

GAO

Testimony

Before the Subcommittee on National Security, Emerging Threats, and International Relations, Committee on Government Reform, House of Representatives

For Release on Delivery
Expected at 1 p.m. EST
Tuesday, June 1, 2004

GULF WAR ILLNESSES

Federal Research Efforts Have Waned, and Research Findings Have Not Been Reassessed

Statement of Janet Heinrich
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Highlights of [GAO-04-815T](#) testimony before the Subcommittee on National Security, Emerging Threats, and International Relations, Committee on Government Reform, House of Representatives

Why GAO Did This Study

More than a decade after the 1991 Persian Gulf War, there is continued interest in the federal response to the health concerns of Gulf War veterans. Gulf War veterans' reports of illnesses and possible exposures to various health hazards have prompted numerous federal research projects on Gulf War illnesses. This research has been funded primarily by the Department of Veterans Affairs (VA), the Department of Defense (DOD), and the Department of Health and Human Services (HHS). In 1993, the President named the Secretary of VA as the responsible party for coordinating research activities undertaken or funded by the executive branch of the federal government on the health consequences of service in the Gulf War. In 2002, a congressionally mandated federal advisory committee—the VA Research Advisory Committee on Gulf War Veterans' Illnesses (RAC)—was established to provide advice on federal Gulf War illnesses research needs and priorities to the Secretary of VA.

This statement is based on GAO's report entitled *Department of Veterans Affairs: Federal Gulf War Illnesses Research Strategy Needs Reassessment* ([GAO-04-767](#)). The testimony presents findings about the status of research on Gulf War illnesses and VA's communication and collaboration with RAC.

www.gao.gov/cgi-bin/getrpt?GAO-04-815T.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Janet Heinrich at (202) 512-7119.

GULF WAR ILLNESSES

Federal Research Efforts Have Waned, and Research Findings Have Not Been Reassessed

What GAO Found

The federal focus on Gulf War-specific research has waned, but VA has not yet analyzed the latest research findings to identify whether there were gaps in research or to identify promising areas for future research. As of September 2003, about 80 percent of the 240 federally funded medical research projects for Gulf War illnesses had been completed. In recent years, VA and DOD have decreased their expenditures on Gulf War illnesses research and have expanded the scope of their medical research programs to incorporate the long-term health effects of all hazardous deployments. Interagency committees formed by VA to coordinate federal Gulf War illnesses research have evolved to reflect these changing priorities, but over time these entities have been dissolved or have become inactive. In addition, VA has not reassessed the extent to which the collective findings of completed Gulf War illnesses research projects have addressed key research questions or whether the questions remain relevant. The only assessment of progress in answering these research questions was published in 2001, when findings from only about half of all funded Gulf War illnesses research were available. Moreover, it did not identify whether there were gaps in existing Gulf War illnesses research or promising areas for future research. This lack of a comprehensive analysis of research findings leaves VA at greater risk of failing to answer unresolved questions about causes, course of development, and treatments for Gulf War illnesses.

RAC's efforts to provide advice and make recommendations to the Secretary of VA on Gulf War illnesses research may have been hampered by VA senior administrators' poor information sharing and limited collaboration on research initiatives and program planning. For example, VA failed to inform RAC about its 2002 major research program announcement that included Gulf War illnesses research. VA and RAC are exploring ways to improve information sharing and collaboration, including VA's hiring of a senior scientist who would both guide VA's Gulf War illnesses research and serve as the agency's liaison for routine updates to the advisory committee. However, most of these changes had not been finalized at the time of GAO's review.

Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today as you consider the current status of the federal government's research into the health concerns of Gulf War veterans. In the years following the 1991 Persian Gulf War, approximately 80,000 veterans have reported various symptoms including fatigue, muscle and joint pains, headaches, memory loss, skin rash, diarrhea, and sleep disturbances. Scientists have agreed that many veterans have unexplained illnesses—commonly referred to as Gulf War illnesses—that are characterized by one or more symptoms that do not conform to a standard diagnosis. Gulf War veterans' reports of illnesses and possible exposures to several known and potential health hazards have prompted numerous federal research projects on the nature, extent, and treatment of Gulf War illnesses. Federal Gulf War illnesses research projects have been funded primarily by the Department of Veterans Affairs (VA), the Department of Defense (DOD), and the Department of Health and Human Services (HHS). In 1993, the President named the Secretary of VA as the responsible party for coordinating research activities undertaken or funded by the executive branch of the federal government on the health consequences of service in the Gulf War. In 2002, a congressionally mandated federal advisory committee—the VA Research Advisory Committee on Gulf War Veterans' Illnesses (RAC)—was established to provide advice on federal Gulf War illnesses research needs and priorities to the Secretary of VA. The committee is made up of members of the general public, including non-VA researchers and veterans' advocates.

My remarks will summarize our findings on the status of federal research on Gulf War illnesses and VA's communication and collaboration with RAC. My statement is based on our report entitled *Department of Veterans Affairs: Federal Gulf War Illnesses Research Strategy Needs Reassessment* (GAO-04-767), which will be issued today. The report also includes a description of the status of DOD's investigations on potential exposures of service members and veterans to health hazards, such as chemical and biological agents, and efforts that have been made by VA and DOD to monitor cancer incidence among Gulf War veterans.

