children per woman in the former East Germany during 1992-95. This was plausibly attributed by Nicholas Eberstadt and others to a severe disruption of life after the fall of the Berlin Wall--young people traveled or scrambled for jobs or apartments during those years and did not have babies. But there is little indication of things getting back to normal, if by "normal" we mean replacement-level fertility. Nor is low fertility limited to populations that have undergone severe shocks to their systems. Period fertility rates below one child per woman have persisted in the Basque country in Spain and in much of Italy during the 1990s. The Baltic countries, and many countries in Eastern and Southeastern Europe, on both sides of the former Iron Curtain, have total fertility rates below 1.5, and these low rates have persisted for several years. Much of Western Europe and Scandinavia lives with total fertility rates well below replacement level: Sweden is unusual in having had a rebound of sorts during the 1990s. There is some discussion in the demographic literature of whether there is a minimum long-term fertility rate for a large-scale population. A TFR below 1 is

consistent with perhaps a quarter of women remaining childless, voluntarily or involuntarily, but most people experiencing parenthood.

The difference between high, medium, and low projections of fertility lead to different estimates of the size of the Russian population in 2030, ranging from 126 million to 150 million (the 1995 estimate was 148 million). This looks like a broad range, especially when we consider that under all three scenarios the median age of the population in Russia will be over 40. (In other words, the majority of Russians who will be alive in 2030 have already been born.) But in terms of the average growth rate over the course of 35 years, it's quite a small difference--roughly half a percent per year.

Trends in Life Expectancy

Russia had nearly caught up to the West in life expectancy in the early 1960s; in fact, Russia had caught up to Japan, a remarkable achievement. During the early 1960s, life expectancy leveled off and then started to fall in Russia, while it improved dramatically in the United States and especially in Japan. The gap grew steadily, except for a brief reversal of Russia's decline in the mid-1980s, during the years of Gorbachev's strenuous antialcohol campaign.

Two things are important to note:

- We should include the 1960s and 1970s in any discussion of the causes of Russia's poor performance in adult health. For obvious reasons, nationalists and communists in Russia would want to focus on the precipitate decline since 1989, an undoubted catastrophe. But from the purely trendspotting point of view, this decline can better be viewed as resumption of a steady long-term decline temporarily interrupted, we believe, by the antialcohol campaign, during the mid-1980s.
- The Soviet antialcohol campaign deserves more attention than it has gotten in the public health literature.

Can We Use Population Projections To Forecast Social Change?

Our second question concerns the use of population projections for issues more directly concerning most policymakers.

Sometimes useful implications fall out of population projections quite handily. For example, for developed countries, we know fairly precisely how many people are going to be eligible under current rules for publicly funded old-age pensions for decades into the future. The old-age population is the easiest to forecast over reasonable time horizons, because all the ones we will have for the next six or more decades have already been born, so we have to forecast only mortality and net migration.

My middle category, the "maybe" questions here, are those for which there is a strong relationship between the size and age structure of a given population and the outcome of interest, but there is also an important behavioral or technological variable intervening

as well, marring the accuracy of all forecasts. Housing is one of my favorite examples because one of my favorite former bosses, Barbara Torrey, as a young economist at OMB, wrote a chapter for an Appendix to the President's Economic Report in 1970 correctly predicting a big runup in house prices and new home construction during the coming decade. She saw the huge lump of Baby Boomers moving toward typical house-buying ages. Those same Baby Boomers are nearing the next sets of peak ages for changing houses, the years around retirement. Will there be a big selloff as we all try to sell large houses we no longer need to Generation X-ers? I hesitate to predict, in part because I have less nerve than Barbara, but also because there is a "per capita" variable that has changed greatly in the meantime, the number of square feet that a middle-class American expects to live in. Maybe we'll all stay put for awhile.

Finally, I believe there is a category of problems for which there are so many intervening behavioral and policy variables contributing to the outcome of interest that population projections are not of much use. This can be true even if the outcome in question is very highly correlated with standard demographic variables. Take murder, as an example. The pattern seen here is very typical, over time and across societies: murders are committed by young, draft-age men. Because of the Baby Boom followed by the Baby Bust and then an Echo Boom in the US in recent decades, there have been notable changes in the proportion of the US population in the murderous age/sex category. But homicide rates and the proportion of young men do not track well. Still less can we explain differences in homicide rates across nations by differences in the age structure of their populations. If your task is to forecast crime and social dissolution in Russia, you need much more information than the demographic projections will provide.

How To Use Projections

So what is my advice on how to use population projections in policy studies? How do we differentiate among these categories of problems?

First, do not overengineer the population projection in any real-life problem. This is especially so if your problem concerns adults and if your time horizon is a matter of decades and not centuries. (If your time horizon is centuries, I think I'd rather have your job.)

A second caveat is always to use five-year averages and smoother trends, looking for long-term changes. One should not get excited over spikes in time series or anomalous regional reports. The Russian statistical system (and the statistical systems of most countries, for that matter) does not yield to fine-tooth-combing.

The next bit of advice, which I have cribbed from a speech given by economist Alice Rivlin, is to always ask what will happen if the forecast is wrong.

Looking Into Russia's Future (or Peering Into Russia's Present)

Russia's population will not simply disappear. Will its population decline be halted by improving health, by a renewal of young people's confidence in the future, or by drastic

curtailing of reproductive choice? All three are possible, but I don't see anything in either the fertility or the mortality trend that would force either rate back to "normal."

Nevertheless, looking at several different projections forces us to think about choices and allows us to understand their deep implications. Perhaps the greatest value of demography lies just in telling us what is happening now, under the surface, in any society, including our own, and what has been going on the recent past. I would like to title a future talk, "The Retrodictive Power of Demography."

Murray Feshbach

Georgetown University and The Wilson Center

Demographic Trends

In trying to estimate the population size of West Germany in 2002 (obviously done when there was a West Germany) demographers used three scenarios. The high included a Total Fertility Rate (TFR) of 2.5, medium was 2.1, and the low was 1.3. To put things in context, Russia's current real TFR is below the lowest scenario for West Germany. If Russia's current birth rate and death rate holds constant, the Russian population could decline by 30 percent by 2050.

The situation will not hold constant, however. In fact, it will get worse. The fertility rate will continue to decline because a third of all Russian women cannot have children (due to gynecological problems that are often the product of sexually transmitted diseases). The rate of syphilis has risen by 40 times among 10 to 14-year-old females. As many as a quarter of all women are sterile due to poor medical consequences of abortion. Anemia in pregnant women has increased threefold. If one is concerned about intellectual capital, one should be concerned by the percentage of mentally retarded and disabled children being born in Russia, often due to alcohol.

Demographers aren't interested in the number of deaths due to tuberculosis, multidrug resistant TB, and HIV. I believe, however, that the total number of deaths due to these causes will be greater than the total number due to cancer and heart disease combined.

It is true that there was an increase in average life expectancy for two years before 1999. The average life expectancy for men had risen from 58 to 60 years. However, this has turned again and in 1999 was below 60. The people being affected by this low rate of life expectancy are men in their working years. As a consequence, this has dramatic effects for the military and the economy as a whole (as opposed to older people dying or infants dying).

The current total fertility rate in Russia is 1.17 (well below replacement rate). It takes on average 10 years for fertility rates to turn upward. The peak was in 1987 at 2.2 children per woman. The Russians are now at 50 percent of their 1987 peak. They have never

reached 2.5 children per woman--which is the typical high scenario in population projections.

Not only do the Russians suffer from infectious and parasitic diseases that affect the Third World, they also have first world diseases of cancer and heart disease--at two to three times higher than in the US.

The years to come in Russia will be grim indeed from a demographic standpoint. So also stated President Putin in his first State of the Union message in the summer of 2000.

Timothy Heleniak³
World Bank

Migration Trends in Russia During the 1990s

Migration as a component of population change and the impact that it has had on Russia and the Russian regions is often overlooked. This is not surprising given some of the dramatic fertility and mortality trends that have been occurring in Russia and some of the other transition states of Europe and Asia. Trends in both international and internal migration and the impacts that these trends have had are explored below. (International migration is defined as migration between Russia and other countries, even though at the beginning of the 1990s this type of migration was technically internal.)

External Migration

- For most of the Soviet period, the predominant migration pattern was outward from the core of the Russian state to the non-Russian states of the FSU and toward Siberia. This trend reversed itself in 1975, and the return migration increased dramatically in 1992 when the Soviet Union split up and the economic reforms started.
- Net migration to Russia peaked in 1994 at over 800,000 persons. Net migration has fallen since then to just 300,000 in 1998.
- The breakup of the Soviet Union accelerated migration trends out of central Asia and the Transcaucasus while reversing trends from the Baltic and other Slavic states.
- Migration compensated for some of the slowing natural increase of the population, but since 1992 it has not been sufficient to compensate entirely; since then the population has been declining.
- Between 1989 and 1998, there has been a positive net migration of 3.3 million into Russia. This consists of a positive net migration of 4.2 million from the other FSU states and a negative net migration of 900,000 to the "far abroad."

- Of the total net migration between 1989 and 1998, about 40 percent has been from Kazakhstan, 20 percent Uzbekistan, and ten percent each Tajikistan, Azerbaijan, and Georgia. Overall, just over 10 percent of the Russia diaspora in the non-Russian states has returned--half or more from the Transcaucasus and Tajikistan.
- With the exception of Belarus, there has been positive net migration from all the other FSU states into Russia.
- Net migration to the "far abroad" has been much less than expected (about one percent of the 1989 population) and been rather steady, averaging just less than 100,000 persons a year from 1990 to 1997. About half of this migration has been to Germany, a quarter to Israel, and about 10 percent to the United States.

Internal Migration

- The predominant internal migration pattern during the transition period has been out of the North and Far East toward European Russia.
- The region defined as the North has had an out-migration of over 10 percent of the population with regions such as Magadan and Chukotka losing half their populations.
- The Russian North was over populated as compared to northern regions elsewhere in the world. There are 11 northern settlements in the world with a population over 200,000, and 10 of them are in Russia. The exodus from the north started in the late 1980s and accelerated with price liberalization and the start of economic reforms in 1992.
- Like migration elsewhere, the migration from the Russian North has been age, sex, and occupationally selective, favoring young males in industry leaving an increasingly elderly population in the North.

Migration Patterns Following the August 1998 Ruble Devaluation

- Migration out of Russia increased by 18 percent in the last four months of 1998 after declining by 15 percent in the first eight months. Overall, the number leaving Russia declined by 20,000 between 1997 and 1998, while those coming to Russia declined by 70,000. Emigration to Israel has doubled since the ruble crisis.
- The migration from the North seems to have slowed considerably, probably due to the inability of people to migrate and the lack of opportunities elsewhere in the country.

Implications of Migration Patterns

- Loosened border controls have caused there to be nearly one million transit and illegal migrants in Russia.

- The rapid migration following the breakup of the Soviet Union and the onset of reforms has left warped age structures in both sending and receiving regions.
- If the experience of other empires serves as a guide, empires take a long time to dissolve. Russia may not be done breaking up, and population movements may not be over.

Michael Sacks
Trinity College

Economic Decline and Shifts in the Labor Force

The collapse of Russia's economy in the 1990s has been associated with a steady decline in the size of the employed population. There is considerable unevenness in the change both across regions and across sectors of the economy. Construction and sectors of industry, for example, have contracted most sharply, while areas of the service sector have been growing.

Data on the employment of workers in 14 branches of the economy for the period from 1990 to 1995 suggest that change in the labor force is contributing to increasing regional differences. Workers in the most dynamic sectors are becoming increasingly concentrated in a few regions. The important expanding area of credit, finance, and insurance shows this in particularly stark manner. The regions around Moscow and St. Petersburg together comprised nearly a quarter of all workers in this branch in 1995, up from one-eighth in 1990. The regions that showed the greatest growth in credit, finance, and insurance were the regions with the largest total labor force. Wage data revealed a surprising curvilinear pattern, rather than a steady growth in regional inequality. Regional variation in average monthly wages increased sharply between 1991 and 1992 and continued to rise through 1994. But in the next few years regional wage variation showed a small but consistent decline. A similar curvilinear pattern was apparent in the within-region of wages across 16 branches of the economy. The differences among branches increased sharply between 1990 and 1992, but between 1993 and 1995 the level of variation declined. This pattern can be attributed in large part to the precipitous rise and then decline in the relative wages of workers in credit, finance, and insurance--the most highly paid branch of the economy.

