

**UNIDAD EDUCATIVA PARTICULAR JAVIER
BACHILLERATO EN CIENCIAS**

**MONOGRAPH
CREATION OF CHEMICAL WEAPONS FOR
COUNTRIES IN WAR**

**STUDENT:
DANIELA ISABEL DELGADO HERNANDEZ**

ADVISER: LCDA. GLENDA TORRES

THIRD BACCALAUREATE “C”

2018 – 2019



JESUITAS
ECUADOR



Av del Bombero Km. 5½ Vía a la Costa - Teléfono: (593) 4-2003520
Nivel Inicial 200-4309 - Ed. Básica 200-4160 - Bachillerato 200-1221
E-mail: info@uejavier.com - Código Postal: 09-01-4849

[f](https://www.facebook.com/uejavierEC) [@uejavierEC](https://www.instagram.com/uejavierEC) [y](https://www.youtube.com/uejavierEC) www.uejavier.com

GRATITUDE

I wish to thank my parent for giving me the chance to study in this school and my mom for supporting me in every step I take in life, for guiding and giving me tips to make my choices and for being there always for me, I want to thank my teachers who have been there helping me to be a better person and teaching things about life and specially for educating me. I'm so grateful with every person who has been there since the first day of school helping me to be a better student and person. I would also like to thank the school for teaching me the value of friendship and what it is to be more to serve better, to teach important values to young people now and for others generations for many years, being part of this school means a lot to me because thanks to this school I made a new family. I also want to thank my sister for being a wonderful person who is always attentive as I feel and for always being there for me.

For me it is a pleasure and honor to be in this school and to be able to call myself a Javeriana, this school has helped me to grow as a person and I'm so grateful with all the persons that were on my way to graduate.

SUMMARY

Chemical agents are made for civil wars, world wars and other conflicts for so many years these chemicals have been present in our lives, causing so much damage to people, nature and the earth because of the chemicals they release. There are so many different types of chemicals, some examples are the nervous agents that affects mainly the nerves of the body and mind, leaving the body without ability to move, vomiting and some other symptoms. Another one is the blister agent, this affects the skin of the person who has become contact with this gas or liquid making blisters and burning on the skin, also affects the trachea, eyes and mucus on the system. There are more chemicals that has been used and we don't know about them yet. The other one is choking agent, the symptoms are lack of oxygen, the lungs are compressed and vomiting, and it feels like the air is not enough. Then the current elaboration of chemicals, There are many ways to create a chemical weapon, for many years these types of manufacturing have been taking place for these weapons, from the first world war (even before) to the present. These weapons are a series of chemicals compressed into a small bomb or a kind of shell to protect it before being explode. These resources have been used for wars, conflicts and some others. One that left a mark and is recognized by the majority of the population is the Hiroshima and Nagasaki bombs.

INDEX

INTRODUCTION	4
CHAPTER I	
TYPES OF CHEMICAL WEAPONS	5
1.1 Nerve agents.....	5
1.2 Blister agents.....	7
1.3 Choking agents.....	9
<u>CHAPTER 2</u>	
CURRENT ELABORATION OF CHEMICAL WEAPONS	11
2.1 What is a chemical weapon.....	11
2.2 History of chemical weapons use.....	13
2.3 When it started the use of this weapons	14
<u>CHAPTER 3</u>	
RESULTLS OF THE SURVEY	17

INTRODUCTION

The following monograph is about “creation of chemical weapons for countries in war” to define and describe how chemical weapons are made and what countries use this type of weapons and recognize the damage of these. The different types of chemical weapons that are in the world and how they affect the people and ecosystem.

The monograph is composed of 3 chapters, each one of them explains the characteristics of chemical weapons and what they do when they are used. Chapter #1 talks about types of chemical weapons (nerve agents, blister agents, choking agents) what are the effects in people and what do they cause. Chapter #2 talks about the current elaboration of chemical weapons (what is a chemical weapon, history of chemical weapons use, when it started the use of these weapons) and chapter #3 talks about a survey that is conducted in order to draw conclusions from what people think about these weapons.

So in conclusion this monograph is for getting to know and highlighting the things that these weapons have been producing during wars or other conflicts, and how dangerous this toxic weapons are for the world. The consequences of these acts are deaths or injured people, and in the most cases, injured people end up dying because of the strong chemicals.

