

Defensewide Activities

Overview

The Department of Defense contains a number of organizations that are not part of the Departments of the Army, Navy, or Air Force. Instead, those defensewide organizations perform activities that support DoD as a whole. Such organizations employ some military personnel, but they do not directly fund those personnel, because all military personnel are part of one of the services.¹ However, they do employ and fund DoD civilian personnel—about 216,000, on average, over the 2017–2021 period, according to the DoD’s budget plans.

Defensewide organizations fall into three broad categories:

- Organizations that make up DoD’s highest levels of command and control—the Office of the Secretary of Defense, the Joint Staff (a headquarters staff at the Pentagon composed of personnel from all of the services that assists the Chairman of the Joint Chiefs of Staff), and the regional combatant commands (groups of personnel from multiple services that are responsible for U.S. military strategy in specific geographic areas, such as U.S. Africa Command and U.S. Pacific Command).
- Organizations that provide specialized military capabilities that are not specific to any one service—examples include Special Operations Command, the Missile Defense Agency, and the military intelligence agencies.
- Organizations that give administrative support to all of DoD—most notably, the Defense Health Program

(DHP), which provides health care to service members, retired military personnel, and their dependents. Other such organizations operate schools for military dependents, run commissaries and exchanges (stores for military families), take care of payroll and finance activities, and provide telecommunications and logistics services. This category accounts for the largest share of defensewide operation and support (O&S) funding,

For this analysis, the Congressional Budget Office largely combined the first two categories of defensewide organizations. Most information about military intelligence activities is classified, so CBO could not describe their portion of DoD’s budget in any detail.² The only organization from the first two categories whose budget CBO treated separately, for visibility, was Special Operations Command. All of the other organizations in those two categories were included either in the group “Classified Defensewide Funding” or in the group “Rest of the Defensewide Organizations.”

For the third category, CBO distributed the costs of organizations that provide administrative support for DoD as a whole to the various units that generate the workload for those organizations. For example, CBO assigned the largest single defensewide cost—that of the Defense Health Program—to major combat units according to their numbers of active- and reserve-component personnel and their respective costs. Thus, the costs shown in the previous chapters for a major combat unit (or its support units or overhead activities) include that unit’s portion of DHP costs. The DHP also funds health care for retired military personnel and their dependents, but CBO did not distribute that portion of the program’s

1. Military personnel who work in defensewide activities, such as members of the Joint Staff and combatant commanders, are funded by the military service to which they belong. When service members are assigned to a defensewide activity, the activity tracks the costs incurred for those personnel through a system of DoD internal accounting credits that show the amounts that the military services must contribute to defensewide personnel costs.

2. DoD provides some insight into the classified portion of defensewide O&S spending in its publicly available budget materials, but that information relates only to the year for which the budget request is being made, not to the full five years covered in DoD’s budget documents.

funding among units because it is not a cost of maintaining current units. Instead, that part of DHP funding is shown in a separate entry in this chapter.

Since the late 1970s, the share of its funding that DoD devotes to defensewide activities has been growing—not necessarily because the department is providing greater amounts of support (although in some cases, such as health care, it is) but generally because DoD is becoming a more fully integrated institution over time. Many of the functions now carried out by defensewide agencies were formerly performed by the individual services but have gradually been centralized. That trend is generally seen as positive and as especially appropriate for joint installations and activities. (There is no reason, for example, to believe that the Air Force is particularly well suited to operating commissaries for Air Force personnel in a way that another, more focused, organization would not be.)

One consequence of the growing share of funding devoted to defensewide activities is that the costs that a military department bears for sustaining its units do not reflect the full cost of those units because defensewide agencies incur some of those costs. Thus, simply looking at the Army's cost to sustain an infantry brigade combat team—without including the defensewide costs associated with such things as processing the unit's payroll, educating its dependents, or providing commissaries for its personnel—will understate the unit's true costs.

CBO included such defensewide support as part of the cost of every unit, so the total cost of a military department's units in this analysis reflects those additional costs. As a result, the total cost that CBO attributes to the Army, for example, to sustain all of its units exceeds the Army's total O&S budget, whereas the amount of purely defensewide costs not attributed to any military department is much smaller than the defensewide O&S budget.

The rest of this chapter presents CBO's analysis of the following major defensewide activities:

- Special operations; see page 111.
- The Defense Health Program; see page 114.
- All of the other units and activities that support DoD as a whole, presented together; see page 116.

This chapter also examines two topics of special concern to the Department of Defense:

- The structure of the U.S. military's nuclear forces; see page 117.
- The United States' missile defense capability; see page 120.

