

RAND REVIEW

Spring 2006

Vol. 30, No. 1

Iraq and Beyond

Recognizing Shortfalls in Performance,
Identifying Options for Improvement



**Sustaining
Army Forces**



**Promoting
Reenlistments**



**Rebuilding
Iraqi Security**

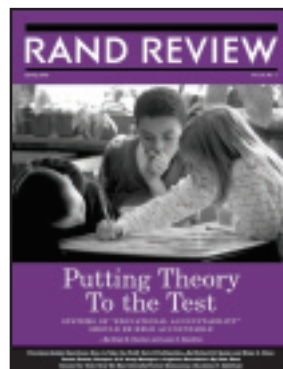


**One World, One Well:
How Populations Can Grow on a Finite Water Supply**

**Think Locally, Act Nationally:
Police Efforts in Fighting Terrorism Need Greater Federal Leadership**

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Message from the Editor

Our essays on “Iraq and Beyond” might appear to be retrospective on the surface, but their core conclusions remain vital, useful, and relevant for Iraq right now and for potential conflicts elsewhere in the future. Each essay outlines numerous lessons learned but not yet fully applied.

The centerpiece and accompanying essay by Eric Peltz and his team of logistics researchers bring to light, more than three years after the invasion of Iraq, some unfamiliar details of the operation. The challenge of sustaining U.S. forces was most acute early in the war, but some of the problems persisted well into the conflict and have only recently been resolved. There are numerous indispensable lessons to be learned from the nuts-and-bolts assessment of Operation Iraqi Freedom.

The essay by James Hosek on promoting reenlistments describes some of the continuing concerns expressed by U.S. soldiers deployed to Iraq and also by those left behind. All strata of personnel have reported rising levels of stress associated with the heightened pace of military operations. As the stress has gone up, the intentions to reenlist have gone down. Policymakers are working to implement a variety of measures to offset the negative effects among personnel, and in fact actual retention rates have remained high. However, the concerns will not go away any time soon.

The concluding essay by Andrew Rathmell and his colleagues, all of whom served with the Coalition Provisional Authority in Iraq during 2003 and 2004, offers an insider’s view of what has gone right and what has gone wrong with rebuilding Iraqi security institutions. The essay underscores the importance of long-term efforts to cultivate police, judicial, intelligence, defense, and other security institutions, whether in Iraq or in any other country, in the wake of armed conflict. Such efforts are now being debated daily in Baghdad, Washington, and London.

—John Godges

On the Cover

Left: U.S. Army Sgt. Dan Farey from Central Point, Ore., guards an underpass in Baghdad, Iraq, on July 17, 2003.
AP PHOTO/DARIO LOPEZ-MILLS

Center: Soldiers from the 3rd Armored Cavalry reenlist in Colorado Springs, Colo., on Dec. 1, 2004.
AP PHOTO/JACK DEMPSEY

Right: Iraqi policemen demonstrate against changes in the command and structure of their unit in Basra, Iraq, on April 2, 2006.
AP PHOTO/NABIL AL-JURANI

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Repopulating New Orleans: Big Problem for the Big Easy

One week after Hurricane Katrina and the subsequent flooding from damaged levees in August and September 2005, the population of New Orleans had dwindled from nearly half a million to no more than a few thousand. RAND researchers estimate that the city's population will recover gradually to only about a quarter million, or roughly half the pre-Katrina population, by September 2008, fully three years after the hurricane.

“Because so many New Orleanians lived in areas that experienced flood damage that was so serious or severe, the challenges of rebuilding those areas strongly dampen the potential for the population to recover in those areas,” according to Narayan Sastry, coauthor of the RAND study, *The Repopulation of New Orleans After Hurricane Katrina*.

At the request of the Bring New Orleans Back Commission, RAND researchers conducted a rapid assessment—from late November 2005 to early January 2006—to develop estimates of the future population of New Orleans. The researchers found that the key factor determining how quickly New Orleans can be repopulated is housing availability: 55 percent of the city's pre-Katrina population

of 485,000 suffered severe damage to their housing after parts of New Orleans were inundated by floodwaters more than four feet deep.

The researchers provided four estimates: an immediate one (over the next three to six months) and three near-term ones (over the next one to three years). As shown in the figure, the 2008 population estimate is 272,000—about 56 percent of the pre-Katrina population. The population was projected to rise rapidly to about 155,000 in March 2006 as basic repairs and stabilization of housing were completed, public services and infrastructure were restored, and schools and universities were reopened. The repopulation was projected to taper off thereafter.

As to where the repopulation will occur, the findings show that the population returning to the city will be initially concentrated in the higher-elevation areas on either bank of the Mississippi River, with

repopulation in other parts of the city proceeding very slowly.

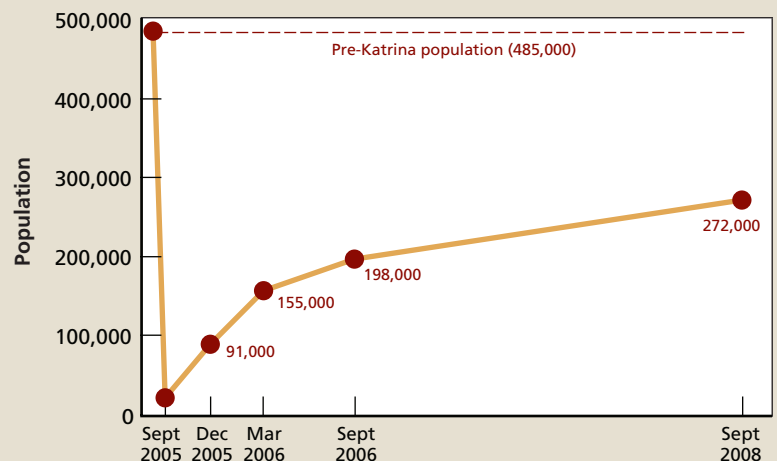
The study argues that policy-makers could speed the repopulation by enacting policies and procedures to streamline the process of obtaining permits to repair and reconstruct housing, something that has already begun. Repopulation could also be accelerated if government officials provide clear and comprehensive information about progress toward and ultimate goals for restoring essential city services and systems, such as public transportation, levees, public safety, public education, and hospitals.

“The more government at every level can do to reduce these uncertainties, the more rapid the conclusion of the recovery process is likely to be,” said coauthor Kevin McCarthy. ■

For more information: *The Repopulation of New Orleans After Hurricane Katrina*, ISBN 0-8330-3940-7, 2006.

The key factor determining how quickly New Orleans can be repopulated is housing availability.

By September 2008, the Population of New Orleans Is Estimated to Grow to 56 Percent of Pre-Katrina Levels



SOURCE: *The Repopulation of New Orleans After Hurricane Katrina*, 2006.

Only Half in Flood-Prone Areas Purchase Flood Insurance

While Hurricanes Katrina and Rita have focused public attention on flooding, it is not a problem just for those living on the coasts.

Millions of homes across the United States lie in areas (so-called Special Flood Hazard Areas, or SFHAs) that have at least a 1 percent chance of flooding per year. Still, “only about half of homeowners living in SFHAs buy federal flood insurance, leaving millions of families at risk for severe financial losses when floods strike,” said Lloyd Dixon, lead author of a new RAND report.

Coming up with reliable estimates of who buys flood insurance—the “market penetration rate”—is challenging because of a lack of data. Using an innovative approach based on property parcel data, researchers have found that about 50 percent of the 3.6 million single-family homes that are in SFHAs have flood insurance. Only 1 percent of the 76 million homes that are not in SFHAs do. There is also substantial geographic variation: Rates of coverage for homes within SFHAs in the South and West are about 60 percent, while rates range from 20 to 30 percent in the Northeast and Midwest.

Few homeowners buy flood insurance unless they are required to do so. Federal law requires most homes in SFHAs with mortgages to purchase flood insurance. As shown in the figure, 50 to 60 percent of homes in SFHAs are subject to this mandatory purchase requirement, and a substantial proportion of these homes do have flood insurance.

In contrast, roughly only one in five homeowners in SFHAs who are not subject to the mandatory purchase requirement buys flood insurance. “Many homeowners who suffered substantial damage from Hurricane Katrina were in this voluntary market,” Dixon noted.

When it comes to identifying additional factors that may explain these market penetration rates, the study finds that the number of homes in an SFHA community is key. The penetration rate is 66 percent in communities with more than 5,000 homes in the SFHA but declines precipitously to only 16 percent when there are 500 or fewer homes in the SFHA.

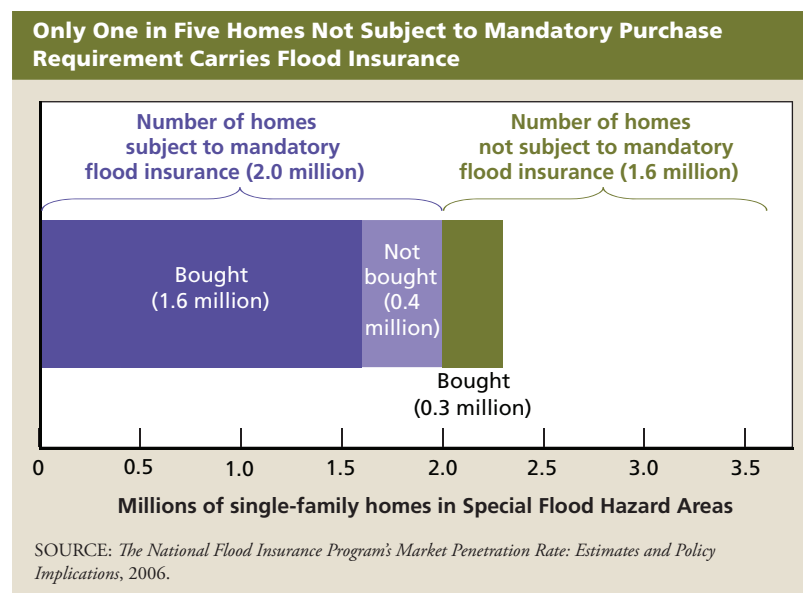
While such communities provide a growth opportunity for flood insurance, Dixon pointed out that “the sheer number of such communities—19,000 of the 20,000 communities where federal flood insurance is available—makes it difficult for policymakers to develop

strategies.” Market penetration is also much lower in inland communities (35 percent) than in communities subject to coastal flooding (63 percent).

Although the study was completed before Hurricanes Katrina and Rita, the results are useful for evaluating reforms that are now being debated for the National Flood Insurance Program, such as recent proposals to extend the mandatory purchase requirements to all homes in SFHAs. ■

For more information: *The National Flood Insurance Program’s Market Penetration Rate: Estimates and Policy Implications*, http://www.rand.org/pubs/technical_reports/TR300/, online only, 2006.

“Many homeowners who suffered substantial damage from Hurricane Katrina were in this voluntary market.”



Quality of Health Care Is an Equal Opportunity Gamble

Virtually every adult in the United States who uses the health care system faces a significant risk of failing to receive needed care, regardless of race, gender, income, age, or insurance status, according to a RAND study published in the March 16 issue of the *New England Journal of Medicine*.

The study assessed the quality of care received by a national sample of people living in major metropolitan areas, measuring quality across the continuum of care for 30 acute and chronic conditions that constitute the leading causes of death and disability in this country and for key preventive services.

As previously reported by RAND, adults nationwide receive 55 percent of recommended care overall. When looking at socioeconomic subgroups, we can see (as the figure shows) that although differences do exist across gender,

income, age, and race categories, “the differences pale in comparison to the chasm between where we are today [in overall quality of care] and where we should be,” said lead author Steven Asch. The study also found that health insurance status was largely unrelated to the quality of care among those with at least some access to care.

“These findings tell us that no one can afford to be complacent, and they underscore that the quality-of-care problem in this country is profound and systemic,” Asch said.

To be included in the study, participants had to have at least one encounter with the health care system over a two-year period, which indicates that they all had some minimal access to care. Other studies have shown disparities in access to care by race, income, and insurance groups.

The RAND study found that access alone was not enough to

guarantee the appropriate delivery of care. Other barriers to receiving necessary care exist once patients get in the door.