CHAPTER I

TYPES OF CHEMICAL WEAPONS

This chapter is about talking the differences of the types of chemical weapons and the damage, symptoms and consequences that they cause on the human system.

Chemical weapons are used in war for the last years, they are famous for making a lot of damage and also used in wars, they are a lot of types of chemical weapons like toxic chemicals, they are defined as causing temporary incapacitation also dead to humans

1.1 Nerve agents

Nerve agents is a type of chemical weapon, this agent appears in liquid, gas, dust or vapour. so when you inhale this chemical or it makes contact with the skin it can cause seizures and loss of body control also you can feel like paralyse in you muscle including lot of damage to the heart and diaphragm, probably causing death in 5 minutes, poisoning may also happen when consumption of food or liquids contaminated with this nerve agents, this agent have a lot to do since the second war, also nerve agents acquired their name because it can affect the nerves of your body and is highly toxic to the touch of the skin

In 1930 that German chemist realized that organophosphorus could be poisonous. Also in 1934 doctor Gerhard Schrader (a chemist at IG Farben) had the idea of creating a pesticide. Later a phosphorus compound with an extremely high toxic was created for the first time ever. This phosphorus compound, given the name tabun was the first of the substances that give the name as nerve agents.

"I am glad to be fully engaged again in the field of plant protection. My work during the war in the field of toxic substances never complied with my wishes." "I should like to assist in improving nutrition, but not in inflicting new wounds." (Schrader, 1936)

The formulae for some nerve agents are:

- Tabun, GA: $(\text{CH}_3)_2\text{N}-\text{P}(=\text{O})(-\text{CN})(-\text{OC}_2\text{H}_5)$
- Sarin, GB: $\text{CH}_3-\text{P}(=\text{O})(-\text{F})(-\text{OCH}(\text{CH}_3)_2)$
- Soman, GD: $\text{CH}_3-\text{P}(=\text{O})(-\text{F})(-\text{CH}(\text{CH}_3)\text{C}(\text{CH}_3)_3)$

The effects of the nerve agents can be different depending on the dose the person face

Poisoning takes more longer when the nerve agent enters to the body through the pores. Nerve agents are fat-soluble and can penetrate the outer layers of the skin but it takes some time before the poison can reach the blood vessels. The symptoms begin at minutes 20-30 after the first contact with this agent.

When exposed to a higher dose of nerve agent, the muscular symptoms are more pronounced, the victim may suffer convulsions and lose their consciousness.

It can cause muscles paralysis in the area of the respiratory system that means that nerve agents also can affect this system. The combination of this two elements can cause death, the feelings that give is like suffocation.

Also you can tell that the person have been near the vapour of a nerve agent if you see their pupils, they would be small and pointed.

In fact nerve agents attacks most to the nerves of your body, they also have an extremely rapid effect one time that this agent has made contact with your system you have to go to medical attention immediately, some of the cases can be successful and it can heal the poison of the body, but that depends of the quantity of poison your body has, for more poison the system has, little would be the chances to save it from dying paralyzed.

1.2 Blister agents

These oily substance act on via inhalation and contact with the skin, affect the eyes, respiratory, tract and the skin, first is irritating but after that acts in another way causing several burns, as they name says blister agents cause skin blisters, they also act on the eyes, mucous membranes, lungs, skin and blood-forming organs. It can cause vomiting and diarrhea when ingested

One of the examples of blister agents is sulfur mustard (H, HD), nitrogen mustard (HN) blister agents were approved and tested in combat in 1917 by germany and it have been used especially

in the war Iran-Iraq (1980-1988) they are dispersed in liquid or vapour, they take long to disappear.

Blister agents can contaminate ships, terrain, cars, aircraft or equipment with a persistent hazard

Since 1917 mustard was been worried military personal with a lot of problems that it plants in the field of protection. It should be notice how easy it can be create a sulfur mustard and the possibilities future chemical war HD will be preferred to HN.

If sulfur mustard reach contact with your skin or any part of your body, the eyes will be the most affected because they are sensitive to this type of gas, vapour or liquid, because the effect in the eyes are very painful, it can cause conjunctivitis and severe lesions on the eyes if is not treated immediately. The lid of your eyes turn red. You can treat this less than 1 hour because after 1 to 4 hours is very dangerous and less expectation of saving the eyes. Now if only a small of dose is applied to the skin, it turns red and it would itch very hard, an intense dose of blister agent can cause blisters on the skin. Generally it takes 4 to 24 hours to form the blister on the skin, this ones are several because they are sensitive to the touch and it breaks easily and the healing of this is very slow, it takes for many weeks to months for the skin to really heal well.

