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Jomana, Amara; Hendricks, Ann

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**Health Care Issues of the Iraq and Afghan Wars:
Short- and Long-Term Impacts on US Veterans Health Care**

Jomana Amara, PhD, Defense Resources Management Institute, Naval
Postgraduate School,
and
Ann Hendricks, PhD, VA Boston Healthcare System and
Boston University School of Public Health

Acknowledgement: We especially thank Yumiko Stenstrum of the VA Boston Healthcare System and Terri Cholar and Gregory Riley of DMDC for their invaluable assistance. We also thank Austin Frakt, Steven Pizer, Julia Prentice, Lynn Wolfsfeld, an anonymous referee, and attendees of the Western Economic Association Conference for their comments on an earlier version of this paper

This paper was not commissioned or reviewed by the Departments of Defense or Veterans Affairs. The views expressed are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the Department of Defense.

**Health Care Issues of the Iraq and Afghan Wars:
Short- and Long-Term Impacts on US Veterans Health Care**

Abstract

Public information about the use of health care through the Veterans Health Administration (VHA) by veterans of the Iraq and Afghan wars (OIF/OEF) underscores the potential for overestimating the impact on the taxpayer. Pressing needs of newly discharged veterans require immediate attention, especially for PTSD, TBI, and physical disability services, but the demand for immediate post-deployment VHA services is overshadowed nationally by the demands of the aging Korean and Vietnam War cohorts in terms of the number of patients and the total cost of their care. In addition, the long-run care needs for aging OIF/OEF veterans will be significant.

US veterans, their families, Congress, and the public are concerned about the nation's ability to provide medical care for members of the armed forces returning from active war duty in Afghanistan and Iraq, conflicts labeled "Operation Enduring Freedom" and "Operation Iraqi Freedom," respectively (or OIF/OEF).¹⁻⁴ News stories of injured OIF/OEF soldiers primarily focus on care for veterans with brain or spinal cord injuries, amputations, and mental disorders connected to military service, conditions that can be very costly to treat. Returning veterans have sought care for a broad range of conditions, however, including all major diagnostic categories.⁵

The rigors of combat deployment may result in a substantial increase in service-connected conditions that do not show up in casualty statistics. Back strains and other muscle or skeletal problems may not have been reported in the conflict area, but may bring older reservists to the Veterans Health Administration (VHA) after separation from the military. Similarly, veterans who have been away from family and friends for more than a year may have trouble adjusting to family life when they return. Readjustment reactions may not manifest in the deployment area and may not be disabling conditions, but may require psychological help when the military personnel become veterans.

Conventional wisdom holds that care for returning veterans is placing a large burden on VHA, the part of the Department of

Veterans Affairs providing health care to veterans.⁶ This impact needs to be assessed in the context of the other demands on the VHA system, especially that from the Vietnam War cohort.

Vietnam veterans are entering that period of life with the greatest health burden from chronic disease and old age. In fact, demand for immediate post-deployment VHA services by OIF/OEF veterans is overshadowed nationally by the demands of the aging Korean and Vietnam War cohorts in terms of the number of patients and the cost of their care.

Health care demands of recently discharged veterans are not spread equally across veterans, states, or VHA medical centers, however. Some veterans have suffered tremendous physical and psychological traumas while others have experienced little or no trauma. Some states are home to larger communities of veterans; some had more reservists and National Guard units called up and therefore have larger numbers of these veterans following their separation from military duty. Differential impacts are especially likely for VHA medical centers that specialize in mental health services as well as for traumatic brain injury (TBI) or rehabilitation services throughout the system.

This report of trends in the veteran population and costs of care supports a conclusion that the immediate medical needs engendered by OIF/OEF are the most important incremental health care cost of these wars. As discharged military personnel age,

their health care costs will increasingly be for different types of services than the OIF/OEF veterans require today: care for complex chronic conditions rather than for war injuries; for dementias rather than mental health disorders triggered by traumas. A large portion of the long-run care for OIF/OEF veterans would have been required even if the nation had not gone to war, because the veterans could be expected to develop chronic conditions as they age, as the veterans of prior conflicts have done.

In this paper, we place the OIF/OEF cohort in the context of all living US veterans in order to set the context of resource needs. We then estimate the health care demands on VHA of veterans from this first decade of the twenty-first century in the absence of the OIF/OEF conflicts and examine the impact of OIF/OEF on the VHA, especially in the area of PTSD, TBI, and physical disability services.