As in the Soviet period, gender remains one of the most significant dimensions of inequality. Women face more blatant discrimination and continue to be impeded by their far greater assumption of child care and other household responsibilities. The curtailment of subsidized social services has made their situation particularly difficult. A striking indicator of gender difference is the fact that, in July 1996, males comprised 82 percent of all the heads of small enterprises (defined as having between five and 100 employees).

Women were far more likely than men to be displaced from the labor force, and men appear to be shifting much more rapidly than women into newly expanding branches.

Thus, regional variation is likely to be far more attributable to the employment patterns of men than of women. The study of gender differences in change, however, is seriously compromised by inconsistencies in statistical data and the sparse information on regional variation.

Susan Lehmann

American Councils for International Education

The Societal Consequences of Demographic Trends

At the end of every political era in Soviet history, scholars have been overwhelmingly inclined to believe that the policies of the new political leadership would be a continuation of the old. And scholars have been resoundingly wrong each time. This leads me to ask, "What if Russia's economy were to take off in the near future?"

Regional Variation in Age Structure

If one examines the percentage of the population which is currently under age 18, what jumps out is that, with the exception of St. Petersburg, the oblasts with the fewest young people are located in the Central Region less than 320 kilometers from Moscow.

Conversely, the regions with the largest percentage of young people are generally several thousand kilometers from Moscow, much less ethnically Russian, and are home to major non-Christian religions.

- On the plus side, our 1997 study of high school seniors found that Russians living in ethnically diverse oblasts and republics were more tolerant of other ethnic groups and religions than Russians living in Russian-dominated oblasts. Thus, it is perhaps a good thing that a growing proportion of Russia's youth is being raised in an ethnically diverse environment.
- On the minus side, the regions with a large percentage of young people are currently very dependent on natural resource extraction-based industries. There will be fewer modern employment opportunities awaiting youth in their home regions. If the economy improves, some of Russia's labor force will need to migrate to Central Russia to find employment. Yet on average the non-Russian youth can be expected to have much lower proficiency in Russian and Western European languages. These youth may find Central Russian culture and values alien. The bottom line is if politicians assume that the dominant social concerns of the Central Region of Russia are typical of all of Russia, they will establish national policy priorities that ill fit some of the regions.

Childbearing Patterns

Much has been made of the drop in the birth rate. The real question, it seems to me, is whether this drop is permanent or temporary. I see the Russian situation as parallel with that which prevailed in the United States in the early 1980s, when people feared a permanent drop in fertility rates. What we later discovered was that women were

changing their behavior--having children later than previously. There was a small decline in the total fertility rate, but many births were postponed as opposed to precluded.

Our 1997 national survey in Russia showed that among currently childless young adults aged 24-32, 61 percent want two children. Only five percent of currently childless young adults want to end up with no children. A two-thirds majority of all respondents desired two children. If the new political regime is more successful in turning the economy around than the last, I think that a baby boom will occur.

- Such a boom would not be universal, however. In July 1998 we interviewed 1,800 Russian entrepreneurs and small businessmen. What is striking is how many fewer children entrepreneurs have at a given age when compared with the general population. These data suggest to me that a new, more Western-oriented subgroup exists in the Russian population. This group would be less likely to participate in a baby boom.

Vladimir Kontorovich
Haverford College

A Case Study: The Far East

There are two important demographic trends in Russia today:

- An aging and declining population driven by low birth rates.
- Migration from the peripheral areas settled during the earlier era of demographic and territorial expansion: from the Northern, East Siberian, and Far Eastern economic regions to European Russia.

East Siberia and the Far East comprise 60.5 percent of Russia's territory and 11.2 percent of its population. Both regions are extremely sparsely populated (2.2 and 1.2 people per square km). Migration and natural decline will further reduce the already-low density of these regions. The most likely future for East Siberia and the Far East is the continued decline and aging of their populations, economic stagnation, and net subsidization by the rest of the country.

- At present, the rate of outmigration is limited by the absorptive capacity of European Russia. If the Russian economy continues to improve, the outflow of people from the periphery will accelerate.
- These regions' low population density and remoteness from markets make it infeasible to locate manufacturing there. Manufacturing built under Communism has died or is dying, and it will not be replaced by new investment.

- Natural resource extraction is a viable sector in East Siberia and the Far East, but it cannot absorb the workers displaced by the decline of manufacturing. The natural resource sector itself needs to lay off labor in order to stay afloat.
- Rents from some of the natural resources will shore up some of the provinces in the Far East and East Siberia. However, the rents will be too small to halt the outmigration in these provinces or to spread around neighboring ones.

Attempts to resettle East Siberia and the Far East with Russians, Slavs, or Russian-speakers in general will be futile. These groups of population themselves will be shrinking in the future, and more attractive migration alternatives will be open to them.

- Perhaps the only hope to inject economic dynamism into these regions is to allow Chinese immigration and settlement. The Chinese will put to use resources that are neglected now, boost these regions' trade with China and the rest of the world, and increase market size so as to make viable the location of manufacturing plants there.

Historically, societies that sustained population growth have conquered or otherwise absorbed their less-populous neighbors. East Siberia and the Far East have only two things between them and absorption by China: the Russian nuclear deterrent and their bad climate.

Jacob Kipp

Foreign Military Studies Office, US Army Training and Doctrine Command

Russia's Demography and Its Military

Throughout its modern history--from Peter the Great until the present--Russia's population has figured significantly in the calculation of national power. Peter's ability to raise a standing army from among the Empire's serf population and to staff it with competent officers played a significant role in Russia's victory in the Northern War and continued to be a decisive factor in Russia's place in the European balance during the wars of Elizabeth, Catherine the Great, and Paul.

In the 19th century, the military--which played a leading role in developing scientific methods of population counting--gathered information on the mobilization potential of the Russian state and its potential enemies. In 1874 Russia got its first law on general conscription of all estates, which provided the basis for a mass mobilization army. Russia could reduce the size of its standing army, as it passed cadres through shorter terms of service it kept them available for callup in case of mobilization. Scientific demographics lagged behind these military efforts. The Soviet Union conducted six censuses, the last one in 1989. Taking a census in Stalin's Soviet Union was a dangerous business: witness the repression of the census of 1937 and those who took it.

The rapid growth of Russia's population and the mechanism for mass mobilization created in Europe, especially in the German General Staff, the impression of a Russian "steamroller." But Russia's numbers, however imposing they may have seemed in Berlin, Vienna, London, or Paris, did not translate into a capability for the rapid projection of military power. This was due in part to low population density, which translated into a slower mobilization process.

After the war, revolution, and civil war, the Soviet state and Red Army retained a keen interest in the calculation of mobilization potential--both domestic and foreign. As a rule of thumb, the Soviet General Staff assumed that a state could put under arms roughly ten percent of its population in case of general war. In actual fact, the Soviet war economy proved more effective than that in raising forces and sustaining domestic industrial production when tested during the Great Patriotic War. One of the great continuities of the Soviet military system was the retention of such mobilization potential throughout the Cold War, even after the introduction of nuclear weapons and intercontinental delivery systems. Demographics--the results of the population losses during the purges and World War II--was one of the factors that led Khrushchev toward manpower cutbacks and greater reliance on strategic nuclear forces. But the mobilization system survived, and even with the front load of active units deployed in Central and Eastern Europe, the Soviet strategic system still relied upon that mobilization system to provide follow-on strategic echelons for strategic-operational actions. By the late Soviet period, demographic trends--declining birthrates among Slavs and increasing birthrates among Central Asians--were raising serious questions regarding the effectiveness of the existing mobilization system, especially after the deployment of troops from Central Asia to Afghanistan.

One of the demographic consequences of the Soviet military economy was the mass movement of population--often as slave labor--to peripheral regions of the Union in order to provide a military-industrial base in those regions. Such policies created highly urbanized and industrial regions that were dependent upon the center for transfer payments to maintain the regions. With the collapse of the center and the loss of resources, these regions have become economically untenable and militarily vulnerable. Three particular military-industrial complexes deserve serious attention in this regard: that created to support the Northern Fleet on the Kola Peninsula; the Trans-Baikal complex that was supposed to provide industrial base and deployment area for operations against Manchuria; and the Far East complex, based on the maritime provinces and centered upon Vladivostok.

With the collapse of the Soviet Union, Russia lost a large share of the population base upon which the USSR's mobilization system depended, yet retained many of the peripheral areas that had been built up under the Soviet war economy. The continued decline of the national economy and the decline in the male draft-age population called into question the viability of the old mobilization system. Evidence suggests that this latter trend will only worsen. There will be no "Russian steamroller" in the 21st century.

Moreover, the potential military threats to Russia are radically different and raise very different force requirements than those of the Cold War. The old mobilization system is irrelevant to the current requirements for rapid deployment forces for crises on the periphery. The revolution in military affairs requires not masses of troops but well-educated and trained cadre who are at home with electronic and computer systems.

Russia has gone from a state where its population resources were perceived to be a clear and apparent manifestation of national military power to one in which regional imbalances and ecological-economic crises have made demographic trends into an explicit vulnerability. The acute problem of low density of population to area and the continued existence of multiple threat axes can only become more acute as Russia's population declines in the first half of the next century. A smaller, mobile, professional military would be a potential answer to these issues. However, the immediacy of the threats requiring ready-response forces and the inability of the national economy to provide the necessary funds for such forces precludes any such solution for the near future. In the absence of conventional mobilization potential and easy access to the precision-strike technologies of the revolution in military affairs, Russia's military, as we recently witnessed in "Zapad-99" exercise, is forced to rely upon nuclear weapons to "manage" regional conflicts. This is not a development that can be treated as a positive trend, precisely because it raises the risks of miscalculation in a crisis situation. Strategic nuclear weapons still may convey political status, but they are of marginal utility to deal with the peripheral crises facing Russia or the long-term implications of demographic decline.

Trends in Russian Intellectual Capital

Nancy Birdsall

Carnegie Endowment for International Peace

Education, Globalization, and the Demands of the 21st Century

I have been asked to talk about education, globalization, and the demands of the 21st century. I have three simple points. First, at the individual level, intellectual capital is **the** critical asset in a global world. By intellectual capital, I mean education and the ability to acquire knowledge. Second, at the country level, good education policy, though necessary, is not sufficient for economic growth. And third, the key to more relevant and better education for a nation is not only, or even primarily, the education system; the economic demand for education is what matters.

Education is the critical asset at the individual level

Private returns to education in the form of wages are up everywhere in the world. In the United States, the ratio of wages for college graduates to wages for high school graduates has increased tremendously since 1980. It is only in the last year or so that

the ratio has begun to level off. It is the same story in Latin America, where skilled labor is relatively scarce. In almost all Latin American countries, real wage growth for skilled labor has far outpaced that for unskilled labor.

The general trend of market reform is behind this. As countries liberalize their economies, education becomes a more important asset. This is seen in Russia and other economies in transition, where the return to education has gone up in recent years. In Russia, the returns to a year of education more than doubled between 1991 and 1994.

Private returns to education are on the rise because education is becoming a scarce commodity in the market. With economic integration and technological change, opportunities for educated workers can increase faster than opportunities for the unskilled.

Finally, returns to education are not only going up on average: the premium to education is greater the more education a person has. This is a partial explanation for increasing wage inequality in the US and elsewhere.

Two theories are used to explain the increasing demand for skilled relative to unskilled labor and thus increasing returns to education (and increasing inequality of wages) around the world. The first blames trade and economic integration (globalization). The second blames changes in technology (the demands of the 21st century). It is no doubt some combination of the two--with trade and international investment at the least the vehicles for the rapid dissemination of new technology and thus new labor demands.

In the information age, the critical question is whether in the long run computers and the Internet will complement education and skill, as now seems to be the case, or substitute for education. In the US, technological changes seem to have been skill-biased, though in the case of computer and Internet use it could certainly be that more educated workers are a cause of more computer use.

Education is necessary but not sufficient for a country's growth

My main point at the country level is that though investment in education is necessary, it is not sufficient for increased growth or decreased inequality.

Education is an asset that can lead to higher growth. Additionally, education can have positive spillovers. Education enhances the value of other assets, including itself. This can lead to a virtuous circle, with more education leading to growth, which in turn leads to higher investment in education. Microeconomic evidence and high private returns suggest this to be the case. But there are a number of examples of high investment in human capital without high levels of growth. This was the case for the former Soviet Union, for Argentina, and for Ghana. Education alone doesn't contribute to higher income if uncertainty and market distortions undermine the harnessing of the potential skills in the labor market. In East Asia, for the decade prior to the recent crisis growth

was the output of a combination of macroeconomic stability, markets that worked, and human capital investment.