Mustard agents also attacks all the mucous on the system if it is inhaled for the person, this agent would attack the membrane of the respiratory tract, after a few hours it would attack the nasal cavity and the throat, affecting the bronchus and laringe, also one of the effects that these agent cause is dry cough and feel burning in the throat and the lungs also may be affected too, if the patient does not consult medical attention and the dose was too several it could die in a few days.

The only way to be protected for this agents is having a full protective ensemble, and this only would protect the lungs, and nasal conducts , the blister in the skin can be treated as well but only if the dose of this agent is low, it can be treated with a paste to calm the itchiness.

1.3 Choking agents

This agents actually attacks the lungs

To this group belong:

- CG - phosgene
- DP - diphosgene
- kCl - chlorine
- PS – chloropicrin
-

The most toxic of this category of choking agents is the phosgene, because they damage the lungs and probably is going to be used in the future, the first use of phosgene was in 1915 and it represent the 80% of the deads in World War 1. (Federation of american scientists, 2013)

This agent is a colorless gas that it cannot been seen and also can be in the air for hours. the characteristics of this agent is that the person who has contact with this one can feel a very sensation on the lungs (pulmonary edema) with the exposure to very high concentrations of this agent can cause death in less than 12 hours, if it pass this time of 12 hours the expectation of life would be 24-42 hours.

When it immediately makes contact the symptoms are coughing. Choking, and pression on the chest, other symptoms are headache and vomiting, some patients doesn't develop caught but that doesn't mean that they are free of suffering a pulmonary edema. also the vomiting it feels a little rough because of the dry throat, the patient can develop shock symptoms with pale skin and shaking of cold, low blood pressure. If the person survives at least 42 hours they usually recover.

CHAPTER 2

CURRENT ELABORATION OF CHEMICAL WEAPONS

This chapter is about how chemical weapons are elaborated and the items that are used for these creations. To know how dangerous they and the cautions are we have to take.

Also, to know the differences between them and that chemicals can be used in a good way and in a bad way.

2.1 What is a chemical weapon

The actual and general definition of a chemical weapon is that is a toxic chemical that is contained in a bomb or a shell before they are exposed. The term chemical weapon is applied to any toxic weapon that cause dead, irritation, and suffocation, depending of what chemical are used. They are so many types of chemical weapons, different effects, different names and also different types of damage on the victims

The toxic chemicals that have been used as chemical weapons, or have been developed for use as chemical weapons, can be categorised as choking, blister, blood, or nerve agents. The most well-known agents are as follows: choking agents—chlorine and phosgene, blister agents (or vesicants)—mustard and lewisite, blood agents—hydrogen cyanide, nerve agents—sarin, soman, VX. (organisation for the prohibition of chemical weapons , 2013)

Of course they are some chemical weapons that it still in the industry, for example toxic weapons are employed like basic raw material. Also, they make fumigants or insecticide that in normal use of these are approved but it still have the categories of chemical toxic, because if you contain amount of these substances it can be dangerous. But many chemicals are also used for pacific and commercial reasons. Not every chemical toxic is used for making a damage, some are used like in a good way, but that doesn't mean that it would stop the fabrication of chemical weapons.

At the same time it can't be prohibited the use of chemicals because it can stop the commercialization and the technology advances that in many years have been discovered, so we have to be very clear that chemicals are used but obviously with a warning system from the state of every country. The first part of definition of chemical weapon is that it is toxic and if is not approved by the CWC (Chemical Weapons Convention) its prohibited and instantly makes them a weapon for cause dead or injure a human or an animal, chemicals like chlorine, phosgene and hydrone cydane. So we have to consider that chemicals have a good side and a dark side, equally we can't prohibited the use of these, just because it has earned a position in the industry (talking about good chemicals)

Talking about bad chemical these are ones of many types:

- Chloroform: Can irritate skin, eyes and lungs, affecting also the nervous system, used in the world war I

- Acetonitrile: this is a flammable irritant substance and it can turn you into cyanide if you inhale this.
- Formaldehyde: Can give you sinusitis and asthma, problems when you are breathing and headache
- Phosgene: Smells like moldy hay, it's also irritating but six times more as the chloroform
- Mustard gas: Famous Blister agent that its name was given because of the yellow gas, this agent makes you blind and gives serious heart attack

But the chemicals that caused most deaths and injuries in World War I were phosgene, chlorine and mustard gas. These three gases were the most used in that year and in the war.