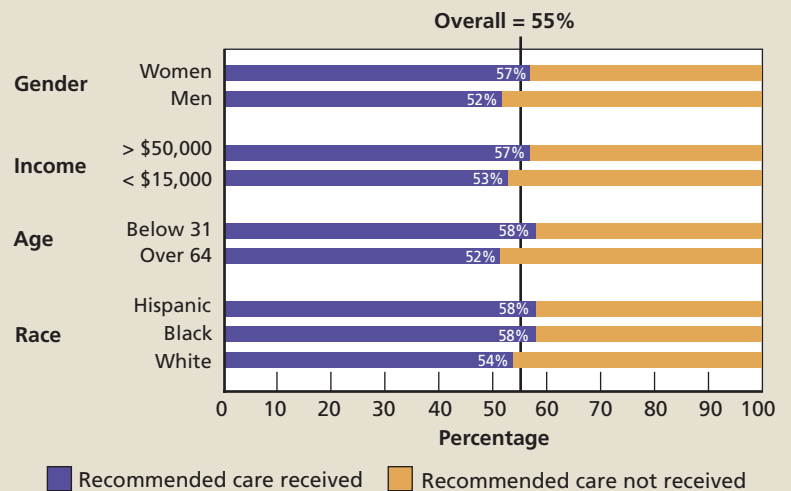
“Policies to improve access, while critically important, will not by themselves fix the quality problem,” Asch noted.

Given the large quality-of-care chasm between observed and optimal care for all patients—and the relatively small gaps across demographic subgroups—the authors concluded that in addition to programs that are designed to reduce disparities in access and health outcomes among demographic subgroups, broader efforts to improve care for all are needed.

According to coauthor Elizabeth McGlynn, “We need to fundamentally redesign the health system to ensure that no matter who you are or where you go for care you will get what you need.” ■

“No one can afford to be complacent. The quality-of-care problem in this country is profound and systemic.”

Small Differences Exist, but the Gap Between Observed and Desired Quality of Care Is Large for All Groups Receiving Care



SOURCE: “Who Is at Greatest Risk for Receiving Poor-Quality Health Care?” *The New England Journal of Medicine*, Vol. 354, No. 11, March 16, 2006, Steven M. Asch, Eve A. Kerr, Joan Keesey, John L. Adams, Claude M. Setodji, Shaista Malik, Elizabeth A. McGlynn.

Arthritis Care for Older Patients Deemed Poor; Medication Safety, Poorer

Arthritis is a debilitating disease that affects anywhere from 50 to 80 percent of the elderly population. But when it comes to treating the elderly who have arthritis, the quality of care they receive is often poor, and even more so when it comes to addressing the potential hazards of arthritis medications, according to a RAND study published in the April 15 issue of *Arthritis Care & Research*.

In previous studies, researchers relied only on medical record reviews, which could underestimate the quality of care because medical records do not document such things as education and counseling provided or the use of nonprescription medicines. The new study used clinical data received directly from 339 patients 75 or older receiving care for arthritis in two large medical groups in the western United States, thus enabling researchers to capture a more complete image of the quality of care provided.

The figure shows the key results of the study, which looked at four indicators of treatment quality and four indicators of medication safety. The bars measure whether doctors took the indicated action in a particular situation. For example, the first bar measures whether a doctor performed an annual assessment of the functional status and the degree of pain for each patient with arthritis.

Overall, doctors took the indicated actions 57 percent of the time across all eight indicators. But researchers found that failing to address medication safety was the most severe quality problem. On average, patients received the recommended care with respect to medication safety just 44 percent of the time. In contrast, patients received some recommended treatment 64 percent of the time.

“The quality of arthritis care is similar to other medical conditions—which is not very good,” said David Ganz, the study’s lead author.

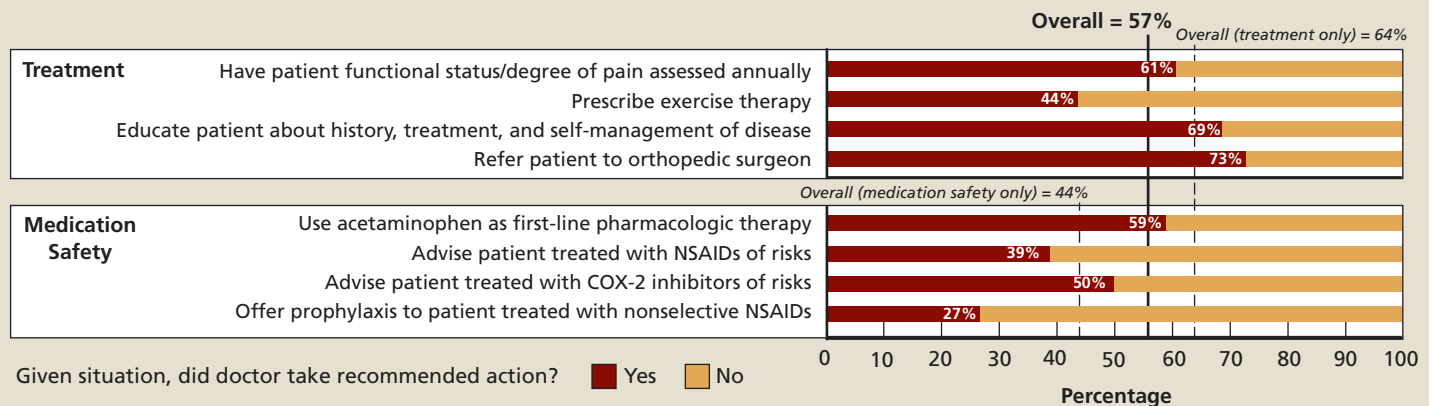
“Arthritis dramatically affects the quality of life of older people. Better care would make a real difference in these patients’ lives.”

Efforts to improve arthritis care should focus on instructing patients about safe medication use, said Ganz, particularly since older patients tend to take many prescription drugs.

The study was conducted by a collaboration of researchers from the RAND Corporation; the David Geffen School of Medicine at the University of California, Los Angeles; and the Greater Los Angeles Veteran Affairs Healthcare System. Partial funding for the project came from the Arthritis Foundation and the Robert Wood Johnson Foundation. ■

Overall, doctors took the indicated actions 57 percent of the time across all eight indicators.

Doctors Took Recommended Actions More Often for Treatment Than for Medication Safety of Elderly Arthritis Patients



SOURCE: “Quality of Osteoarthritis Care for Community-Dwelling Older Adults,” *Arthritis Care & Research*, Vol. 55, No. 2, April 15, 2006, David A. Ganz, John T. Chang, Carol P. Roth, Min Guan, Caren J. Kamberg, Fang Niu, David B. Reuben, Paul G. Shekelle, Neil S. Wenger, Catherine H. Maclean.
 NOTES: NSAIDs = nonsteroidal antiinflammatory drugs; COX-2 = cyclooxygenase 2.

Cutting Copayments for Sickest Patients Can Yield Big Payoffs

A new RAND study on prescription drug benefits has identified a way to both improve patient care and hold down rising medical costs in the United States: a targeted policy of reducing drug copayments for the sickest patients taking certain drugs.

Researchers tested this “variable copayment” approach by simulating its effect on the 6.3 million U.S. adults with either private insurance or Medicare coverage who take statin drugs to reduce their cholesterol, dividing the group into high-, medium-, and low-risk categories. The study found that reducing drug copayments for the sickest patients increased compliance with their medications.

“As a result, many people had fewer health problems and were hospitalized less often,” said coauthor Dana Goldman.

Compared with a base case where patients in all risk categories had a \$10 copayment for a one-month supply, the variable copayment approach charged high- and medium-risk patients no copayment and low-risk patients a \$22 copayment. Outcomes included a health measure (whether patients fully complied with the treatment), two cost measures (costs to health

insurance plans and to patients), and two usage measures (effects on hospitalizations in general and emergency room visits in particular). The results appeared in the January 2006 issue of *The American Journal of Managed Care*.

The table shows that the variable copayment approach improved most outcomes. Full compliance went up for higher-risk patients. Full compliance went down for lower-risk ones, but this group does not benefit nearly as much from therapy. Overall drug spending increased modestly for health insurance plans, but patient out-of-pocket payments decreased. More significantly, the number of hospitalizations and emergency room visits declined by 79,000 and 31,000, respectively. Taken together, these improvements added up to more than \$1 billion in estimated savings.

Although the approach appears promising, researchers warn that there are some potential problems.

For example, health insurance plans using this approach might attract higher numbers of sicker patients while deterring healthier patients. Thus, insurance plans pursuing the approach might want to use some of the cost savings to lower premiums for healthy patients or to create some incentives for healthy patients who closely follow their drug regimens.

“We don’t want to penalize people for being healthy,” said coauthor Geoffrey Joyce. “The goal is to encourage people to be healthier—both by taking their medicine and by following healthier lifestyles overall.”

While the research looked only at statins, it seems likely that lowering patient copayments for other drugs that are used to treat chronic illnesses could also prompt more patients to take their prescribed medications, thus lowering medical costs in the United States even further. ■

Improvements added up to more than \$1 billion in estimated savings.

Variable Copayment Approach Improved Most Outcomes			
Outcome	Base Case Copayment	Variable Copayment	Difference
Full compliance			
High-risk patients	62%	71%	+9%
Medium-risk patients	59%	69%	+10%
Low-risk patients	52%	44%	-8%
Health insurance plan payments (prescription drugs only)	\$4.34 billion	\$4.37 billion	+\$30 million
Patient out-of-pocket payments	\$583 million	\$552 million	-\$31 million
Number of hospitalizations	2,412,000	2,333,000	-79,000
Number of emergency room visits	1,551,000	1,520,000	-31,000

SOURCE: “Varying Pharmacy Benefits with Clinical Status,” *The American Journal of Managed Care*, Vol. 12, pp. 21–28, January 2006, Dana P. Goldman, Geoffrey F. Joyce, Pinar Karaca-Mandic.

Most Reservists Earn More Money When Called to Active Duty

“Reservists Pay Steep Price for Service,” trumpeted a headline in a 2003 *USA Today* story about U.S. military reservists losing income when deployed. But according to Jacob Klerman, lead author of a 2005 RAND study, “most U.S. military reservists called to active duty in 2003 actually saw their earnings rise—a finding that contradicts the conventional wisdom.”

The conventional wisdom was based on a May 2004 defense department survey of reservists who were called to active duty. In that survey, 51 percent of the reservists reported an earnings loss, including 44 percent of the total who reported a drop of 10 percent or more and an overlapping 21 percent of the total who reported an income loss of 20 percent or more.

But the accuracy of the 2004 survey is questionable. It relied on self-reported earnings, which are subject to error, and only 30 percent of those surveyed responded, which means it may not be representative of all reservists. Moreover, the survey explicitly instructed reservists to report before-tax income, ignoring the fact that military allowances and pay received while serving in a combat zone are tax free.

RAND researchers took a different tack, using civilian and military payroll data to estimate earnings losses. Using payroll data addresses many of the concerns with the survey data: Everyone “responds” to payroll data, the data come from computer systems (not individual recall), and it is possible to impute the value of the military tax benefit.

The researchers found that 72 percent of the reservists had experienced pay increases. “The average income boost was 25 percent over what they had earned when not serving on active duty—about \$10,000 per year,” said Klerman.

Researchers did find that 28 percent of the reservists studied lost pay after being called to active duty and that about 20 percent of all reservists lost 10 percent or more of their normal income (see the figure). Still, this is a far smaller problem than was noted in the survey data.

