Journal of Law and Policy

Volume 13
Issue 2
SCIENCE FOR JUDGES IV:
Agent Orange Revisited and Human Behavior
Research

Article 5

2005

The Role of Science in Department of Veterans Affairs Disability Compensation Policies for Environmental and Occupational Illnesses and Injuries

Mark Brown

THE ROLE OF SCIENCE IN DEPARTMENT OF VETERANS AFFAIRS DISABILITY COMPENSATION POLICIES FOR ENVIRONMENTAL AND OCCUPATIONAL ILLNESSES AND INJURIES

Mark Brown, Ph.D.[*]

INTRODUCTION

The U.S. Department of Veterans Affairs (VA) has responded to the healthcare and disability compensation needs of veterans of the Vietnam War for more than three decades. Ongoing concerns by veterans, their families, Congress and others have made long-term health effects from exposure to Agent Orange and other herbicides used in the Vietnam War a major focus of the VA's response.

Part I of this article will provide an overview of the VA's mandate with respect to the provision of federal benefits to veterans and their families. This section also will discuss the requirements that veterans applying for such benefits must meet and the difficulties veterans face when their claims are based on latent illnesses arising from hazardous exposures that occurred years before. Part II will describe the VA's approach to disability compensation for Vietnam veterans exposed to Agent Orange as well as the VA's more recent attempts to duplicate that approach

[*] Mark Brown, Ph.D., is the Director of the Environmental Agents Service of the U.S. Department of Veterans Affairs. This paper was presented to the fourth program on Science for Judges, held at Brooklyn Law School on November 4, 2004. The author would like to acknowledge Mr. David Barrans, U.S. Department of Veterans Affairs, for his help in reviewing this manuscript and for explaining legal citations.

for veterans from other combat missions, including the 1991 Gulf War. This article concludes that, despite some unanticipated consequences, the VA's approach to Agent Orange has worked well for establishing scientifically based and politically acceptable compensation policies for Vietnam veterans. Efforts to apply this approach to other groups of combat veterans with possible environmental and occupational injuries and illnesses, however, have not been successful.

I. PROVIDING DISABILITY COMPENSATION FOR VETERANS

The VA is responsible for providing a wide range of federal benefits, including healthcare, disability compensation, education and vocational training, home loans, pensions, rehabilitation, and survivor and burial benefits, to nearly 26 million American veterans and their families.[1] The provision of this wide range of services has made the VA the second largest of all Cabinet-level departments in terms of budget and staff. The VA's fiscal year 2004 spending was $62.1 billion—$29.1 billion for healthcare and $32.4 billion for benefits, including disability compensation.[2] The VA's national healthcare system includes 158 hospitals, with at least one in each of the forty-eight contiguous states, Puerto Rico, and the District of Columbia. In fiscal year 2003, the VA provided healthcare to about 4.8 million veterans, who made more than 49.8 million outpatient clinic visits.[3]

The VA's disability compensation program provides monthly monetary benefits to veterans who are disabled by service-connected injuries or diseases, that is, for illnesses or injuries that were incurred or aggravated *during their active military service*.[4] The amount of a monthly disability check is established by Congress and is based on the degree of the service-connected disability in 10% increments (10%, 20%, etc.), as determined by a

---

[1] Office of Public Affairs Media Relations, U.S. Dep't of Veterans Affairs, Facts about the Department of Veterans Affairs (Feb. 2005), *available at* http://www.va.gov/OPA/fact/docs/vafacts.pdf.

[2] *Id.*

[3] *Id*.

[4] *Id*.

VA disability rating specialist.[5] Currently, a veteran with a 10% service-connected disability receives $108 per month, while a veteran with a 100% service-connected disability receives $2,299 monthly.[6] In fiscal year 2003, the VA spent $26 billion providing disability compensation, death compensation, and pensions to about 3.4 million veterans, and to nearly 600,000 spouses, children, and parents of deceased veterans.[7]

A. Direct Service Connection and Disability Compensation

Establishing service connection and degree of disability usually requires a simple review for a veteran with an acute disease or injury, for example, a bullet or shrapnel wound.[8] Most veterans receiving disability compensation from the VA have injuries that may be assessed through such a direct service connection approach. Establishing direct service connection can be more contentious, however, when the illness or injury involves a chronic disease possibly caused by an environmental or occupational exposure that may have occurred decades in the past (for example, exposure to benzene as a potential cause of leukemia).