Our findings are based on interviews with senior officials within VA and DOD and senior managers within each agency's relevant research offices. We analyzed pertinent agency documents, including annual reports to congressional committees describing research priorities, ongoing and completed projects, and agency funding. Additionally, we interviewed RAC officials, attended a RAC meeting, and reviewed RAC reports and recommendations. We conducted our work from September 2003 through

May 2004 in accordance with generally accepted government auditing standards.

In summary, the federal focus on Gulf War-specific research has waned, and VA—the agency with lead responsibility for coordination of Gulf War illnesses issues—has not yet analyzed the latest research findings to identify whether there were gaps in research or to identify promising areas for future research. As of September 2003, about 80 percent of the 240 federally funded medical research projects for Gulf War illnesses had been completed. In recent years, VA and DOD have decreased their expenditures on research specifically for Gulf War illnesses and have expanded the scope of their medical research programs to incorporate the long-term health effects of all hazardous deployments. Interagency committees formed by VA to coordinate federal Gulf War illnesses research evolved to reflect these changing priorities, but over time these entities have been dissolved or have become inactive. In addition, VA has not reassessed the extent to which the collective findings of completed Gulf War Illnesses research projects have addressed key research questions or whether the questions remain relevant. The only assessment of progress in answering these research questions was published in 2001, when findings from only about half of all federally funded Gulf War illnesses research were available. Moreover, the summary did not identify whether there were gaps in existing Gulf War illnesses research or promising areas for future research. The lack of a comprehensive analysis leaves VA at greater risk of failing to answer unresolved questions about causes, course of development, and treatments for Gulf War illnesses.

RAC's efforts to provide advice and make recommendations on Gulf War illnesses research may have been hampered by VA senior administrators' incomplete or unclear information sharing and limited collaboration on Gulf War illnesses research initiatives and program planning. For example, VA failed to inform RAC about its 2002 major research program announcement that included Gulf War illnesses research. However, VA and RAC are exploring ways to improve information sharing, including VA's hiring of a senior scientist who would guide VA's Gulf War illnesses research and serve as the agency's liaison for routine updates to RAC. However, most of these changes had not been finalized at the time of GAO's review.

Background

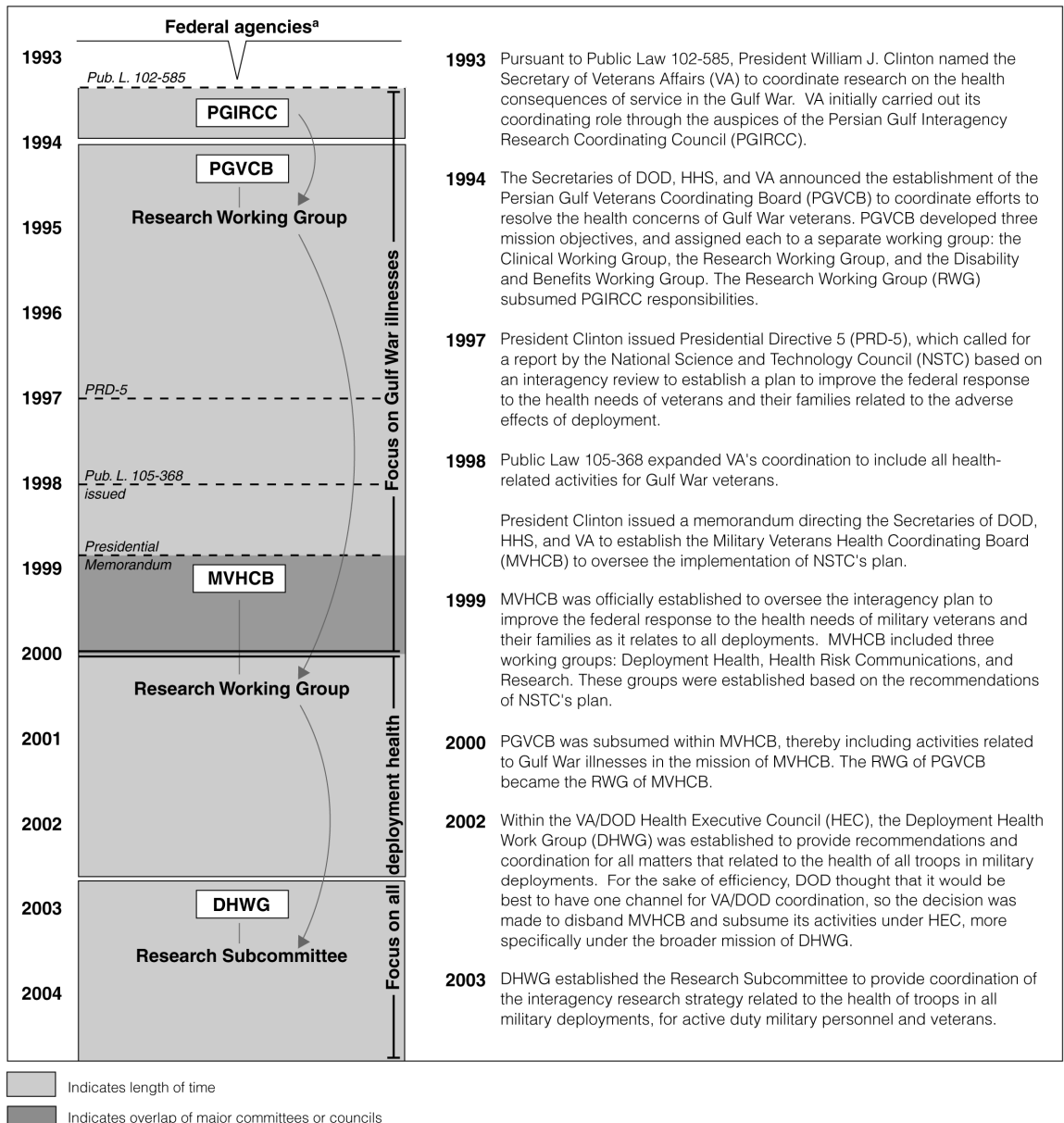
Although about 700,000 U.S. military personnel were deployed to the Gulf War in the early 1990s, casualties were relatively light compared with those in previous major conflicts. Some veterans began reporting health