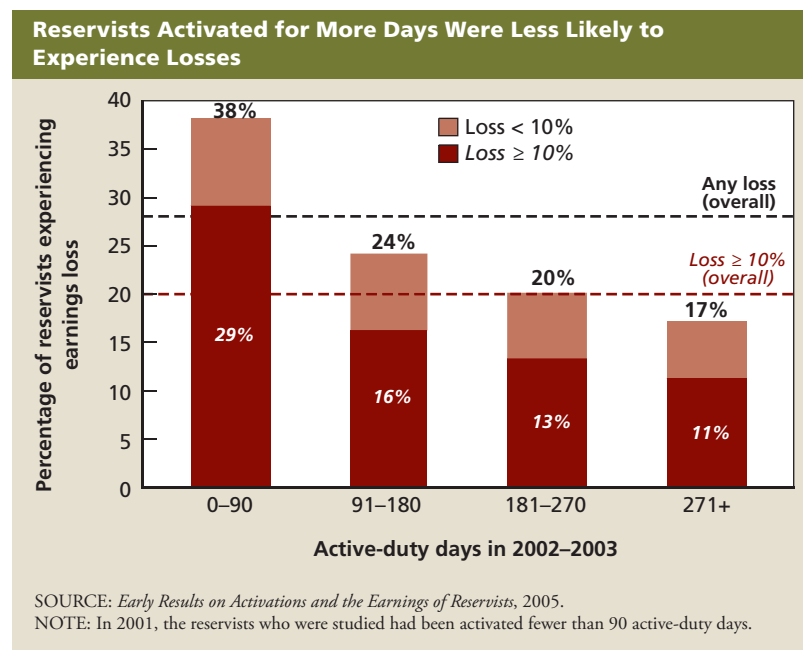
The percentage of reservists who experienced gains in income increased with the number of active-duty days served. As noted, across all activations of any duration, an average 72 percent of reservists experienced an income gain and 28 percent experienced a loss. But for reservists who were activated,

for example, for more than 271 days during 2002 and 2003, 83 percent experienced a gain and 17 percent experienced a loss.

Despite the overall gains, Klerman pointed out that “the increase in earnings might not be sufficient to compensate reservists for the hardships of active-duty service, like being away from family and in harm’s way.” For that reason, the U.S. Department of Defense could still face challenges when it comes to recruiting and retaining reservists. ■

For more information: *Early Results on Activations and the Earnings of Reservists*, ISBN 0-8330-3819-2, 2005.

“The average income boost was . . . about \$10,000 per year.”



Plagued by Apathy?

The Uneven Responses of Science and Public Policy to HIV and AIDS in Africa

AS THE WORLD GIRDS FOR THE POSSIBILITY of a bird flu pandemic, the HIV and AIDS pandemic marches relentlessly onward, almost lost in the background. But the numbers are mind-numbing: As of 2005, more than 40 million people worldwide were living with HIV. The brunt of the pandemic has fallen on sub-Saharan Africa, where more than 25 million people are living with the disease, over 6 million of whom are between the ages of 15 and 24.

As special envoy of the secretary-general of the United Nations for HIV and AIDS in Africa, former Canadian ambassador Stephen Lewis has crisscrossed the African continent, witnessed firsthand the pandemic's grim toll, and written movingly about it in his book, *Race Against Time*. Speaking at RAND, he offered some provocative, sobering, and impassioned thoughts about how the race is going and what must be done to win it.

Beyond the "Silver Bullet"

Given the daily toll the pandemic is taking in developing countries and in sub-Saharan Africa in particular, "finding a vehicle or vehicles to break the back of the pandemic is imperative," said Lewis. The best "vehicle" in scientific terms would be the discovery of a vaccine—the so-called silver bullet—but a vaccine remains as elusive as the virus itself, which Lewis described as having "an almost Machiavellian dexterity in manipulating itself in ways that elude scientific inquiry." He noted that the consensus, even among the most optimistic, is that it will take ten years or more to develop a vaccine.

Potentially closer in time is the scientific formulation of a microbicide that women could self-administer, much as one would today's spermicides, to prevent the transmission of the virus. "There is a full court press to see if microbicides can be discovered and made available to women in developing countries in the next four to seven years," said Lewis. If such a microbicide is even 60 percent effective, it could save millions of women's lives.

What makes the need for a microbicide so pressing is that women, particularly those between the ages of 15 and 24, are the most vulnerable to infection. "There is an almost Darwinian selection of women for disproportionate vulnerability," said Lewis, explaining that 75 percent of young Africans who are living with the virus are women and girls. The end result is that the virus is "denuding the African continent of women and threatening whole societies, a catastrophe unlike anything in history."

Halting Policy Progress

While the science for preventing transmission of the virus is still out of reach, much of the science for treating the disease is well within grasp. Science continues to search for ever-better antiretroviral treatments, but merely applying the science that already exists now in the developed world to the developing world could prolong lives.

Pascazia Mukamana, left, holds her three-year-old sister Solange Muragishemaria, who displays symptoms of HIV infection, at their home in Rwanda in May 2003. Months earlier, Mukamana had quit school to raise three siblings after their mother had died from AIDS.



AP PHOTO/KAREL PRINSLOO

Lewis gave a number of examples that show the promise of public policy. The cost of using today's brand-name antiretroviral medications is too high for developing countries. But the Clinton Foundation has negotiated an arrangement with Indian drug companies to sell generic medications—an arrangement that has dramatically reduced prices for poorer countries. Similarly, the Clinton Foundation has also negotiated for a pediatric dose of HIV medications, which will help many of the world's 2.3 million children who are living with the virus. Currently, half a million children die of AIDS every year.

Still, the broader potential of public policy remains largely unfulfilled, primarily when it comes to providing money to combat the virus. In July 2005, the leaders of the Group of 8 (Canada, France, Germany, Italy, Japan, Russia, the United Kingdom, and the United States) met at the Gleneagles Summit in Scotland and committed their countries to ensuring universal access to anti-AIDS drugs in Africa by 2010. But just eight weeks later, when the Global Fund to Fight AIDS, Tuberculosis, and Malaria—which Lewis considers the best financial vehicle to break the back of the pandemic—requested \$7.1 billion, it received just \$3.8 billion. Such ringing promises, according to Lewis, often end up as empty rhetoric.

Lewis also sees a double standard when it comes to preventing mother-to-child transmission in developing countries. “We are using single-dose nevirapine that reduces transmission by up to 50 percent, but if we used full HAART [highly active antiretroviral therapy] during pregnancy as we do in the Western world, the level of transmission would be 1 percent or less.”

Another double standard relates to saving the mothers so that their surviving children will not be orphaned. Three or four years ago, Lewis met three pregnant women at a health clinic in Kigali, Rwanda. The women asked him: “We’ll do anything for our babies, but what about us?” While a strategy for treat-

“There is an almost Darwinian selection of women for disproportionate vulnerability.” The virus is “denuding the African continent of women and threatening whole societies, a catastrophe unlike anything in history.”

ing not just the newborns but also their mothers has been the standard of care in the developed world for years, the ability to prolong mothers' lives is just now slowly being put in place in some countries in Africa. Today, some 14 million children across the continent are orphaned by AIDS.

Stuck in Neutral

In the race against time, Lewis suggested that the developed world is an apathetic competitor. While both science and public policy continue to putter along, the pandemic is winning. The consequences are dire and much larger than the individual lives lost. None of the 2015 targets for the United Nations' Millennium Development Goals will be met in Africa, said Lewis, in significant measure because the force of the HIV and AIDS pandemic has sabotaged the continent's capacity to achieve them. Those 2015 targets include reducing extreme poverty by half and making primary school available for free to all children.

Without an extraordinary effort from all corners of the international community, he warned, the world will mark a very different kind of milestone in the near future. “At the present rate, we’ll have a cumulative total of 100 million deaths and infections by the year 2012.” ■

One World, One Well

How Populations Can Grow on a Finite Water Supply

By Jill Boberg

Jill Boberg is an environmental policy analyst and a RAND consultant.

Earth is called the water planet, as water covers 71 percent of the Earth's surface, with additional water lying in glaciers, icecaps, the atmosphere, and underground aquifers. However, very little of this water is available for human use. Of the 1.4 billion cubic kilometers of water on Earth, only a tiny fraction of it—200,000 cubic kilometers, or just 0.014 percent—is fresh water accessible for human needs, including water for the ecosystems on which humans depend.

The availability of fresh water has become a pressing global concern because of unprecedented growth in the human population. The demand for naturally recycled fresh water continues to grow while the supply remains all but fixed. The greatest growth in demand is occurring in developing countries, which have the fewest natural, social, and economic resources to meet it.

To avert a global water crisis, local and national water managers need to understand the effects of demographic factors on water demand and institute reforms to help people safeguard the water supply. Some policy tools can help reduce demand, while others can

help augment the supply available for human use. Equally important is revamping the governance of many water systems.

Demand by Sector and Population

Agriculture accounts for nearly 70 percent of all the fresh water used worldwide (see Figure 1). Industry accounts for about 20 percent. Domestic uses account for the remaining 10 percent. But the relative proportions of water withdrawn by each sector differ considerably from continent to continent. The dominance of agriculture tends to decline with higher levels of industrialization.

The world's changing demographics will have a strong effect on the Earth's freshwater supply. Population expansion, household contraction, urbanization, and economic development will all increase the amount of water withdrawn and influence the quality of water available.

The tripling of the human population in the past 70 years has been accompanied by a sixfold increase in water withdrawals. Of greater concern, the number of households worldwide has increased at a rate even faster than that of population growth—the result of lower fertility rates, higher divorce rates, aging populations, and a decline in multigenerational family units.

The proliferation of smaller households may do more environmental damage than does simple population growth. Per capita, smaller households consume more water and produce more waste than do larger households. By requiring more housing units, smaller households also consume more construction materials and contribute to urban sprawl. Urban sprawl damages water quality by paving over land that would otherwise help filter the water that replenishes lakes and rivers.

Increasing urbanization is both a symptom and a cause of strained water supplies. When farmers migrate to cities, it is often because of deforestation, desertification, drought, or lack of arable land. Migration to cities inflicts several negative consequences

The proliferation of smaller households may do more environmental damage than does simple population growth.

on urban water resources: depleting municipal water supplies, generating more waste than the surrounding environment can absorb, contaminating local groundwater, and ultimately requiring waterborne sanitation systems that alone increase the demand for fresh water by about 40 liters per capita per day.

In terms of economic development, industrialized countries use more water per capita than do developing countries to run industry, grow food, produce electricity, and process waste. People in industrialized countries also demand more water-intensive products and services.

Supply by Region

Much of the world's water lies far from population centers. A large percentage of the water is found in the Amazon basin, Canada, and Alaska. About three-quarters of annual rainfall comes down in areas where less than one-third of the world's population lives. And because rainfall and river runoffs occur in very large amounts in very short time periods, many people cannot make use of most of the world's freshwater supply.

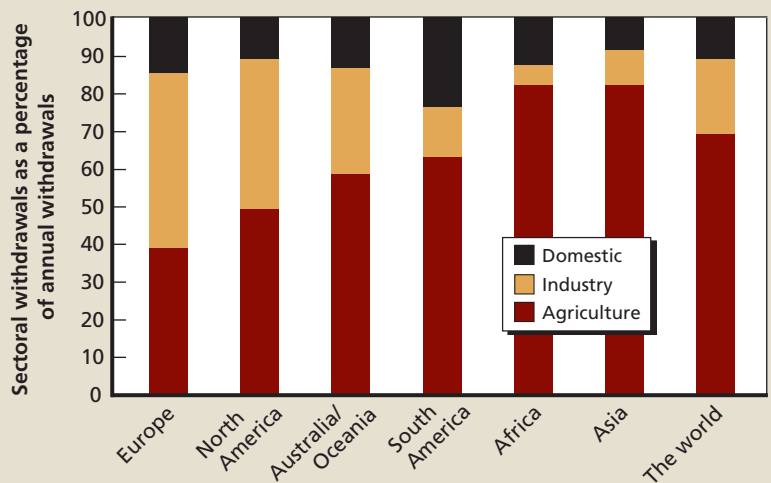
Figure 2 shows both the large variation across continents in the availability of "blue water" (the annually renewable supply of fresh water that can be tapped without leading to its depletion) and the effect of population on availability. The two extreme cases are Asia and Australia/Oceania. Asia has the highest total water availability but the lowest per-capita availability, whereas the opposite holds true for Australia/Oceania because of its lower total population.

Figure 3 gives a clearer picture, showing the per-capita renewable water supply by river basin. Looking again at Australia, it is clear that some areas—the most populated areas—have large per-capita supplies of water, whereas other parts of the continent, where very few people live, have very small per-capita supplies of water. In Asia, although the continent as a whole has relatively low per-capita water availability, some areas are quite well endowed with water.