2.2 History of chemical weapons use

“I believe it to be rather unlikely that any man in his right mind would have volunteered for such an experiment.” (Maddison, 1956)

— Ulf Schmidt, historical expert appointed to the
Public inquest into the 1953 death of Ronald Maddison

During World War I, phosgene and chlorine were the first chemicals to explode in the field for the first time ever in a bad way of use, these chemicals were made in massive quantities for the war. The first attack with chlorine gas occurred in April 22 of 1915 in Belgium; the use of these

chemical weapons in the war, including the “yellow mustard” or “mustard gas” caused 90,000 deaths and over a million of injured persons. The affected ones in the chemical warfare would be affected for the rest of their lives, that is because the people who survived to the war it has second effects from the chemicals they were exposed to in world war I.

In the end of the war, 124,000 tonnes of chemical agents have been used for the war, the delivery method changes in the middle of XX century, increasing the weapons to kill people or give them psychically mental disorders because of the chemicals. So during the cold war the Soviet Union and United States have a lot of reserves chemical weapons for the war, but in total these two countries had the necessary amount of chemicals to destroy half of the animals, plants and human being in the earth.

Iraq also used a lot of chemicals weapons in 1980 during the war, Iraq used the famous “mustard agent” and a lot of nerve agents which causes the death of nerves in the system. So in fact chemical weapons have been in our world by so many years.

2.3 When it started the use of this weapons

Chemical weapons have been in our world for so many years, actually now a days we have the modern technology that can make high rank weapons but obviously the government control all of that information, chemical weapons are a dangerous in every level so that's why is prohibited and illegal to create one without permission of the government.

Here are some notable moments in chemical warfare through the years:

1675: France and Germany worked to do bas chemicals weapons, they want to use poisoned bullets

1845: French troops force more than 1000 members of a berber to go into a cave and kill them using smoke

1861-1864: During the american civil war both civilians and soldiers where in an agreement to use chemical weapons

1874-1907: Some of international treaties want to use poison weapons in the war

1914: in **August** 1912, the first tear-gas grenade was created for use by the police, but in the World War I also it was used.

October, german forces drop 3,000 bombshells of diasidine chlorosulfate that causes lung damage.

1917: Mustard agent were used for the first time by the German force.

1936: Gerhard Schrader a German chemist, completes the purification of tabun that is a potent nerve agent, he want to create a pesticide not a chemical weapon.

1939-1945: During World War II poison gases was used by the Nazi concentration camps to kill civilians, also Japanese camps, and nerve agent are used by Nazis. (EVERTS, 2015)

U.S it was the first country to develop and use them, and the only one that used them during in a war, they also used them to bomb Nagasaki and Hiroshima, Russia it was the second country to discover and develop nuclear weapons when it was the Soviet Union and is one of the biggest

arsenal including 7,000 nuclear warhead, in the actuality they pay for the renovation of their weapons, UK it was the third in these positions.