Study Data and Methods

Most of the data presented here is from reports, testimony and data that are publicly available through VHA or other federal websites or in the health care literature. We focused on five critical components that would mark a departure from the steady state for veterans health care: 1) numbers of new veterans; 2) numbers of wounded veterans, particularly those with severe injuries; 3) proportions of new veterans with mental

health problems; 4) changes in veteran benefits; and 5) changes in new veterans' use of health care services, especially those of the VHA.

Through an unfunded project approved by the Institutional Review Boards at both NPS and VA Boston Healthcare System, we were also able to obtain counts of reservists, national guards and active duty military who were deployed since the end of 2001. These previously unpublished counts provide us with up to date estimates of the numbers of new veterans since the beginning of the OIF/OEF conflicts.

The Veteran Population

In 2001, the US veteran population was 26.1 million, the majority of whom were in their late 50s or older.⁷ Since then, the US has engaged in major military operations in Afghanistan and Iraq, deploying 1.5 million troops during these conflicts as of spring, 2007.⁸ The number of total active duty personnel remains low compared to most of the past 70 years, however, at about 1.4 million a year compared to over 12 million in World War II and almost 4 million in the late 1960s.⁹ Growth in the total number of US veterans in the past 70 years followed the nation's involvement in World War II, the Korean conflict and Vietnam (Exhibit 1).

The total number of veterans peaked in the early 1980s. Since then the total has generally declined as many older

veterans have died and the military downsized as a result of the end of the Cold War. Thus, the majority of veterans today served in the Vietnam War or earlier conflicts. Despite the deployments in Afghanistan and Iraq, the projected veteran population as of 9/2007 has decreased to 23.5 million with approximately 39% age 65 or older.⁸

The number of veterans discharged since 2002 who served in OIF/OEF was over 850,000 by April of 2008, 49% of whom were reservists or national guard.⁶ Since 2002, the total number of veterans discharged is estimated at about 1.4 million, over 6.5% of all living veterans. This total addition to the veteran population has only a marginal impact on the veteran demographics, however. For example, even if all the new veterans were 22 years of age, they would drop the average veteran age by only about two years, from 60 to about 58.

The importance of the veteran cohorts from prior conflicts is apparent from the distribution of the veteran population by age (Exhibit 2). The healthcare needs of these older veterans are those of most middle-aged and elderly Americans with complex chronic conditions - e.g., diabetes plus chronic heart failure - with additional complications from disabilities sustained during military service, including mental health disorders. These veterans will continue to comprise most of the demand on VHA funding and services in the near future until the majority of

the Korean War and Vietnam War cohorts pass through the system in about 2015.

In the last century, the number of military personnel wounded in war has been far more numerous than deaths. For example, the Congressional Budget Office reports that the number of troops wounded in action in OIF was seven times the number of deaths (as of January 2007). Table 1 details the US military deaths and casualties from principal wars since the Civil War. The table indicates an increasing ratio of wounded to dead over time. Battlefield medicine, evacuation procedures, and battle field medical support services have evolved tremendously over time leading to greater survival rates for injured troops. The greater proportion of wounded to dead for OIF/OEF can also be attributed to the use of body armor and helmets. This protective gear shields the user from bullets and shrapnel, improving overall survival rates.

Major casualties sustained in OIF/OEF can result in amputations and TBI. The number of amputees is relatively low for OIF/OEF compared to other major conflicts (Table 2), but the percentage of the wounded who had amputations (at 1.5%) is close to that for the Vietnam conflict (at 1.7%). These numbers do not distinguish loss of fingers and toes from loss of entire limbs, however.

It is extremely difficult to obtain the number of veterans suffering from TBI, in part because some cases of closed brain injury may manifest later, even after separation from the military. Nevertheless, TBI appears to account for a larger proportion of casualties among injured troops in OIF/OEF than in other wars.⁸ It is estimated that 14%-18% of the Vietnam War combat casualties (21,500 to 28,000 troops) suffered TBI, with or without another lethal wound.⁹ As a point of comparison, DoD reported a total of 5,503 TBI cases as of January, 2008 for OIF/OEF.¹⁰ However, researchers have reported much larger numbers of OIF/OEF veterans suffering from TBI, from 8,000 to almost 70,000.¹¹ These larger numbers include estimates of veterans with mild or moderate TBI, which are more difficult to diagnose than the results of severe injuries.