Cap Demand First

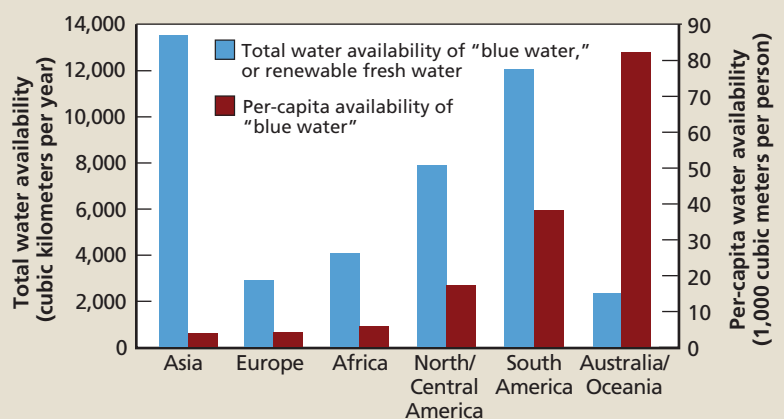
The tools chosen to manage water will depend on local conditions, but demand management will almost always be critical. Especially important in developing countries, demand management could defer large investments in water supply infrastructures, essentially buying time. In fact, a \$2 million investment in demand management could delay a \$200 million investment in new infra-

Figure 1—Agriculture Accounts for Nearly 70 Percent of Annual Freshwater Usage Worldwide



SOURCE: World Meteorological Organization, *Comprehensive Assessment of Freshwater Resources of the World*, New York: World Meteorological Organization, 1997.

Figure 2—Population Growth Has an Enormous Influence on Water Availability



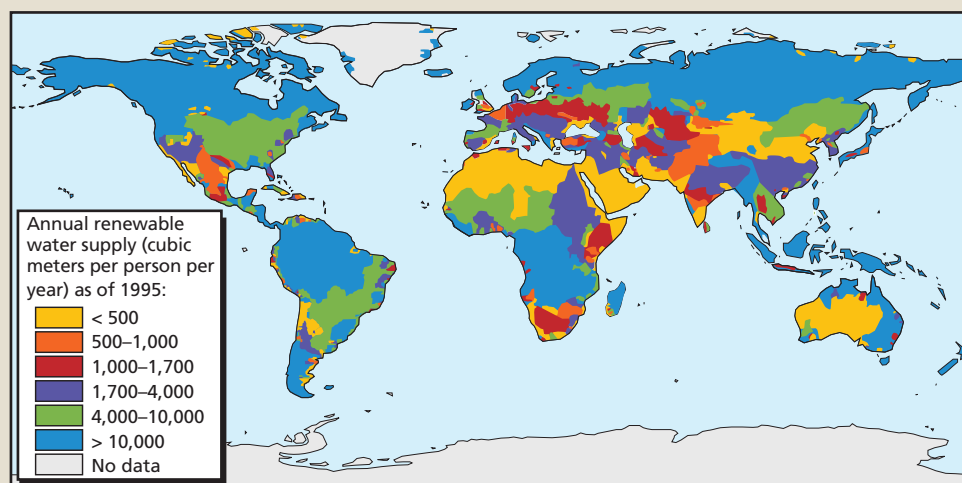
SOURCES: Igor A. Shiklomanov, *Archive of World Water Resources and World Water Use*, Global Water Data Files, State Hydrological Institute, St. Petersburg, Russia, CD-ROM, 1998; Peter H. Gleick, "The Changing Water Paradigm: A Look at Twenty-First Century Water Resources Development," *Water International*, Vol. 25, No. 1, 2000, pp. 127–138, online at www.iwra.siu.edu/win/win2000/win03-00/gleick.pdf as of March 2006.

structure for ten years, according to the United Nations Centre for Human Settlements.

To cap demand, water managers can choose among the following policy tools: institutional and legal changes, market-based incentives, nonmarket instruments, and direct interventions.

Some types of *institutional and legal changes* are more controversial than others. One is water-quality matching, which channels pure water only to functions that require it, such as human consumption, and lower-quality water to things like irrigation and

Figure 3—Annual Renewable Water Supply Per Person Varies Greatly Across and Within the Continents



SOURCE: *Liquid Assets*, 2005.

industrial processing. Another is decentralization, which allows local communities to control their own water supplies.

The most controversial change of this type is privatization, or involving private firms in building and operating water-management systems. It is controversial because these firms are motivated by private profits, whereas water is usually believed to be a common good. Before privatization becomes a widely available option, concerns must be addressed about equitable access to water for the poor, the integration of environmental priorities, and the sharing of environmental risks.

Among the *market-based incentives*, the most common is water pricing. Huge public subsidies now flow to agricultural users in most countries. In the United States and Mexico, agricultural users pay only about 11 percent of the full cost of water. Water pricing may raise or lower prices for all or certain users, adjust subsidies and taxes, and levy charges for pollution flows or effluents. Such reforms typically reduce demand, increase conservation, enhance environmental sustainability, and spur reallocation among the agricultural, industrial, and domestic sectors.

Nonmarket instruments consist mostly of laws and regulations—such as quotas, licenses, pollution controls, and usage restrictions—to control water consumption. Educational campaigns to encourage water conservation are important complements to other nonmarket instruments.

Direct interventions include technological and other measures to conserve water. Examples are leak detection and repair programs, efficiency standards for plumbing fixtures, investments in infrastructure, modified industrial processes, and shifts toward water-efficient crops.

Tap Supply Next

While demand management promotes conservation and efficiency, supply management involves the location, development, and exploitation of new sources of water. Again, local conditions will dictate the best balance among the supply management options described below.

Dams and water-control structures are used for electric power generation, flood control, water storage, irrigation, and domestic water provision, thus offering substantial benefits. However, dams have large environmental, social, and demographic consequences, such as the submergence of forests and wildlife, the release of greenhouse gases from the decay of submerged vegetation, the relocation of families, the destruction of villages and historic and cultural sites, the disruptive effect of altered river routes, and the risk of catastrophic failure. Currently, there are more than 41,000 large dams worldwide. The costs of such projects have reached their financial, legal, and environmental limits in most industrialized and some developing countries.

Small-scale irrigation systems could expand with fewer constraints than could large-scale water projects. But success depends on factors such as technology, infrastructure, and implementation.

Groundwater is an efficient source of irrigation water because it can be tapped when and where it is needed, reducing transportation costs. However, sustainable use of groundwater requires oversight to ensure that the amount tapped does not exceed the amount recharged each year. Because many developing countries depend on groundwater for irrigation, and on irrigation for the food supply, the uncontrolled depletion of groundwater aquifers poses a serious threat to food security in many areas, particularly the northern China plains and western and peninsular India.

Reforestation of degraded and unproductive land can be cost-effective in the long term if all the ensuing benefits are taken into account: better water supply, larger agricultural revenues, and less pollution. But the high initial cost, combined with the drive to find short-term solutions, makes reforestation less appealing in many regions. This is especially true in densely populated poorer countries, where competition for land and resources is fierce. As a general rule, though, one of the best and most cost-efficient ways to secure water supplies around cities is to conserve forests.

Interbasin transfers and water exports are two more ways to bring water to places with dense populations or insufficient supplies. Interbasin transfers (using canals or pipelines to transport water) require infrastructures that are expensive and potentially environmentally harmful, both to the freshwater ecosystem from which the water is extracted and to the lands over which the pipes or canals must flow. Meanwhile, selling water through exports has been controversial because, again, water is perceived as a common resource that should not be sold by private companies.

Water reallocation among the agricultural, industrial, and domestic sectors can be accomplished either via government mandates or via market incentives. Reallocation from agricultural to other uses is already occurring in Chile, California, and elsewhere. Because water in developing countries is consumed predominantly by agriculture, reallocating even small percentages of the water to the domestic sector can fill that sector's needs.

Desalination, or turning saltwater into fresh drinking water through the extraction of salts, is an extremely expensive, energy-intensive process that produces brine that must be disposed of carefully to avoid environmental damage. For these reasons, desalination is an unappealing option, except in arid, relatively wealthy countries, such as Kuwait, Saudi Arabia, and Israel.

Water harvesting, or the capture and diversion of rain or floodwater, is an agricultural tradition now being adapted for urban domestic purposes. Required in new buildings in some Indian cities, water harvesting can both decrease the polluted runoff in urban areas and increase the efficiency, productivity, and soil fertility in rural areas.

Water reclamation and reuse have cut industrial water use in some developed countries, notably Japan and the United States, while reducing the pollution

released by industry into oceans, lakes, and streams. Wastewater and gray water (from showers and sinks, for example) can be used in gardens or stored in soak pits for groundwater recharge. Several such schemes are already in operation in Israel, Portugal, Tunisia, Namibia, California, and Japan and are being considered or pursued in Morocco, Jordan, Egypt, Malta, Cyprus, Greece, Spain, France, and Italy. The practice is limited, though, wherever the water contains high levels of salts or heavy metals.

Pollution control laws in developed countries have helped to clean up rivers, lakes, and streams and to promote conservation and efficiency. Although most countries have pollution-control laws, many developing countries lack the political will or financial resources to enforce them.

A Parched Planet?

There will continue to be localized problems of water scarcity and perhaps widespread problems in some areas. But a global water crisis can be averted. There are numerous ways to improve water management and to satisfy demand, even for growing populations. The best set of tools for any given location will depend on its social, political, economic, and physical climate.

Attention to demographic factors is an important part of the formula for staving off a water crisis. Sustainable water development and management will require the integration of social, economic, and environmental concerns. This effort will be enhanced by research that focuses on as small a scale as possible, preferably the scale of natural watersheds, to help policymakers around the world manage water at levels that are both socially and environmentally relevant. ■

Related Reading

Liquid Assets: How Demographic Changes and Water Management Policies Affect Freshwater Resources, Jill Boberg, RAND/MG-358-CF, 2005, 152 pp., ISBN 0-8330-3296-8, \$18.

Withdrawing Liquid Assets: How Demographic Trends Affect the Freshwater Supply, RAND/RB-9102-CF, 2005, 2 pp., www.rand.org/pubs/research_briefs/RB9102/.

As a general rule, one of the best and most cost-efficient ways to secure water supplies around cities is to conserve forests.

Iraq and Beyond

Recognizing Shortfalls in Performance

AMONG THE ISSUES SPARKED BY THE IRAQ WAR are three distinctly practical ones: sustaining U.S. Army forces in combat, promoting reenlistments across the services, and rebuilding Iraqi security forces and institutions. At times, these efforts have been hampered by shortfalls in U.S. performance. As outlined in the eight pages to follow, the lessons learned can help to reduce the risks and costs in future contingencies.

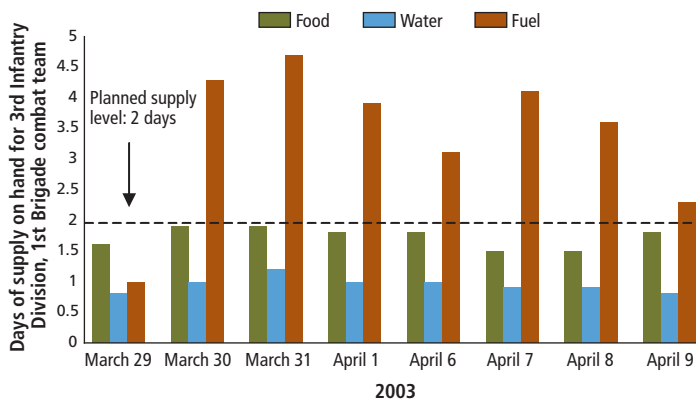
The problems with sustaining army combat forces began right away, as depicted below. Just days after the ground advance started rolling on March 21, 2003, the on-hand supplies held by army ground forces were lower than planned for all commodities except fuel. There simply were not enough cargo trucks to move all of the needed supplies—both because of unforeseen demands on the trucks and because of a shortage of trucks. As a point of reference, there was only an estimated one truck

for every 194 soldiers in Operation Iraqi Freedom in 2003, versus one truck for every 73 soldiers in Operation Desert Storm in 1991.