problems shortly after the war that they believed might be due to their participation in the conflict. VA, DOD, HHS, and other federal agencies initiated research and investigations into these health concerns and the consequences of possible hazardous exposures.

VA is the coordinator for all federal activities on the health consequences of service in the Gulf War. These activities include ensuring that the findings of all federal Gulf War illnesses research are made available to the public and that federal agencies coordinate outreach to Gulf War veterans in order to provide information on potential health risks from service in the Gulf War and corresponding services or benefits. The Secretary of VA is required to submit an annual report on the results, status, and priorities of federal research activities related to the health consequences of military service in the Gulf War to the Senate and House Veterans' Affairs Committees. VA has provided these reports to Congress since 1995. In May 2004, VA issued its annual report for 2002.¹ VA has carried out its coordinating role through the auspices of interagency committees, which have changed over time in concert with federal research priorities and needs. Specifically, the mission of these interagency committees has evolved to include coordination for research on all hazardous deployments, including but not limited to the Gulf War. (See fig. 1.)

¹See Deployment Health Working Group Research Subcommittee, Department of Veterans Affairs, *Annual Report to Congress: Federally Sponsored Research on Gulf War Veterans' Illnesses for 2002* (Washington, D.C.: 2004).

Figure 1: Evolution of Interagency Committees That Coordinated Federal Gulf War Illnesses Research from 1993 to 2004



Note: GAO analysis of VA data, public laws, and presidential directives.

^aFederal agencies are VA, DOD, and HHS.

Federal research efforts for Gulf War illnesses have been guided by questions established by the interagency Research Working Group (RWG), which was initially established under the Persian Gulf Veterans Coordinating Board (PGVCB) to coordinate federal research efforts. Between 1995 and 1996, the RWG identified 19 major research questions related to illnesses in Gulf War veterans. In 1996, the group added 2 more questions regarding cancer risk and mortality rates to create a set of 21 key research questions that have served as an overarching strategy in guiding federal research for Gulf War illnesses. (See app. I for the list of key questions.) The 21 research questions cover the extent of various health problems, exposures among the veteran population, and the difference in health problems between Gulf War veterans and control populations. In 1998, the RWG expanded federal Gulf War illnesses research priorities to include treatment, longitudinal follow-up of illnesses, disease prevention, and improved hazard assessment; however, no new research questions were added to the list of 21 key questions. With regard to veterans' health status, the research questions cover the prevalence among veterans and control populations of

- symptoms,
- symptom complexes,
- illnesses,
- altered immune function or host defense,
- birth defects,
- reproductive problems,
- sexual dysfunction,
- cancer,
- pulmonary symptoms,
- neuropsychological or neurological deficits,
- psychological symptoms or diagnoses, and
- mortality.

With regard to exposure, the research questions cover

- *Leishmania tropica* (a type of parasite),
- petroleum,
- petroleum combustion products,
- specific occupational/environmental hazards (such as vaccines and depleted uranium),
- chemical agents,
- pyridostigmine bromide (given to troops as a defense against nerve agents), and

-
- psychophysiological stressors (such as exposure to extremes of human suffering).

In 2002, VA established RAC to provide advice to the Secretary of VA on proposed research relating to the health consequences of military service in the Gulf War.² RAC, which is composed of members of the general public, including non-VA researchers and veterans' advocates, was tasked to assist VA in its research planning by exploring the entire body of Gulf War illnesses research, identifying gaps in the research, and proposing potential areas of future research. VA provides an annual budget of about \$400,000 for RAC, which provides salaries for two full-time and one part-time employee and supports committee operating costs. RAC's employees include a scientific director and support staff who review published scientific literature and federal research updates and collect information from scientists conducting relevant research.³ RAC's staff provide research summaries for discussion and analysis to the advisory committee through monthly written reports and at regularly scheduled meetings. RAC holds public meetings several times a year at which scientists present published and unpublished findings from Gulf War illnesses research. In 2002, RAC published a report with recommendations to the Secretary of VA. It expects to publish another report soon.

Federal Research on Gulf War Illnesses Has Decreased, and VA Has Not Collectively Analyzed Research Findings to Determine Research Needs

As of September 2003, about 80 percent of the 240 federally funded research projects on Gulf War illnesses have been completed. Additionally, funding for Gulf War-specific research has decreased, federal research priorities have been expanded to incorporate the long-term health effects of all hazardous deployments, and interagency coordination of Gulf War illnesses research has diminished. Despite this shift in effort, VA has not collectively reassessed the research findings to determine whether the 21 key research questions have been answered or to identify the most promising directions for future federal research in this area.