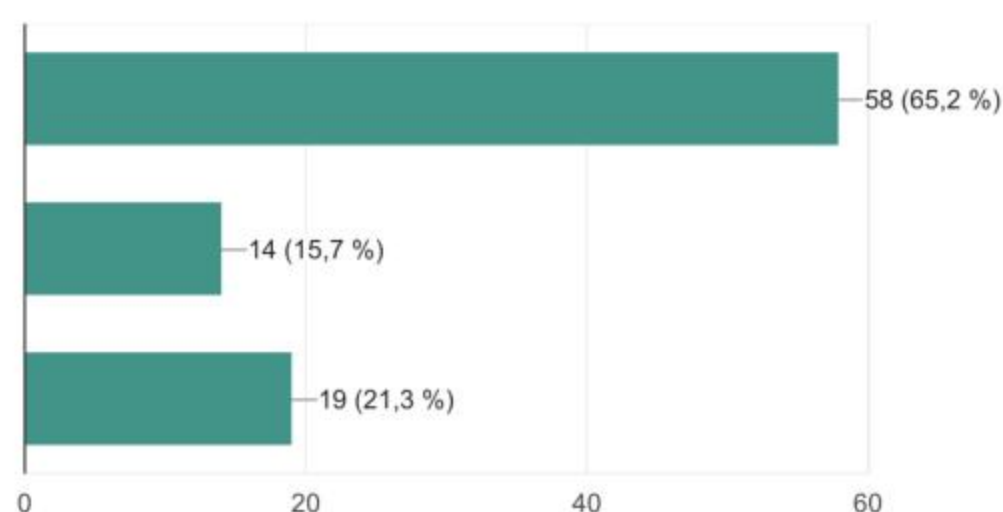
Another catastrophic situation about chemical bombs was the explosion of the atomic bomb of Hiroshima, that was recorded at 8:15 am in August 6 1945, little boy was the nickname that Americans put to the Hiroshima bomb that explodes at an altitude of 600 above the Japanese city, the explosion equivalent to 16,000 tons of TNT created a heat wave about 30,000 degree centigrades, killing about 140.000 people, a 6 kilometers column rise up from the ground when the bomb explodes and cover the entire city, the Hiroshima bomb was the first atomic bomb to explodes above of a civil population and left a lot of injured people after the explosion the survivors have burns all over their bodies and blister in their faces all causes by the bomb and the heat wave that it cause, the second bomb was the Nagasaki this one was released three days after the Hiroshima bomb (August 9) equivalent to 21,000 tons of TNT, instantly end up with 70,000 lives over the city, and other ones die after the radiation affects them, a flag represents where the bomb fell, the survivors were left with anomalies in their bodies, mutilated, burn, and also problems in their system for the radiation. Also detected that they would have problems in the future if they decide to have kids.

CHAPTER III

RESULTS OF THE SURVEY

This chapter is about to know the results from the survey made to the students of third baccalaureate. The survey was about chemical weapons and what do the people think about them, basically people have the idea that these arms have to be illegal and with obvious reasons, these types of arms make a lot of disasters.

Do you know what chemicals weapons are and what they are used for?



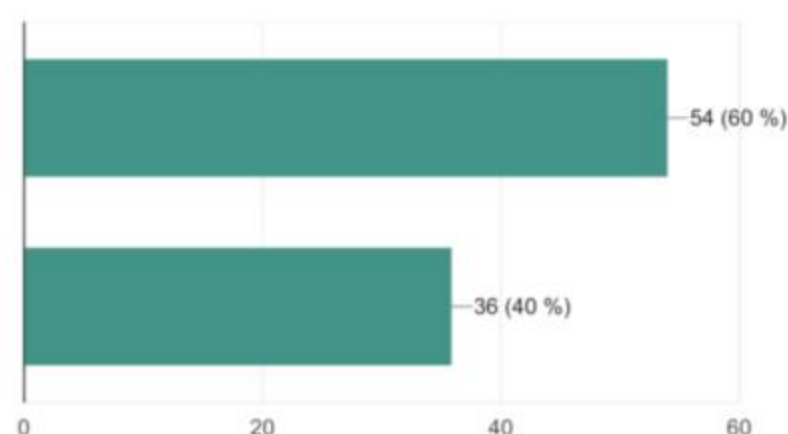
Author: Daniela Isabel Delgado

Source: survey applied

In this question of the survey we can observe that 62.5% of the people who have voted know what a chemical weapon is, what they do and the use of them. The other 21.3% have an idea of

what a chemical weapon can be but do not have complete knowledge of it, finally 15.7% of the respondents do not know what a chemical weapon is.

Do you know any type of weapon or chemical agent?

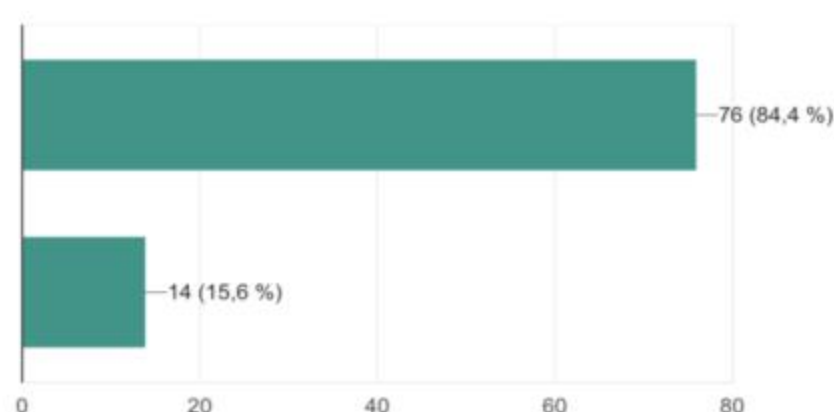


Author: Daniela Isabel Delgado

Source: survey applied

60% affirms that they know some type of weapon or chemical agent, the other 40% says that they do not know any type of weapon/chemical agent.