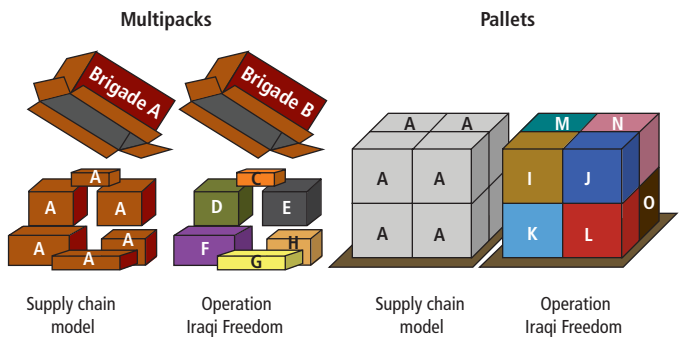
The most perilous of the early days came between March 24 and March 30, 2003. Unanticipated resistance from Iraqi irregulars, known as *Fedayeen*, conspired with a devastating sandstorm, known as a *shamal*, to halt the advance toward Baghdad for nearly a week. During this time, supplies held by the combat forces were nearly drained.

However, the logistics system weathered the challenge by keeping just enough critical supplies flowing north. Even when the *shamal* ended, though, the advance could not proceed until follow-on U.S. combat units could relieve the initial invasion forces of the unexpected requirement to secure the *Fedayeen*-defended urban areas of An Nasiriyah, As Samawah, and An Najaf astride the supply lines.

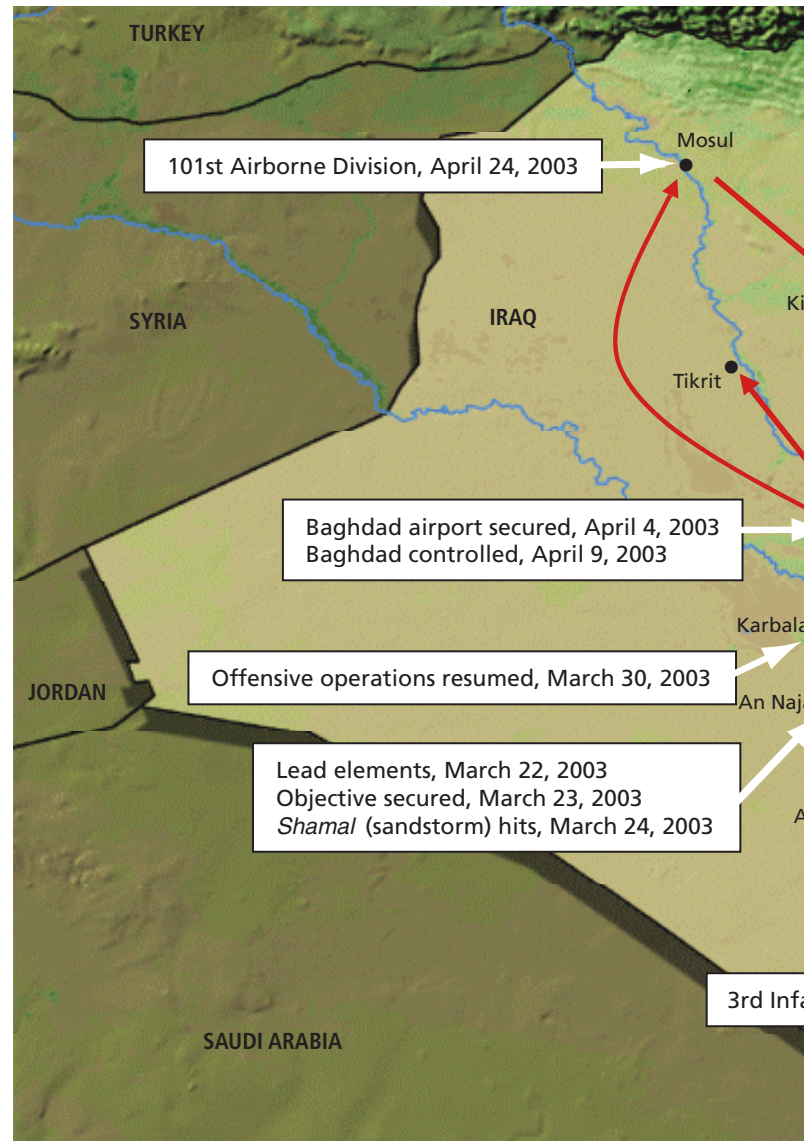
One Week into Operation Iraqi Freedom, Food and Water Supplies Were Thin, but Fuel Was Plentiful



Early in the Operations, Shipments from the United States to Designated Army Units in Iraq Often Contained Items Intended for Other Units



Intended destinations of boxes within multipacks—and of multipacks within pallets (letters designate different notional brigades)



SOURCE: *Sustainment of Army Forces in Operation Iraqi Freedom: Major Findings and Recommendations*, Eric Peltz, Marc L. Robbins, Kenneth J. Girardini, Rick Eden, John...

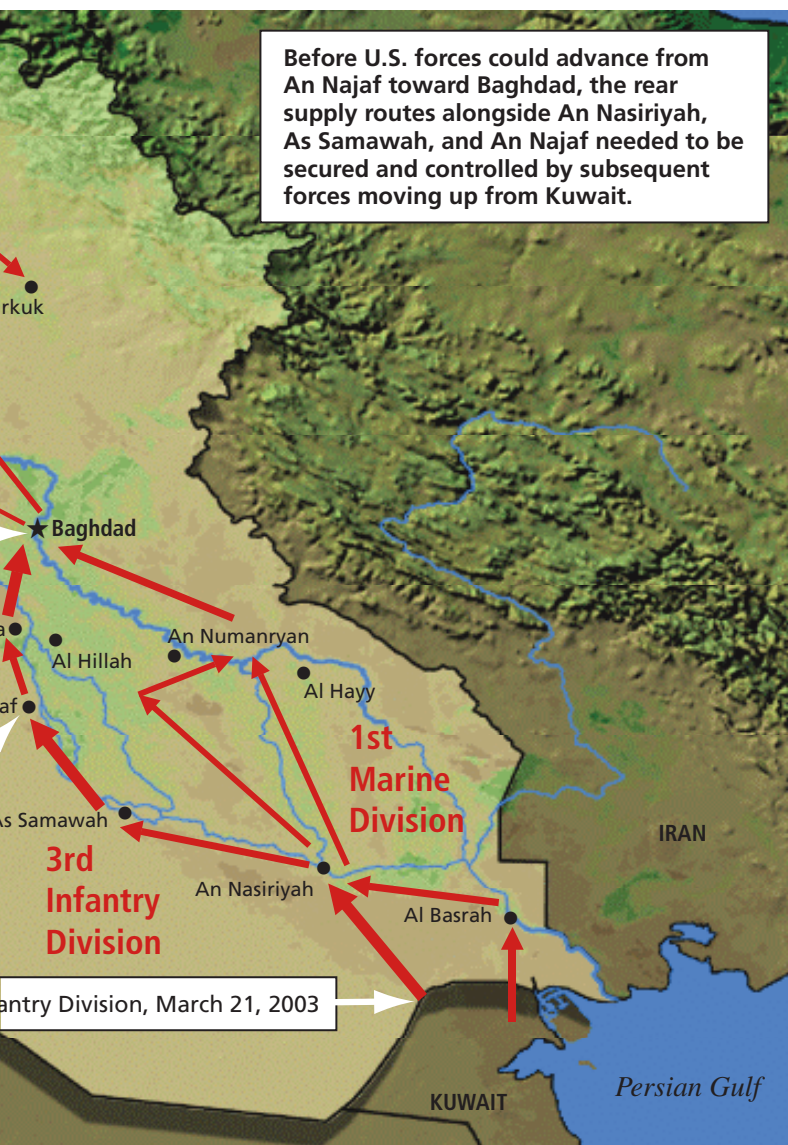
Performance, Identifying Options for Improvement

The supply of food and water improved quickly, but repair parts deliveries continued to be plagued by distribution problems, compounded by national supply shortages and delayed financing processes, as battles persisted into the fall of 2003 and beyond. The combination of problems left the repair parts supplies of many army units drained thin. It took close to a year before the repair parts supply chain became effective.

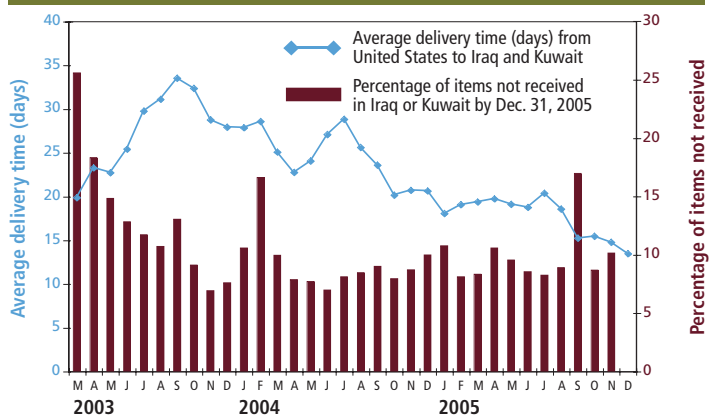
The good news is that there were no major operational consequences stemming from the problems with logistics processes, as distinct from, say, the need to secure supply lines. That is, there is no evidence of an inability to accomplish a tactical mission, a failure to achieve desired battlefield outcomes, a change in any course of action, or the foreclosure of a desired option as a result of logistics problems specifically.

However, what the problems did affect were assessments of risk. The combination of low levels of on-hand supplies, known distribution problems, and limited visibility of incoming supplies resulted in calculations of elevated risk in the minds of the commanders and soldiers engaged in combat operations.

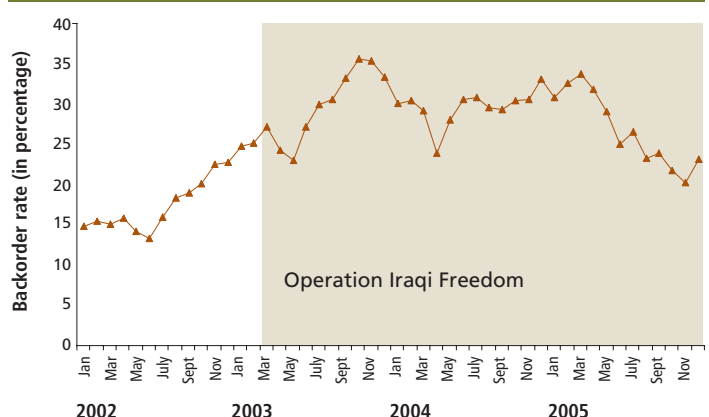
The potential operational effects of the logistics problems were successfully mitigated through intensive management, creative adaptations, and the resolve of soldiers continually pushing themselves to the limit. But such actions might not be enough to overcome such problems in every situation. The perceived level of risk might have triggered more significant changes in courses of action in the face of a more capable enemy. ■



Stateside Personnel Shortages Led to Delivery Delays, Which Were Exacerbated by Mixed Shipments, Which Also Led to Lost Materiel



War Reserve Shortages and Delayed Production Increases Caused the Backorder Rate for Army Repair Parts to Skyrocket in Late 2003 and 2004



John M. Halliday, Jeffrey Angers, RAND/MG-342-A, 2005, 152 pp., ISBN 0-8330-3783-8, \$25.

Iraq and Beyond

Sustaining Army Forces

By **Eric Peltz, Marc L. Robbins,
and Kenneth J. Girardini**

Eric Peltz is a senior management systems analyst and director of the logistics program within RAND Arroyo Center. Marc Robbins is a senior management scientist at RAND. Ken Girardini is a senior operations researcher at RAND.

By virtually every account, the major combat operations of Operation Iraqi Freedom (OIF) that toppled Saddam Hussein's regime in the spring of 2003 were remarkably successful in terms of achieving the military objectives. Yet there is a general belief within the U.S. Army and the broader defense community, supported by our analysis, that this success was achieved despite numerous logistics problems.

When ground forces attacked in March 2003, there were not enough cargo trucks to move the needed supplies. This shortage was due to both higher-than-anticipated demands on trucks and factors that limited their number. As a result, supplies ran low for all commodities except fuel. (Compared to other commodities—such as food, water, and ammunition—fuel had been the subject of better planning and received greater resources.)

The advancing combat units also lacked the communications equipment needed to order repair parts while on the move. This became particularly problematic for the army's 3rd Infantry Division, because it

had to rely on parts, prepositioned in Kuwait, that fell far short of adequate.

Soon after the invasion, severe problems cropped up in the distribution of supplies from the United States. These problems substantially delayed delivery of repair parts to U.S. troops in Iraq. In fact, the inventories of repair parts held by major combat units shrank to less than ten percent of the parts needed to repair broken equipment.