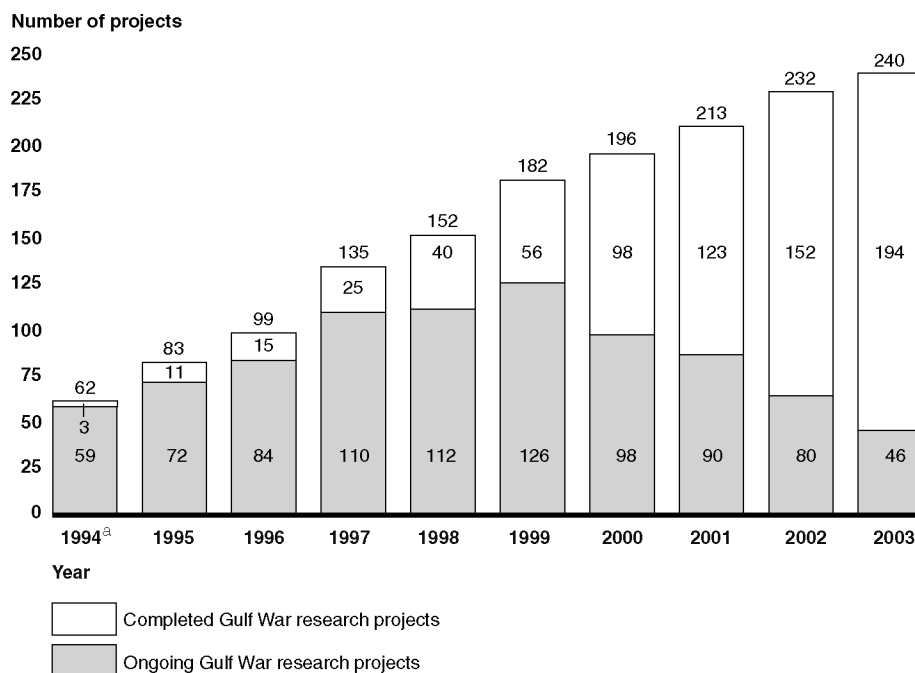
²VA was required to establish RAC by the Veterans Programs Enhancement Act of 1998, Pub. L. No. 105-368, § 104, 112 Stat. 3315, 3323 (1998).

³RAC's scientific director, a research associate professor, is also an appointed member of RAC.

Most Federal Gulf War Illnesses Research Projects Are Complete, and Funding Is Decreasing as Research Priorities Evolve

Since 1991, 240 federally funded research projects have been initiated by VA, DOD, and HHS to address the health concerns of individuals who served in the Gulf War. As of September 2003, 194 of the 240 federal Gulf War illnesses research projects (81 percent) had been completed; another 46 projects (19 percent) were ongoing.⁴ (See fig. 2.)

Figure 2: Cumulative Number of Ongoing and Completed Federal Gulf War Illnesses Research Projects by Year



Source: VA.

Note: GAO analysis of VA data.

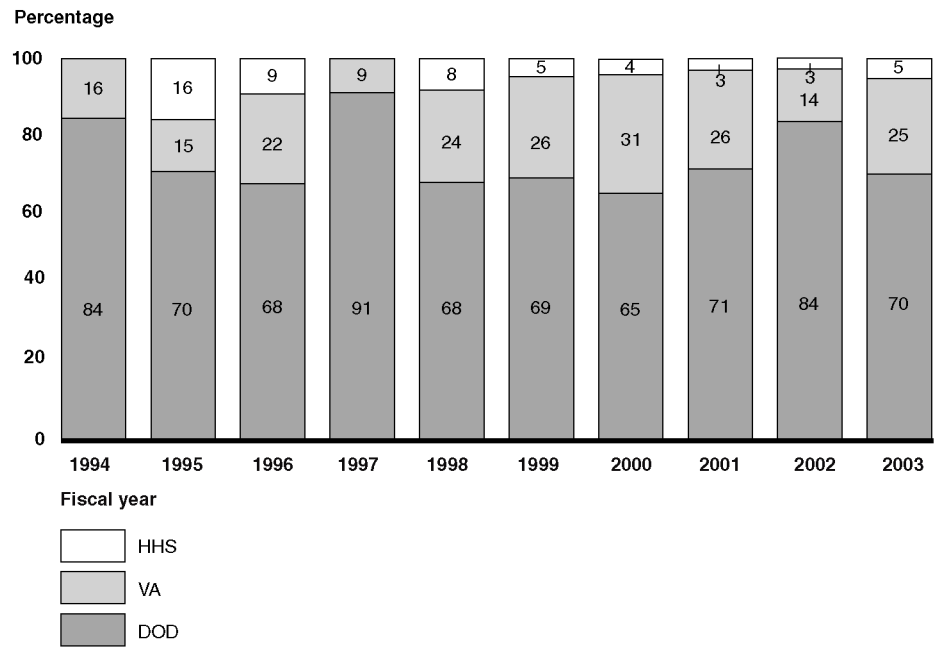
^aThis total includes ongoing projects from 1991 through 1994.