In your opinion you think chemical weapons should be banned?

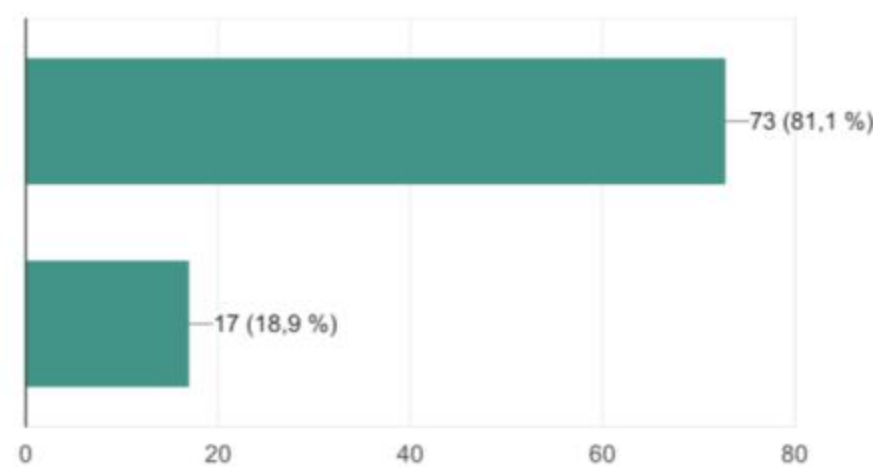


Author: Daniela Isabel Delgado

Source: survey applied

84.4% agree that chemical weapons should be prohibited as they are a threat to nature and life because they destroy everything by causing the explosion, the other 15.6% do not agree with this

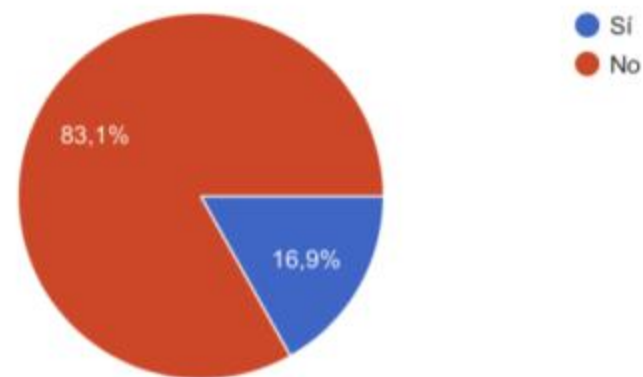
Do you know the Hiroshima bomb and what damage it cause



Author: Daniela Isabel Delgado
Source: survey applied

81.1% know what the Hiroshima bomb was and the damage it caused in the city that was launched, the other 18.9% do not know what the Hiroshima bomb is

Do you think the use of chemical weapons in war situation is good?

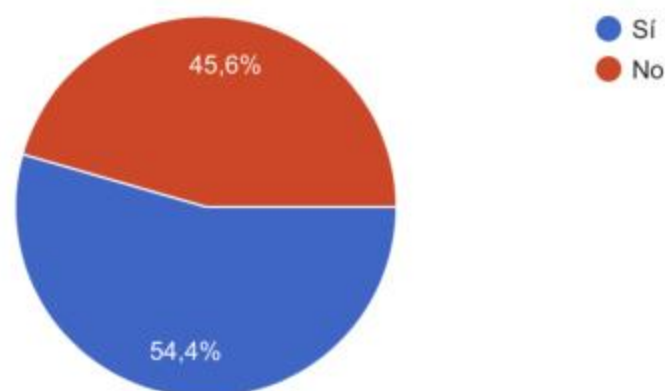


Author: Daniela Isabel Delgado

Source: survey applied

83.1% say that they don't agree that chemical weapons are used in war situations, they simply should not be used, and the other 16.9% say that they should be use.

Do you think governments should have a budget for research and development of chemical agents for war purposes?