Major Element of the Force Structure

Special Operations

	Total	Direct	Indirect ^a	Overhead
Army Special-Operations Forces^b				
Total Military Personnel	45,100	32,370	0	12,730
Total Annual Cost (Millions of 2017 dollars)	7,210	3,190	0	4,020
Navy Special-Operations Forces^b				
Total Military Personnel	16,440	9,900	0	6,550
Total Annual Cost (Millions of 2017 dollars)	2,370	1,050	0	1,330
Marine Corps Special-Operations Forces^b				
Total Military Personnel	3,530	2,130	0	1,410
Total Annual Cost (Millions of 2017 dollars)	490	210	0	280
Air Force Special-Operations Forces^b				
Total Military Personnel	24,070	15,900	0	8,170
Total Annual Cost (Millions of 2017 dollars)	3,730	1,840	0	1,890
Special Operations Command^c				
Total Military Personnel	0	0	0	0
Total Annual Cost (Millions of 2017 dollars)	5,370	5,370	0	0

“Direct” personnel and costs are associated with a major combat unit, “indirect” personnel and costs are associated with units that support the major combat unit, and “overhead” personnel and costs are associated with the major combat unit’s share of administrative or overhead activities. For more information, see Chapter 1. The numbers shown here are rounded to the nearest 10 personnel or \$10 million; more detailed information is presented in Appendixes A and B.

- In the analytic framework used for this report, special-operations units are considered to not have any units supporting them and thus to not have any indirect personnel or costs.
- Funding for the services’ special-operations units comes from each service’s budget, so these numbers appeared in previous chapters in the entries for “Other Units and Activities.” They are repeated here to provide a complete picture of the costs of the U.S. military’s special-operations forces.
- Funding for Special Operations Command (SOCOM) comes from the defensewide operation and maintenance budget. Like other defensewide organizations, SOCOM does not directly fund any military personnel of its own (because all military personnel are part of one of the services). No overhead costs are shown for SOCOM because such costs are apportioned on the basis of the number of military personnel in an activity.

The Department of Defense has traditionally distinguished between “special forces” (SF) and “special-operations forces” (SOF). Special forces are a fairly small set of units that perform direct-action missions (small, short-duration raids, ambushes, or assaults in hostile territory, such as the raid on Osama bin Laden’s compound in Pakistan). SF units include the units most commonly associated in the public’s mind with special operations,

such as the Army’s Green Berets and Rangers and the Navy’s Sea, Air, and Land forces (known as SEALs). Special-operations forces encompass a larger set of units that include not only SF units but also personnel responsible for psychological operations, civil affairs, and other specialized activities, all of which are overseen by Special Operations Command (SOCOM)—the organization within DoD responsible for special-operations forces.

Each military service recruits personnel for its special-operations units, provides their initial training, and pays their salaries. SOCOM provides those units with specialized training and equipment. SOCOM also develops doctrine and strategy for special-operations units and is responsible for ensuring that all U.S. special-operations forces can be used in a unified way by a combatant commander (as opposed to having separate special-operations communities in each service that operate in their own ways and focus on their own limited missions).

Current and Planned Structure. DoD's special-operations forces consist of a broad array of diverse units. In all, the department plans to field an average of about 60,000 special-operations direct personnel over the 2017–2021 period.

Purpose and Limitations. SOF are intended to be versatile forces, capable of conducting a wide range of missions, including those that other military units would not be suited for. Among their multiple roles, the most important are considered to be direct action, special reconnaissance, foreign internal defense, and security-force assistance. The last two activities involve helping friendly governments improve their military capabilities (often in order to defeat insurgencies hostile to the United States); those missions generally require the largest commitments of SOF personnel and time. Thus, special-operations forces could be described as an exceptionally well-trained and well-equipped set of trainers for foreign militaries—capable, when needed, of performing combat roles as well.

SOF have numerous limits on their use, which relate to the extremely difficult missions they are often assigned. For example, direct-action missions generally require very good intelligence, as well as a situation in which a small force, operating with the benefit of surprise, can achieve a highly valuable objective. Even so, direct-action missions have a mixed record of success—SOCOM was created in the 1980s largely in response to the failure of special forces to rescue U.S. hostages in Iran. Where the conditions for direct action are not present, SF can function as highly trained light infantry, although that role is often considered a waste because it does not capitalize on the unique capabilities of special forces. That role has also been associated with poor outcomes on some occasions, such as in Mogadishu, Somalia, in 1993 (when what was supposed to be a short raid turned into an overnight confrontation with local militiamen that resulted in

many SF casualties) and in Tora Bora, Afghanistan, in 2001 (when SF personnel failed in an attempt to capture Osama bin Laden).