From 1994 to 2003, VA, DOD, and HHS collectively spent a total of \$247 million on Gulf War illnesses research. DOD has provided the most funding for Gulf War illnesses research, funding about 74 percent of all federal Gulf War illnesses research within this time frame. Figure 3 shows

⁴Annual reports to congressional committees submitted by VA on federally sponsored research on Gulf War veterans' illnesses identify projects as completed when total project funding has concluded.

the comparative percentage of funding by these agencies for each fiscal year since 1994.

Figure 3: Funding Share for Gulf War Illnesses Research by Agency and Fiscal Year

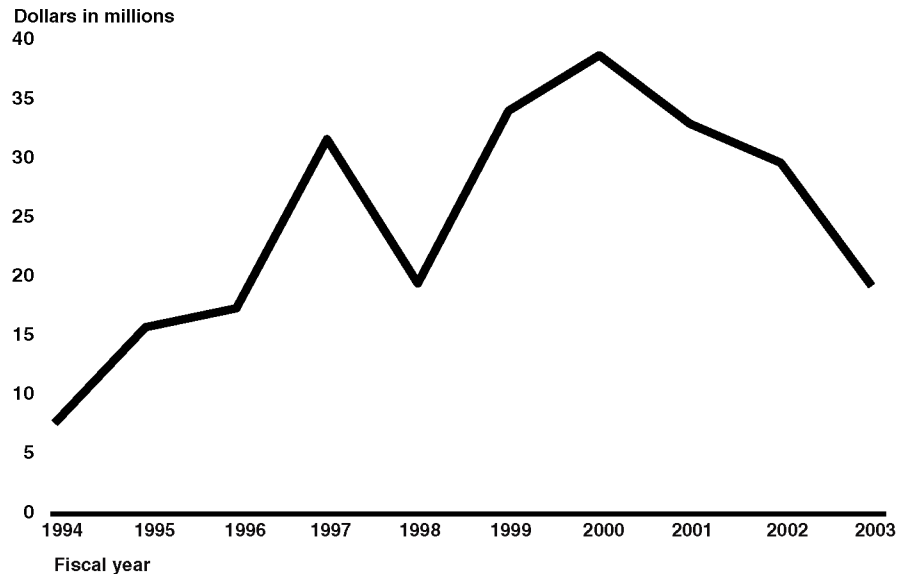


Source: VA.

Note: GAO analysis of VA data. Percentages may not add to 100 percent because of rounding.

After fiscal year 2000, overall funding for Gulf War illnesses research decreased. (See fig. 4.) Fiscal year 2003 research funding was about \$20 million less than funding provided in fiscal year 2000.

Figure 4: Funding for Gulf War Research Projects, Fiscal Years 1994-2003



Source: VA.

Note: GAO analysis of VA data. Dollars include only direct costs (actual research activities and materials) for each agency and have not been adjusted for inflation.

This overall decrease in federal funding was paralleled by a change in federal research priorities, which expanded to include all hazardous deployments and shifted away from a specific focus on Gulf War illnesses. VA officials said that although Gulf War illnesses research continues, the agency is expanding the scope of its research to include the potential long-term health effects in troops who served in hazardous deployments other than the Gulf War. In October 2002, VA announced plans to commit up to \$20 million for research into Gulf War illnesses and the health effects of other military deployments. Also in October 2002, VA issued a program announcement for research on the long-term health effects in veterans who served in the Gulf War or in other hazardous deployments, such as Afghanistan and Bosnia/Kosovo.⁵ As of April 2004, one new Gulf War illnesses research project, for \$450,000, was funded under this program announcement.

⁵The October 2002 research program announcement on deployment health research remains open for researchers to submit proposals.

Although DOD has historically provided the majority of funding for Gulf War illnesses research, DOD officials stated that their agency currently has no plans to continue funding new Gulf War illnesses research projects. Correspondingly, DOD has not funded any new Gulf War illnesses research in fiscal year 2004, except as reflected in modest supplements to complete existing projects and a new award pending for research using funding from a specific appropriation. DOD also did not include Gulf War illnesses research funding in its budget proposals for fiscal years 2005 and 2006. DOD officials stated that because the agency is primarily focused on the needs of the active duty soldier, its interest in funding Gulf War illnesses research was highest when a large number of Gulf War veterans remained on active duty after the war—some of whom might develop unexplained symptoms and syndromes that could affect their active duty status.⁶ In addition, since 2000, DOD’s focus has shifted from research solely on Gulf War illnesses to research on medical issues of active duty troops in current or future military deployments.⁷ For example, in 2000, VA and DOD collaborated to develop the Millennium Cohort study, which is a prospective study evaluating the health of both deployed and nondeployed military personnel throughout their military careers and after leaving military service. The study began in October 2000 and was awarded \$5.25 million through fiscal year 2002, with another \$3 million in funding estimated for fiscal year 2003.

VA’s Coordination of Federal Gulf War Illnesses Research Has Lapsed, and VA Has Not Determined Whether Key Research Questions Have Been Answered

VA’s coordination of federal Gulf War illnesses research has gradually lapsed. Starting in 1993, VA carried out its responsibility for coordinating all Gulf War health-related activities, including research, through interagency committees, which evolved over time to reflect changing needs and priorities. (See fig. 1.) In 2000, interagency coordination of Gulf War illnesses research was subsumed under the broader effort of coordination for research on all hazardous deployments. Consequently, Gulf War illnesses research was no longer a primary focus. The most recent interagency research subcommittee, which is under the

⁶DOD officials also told us that there are about 100,000 Gulf War veterans currently on active military duty but these veterans generally are in good health.