1. The Legal Standard

Congress has provided the VA with statutory guidance for evaluating a direct disability compensation claim. Pursuant to statute, the VA is authorized to pay disability compensation only for a "disability resulting from personal injury suffered or disease contracted in line of duty, or for aggravation of a preexisting injury suffered or disease contracted in line of duty, in the active military,

---

[5] U.S. DEP'T OF VETERANS AFFAIRS, FEDERAL BENEFITS FOR VETERANS AND DEPENDENTS 73 (2005), *available at* http://www.vetwatchnw.com/Fedben.pdf.

[6] *Id*. at 73.

[7] Office of Public Affairs Media Relations, *supra* note 1.

[8] Compensation and Pension Service, U.S. Dep't of Veterans Affairs, Disability Compensation Benefits (Dec. 2004), *available at* http://www.vba.va.gov/bln/21/Milsvc/Docs/Compeg.doc.

naval, or air service."[9]

The required showing that a disease was incurred in service can present significant difficulties in cases involving latent diseases allegedly associated with exposures many years earlier. Courts have held that claimants must establish a causal "nexus" between their current diseases and some incident or exposure during military service.[10] The VA has, however, adopted a relatively generous approach to resolving factual issues pertinent to this inquiry. A VA regulation, 38 C.F.R. section 3.102, establishes what is known as the "reasonable doubt" or "benefit of the doubt" doctrine, which also has been referred to as the "tie goes to the runner" rule based upon the baseball analogy. In relevant part, the regulation provides:

> It is the defined and consistently applied policy of the Department of Veterans Affairs to administer the law under a broad interpretation, consistent, however, with the facts shown in every case. When, after careful consideration of all procurable and assembled data, a reasonable doubt arises regarding service origin, the degree of disability, or any other point, such doubt will be resolved in favor of the claimant. *By reasonable doubt is meant one which exists because of an approximate balance of positive and negative evidence which does not satisfactorily prove or disprove the claim*. . . . The reasonable doubt doctrine is also applicable even in the absence of official records, particularly if the basic incident allegedly arose under combat, or similarly strenuous conditions, and is consistent

---

[9] 38 U.S.C. § 1110 (2005).

[10] Shedden v. Principi, 381 F.3d 1163, 1166-67 (Fed. Cir. 2004) ("[I]n order to establish service connection . . . the veteran must show: (1) the existence of a present disability; (2) in-service incurrence or aggravation of a disease or injury; and (3) a causal relationship between the present disability and the disease or injury incurred or aggravated during service."); McCartt v. West, 12 Vet. App. 164, 168 (1999) (holding that, in the absence of an applicable presumption of service connection, a claimant alleging disability due to Agent Orange exposure had to submit "medical evidence of a nexus between Agent Orange exposure and the appellant's current [disease]").

with the probable results of such known hardships.[11]

In other words, the VA adjudicates a veteran's direct service disability compensation claim based upon the merits of the individual case and grants a claim when the VA determines that a veteran's illness or injury *is at least as likely as not* to have been caused by the environmental or occupational exposure.

2. Four Key Categories of Evidence for Direct Service Connection

As a practical matter, establishing a "nexus" between a current disease and a claimed environmental or occupational exposure in service generally requires four key categories of evidence:

1. *Evidence of a Scientific Association*. Veterans must show credible scientific or medical evidence that the exposure involved is accepted as being associated with their specific illness or injury;

2. *Evidence of Military Exposure*. Veterans must show evidence that the relevant environmental or occupational exposure occurred during their active military duty;

3. *Evidence of Temporal Plausibility*. Veterans must show that their illnesses or injuries were initiated or were exacerbated during active military duty; and

4. *Evidence of Exposure Magnitude.* Veterans must show evidence of an unusually large or prolonged exposure to support the conclusion that the exposure was at least as likely as not to have been the specific cause of their illnesses or injuries, in comparison to all other potential causes of those illnesses experienced before and after military service.

The "Evidence of Exposure Magnitude" requirement means that a minimal, short-term, or commonplace exposure to an environmental hazard *might* support the *possibility* that an illness or injury was caused by the exposure; however, it might fail to cross the statutory threshold requiring that it be *at least as likely as*

[11] 38 C.F.R. § 3.102 (2005).

not to have been the cause when compared to all other possible causes. For example, a veteran who served two years in the military and was diagnosed with leukemia at age fifty may have had forty-eight years of exposure to benzene (a component of gasoline) as a civilian *outside* of his military service and only two years of exposure during service. Evidence that might support an unusually large benzene exposure could include documentation that the veteran's military occupation, for example, regular motor vehicle maintenance duties, specifically involved contact with benzene.