When special-operations forces are performing their more common role of training foreign militaries, their effectiveness is limited by their host countries' willingness and ability to make use of that training. In general, it is difficult to assess how well a foreign country would combat an insurgency with or without the assistance of U.S. special-operations forces. Insurgencies are generally ended not through military force but through negotiated settlements; however, having a strong military often helps a government persuade insurgents to negotiate and strengthens the government's position during the negotiations. Another limitation associated with using SOF is that because they often assist countries that have relatively unstable or unpopular governments, their work risks associating the United States with the actions of those countries' militaries, as happened in El Salvador in the 1980s.

Past and Planned Use. Many of the missions for which special-operations forces are intended—as well as many of their past and current operations—are classified. A common complaint of both the SOF and intelligence communities is that because of the classified nature of their work, their failures are more visible than their successes, giving the public a distorted view of their value.

SOF have participated in all major U.S. combat operations since SOCOM was created. In most cases, their participation was not central to the outcome of those combat operations (largely because their role was limited to providing reconnaissance or carrying out small missions within the larger operation). However, in Operation Enduring Freedom in Afghanistan, SOF units played a leading role in the initial phases of ground combat by assisting Afghan rebel forces by calling in air strikes; conventional U.S. ground forces arrived only after the Taliban had lost control of much of the country. Since the invasion, SOF have been used extensively in and around Afghanistan, achieving a notable success with the direct-action mission of killing Osama bin Laden but experiencing more mixed results when employed as light infantry (as at Tora Bora).

SOF have also been widely used for activities other than major combat operations. Some of the largest commitments of U.S. special-operations forces for

foreign internal defense and security-force assistance have occurred in El Salvador, Colombia, Iraq, Afghanistan, the Philippines, and, more recently, the Horn of Africa and Trans-Saharan Africa. None of the foreign governments that received such assistance have been militarily overthrown by insurgents or terrorists, although some remain unstable. However, the government of Mali was overthrown by members of the country's military twice since U.S. assistance began, weakening the government in its fight against insurgents and exposing the United States to criticism about the effectiveness of its training. Some SOF commitments have also opened the United States to criticism because of the actions of the foreign militaries it has assisted (particularly those in Latin America).

SOCOM and other DoD sources frequently describe special-operations forces as crucial for antiterrorism missions. In essence, such missions are the same as traditional SOF missions except that the adversaries are terrorist groups rather than insurgents or other countries' militaries. Many of the SOF operations in countries mentioned above were antiterrorist missions. Special-operations forces have also participated in a wide variety of smaller missions, such as helping to evacuate noncombatants during a crisis or providing humanitarian assistance or disaster relief.

Major Element of the Force Structure

Defense Health Program

	Total	Direct	Indirect	Overhead
Defense Health Program for Retirees				
Total Military Personnel	0	0	0	0
Total Annual Cost (Millions of 2017 dollars)	14,720	14,720	0	0

“Direct” personnel and costs are associated with a major combat unit, “indirect” personnel and costs are associated with units that support the major combat unit, and “overhead” personnel and costs are associated with the major combat unit’s share of administrative or overhead activities. For more information, see Chapter 1. The numbers shown here are rounded to the nearest \$10 million; more detailed information is presented in Appendixes A and B.

Defensewide organizations do not directly fund any military personnel of their own (because all military personnel are part of one of the services). In addition, in the analytic framework used for this report, defensewide organizations are considered to not have any units supporting them and thus to not have any indirect personnel or costs. No overhead costs are shown for the defensewide organizations because such costs are apportioned on the basis of the number of military personnel in an activity.

The Department of Defense offers medical and dental care to more than 9 million service members, military retirees, and eligible family members through the Military Health System (MHS) at an estimated cost of about \$47 billion in 2016.³ The MHS exists to ensure that service members are fit for deployment and to care for them if they are sick, injured, or wounded. The system also provides care for military families and retirees.

Current and Planned Structure. The cost of the MHS is accounted for in three major blocks of DoD’s budget:

- The Defense Health Program—a defensewide activity that pays for nearly all of the civilian personnel associated with the MHS, as well as for contracts for private-sector care and purchases of medical supplies.⁴
- Funding for MHS military personnel—including the pay of service members associated with the MHS, which is funded by their military departments. (Together, those first two blocks make up the TRICARE system, which is responsible for providing care to active-duty service members and their families and military retirees and their families.)

3. See Congressional Budget Office, *Long-Term Implications of the 2016 Future Years Defense Program* (January 2016), pp. 22–25, www.cbo.gov/publication/51050.

4. For a fuller discussion of the MHS, see Congressional Budget Office, *Approaches to Reducing Federal Spending on Military Health Care* (January 2014), www.cbo.gov/publication/44993.