Shipments from the United States were hobbled initially by miscommunication between the army and the U.S. Defense Logistics Agency on how to consolidate shipments stateside. This generated an unexpected re-sorting workload in theater, which in turn led to delays and some "lost" shipments, as units in Iraq often received items intended for other units. Later, as the scale and pace of stability operations grew, the demand for repair parts and other supplies outstripped the capacity of the major stateside distribution center supporting OIF. It took nine months for the Defense Logistics Agency to gain funding approval, increase capacity, and work off the backlog.

As the heavy pace of operations continued into the summer of 2003 and beyond, the army's inventories ran low on a wide range of repair parts. There were insufficient national war reserves, insufficient replenishment capabilities, and insufficient funding. Combined, these factors caused the backorder rate for key repair parts managed by the army, such as engines, to skyrocket to 35 percent of all orders (see the centerpiece on pp. 16–17). Recovery from these problems extended into late 2005.

To prevent such problems in the future and to reduce the risks for troops, we offer several suggestions. These range from a shared vision of an interorganizational structure for the supply chain to numerous logistics particulars. The shared vision is needed to build better integration among the private sector, the army, the other military services, and the other defense organizations involved in supplying army forces. The logistics particulars include improved communications systems for army logistics units, improved inventories to accommodate potential contingencies, planning and budgeting processes that account for uncertainty and surprise, and thorough joint and interagency training for the entire logistics system.

The supply chain needs to be integrated through a common vision of an interorganizational structure, fleshed out with principles and roles agreed upon by all of the military supply chain's organizations. Such agreement will ensure that each process and organization is focused on overall effectiveness rather than on internal optimization. Many of the logistics problems we identified were the result of elements of the supply chain either not being aligned with other parts of the system or being designed without a clear focus on sustaining the units on the battlefield.

Higher funding priority should be given to communications systems for logistics units. Non-line-of-sight, mobile communications are essential for logistics forces operating over extended distances. To operate effectively, it is imperative that logisticians be able to respond quickly to changes in the battlefield situation. Timely and accurate information about the availability of supplies en route is also critical to operational commanders.

Stability operations require adequate treatment during inventory planning. Some supply problems were driven by the long-continuing high demands of stability and counterinsurgency operations. In hindsight, this is not surprising, because such operations are not generally embedded in the formal planning processes used to determine logistics resource requirements. Henceforward, stability operations scenarios should be considered in both deliberate and crisis-action planning to identify inventory and other logistics requirements.

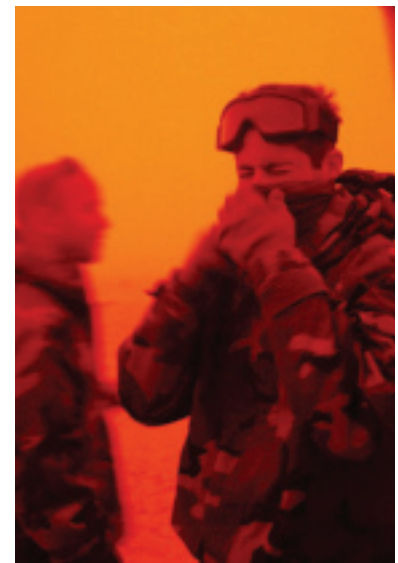
Resource planning should account for uncertainty and the implications of capacity shortages. Once a backlog develops, capacity must ramp up not only to work off the backlog but also to meet the higher, ongoing level of unanticipated demand. Risk assessments during planning should recognize the long-term operational

effects of insufficient capacity, informing decisions about how much slack or buffer capacity should be in the system. Surprises must be expected, and the supply chain must be agile enough to respond.

Joint training should exercise the entire logistics system. The army should review all logistics processes to determine which ones are not exercised in training with all requisite joint organizations. During exercises, tactical units should have to set up logistics operations from scratch. Theater commanders need to plan theater distribution systems. Theater distribution centers need to be set up. Ports need to be opened. Even the national-level spare-parts planning and financial approval processes should be exercised. Exercises will reveal roadblocks and bottlenecks as well as improve execution during the next war.

In all cases, the levels of acceptable risk need to be carefully examined. Just a few days into Operation Iraqi Freedom, a severe sandstorm, known as a *shamal*, generated a dramatic example of how a two- to three-day disruption could hinder a force operating with limited supplies. The logistics system was able to handle the storm, but just barely, thanks to just enough inventory held by tactical units. The goal now is to determine how to make the logistics system work better, particularly in expeditionary operations, and to anticipate what future storms it might be called upon to weather when determining what is just enough. ■

Under an orange sky, Sgt. Steven Brussel covers up from a blowing sandstorm, or shamal, in the desert near Karbala, Iraq, on March 26, 2003. Troops from the U.S. Army's 3rd Infantry Division were stalled in the desert less than 100 miles from Baghdad.



AP PHOTO/JOHN MOORE

Related Reading

Sustainment of Army Forces in Operation Iraqi Freedom: Battlefield Logistics and Effects on Operations, Eric Peltz, John M. Halliday, Marc L. Robbins, Kenneth J. Girardini, RAND/MG-344-A, 2005, 116 pp., four-color illustrations, ISBN 0-8330-3806-0, \$30.

Sustainment of Army Forces in Operation Iraqi Freedom: Major Findings and Recommendations, Eric Peltz, Marc L. Robbins, Kenneth J. Girardini, Rick Eden, John M. Halliday, Jeffrey Angers, RAND/MG-342-A, 2005, 152 pp., four-color illustrations, ISBN 0-8330-3783-8, \$25.

Iraq and Beyond

Promoting Reenlistments

By James Hosek

James Hosek is a senior economist at RAND.

The ongoing wars in Iraq and Afghanistan have placed unprecedented strains on the all-volunteer U.S. military force, requiring an application of power that is more intensive and more prolonged than at any time since the era of the draft during the Vietnam War. Moreover, the one-third cut in active-duty personnel since the end of the Cold War, from 2.1 million to 1.4 million, has necessitated longer and repeated deployments, especially for the army and the Marine Corps.

These deployments have posed extraordinary challenges for service members and their families. Personnel are sometimes deployed for 12 months in nontraditional, hostile conditions, with only six months at home before their next deployment. The strains have been borne by nondeployed personnel as well. Like deployed personnel, nondeployed personnel frequently work long days to support the heightened pace of military operations. Both deployed and nondeployed personnel report rising levels of stress as the result of the increasing frequency of working long days.

Of particular concern to defense policymakers, the added stress from working long days has lowered the intentions of personnel to reenlist. This pattern holds true for both deployed and nondeployed personnel across all four major services: the army, air force, navy, and Marines (see the figure). There is practically

no difference between those who are deployed and those who are not.

To offset the negative effects of the long workdays, the U.S. Department of Defense should

- spread deployments widely across service members and units
- examine further ways to compensate personnel who are deployed repeatedly or for long durations
- consider additional pay and recognition for nondeployed personnel who frequently work long days
- provide deployed troops with effective, accessible, and inexpensive communication home
- consider expanding mental health programs to help personnel cope with combat-related stress.

Indeed, the military services are now taking some of these steps, and in fact retention has remained high during the Iraq and Afghanistan operations. Ongoing research at RAND has contributed to a deeper understanding of the factors that affect stress and the intention to reenlist in the military—and the type of actions that defense policymakers can take to sustain retention.

The good news is that service members value deployments as an opportunity to use their training in real-world missions and to participate in meaningful operations. However, service members have preferences and expectations for the duration and frequency of deployments. If deployments exceed those parameters—as may occur with prolonged durations or uncertain schedules—then satisfaction with military life can suffer. When possible, therefore, deployments should be spread widely across qualified

service members and units rather than limited to the same individuals.

Increasing deployment pay could offset some of the negative effects of unusually long and frequent deployments on morale and reenlistment. The defense department is now looking into increasing such compensation. In addition, heavy deployment schedules now and in the future could deter some prospective recruits. Therefore, the military might need to offer enlistment bonuses to compensate for the greater perceived risk.

It is also worth considering additional pay and recognition for nondeployed personnel who are often called upon to work longer than the usual duty day. Nondeployed personnel report that such hours create stress at both work and home, leaving little time for a personal life. Yet personnel receive no extra pay for frequently working extra hours. One option for introducing such pay would be to extend the eligibility for Special Duty Assignment Pay to include personnel who do not deploy but who fill positions that require many long days.

The aspects of deployment that increase stress and discourage reenlistments most significantly are family separation, high operations tempo (lengthy and frequent deployments), long work hours, and uncertain schedules. These aspects could be mitigated through various means.

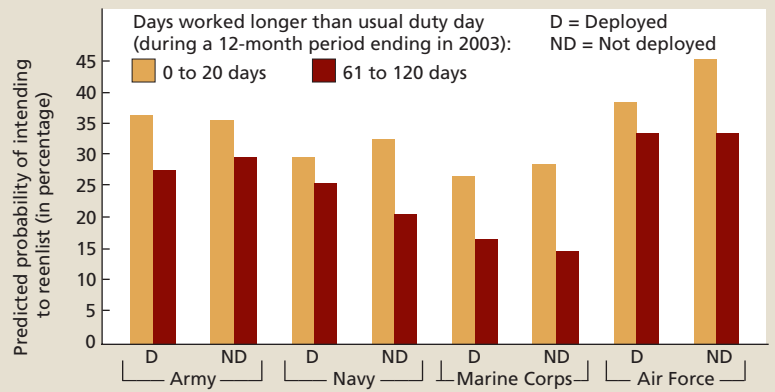
Focus groups that we have conducted with service members suggest that effective, accessible, inexpensive communication home while on deployment would help to reduce the stress of family separation. Expanded family-support programs might also play a role.

With respect to the high operations tempo, our analysis of survey data has found that service members who feel that they and their units are well prepared have lower-than-usual stress and higher reenlistment intentions. Coupled with this, we have learned from focus group members that training needs to be continuously revised to keep up with nontraditional tactics and with counterinsurgency, stabilization, and peacekeeping operations. The military is, in fact, adapting its training to include the lessons learned in Iraq and Afghanistan.

To ease the burden of long hours, certain tasks might be eliminated or postponed. Personnel might be temporarily reassigned to assist with pressing tasks. And, as mentioned, pay might be increased.

To offset the effects of uncertain schedules, a predictable rotation cycle could help. But when deployment times are not predictable, it would be useful to advise service members of this uncertainty so that they and their families can plan around it.

Deployed or Not Deployed, Enlisted Personnel Who Frequently Work Long Days Report Less Intention to Reenlist



SOURCE: *How Deployments Affect Service Members*, 2006.

Some focus group participants said that they coped informally with combat-related stress by turning to their buddies for support rather than seeking professional help. Among the reasons given for doing so were that buddies had shared the same experiences and “understood,” and that visiting a mental health professional would be entered into their personnel file and might be perceived as a sign of weakness.

Military health officials now mandate screening for posttraumatic stress disorder among returning personnel. Mandatory screening eliminates the stigma an individual might feel in seeking help. The services also offer counseling to departing and returning personnel, helping them cope with stress related to family separation and reintegration. But these programs might need to be expanded to ensure that all members, even those who live far from bases, have access to mental health care. In addition, because soldiers often rely on their buddies, it might be useful to train soldiers how to help other soldiers handle stress.

It is important to keep in mind that our data and focus groups reflect only the early stages of the wars in Iraq and Afghanistan. Since 2004, the fighting in Iraq has become far more lethal, some personnel have been ordered to stay on duty even after having fulfilled their terms of service, and growing numbers of personnel have faced their second or even third deployments. It remains to be seen how these changes might alter the research findings. ■

Related Reading

How Deployments Affect Service Members, James Hosek, Jennifer Kavanagh, Laura Miller, RAND/MG-432-RC, 2006, 150 pp., ISBN 0-8330-3868-0, \$24.

Iraq and Beyond

Rebuilding Iraqi Security

By Andrew Rathmell, Olga Oliker, Terrence K. Kelly, David Brannan, and Keith Crane

Andrew Rathmell is a senior research leader with RAND Europe. All five authors are RAND researchers who served with the Coalition Provisional Authority in Iraq during its existence in 2003 and 2004.

