

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Environmental Studies Undergraduate Student
Theses

Environmental Studies Program

Fall 2015

Poor Air Quality Affects Those Who Have Served in Afghanistan

Kaylee Wheeler

University of Nebraska Lincoln

Follow this and additional works at: <https://digitalcommons.unl.edu/envstudtheses>

Disclaimer: The following thesis was produced in the Environmental Studies Program as a student senior capstone project.

Wheeler, Kaylee, "Poor Air Quality Affects Those Who Have Served in Afghanistan" (2015). *Environmental Studies Undergraduate Student Theses*. 171.

<https://digitalcommons.unl.edu/envstudtheses/171>

This Article is brought to you for free and open access by the Environmental Studies Program at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Environmental Studies Undergraduate Student Theses by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Poor Air Quality Affects Those Who Have Served in Afghanistan

By
Kaylee Wheeler

AN UNDERGRADUATE THESIS

Presented to the Faculty of
The Environmental Studies Program at the University of Nebraska-Lincoln
In Partial Fulfillment of Requirements
For the Degree of Bachelor of Science

Major: Environmental Studies
With the Emphasis of: Natural Resources

Under the Supervision of Dr. Kent LaComb

Lincoln, Nebraska

December 7, 2015

Poor Air Quality Affects Those Who Have Served in Afghanistan

Kaylee Wheeler, B.S.

University of Nebraska May 2016

Advisor: Dr. Kent LaCombe

Abstract

The United States has been in the war against terrorism for the past 14 years in Afghanistan. Afghanistan is a country torn by war for hundreds of years which has impacted the landscape and the environment. The economy of Afghanistan has suffered as a result and the country is classified as an underdeveloped country, but the economy is gaining on a slow increase. There is still little enforcement on the environmental regulations resulting in thousands of Afghani deaths every year from poor air quality. The United States has contributed to the poor air quality by using open burn pits to dispose of trash and fecal matter. As a result, service members are returning home with new respiratory conditions that they did not have prior to deployment to Afghanistan. The DOD and the VA have done little in supporting the returning soldiers by not accepting that the poor air quality has made a negative impact on their respiratory system. There have been several studies done in support of the effects of breathing the toxics in Afghanistan but because of the insignificant difference between deployed personnel and non-deployed personnel respiratory symptoms, more precise studies will have to be conducted. Resources will need to be more readily available for the returning soldiers so we can avoid the problems we ran into when acknowledging and treating Gulf war-era soldiers exposed to Agent Orange.

PREFACE (ACKNOWLEDGEMENTS)

Thanks to the men and women who have worn the uniform of their country, the University of Nebraska-Lincoln, and to everyone who has supported me in this thesis and my transition back home from my deployment to Afghanistan in 2013.

Table of Contents:

Introduction	1
U.S. Pollution Invasion	1
Afghanistan's Demographics	2
Afghanistan Industry	2
Lung Function	2
U.S. Regulation	3
Islamic Republic Environmental Law	4
What's Restricting?	4
What does this mean?	4
Current Strategies	
DOD Involvement	5
VA involvement	8
VA History	9
Code of Federal Regulations Title 38	9
Possible Solutions	9
Table 1	7
Table 2	7
Figure 1	8

Air Quality in Afghanistan

Throughout human history, people have had disputes; one doesn't like how the other does things or believes that they are simply "better" and there-for they deserve more. Too frequently, the end result is war. For this paper, war will be defined as a military action and destruction of the land. This force has for the majority, proven its effectiveness though it's had a major negative effect on the surrounding environment. The land that once supported a civilization is frequently rendered useless, the air becomes polluted and not only effects the remaining local people but the soldiers deployed there by breathing in that pollution. Bombs and artillery have created vacant area's with little vegetation, causing erosion and pollute the water, dust is thrown in the air and the burning of material releases ash, CO₂ and other chemicals into the air, polluting it to the point of being carcinogenic. As soldiers come home they face a new battle of dealing with the negative affects deployment has on their bodies and minds and getting the support they need.

The wars on Terrorism that the United States and so many other countries that have declared have created quiet the environmental impact on not only the local people of Afghanistan but the returning soldiers. Our soldiers, airmen, sailors, and marines are returning from war with at least a 10% disability because of the air quality in Afghanistan. Much of it is from dust, but everything on base is burned including fecal matter, and is released into the air. The military has learned over the years from past wars such as the Vietnam War, with Agent Orange being the biggest one of them all, is that we will not know what the actual effects of air quality are until many years after the troops have returned home. This 10% disability is to protect returning soldiers of future respiratory problems, so they will not have to pay out of pocket for everything from the government leadership putting them through harsh environmental conditions.