Demand matters

In the former Soviet Union, wage compression distorted the market and decreased the incentive for people to invest in education. In Latin America, government-subsidized incentives for physical capital put education and other forms of human capital at a relative disadvantage and led to a lower return to investment in education. Labor market regulations that reward seniority rather than mobility and public programs that encourage rent-seeking and reward cronyism all decrease the return and thus the incentive for families and individuals to invest in education.

Concluding remarks

First, a caution about the reliance on natural resources. Such a reliance is associated with a concentration of wealth and political power, which is also associated with the reluctance among elites to finance the education of the poor majority. Second, labor rights are an inefficient vehicle for broad social justice. Third, vocational training, which is seen by many as a quick fix for lousy education systems, can be a sinkhole for wasteful public spending. Vocational training works when employers pay for it. This is because training is a complement, not a substitute, for general education. Last, there is a critical role for public-sector investment in basic education, in basic research, and in other quasi-public education goods.

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Educational Patterns in Today's Russia

Russia inherited an "elitist" 1930s educational system from the former Soviet Union. It is a system that spends disproportionately on higher education, and especially on a handful of prestigious institutions, while leaving basic education woefully underfunded. Thus, while Russia resembles much of the rest of the world at the university level, it does not do so at the other levels. Now that Russia realizes that its current educational system is not suited for the 21st century, it finds itself short of the resources needed to reform it.

Given that the Information Technology Revolution becomes possible only when it is widespread, one must ask about the likelihood of Russia being able to participate. All of today's qualitative indicators are bad. There is no "creative destruction" of antiquated institutions taking place, and the growing income gap among the population is leading to a socio-educational division, in which the new wealthy class (20 percent) will send their children abroad to be educated or will avail themselves of expensive private education in Russia, the broad middle (60 percent) will receive an education inadequate to the demands of the global economy, and a growing segment of the population at the bottom end (20 percent) will be functionally illiterate. It is that middle 60 percent that presents a

serious obstacle for integration into the 21st century global economy. The country's skill levels are not going to be that of a superpower. While at some point technology can obviate the need for some skills, we are not yet at that point.

Russia's leadership does not appear to understand the value of spreading knowledge. Primary education has been reduced from five years to four, and the curriculum still focuses on providing data rather than on developing cognitive skills. In the "new economy" the key skill is the ability to learn new things and acquire new skills. Moreover, basic social conditions, especially child nutrition, reduce the effectiveness of any education. The result will be a work force that has basic literacy but which will be ill-suited for a market economy.

The current system is also elitist geographically in that the Moscow-based Russian elite does not perceive an interest in the quality of education in the provinces. The Soviet pattern, in which 80 percent of those studying at the (prestigious) Moscow and Leningrad institutions were from the provinces, has been reversed. Today, 80-90 percent of those studying in Moscow or St. Petersburg are natives of those cities.

In a country that can't provide clean drinking water for large segments of the population, the returns on which are enormous for the individuals receiving it, it would be a mistake to provide free higher education at public expense. Public funds should go into public goods.

One development worth noting is the shift of responsibility for education from the central government to local and regional governments, largely as a result of collapsing central government revenues over the past decade. That will have huge effects, mostly positive, and in that sense, the faster this change occurs, the better. It remains to be seen to what extent the Russian central government will move to be an agent of information and accommodation rather than seeking to do everything itself. There is an important role for the government as a supplier of information to make the Russian people better consumers of the educational "product."

That said, however, the educational system is **not** the leading indicator of change and is not the place to begin effecting change. The real spur to innovation is not education, but the economy. Russia needs to remove the country's underlying economic and social distortions before being able to successfully tackle the reform of the education system. In that regard, the likely attempts by the next Russian government to increase state involvement in the economy will only increase corruption and the waste of money.

Given the high productivity of the US economy in the face of widespread criticism of the American educational system, perhaps we are measuring the wrong things. There is some question as to whether official statistics capture the teaching of skills that may be taking place in non-traditional ways or the types of education that are encouraging innovation.

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Russian Educational Policy and Politics

On the one hand, Russia is experiencing an unprecedented "pedagogical revolution." This explosion of institutional diversification, curricular reform, and instructional and technological innovation is particularly strong in the social sciences and especially pronounced in the major cities and elite institutions. On the other hand, however, the public educational system as a whole is profoundly threatened by the deepening financial and professional crisis that could permanently degrade Russia's intellectual and human capital. Such systemic degradation--which may already be near or past the "tipping point" of irreversible damage--directly threatens Russia's prospects for sustainable democratic and market reform and could contribute to political reaction, social disintegration, and regional fragmentation.

The past decade has witnessed an unprecedented array of international assistance programs for the reform of post-Soviet education. These programs have been vital to nurturing and sustaining the "pedagogical revolution" by supporting new institutions, faculty and student exchanges, conferences, publications, and the integration of at least part of the Russian educational system into the global network of information technology. Yet there have been several persistent problems with these assistance efforts. They have often been poorly coordinated and marked by parallelism, self-defeating rivalries, and unrealistic expectations. International donors seem to have paid the least attention to those sectors that have been the most severely degraded over the last decade: preschool and early childhood education, secondary vocational education, and rural and minority education. Furthermore, much of this international assistance focused either on nurturing new or private institutions or on supporting individuals outside of their institutional and professional contexts. Such strategies left many state or public institutions largely unreformed or returned individual researchers and educators to their conservative and stagnant institutions after the conclusion of their limited grant support or exchange experience.

Within the Russian educational system, virtually all of the actors seem to be struggling simply to sustain themselves, with few able or willing to address the imperatives of systemic reform. The Ministry of Education witnessed the steady erosion of its administrative capacity and budgetary resources throughout the 1990s. Nonetheless, the Ministry still plays an important role in setting and coordinating educational policy and academic standards. While several prominent reformers, such as Viktor Bolotov, remain within the Ministry, it now seems to be increasingly dominated by traditionalist and Communist elements tied to the Russian Duma and the Russian Academy of Education.

The Trade Union of Workers in Public Education and Science still includes more than a million members and continues to collect dues. Yet the Trade Union has seemingly also been largely paralyzed by the ongoing educational crisis and has confined itself to

obstructing "reforms"--such as staff cutbacks and "privatization"--that threaten its members. The Union continues to lobby for the payment of wage arrears, and yet wages remain dismal and teachers' strikes persist. A draconian new labor code that is under discussion may cripple the "official" union movement, yet the potential remains for serious civil unrest and "wildcat" labor actions led by impoverished professionals and teachers.

Regional governments remain problematic actors at best in the politics of Russian education. Only a handful of so-called "donor regions" are able to adequately fund educational services. The regions are frequently accused of diverting or blocking federal expenditures earmarked for education and other social services. Most important, in the chaotic rush to decentralize financial and administrative responsibility in education, few safeguards were in place to prevent powerful regional or institutional interests from carving out authoritarian fiefdoms for themselves, or from partially "privatizing" educational property and services. While some regions have responded creatively in restructuring and consolidating institutions or in developing new, more local curricula and teaching materials, there has also been an upsurge of ethnocentrism and nationalism that threatens both local minority rights and national cohesion.

As for the educational institutions and the profession itself, there have been both enormous gains and catastrophic losses. On the one hand, many institutions have gained real autonomy and individual instructors and teachers a significant measure of educational and intellectual freedom. On the other hand, almost all are constrained by widespread institutional inertia and financial crisis. Ironically, the rush to decentralize often empowered rectors and administrative authority at the expense of faculty and staff. Despite some innovative new approaches to teacher education, there has been a catastrophic "internal brain drain" out of education, especially of younger faculty and those with the most urgently needed skills, such as computer literacy and foreign languages. The median age of the teaching corps is rising, and those faculty and staff members who remain are exhausted by having to hold multiple jobs.

Finally, there is the long-suffering public, especially parents, and students themselves. While some have flourished in the new conditions of expanded academic freedom, the vast majority of the Russian public has witnessed the steady erosion of both quality and equity in Russian public education. Student unrest and mobilization against mandatory tuition payments hold enormous potential both to destabilize the system and to paralyze needed reforms. More ominously, the catastrophic health and environmental problems facing Russian children and the dismal conditions in many preschools and elementary schools directly threaten the "readiness to learn" of virtually an entire generation.

It is hard to escape the impression that the fundamental premises of the "radical" educational reforms of the early 1990s were, in hindsight, fatally flawed. Rapid decentralization, chaotic "democratization," and involuntary privatization did not, in fact, foster sweeping institutional reform and spark an upsurge of professional activism.

So, what is to be done?

- First, there is an acute need to sustain and expand our own research capacity, the better to guide international assistance efforts in support of educational and social policy reform in all of the Soviet successor states. Furthermore, international public and private assistance efforts need to be much better coordinated.
- Second, there needs to be much more attention to sustaining and building professional networks and associations, as well as strong teachers' organizations that are committed to reform. It is meaningless to talk of democratizing curriculum and instruction if there are few active professionals left to implement such reform.
- Finally, a renewed focus in both international assistance programs and Russian domestic policy on the unglamorous yet vital field of teacher education and in-service training could help directly revitalize the professional capacity of regional and local educational institutions and local schools.

There is, of course, a real danger that such a drive for increased professional power could further entrench existing academic and administrative elites or that it could create new mechanisms to "trap" or monopolize federal, regional, and international funds intended for reform. One possible defense against this would be to creatively leverage international assistance to try to foster meaningful structural and professional "democratization" within the system; for example, by helping cultivate new mechanisms for faculty governance, new practices to protect academic freedom, meaningful new roles and resources for individual departments, and intra and inter-regional research and teaching networks--in other words, to help faculty and staff build mechanisms for professional development with which to empower themselves.

Most important, any foreign-sponsored approach to further educational "reform" that would openly triage educational opportunity will, ultimately, cripple the system's potential for excellence. Such harsh austerity measures would also be politically untenable, given the widespread public commitment to equity.

While being cautious about the use of foreign models, one could argue that recent American innovations in teacher education and professional development are directly relevant to Russia's crisis. Efforts to rethink "teaching as the learning profession" through expanded pre-service teaching, classroom-level research, team teaching, and professional empowerment may be a useful paradigm to frame a new generation of Russian-American cooperation in our mutual pursuit of systemic reform in public education.

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Russia's Managerial Corps: Skills and Attitudes

Russia's new entrepreneurs often find themselves facing shortages of skilled labor suitable to the new activities and conditions. They also face difficulty in retaining skilled workers, and, in the case of managers of formerly state-owned and newly privatized enterprises, are finding it difficult to change the attitudes of the workers they acquired along with the physical plant. In response, they are having to resort to a variety of innovative approaches to human resource management.

In some cases they are investing in the skill-training of their existing employees, including management development programs in Russia and abroad. They also have to find ways to retain those in whom they have invested. Aside from the basic technique of improving overall working conditions, some enterprises have found it necessary to invest in new technology to create opportunities for innovation and creativity that will keep scientists from leaving for more interesting work, as well as in providing performance-based bonuses and stock ownership as rewards and incentives.

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Trends in the Russian Work Force, 1988-1998

Civilian Labor Force

Thirteen years ago, Stephen Rapawy estimated that the Soviet civilian labor force would grow from 149 million people in 1985 to 163.7 million in 1998, an increase of 14.7 million job-seekers. His estimates were right on track until 1990. He predicted that the civilian labor force would be 152.2 million in 1990, and that is precisely what it was. But then something went haywire. Instead of the civilian labor force of the former Soviet Union increasing from 152.2 million on the eve of its collapse to 163.7 million eight years later, the number of job-seekers plummeted 30.6 million to a mere 133.1 million in 1998. The decline was unprecedented in the postwar era. In a twinkling of an eye in demographic terms, the civilian labor force had diminished 18.7 percent. The same story was replicated in the Russian Federation. There were 82 million Russian job-seekers in 1991, which was forecast to rise to 87 million in 1998. But the actual figure was 71.4 million--a 13 percent decline.

The transfer of civilian job-seekers into the armed forces does not account for the sharp contraction of Russia's labor force. Rather, the decline is attributable to three overlapping factors.