- Accrual charges levied against the services for all military personnel—funds deducted from military personnel appropriations and credited to the Medicare-Eligible Retiree Health Care Fund, which reimburses military medical facilities for care provided to Medicare-eligible retirees and their family members and also covers most of the out-of-pocket costs of Medicare-eligible retirees and their family members who seek care from private-sector Medicare providers.

Although the Defense Health Program is the only portion of the Military Health System whose costs are included in the defensewide budget, the discussion below focuses on the MHS as a whole.

In the Congressional Budget Office’s analysis, the system’s costs for current service members and their families are included in the costs of the various elements of the force structure discussed in previous chapters, allocated in proportion to the number of military personnel employed by those elements. The \$14.7 billion shown here covers only health care for military retirees and their families. CBO did not divide that cost among various elements of the force structure because it is not a cost of current forces and it cannot be altered by decisions about the future force structure. Instead, that cost results from prior decisions about the force structure that produced the current pool of retirees and from the policies and laws that govern health care benefits for military retirees. Lawmakers could change those laws, but in the past, they have been extremely reluctant to do so.

The MHS is separate from the health care system operated by the Department of Veterans Affairs (VA), which has its own funding. VA provides health care to veterans who have service-connected disabilities or who meet certain other criteria. (It also provides cash payments that compensate for service-connected disabilities and GI Bill benefits that reimburse some of the costs of higher education for veterans.) The Military Health System is available to the roughly 2 million people who served long enough to retire from the military—typically for at least 20 years—and to their eligible family members. VA benefits, by contrast, are potentially available to the 22 million veterans who received honorable or general discharges from the military, regardless of whether they served long enough to retire. Therefore, military retirees may be eligible for VA health benefits, but veterans who did not serve long enough to retire from the military are not eligible for MHS benefits after they leave the service.

Purpose and Limitations. Providing health care is considered an important military function for several reasons:

- It cares for personnel who are involved in ongoing military operations.
- It represents a substantial portion of the total compensation package that military personnel receive and is thus important for recruiting and retaining service members.
- It plays a key role in maintaining the readiness of units by making sure that military personnel are healthy.
- It helps lessen some of the challenges of military life because service members can generally be assured of receiving quality medical care for themselves and their families even when they are deployed for an operation or stationed in a foreign country.
- It is widely seen as a moral duty to care for people who may risk their lives while serving their country.

The MHS accounts for a large portion of DoD's budget—about a quarter of the total operation and support budget—and has been growing rapidly in recent years.⁵ Past analyses by CBO indicate that much of that cost growth has occurred for two reasons: Military retirees are increasingly choosing to use MHS services rather than to

rely on health insurance provided by a subsequent employer (or their spouse's employer), and MHS beneficiaries generally use medical care at relatively high rates. Those beneficiaries face very low premiums or copayments for their care, and people tend to use a service more when they pay less for it themselves. As a result, DoD takes in fairly small revenues from MHS beneficiaries while experiencing the high costs that stem from their intensive use of care. DoD has put forward a number of proposals in recent years to increase the amount of cost sharing for MHS beneficiaries in an effort to reduce the costs of the system. So far, however, lawmakers have not been receptive to such proposals.⁶

Past and Planned Use. The vast majority of the MHS's workload results from providing health care to service members, retirees, and their eligible family members during peacetime. That workload is not expected to change appreciably anytime soon.

The MHS also provides health care for personnel who are involved in ongoing military operations, and it is likely to keep doing so as long as such operations include any risk of casualties.⁷ Although that role is important, it requires less funding and creates less workload than the peacetime provision of health care.⁸ The main reason is that deployed service members make up only a small portion of the system's total beneficiaries—not all service members are deployed at a given time, and family members and retirees are not deployed. In addition, the MHS often takes part in humanitarian missions of various sorts, such as providing medical assistance in the aftermath of natural disasters.

5. See Figure 2-3 in Congressional Budget Office, *Long-Term Implications of the 2016 Future Years Defense Program* (January 2016), p. 24, www.cbo.gov/publication/51050.

6. For a brief legislative history of such cost-sharing proposals, see Congressional Budget Office, *Costs of Military Pay and Benefits in the Defense Budget* (November 2012), Appendix C, www.cbo.gov/publication/43574.

7. Even operations that do not involve combat generate a need for medical care. Casualties include diseases and nonbattle injuries, which in many cases require more medical attention than battle injuries (even during active combat operations).

8. For more discussion of the effects of recent combat operations, see Congressional Budget Office, *Approaches to Reducing Federal Spending on Military Health Care* (January 2014), pp. 16–19, www.cbo.gov/publication/44993.