From May 2003 to June 2004, the Coalition Provisional Authority (CPA) in Iraq sought to reconstruct Iraqi security forces and to develop Iraqi security institutions. We examined these attempts in the defense, interior, and justice sectors. We assessed the CPA's successes and failures so that we could draw lessons from the experience, insofar as currently possible.

In planning for postwar Iraqi stabilization and reconstruction, the United States and its coalition partners had assumed a benign security environment and an Iraqi police force able to maintain order. Instead, the security environment deteriorated, and those police and security forces that remained were incapable of responding to rising criminality and political violence.

Once the CPA agreed in November 2003 to shift power to the Iraqis by the end of June 2004, the CPA was confronted with the challenges of restoring order, rebuilding Iraqi security forces, and building security institutions on an abbreviated timeline. Consistently, the emphasis on meeting short-term security needs at

the expense of building long-term security institutions led to failures.

These shortfalls must be addressed if the Iraqi security sector is to develop into an effective and accountable part of the nation's governance framework. It is critical that Iraqi leaders and their international advisers not become mesmerized by the fielding of large numbers of security forces. While numbers are important, it will be vital to invest in the intangibles that cannot be so easily quantified, such as development of joint judicial and police investigatory capabilities; development of national security institutions, including the ministries of defense and interior; and sustained support to the justice sector, including anticorruption programs.

Another important need is for the Iraqi government at the highest levels to develop the capacity to make and implement security policy on its own. However, the United States and its coalition partners must realize that Iraqi ministers and senior officials are likely in the near term to be focused mainly on survival. In this perilous environment, it will be up to the United States and its international partners to ensure that long-term institution-building remains on the Iraqi agenda.

In retrospect, the CPA left a mixed record overall. Its aim was to build sustainable institutions that would contribute to the emergence of a secure and democratic Iraq. Its successes were often coupled with failures, or at least shortfalls that have persisted to this day. Several examples stand out:

- The CPA helped Iraq's political leaders establish security institutions, most notably the Ministe-

rial Committee for National Security. However, there is little sign yet of the development of true coordination among various security ministries at working levels.

- The CPA focused on identifying appropriate personnel to rebuild the Iraqi Ministry of Defense. This might prove wise if the ministry is allowed to mature. However, there are signs that the ministry will remain weak, which bodes ill for civilian control of the military.
- When the CPA dissolved all other security forces, the Iraqi Police Service became the assurer of public safety and the lead Iraqi counterinsurgency force. But it was not trained or equipped for these roles. The situation had improved a little by June 2004 and continued to do so thereafter. However, the government institutions in Baghdad and in the provinces that oversee the police remain very weak.
- Critical ministries such as oil and electricity are deploying increasingly professional security forces. However, the overall regulation of private security forces remains problematic.
- Judicial reforms, including the establishment of an independent judiciary, made considerable progress under the CPA. However, efforts to fight organized crime and corruption have languished.
- The CPA failed to develop an integrated, coordinated Iraqi intelligence apparatus. Such an apparatus could have been of great importance in the campaigns against the insurgency and organized crime.
- The CPA instituted a stipend program for former members of the armed forces and appointed “clean” former officers to the security forces and ministries. However, the effort was insufficient to keep some former soldiers from joining the insurgency.

We identified six problems underlying the CPA’s approach that need to be addressed if Iraq is to recover from these past mistakes:

1. *A lack of worst-case and contingency planning.* This included the failure to prepare for the infiltration and intimidation of police forces, which required coalition troops to step back into the front line of security in key urban areas.

2. *Structural constraints on rational policy development.* An early, integrated approach to security-sector development rapidly unraveled. Coordination was subsequently devalued. Incentives to achieve it were not established.



AP PHOTO/STEFAN ZAKLIN

A U.S. soldier walks through the damaged building of the Coalition Provisional Authority headquarters in Najaf, Iraq, on April 17, 2004. The CPA had come under regular mortar and small arms fire in the previous few weeks.

3. *Inability to mobilize funding and personnel.* In most nation-building operations, mobilization of non-military resources has been problematic. In Iraq, the scale of the operation and the security situation severely tested established mechanisms, and a reliance on untested mechanisms delayed the deployment of resources.

4. *Emphasis on meeting the short-term needs of fielding Iraqi security forces at the expense of the long-term goals of building Iraqi security institutions.* Filling the immediate security vacuum involved measures such as rapidly recruiting police and civil defense personnel with minimal vetting, as well as relying on tribes and militias, which were contrary to the coalition’s long-term goal of engineering a sweeping reform of the nation’s security sector.

5. *Delays in ensuring Iraqi ownership of the reform process.* Until November 2003, the CPA imported foreign expertise to manage Iraqi security affairs. It was only afterward that the CPA focused on developing Iraqi leadership and capacity. The result was patchy Iraqi ownership of reform, as well as limited capacity within the security institutions.

6. *Ambiguity in long-term security relationships.* It was never clear if the United States would have guaranteed protection for Iraq against external aggression for the foreseeable future, which would have allowed Iraqis to concentrate on building internal security forces. ■

Related Reading

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Think Locally, Act Nationally

Police Efforts in Fighting Terrorism Need Greater Federal Leadership

**By K. Jack Riley, Jeremy M. Wilson,
Gregory F. Treverton, and Barbara Raymond**

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Virtually everyone agrees that the U.S. war on terrorism should involve local police departments and state law enforcement agencies. Nonetheless, such efforts have been spotty, incomplete, and devoid of a coordinated national strategy. Two counterterrorism concerns that call for greater national leadership today are (a) police personnel policies and (b) state and local intelligence activities.

The expanded set of police responsibilities since 9/11 has required a commensurately expanded set of police skills. Police departments are increasingly being asked to take on duties that fall within the homeland security arena. At the same time, departments across

the country are short staffed and finding it increasingly difficult to recruit qualified personnel to perform traditional tasks. All police departments could benefit from a federal effort to address the shared problems of personnel recruitment and retention. As local police departments are called on to play a larger role in national security, there is a compelling need for the federal government to play a larger role in contributing to the development of local police capabilities.

With respect to intelligence activities, state and local law enforcement agencies could be uniquely positioned to augment federal intelligence capabilities by virtue of being present in nearly every American community, knowing local individuals and groups, and already using intelligence to combat crime. However, the bulk of local intelligence activity is now concentrated among larger police agencies that typically pay for the work themselves, receiving little or no explicit federal support.

In fact, the federal government today is showing *less* interest in providing such support than it once did. The proposed federal budget for fiscal year 2007 includes a 41 percent *cut* from fiscal year 2006 in the law enforcement assistance programs run by the U.S. Department of Justice and U.S. Department of Homeland Security. The combined budget for such programs run by the two departments would be \$105 million less in 2007 than the amount received by the justice department alone in 2004. The International Association of Chiefs of Police has noted that the proposed budget would mark a ten-year low in federal funding for the assistance programs.

All police departments could benefit from a federal effort to address the shared problems of personnel recruitment and retention.



AP PHOTO/ROB CARR

Effectively integrating the vast supply of state and local counterterrorism resources into a coordinated national strategy will depend on addressing six critical issues. Two pertain to police personnel policies: strategic planning support from federal authorities and a workforce planning model for local police agencies. Four pertain to state and local intelligence activities: resources, training, development of doctrine, and guidance from the courts regarding civil liberties.

Police Personnel Policies

A clear argument can be made for national leadership on police personnel issues. Since the terrorist attacks of Sept. 11, 2001, local police agencies have accepted new duties related to homeland security, especially in jurisdictions with likely terrorist targets, such as airports and seaports. Police officers have also assumed new intelligence duties, such as working with federal law enforcement officials to identify potential terrorist activity.

In some ways, the homeland security mission draws on traditional police skills, such as helping to prevent crimes and attacks against people and places. In other ways, the mission places greater emphasis on new skills, such as responding to attacks involving chemical, biological, and other unconventional weapons. Many police managers believe the expanded responsibilities require additional officers as well as new skills.

At the same time, police departments are anticipating a wave of retirements among aging baby boomers and are reexamining the skills needed by young recruits. Numerous departments are adopting more community-policing policies, which emphasize communications skills. Adding to the challenge, police departments could now face growing competition for recruits from an expanding number of federal and private security jobs, exacerbating the competition for staff that already occurs among agencies operating within the same regions.

A good case study of the challenges facing many departments today is the Long Beach Police Depart-

Greensboro Police officer Ron Stewart scans the crowd during a college basketball game in Greensboro, N.C., on March 10. The FBI said there was no specific, credible threat of a terrorist attack at college basketball arenas but acknowledged alerting law enforcement officials of an Internet posting discussing such attacks.

Maryland law enforcement officials discuss port security at the Port of Baltimore on Feb. 21. They are, from left, Maryland Director of Homeland Security Dennis Schrader, Maryland Gov. Robert Ehrlich, Maryland Port Administrator Brooks Royster, Maryland Secretary of Transportation Robert Flanagan, and Maryland Transportation Authority Police Chief Gary McLhinney.



AP PHOTO/GAIL BURTON

ment, in Long Beach, a California city of nearly 500,000 residents and about 1,000 sworn police officers. Since 9/11, Long Beach police have shifted resources to boost protection of the city's seaport, airport, and water treatment facilities. Detectives have been reassigned from a white-collar crime unit to a new counterterrorism unit. However, staffing has been reduced among officers assigned to the narcotics division, foot patrols, and lower-urgency programs, such as youth drug-awareness efforts.

As do many police departments, the Long Beach Police Department uses standard computerized programs to help deploy officers on patrol. But there are no such tools available to help the department balance its standard deployment needs with the new demands for homeland security.

Given the nature of their work, police departments usually focus on short-term objectives, such as daily staffing needs and mandatory training requirements. But to adapt to the new homeland security duties and the changing labor force, police departments will also need to develop long-term plans for recruiting enough new officers with the right skills.

Some departments could develop their own strategies to recruit new officers. These departments could, for example, analyze the skills needed among future officers, forecast the number of personnel needed for future challenges, and survey young people to gauge their interest in police work. Surveys on youth demographics and attitudes could also indicate whether the departments need to make changes to attract the best candidates. Further strategic planning might also help resolve debates within many departments over whether to modify entry requirements, such as accepting candidates who are less physically fit, who have histories of prior drug use, or who have financial debts—or, conversely, requiring successful candidates to have accumulated a greater minimum number of college credits.

But most police departments do not have the resources to study long-term issues in this way. Rather, many departments find themselves busier than ever with expanded daily duties while being caught in the midst of a period of rapid change.

An alternative and most likely superior approach would be if the forecasting and planning for police personnel needs could be spearheaded at the national level, either by the U.S. Department of Justice or by a national trade organization. A central national clearinghouse for police personnel information would be particularly beneficial for small police departments. Many states also have organizations that could assist with police personnel planning.

Congress has an important role as well. Congress should recognize that federal laws designed to fight terrorism typically increase the demand for local police services and have serious implications for police personnel. Therefore, Congress should examine how to allocate federal resources accordingly.

Intelligence Activities

To assess how state and local intelligence activities have developed since 9/11 and how they could develop further, we carried out three studies. We analyzed data from a 2002 survey on counterterrorism preparedness among 259 state and local law enforcement agencies across the United States. We conducted case studies of eight metropolitan police departments. And we analyzed the available statistics on wiretaps and related activities, including oversight of these activities, to understand how these types of state and local efforts contribute to national efforts.

The survey revealed the extent to which the state and local agencies were engaging in counterterrorism intelligence activity in 2002. Fully 75 percent of the states had specialized counterterrorism units, compared with just 16 percent of local agencies that reported having such units. Likewise, state agencies had greater experience with incident management and response, incident investigations, and hoaxes. Local units typically had limited missions (primarily information sharing). State units were more likely to take on more-expansive roles.

In general, state agencies reported greater awareness of terrorist operations and threats than did local agencies. Substantial majorities of state agencies indicated knowledge of terrorist groups operating within their states, whereas only small minorities of local agencies indicated knowledge of such groups operating within their jurisdictions (see the figure).