- First, jobs which had been readily available during the Soviet period for those outside the "working age" (16-54 for women; 15-59 for men) disappeared, forcing substantial numbers into retirement. Rapawy's estimates for 1991 indicate that approximately 8.2 million people could be included in this category.
- Second, a general decline in health and a sharp rise in adult male mortality may be contributing factors.

- And last, many people who were discouraged by the hardships of Russia's economic transition may have turned to criminal activities such as prostitution and drug trafficking.

The official unemployment rate during the Soviet period was zero. The State provided paying jobs for all those legally obligated to work and for roughly 15 million others but without distinguishing whether this employment was voluntary, efficient, or even productive. The abandonment of administrative command planning and the emergence of product markets changed the labor market significantly. The potential labor force under these new conditions became the number of job-seekers willing to work at prevailing wages.

- In 1998 over 19.5 million Russians were unemployed, and the unemployment rate was 27.3 percent.
- Women have borne a much larger share of the adjustment burden than men. From 1985-1997, male employment fell 6.4 percent, but female employment fell 20.6 percent. The United Nations asserts that women in Russia tend to remain unemployed longer than men.

During the past decade, as regards employment, there has been a significant decline in the relative share of industrial activity and compensating gains for transport, communications, and other services. The latter can be interpreted partly as a progressive shift to demand-responsive activities, as can other qualitative improvements concealed by share statistics, but gains of these sorts, if any, have been few and far between in the industrial sector.

This brings us to the larger question of whether Russia? The big picture during the nineties has been one of diminished labor activity and even steeper declines in production, especially in industry. Labor productivity has plummeted catastrophically both in ruble terms and even more drastically from the perspective of purchasing power parity.

There appears to be a recognition that Russia's economic transition failed, at least in its first stage, and consequently that the fate of its workers depends predominantly on whether the Kremlin can succeed in modernizing and competitively integrating itself into the global economy. For the moment, bolstering aggregate effective competitive demand for Russia's products is key. Labor skills, training, and education are secondary considerations. If tomorrow merely replicates today, the Russian labor force will continue to be misemployed on a grand scale as it has been since the Bolshevik revolution, exacerbated by acute involuntary unemployment. And it is not out of the question that the situation could get worse. The possibility of a disciplined Chinese authoritarian-laissez faire solution stressing a new arms buildup and modernization likewise should not be excluded.

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The Impact of Brain Drain

While external brain drain of active Russian scientists and engineers has been limited during the past decade to 1,000-2,000 specialists per year, there has been a massive internal drain of technical talent away from R&D facilities into maintenance shops, commercial trading organizations, and other activities distant from their technical training and experience. Among the emigres, however, have been a few internationally known scientists and a significant number of highly talented young engineers. The impact of emigration on Russian research capabilities in a few specialties has been devastating, while the internal flight of specialists has been felt in almost all specialties. In addition to these traditional concepts of external and internal brain drain, new forms of brain drain have included the propensity of Russian scientists to publish reports in foreign journals that local colleagues can no longer afford and the hiring by foreign firms of top talent that remains in the country but must treat all discoveries as industrial secrets.

Most Russian specialists who come to the United States as emigres do not find positions in science, with the most successful using their language and entrepreneurial skills to find jobs in commerce. However, about 50 percent of Russian scientists and engineers who come to the United States as long-term (more than three months) exchange visitors or temporary skilled workers end up staying here, usually working in technical areas. During the past several years, a large number of computer software specialists have found permanent employment in the United States through this route.

The brain drain is rooted in the economic crisis that has dramatically reduced government funds available to support scientific activities and has forced industrial organizations to focus on meeting immediate financial requirements rather than making commitments to research activities with deferred payrolls. Thus, there has been a rapid decline in salaries in almost all sectors of the economy, much equipment is obsolete, and many research facilities are no longer operative. A few centers of excellence have survived, usually with the assistance of grants or contracts from abroad.

In 1992 there were about 900,000 active researchers in Russia. At present, 450,000 specialists are formally classified as researchers, but only about 100,000 spend more than one-half their time investigating unexplored terrain or developing new or improved techniques. While most of the remainder might like to continue their careers, they no longer have the supplies, facilities, and incentives to conduct serious research. Also, science and technology are no longer respected professions as in past decades.

About 60,000 scientists, engineers, and technicians have unique skills and experience that could be of interest to developing countries attempting to achieve advanced technology weapons capabilities. About 30,000 of them are in the aerospace sector, 20,000 in the nuclear sector, and 10,000 in the chemical and biological sector. An

estimated one-third are no longer affiliated with defense-oriented institutions, having either retired or moved on to other careers; another one-third are continuing to devote the bulk of their time to military-related activities, and the final one-third is attempting to convert weapons-related skills to programs with civilian applications.

The future continues to look bleak although there has been an upswing in enrollment of university-level students in the science and engineering faculties throughout the country. The employment outlook for graduates is not good, and most graduates are attracted to the commercial sector. The situation is very serious in the applied sciences since the very best qualified specialists may be hired by foreign firms--often with overseas employment in mind--while the less fortunate are left to find other paying jobs that are very scarce in the science and technology sector. The aging of the work force is a major problem; the pension payments are so low that there is little incentive to retire and make way for an influx of new talent at technical institutions. On the positive side, many former weapons scientists are losing touch with defense developments. Although from the technical point of view they are becoming less of a proliferation concern, from the economic perspective they may become increasingly interested in foreign contract opportunities. They simply see no hope of early economic revival in Russia. Foreign contracts and grants, particularly those of longer duration, are very important in reducing the likelihood of expertise to states with hostile intentions.

If the Russian economy improves, in time the brain drain may slowly turn around. The likelihood that Russians currently working abroad could be enticed to return to Russia or would even be accepted by those who have stayed behind seems low, however.

Russian Health Trends and Their Implications

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The Global Context: Health Trends and Economic Development

Multiple drivers affect health status and economic outcomes in complex, interrelated ways. The difficulty of parsing the impact of various drivers impedes the design of effective public policies.

Cross-national studies indicate that there is generally robust, positive, statistical correlation between literacy, urbanization, life expectancy, infant mortality, and per capita income, to name five factors. But the causal relationships among these indicators are less clear. (Indeed there is a positive correlation between the rates of death due to cancer and per capita income, but no one believes that the former causes the latter.) Moreover, the parameters derived from these studies (on the impact of per capita

income on infant mortality, for example) are typically larger than the actual changes observed over time in particular countries.

Detailed household level studies highlight two aspects of this phenomenon. First, the relationship between health status and economic income is subject to significant threshold effects. For example, nutrient intake, health status, and income are highly correlated for very low income populations, but there is a low income elasticity of demand for nutrients across whole populations. Second, there may be very strong interactions between household and environmental factors. For example, literate households may move to neighborhoods with access to safe drinking water, giving rise to a strong correlation between literacy and health status in particular communities.

As a consequence, much of what we think we understand in this area falls in the category of "stylized facts"--that is, suppositions that are usually, though not always true. Yet, these sorts of "rules of thumb," together with detailed understanding of particular circumstances, are critical for understanding how authorities might prioritize and optimally allocate limited public health resources.

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The Explosion of Tuberculosis

The rate of TB infection in Russia has exploded over the past decade, rising from 34 cases per 100,000 population in 1990 to 83 per 100,000 in 1998 (as a point of comparison, the US rate in 1998 was 6.8 per 100,000). The normal expectation is that approximately 10 percent of those who are infected will develop the disease.

During the Soviet period there was an elaborate system for controlling TB with the entire population undergoing annual TB screenings (a practice abandoned in the U.S. some 30 years ago), forced hospitalization of up to two years, a system of special TB hospitals, a seven-year follow-up protocol, and frequent use of surgery (as many as 20,000 per year vice 25 per year in the United States.). There was even a "Sanatorium Effect"--a decline in the infection rate even prior to the advent of anti-TB drug therapies as a result of the mere removal of infected persons from the general population.

With the advent of drug therapies, however, Soviet drug shortages produced a form of "therapeutic anarchy" that continues into the present. The WHO-recommended Directly Observed Therapy-Short Course (DOTS) protocol has been implemented in only seven oblasts (out of 89 oblasts and republics within the Russian Federation), and cure rates remain very low (60-80 percent vice 95 percent in the West). Russian patients tend to come in late to be diagnosed, often drop out of the treatment program, or have (or develop) Multiple-Drug Resistant (MDR) strains of the disease. The treatment costs for MDR TB are quite high--\$2500 per patient for the 18- to 24-month course of treatment (vice \$50 per patient for regular TB).

There is a general lack of support from the Ministry of Health for the anti-TB effort, and the hierarchical medical system provides limited access to information. The implementation of DOTS will require changes in the laws of the individual oblasts and republics. Moreover, there is no support system for socially marginalized populations (the homeless, drug addicts, prostitutes, prison inmates - the most likely to become infected). The World Bank has provided some \$100 million to Russia to expand the DOTS program, but even that sum will not cover the entire country with DOTS Plus; there is a shortage of trained personnel to spread the technique, and there is some concern over loss of jobs in hospitals as a result of the changeover to DOTS.

Money is clearly needed, and funding must be sustainable. A successful effort will also require a change in the mindset of the Russian TB community and significant prison reform. Most of the international TB community sees this as a generation-long process. The good news is that the Russian medical establishment is now working more closely with the World Bank. The bad news is that the risk of a truly explosive spread of the disease is very high, aided by the close environment in which many of those infected live. The prison system is an especially important breeding ground for TB, and infection rates there are in the 3,000-5,000 per 100,000 population range. Although the spread of HIV/AIDS into the general population presents yet another, and interconnected, health crisis, it may have the positive effect of drawing political support to the fight against TB.

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The Continuing Struggle With Alcohol

Russians continue to be plagued by alcoholism, an historical inheritance of the Soviet Union and the Russian Empire before that. Russians' alcohol dependency compounds Russia's other problems, such as high rates of divorce, mentally handicapped children, poor compliance with treatments for other diseases, etc. Treatment of alcoholism remains unsophisticated, based largely on aversion therapy. The effectiveness of such treatment is not sufficiently studied.

What should be done? Earlier efforts to limit alcohol consumption--most famously, Gorbachev's anti-alcohol campaign--failed because the Russians just were not ready for them. The Russians would benefit from a greater focus on prevention for adults and also for children and adolescents and more research studies about the problem. A greater recognition of the impact of drinking on pregnant women is required. More public education about the causes and impact of alcoholism could play a very useful role.

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The Ravages of HIV/AIDS

HIV/AIDS is a rapidly growing and severely under-reported disease in Russia. While the number of registered cases as of late July 2000 stood at 53,170, even Russian officials admit that the real number is anywhere from 10 to 100 times that. What is important, however, is not the absolute number, but the rate of growth, which is very high.

Moscow City and Oblast, the city of St. Petersburg, and the Kaliningrad region report the highest number of cases. Russia is now one of only two places in the world in which pediatric AIDS is a huge problem.

The growing number of IV drug users and young prostitutes is playing a key role in spreading the disease. Condom use among Russians is relatively low; a 1998 study showed that only 23 percent of women reported having their partners use them, and the rate reported by prostitutes was much lower. The spread of HIV/AIDS has been accompanied by an explosion in the infection rates for all sexually-transmitted diseases.

Public attitudes toward those with HIV/AIDS is not very enlightened--a shockingly large percentage of those questioned in one survey suggested killing those with HIV/AIDS--and the government has reportedly re-opened old GULAG camps to house HIV and TB-infected prisoners.

Prospects for dealing with HIV/AIDS in Russia are quite dim, and there is a grave risk of "auto-extermination."

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The Impact of Growing Inequality

What is the relationship, if any, between the economic reforms implemented in Russia in the 1990s and the mortality crisis that occurred during the same period? The mortality upsurge has been heavily concentrated among men in their prime working ages, suggesting that rising mortality rates may be at least in part linked to the substantial changes in the labor market that occurred in Russia during this period. In particular, could there be a link between the tremendous increase in inequality in Russia in the early 1990s and the mortality crisis that occurred simultaneously with this increase?

The relationship between inequality and mortality both within and across countries has become a subject of much interest and debate in recent years. Researchers also continue to debate the specific mechanisms that might generate a positive correlation between mortality rates and income inequality. One possibility is that increased income inequality may result in greater frustration and stress, which in turn may lead to higher

death rates (particularly due to cardiovascular disease). The positive correlation between inequality and mortality may also reflect increasingly unequal access to medical care and education, or it could operate through crime rates, with higher inequality inducing more crime.