Major Element of the Force Structure

Other Defensewide Units and Activities

	Total	Direct	Indirect	Overhead
Classified Defensewide Funding				
Total Military Personnel	0	0	0	0
Total Annual Cost (Millions of 2017 dollars)	14,540	14,540	0	0
Rest of the Defensewide Organizations				
Total Military Personnel	0	0	0	0
Total Annual Cost (Millions of 2017 dollars)	4,060	4,060	0	0

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Defensewide organizations do not directly fund any military personnel of their own (because all military personnel are part of one of the services). In addition, in the analytic framework used for this report, defensewide organizations are considered to not have any units supporting them and thus to not have any indirect personnel or costs. No overhead costs are shown for the defensewide organizations because such costs are apportioned on the basis of the number of military personnel in an activity.

The Department of Defense includes a wide variety of other defensewide activities and organizations. A significant portion of their funding is classified, however, which prevents the Congressional Budget Office from providing any detail other than the amount of classified operation and maintenance funding that DoD discloses in its publicly available budget documents.⁹ (Operation and maintenance funding is a subset of operation and support funding.)

The rest of the defensewide organizations, which represent a relatively small amount of DoD’s O&S budget, fall into two groups:

- High-level command-and-control functions, such as the Office of the Secretary of Defense, the Joint Staff, and the combatant commands. Although they are fairly small, those organizations include civilian and military personnel from multiple military departments and have responsibilities that affect significant portions of DoD’s mission.
- Miscellaneous activities that cannot be characterized as supporting any major combat units (and thus were not included in the costs for those units). Such activities include the Defense POW/MIA Office, which works to help U.S. prisoners of war and to locate personnel missing in action; the Defense Security Cooperation Agency, which works with foreign countries’ militaries and oversees military aid and arms sales to other nations; and the Office of Economic Adjustment, which helps state and local governments deal with the economic consequences of cutbacks in defense industries or closures or expansions of military bases.

9. DoD’s O-1 budget display presents the full amount of classified operation and maintenance funding for each military department and for defensewide activities, but only for a limited number of years and with no breakdown between intelligence and other classified activities or other details. See Office of the Under Secretary of Defense (Comptroller), *Department of Defense Budget, Fiscal Year 2017: Operation and Maintenance Programs (O-1), Revolving and Management Funds (RF-1)* (February 2016), <http://comptroller.defense.gov/BudgetMaterials.aspx>.

Special Topic

Nuclear Forces

	Total	Direct	Indirect	Overhead
Ballistic and Guided Missile Submarines				
Military Personnel per Unit	660	320	80	260
Annual Cost per Unit (Millions of 2017 dollars)	170	70	40	50
Minuteman III Missile Squadron^a				
Military Personnel per Unit	2,040	690	650	690
Annual Cost per Unit (Millions of 2017 dollars)	380	130	90	160
B-52 Bomber Aircraft Squadron^b				
Military Personnel per Unit	3,830	1,310	1,220	1,300
Annual Cost per Unit (Millions of 2017 dollars)	740	270	170	300
B-2 Bomber Aircraft Squadron^b				
Military Personnel per Unit	8,660	2,120	3,600	2,940
Annual Cost per Unit (Millions of 2017 dollars)	1,840	670	490	680

Funding for the services' nuclear forces comes from each service's budget, so these numbers appeared in previous chapters in the entries for "Other Units and Activities" or "Bomber Squadrons." They are repeated here to provide a complete picture of the costs of the U.S. military's nuclear forces. For additional details, see Congressional Budget Office, *Projected Costs of U.S. Nuclear Forces, 2015 to 2024* (January 2015), www.cbo.gov/publication/49870.

"Direct" personnel and costs are associated with a major combat unit, "indirect" personnel and costs are associated with units that support the major combat unit, and "overhead" personnel and costs are associated with the major combat unit's share of administrative or overhead activities. For more information, see Chapter 1. The numbers shown here are rounded to the nearest 10 personnel or \$10 million; more detailed information is presented in Appendixes A and B.

a. Squadron of 50 Minuteman missiles.

b. Notional squadron of 12 aircraft (actual squadrons vary in size).

The U.S. strategic nuclear force has traditionally been seen as a triad consisting of land-based intercontinental ballistic missiles (ICBMs), sea-based ballistic missile submarines (SSBNs), and airborne bomber aircraft. All of those platforms are capable of delivering nuclear weapons over long distances.