The vast difference in the estimates underscores the difficulty of obtaining reliable data for these injuries. In addition, there is no single International Statistical Classification of Diseases and Related Health Problems (ICD 9) code for TBI. The codes identify various types of injuries to the head distinguished, for the most part, by the section of the head injured rather than by the severity of the injury to the brain. Various organizations and researchers use subsets of the codes. Also, some estimates reported in peer reviewed journals are based on soldiers' responses to screening questions from

post-deployment surveys and not actual diagnosis made by medical personnel. Finally, many of those screened for TBI do not keep their follow up medical appointments or if they do keep the appointment may be ruled out for TBI.

Findings from the National Vietnam Veterans' Readjustment Study suggest 830,000 Vietnam veterans suffered symptoms associated with PTSD at the time of the study in 1983, about 9% of the troops serving during the era or approximately 26% of theater veterans.¹² In the case of OIF/OEF, 15.6% to 17.1% of veterans deployed to Iraq reportedly displayed symptoms of PTSD and 11.2% of veterans deployed to Afghanistan reportedly did so.¹³ These percentages suggest that perhaps as many as 77,000 to 120,000 of all active duty military who have separated from service since 2002 may have symptoms of PTSD. In total, VHA reports that almost 40,000 OIF/OEF veterans who have accessed VHA health care to date displayed symptoms of PTSD.²

Veterans Health Care

In 2001, 3.9 million veterans used VHA health care services. Approximately half of this VHA patient population was 65 years or older, about 5 years above the median age for the veteran population overall. That year's VHA medical care budget was \$20.1 billion, an 11% increase from 1999.¹⁴ During this time, the number of patients treated annually increased by more than

11% primarily due to a major restructuring of the veterans' health benefit in recognition that their medical care required more management of chronic conditions rather than acute hospitalization and its follow up care.¹⁵

VHA medical care expenditures (almost \$40 billion for fiscal year 2008)⁷ primarily represent the on-going costs to the nation of prior military engagements, not OIF/OEF. For fiscal years 2005 and 2006, VHA funding required for the health care of returning OIF/OEF troops was highlighted in requests for supplemental appropriations.^{16,17} The supplemental was \$1.8 billion in 2007 and budget authority from emergency funds for FY 2008 is almost \$3.7 billion.⁷

OIF/OEF veterans who have left active duty are now eligible for at least five years of free VHA health care.¹⁸ Of these, the Congressional Budget Office reports that well over 225,000 have sought any care from VHA, representing at most about 5% of the current VHA annual patientload of about 5 million patients.¹ This count is cumulative, however. In any one year, the number is considerable less. In 2006, for example, it was 155,000.¹⁹

The health problems of all OIF/OEF veterans who have received VHA care encompassed more than 7,990 diagnostic codes with the most common health problems being musculoskeletal (joint and back), mental, nervous system/sense organs, digestive system and "Symptoms, Signs and Ill-Defined Conditions."² This

last category is a catch all category that is commonly used for outpatient diagnosis. It consists primarily of common symptoms that do not have an immediate obvious cause.

A small proportion of the OIF/OEF patients require intensive surgical and/or rehabilitative care for severe injuries. For example, as of January 2008, there were 1,031 amputees and 5,503 patients with diagnosed TBI.²⁰ VA has given preliminary mental health diagnoses to over 100,000 OIF/OEF veterans. Of these, at least half are likely to be identified as suffering from PTSD.² These chronic conditions can be costly to treat over a number of years. However, a large proportion of the more than 225,000 patients who have used VA services may simply be availing themselves of their benefit that allows them free VHA services for the first five years post-discharge. There is no method of predicting if they will continue to be eligible for VHA services since future policies are uncertain but one can assume that, at a minimum, the current legislation and policies will remain in effect.²¹

The utilization and costs of VHA health care for the OIF/OEF patients have to be estimated in both short- and long-run time frames. In the short run, some OIF/OEF veterans require more intense acute or rehabilitative care. In the long run, their care will require primarily the same types of services currently received by veterans of other conflicts.