One possibility particularly relevant for Russia is the idea that one's relative ranking in society may affect health: a sense of relative deprivation may create feelings of hopelessness or induce individuals to engage in risky behavior. The Russian mortality crisis has most severely affected men in their prime working ages, and this same group has experienced a substantial loss in wages, both real and relative, since the beginning of the reforms in Russia. For example, in 1991 men with 21 to 30 years of potential labor market experience earned 16 percent more on average than new entrants to the labor market. By 1994, this ratio had fallen to negative 4 percent, and men who would be at their peak earning years in other industrialized countries actually earned lower wages on average than did new entrants to the labor market. These changes in relative wages may be important in explaining rising mortality rates among older men of working age since it reflects a substantial devaluation of the human capital of these workers. The uncertainty in the labor market for older men combined with their loss of relative standing may also explain the astonishing suicide rates recorded for men in older age groups. Given the profound and rapid changes experienced by the Russian population in the last decade, it is likely that increased stress is at least in part responsible for the upsurge in mortality rates, and increased stress may in turn be due in part to increased inequality.

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Trends in Russia's Health Situation and Establishment

Until the mid-1960s, Soviet socialized medicine (SSM) served as a redeeming feature in an otherwise bleak totalitarian system. It was credited with a dramatic improvement in the health of the population. A health crisis began to develop at that time, signaled by an unexpected rise in mortality and decline in life expectancy. The crisis may be attributed to increased defense expenditure, a stagnating and inefficient economy, and the inability of SSM to deal with the transition from infectious to chronic conditions resulting from the introduction of antibiotics after World War II. Health expenditures decreased from an estimated 6-6.5 percent of gross domestic product to about 2 percent at the time of the regime's collapse. SSM constitutionally guaranteed universal (though not equal) access to health care, an historic first. Provided as a public service financed from the state budget, SSM suffered from severe structural problems and perverse economic incentives. Financed on the residual principle, riddled by over-bureaucratization, over-centralization, over-specialization, inertia, and rigidities, it paid miserly salaries to most of its physicians in an occupation that was overwhelmingly feminized. Isolated from medical advances in the rest of the world, its clinical practices were often obsolete and sometimes characterized as "free lethal medicine." It suffered

equipment shortages and heavily depended on the importation of pharmaceuticals from Eastern Europe and this undercapitalized its own pharmaceutical industry. There was little effort at health promotion to foster a healthy lifestyle for the population.

The collapse of the regime was seized as an opportunity to reform the ailing SSM mainly through the introduction of obligatory medical insurance, thus removing it from the budget. For a variety of reasons, obligatory medical insurance has not proven the panacea as expected, and medical care remains a most problematic area for the greater part of the population. Medical care is increasingly paid for by the individual (making a mockery of the constitutional provision of free health care, a provision inherited from the Soviet regime). The provision of such care has become polarized between a small group who can afford to pay for the best available privately, and a large group who cannot afford such care. Physicians have gone on strike arguing that a "hungry doctor is dangerous to health!" In addition, the collapse of the system of public health following decentralization and the devolution of power to the regions has facilitated the emergence and re-emergence of many infectious diseases and environmental deterioration that had been controlled under the previous regime. Not only is the explosive growth of AIDS a major emerging problem, but the reappearance of tuberculosis and particularly multiple-drug-resistant strains poses a threat not only to the Russian population but also to others because the ease of transmission given contemporary means of transportation.

Judyth L. Twigg

Virginia Commonwealth University

Challenges for Russia's Social Insurance

The financing of Russian health care suffers from institutional legacies held over from the Soviet period. These legacies can best be expressed in terms of two principles:

- The residual principle, in which health care was funded with whatever was "left over" after higher priority line items, such as the military and space programs, were funded.
- The expenditure principle, in which clinics and hospitals were faced with perverse incentives that focused exclusively on quantitative, gross output-oriented indicators and encouraged inefficiency and waste of scarce resources. (The term "expenditure" refers to the fact that rewards were offered to those who used more inputs in order to achieve a given quantity of output.)

Russia's challenge since the collapse of the Soviet Union has been to reverse the damaging effects of these two principles. The health sector's solution to the problem has been its system of Obligatory Medical Insurance, first conceived in 1991 and finalized in Russian law in April of 1993. The system collects money from employers on behalf of their workers via a 3.6-percent tax on the wage fund and from local

governments on behalf of all citizens who do not work. That money is channeled through 89 new quasi-governmental Territorial Health Insurance Funds to a network of private insurance companies which contract with providers on behalf of patients. Competition among providers and among insurance companies, as well as the insurance companies' activities in protecting the rights of patients, is supposed to raise the quality of medical care and ensure efficiency.

Has the insurance system reversed the residual principle? Yes and no. Health has certainly suffered less than other traditionally neglected sectors, such as education and cultural programs. But local governments routinely and brazenly shirk their responsibility for paying into the system on behalf of nonworking people, resulting in a dramatic mismatch between the amount of money available for health care and the comprehensive care promised to all Russian citizens in Article 41 of the Constitution. As a result, health care workers are dramatically underpaid with wage arrears a continuing problem and talented physicians leaving the profession in droves. Patients also suffer from increasingly open demands to pay out-of-pocket for care supposedly guaranteed to be free at the point of service.

Has the insurance system reversed the expenditure principle? Here the picture is even less positive. Because the Obligatory Medical Insurance system accounts for only about 25 percent of total Russian health-care spending, with federal and local budgets making up the bulk of the rest, the incentive structure which governs provider behavior is functioning poorly. Insurance-based incentives are not as the insurance law envisioned.

- There is still no real clear competition between providers: patients hold a widespread opinion that "all doctors are the same," and physicians' salaries are set according to a rigid scale.
- There is limited competition between insurance companies as well with many regions enjoying the services of only one or no insurance companies.

The only hope for competition-based efficiencies, therefore, comes from the development of a private health care sector, which so far is dramatically limited by a national legislature nervous about the impact of privatization on access and cost of services.

Many proposals are on the table for the future of health care financing in Russia, including:

- A bill before the legislature which would abolish insurance companies, essentially returning health care to the single-payer Soviet model.
- A merger of the social insurance and medical insurance funds.
- Abolition of the rigid salary scales for health care workers, an idea supported by the last several health ministers.

- A recentralization of health care administration in an effort to curb the waste stemming from politically motivated and needless duplication of health facilities by neighboring regions, non-health-related use of health care funds at the regional level, and instability in regional-level health care leadership.
- Restructuring of health services, including a de-emphasis of expensive hospital care in favor of outpatient testing and service provision and a move away from over-specialization of personnel toward more general practice physicians.

In sum, money alone is not the answer to Russia's health care ills. Money is a necessary but not sufficient condition to solve the many problems of the Russian health care system. The political will to overcome the residual principal must be accompanied by the restructuring necessary to overcome the expenditure principle. Otherwise, additional resources allocated to health care will be wasted.

Teresa Ho
World Bank

Foreign Assistance for Health Reform

Health care reforms in Russia need to be led from the center, but implementation must be left to the regions in close collaboration with the center. At present, however, only six regions are really implementing health care reforms, and the succession of health ministers have not proven strong advocates for reform.

Under these conditions, foreign donors need to serve as catalysts for reform, for real health care reform will not arrive in Russia over the next 10-20 years without a fundamental change in approach. Foreign donors can bring an aura of legitimacy to reform-minded Russians and build a constituency for reform. They must continue to work with the individual regions to pilot new ideas, but they must make the Ministry of Health a stakeholder by treating it as a partner in the reform experiments. Foreign donors can also play a critical role in the dissemination across regions of the results of reform experiments in particular regions.

Foreign emphasis on the need to privatize health care sets the wrong priority. The emphasis needs to be on specific projects. The World Bank has a growing portfolio of projects in Russia (\$336 million in ongoing projects and another \$118 million in planned projects). Projects that make a difference include those addressing women's health through education and making contraceptives available, and improving the quality of the blood supply. The provision of medical hardware should be only in the context of structural reform, providing additional incentives for reform. The need for medical equipment is enormous--\$3 billion would not be enough to meet the need. Donors should also avoid paying for recurring costs, such as drugs. The USAID programs are good examples of programs that are adopting the right approach. One other hopeful sign is the growing involvement of the Russian Orthodox Church in social services.

As regards the TB program, the best case scenario is that DOTS and DOTS Plus are adopted widely and work well, and that TB rates decline, although they are likely to go up sharply again once the full force of HIV/AIDS hits.

Trends in Russian Physical Infrastructure

Ricardo Halperin
World Bank

The Broad Context

Under socialism, Russia's approach to infrastructure was characterized by:

- Free (or very cheap) infrastructure services (including housing, but very low wages).
- Consistent neglect of maintenance.
- Weak local governments.
- Poor use of urban space.
- State-promoted urbanization, frequently without a solid economic underpinning.
- Neglect for environmental quality.

This has resulted in numerous negative consequences today, including a tremendous need for reconstruction due to the poor quality of materials used in the past; a decade of underemployment resulting from over-concentration of workers in cities; large shifts in demand for infrastructure services after 1989; and poor availability of infrastructure services. All of these are obstacles to private sector-led growth.

The lack of investment over the past decade also has contributed to the serious deterioration of infrastructure and associated services. The incipient and often unreliable establishment of rule of law, corruption, and political uncertainties have constrained private interest in investing in infrastructure projects. Transfer of responsibilities for some infrastructure services from central to local government was in some cases premature because local authorities often lacked technical, managerial, and financial capacity to handle the new tasks. Local governments can't service the debt, and the central government refuses to help. At the same time, prices to households generally remain well below costs, with limited targeting of subsidies.

As a result, infrastructure is a big problem in Russia on many fronts. For example, housing is a real issue. People are locked into whatever housing they have because the real estate and rental markets have not developed. Public transportation in many cities has deteriorated, because municipal governments can't replace old equipment. Roads are in bad shape: the road from Moscow to St. Petersburg--which presumably should be the best road in Russia--is only two lanes, and there are hardly any places where one

could stop for refreshments. Deterioration of water services in some areas could result in serious health problems.

Poverty is a big problem in Russia. Any attempt to help the poor through improvement in providing infrastructure services must be part of a more comprehensive effort to deal with the root problems. Otherwise the benefits will be short lived. There must be a commitment on the part of the government.

Priority attention should be given to:

- Development of land and real estate markets, including a financial system that will help those who want to build a house to obtain financial support. Operation of the financial markets and institutions must be addressed. Subsidies should be redirected only to those who really need them.
- Introducing good accounting systems and efficient management of assets. Good practices borrowed from the West should be helpful.
- Optimizing the division of responsibility between the national and subnational governments. Decentralization is desirable on political grounds, but in the short run it means that services are not being provided as efficiently as they should.
- Improving the legal and regulatory framework for private investment.

Under Yel'tsin, the government was broken at both the national and local levels; thus, foreign investment was unlikely. Options were therefore limited, leading to a bleak prognosis. The jury is still out for the new government.

Steven Rosefielde

University of North Carolina, Chapel Hill

The State of Russia's Capital Stock

New capital formation in Russia in 1998 was less than one-fifth the level of 1990. Half of this decline is explained by the decrease in Russia's GDP, and the rest by the reduced share of new gross fixed capital formation in the GDP from levels nearly treble America's in 1975 to a level less than 50-percent higher in 1999. The most important aspect of this sea change is that, despite its hyperdepression, Russia has been able to devote enough resources in real terms to maintain the absolute size of its fixed capital stock. This presumably means that if normal rates of capacity utilization can be restored, production could quickly recover to Soviet levels.

The Russian Government reports data on the capital stock, excluding land, forests, and minerals, divided into three components: fixed productive capital, circulating capital, and housing.

- Fixed productive capital--defined as installed assets and incomplete construction projects intended for use in the production of goods and services--accounted for 94 percent of the capital stock in 1996. Fifty-five percent of this fixed productive capital supported the production of goods; 45 percent, services.
- Circulating capital--including uninstalled machinery in warehouses and transit, other unsold inventories, semifinished goods and materials--comprised 2 percent of the capital stock, with the remaining 4 percent attributed to housing.

For purposes of international comparison, it is best to revalue Russia's capital stock in dollars. According to Abram Bergson's estimates of the reproducible capital stock (fixed capital and inventories), the Soviet capital stock was 79 percent of America's in 1975. During the next decade, this figure rose to 117 percent, rising to 135 in 1990. The Russian component of the Soviet stock was 62 percent, or 84 percent of the American level. However, the Russian statistical agency has changed its purchasing parity estimates several times during the nineties. Based on these revisions, the adjusted size of the Russian capital stock in 1998 is somewhere in a range between 36 and 44 percent of the American level.