Current and Planned Structure. As part of the nuclear force structure, the Navy plans to field 14 SSBNs and 4 guided missile submarines (SSGNs) in 2017.¹⁰ It does not expect to change those numbers through 2021 (although the Department of Defense plans to reduce the number of active missile launch tubes on each SSBN from 20 to 16 by 2018 to comply with the New START

arms control treaty). The Air Force intends to field 450 Minuteman III ICBMs in 2017, but current plans call for it to reduce that number to 400 by 2018 to comply with the New START treaty. The Air Force's B-52 and B-2 bombers are also capable of delivering nuclear weapons, but unlike SSBNs and ICBMs, they spend most of their time performing their conventional (non-nuclear) role. DoD plans to remove the ability of some B-52s to deliver nuclear weapons by 2018 to comply with

10. The Navy's budget documents group the 14 SSBNs with the 4 SSGNs, which are former SSBNs that have been converted to launch Tomahawk cruise missiles and to support special operations.

the New START treaty.¹¹ The nuclear warheads that missiles are armed with are funded mainly through Department of Energy accounts, which are not included in this analysis.

For the past 40 years, the U.S. nuclear force structure has been affected by the outcomes of arms control negotiations (although the United States always has the option to change its nuclear force structure unilaterally and has sometimes done so).¹² The most recent arms control agreement, the New START treaty, has been in effect since 2011 and limits the total numbers of deployed strategic missiles and bombers (700), deployed strategic nuclear warheads (1,550), and deployed and non-deployed strategic missile launchers and bombers (800). The United States currently exceeds those limits, but it has until 2018 to comply with the treaty.

Purpose and Limitations. In practice, the fundamental role of U.S. nuclear forces is to deter any nuclear attack on the United States, its allies, or its partners through the threat of a devastating counterattack. However, at various points in history, U.S. policymakers have also considered the possibility of using nuclear forces to initiate an attack on a hostile state, to deter nonnuclear attacks on the United States, or to deter nonnuclear attacks on U.S. allies. (In particular, much debate during the Cold War focused on whether nuclear weapons could deter a possible Soviet invasion of Western Europe.)

As a deterrent, nuclear forces are intended to allow the United States to retaliate with so much firepower that no rational enemy could possibly view a nuclear attack on the United States as a reasonable option. Deterrence is a theoretical approach for understanding the decision-making process of opponents, and there are several variations on the core theory. However, almost all of them

agree that successful deterrence requires a credible commitment and capability to respond with overwhelming force to any nuclear attack. Some variations on the theory would add that there are no uses for nuclear forces other than deterrence—which suggests that the purpose of nuclear weapons is to not be used. If U.S. decisionmakers agree with such views, the main limitation of nuclear forces is that their only role is to provide a credible deterrent. Another limitation is that some nuclear-armed opponents might not be rational actors and thus might not be deterred by U.S. nuclear forces.¹³ Finally, the use of nuclear weapons is limited by the fact that such use is considered by many people to be unacceptable in most circumstances.

Each part (or “leg”) of the nuclear triad has unique strengths and weaknesses that complement those of the other legs, such that the full triad is generally considered much more powerful than a “pure” deterrent composed of only one type of system. Historically, most of the value of the triad lay in discouraging the Soviet Union from launching a nuclear first strike on the United States that would have destroyed the U.S. capability to respond with a second strike. In the present era, concerns about deterrence often focus more on smaller nuclear powers (such as North Korea) that have less sophisticated arsenals for delivering nuclear weapons. Those smaller powers cannot credibly threaten a first strike that would destroy the U.S. capability to respond. However, all recent U.S. nuclear policy statements have indicated a commitment to maintaining the full triad. Because each leg of the triad is aging, DoD has modernization programs in place for all three.

U.S. ICBMs and SSBN-launched missiles are armed only with nuclear warheads and cannot be used for any non-nuclear purpose. (Although DoD has considered arming those missiles with conventional warheads, it has not done so.) The bomber fleet, by contrast, has routinely been used in major conflicts to deliver conventional weapons. During the Cold War, bombers were seen mainly as a nuclear delivery platform, and the majority of the bomber fleet was usually on some form of standby, able to launch quickly in case it was needed to carry out nuclear strikes. In the post-Cold War era, bombers have

11. DoD also deploys short-range, smaller-yield nuclear weapons, known as tactical nuclear weapons. During the Cold War, all three military departments deployed such weapons, which numbered more than 10,000. They included bombs delivered by aircraft, artillery shells, torpedoes, land mines, sea-launched cruise missiles, and short-range surface-to-surface ballistic missiles. Today, only the Air Force deploys tactical nuclear weapons—bombs delivered by tactical aircraft. Those forces are not discussed here.

12. Recent arms control treaties have given the parties flexibility in meeting their obligations by specifying the total number of warheads or delivery systems allowed but letting each nation determine the mix of ICBMs, SSBNs, and bombers fielded.