In practice, this point can represent a significant hurdle for establishing direct service connection for an illness or injury caused by an environmental or occupational exposure. For example, benzene is only a single and probably relatively minor cause of all leukemias, and leukemia from all causes is not an uncommon disease. Further, virtually everyone experiences constant, minor benzene exposure because benzene is a component of gasoline and other common solvents. Despite these restrictions, most disability claims for environmental or occupational injury or illness are based upon this direct service connection approach.

B. An Alternate Route to Disability Compensation: Presumptive Service Connection

The VA has the authority to bypass one or even all of the four key categories of evidence required for a direct service claim by establishing a "presumptive" or automatic service connection. For example, 38 C.F.R. section 3.307 and 38 C.F.R. section 3.309 list some relatively common chronic diseases, including arthritis, leukemia, and Type II diabetes, that the VA can presume to be service connected when they appear within a certain period after separation from military service, even if available evidence is not sufficient to support a *direct* service connection. These presumptively service connected illnesses must lead to at least 10% disability and appear generally within one year from the date of the claimant's separation from military service.[12] Similarly, in

[12] 38 C.F.R. § 3.307 (2005); 38 C.F.R. § 3.309 (2005).

1995, Congress authorized the VA's compensation of veterans with undiagnosed illnesses or with difficult to diagnose illnesses, such as chronic fatigue syndrome, fibromyalgia, and irritable bowel syndrome, that are defined by a cluster of signs or symptoms.[13] Under 38 U.S.C. section 1117, the VA is empowered to provide compensation to Gulf War veterans who, for at least six months, exhibit objective evidence of 10% or greater disability, which may include disability due to fatigue, skin conditions, headache, muscle and joint pain, sleep disturbances, abnormal weight loss, menstrual disorders, and neurologic or neuropsychological, respiratory, gastrointestinal, and cardiovascular illnesses.[14] Approximately 3,200 veterans of the 1991 Gulf War have received compensation based upon this law.

These statutes give veterans the benefit of the doubt in cases in which certain poorly understood illnesses manifest within a defined period. Further, they effectively eliminate at least the "Evidence of Temporal Plausibility" requirement of the direct service connection test. Presumptive service connection for the specified diseases is not, however, automatic, and the VA may consider evidence in rebuttal of service connection, including "any evidence of a nature usually accepted as competent to indicate the time of existence or inception of disease . . . ."[15] In fact, the VA's statutorily defined Agent Orange Vietnam Veteran compensation policies, described in Part II of this article, have eliminated essentially all four key categories. Not surprisingly, this has also produced certain unexpected problems.

II. BACKGROUND ON THE VA'S PRESUMPTIVE SERVICE CONNECTION FOR AGENT ORANGE

Vietnam veterans during the 1960s and 1970s voiced increasing concerns about how exposure to herbicides and dioxin had affected their health. Some veterans cited Agent Orange as the source of various health problems that extended to birth defects

---

[13] 38 U.S.C. § 1117.

[14] *Id.*

[15] 38 C.F.R. § 3.307 (2005); 38 C.F.R. § 3.309 (2005).

among their children. Initially, the VA had problems establishing policies on Agent Orange disability compensation. Minimal veteran exposure information and limited scientific understanding of Agent Orange and dioxin health effects meant that in the face of mounting concerns from veterans and others, essentially all four necessary categories of evidence for direct service connection were missing.

In response, in 1991, Congress passed Public Law 102-4, more commonly known as the "Agent Orange Act." The Act mandated a new process for establishing presumptive service connections for illnesses related to Vietnam veterans' exposure to Agent Orange, other herbicides, and the contaminant dioxin, including a presumption of exposure to those agents.[16] The new law represented a significant breakthrough for establishing compensation policies in this area for what remains a controversial issue even today.

The Agent Orange Act directed the VA to contract with the National Academy of Sciences (NAS) to conduct a comprehensive review of all scientific and medical literature on the health effects from exposure to Agent Orange and other herbicides used in Vietnam, and to dioxin. The initial 1994 NAS report—an exhaustive and thorough review of *all* published literature on health effects from exposure to these agents—established the pattern for all future reports. Most of the reviewed literature came from studies of civilians exposed either through industrial accidents or in the workplace rather than from veterans themselves.