To define environment for this paper will be used in terms of air quality, erosion, and water quality. The actual properties that make an environment, not necessarily the environment that people have created but what was already there before people. To be more specific, how war has had an effect on the air quality, since air quality does not only effect the local people of the conflict but also the troops that are sent to physically use force against that population. We will discuss not only how poor air quality has negative effects on the military personnel but how little support military personnel have had from the U.S. government in treating those negative effects. We will also discuss some possible solutions for the U.S. to better serve the soldiers that return home with health problems that have arisen from the exposure to poor air quality.

US pollution invasion:

Over the course of several hundred years Afghanistan has been impacted by some sort of war, whether it was civil or the invasion by another country. The U.S. began playing a part in Afghanistan's history when Russia invaded during the height of the Soviet Union in 1979. Once the Soviets retreated after signing a peace treaty in 1988, civil war within Afghanistan continued creating the Taliban. In 2001 Taliban followers crashed two planes into the World Trade Center resulting in the U.S invading and declaring war on terrorism². (BBC News; Afghanistan profile - Timeline, 2015). As of January 2015, the Afghan National Defense and Security Forces (ANDSF) took over for their countries security and NATO and the U.S. are there for support.

Since 2001 2,238 U.S. military personnel have died in combat and over 20,000 have been wounded in action 25(U.S. Department of State, 2015).

Afghanistan's demographics:

Afghanistan is a landlocked country with its longest border being the northern part of Pakistan and bordering the eastern side of Iran. The Hindu Kush mountain range makes up most of the landscape; Afghanistan has wet winters and dry summers. During the summer, there is enough of a temperature gradient from the tops of the mountains to the basins that creates enough wind for frequent wind storms that generate dust storms. With poor land management, soil erosion has increased adding to the intensity of the dust storms like the United States fell victim too, in the mid-west during the 1930's.

Afghan industry:

The industry activities in Afghanistan have played a major role in the poor air quality. Oil refineries filter very little in the refining process. The refined oil is then burned in brick factories and domestic heaters releasing a great deal of sulfur and carbon dioxides. The United Nations Environmental Program (UNEP) did a test in 2002 in several urban areas finding poor technology usage which created large puffs of black smoke being released into the air and drifting to nearby local populations. Many of the workers wore little protective gear and suffered health problems because of the smoke. The UNEP estimated in 2002 there were about 500,000 cars, 30,000 buses, and 50,000 trucks all using a low grade diesel. Air quality worsens in the fall and winter with the increase of ovens and stoves using toxic emitting material as fuel since firewood is scarce⁷ (Department of Defense Environmental Policy in Afghanistan during Operation Enduring Freedom; Afghanistan's Air Quality; Steven Loerscher, August 31, 2008). Afghanistan has seen a slow increase in economic growth in the past five years, mainly due to construction and agricultural sectors. ⁴(Heritage Organization; 2015 Index of Economic Freedom; Afghanistan). Today the exchange rate between the U.S. Dollar and the Afghani is every 1 USD is equal to 66.59 AFN, as of the end of November 2015 ⁵(Da Afghanistan Bank, November 30, 2015). The buying power in 2014 on average for Afghani's per capital is \$1,900 USD per 123,461.98 AFN ⁶(Central Intelligence Agency; The World Factbook; Field Listing:: GDP – Per Capita (PPP); Country Comparison to the World) though, Afghanistan is considered an underdeveloped country mostly because of the invasions by Russia and then with the United States who declared war on Terrorism.

Lung function:

Toxins in the air wreak havoc on the respiratory system which can cause health problems as we get older. Our lungs allow oxygen to enter the blood stream and take out carbon dioxide. Our bodies have several different tactics for keeping impurities out of the lungs that could cause irritation; the nose, acts as a filter keeping large particles out of the air ways. From the nose and down the breathing tubes are lined with a layer of mucus that with the help of little hairs called cilia, move smaller particles down through the throat. Lastly if the lungs are irritated the muscles will tighten trying to keep the irritant out. When too much of a small irritant is breathed in, it can

overwhelm the body's defenses which could cause problems and make it difficult to breathe⁸ (American Thoracic Society; Anatomy and Function of the Normal Lung).

Particulate Matter (PM) are particles found in the air that are small enough for us to breathe (*e.g. dust, smoke, and/or liquid droplets*). The smaller the particle size the more effect they have on the lungs; 2.5 micrometers in diameter or smaller⁹ (EPA; Particulate Matter, Health). These smaller particles, when inhaled, cause the lungs to tighten which can have major health effects such as nonfatal heart attacks, irregular heartbeat, increase asthma, and increase in respiratory symptoms such as coughing/ difficulty breathing, and bronchitis (Figure 1). Although children and older adults are most affected by these symptoms people who are considered healthy but have been exposed to polluted air for an extended period of time can develop these symptoms as well, such as the service members serving in the Afghanistan.