Does this imply that if Russia miraculously used its capital stock to full capacity, that its per capita GDP would be restored to 68 percent of the 1989 US level (51 percent taking into account America's progress 1989-98), or to 34 percent (24 percent) at Goskomstat's 1998 purchasing power parity? Opinions vary widely. Some contend that most of the contraction in Russia's GDP is a plus rather than a minus because the goods foregone "subtract" value. To the extent that they are right, the dollar value of the capital stock is overstated unless these assets can be redirected to better use. At issue here is fungibility (the ability to modify characteristics of fixed assets). If the capital stock can be cost-effectively re-engineered to produce competitively, then the old stock can be modernized. If not, then as much as 50 percent of the stock may need scrapping.

Even though the Soviets may have narrowed the technology gap with the West from 1960-1980, the capital stock is still worthless from an international point of view because Russia's manufactures are unmarketable. (Its military-industrial sector is another matter.) The preservation of Russia's capital stock during the period of post-Soviet crisis is thus a mixed blessing. It gives the Kremlin the option of reverting to a closed economy but not integrating into the global market. Russia's civilian technologies have fallen further behind the West during the lost decade of the nineties, and it will take generations to catch up.

Matthew Sagers
PlanEcon, Inc.

Energy Networks, Power Generation, and Associated Infrastructure

Crude oil transportation infrastructure--the pipelines used for moving crude oil--has diminished. It is operated by a monopoly (Transneft') that is state owned but is also commercialized and fairly liberalized in terms of prices (tariffs). The field pipelines are operated by individual producers. One of the key things about pipeline infrastructure is the dramatic decline in the amount of oil being transported (about 48 percent of what it was in the late 1980s at its peak). This dramatic decline has been accompanied by pipeline bottlenecks. Before, the system was built with large amounts of internal capacity, with relatively small pipelines headed to international destinations. The main pipeline system was designed to move oil from places of production to an internal market in the former USSR; in the transition period, a larger proportion of total flows has been directed to international markets.

In the crude oil system, what is needed is more export capacity, since the domestic market is already saturated. About 2/3 of Russia's oil exports transit other states (Ukraine, Belarus, Latvia, etc.). Because of the bottlenecks, these states have exacted sizable transit fees. The Russians need leverage on transit fees by expanding export capacity to create more competition; they would also like to establish more capacity on their own territory. For Russia, oil coming from the Caspian producers is very lucrative, but the Russians need better export capacity to exploit this opportunity. The bulk of the network was installed in the 1960s and 1970s and needs to be replaced. The lifetime of crude oil pipelines is about 30 years. Despite this, the oil trunklines themselves are actually in pretty good shape. Transneft' has been flush with cash because of relatively high tariffs. The accident rate is down since Soviet days. The Russians also have achieved a sizable reduction in the amount of oil being spilled. The weakest link is the deteriorating field pipelines owned by the local producing companies.

Russia's gas pipeline infrastructure is entirely in hands of Gazprom. The distribution system is under other organizations. Gazprom is the big player in Russian gas, and its control of the transmission system, rather than its high percentage of the total amount of gas produced in Russia, makes it the key organization. There is a large amount of gas produced outside of Gazprom, but the other producers have no market unless they can move the gas to somewhere else. As a result, they are entirely dependent on Gazprom. Unlike the situation in the oil sector, where there is a huge decline in shipments, the gas sector has remained stable because the consumers do not have to pay for gas. As a result, gas consumption remained stable during the transition period, when the economy declined by about 50 percent. We do not know much about bottlenecks in the internal system, because unlike the case with oil, no one has commissioned studies to look at it.

There is little need for new gas pipeline construction. The pipelines are aging and will need refurbishment, but the gas pipeline system was not built until the 1980s, so the situation is not as urgent as with the oil pipelines. Reliability has improved considerably during the 1990s. Most breakdowns resulted from initial construction, so without new construction accidents have declined. New pipeline needs are tied to exports rather than internal usage.

Russia has the largest installed power generation infrastructure capacity in the FSU. The overall amount of generation dropped significantly during the 1990s but not as dramatically as overall GDP. There is a slight shift away from thermal toward hydro and nuclear energy. Russia's GDP growth is estimated at about 2.5 percent over the next two decades, while electricity generation is expected to increase by only 1.6 percent. Russia will not become a big exporter; most electricity will be used inside the country. Some restructuring of power usage will occur; industry will be a lower percentage, and households will be more important. As a result, a larger amount of generating capacity is required at certain times since households use more electricity at certain hours, unlike industry, which uses electricity more consistently throughout the day and night.

What will the Russians need in the future? According to the PlanEcon forecast, they will need some 242 gigawatts (GW) of generating capacity compared to 214 GW currently. But with retirements, they will need some 110 GW, mostly thermal (gas-fired). They already have an extensive electrical grid, although some needs to be spent on refurbishment.

Oil is the big ticket item. A great deal of money is required not just for pipelines, but for drilling (and upstream production) as well. Gas will not need as much investment to sustain production, although gas output will grow at a higher rate than oil.

Robert N. North
University of British Columbia

Russia's Transport Infrastructure

The past decade was one of almost unrelieved decline in the Russian economy. For transport this has meant, on the one hand, a decline in business, non-paying customers, and a lack of funds for new equipment. On the other hand, reduced traffic has meant a lack of pressure on the overall transport infrastructure. Routeways and terminals have been under used, and the need to scrap aging equipment has been offset by reduced demand.

Within that overall picture there are many points of strain because Russian transport is now operating in a different environment from that for which it was designed. Aspects of that changed environment include:

Legal and financial conditions. The legal environment has been adapted only slowly to the new society. There are still leftover laws from Soviet times and serious gaps in the legal system. For example, city transport is still required to carry many classes of passengers without payment, and it can be very difficult to pursue non-paying customers through the courts. As for the financial environment, transport firms are expected to arrange their own financing now, but the country lacks financial institutions oriented to their borrowing requirements.

Transport company-customer relations. In Soviet times, traffic was assigned to carriers in five-year plans. Now, frequent, sudden changes in demand require both flexibility and spare capacity.

Relations with government. There is now much less commercial direction of transport from the central government than there was in Soviet times. Transport companies now have to deal with several layers of government, which rarely act in concert. All are primarily concerned with raising money and therefore liable to tax anything that appears to be taxable.

The nature of competition. There was certainly competition in Soviet transport, despite official protestations of a "unified transport system." But different ministries competed mainly by political lobbying. Now there is fierce competition within and among transport modes, involving in some cases both licensed and unlicensed operators, as well as competition with foreign companies.

The geography of demand. Demand has fallen on many domestic routes and routes linking Russia to other ex-Soviet countries and Eastern Europe. It has risen on some routes to Western Europe and China.

A major effect of the changed environment has been to make international operations very attractive to any transport company that has the potential to engage in them, while some domestic operations have become extremely unattractive. This, in turn, has led to a focus on improving the infrastructure serving international operations, while that serving the domestic market has often been neglected.

These broad themes resurface as we examine the various transport modes.

Railways. The railways differ from all other modes in that they have remained under the full control of the federal government with their own ministry, albeit with more devolution of responsibilities to regional divisions than before. The decline in traffic means that the technical capacity of the railways is being used only about 50 percent at present. Import/export traffic is the only aspect that has grown, rising by about 30 percent.

Maritime transport. Sea transport has been denationalized, but 10 major regional shipping lines remain from the Soviet era. They compete with new shipping companies, but most competition comes from foreign shipping companies, which handle some 60 percent of Russian foreign trade traffic. Many Russian ships were actually transferred to foreign registry themselves, to be used as collateral for loans for new building. The fleets remaining under Russian registry are much smaller than they used to be and are old, badly fueled, and require large crews. Competition from the Baltic states--which got more investment during Soviet times than Russian ones and whose ports tend to be better sheltered and more accessible--has been severe. In the Far East, the ports have fared better because of a lack of foreign competition and their easy access to Northeast China, which is generating transit traffic. In 1993, the government--particularly concerned about ensuring deliveries to the North--announced a program for a revival of

the Russian merchant fleet, which involved government financing and guarantees. For the most part, however, the promises of funding have not been fulfilled.

Passenger transport by sea has virtually disappeared, and the ships have been sold abroad or used as cruise ships by foreign lines with Russian interests.

Inland waterways have suffered more than any other mode in post-Soviet times. Traffic has declined by about a quarter. They were responsible for moving goods to the North, more so than ocean shipping, but with the disappearance of subsidies for Northern development, shipments to the North declined precipitously. The rivers used to have a lot of passenger traffic, mostly by hydrofoils, which became far too expensive to operate. River shipping companies have instead concentrated on one profitable activity: river-sea vessels which can operate both on the rivers and larger canals as well as at sea and in coastal waters. Currently, of somewhat over 800 vessels, most are used in foreign traffic to go to the Baltic, the North Sea, the Mediterranean, and Southeast Asia. Nearly half the tonnage of Russian foreign exports has gone out in sea vessels rather than other ocean-going vessels.

Motor transport. Russian freight transport carriers have faced numerous challenges, such as conflicting regulations imposed by different levels of government, competition from unlicensed private operators, and competition from foreign companies, which often exceed their legal involvement in foreign operations to take on domestic transport as well. Russian foreign trade carriers also have the disadvantage that higher quality imported equipment, required to meet EU environmental standards, was very expensive for them.

In Soviet days, passenger transport relied on Soviet subsidies. Now there is virtually no self-supporting transport, but the state subsidies are gone. Of 1,300 cities with public transport, only 300 have concluded subsidy agreements with local authorities, the solution recommended by the government. If local authorities agreed to provide subsidies, 1990 levels of services might be restored by 2005.

Russia is very poorly supplied with roads by Western standards. There is no continuous East-West road across the country, although a plan has been announced to fill in the gaps in Eastern Siberia and the Far East in the next few years. There have been foreign credits obtained, but mainly for upgrading roads and bridges in the West. Many such roads are parallel to railroads that are underused.

Air transport. The extreme centrality of Moscow in air traffic that existed in Soviet times has changed. Aeroflot, which used to control everything, has become much smaller, and most of its regional divisions still operate as separate companies. The central government is encouraging amalgamation to reduce the huge number of airlines in the country, most of which are not viable due to the cutoff of subsidies from Soviet times and the decline in domestic traffic.

Some airlines have closed, partly a matter of competition, but some claim the main reason is the failure of the government and armed forces to pay their debts. Fierce competition has affected all airlines, and most cannot afford to buy new aircraft. The leasing system for domestic aircraft is very primitive, and the government has only just begun to step in to facilitate leasing of major aircraft. The airlines tend to prefer foreign products because after-sales service is superior and foreign planes can normally operate 11-12 hours a day, while locally produced ones can operate only 5-6 hours a day.

Airports are also controlled by separate companies now, though in fact they are controlled by regional authorities for the most part. Ownership of many northern airports has been transferred to enterprises or local communities, and many have closed. The disappearance of airports in the South has been still greater. In contrast, in the Far East, where there was one international airport, now there are six.

Concluding Thoughts

The Russian transport system is certainly struggling and most of it is unsuitable to post-Soviet conditions. A decline in demand has saved it, but how long can this continue? On the positive side, however, the companies have experienced a steep learning curve and are adapting and becoming competent. They need an effective legal and fiscal environment to provide the stability that will allow them to plan. With that, they could actually do quite well.

Clare Romanik

Urban Institute

Russia's Housing Stock

The Russians would like to increase their housing stock to replace housing in poor shape and to expand housing space per capita, but housing construction has fallen off since 1988. The existing housing stock is plagued with very serious maintenance issues because much of the post-Stalin housing was built with poor materials and poor workmanship, and most housing was poorly maintained under a monopoly system. Today, much of the residential construction remains unfinished, dwarfing finished construction. This is caused by lack of government funds, inflation, and the reluctance of the private sector to invest in long-term projects.

In recent years, investment by individuals and the private sector has increased, while state-sponsored construction has declined dramatically. In addition, a mixture of consortia--private developers, municipalities, and enterprises--are working together. Actual construction is being performed by workers from other former Soviet states, who tend to underbid their Russian counterparts. The private sector has also become involved in maintenance, thanks largely to the USAID Housing Sector Reform Project (HSRP), which introduced this concept. There are 2.3 million units in Moscow today that

are maintained by competitive private companies, and twenty other cities have introduced similar reforms.