A. NAS Science and VA Policy

The Agent Orange Act assigns the NAS the responsibility of evaluating the relevant science.[17] The VA, in turn, is given responsibility for translating the NAS's scientific conclusions into

---

[16] Agent Orange Act of 1991, Pub. L. No. 102-4, 105 Stat. 11 (1991) (codified as amended at 38 U.S.C. § 1116).

[17] 38 U.S.C. § 1116 note (stating that the Act authorizes the National Academy of Sciences "to review and evaluate the available scientific evidence regarding associations between diseases and exposure to dioxin and other chemical compounds in herbicides").

veteran compensation policy.[18] In other words, the statute expressly invites the Secretary of Veterans Affairs to consider evidence *in addition to* that provided by the NAS. In practice, the VA assembles an internal taskforce of scientists, medical doctors, attorneys, and compensation experts to evaluate and recommend possible policy options to the Secretary in response to an NAS report.

The Act further provides for an automatic "Evidence of a Scientific Association" for all Vietnam veterans, stating that "[a]n association between the occurrence of a disease in humans and exposure to an herbicide agent shall be considered to be positive for the purposes of this section *if the credible evidence for the association is equal to or outweighs the credible evidence against the association.*"[19] Based on the 1994 NAS report, the VA decided to presumptively recognize a range of illnesses, including soft tissue sarcoma, non-Hodgkin's lymphoma, Hodgkin's disease, chloracne, porphyria cutanea tarda, multiple myeloma, and respiratory cancers. The Agent Orange Act also requires the NAS to update its reviews based on new science at least every two years.[20] Updated reviews, published in 1996, 1998, 2000, and 2002, have expanded the VA's list of presumptively service-

---

[18] 38 U.S.C. § 1116(b)(1)-(2). In relevant part, the statute states:

> Whenever the Secretary determines, on the basis of sound medical and scientific evidence, that a positive association exists between (A) the exposure of humans to an herbicide agent, and (B) the occurrence of a disease in humans, the Secretary shall prescribe regulations providing that a presumption of service connection is warranted for that disease for the purposes of this section. In making determinations for the purpose of this subsection, the Secretary shall take into account (A) reports received by the Secretary from the National Academy of Sciences under section 3 of the Agent Orange Act of 1991, and (B) all other sound medical and scientific information and analyses available to the Secretary. In evaluating any study for the purpose of making such determinations, the Secretary shall take into consideration whether the results are statistically significant, are capable of replication, and withstand peer review.

Id.

[19] 38 U.S.C. § 1116(b)(3).

[20] *Id.* § 1116 note.

connected illnesses to include acute or sub-acute peripheral neuropathy, Type II diabetes, prostate cancer, and most recently, chronic lymphocytic leukemia. Based upon the 1996 NAS update and congressional action, Vietnam veterans' children with spina bifida are also eligible for certain compensation and other services.[21]

The Act also prescribes a "presumption of exposure" that effectively frees a Vietnam veteran from having to show "Evidence of Military Exposure," "Evidence of Temporal Plausibility," and "Evidence of Exposure Magnitude," the second, third, and fourth key categories of evidence required for establishing a direct service connection.[22] As a result of this statutorily defined policy, an eligible veteran (i.e., a veteran with any discharge other than dishonorable discharge) must only show that he is a Vietnam veteran diagnosed with one of the diseases presumptively recognized as service connected to herbicide exposure. Once this showing is made, service connection becomes automatic.

This process eliminates a significant burden for Vietnam veterans trying to establish service connection and disability compensation for illnesses related to herbicide exposure. However, there have been unexpected consequences in terms of apparent inequities and unanticipated costs.

---

[21] 38 C.F.R. § 3.814 (2005).

[22] 38 U.S.C. § 1116. Specifically, the statute provides:

> For purposes of establishing service connection for a disability or death resulting from exposure to a herbicide agent, including a presumption of service-connection under this section, a veteran who, during active military, naval, or air service, served in the Republic of Vietnam during the period beginning on January 9, 1962, and ending on May 7, 1975, shall be presumed to have been exposed during such service to an herbicide agent containing dioxin or 2,4-dichlorophenoxyacetic acid, and may be presumed to have been exposed during such service to any other chemical compound in an herbicide agent, unless there is affirmative evidence to establish that the veteran was not exposed to any such agent during that service.

Id. § 1116(f) (2005).