US regulations:

Coal fired plants emit about two-thirds of the U.S. emissions of sulfur dioxide and about one-third of nitrogen oxides¹⁰ (EPA; Air Enforcement, July 8, 2015).

The Clean Air Act was first set in place in 1970 by the Environmental Protection Agency (EPA) to regulate emissions of hazardous air pollutants that affect the public health and welfare. There was beginning to be a major hazard of acid rain in the eastern states and up into Canada from the coal fired plants. Acid rain occurs in precipitation with high levels of nitric and sulfuric acid, which is toxic to plants and animals in an ecosystem¹¹ (National Geographic; Acid Rain). The Clean Air Act has been revised several times because major polluters failed to meet deadlines in decreasing emissions. When the government established the cap and trade policy, it limited the amount of carbon dioxide that can be emitted each year. Companies that have a large emission rate are given permits for the total amount of pollution they are allowed for that year. If a company wants to or knows it will be emitting more than their permit allows, they can buy unused emissions allowance from another company that will not be emitting the amount of pollutants that their permit allows. This gives companies an incentive to invest in cleaner technology because then they will be getting money from selling their emissions and spending less on permits¹² (Environmental Defense Fund; How cap and trade works).

Islamic Republic of Afghanistan Environmental Law:

¹³In Afghanistan the Islamic Republic of Afghanistan Environment Law or more known as the National Environmental Protection Agency (NEPA) of Afghanistan, published a series of laws on January 25, 2007 regarding to the environment, sustainability, and the effects to public health. According to this the Islamic Republic of Afghanistan have the duties to protecting the welfare of the people, to adopt and implement programs to maintain natural resources, rehabilitating the environment, preventing and controlling pollution, and informing the public that they can help make decisions affecting human health, the environment, and natural resources. The publication goes on to state that the company will be required to obtain a permit in regards to the possible or current environmental impact. This permit will not be issued until the immediate affected public have been properly informed and given a time to have a

community hearing to voice their opinions. Once granted the permit the company will need to renew ever five years. If for any reason the permit holder breaches the conditions of the permit, fail to comply, or state false or misleading information they will be sentenced to a mid-term imprisonment and/or a cash fine equivalent to the damage caused.

What's Restricting?

Since a military mission comes first, conducting studies for health surveillance and exposure assessment are difficult in a war zone because it is not military mission essential¹⁴(Review of the Department of Defense Enhanced Particulate Matter Surveillance Program Report, 2015). This limits personnel and resources to conduct studies, along with the extreme temperatures and lack of electricity in collecting samples. Also, the studies that have been done are not concluding that there is a significant difference between those exposed to airborne hazards and burn pits from those not exposed. Even though there may be a connection between airborne hazards and respiratory problems because, of the lack of information and convincing information the VA and the Department of Defense (DOD) are hesitant in reacting. Traditionally the DOD has not been subject to any significant environmental laws, which allows the DOD to use as much or as little of the land as they want with as little or as much of environmental protection as they deem necessary^{1, 3} (Department of Defense Environmental Policy in Afghanistan During Operation Enduring Freedom by Steven Glade Loertscher, August 31, 2008).

During the Cold War, the lack of significant environmental laws gave DoD the discretion to engage in as much (or as little) environmental protection as it wanted to. Since most United States environmental laws, regulations, and executive orders don't apply to overseas contingency operations, DoD retains a significant amount of discretion during the War on Terror.

DOD environmental policy in Afghanistan During Operation Enduring Freedom; Steven Glade Loertscher; August 2008

What does this mean?

With all of this information how does it apply to military personnel? Even though soldiers may not be in direct, continuous contact with these pollutants like the locals are, they are in the area of pollution for an extended period of time. For instance, during my deployment our mission involved traveling around to different camps and building various buildings to hold the drawback of troops. During that time, we were not in direct contact with the open burn pits however we were exposed to them and the many dust storms that occurred. The extended period of time of exposure may not cause dramatic health problems as it does for the Afghans there are approximately 3,000 deaths per year from poor quality conditions, any exposure still puts soldiers at risk of having health problems after their return home¹⁵ (Phys.org; Mustafa Kazemi; In Kabul, air pollution a bigger killer than war; June 9, 2011). The concern is similar to what veterans experienced with Agent Orange during the Gulf War, were at the time of the exposure the thought of health side effects were not a concern to anyone until several years later after the soldiers had been home. According to Fred Milano in his 2000 article *Gulf War*

Syndrome: The 'Agent Orange' of the Nineties in the International Social Science Review Vol. 75, only after the soldiers came home and health problems started occurring did things start to be questioned. Veterans and their families were voicing their opinions for the government to conduct a major epidemiological study that would provide a picture on the health problems of Gulf War veterans. The government continued to dismiss the growing issue, simply because a large portion of those who were enlisted were considered to be lower class and therefore expendable. The government acknowledging that they had put troops in a biological environment would down grade the fact that they had a convincing military victory, a ground campaign only lasting a 100 hours with very few casualties¹⁶.