13. That possibility is frequently raised in discussions of North Korea's and Iran's nuclear programs, as well as in hypothetical cases in which a terrorist group obtains a nuclear weapon.

been used extensively for conventional strikes, although the B-2 fleet and part of the B-52 fleet still routinely train for nuclear missions.

Past and Planned Use. The United States used two nuclear weapons against Japan in World War II but has not employed any nuclear weapons in combat since then. No other country has used nuclear weapons in combat.

Supporters of the theory of deterrence point to the lack of nuclear exchanges as evidence that nuclear deterrence has been extremely successful. Nevertheless, as with all counterfactual examples, there is no way to prove that the U.S. nuclear deterrent was directly responsible for preventing a nuclear attack by the Soviet Union during the Cold War.

Special Topic

Missile Defense

The United States is currently operating a number of systems to protect itself and its allies from missile strikes. Those systems are generally developed and purchased by the Missile Defense Agency (MDA), and their acquisition costs are paid through the defensewide portion of the Department of Defense's budget. Once purchased, however, missile defense systems are operated by the services, and most of their operation and support (O&S) costs are included in the budgets of the relevant military departments. In this report, all of a department's O&S costs for missile defense are included in its chapter's entry for "Other Units and Activities" (under "rest of" the department).

Several missile defense systems do not significantly add to their service's O&S costs. For example, the Army fields Patriot missile battalions as part of its normal air-defense force structure, and the Navy fields Aegis cruisers and destroyers as part of its normal surface combatant fleet. Equipping those battalions and ships with advanced missiles capable of performing missile defense does not result in substantial new O&S costs to the Army or the Navy because those units existed already. If, in the future, missile defense missions caused more Patriot units to be created or more ships to be purchased, those forces' O&S costs might be more directly attributable to missile defense.

Other missile defense systems, such as the Ground-Based Midcourse Defense system and the Terminal High Altitude Area Defense system, incur additional O&S costs. However, those costs are very small compared with the costs of other elements of the force structure.

Current and Planned Structure. DoD has four major missile defense systems, which are designed to intercept threatening missiles in midair:

- The Ground-Based Midcourse Defense (GMD) system, which the Army operates from various land bases (primarily Fort Greely, Alaska), is designed to protect the United States against long-range ballistic missiles. That system is intended to intercept missiles during the midcourse part of their flight (the phase after a missile's rocket motor has stopped burning and accelerating the missile but before air resistance from

reentry into the atmosphere has begun decelerating it). In that phase, missiles are at their maximum speed and are generally following predictable, parabolic paths.

- The Aegis Ballistic Missile Defense (BMD) system, a midcourse-phase interception system operated by the Navy from cruisers and destroyers, is designed to protect allies and U.S. forces from medium- and intermediate-range ballistic missiles.¹⁴ DoD is developing a land-based variant of the Aegis system, as well as an interceptor capable of targeting missiles during the terminal phase of their flight (when air resistance from reentry has begun decelerating them). Missiles in that phase are very close to their targets, which greatly reduces the time that missile defense systems have to react to them but also allows the use of relatively short-range and lower-cost interceptor missiles.
- The Terminal High Altitude Area Defense (THAAD) system, a terminal-phase interception system operated by the Army from mobile launchers, is designed to intercept short- and medium-range ballistic missiles as they near their targets.
- The Patriot Advanced Capability 3 (PAC-3) system, a terminal-phase interception system operated by the Army from mobile launchers, is similar to THAAD but is better suited to intercepting smaller short-range ballistic missiles. It can also intercept cruise missiles and aircraft.

The Missile Defense Agency has explored some other missile defense concepts and systems—and is likely to develop new systems in the future—but none of those other systems are deployed now or are likely to be deployed soon. MDA also invests heavily in command-and-control systems and sensors to support the missile defense mission. However, most of that spending comes from DoD's acquisition funding rather than from the O&S budget, so it is not included in this analysis.

14. Intermediate-range ballistic missiles have ranges between 3,000 and 5,500 kilometers; medium-range ballistic missiles, between 1,000 and 3,000 kilometers; and short-range ballistic missiles, fewer than 1,000 kilometers. Intercontinental ballistic missiles have ranges greater than 5,500 kilometers.

Purpose and Limitations. Missile defense systems are intended to defend against ballistic missiles fired at the United States, its allies, or its deployed forces. Ballistic missiles, which were developed during World War II, are initially powered by a rocket motor that boosts them high into the air; after that they coast on an arching (ballistic) trajectory, powered only by gravity as they fall to Earth toward their target. Ballistic missiles are very difficult to intercept once fired—their speed, high-altitude flight, and long range mean that developing weapon systems capable of destroying them in flight is extremely challenging. Those same characteristics have also made ballistic missiles a preferred delivery system for nuclear weapons (as discussed in the previous entry). The difficulty of defending against nuclear-armed ballistic missiles is one of the main reasons that the United States continues to rely heavily on deterrence to protect against nuclear attacks.