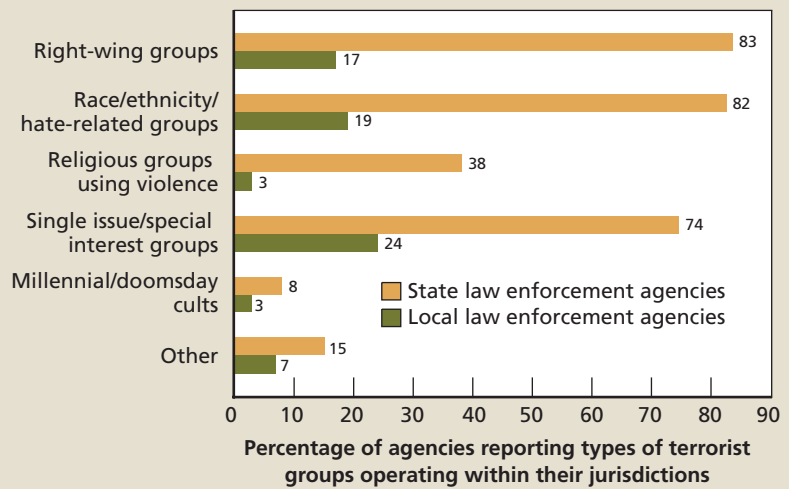
Among local police departments, the bulk of the activity was concentrated among the larger departments. There was a correlation between the size of a local agency and its threat assessment activity: The larger the agency, the more likely it was to have done a threat assessment.

About a third of local agencies had participated in the FBI's joint terrorism task forces (JTTFs). In a JTTF, several intelligence, homeland security, and law enforcement authorities from federal, state, and local agencies collaborate on terrorism prevention and intelligence under FBI supervision. Once again, we found that the larger the local agency, the more likely it would have participated in a JTTF. Nearly all state agencies had collaborated with JTTFs.

We expect that the situation has changed, and no doubt improved somewhat, since 2002. But the survey gave us a baseline against which future progress could be measured, and it raised key concerns. The primary one is that many local agencies lacked experience with and exposure to terrorism issues. Typically, they had not responded to incidents, were less likely to claim that there were radical groups in their jurisdictions, and were less likely to operate specialized units or functions. The survey informed us about what types of issues to explore in the case studies.

In the case studies, we have since found that state and local agencies are typically paying for intelligence activities "out of their own hides." That is, they are not receiving explicit federal support but are paying for the activities out of internal reallocations that often take

Most State Law Enforcement Agencies Reported Terrorist Groups Operating Within Their Jurisdictions; Most Local Agencies Did Not



SOURCE: *State and Local Intelligence in the War on Terrorism*, 2005.

money away from other law enforcement programs. Among local police departments, the counterterrorism intelligence gathering and analysis tend to occur not within separate counterterrorism units but within larger criminal intelligence units. Local police have also increased their staffing for such counterterrorism efforts but have also typically done so at the expense of other policing areas, such as countering gangs, narcotics, fraud and forgery, vice, burglary, and auto theft.

In general, local police departments rely on federal guidelines for shaping their intelligence functions, but most local departments have little capacity to analyze the information they collect or receive. Federal grants have been available for local counterterrorism efforts, but most of the money has been earmarked and used for equipment and consequence management, not for training in intelligence analysis.

Meanwhile, our study on wiretaps revealed that there has been a substantial increase in state and local involvement in wiretapping and related activities since 9/11. To the extent that local involvement in intelligence has occurred through participation in federal task forces, the local surveillance activity has been guided by federal regulations and overseen by federal courts. This has been the ideal division of labor. However, the oversight of locally initiated intelligence programs

State and local agencies are typically paying for intelligence activities "out of their own hides."

and intelligence activities *independent* of federal task forces has been mostly ad hoc, informal, or conducted through local chains of command. This has been less than ideal.

In either case, we found the paucity of local capacity for intelligence analysis to be striking. Only the very largest police departments have any analytic capacity at all. Departments should be capable of taking the guidance provided by federal officials and relating it to an awareness of the local domain.

Both the 2002 survey and the subsequent case studies have pointed to a further concern: The work of the JTTFs have been constrained because state and local participants are required to have security clearances at the level of their FBI counterparts. However, only half of the state and local agencies indicated that all their personnel who had applied for such clearances had received them. It is imperative to find ways to share information and to share it more widely.

In short, the picture of state and local involvement in counterterrorism intelligence is mixed. On the one hand, the involvement is probably not as pervasive as feared among civil libertarians, because relatively few state and local agencies appear to be supporting such activity to any great extent. On the other hand, there has been a marked increase in intelligence activity among the larger police departments that are engaged in it. As a result, a substantial portion of the American population may be in police jurisdictions with active intelligence programs.

Addressing the Critical Issues

Our findings suggest that six major issues need to be addressed with regard to the counterterrorism efforts of state and local law enforcement agencies. The first two issues pertain to police personnel management in light of the new mission of homeland security. The subsequent four issues pertain to intelligence activities conducted at the state and local levels.

1. *Although strategic planning by local police agencies is critical to effective force management, such planning can be a challenge for departments without analytic resources.* All departments should be examining the services that they expect to continue to provide, any anticipated changes in services linked to significant population or other environmental changes, any new or expanded services for homeland security or other missions, and the skills needed among future police officers. Ideally,

a national resource would exist to provide support for local departmental efforts at strategic planning.

2. *An important next step for the nation is to develop a strategic planning “model” for local police personnel allocation.* For example, a simple spreadsheet or computer software program could allow local police leaders to input a set of straightforward variables—such as current workforce characteristics, desired workforce characteristics in five years, estimated attrition, and trends in the labor pool—and could then illustrate when hiring should occur, what types of officers should be hired, and how many. Such a police deployment model would incorporate key elements common to most police departments across the country but would depend on the input of factors specific to each agency. Such a model should be pilot tested in several cities in the country.

3. *The financial sustainability of state and local counterterrorism intelligence activities (and, more generally, state and local homeland security missions) is in question.* Funding for these activities is not coming from the federal government but is being borne by state and local budgets. It remains unclear whether state and local agencies will continue to support these activities as other demands on them increase. It is also unclear whether these activities assist with or detract from traditional crime prevention activities at the local level.

On the one hand, municipalities consistently report that they are redirecting traditional crime-fighting resources to support homeland security missions. These redirections have unknown consequences for staffing, morale, and preparedness for traditional missions of crime prevention and response at a time when many communities are experiencing surges in traditional forms of crime. On the other hand, some state and local agencies report that counterterrorism intelligence activities might *increase* their effectiveness against organized crime, drug trafficking, and gang activity by building skills that are critical to confronting such problems.

To our knowledge, no credible analysis of the consequences has been performed. This deficiency should be remedied so that we could begin to determine the costs and benefits of current methods of funding state and local counterterrorism intelligence activities.

4. *The training of state and local personnel involved in intelligence activity appears insufficient.* The primary

need is for more training in analysis at the state and local level. Training would include techniques for increasing awareness of the local domain and for undertaking local threat assessments. Training would also address another concern: the widely varied and ad hoc nature of counterterrorism intelligence guidelines among the states, which complicates coordination.

Law enforcement organizations, too, must be “trained.” They should develop clear mission statements, adopt minimum standards for data collection, develop proper file maintenance standards, and implement appropriate staff training and certification processes.

It is worth noting that centralized training might permit improved federal oversight. The existing oversight mechanisms are largely a product of local decisionmaking processes. A central training program would permit federal authorities to make better cross-jurisdiction comparisons and to gain greater insight into the myriad formulations of local intelligence programs now operating.

5. Scant doctrine for shaping state and local intelligence activity exists. The process of developing, organizing, and managing state and local participation in counterterrorism intelligence is largely improvised. Most localities develop their own policies and procedures without strong guidance on many issues. It seems likely that there will be an increasing need for doctrine, or fundamental principles, to guide federal, state, and local actions. Since most state and local agencies participate in counterterrorism intelligence activities through the JTTFs, the task forces are one logical mechanism for developing a clear, consistent doctrine.

There are alternative ways that the federal government can accomplish this same goal. For example, greater federal funding for state and local intelligence agencies would permit a greater regulatory role over what is now a fairly loose process. Such a structure would give local police an incentive to develop internal guidelines and external oversight by tying them to funding.

Similarly, the federal government could pay the cost of an “intelligence supervisor” for eligible law enforcement agencies. The supervisor would have a role analogous to that of the federal security director at airports, who provides day-to-day security direction, even though airport operations are mostly local functions. In the same way, an intelligence supervisor could be selected by national authorities, such as the

FBI, and trained according to national intelligence standards. Although law enforcement throughout the United States is fundamentally local in nature, there is no reason that law enforcement *intelligence* needs to be.

These three options for instituting a federal role in developing doctrine do not constitute an exhaustive list. Nor should their mention here be construed as endorsing any particular approach. Indeed, none of them addresses the role that the U.S. Department of Homeland Security and other federal agencies should play in interacting with state and local agencies. But all three options underline the need to clarify the federal role in state and local counterterrorism intelligence activities.

6. The courts—the federal courts in particular—should strike the balance between privacy and civil liberties, on the one hand, and national security on the other. Even homeland security intelligence officials at the federal level feel they have little guidance when deciding what they should do with information they collect, especially about American citizens. Can federal officials keep the information in government databases? For how long? And on what basis? It will be up to the courts to enforce proper guidelines when constitutional or statutory standards apply and to put pressure on the executive branch to issue clear guidelines when such standards do not apply.

These issues will increasingly be decided by the courts. It will be up to them—the federal courts in particular—to continue assessing whether the relaxed intelligence procedures of the war on terrorism are striking the correct balance between liberty and security. ■

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In Policy Analysis, Just the Facts, Please

By James A. Thomson



PHOTO: DIANE BALDWIN

James Thomson is president and chief executive officer of the RAND Corporation. A longer version of this commentary appeared in The Hill on March 8, 2006.

In the 1950s, the phrase “just the facts, ma’am” became part of the American vocabulary because it was repeated so often by the fictional Sgt. Joe Friday on the hit TV show *Dragnet*.

Friday (played by Jack Webb) was a Los Angeles Police Department detective, and he uttered his famous phrase during his questioning of potential witnesses in investigations. His goal was to separate fact from opinion and conjecture so that he could get the information he needed to come up with an objective analysis to help solve a crime.

Yet as increasingly partisan and polarized debates rage across the United States today—pitting conservatives against liberals, Democrats against Republicans,

and people from various groups against one another—the plain and simple facts are getting lost in a sea of opinion flooding the media and cyberspace. Each side claims its own “facts”—as if shouting the loudest, coming up with the cleverest argument, or spending the most on TV ads could decide which “facts” are correct.

As the late Sen. Daniel Patrick Moynihan of New York once said, “We are each entitled to our own opinion, but no one is entitled to his own facts.” Facts are facts and are not based on who utters them or the views of the audience.

Unfortunately, opinion-based battles rather than fact-based battles have become the rule rather than the exception in debates about some of the most crucial issues of our times—ranging from Iraq to the economy to health care.

Too often, instead of searching for the facts and then using them to reach conclusions about what actions to take, opposing sides reach conclusions first and then look for “facts” later to back them up. This turns the concept of analysis on its head. It leads to polarization and confrontation, rather than accommodation and compromise.

The RAND Corporation is in the business of providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. We gather the facts, figure out what they mean, and then make recommendations about what actions are needed to reach the desired goal.

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Opinions belong in public debate. They are at the heart of our political system. We elect our leaders because of their opinions and values, and we expect them to exercise good judgment. But before an intelligent debate can begin, we need to know what we are debating, and that requires objective facts.

This is why some of the best advice about how to start solving the most pressing problems of the 21st century was given back in the 1950s by Sgt. Friday: “Just the facts, ma’am.” ■

The plain and simple facts are getting lost in a sea of opinion flooding the media and cyberspace.

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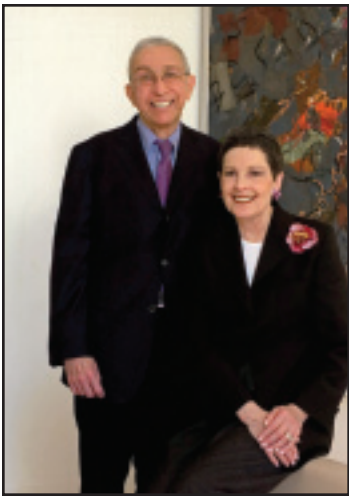
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