1. Credibility and Independence

The strengths of the NAS scientific review process are its breadth and thoroughness, and the NAS's reputation for independence and scientific prestige. Earlier efforts by the VA to conduct its own scientific reviews on herbicide health effects were viewed by many veterans as lacking credibility and independence.[23] Although veterans have not always been happy with the NAS findings, the NAS's credibility has remained intact. Indeed, the NAS process has become an essential step in ensuring that new service connection presumptions command scientific credibility.

2. Compensation Inequities

Without statutorily defined presumptions, Vietnam veterans would have difficulty establishing a direct service connection for any illnesses related to herbicide or dioxin exposure. In particular, it would be difficult for claimants to provide "Evidence of a Scientific Association," "Evidence of Military Exposure," and "Evidence of Temporal Plausibility." Epidemiological studies of Vietnam veterans suggest that herbicide and dioxin exposure play, probably at most, only a minute role in overall mortality.[24] Taken together, these studies suggest that Vietnam veterans would have pronounced difficulty establishing "Evidence of Exposure Magnitude," that is, evidence that their exposures were sufficiently

---

[23] U.S. DEP'T OF VETERANS AFFAIRS, REVIEW OF LITERATURE ON HERBICIDES, INCLUDING PHENOXY HERBICIDES AND ASSOCIATED DIOXINS (1981-1992) (vols. 1 & 2 prepared by JRB Associates, McLean, Va.; vols. 3 to 18 prepared by Clement Int'l, Fairfax, Va.; vols. 19 & 20 prepared by Info. Ventures, Phila., Pa.).

[24] Numerous epidemiological studies of Vietnam veterans in general do not show that this group has higher mortality or morbidity from most of the diseases presumptively connected to herbicide exposure. An excellent summary of mortality and morbidity research on Vietnam veterans compared to their non-deployed peers is available in "Veterans and Agent Orange: A Continuing Medical Education Program," an independent study course first published in 2002 by the Department of Veterans Affairs, Employee Education System, *available at* www.va.gov/VHI/.

great or prolonged to make it at least as likely as not that the exposures were the cause of the veterans' illnesses or injuries when compared to all other potential causes. A related problem is that the Agent Orange Act has created a narrow focus on herbicides as the key to Vietnam veterans' illnesses when in fact they almost certainly play only a very minor role.

Further, the Agent Orange Act applies only to Vietnam veterans. Non-Vietnam veterans exposed to herbicides and dioxins do not receive the benefit of presumptive service connections; however, many non-Vietnam veterans have been exposed to these agents, including U.S. troops serving during the Vietnam War but *only* in nearby countries, including Cambodia, Laos, and Thailand, or off-shore aboard ships. The U.S. military during 1968 and 1969 also used Agent Orange and similar herbicides to defoliate the demilitarized zone between North and South Korea. The military use of Agent Orange and related herbicides also was tested and developed at U.S. bases located in the United States and abroad.

There is no obvious scientific or public health basis for excluding these non-Vietnam War veterans from the presumptive service connection offered to Vietnam veterans. Nevertheless, the Agent Orange Act does not reference these veterans. To partially address this apparent inequity, the VA has established the general policy that when a non-Vietnam veteran is diagnosed with one of the presumptively service-connected Agent Orange illnesses *and* the veteran can provide evidence of exposure to Agent Orange, then he can be granted service connection through a sort of modified direct service connection route.

Even this approach may ultimately prove unmanageable because, in fact, the majority of veterans could in principle claim herbicide exposure during military service, and thus, service connection for related illnesses. From the 1950s to the early 1970s, Agent Orange and related herbicides, including those with dioxin contaminants, were extensively used domestically for weed control on lawns and golf courses (including those on military bases and even VA hospitals), in forestry, and for weed control along fences, borders, and roads. Thus, *everyone* living during that period likely would have had some exposure.

Moreover, why should this policy be limited to military

personnel? Many domestic civilian workers used these same chemical agents. The VA has received inquiries about the VA's Agent Orange compensation policies from employees of the U.S. Department of Interior who were involved in spraying these herbicides on U.S. forests during the 1960s and 1970s. Indeed, the Government Accountability Office (GAO) recently asked the VA why these same policies should not be applied to workers' compensation claims filed with the U.S. Department of Labor. Similarly, the Government of Vietnam has publicly insisted that the U.S. government provide compensation to Vietnamese civilians for Agent Orange-related injuries. (Thus far, the U.S. government has denied this request.)