Expenditures for Signature Conditions of OIF/OEF

In the short run, national policy changes concerning treatment for TBI, amputations, and PTSD are requiring major investments. VHA has considerable experience treating amputees, TBI and PTSD. For example, between 1998 and 2000, VHA discharged 3,006 inpatients with TBI diagnoses.²² Evaluations of their VHA costs of care found ranges for the mild and moderate cases, primarily skull fractures, from \$17,000 to \$45,000, depending on whether the treatment center was in a teaching or non-teaching facility, with or without a dedicated TBI unit. In general, teaching facilities were more costly, but dedicated units were less. Severe cases of TBI from OIF/OEF should cost considerably more than this not only because of inflation since the late 1990s, but because these patients exhibit more symptoms of polytrauma, indicating more extensive physical damage and greater mental or emotional impacts.²³ Further, extensive care for TBI patients can be required for several years at least as health problems stemming from the injuries persist.

VHA has added four Polytrauma Rehabilitation Centers (in Tampa, Florida; Richmond, Virginia; Minneapolis, Minnesota; and, Palo Alto, California) and 17 Polytrauma Network Sites. The latter have specific amputation, rehabilitation, and mental health expertise including: Comprehensive Physical Medicine and Rehabilitation Service; accredited Inpatient Rehabilitation

Unit; accredited Prosthetic/Orthotic Lab; certified prosthetist on staff; Surgical expertise in the area of amputation care and polytrauma; Specialized PTSD programming; Presence of Driver's Training Program; Access to tele-rehabilitation technology

While this policy places interdisciplinary expertise within each of the VHA's 21 geographic regions, many veterans will find the cost of travel to these centers to be prohibitive.

Improving the standard of care at the other 150 of so medical centers and the more than 800 community outpatient clinics will help some disabled veterans living far from the special polytrauma programs. In the past, veterans have relocated to be closer to the VHA health care they needed. Some OIF/OEF veterans may also resort to this solution. Establishing additional clinics or contracting with local providers are other ways to make services available, but there is a limit. The requisite skills do not exist in all towns and in some states the veterans requiring those services are too sparsely located to assure the providers of a livelihood.

The polytrauma investment was funded through a supplemental appropriation of about \$1.8 billion in 2005-2006. That appropriation was also intended to shorten veterans' waiting times to see VHA providers. One reason for this expansion of services is the potential for higher than average suicide rates

among returning veterans,²⁴ which may be reduced if the veterans can access mental health care in a more timely way.

Treatment for serious mental illness, such as PTSD, can vary from year to year for a given patient, but often requires multiple years of care. Although no cost information is currently available for mental health services for OIF/OEF veterans, in 1999, the average total cost of care within VHA was \$8,284 for patients with PTSD, about 70% above the overall average that year.²⁵ Much of that additional cost is shown to be associated with the patients' physical ailments, however. For example, mental health disorders are implicated in long-run physical problems such as cardiac disease.²⁶ By delivering care sooner to OIF/OEF veterans, the VHA might be able to reduce the development of co-morbid conditions.

With respect to amputations, the mission of VHA and DoD collaboration is "to rehab our military amputee patients to the highest possible level of physical function so that the loss of a limb does not prevent them from returning to their military profession."²⁷ The technology now available to accomplish this mission is much more costly than prosthetic technology before these conflicts because the use of microprocessors gives a higher level of functioning. For example, the "C-leg", a titanium leg with a microprocessor in the knee, cost about \$50,000 in 2003, without including the costs of related

rehabilitation care.²⁸ Because VHA allows all veteran amputees to request and receive any prosthetic device, the impact of this DoD policy on the VHA budget is unknown. The long-run costs are currently being evaluated by VHA researchers to evaluate costs over 5-, 10-, 20-year and lifetime time frames compared to two alternative types of prosthetics.²⁹

In the long run, care for the OIF/OEF veterans will require the same types of services currently received by veterans of other conflicts such as care for complex chronic conditions, diabetes, high blood pressure, pulmonary disease, heart failure, cancer. Two differences arising from the conflicts may lead these veterans to rely more on publicly-funded programs such as VA and Medicare for this future care. First, greater burdens of disability may limit the veterans' return to employment and ability to access private sector health insurance. Second, receiving care in VA in the early years after separation from the military may lead them to be more accustomed to this source of care compared to earlier cohorts.