The quality of housing construction has increased somewhat. There is somewhat greater connection to sewer lines, more central heating, better floor plans, larger units, and use of better materials (brick and wood). In 1996, the government started a new program to stimulate housing construction which encouraged using indigenous materials such as wood.

The real challenge is creating a housing market and encouraging more private involvement and investment. Privatization of residential housing has give Russians an asset with which they are able to purchase new housing, thus promoting housing construction and a housing market. Forty-two percent of the housing eligible for privatization has already been privatized. Pensioners have been the most proactive about privatizing, because privatization is necessary if they want to leave their unit to someone not living in the unit rather than have it revert back to the state after their death. Others have not been so eager because of concerns about maintenance and property taxes and the knowledge that they would always have the option with no time limit. Thus, in the past few years the privatization trend has tapered off considerably.

The introduction of housing allowances (also with the help of USAID's HSRP) will encourage housing construction by allowing rents to increase. Rents and utility fees have been stuck at very low rates--the top quintile spends more on alcohol and tobacco than on housing--but the government did not want to take the unpopular move of increasing rents, especially when there are new poor who would have trouble paying. Housing allowances are means-tested assistance to low-income families on the street. As rents increase, the return on housing will increase.

Mortgage financing is an important part of the housing market in developed countries. In 1996, the Russian Government established an agency to facilitate mortgage financing. The financial crisis of 1998--when wages declined while housing prices remained fairly constant--further slowed home purchase. The dream of buying new housing faded after 1998 and is only slowly recovering. Sustained low inflation, rouble stability, and reduced public debt will be essential to create an economic basis for a mortgage market.

DJ Peterson
RAND Corporation

Infrastructure and the Environment: The Cases of Water and Sanitation

Municipalities are a leading source of water pollution in Russia, discharging 52 percent of noncompliant wastewater to the environment. Sixty-nine percent of wastewater systems lack capacity to treat the volume and type of current flows. In 1997 only about 10 percent of wastewater requiring purification was treated to standard by municipal and

industrial facilities. Surface waters also are degraded by non-point sources--agriculture and livestock operations and urban and suburban development. The explosion in unregulated residential and dacha community development to the west of Moscow, for example, has threatened the city's principal watershed.

Most rivers, lakes, and reservoirs do not comply with Russian ambient water quality standards. Principal pollutants include biological contamination, nutrients, petroleum products, and heavy metals. Two-thirds of drinking water supplies come from surface sources, so water pollution has a significant impact on drinking water quality and public health. Groundwater supplies, in general, are cleaner, although many regions relying on groundwater (Samara, Penza, Tula, Rostov, Primorye) have reported problems. According to the Russian environment agency, Arkhangelsk, Kemerovo, Murmansk, Karelia, Primorye, Dagestan, and Sakha-Yakutia are the regions with the worst drinking water quality problems.

The Russian public health service reported that approximately 20 percent of samples taken from public water supplies in 1997 failed to meet health norms for physical-chemical criteria, and 10 percent failed biological criteria (as compared with 20 and 16 percent, respectively, in 1991). Substandard drinking water contributes to an estimated ten percent elevation in gastro-intestinal illness, and the 1990s witnessed an increase in reported cases of gastroenteritis, hepatitis A, and bacterial dysentery. According to one estimate using 1994 data and published by the Russian environment agency, water pollution imposed a cost of about one percent of official GDP, or about \$13 billion.

Communal infrastructure and services have been undermined by economic decentralization and dislocation. In the Soviet era, municipal water supply, sewage and wastewater treatment, solid waste disposal, and street cleaning and snow removal were funded largely by central budgets. Industries often provided such services free of charge to the communities around them. Responsibility for these services has now shifted to local governments and public utilities which lack the revenue-generating capacity, know-how, or political will to adequately operate and maintain systems in Russia's new environment. Metering and volumetric billing for water use and wastewater discharge typically cover only larger users. Tariffs are relatively high (an effort to soak those with deep pockets) but firms and public entities (schools, hospitals, the military) enjoying the support of officials often skip payments or resort to barter. Residential consumers are charged a modest flat fee. The bottom line is that Russia's utilities cannot cover their operating costs (e.g., reagents and electricity) and have deferred maintenance and capital investment. Bringing Russia's water and sanitation systems up to the standards of the European Union would likely cost hundreds of billions of dollars. Not surprisingly, system performance generally has not improved, even in the wake of the 1998 financial crisis, when demand for water and pollutant loads fell due to the drop in industrial activity.

Improving drinking water quality does not require capacity expansions, as commonly called for in development plans. Systemwide water loss is estimated to be on the order of 50 percent, according to the World Bank; Russia's environment agency has reported

that leaky faucets alone waste about 20 percent of the supply. Experience in Central Europe and the Baltics suggests that higher tariffs can reduce demand by 20-30 percent or more. Reducing water consumption will help ease treatment burdens and pollution loads.

For the immediate future, improving infrastructure and utility management are key. Developing a sustainable revenue stream will require higher tariffs and more effective metering and billing schemes that extend to residences and smaller businesses and penalize debtors. The public may oppose rate increases; therefore outreach will be required to show how higher fees can be offset through conservation and lead to better water quality. Programs to install low-flow devices and repair leaks in homes can further reduce water demand, while technical assistance to businesses can reduce or eliminate pollution loads discharged to municipal sewers. Utility performance measures must be changed from favoring delivery volumes to emphasizing productivity, profitability, and service quality. As with all state enterprises in Russia, staffs will have to be cut and operations optimized. Finally, insulating utilities from corruption and political influence and exposing these monopolies to sunshine, public scrutiny, and oversight are essential; otherwise management has incentive to extract rents and squander resources.

Over the coming decades, infrastructure performance across Russia is likely to vary considerably, reflecting increasing disparities in economic prospects and governance among regions and urban and rural areas. Some regions (Moscow, St. Petersburg, Novgorod) have identified better infrastructure and services as key to economic development and attracting foreign investment, and these factors are likely to be a key driver of change in the future. In any case, major international technical assistance to promote demand reduction, develop sources of finance, and improve utility management will be required.

Appendix A

Conference Agenda Russian Demographic Trends and Their Implications

System Planning Corporation
1000 Wilson Boulevard, Arlington, VA
22209 Thursday, 15 July 1999

8:00 a.m. Registration and Coffee

8:30 a.m. **Introduction**
Shelley Deutch, National Intelligence Council
Dan Goldberg, Department of Defense
David Gordon, National Intelligence Council

- 8:45 a.m. **The Predictive Value of Demographics**
John Haaga, Population Reference Bureau
- 9:30 a.m. **Russian Demographic Trends**
- Demographic Trends*
Murray Feshbach, Georgetown University
- Migration Trends*
Timothy Heleniak, World Bank
- Economic Decline and Shifts in the Labor Force*
Michael Sacks, Trinity College
- Commentary*
F. Sam Notzen, Centers for Disease Control and Prevention
- 10:45 a.m. Break
- 11:00 a.m. **Implications for Russia**
- Societal Consequences of Russia's Demographic Trends*
Susan Lehmann, American Councils for International Education:
ACTR/ACCELS
- A Case Study: The Far East**
Vladimir Kontorovich, Haverford College
- Implications for Russia's Military**
Jacob Kipp, Center for Army Lessons Learned, US Army
- 12:30 p.m. Lunch
- 1:30 p.m. **Roundtable and Audience Discussion--Implications for the West
and the Rest of the World**
- 2:45 p.m. Adjournment

Appendix B

Demographic Trends: Speaker Biographies

Murray Feshbach served as Chief of the USSR Population, Employment and Research and Development Branch of the Foreign Demographic Analysis Division (now the Center for International Research) of the US Bureau of the Census. Since his retirement from the US Government in 1981, he has been a Research Professor at Georgetown University and a Fellow of the Kennan Institute of the Woodrow Wilson International Center for Scholars. He was also the first appointed Sovietologist-in-Residence in the Office of the Secretary General of NATO (1986-1987).

David Gordon was appointed National Intelligence Officer for Economics and Global Issues in the National Intelligence Council (NIC) in May 1998. Before joining the NIC, he was Senior Fellow at the Overseas Development Council. From 1993 until 1995, he was a senior professional staff member on the House International Relations Committee. Earlier, he served as the regional economic policy and governance adviser for eastern and southern Africa for USAID in Nairobi.

John Haaga is currently project director at the Population Reference Bureau for MEASURE *Communication*, a five-year project funded by USAID. He was previously the staff director of the Committee on Population at the National Academy of Sciences. Prior to that, he worked in Bangladesh for the Population Council and in Los Angeles, Washington, and Kuala Lumpur for RAND.

Timothy E. Heleniak is an economist in the Development Economics Department of the World Bank, where he works on human development issues in the transition countries of Europe and Asia. He specializes in migration, population change, and regional development issues. Recent publications include *Out Migration and Depopulation of the Russian North During the 1990s* and *The Changing Nationality Composition of the Central Asian and Transcaucasian States*.

Jacob W. Kipp is senior analyst with the Foreign Military Studies Office of the US Army Training and Doctrine Command at Ft. Leavenworth, Kansas. Professor Kipp has taught many years at the University of Kansas and is a recognized expert on the Soviet and Eastern European military and naval history. He is a frequent contributor to NATO seminars and serves as the American editor of the quarterly journal, *European Security*.

Vladimir Kontorovich is an Associate Professor at Haverford College, PA, where he has been teaching Economics since 1987. An author of several articles on Soviet economic growth, inflation, economic reform, and R&D, he has conducted contract

research for the Department of Defense and the CIA. He has also served as a consultant to Wharton Econometrics, PlanEcon, and SAIC.

Susan Lehmann is Institutional Research Manager at the American Councils for International Education. Since 1992, she and her colleagues have conducted more than ten national surveys in the former Soviet Union. Her recent publications include *Inter-ethnic Conflict in the Republics of Russia in the Light of Religious Revival* and *Islam and Ethnicity in the Republics of Russia*.

Michael Sacks is Professor of Sociology at Trinity College in Hartford, Connecticut. He is the author of *Women's Work in Soviet Russia* (1976) and *Work and Equality in Soviet Society* (1982) and coeditor of *Understanding Soviet Society* (1988). His current research concerns the growing regional inequality in Russia and differences in the way men and women have fared in the post-Soviet transformation.

Appendix C

Conference Agenda Trends in Russian Intellectual Capital

System Planning Corporation
1000 Wilson Boulevard, Arlington, VA
22209 Thursday, 14 September 1999

08:30 a.m. Introduction

Shelley Deutch, Deputy National Intelligence Officer for Russia and Eurasia

Dan Goldberg, Department of Defense

George Kolt, National Intelligence Officer for Russia and Eurasia

08:45 a.m. **The Global Context**
Education, Globalization, and the Demands of the 21st Century,
Nancy Birdsall, Carnegie Endowment

09:30 a.m. **Russia's Educational Establishment**

Educational Patterns in Today's Russia

Harley Balzer, Georgetown University

Russian Educational Policy and Politics

Mark S. Johnson, Colorado College

11:00 a.m.	Break
11:15 a.m.	<p>Russian Intellectual Resources</p> <p><i>Russia's Managerial Corps: Skills and Attitudes</i> Sheila Puffer, Northeastern University</p> <p><i>Trends in the Russian Workforce</i> Steven Rosefielde, University of North Carolina-Chapel Hill</p> <p><i>The Impact of Brain Drain</i> Glenn Schweitzer, National Academy of Sciences</p>
12:30 p.m.	Lunch
13:30 p.m.	Plenary Discussion: What Salient Trends Have We Discovered?
13:45 p.m.	<p>Small Group Sessions</p> <p>Given these trends;</p> <ul style="list-style-type: none"> • What kind of workforce is Russia likely to need in 20 years, and how does that mesh with current supply? • What are the implications of current trends for Russia's political, economic, and military development? • What are the implications for Russian policy? • What are the implications for other countries and international organizations?
14:45 p.m.	Break
15:00 p.m.	Small Group readouts/Plenary discussion
16:00 p.m.	Plenary Adjourns
16:00-16:30 p.m.	Working group session: next steps

Appendix D

Intellectual Capital: Speaker Biographies

Harley Balzer is Associate Professor of Government and Director for the Center of Eurasian, Russian, and Eastern European Studies at Georgetown University. His research interests include Russian and Soviet social history, science and technology, education, Russian politics, and US-Russian relations. During 1993, Dr. Balzer took a partial leave from Georgetown to serve as Executive Director and Chairman of the Board of the International Science Foundation.