Intercontinental ballistic missiles (ICBMs) and the very similar submarine-launched ballistic missiles (SLBMs) present the greatest technical challenges to effective missile defense: Their very long range (between continents) requires extremely powerful engines, which accelerate them to very high speeds and loft them in very high ballistic arcs. Intermediate-range, medium-range, and short-range ballistic missiles are somewhat less challenging because they reach lower maximum speeds and usually fly at lower altitudes. In general, ICBMs and SLBMs are the most costly and difficult weapon systems to develop and are designed to deliver nuclear weapons, meaning that usually only the largest nuclear powers possess them. Short-range ballistic missiles are much less costly and difficult to develop, are fielded by many countries, and are generally armed with conventional explosive payloads rather than nuclear warheads. Medium-range ballistic missiles are more expensive and less plentiful than their short-range counterparts, and intermediate-range ballistic missiles are more costly and less common than medium-range missiles.

The first missile defense systems were developed by the United States and the Soviet Union in the 1960s and 1970s. They were designed to destroy a ballistic missile after its launch by detonating a nuclear warhead in its vicinity. However, because of the undesirability of using nuclear warheads, the United States began in the 1980s to extensively research ways to use conventional explosive or kinetic warheads to destroy ballistic missiles.¹⁵ The

initial Patriot missile system, which was fielded as an air-defense system in the 1980s, also possessed a limited ability to destroy short-range ballistic missiles. Since then, the United States has made significant technical progress in developing systems to destroy all types of ballistic missiles, and MDA now has systems capable of intercepting all of those types of ballistic missiles.

Effective missile defense remains highly challenging. As a result, analysts outside DoD have raised a number of concerns about the feasibility of missile defense in general and about the performance of current U.S. systems in particular—especially against an adversary that can field decoy warheads and other countermeasures to confuse defense systems. MDA has faced external criticism of its test programs and their results, and it is difficult to assess how effective the systems that DoD has fielded would be in an actual missile attack.

Even if all of its current systems perform as DoD plans, the GMD system intended to defend U.S. territory against missiles is designed to protect against attacks by very small numbers of long-range ballistic missiles—the sort of attack that might be launched by a so-called rogue state, such as North Korea or Iran. That system is not intended to defend the United States against attacks by large numbers of nuclear-armed missiles.

Past and Planned Use. During Operation Desert Storm in 1991, the Army used Patriot missiles to defend against Iraqi Scud missile attacks targeted at Saudi Arabia, Israel, and U.S. and coalition forces. The Army's missiles were early-model Patriots rather than the current PAC-3 design, and their effectiveness in actually shooting down Iraqi missiles has been the subject of debate. (Part of the difficulty in assessing their performance is that many engagements with Scud missiles ended up being near misses that may not have destroyed those missiles, resulting in an ambiguous operational record.) PAC-3 missiles were employed in 2003 during the invasion of Iraq with some success. None of the remaining systems in the current generation of U.S. missile defenses have been used in combat.

15. Unlike explosive weapons, kinetic weapons destroy their targets by hitting them at high speed. A kinetic warhead can be fairly small and thus easier to accelerate to high speed, but it requires much more accurate guidance than an explosive or nuclear warhead does.

Currently, two of the primary missions for U.S. missile defense systems are to protect the United States against a limited attack by North Korean nuclear-armed ICBMs (using the GMD system) and to protect U.S. forces and allies in Europe against an attack by Iranian nuclear-armed intermediate-range ballistic missiles (using ship- and land-based versions of the Aegis BMD system). Both of those missions involve countering a threat that has yet to emerge, because neither of those countries is currently believed to have effectively combined nuclear warheads and ballistic missiles, and neither has yet fielded missiles with sufficient range. It is also unclear whether missile defenses are required to counter those threats. U.S. nuclear forces may be sufficient to deter attacks, as they

were during the Cold War, although it is possible that a reliable missile defense system could enhance the effectiveness of the existing U.S. nuclear deterrent. (The effect of missile defenses on deterrence is an extremely controversial topic.)

The main intended mission for the THAAD and PAC-3 systems is to defend deployed U.S. forces or U.S. allies against attacks by intermediate-, medium-, or short-range ballistic missiles. Such a mission is not speculative: Short-range ballistic missiles have proliferated widely and were used against U.S. forces in Operations Desert Storm and Iraqi Freedom.