Today veterans are returning home with respiratory problems that they did not have prior to being deployed. These respiratory problems are harder to pinpoint the source of cause because of how many things that are in the air. Since air is not confined to a certain area that could cause respiratory problems. Scientist have recorded and documented the air quality conditions in the Middle East concluding that air quality from the non-regulated, poor environment condition factory production, and the poor land management from the disturbance of many wars has made the Middle East one of poorest air quality areas in the world. We also know that fine particulate matter that is less than 2.5 micrometers can cause irritation to the respiratory system even if you do not normally have respiratory problems. Even with this great and wonderful knowledge those who can do something about it are those with money aka the government but that does not mean they will acknowledge the problem, as we have seen in Operation Desert Storm, Vietnam, and World War II. It is much easier and cheaper for them to dismiss the issue as something else such as they did with Post- Traumatic Stress Disorder (PTSD). Another road block is that this current war has been going on since 2001, 14 years in the making of respiratory problems especially for those who have done several tours to the Middle East.

Current Strategies:

DOD Involvement:

In May 2012 Senator Ron Wyden of Oregon wrote a letter to Secretary of Defense Leon Panetta asking that the Department of Defense (DOD) to conduct studies on the air born hazards and make an effort to minimize the soldiers exposure and take steps in providing assistance to those who do become ill from these toxins¹⁷ (R. Wyden, personal communication, May 17, 2012). In late 2010 the GAO (Government Accountability Office) created a report on open pit burning and how and what the DOD and the VA has done and should do. Much of what hasn't been done by the DOD and VA is the lack of understanding on what open pit burning releases and its effects on troops. The report stated that CENTCOM (United States Central Command) had estimated in August of 2010 that there were 251 burn pits in Afghanistan and that the DOD had installed 20 solid waste incinerators in Afghanistan. GAO had pointed out that CENTCOM issued burn pit guidance in 2009, however sampling and monitoring of burn pit emissions have not been conducted as stated in the regulation¹⁸ (Trimble, D. 2010). In 2010 the DOD prohibited open air burn pits and required implementation of alternative disposal methods. There are few

requirements that require the DOD to protect human health because U.S. environmental laws do not apply to outside of U.S. territory¹⁹ (Michael, R. 2015). Michael Riess stated in Villanova Environmental Law Journal, Vol. 23, Iss. 1 [2012], Art. 5 *Actually, We Did Start the Fire, and It Keeps on Burning: The Environmental Health Effects of Military Burn Pits in Afghanistan and Iraq*:

"The health effects from burning waste are so pervasive and detrimental that some medical experts dub burn pits the "Agent Orange" of our generation.¹⁰ Official United States government reports, on the other hand, argue there is insufficient evidence to prove military burn pits pose any significant long-term health effects on soldiers."

The VA did a study in June 2015 on airborne and open burn pit hazards and the effects they have on the soldiers in Iraq and Afghanistan. They found that just from dust storms soldiers returning home had much more difficulty running or walking just one mile than those whom were not exposed to dust storms as shown in Table 1. Those whom had reported being exposed to burn pits had only shown a 1% increase in asthma compared to those who were not exposed, however there is about a 5% increase in those exposed of having chronic bronchitis (Table 2). There is also about a 5 % increase in lung diseases or other conditions that are not already stated in exposed than not exposed (Table 2). Exposed personnel had reported about a 4% decrease of allergies than those who were not exposed (Table 2). The VA study breaks down their findings into exposed and involved in burn pit duties, exposed but not involved in burn pit duties, and not exposed, however, table 1 and 2 for our purpose are compared from either exposed directly and non-directly to burn pits and dust storm versus not exposed. The VA had 28,426 participants ranging from all branches of the U.S. service including Public Health Services, National Guard and Reserve, ranging in ages from less than 30 to over 55 years, and including all ranks with enlisted being at about 83%. Male and female with about 89% more male than female and all ethnicities with white being the most at 86%. The VA concludes that the study does not imply that exposure to burn pits and dust storms are the causes of the illnesses reported. This could be a main reason why there is much resistance from the government in accepting and treating these illnesses as if the soldier's exposure to burn pits and dust storms are not the root cause of these illnesses.