⁷DOD refers to medical research related to current or future military deployments as its Force Health Protection Research Program. This program focuses on prevention of illness, reduction of injuries or the severity of injury, faster evacuation of casualties, and enhancements to general medical capabilities.

Deployment Health Working Group (DHWG), has not met since August 2003, and as of April 2004, no additional meetings had been planned.

Additionally, VA has not reassessed the extent to which the collective findings of completed Gulf War Illnesses research projects have addressed the 21 key research questions developed by the RWG. (See app. I.) The only assessment of progress in answering these research questions was published in 2001, when findings from only about half of all funded Gulf War illnesses research were available. Moreover, the summary did not identify whether there were gaps in existing Gulf War illnesses research or promising areas for future research. No reassessment of these research questions has been undertaken to determine whether they remain valid, even though about 80 percent of federally funded Gulf War illnesses research projects now have been completed. In 2000, we reported that without such an assessment, many underlying questions about causes, course of development, and treatments for Gulf War illnesses may remain unanswered.⁸

RAC's Efforts to Provide Advice May Be Hindered by VA's Limited Information Sharing and Collaboration, but Several Changes to Address These Issues Have Been Proposed

RAC's efforts to provide advice and make recommendations on Gulf War illnesses research may have been impeded by VA's limited sharing of information on research initiatives and program planning as well as VA's limited collaboration with the committee. However, VA and RAC are exploring ways to improve information sharing, including VA's hiring of a senior scientist who would both guide the agency's Gulf War illnesses research and serve as the agency's liaison to provide routine updates to RAC. VA and RAC are also proposing changes to improve collaboration, including possible commitments from VA to seek input from RAC when developing research program announcements. At the time of our review, most of these proposed changes were in the planning stages.

⁸U.S. General Accounting Office, *Gulf War Illnesses: Management Actions Needed to Answer Basic Research Questions*, [GAO/NSIAD-00-32](#) (Washington D.C.: Jan. 6, 2000).

RAC Officials Cite VA's Poor Information Sharing and Limited Collaboration as Impediments in Meeting Its Mission

According to RAC officials, VA senior administrators' poor information sharing and limited collaboration with the committee about Gulf War illnesses research initiatives and program planning may have hindered RAC's ability to achieve its mission of providing research advice to the Secretary of VA. RAC is required by its charter to provide advice and make recommendations to the Secretary of VA on proposed research studies, research plans, and research strategies relating to the health consequences of service during the Gulf War. (See app. II for RAC's charter.) RAC's chairman and scientific director said that the recommendations and reports that the advisory committee provides to the Secretary of VA are based on its review of research projects and published and unpublished research findings related to Gulf War illnesses.

Although RAC and VA established official channels of communication, VA did not always provide RAC with important information related to Gulf War illnesses research initiatives and program planning. In 2002, VA designated a liaison to work with RAC's liaison in order to facilitate the transfer of information to the advisory committee about the agency's Gulf War illnesses research strategies and studies. However, RAC officials stated that most communication occurred at their request; that is, the VA liaison and other VA staff were generally responsive to requests but did not establish mechanisms to ensure that essential information about research program announcements or initiatives was automatically provided to the advisory committee. For example, according to RAC officials, VA's liaison did not inform RAC that VA's Office of Research and Development was preparing a research program announcement until it was published in October 2002. Consequently, RAC officials said that they did not have an opportunity to carry out the committee's responsibility of providing advice and making recommendations regarding research strategies and plans. In another instance, RAC officials stated that VA did not notify advisory committee members that the Longitudinal Health Study of Gulf War Era Veterans—a study designed to address possible long-term health consequences of service in the Gulf War—had been developed and that the study's survey was about to be sent to study participants. RAC officials expressed concern that VA did not inform the advisory committee about the survey even after the plans for it were made available for public comment.

Information sharing about these types of issues is common practice among advisory committees of the National Institutes of Health (NIH), which has

more federal advisory committees than any other executive branch agency.⁹ For example, a senior official within NIH's Office of Federal Advisory Committee Policy said that it is standard practice for NIH advisory committees to participate closely in the development of research program announcements. In addition, NIH's advisory committee members are routinely asked to make recommendations regarding both research concepts and priorities for research projects, and are kept up-to-date about the course of ongoing research projects.

VA and RAC Are Exploring Methods to Improve Information Sharing and Collaboration

In recognition of RAC's concerns, VA is proposing several actions to improve information sharing, including VA's hiring of a senior scientist to lead its Gulf War illnesses research and improving formal channels of communication. In addition, VA and RAC are exploring methods to improve collaboration. These would include possible commitments from VA to seek input from RAC when developing research program announcements and to include RAC members in a portion of the selection process for funding Gulf War illnesses research projects. As of April 2004, most of the proposed changes were in the planning stages.