3. Cost Inequities

The economic implications of the Agent Orange Act may not have been fully anticipated by Congress. In perhaps the most dramatic and expensive example, the 2000 NAS Agent Orange special report concluded that there was "limited/suggestive" evidence associating herbicide exposure and Type II diabetes.[25] (Previous NAS reports had not found such positive evidence, but new scientific studies finally tipped the balance.) After reviewing that finding, in 2001, the VA announced a new presumptive service connection for Type II diabetes among Vietnam veterans.

This decision has significant economic implications. The VA estimated that about 9%, or about 270,000 of the approximately 3 million Vietnam veterans, would have Type II diabetes based solely upon on their age and other demographics. Diabetes often involves prolonged disability, and treatment can be expensive. The VA estimated that disability and treatment would cost several billion dollars over the first five years of implementing this policy. This is a significant portion of the VA's overall disability compensation budget for all veterans.

In fact, epidemiological studies do not show Vietnam veterans

---

[25] INST. OF MEDICINE, NAT'L ACADEMY OF SCIENCES, VETERANS AND AGENT ORANGE: HERBICIDE/DIOXIN EXPOSURE AND TYPE 2 DIABETES 2 (2000) (Nat'l Academy Press, Wash., D.C.).

dying from Type II diabetes at greater rates than their non-deployed peers. This suggests that there are probably only a small number of excess cases of Type II diabetes among Vietnam veterans due to herbicide or dioxin exposure during military service; indeed, the NAS noted that the biggest risk factors for diabetes are lifestyle and obesity. Coupled with limited exposure data, this means that few, if any, of these cases would have been granted service connection via the direct service connection route. In effect, the VA's policy compensates a very large number of veterans who would have been diagnosed with Type II diabetes regardless of their military service in order to ensure coverage of the few veterans who may have contracted the disease because of it.

B. Applying the NAS Process to Gulf War Veterans

Despite these problems, the Agent Orange Act and the NAS process it defined are generally acknowledged as successful approaches to incorporating science into difficult and contentious veteran compensation policy decisions. Nevertheless, more recent attempts to apply the Agent Orange approach to emerging environmental disabilities in veterans have suffered from the unintended consequences associated with implementing the Agent Orange Act for Vietnam veterans and thus far have produced little or no benefit for veterans.

The 1991 Gulf War concluded fourteen years ago. In response to the concerns of veterans and their families, and of Congress that the health of Gulf War veterans might have been affected by exposure to a wide variety of environmental hazards during the war, Congress passed two statutes, Public Law 105-277 and Public Law 105-368.[26] These statutes were drawn directly from the Agent Orange Act of 1991 and established the now-familiar formal NAS process, which mandates regular and thorough reviews of the scientific and medical literature relevant to health and Gulf War

[26] Persian Gulf War Veterans Act of 1998, Pub. L. No. 105-277, 112 Stat. 2681 (1998); Veterans Programs Enhancement Act of 1998, Pub. L. No. 105-368, 112 Stat. 3315 (1998).

exposures.

Major differences in the environmental exposures experienced by individuals serving during the Vietnam and Gulf Wars led to immediate problems with this approach. In contrast to the narrow range of exposures composed of "herbicides used in Vietnam and their dioxin contaminant," the exposures related to service in the Gulf War involved dozens of different and unrelated environmental hazards. In fact, the two new statutes specified thirty-three Gulf War-related environmental and occupational hazards as well as broad categories of hazards to be evaluated through this process. Consequently, although the NAS has produced three major biannual reports, it has yet to complete even an initial review of all of the statutorily defined Gulf War hazards.[27]

In addition, in 1991, there was only a limited amount of scientific literature on health effects of dioxins and Vietnam-related herbicides for the NAS to review. In contrast, virtually all of the Gulf War hazards were well known and characterized, with an abundant health effects literature. The NAS reviews have thus failed to produce any new insights into the health effects of exposure to these hazards, as the NAS's findings have mirrored those found in any standard occupational health and toxicology textbook.