Nancy Birdsall is Senior Associate and Director of Economics Programs, Carnegie Endowment for International Peace. From 1993 until September 1998, she was the Executive Vice President of the Inter-American Development Bank, the largest of the regional development banks. Dr. Birdsall has been a senior adviser to the Rockefeller Foundation, and she is a member of the board for the Population Council and the Overseas Development Council. She has also served on numerous committees of the National Academy of Sciences.

Mark S. Johnson is Assistant Professor of History at Colorado College. He was previously Adjunct Professor of Education at Teachers College, Columbia University. His research interests are in the history of Soviet education and post-Soviet education and social policy.

George Kolt is National Intelligence Officer for Russia and Eurasia. He joined the CIA in 1986 and has served as the Director of European Analysis and Director of the office of Soviet Analysis and its successors. He has an extensive background in Soviet, Russian, and European affairs.

Sheila Puffer is a professor of international business and human resources management at the College of Business Administration, Northeastern University, in Boston. She has been a Fellow at the Davis Center for Russian Studies at Harvard University since 1990. She has also been a faculty member at the State University of Buffalo and an administrator in the Government of Canada. Fluent in Russian and French, Dr. Puffer has published over 70 articles and books on various aspects of management, with a specialization in Russia.

Steven Rosefielde is Professor of Economics at the University of North Carolina; Adjunct Professor of Defense and Strategic Studies, Center for Defense and Strategic Studies, Southwest Missouri State University, Springfield, Missouri; a member of the Russian Academy of Natural Sciences, and editorial board member of the *Journal of Econometric Study of Northeast Asia*. His latest book is *Efficiency and Russia's Economic Recovery Potential to the Year 2000 and Beyond*, Ashgate, 1998.

Glenn Schweitzer, a nuclear engineer by training, is the Director of the Office for Central Europe and Eurasia of the National Research Council. He began his interest in science and technology in Russia in the 1960s as the first Science Attache at the US Embassy in Moscow. Recently, he has managed many exchange programs, served as the first Executive Director of the International Science and Technology Center and

directed policy studies concerning nuclear, biological, and industrial research activities in Russia.

Appendix E

Conference Agenda Russian Health Trends and Their Implications

Systems Planning Corporation
1000 Wilson Boulevard, Arlington, VA 22209

8:00 a.m. Coffee and Registration

8:30 a.m. **Introductory Remarks**

Shelley Deutch, National Intelligence Council

Dan Goldberg, Department of Defense

George Kolt, National Intelligence Council

8:45 a.m. **The Global Context: Health Trends and Economics Development**

Marcus Noland, Institute for International Economics

9:15 a.m. **Russia's Health Challenges, Part I**

Tuberculosis

Nancy Binkin, Centers for Disease Control

The Continuing Struggle With Alcohol

Margaret Murray, National Institutes of Health

The Ravages of HIV/AIDS

David Powell, Wheaton College and Harvard University

The Impact of Growing Inequality

Elizabeth Brainerd, Harvard School of Public Health

11:00 a.m. Break

11:15 a.m. **Russia's Health Challenges, Part II**

Overall Commentary: Russia's Health Crisis

Murray Feshbach, Georgetown University

12:15 p.m. Lunch

1:15 p.m. **The Institutional Base**

Trends in Russia's Health Establishment

Mark Field, Harvard University

Challenges for Russia's Social Insurance

Judyth Twigg, Virginia Commonwealth University

Foreign Assistance for Health Reform: The View From the World Bank

Teresa Ho, World Bank

3:00 p.m. **Roundtable Discussion of Key Questions**

- What are the key trends in Russia's health that will influence Russia's future course?
- What are the implications of these trends for Russia's political, economic, and military development?
- What can be done to improve Russia's situation, and what are the implications for Russian policy?
- What are the implications for other countries and international organizations?

4:00 p.m. Adjournment

Appendix F

Health Trends: Speaker Biographies

Nancy Binkin is Associate Director for International Activities, Division of Tuberculosis Elimination, National Center for HIV, STD, and TB Prevention at the Centers for Disease Control in Atlanta, Georgia. She is a lifetime member of EPITER (Network for the study of applied epidemiology in France) and an advisor to the World Health Organization. She has an extensive background in tuberculosis control and management, epidemiology, and biostatistics.

Elizabeth Brainerd is an Assistant Professor of Economics at Williams College. She is currently a Visiting Scholar at the Center for International Development at Harvard

University and spent the last academic year investigating the mortality crisis in the former Soviet Union and its possible links to the economic reforms in the region. During 1992-93, Professor Brainerd served as an economic advisor to the Russian Government in Moscow as a member of a team of advisors headed by Jeffrey Sachs.

Murray Feshbach served as Chief of the USSR Population, Employment and Research and Development Branch of the Foreign Demographic Analysis Division (now the Center for International Research) of the US Bureau of the Census. Since his retirement from the US Government in 1981, he has been a Research Professor at Georgetown University and a Fellow of the Kennan Institute of the Woodrow Wilson International Center for Scholars. He was also the first appointed Sovietologist-in-Residence in the Office of the Secretary General of NATO (1986-87).

Mark Field first traveled to Russia as a member of a medical delegation in 1956. Presently he is an Associate at the Davis Center for Russian Studies and an Adjunct Professor at the School of Public Health at Harvard.

Teresa Ho has worked as an economist for the World Bank in the Health, Nutrition, and Population (HNP) sector for almost twenty years. During that period, she has led the Bank's health program in a number of countries in West Africa and in Central and Eastern Europe. From 1995 until mid-2000, she managed the Bank's health program in Russia.

George Kolt is National Intelligence Officer for Russia and Eurasia. He joined the CIA in 1986 and has served as the Director of European Analysis and Director of the office of Soviet Analysis and its successors. He has an extensive background in Soviet, Russian, and European affairs.

Margaret Murray is responsible for coordinating the International Research and Training Program for the National Institute on Alcohol Abuse and Alcoholism of the National Institutes of Health. She has extensive experience in developing research and research training programs in Russia and Eastern Europe. Ms. Murray serves on Secretary Shalala's Health Committee under the US-Russia Science and Technology Commission.

Marcus Noland is a senior fellow at the Institute for International Economics and a consultant to the International Food Policy Research Institute. He was a Senior Economist at the Council of Economic Advisors in the Executive Office for the President of the United States and has held numerous research and teaching positions. Dr. Noland has also served as a consultant to the World Bank, the New York Stock Exchange, and the United Nations Conference on Trade and Development.

David Powell is the Shelby Cullom Davis Professor of Russian Studies at Wheaton College (Norton, MA) and a Research Associate of the Davis Center for Russian Studies at Harvard University. He is the author or editor of four books and scores of articles on politics, economics, and social problems in the USSR and post-Soviet

Russia. He is currently completing a book-length manuscript. *The New Sick Man of Europe: Russia's Health Care Crisis and the Response of the West*, and is writing a book on the HIV/AIDS problem in Russia today.

Judyth Twigg is an Assistant Professor of Political Science at Virginia Commonwealth University. Her primary research interests lie in the structure and financing of Russian health care during the post-Soviet transition.

Appendix G

Conference Agenda Trends in Russian Physical Infrastructure

Systems Planning Corporation
1000 Wilson Boulevard, Arlington, VA
22209 Tuesday, 1 February 2000

8:00 a.m.

Coffee and
Registration

8:30 a.m.

Introduction

Shelley Deutch, National Intelligence Council

Dan Goldberg, Department of Defense

8:45 a.m.

Infrastructure and Investment: Relevance and Provenance

Ricardo Halperin, The World Bank

9:30 a.m.

Russia's Commercial Infrastructure

The State of Russia's Capital Stock

Steven Rosefielde, University of North Carolina

Energy Networks, Power Generation, and Associated Infrastructure

Matthew Sagers, PlanEcon, Inc.

10:45 a.m.

Break

11:00 a.m.

Russia's Transportation Infrastructure

Overland Transportation Conditions
Air Travel and Transport
Railroads
Ports and Waterways
Robert North, University of British Columbia

12:00 Lunch

1:00 p.m. **Population Support**

Russia's Housing Stock
Clare Romanik, Urban Institute
Environmental Issues
DJ Peterson, Rand Corporation

2:15 p.m. Break

2:30 p.m. **Roundtable Discussion of Key Questions**

- What kind of infrastructure is Russia likely to need in twenty years, and how does that mesh with current supply?
- What are the implications of current trends for Russia's political, economic, and military development?
- What are the implications for Russian policy? What kind of a burden do needed investments in infrastructure pose for the Russian economy?
- What are the implications for other countries and international organizations?

4:00 p.m. Adjournment

Appendix H

Physical Infrastructure Trends: Speaker Biographies

Ricardo Halperin is Sector Director, Infrastructure Unit, for the Europe and Central Asia region of the World Bank. His responsibilities include overseeing operations in transport, water supply and sanitation, and urban development. He joined the World Bank in 1976 in the Energy Division. In 1994 he moved to the Europe and Central Asia

Division as Division Chief of the Infrastructure and Environment Division, where he remained until promotion to his current position in 1997.

Marcus Noland is a senior fellow at the Institute for International Economics and a consultant to the International Food Policy Research Institute. He was a Senior Economist at the Council of Economic Advisors in the Executive Office for the President of the United States and has held numerous research and teaching positions. Dr. Noland has also served as a consultant to the World Bank, the New York Stock Exchange, and the United Nations Conference on Trade and Development.

Robert North is Associate Professor of Geography at the University of British Columbia. He is an economic geographer specializing in transportation and its role in regional development in the former Soviet Union and present-day Russia. He is the author of *Transport in Western Siberia: Tsarist and Soviet Development*; *Russian Transport: Problems and Prospects*; and various articles and book chapters on Russian and Soviet transportation, especially relating to Siberia, the North, and the Russian Far East.

DJ Peterson is an Associate Policy Analyst with the International Studies Group at the Rand Corporation. He specializes in environmental, natural resources, and science and technology policy and management both in the United States and the transition economies in the former Soviet Union. Dr. Peterson currently is assisting with the development and implementation of a study of best business practices in Russia. He has written more than thirty articles and reports as well as a book entitled *Troubled Lands: The Legacy of Soviet Environmental Destruction*.

Clare Romanik is a Research Associate for the Urban Institute specializing in economic and sectoral research, on-site survey work, and program evaluation. Ms. Romanik has worked on several technical assistance projects in Albania, Czech Republic, Kyrgyzstan, Latvia, Moldova, Romania, Russia, and the Slovak Republic. She also has served as the Institute's project head for a World Bank project on the distributional effects of raising utility rates throughout Russia. She has written or co-authored several papers on housing issues in Russia.

Steven Rosefielde is Professor of Economics at the University of North Carolina and Adjunct Professor of Defense and Strategic Studies, Center for Defense and Strategic Studies, Southwest Missouri State University, Springfield, Missouri; a member of the Russian Academy of Natural Sciences, and editorial board member of the *Journal of Econometric Study of Northeast Asia*. His latest book is *Efficiency and Russia's Economic Recovery Potential to the Year 2000 and Beyond*, Ashgate, 1998.

Matthew Sagers is Director of the Energy Service at PlanEcon, Inc. and editor of two PlanEcon publications. Dr. Sagers is responsible for PlanEcon's consulting work on the energy sector in the former Soviet Union and Eastern Europe and has led several major studies on the electric power industry in the region, refined petroleum product consumption, the restructuring of the oil refining industry in the region, pipeline

constraints and needs, the status of foreign investment in the upstream oil sector, and the natural gas sector. Among his many publications are *The Chemical Industry in the USSR: An Economic Geography* and *The Transportation of Soviet Energy Resources*.

Footnotes

¹ This essay reflects data and conclusions drawn by the author from the presentations made by the numerous experts participating in this seminar series and accompanying discussions, as well as the analysis of the author himself. Although individual facts are not footnoted, their provenance may be found in the set of summaries that follows.

² The 12 regions are Dagestan, Ingushetia, Kabardino-Balkariya, Karachaevo-Cherkessiya, North Ossetia, Chechnya, Bashkortostan, Khanty-Mansiysk, Yamalo-Nenetsk, Tuva, Buryatia, and Yakutiya.

³ The views and opinions expressed here are strictly those of the author and should not be attributed in any manner to the World Bank.