The current veteran population is estimated at about 25 million with more than 5 million accessing VHA health care in a given year. The veteran population is projected to steadily decrease to under 15 million by 2033. There are no projections as to who will be accessing VHA health care at that time, however.

Conclusions

In the short term, the higher-than-expected demand for VHA services from returning OIF/OEF military personnel requires additional resources for amputees, traumatic brain injury centers and psychiatric care. In addition, VHA provides care (primarily in outpatient clinics) for relatively healthy veterans who seek health care within five years after discharge from the service. To keep these demands from competing with and displacing those of older veterans, the nation is investing in resources for treatment of blast injuries, amputations, and PTSD, recognizing that these commitments will have to be sustained as this veteran cohort ages.

The cost to the nation of health care for OIF/OEF veterans depends on 4 factors: 1) How many additional veterans were created because of the conflicts, above and beyond the flow of discharges that would have existed in the absence of the wars; 2) How many additional veterans use VHA services compared to the number who would have been expected to use VHA; 3) The intensity of their use of health care; and 4) The pattern or cycle of care for their condition.

First, OIF/OEF has probably increased the number of newly separated veterans by calling up National Guard and Reservists. The flow of discharges from the Active Duty forces has remained fairly constant since 2002, but over half of all separations in

the OIF/OEF cohort were Guards and Reservists. Of course, some members of the Guard and the Reserves were already veterans, so the exact number of new veterans requires DoD estimation. If half of the 600,000 to 700,000 separations were members of the Guard or the Reserves² and half of them had not been active military before OIF/OEF, then the number of new veterans attributable to OIF/OEF might be about 150,000 veterans, an increase of less than 1% of the total veteran population.

Second, VHA would have expected some number of newly discharged veterans to have sought care from its medical centers and outpatient clinics. In any of the most current years, about 20% of veterans are younger than 50, of whom about 15% (1 million/6.8 million) use VHA in any year. Since the most recent discharges fall primarily into the younger age brackets, their expected use of VHA should have been expected to be non-zero, but less than 15%. This predicted utilization implies that the increased proportion of these new veterans with any VHA use was at most 18 percentage points - from 15% (or less) to the 33% reported. This increased proportion translates into at least 120,000 additional veterans demanding VHA care (20% of 600,000 OIF/OEF veterans as of the end of 2006). This number is less than the additional Guards and Reservists who qualified for VHA care through OIF/OEF, however.

What is the intensity of services that OIF/OEF veterans receive from VHA? The average expenditure per patient in the past 3 years has been just under \$6,000 across all VHA patients, 95% of whom are veterans of earlier wars. VHA reports that the average expenditure for OIF/OEF veterans using VHA services is less than \$3,000 per year. This lower average suggests a much lower intensity of services for most OIF/OEF patients.

The most critically injured OIF/OEF veterans (those with severe TBI, amputations, severe PTSD) require much more than this \$3,000 average, at least initially. The numbers of these more costly patients is also unknown. As of May 30, 2007, there were 12,279 servicemen and women who were wounded in action and did not return to duty within 72 hours. This number is an upper bound on the number of critically injured OIF/OEF veterans as of that date. In addition, estimates put 11-17% of all other discharges (77,000-120,000) as potentially diagnosed with PTSD. These two groups lead to an upper estimate of about 90,000-133,000 veterans with war-related health care needs that are well about the average.

In the long run, many of the less critically ill OIF/OEF veterans who have been VHA patients at some time in 2002-2007 will not continue to use VHA. Most of these veterans are still young and relatively healthy. They will get jobs, have health

insurance coverage and be relatively indistinguishable from other Americans in terms of their health care needs.

Thus, the pressing needs of newly discharged veterans require immediate attention, especially in the area of TBI, PTSD, and physical disability services, but nationally the needs of the aging Korean and Vietnam War cohorts remain far greater in terms of the number of patients and the average cost of their care. The major demand on VHA services continues to be from the aging veterans. It is hard to predict the demand for VA services from this cohort since it is unclear if the veterans are eligible for care from other programs and if they will choose VA care.

Eventually, the aging OIF/OEF cohort will also require services for more chronic conditions. Whether they turn to VHA will depend in part on the nature of their disabilities and their economic situation. Like the majority of veterans today, they may choose other sources of care. Decisions about VA capacity, quality, eligibility, costs, and co-payments will be major drivers of future demand for VA health care. These factors may be more important than combat experience in determining the amount of care OIF/OEF veterans seek from VA.