The first NAS report, completed in 2000, reviewed health effects from exposure to sarin, depleted uranium, pyridostigmine bromide, and certain vaccines, including the anthrax vaccine.[28] The second report, completed in 2003, reviewed the health effects of exposure to all of the insecticides and solvents used in the 1991

---

[27] INST. OF MEDICINE, NAT'L ACADEMY OF SCIENCES, GULF WAR AND HEALTH VOL. 1: DEPLETED URANIUM, PYRIDOSTIGMINE BROMIDE, SARIN, VACCINES (2000) (Nat'l Academy Press, Washington, D.C.) [hereinafter GULF WAR AND HEALTH VOL. 1] (on file with author); INST. OF MEDICINE, NAT'L ACADEMY OF SCIENCES, GULF WAR AND HEALTH VOL. 2: INSECTICIDES AND SOLVENTS (2003) (Nat'l Academy Press, Washington, D.C.) [hereinafter GULF WAR AND HEALTH VOL. 2] (on file with author); INST. OF MEDICINE, NAT'L ACADEMY OF SCIENCES, GULF WAR AND HEALTH VOL. 3: FUELS, COMBUSTION PRODUCTS, AND PROPELLANTS (2004) (Nat'l Academy Press, Washington, D.C.) [hereinafter GULF WAR AND HEALTH VOL. 3] (on file with author).

[28] GULF WAR AND HEALTH VOL. 1, *supra* note 27, at 2.

Gulf War.[29] The third report, completed in 2004, reviewed the health effects of exposure to oil well fire air pollutants and certain other chemicals associated with the 1991 Gulf War.[30]

Taken together, these recent NAS reports contain dozens of somewhat predictable findings on health effects for dozens of hazardous agents. As with the Agent Orange Act of 1991, the new statutes direct the VA to find a positive association between a Gulf War hazard and a specific illness "if the credible evidence for the association is equal to or outweighs the credible evidence against the association,"[31] or to provide to Congress a report including "the Secretary's recommendations as to whether there is sufficient evidence to warrant a presumption of service-connection for the occurrence of a specified condition in Gulf War veterans."[32] When the evidence supports an association with a particular disease more than it does not, the statute requires the VA to develop regulations defining a presumptive service connection for that disease among Gulf War veterans.[33]

C. Policy Problems

The VA has had difficulty applying the NAS findings to Gulf War veterans because nearly all of the reviewed Gulf War-related

---

[29] GULF WAR AND HEALTH VOL. 2, *supra* note 27, at 2.

[30] GULF WAR AND HEALTH VOL. 3, *supra* note 27 (forthcoming publication).

[31] Persian Gulf War Veterans Act of 1998 § 1602(b)(3), 112 Stat. 2681 (1998) (codified at 38 U.S.C. § 1118).

[32] Veterans Programs Enhancement Act of 1998 § 101(i)(2), 112 Stat. 3315 (1998).

[33] Persian Gulf War Veterans Act of 1998, Pub. L. No. 105-277, § 1602(c)(1), 112 Stat. 2681 (1998) (codified at 38 U.S.C. § 1118) ("Not later than 60 days after the date on which the Secretary receives a report from the National Academy of Sciences . . . the Secretary shall determine whether or not a presumption of service connection is warranted for each illness, if any, covered by the report."); *id*. § 1602(c)(2) (codified at 38 U.S.C. § 1118) ("If the Secretary determines under this subsection that a presumption of service connection is warranted, the Secretary shall, not later than 60 days after making the determination, issue proposed regulations setting forth the Secretary's determination.").

hazards represent common, well-characterized occupational exposures that are experienced by virtually all Americans. It may come as a surprise to learn that military environmental exposures generally closely mirror the environmental exposures experienced by all Americans.

1. Considering Exposure Magnitude

The VA has had particular difficulty applying the NAS's conclusions based on studies of civilian workers with occupational exposures to the experience of deployed Gulf War veterans. Although essentially all health effects reported by the NAS are based on studies of workers with occupational exposures typically occurring over years, and indeed decades, deployments during the 1991 Gulf War typically lasted about only three months. For example, in its 2002 report, the NAS documented a slight increase in risk for leukemia among chemical industry workers who have large occupational exposure to benzene. These findings do little to inform us about the potential increased risk of leukemia in the typical Gulf War soldier experiencing an unremarkable benzene exposure during the few months of deployment.

On the other hand, there are certainly examples of Gulf War veterans with greater than everyday or commonplace benzene exposure, for example, veterans who regularly worked on vehicle maintenance. Those cases could involve benzene exposure at levels more comparable to the typical civilian occupational exposures that formed the bases of the studies reviewed by the NAS.

Similarly, many NAS findings on long-term health effects among civilian workers are reported *only* in cases that involved an unusual exposure sufficiently large to cause immediate and serious health effects. For example, certain long-term health effects from common organophosphorus pesticides are well documented, but only as the result of an exposure large enough to cause severe and immediate initial poisoning, typically, an occupational exposure. Exposures that do not cause immediate and serious effects have not been associated with long-term effects. How should the VA apply these NAS findings to the vast majority of veterans who

experienced only unexceptional exposures to these agents? In fact, all Americans have experienced some small, but more or less continuous exposure to common organophosphorus pesticides or to benzene during their lifetimes. Still, these exposures are considered to have negligible health risk significance, *given the small magnitude of the exposure*.