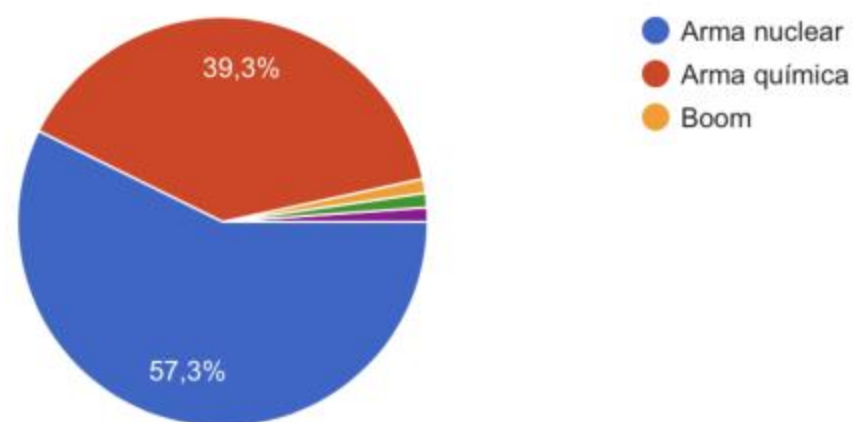


Author: Daniela Isabel Delgado

Source: survey applied

The 54.4% agrees with this idea, the other 45.6% does not agree with this

For you, what is most likely to use a terrorist?



Author: Daniela Isabel Delgado

Source: survey applied

The 53.3% thinks that a terrorist would use a nuclear weapon, the other 42.7% thinks that a terrorist would use a chemical weapon.

CONCLUSIONS

At the end of this monographic work it is concluded that:

Chemical weapons are dangerous for the ecosystem where we live and not only for the habitat where we are but also the damage it does to the people or living being that are in that place. These chemicals. Some chemicals are used daily without any bad use, however there are times when chemicals are used for something more than just “normal use” like daily basics (perfumes, detergents...) it can be said that it is a dark use of chemistry, referring to chemical weapons.

There are too many types of chemical weapons such as those previously mentioned like nerve agents, blister agents, choking agents, and more of those. Mostly these weapons are used in the war.

According to research it has been observed that these chemicals that are used to make bombs, produce certain affects in the human body. Some affect the, mucous membranes, nose, and ears, others to the lungs and make you feel that you run out of air, blister agents causes blisters in your body as burns because of the gas they release, it can also be in liquid. Choking agents make you throat dry and feels like something is pressing your chest.

Chemical weapons has been used for a long time for wars or conflicts. A chemical weapon generally is a toxic bomb that is contained in a shell before they explode (depending on what kind of chemical agent is) they release amount of toxins that are not good for humans or that's why these have some effects in our bodies making affecting our system in several ways.

RECOMMENDATIONS

Promote awareness of this in colleges and universities for greater understanding of the subject also in talks that have to do with the care of the planet or ourselves, since this would give us a better understanding of the subject and be well informed about the details. This will help a lot to take more into account how dangerous it can be.

The more people know about this subject, the more people will have the necessary knowledge to know what these weapons are capable of, what they were or are used for, and above all why they are strictly forbidden.

With this subject we can inform people the damage they cause when they are misused and it is necessary to understand why it is necessary to understand why some people use them for bad action or simply for revenge, whether to end with a town or even a country. Society in general should be aware of this issue for well-being.

Knowing this also prevents bad decisions from being made in the future due a lack of knowledge and prevents the damage it would cause to our lives and to the planet.

BIBLIOGRAPHIC REFERENCES

Everts, S. (2015). *science history institute* . Retrieved from
<https://www.sciencehistory.org/distillations/magazine/a-brief-history-of-chemical-war>

Federation of american scientists. (2013). *Federation of american scientists*. Retrieved from
<https://fas.org/programs/bio/chemweapons/cwagents.html#b03>

Maddison, R. (1956). *Science History Institute* . Retrieved from
<https://www.sciencehistory.org/distillations/magazine/a-brief-history-of-chemical-war>

Organisation for the prohibition of chemical weapons . (2013). *organisation for the prohibition of chemical weapons* . Retrieved from <https://www.opcw.org/>

Schrader, G. (1936, December 23). *Collaborative on Health and the Environment*. Retrieved from <https://www.healthandenvironment.org/environmental-health/social-context/history/gerhard-schrader-father-of-the-nerve-agents>