Current attempts to estimate the additional care for the OIF/OEF cohort over this longer run overstate the amounts because they do not recognize the incremental nature of these

demands. In addition, estimates must take into account that the heavy resource use for those with war-related conditions will decline, on average, until the cohort ages and develops more chronic medical conditions.

Finally, the demands for additional services are spread across the country and not necessarily concentrated near VHA medical centers or clinics. In the past, the veteran population has adjusted around existing VHA facilities. Relocation is a reality facing many returning veterans and will need to be addressed.

¹ Statement of Matthew S. Goldberg, Deputy Assistant Director for national Security, Congressional Budget Office, *Projecting the cost to Care for Veterans of U.S. Military Operations in Iraq and Afghanistan*, before the Committee on Veterans' Affairs, U.S. House of Representatives (October 17, 2007).

² "Report Says Army Hasn't Met Goals for Injured Soldiers," NY Times, September 27, 2007.

³ "Editorial: The wounds outlast the war," NY Times, July 26, 2007; Kaplan, A.

⁴ "Hidden Combat Wounds: Extensive, Deadly, Costly," *Psychiatric Times*, XXV:1

⁵ "Analysis of VA Health Care Utilization Among US Southwest Asian War Veterans" VHA Office of Public Health and Environmental Hazards, November 2006, at www.websitetoolbox.com/tool/post/1nightingale/vpost?id=1637655

⁶ Government Accounting Office, *VA and Defense Health Care: More Information Needed to Determine if VA Can Meet an Increase in Demand for Post-Traumatic Stress Disorder*, 9-20-2004 Available at www.gao.gov/new.items/d041069.pdf, accessed October 22, 2007. Government Account Office.

⁷ The Budget for Fiscal Year 2009, Department of Veterans Affairs, accessed 4-28-2008

⁸ <http://www1.va.gov/vetdata/docs/> accessed 4-22-2008

⁹ Unpublished data, Defense Manpower Data Center (DMDC), Statistical Information Analysis Division, April 21, 2008.

¹⁰ Statement of Matthew S. Goldberg, Deputy Assistant Director for national Security, Congressional Budget Office, *Projecting the cost to Care for Veterans of U.S. Military Operations in Iraq and Afghanistan*, before the Committee on Veterans' Affairs, U.S. House of Representatives (October 17, 2007), p. 5.

⁸ Traumatic Brain Injury in the War Zone, Susan Okie, M.D. The New England Journal of Medicine volume 352:2043-2047 May 19, 2005. Number 20

⁹ Ronald Bellamy, former editor of *Tetbooks of Military Medicine*, Office of the Surgeon General of the U.S. Army, cited in Okie.

¹⁰ Congressional Research Service, Report for Congress "United States Military Casualty Statistics: Operation Iraqi Freedom and Operation Enduring Freedom," RS22452. March 18, 2008.

¹¹ Okie, *ibid.* reports 22% of wounded soldiers as a rough estimate of the numbers with TBI. This would put the absolute number at about 8,000. In a report titled "Mapping the Landscape of Deployment Related Adjustment and Mental Disorders. A Meeting Summary of a Working Group to Inform Research", convened by the Department of Veterans Affairs Office of Research and Development, National Institute of Mental Health, and the United States Army Medical research and Material Command, a 40% of TBI rates in two samples or wounded service

members and a 10-15% in returning service members who had not been wounded is reported. This would translate to absolute numbers of approximately 14,500 for wounded veterans and 68,000 to 100,000 for returning veterans.

¹² See Jennifer L. Price, "Findings from the National Vietnam Veterans' Readjustment Study, at

www.ncptsd.va.gov/ncmain/ncdocs/fact_shts/fs_nvvs.html?opm=1&rr=rr45&srt=d&chorr=true

¹³ "Combat Duty in Iraq and Afghanistan, Mental Health Problems, and Barriers to Care", Charles W. Hoge, Castro, Messer, McGurk, Cotting, and Koffman *New England Journal of Medicine* 2004;351:13-22.

¹⁴ Department of Veterans Affairs, Fiscal year 2001 Performance Report, Washington, D.C.: Government Printing Office, p. 20.