The problem for the VA is that the underlying statutes outlining this process eliminate the requirement for any "Evidence of Exposure Magnitude" that would be necessary for a direct service connection and offer little or no guidance for making distinctions based on exposure magnitude or duration. In effect, this creates the somewhat scientifically implausible result of treating *all* exposures as *equally* likely to lead to an associated long-term health effect. As a result, the VA could presumptively service connect *all* of the illnesses positively associated by the NAS with *all* of the associated Gulf War risk factors identified by the NAS, no matter how universal or trivial the exposure magnitude may have been for most or even all Gulf War veterans.

For these reasons, the VA has thus far been unable to develop any new presumptive service connected disabilities for the wide range of hazardous occupational and environmental exposures associated with the 1991 Gulf War. Some of the NAS findings are still under review.

2. Are New Presumptive Service Connection Polices Necessary?

Any presumptive service connection compensation policy will bring certain negative consequences. Policymakers presumably have determined that the advantages outweigh the drawbacks. In this instance, it is not clear that new presumptive service connections are necessary to provide equitable compensation to Gulf War veterans for the environmental and occupational injuries they sustained during their service.

Both short- and long-term health effects from most Gulf War hazardous exposures were generally very well characterized, even before that war began. That information, which is summarized in the NAS reviews, provides Gulf War veterans with a strong basis for pursuing disability compensation through the conventional

direct service connection route. The NAS reviews provide Gulf War veterans with ready access to scientific information to support the "Evidence of a Scientific Association" criterion. A Gulf War veteran would still be required to show "Evidence of Military Exposure" and "Evidence of Temporal Plausibility" to support a direct service connection claim. However, today many environmental hazards have been inexorably linked with service in the 1991 Gulf War.

Perhaps the greatest obstacle for establishing a direct service connection would be providing "Evidence of Exposure Magnitude" that demonstrates that the veteran's exposure was at least as likely as not to have been the cause of her disability. However, that is a commonplace and hardly insurmountable obstacle for veteran compensation claims in general. For example, in cases in which the NAS had documented long-term health effects marked by immediate and serious health effects at the time of exposure, a veteran's military record or other lay evidence would likely be sufficient to support the veteran's claim. Indeed, veterans might even prevail in cancer claims based on initial exposures that did not involve immediate and obvious effects by demonstrating, through the presentation of their specific military occupation and service records, that they experienced long-term moderate to high-level exposures that are generally associated with cancer in the relevant occupational health literature and that these exposures were "at least as likely as not" the cause of their cancer. Thus, the direct service connection route could cover most disability claims for illnesses that the NAS found to be associated with Gulf War environmental and occupational exposures. More simply, the conventional direct service connection process, based on a review of the identity of the exposure and information about its magnitude, would be sufficient to establish service connection when warranted.

CONCLUSION

The majority of veteran disability compensation claims for injuries related to environmental or occupational exposures are evaluated on the merits of the individual case through the direct

service connection process. New presumptive service connection policies inevitably bring unintended consequences, including a perceived or actual disparity in access to disability benefits for different groups of veterans, unanticipated costs, and scientifically implausible or untenable policies.

Presumptive service connection policies may be useful for specific situations in which it is impractical for veterans to develop a direct service claim, for example, when a veteran is diagnosed with an illness of unclear or unknown cause within a short period following separation from military service. Nevertheless, before considering new presumptive service connections that offer certain veterans special presumptive service connection, the VA and congressional policymakers should first determine that the conventional direct service connection route is not adequate to the task.

When a new presumptive service connection policy is determined to be necessary, it should be implemented in a manner that is considered fair and consistent with available science. In virtually all cases this requires the use of an independent scientific review body, such as the NAS, to ensure the credibility of the new policy and the perception by all parties that the policy is impartially based upon the best science.

Experience has shown that presumptive service connection policies that eliminate consideration of the magnitude of exposure should be avoided because they run the likely risk of inadvertently extending eligibility to all veterans, regardless of how trivial or commonplace their exposures may have been. Some of these issues may require clarification by Congress in the form of legislative fixes for those portions of statutes that have led to unanticipated problems.