Table 1:

Functional Limitations by Reported Dust Storm Exposure Status		
	Exposed	Not Exposed
Function:		
Run or Jog one mile		
Not Difficult	11.2%	22%
Difficult	88.8%	78%
Walk one Mile		
Not Difficult	36.6%	52.2%
Difficult	63.4%	47.8%

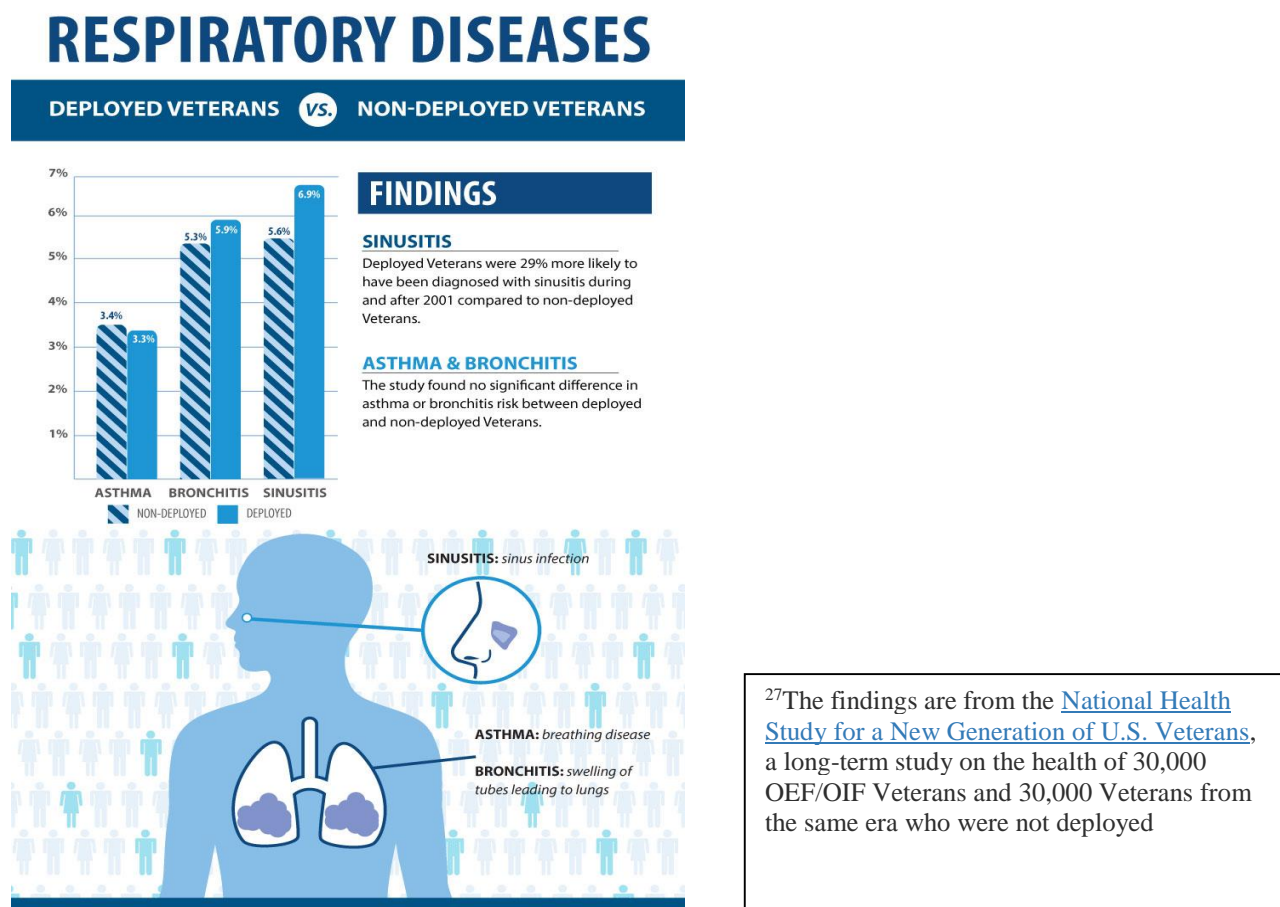
²⁴Total persons: 28,426 (Veterans Health Administration Office of Public Health, 2015).