¹⁵ Perlin JB, Kolodner RM, Roswell RH. The Veterans Health Administration: Quality, value, accountability and information as transforming strategies for patient-centered care. *Am J Management Care*. 2004;10(part 2):828-836.

¹⁶ Statement of The Honorable R. James Nicholson, Secretary, Department of Veterans Affairs, Before The House Veterans Affairs Committee, June 30, 2005,

www.va.gov/OCA/testimony/hvac/05063000.asp

¹⁷ Government Accounting Office, VA Health Care: Budget Formulation and Reporting on Budget Execution Need Improvement, September 2006, GAO-06-958.

¹⁸ All OIF/OEF veterans, by virtue of being combat veterans, are eligible for VHA health care without co-payment for 5 years following separation from the military. The number includes both active duty military and members of the Reserves and National Guard. The roster of war veterans comes from Defense Manpower and Data Center (DMDC) and is updated by DMDC using direct reports from service branches of deployed troops.

¹⁹ Department of Veterans Affairs, Fiscal Year 2008 budget Estimate, Executive Summary, page 1-8, at www.va.gov/budget/summary/volumeImedicalPrograms.pdf

²⁰ TBI and numerous other conditions such as eye or ear injuries are usually diagnosed under the Diseases of Nervous System/Sense Organs category. While it is difficult to get an exact count of mild and moderate TBI cases, the VHA Office of Public Health and Environmental Hazards, has reported almost 70,000 cases of disease of the nervous system (footnote 2 above). This number serves as an upper bound for TBI.

²¹ The National Defense Authorization Act (NDAA) of Fiscal Year 2008 underscores the difficulty in predicting costs as a result of changing policy. The NDAA extended the period of enhanced enrollment opportunity for health care eligibility provided for

veterans who served in a theater of combat from 2 years to 5 years following discharge. When a combat veteran's five year eligibility passes, the veteran may qualify for a priority group and may be charged a co-payment based on income and net worth. The VHA has categorized 8 priority groups for medical enrollment. Generally, veterans in need of care for a service connected disability, veterans who have a compensable service connected condition, veterans whose discharge was for a compensable disability incurred in the line of duty, veterans who are POWs, veterans awarded the Purple Heart, veterans who are catastrophically disabled, veterans with disorders resulting from exposure to hazardous agents, and veterans whose income is below a certain threshold are regarded as high priority and automatically enrolled in Priority Groups 1-6. Veterans with non-service connected conditions and with incomes and net worth above VA established thresholds are enrolled in Priority Groups 7 or 8 and pay co-payments for non-service connected conditions.

²² Vogel B, S Wu, K Reid, Predicting Traumatic Brain Injury Treatment Costs within the VA: The Roles of Patient and Facility Characteristics, Abstract 625, 2003, AcademyHealth.

²³ Lew, HL, JH Poole, SB Guillory, RM Salerno, G Leskin, B Sigford, Persistent problems after traumatic brain injury: The need for long-term follow-up and coordinated care, 2006, JRRD, 43(2):vii-x.

²⁴ Mental Health Advisory Team (MHAT) IV Operation Iraqi Freedom 05-07, Final Report 17 November 2006 , Office of the Surgeon General Multinational Force-Iraq and Office of the Surgeon General United States Army Medical Command

²⁵ Yu W, Ravelo A, Wagner TH, Phibbs CS, Bhandari A, Chen S, Barnett PG, Prevalence and Costs of Chronic Conditions in the VA health Care System, *MCCR* 2003 60: 146S-167S.

²⁶ Kubzansky LD, Karestan CK, Spiro A, Vokonas PS, Sparrow D, Prospective Study of Posttraumatic Stress disorder symptoms and Coronary Heart Disease in the Normative Aging Study, *Archives of General Psychiatry*, January 2007, 64(1):109-116.

²⁷ Testimony of Charles Scoville, Program Manager for the US Army Amputee Patient Care Program, before the House of Representatives Committee on Veterans' Affairs, July 22, 2004, Serial No. 108-50, p. 28.

²⁸ Aisen M, Prosthetics Conference Furthers VA-DoD Research Ties, *VA Research Currents*, 2003, 3(12):1

²⁹ Impact of the DoD Paradigm Shift on VA Amputee Prosthetic Care, accessed 6-5-07 at

www.hsrd.research.va.gov/research/abstracts.cfm?Project_ID=2141696777&UnderReview=no