Since the February 2004 RAC meeting, VA and RAC officials said they have had multiple meetings and phone conversations and have corresponded via e-mail in an attempt to improve communication and collaboration. VA officials said they have already instituted efforts to hire a senior scientist to guide the agency's Gulf War illnesses research efforts and to act as liaison to RAC. According to VA officials, this official will be required to formally contact RAC officials weekly, with informal communications on an as-needed basis. In addition, this official will be responsible for providing periodic information on the latest publications or projects related to Gulf War illnesses research.

In an effort to facilitate collaboration with RAC, VA has proposed involving RAC members in developing VA program announcements designed to solicit research proposals, both specifically regarding Gulf War illnesses and in related areas of interest, such as general research into unexplained illnesses. RAC officials stated that throughout March and April 2004, they worked with VA officials to jointly develop a new research

⁹NIH is the largest funder of medical research in the United States and maintains more than 140 chartered advisory committees. NIH has four types of advisory committees—for the purposes of this report, we refer to practices among two of these types: program advisory committees and national advisory councils.

program announcement for Gulf War illnesses. In addition, VA has proposed that RAC will be able to recommend scientists for inclusion in the scientific merit review panels. VA also plans to involve RAC in review of a project's relevancy to Gulf War illnesses research goals and priorities after the research projects undergo scientific merit review. This could facilitate RAC's ability to provide recommendations to VA regarding the projects that the advisory committee has judged are relevant to the Gulf War illnesses research plan.

Concluding Observations

Although about 80 percent of federally funded Gulf War illnesses research projects have been completed, little effort has been made to assess progress in answering the 21 key research questions or to identify the direction of future research in this area. Additionally, in light of decreasing federal funds and expanding federal research priorities, research specific to Gulf War illnesses is waning. Without a comprehensive reassessment of Gulf War illnesses research, underlying questions about the unexplained illnesses suffered by Gulf War veterans may remain unanswered.

Since RAC's establishment in January 2002, its efforts to provide the Secretary of VA with advice and recommendations may have been hampered by VA's incomplete disclosure of Gulf War illnesses research activities. By limiting information sharing with RAC, VA will not fully realize the assistance that the scientists and veterans' advocates who serve on the RAC could provide in developing effective policies and guidance for Gulf War illnesses research. VA and RAC are exploring new approaches to improve information sharing and collaboration. If these approaches are implemented, RAC's ability to play a pivotal role in helping VA reassess the future direction of Gulf War illnesses research may be enhanced. However, at the time of our review most of these changes had not been formalized.

Mr. Chairman, this completes my prepared statement. I would be happy to respond to any questions you or other Members of the Subcommittee may have at this time.

Contact and Staff Acknowledgments

For further information about this testimony, please contact me at (202) 512-7119 or Bonnie Anderson at (404) 679-1900. Karen Doran, John Oh, Danielle Organek, and Roseanne Price also made key contributions to this testimony.

Appendix I: Key Gulf War Illnesses Research Questions

Between 1995 and 1996, the Research Working Group (RWG) of the interagency Persian Gulf Veterans' Coordinating Board identified 19 major research questions related to illnesses in Gulf War Veterans. The RWG later added 2 more questions to create a set of 21 key research questions that serve as a guide for federal research regarding Gulf War illnesses. (See table 1.)

Table 1: 21 Key Gulf War Illnesses Research Questions

Research Question Number	Key Research Questions
1	What is the prevalence of symptoms/illnesses in the Persian Gulf veterans population? How does this prevalence compare to that in an appropriate control group?
2	What was the overall exposure of troops to <i>Leishmania tropica</i> ?
3	What were the exposure concentrations to various petroleum products, and their combustion products, in typical usage during the Persian Gulf conflict?
4	What was the extent of exposure to specific occupational/environmental hazards known to be common in the Persian Gulf veteran's experience? Was this exposure different from that of an appropriate control group?
5	What were the potential exposures of troops to organophosphate nerve agent and/or sulfur mustard as a result of allied bombing at Muhammadiyah and Al Muthannna, or the demolition of a weapons bunker at Khamisiyah?
6	What was the extent of exposure to chemical agent, other than at Khamisiyah, Iraq, in the Persian Gulf as a function of space and time?
7	What was the prevalence of pyridostigmine bromide use among Persian Gulf troops? ^a
8	What was the prevalence of various psychophysiological stressors among Persian Gulf veterans? Is the prevalence different from that of an appropriate comparison population?
9	Are Persian Gulf veterans more likely than an appropriate comparison group to experience nonspecific symptoms and symptom complexes?
10	Do Persian Gulf veterans have a greater prevalence of altered immune function or host defense when compared with an appropriate control group?
11	Is there a greater prevalence of birth defects in the offspring of Persian Gulf veterans than in an appropriate control population?
12	Have Persian Gulf veterans experienced lower reproductive success than an appropriate control population?

Research Question Number	Key Research Questions
13	Is the prevalence of sexual dysfunction greater among Persian Gulf veterans than among an appropriate comparison population?
14	Do Persian Gulf veterans report more pulmonary symptoms or diagnoses than persons in appropriate control populations?
15	Do Persian Gulf veterans have a smaller baseline lung function in comparison to an appropriate control group? Do Persian Gulf veterans have a greater degree of nonspecific airway reactivity in comparison to an appropriate control group?
16	Is there a greater prevalence of organic neuropsychological and neurological deficits in Persian Gulf veterans compared to appropriate control populations?
17	Can short-term, low-level exposures to pyridostigmine bromide, the insect repellent DEET, and the insecticide permethrin, alone or in combination, cause short-term and/or long-term neurological effects?
18	Do Persian Gulf veterans have a significantly higher prevalence of psychological symptoms and/or diagnoses than do members of an appropriate control group?
19	What is the prevalence of leishmaniasis and other infectious diseases in the Persian Gulf veteran population?
20	Do Persian Gulf veterans have a greater risk of developing cancers of any type when compared with an appropriate control population?
21	Are Persian Gulf veterans experiencing a mortality rate that is greater than that of an appropriate control population? Are specific causes of death related to service in the Persian Gulf?