Table 2:

Reported Provider-Diagnosed Respiratory conditions by Reported Burn Pit Exposure Status		
	Exposed	Not Exposed
Respiratory condition:		
Allergies		
Yes	41.2%	45.1%
No	58.8%	54.9%
Asthma		
Yes	15.2%	14.3%
No	84.8%	85.7%
Chronic Bronchitis		
Yes	13.5%	8.8%
No	86.5%	91.2%
Lung diseases or other conditions		
Yes	9.9%	5.5%
No	90.1%	94.5%

²⁴Total persons: 28,426 (Veterans Health Administration Office of Public Health, 2015)

Figure 1:



VA Involvement:

The Veterans Affairs (VA) as most people have heard through the media has a history of under serving veterans. Which seem a bit odd since 41% of VA employees are veterans as of the fiscal year 2013²⁰ (Source: U.S. Office of Personnel Management, Employment of Veterans in the Federal Executive Branch Fiscal Year 2013.; Non-Seasonal Full-time Permanent Veteran New Hires in the Federal Executive Branch: Top 10 Agencies Fiscal Year 2013; Department of Veterans Affairs Statistics at a Glance; ²⁰(Department of Veterans Affairs Statistics at a Glance, 2014). To continue to complicate things a bit more, it took years for the government to acknowledge and act upon the health effects of Agent Orange but once they did that's what the VA focused on. Those folks who were served in that time frame are now in their 50's, 60's and older and so the VA also have to focus on the aging population health problems such as falls and heart problems. Those who are and have served in Operation Iraq Freedom and Operation Enduring Freedom (OIF/OEF) are 10, 20, 30 years younger and are not concern about falling and breaking a hip. For me when I go to the VA for a yearly physical I get asked if I have fallen within the past 30 days and I am only 23 years old, if I fall it's because I wasn't paying attention

to the unevenness of the ground. The majority of OEF/OIF/OND soldiers do not need Life Alert, they need a college education. There are several VA government funded education funding for veterans such as the GI Bill but if your health problems that originate from your time in service interfere it makes it a tad bit difficult to learn anything in a classroom.

About VA history:

The Department of Veteran Affairs (VA) is the oldest system in serving veterans in the world starting in 1636 with the Pilgrims of Plymouth Colony. The Pilgrims were at war with the Peugeot Indians and passed a law stating that disabled veterans would be supported by the colony. In 1776 Continental Congress provided pensions to the disabled soldiers. In the 19th Century federal government created the first domiciliary and medical facility for veterans with the expanding pensions to widows and dependents. Entering World War 1, Congress established veteran benefits including; disability compensation, insurance for service personnel and veterans, and vocational rehabilitation. After World War 1 there were three federal agencies: Veterans Bureau, Bureau of Pensions of the Interior Department, and National Home of Disabled Volunteer Soldiers. In 1924 veteran benefits were open to non-service related disabilities and four years later these services were open to women and National Guard. By 1930 President Hoover signed the Executive Order 5398 creating the Veterans Administration consolidating the three federal agencies. In 1944 Congress enacted the GI Bill to allow veterans to get a higher education after their time in service ²¹(VA History, 2015).

***Code of Federal Regulations title 38:**

²²The Code of Federal Regulations (CFR) title 38 (2008) has 17 parts discussing pensions, bonuses, and veterans' relief of the VA. This complex and tedious document covers a divers scenarios involving VA employees, veterans, spouses, dependents, and various entities involved. The time line starts with the Indian Wars in 1817 and only going up to and including the Persian Gulf War 1990, but does not include the most recent War on Terrorism. Congress oversees' and evaluates §§1.460 through 1.499 which includes any program or activity, including education, treatment, rehabilitation or research, which relates to drug abuse, alcoholism or alcohol abuse, infection with the human immunodeficiency virus, or sickle cell anemia, but only upon request of committees or subcommittees. The publication does not cover much of the exposure of air born hazards from the desert or explain the disability processes in claiming the effects of those hazards have had on the soldier. This makes it difficult for a soldier who is having problems with the respiratory system to have it diagnosed and treated with compensation. Just one more reason as to why the VA is not accepting the known hazards of the poor air quality in Afghanistan.

Possible solutions:

There will always be conflicts of some sort that arrive, it's an enviable fact that we have to accept, someone will always think they are better, and it's just a part of our culture as a whole. But those who go off and defend their country who willingly put their life on the line for the better good of more than just themselves do not deserve to be ignored on the state side. They put

their life on hold and sacrifice everything the government should willingly playing a part in making sure they get the health care they deserve. Studies should be conducted and examined carefully on the health effects are troops are exposed to during the time of conflict, that way when treaties are signed and troops come home they will not have to wait who knows how long before the government recognizes the health issue and begins treatment.

It's one thing to say you support veterans but it's another acting upon it. That's not to say we haven't done anything; we have done amazing work with things like the Wounded Warrior Project and helping homeless veterans but what about the hundreds of thousands who come back with no physical injury. They want to do something with their life like getting an education and having a career that does not involve travel to dangerous places and ensuring their will is in order. Asking a 19 year old to write their will is a frightening thing to do. If they return safe and sound they are going to want to do something with their life. They are hardly old enough to drink, they have an entire life ahead of them to make a difference, to have an impact somewhere else. But, when they return they are not the same student they were when they graduated high school. Adding on to that, they are experiencing difficulties of breathing from exposure of poor air quality and difficulties of concentrating from the dramatic change from battle field to classroom, can make attending class difficult. When I returned home I went from living with 90 people for seven months to it just being me within just a day and that dramatic change showed when I returned to school. The side effects of not being able to breathe like I had before deployment made using exercise for an outlet of frustration more frustrating.

The GAO report suggested possible actions to the Secretary of Defense to mitigate environmental health risks to service personnel by implementing burn pit management guidance, update contracts for burn pit operations, monitor burn pits within accordance with guidance, and improve adherence to guidance on waste management²³. In 2012 Dr. Magnusson conducted a study on the exposure that Swedish soldiers had to air pollutants in Afghanistan. He concluded that particulate matter was the main health hazard. However, because of high concentration of particles that have a high content of toxic organics further monitoring would be needed to fully understand the characteristics of the health hazards ²⁶(R. Magnusson, 2012). This continues the marry-go-round effect of always needing to conduct more studies for further understanding. There needs to be an underlying understanding that no matter how much is believed more studies will better understand the hazards and in turn help the soldiers, there will never be enough studies done. For this we need to decide when enough sufficient studies have been done to begin treating affected soldiers. Then there will need to be an understanding what is considered sufficient and understanding that however small amount that number may be at the current time, because we do not know what the long term affects are. Acting now in treatment and finding little long term affects in 50 years is a better option then waiting 30 years and finding out that there was a hazard that should have been addressed yesterday.

Memoir:

I was deployed in 2013 with NMCB 15 to Afghanistan where we built several buildings in support of the draw down of troops. This thesis was based on personal experiences with the struggles with the VA and returning back to school from deployment. I have watched fellow soldiers, sailors, airmen, and marines struggle through school after their time in service with not having the resources they need because they are not like the traditional student or the average non-traditional student. The effort of this thesis is in hope that more people will understand that there is more to a returning soldier's struggles than PTSD and that it will take all of us to make a positive change in helping our returning soldiers.

*For more information on the VA rating of respiratory system; CFR 38 4.97, pg. 415-420

Bibliography:

- ²¹About VA. (2015, August 20). Retrieved November 23, 2015, from http://www.va.gov/about_va/vahistory.asp
- ¹¹Acid Rain Facts. (2015). Retrieved November 23, 2015, from <http://environment.nationalgeographic.com/environment/global-warming/acid-rain-overview/>
- ²Afghanistan profile - Timeline - BBC News. (2015, October 27). Retrieved November 23, 2015, from <http://www.bbc.com/news/world-south-asia-12024253>
- ¹⁰Air Enforcement. (2015, July 8). Retrieved November 23, 2015, from <http://www2.epa.gov/enforcement/air-enforcement>
- ⁸American Thoracic Society - Anatomy and Function of the Normal Lung. (2015, February 1). Retrieved November 23, 2015, from <http://www.thoracic.org/copd-guidelines/for-patients/anatomy-and-function-of-the-normal-lung.php>
- Chapko, M., Borowsky, S., Fortney, J., Hedeon, A., Hoegle, M., Maciejewski, M., Lukas, C. (2002). Evaluating of the Department of Veterans Affairs Community-Based Outpatient Clinics. *Medical Care*, Vol. 40, No. 7, 555-560
- ⁵Currency Converter for Afghanistan. (n.d.). Retrieved November 23, 2015, from <http://www.xago.org/english/afghanistan/currency-converter.php>
- ⁴Da Afghanistan Bank. (2015, November 30). Retrieved November 30, 2015, from dab.gov.af/en
- ²⁰*Department of Veterans Affairs Statistics at a Glance*. (2014, December 1). Lecture presented at U.S. Department of Veteran Affairs.
- Edwards, S. (2011). The Department of Veterans Affairs' Entitlement Complex: Attorney Fees and Administrative Offset After "Astrue V. Ratliff." *Administrative Law Review*, Vol. 63, No. 3, 561-597
- ¹²How cap and trade works. (2015). Retrieved November 23, 2015, from <https://www.edf.org/climate/how-cap-and-trade-works>
- Institute of Medicine. (2011). Long-Term Health Consequences of Exposure to burn Pits in Iraq and Afghanistan. Washington, DC: The national Academics Press, ISBN. 978-0-309-21755-2
- ¹³Islamic Republic of Afghanistan Environmental Law; National Assembly, Official Gazette, No. 912, January 25, 2007.
- ¹⁵Kazemi, M. (2011, July 9). In Kabul, air pollution a bigger killer than war. Retrieved November 23, 2015, from <http://phys.org/news/2011-06-kabul-air-pollution-bigger-killer.html>