Source: VA.

^aPyridostigmine bromide (PB) is a drug that was supplied to troops for use as a pretreatment for potential exposure to nerve agents.

Appendix II: Charter For the VA Research Advisory Committee On Gulf War Veterans' Illnesses (RAC)

**DEPARTMENT OF VETERANS AFFAIRS
CHARTER OF THE
RESEARCH ADVISORY COMMITTEE ON
GULF WAR VETERANS' ILLNESSES**

A. OFFICIAL DESIGNATION: Research Advisory Committee on Gulf War Veterans' Illnesses (RACGWVI).

B. OBJECTIVES AND SCOPE OF ACTIVITY: The Department of Veterans Affairs (VA) Research Advisory Committee on Gulf War Veterans' Illnesses shall provide advice and make recommendations to the Secretary of Veterans Affairs on proposed research studies, research plans, and research strategies relating to the health consequences of military service in the Southwest Asia theater of operations during the Persian Gulf War. The Committee shall not conduct scientific research.

The guiding principle for the work of the Committee shall be the premise that the fundamental goal of Gulf War-related government research, either basic or applied, is to ultimately improve the health of ill Gulf War veterans, and that the choice and success of research efforts shall be judged accordingly. The Committee shall assess the overall effectiveness of government research to answer central questions on the nature, causes, and treatments of Gulf War-associated illnesses.

C. PERIOD OF TIME NECESSARY FOR THE COMMITTEE TO CARRY OUT ITS PURPOSE(S): The Committee was established in compliance with statutory instructions contained in Section 104 of Public Law 105-368. It has no termination date.

D. OFFICIAL TO WHOM THE COMMITTEE REPORTS: The Committee shall report to the Secretary of Veterans Affairs.

E. OFFICE RESPONSIBLE FOR PROVIDING THE NECESSARY SUPPORT TO THE COMMITTEE: The Department of Veterans Affairs will provide support for the Committee. A VA employee selected by the Secretary of Veterans Affairs shall be the Designated Federal Officer, under the direction of the Committee chair. Technical support for the Committee shall be provided by a staff that reports to the Committee chair, who may appoint a technical director for the staff to supervise its operation. Staff members may be VA employees, employees of other government agencies, or independent agents employed as temporary VA employees.

F. DUTIES FOR WHICH THE COMMITTEE IS RESPONSIBLE: The Committee shall provide to the Secretary of Veterans Affairs, not later than December 1 of each year, an annual report summarizing its activities for the preceding year. The Committee is authorized to develop additional reports and recommendations regarding relevant research. During its review of such research and in compliance with governing law, the Committee shall have access to all VA documents and other information sources it finds relevant to such review. Recommendations contained within a formal Committee

report shall be submitted to the Secretary and other appropriate officials, as directed by the Secretary.

The Committee shall be comprised of members of the general public, including Persian Gulf War veterans, representatives of such veterans, and members of the medical and scientific communities representing appropriate disciplines such as, but not limited to, biomedicine, epidemiology, immunology, environmental health, neurology, and toxicology. The Secretary of Veterans Affairs may appoint non-U.S. citizens as Committee members.

Members shall be appointed for two- or three-year terms. The Secretary of Veterans Affairs may renew the terms of members. The Secretary shall appoint the chair of the Committee. The term of office for the chair shall be two years, also renewable by the Secretary.

The Committee may establish subcommittees to carry out specific projects or assignments. The Committee chair shall notify the Secretary upon the establishment of any subcommittee, including its function, members and estimated duration.

The Secretary of Veterans Affairs may establish a panel of experts representing appropriate medical and scientific disciplines to assist the Committee in its work. Panelists may be called on by the Secretary for advice and consultation, and may advise the Committee on research or conduct other appropriate activities for the Committee, at the request of the Committee chair. Panelists shall report directly to the chair or such Committee members designated by the chair, but they shall not be members of the Committee.

G. ESTIMATED ANNUAL OPERATING COSTS IN DOLLARS AND STAFF-YEARS:

The estimated annual cost for operating the Committee and its support staff is \$400,000 and 4 FTE. All members will receive travel expenses and a per diem allowance in accordance with the Federal Travel Regulations for any travel made in connection with their duties as members of the Committee.

H. ESTIMATED NUMBER AND FREQUENCY OF MEETINGS: Meetings of the Committee shall occur not less than twice annually at the call of the chair. Meetings of the subcommittee(s) shall be convened as necessary. A federal government official shall be present at all meetings.

I. COMMITTEE TERMINATION DATE: None.

J. DATE CHARTER IS FILED:

APPROVED: Signed by Anthony J. Principi
Secretary of Veterans Affairs

Date: 1/14/2004

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