- KBR, Inc., Burn Pit Litigation, U.S. dist. LEXIS 26862, Vol. 11, Iss. 3, 21-22 (2013)
- ^{1, 3, 7}Loertscher, Steven Glade. Department of Defense Environmental Policy in Afghanistan During Operation Enduring Freedom; Afghanistan's Air Quality. August 31, 2008. Retrieved November 23, 2015.
- ²⁶Magnusson, P., Hagglund, L., Wingfors, H. (2012). Broad Exposure Screening of Air Pollutants in the Occupational Environment of Swedish Soldiers Deployed in Afghanistan. *Military Medicine*, Vol. 177, 3:318
- ¹⁶Milano, F. (2000). Gulf War Syndrome. *The 'Agent Orange' of the Nineties*, Vol. 75 (1& 2), 16-25.
- ²²Mosley, R. 38 Code of Federal Regulations. Pensions, Bonuses, and Veterans' Relief. Office of the Federal Register National Archives and Records Administration 1.650-1, 1.930-936, 3.150-160, 3.200-203, 3.303-363, 3.370-385, 4.96-97. July 1, 2008.
- ¹⁴National Research Council (US) Committee for Review of the DOD's Enhanced Particulate Matter Surveillance Program Report. Review of the Department of Defense Enhanced Particulate Matter Surveillance Program Report. Washington (DC): National Academies Press (US); 2010. From: <http://www.ncbi.nlm.nih.gov/books/NBK210114/> Retrieved November 23, 2015.
- ⁹Particulate Matter (PM); Health. (2015, September 10). Retrieved November 23, 2015, from <http://www3.epa.gov/pm/health.html>
- Pine, W., Russo, W. (2009). Making Veterans Benefits Clear: VA's Regulation Rewrite Project. *Administrative Law Review*, Vol. 61, No. 2, 407-422
- ²⁷Public Health. (2015, June 3). Retrieved November 30, 2015, from <http://www.publichealth.va.gov/epidemiology/studies/new-generation/sinusitis-asthma-bronchitis.asp>
- Rathbone-McCuan, E., Harbert, T., Fulton, J. (1991). Evaluation as an Imperative for Social Services Preservation: A Challenge to the Department of Veterans Affairs. *Council on Social Work Education*, Vol. 27, No. 2, 114-124
- ¹⁹Riess, Michael. Actually, We Did Start the Fire, and It Keeps on Burning: The Environmental Health Effects of Military Burn Pits in Afghanistan and Iraq, 23 *Vill. Envtl. L.J.* 117 (2012). Retrieved October 10, 2015.
- Russo, W. (2013). Initial Research on the Long-Term Health consequences of Exposure to Burn Pits in Iraq and Afghanistan. *Department of Veterans Affairs Federal Register*, Vol. 78, No. 23
- Shriver, T., Web, G., Adams, B. (2002). Environmental exposures, Contested Illness, and Collective Action: The Controversy Over Gulf War Illness. *Department of Sociology, Humboldt State University*, Vol. 27, No. 1, 73-105.

- ⁶The World Factbook. (2015). Retrieved November 23, 2015, from <https://www.cia.gov/library/publications/the-world-factbook/fields/2004.html>
- ^{18, 23}Trimble, D. (2010). AFGHANISTAN AND IRAQ. *DOD Should Improve Adherence to Its Guidance on Open Pit Burning and Solid Waste Management*, GAO-11-63, 2-47. Retrieved October 16, 2015, from GAO Highlights.
- ²⁵U.S. Relations With Afghanistan. (2015, October 29). Retrieved November 30, 2015, from <http://www.state.gov/r/pa/ei/bgn/5380.htm>
- ²⁴Veterans Health Administration Office of Public Health. (2015). Report on Data from the Airborne Hazards and Open Burn Pit (AH&OBP) Registry. VA AH&OBP Summary Report #2. U.S. Department of Veterans Affairs.
- Wingors, H., Hagglund, L., & Magnusson, R. (2011). Characterization of the size-distribution of aerosols and particle-bound content of oxygenated PAHs, PAHs, and n-alkanes in urban environments in Afghanistan. *Atmospheric Environment*, Vol. 45, 4360-4369. Doi: 10.1016