

# VACCINES, how do they work?

GROUP: Talaiak

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SCHOOL: Elorrio BHI.

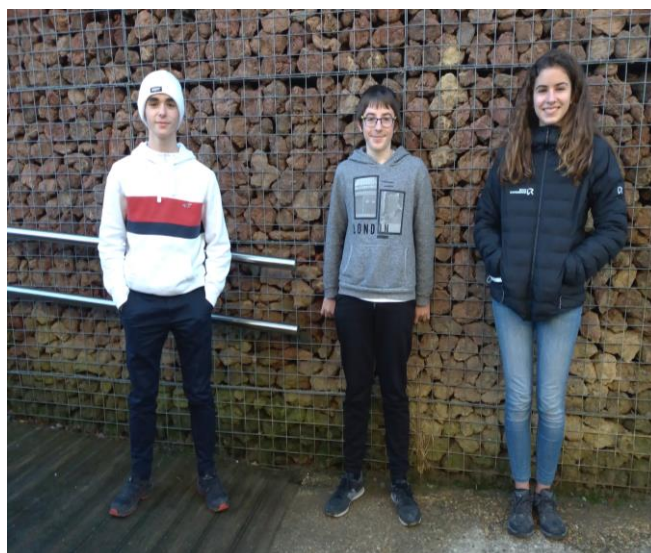
## Introduction

This project is about vaccines. With this project we wanted to find out if people really knew how they work or if they have wrong ideas about this topic and why they don't want to vaccinate.

First of all we made a survey with students, teachers and parents of Elorrio BHI. With the answers we obtained we were able to know that half of the people did not know how the vaccines work.

To inform people we have collected information in order to know what vaccines are, how they work, and other concepts such as what are the types of immunity.

With this project we would like to inform people, and encourage them to get vaccinated because it is very important to be safe yourself and the whole community.



## Hypothesis

Our hypothesis was the following:

**Do people have myths or misconceptions about vaccination?**

Before starting with the work, we asked ourselves what the aim of the project would be and we decided that the purpose of it is to unprove the myths or misconceptions people around us may have about vaccines.

We expected that a great majority of the population think vaccines are harmful to the human being. Some of them also believe that the Covid-19 vaccines contain a chip inside (which is absolutely false, according to our bibliographical search).

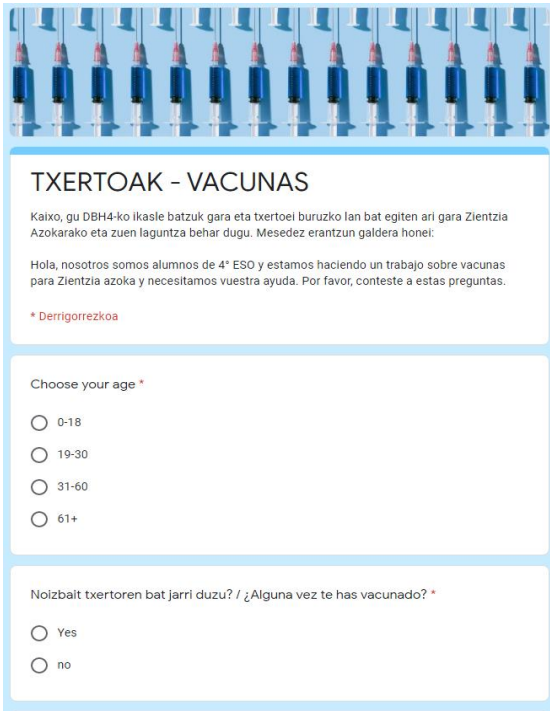
## Materials and methods:

### Materials:

- A quest that was sent to to parents, students and teachers
- Different information sources, mainly websites.

### Methods

1. Prepare an inquiry
2. Send the inquiry to the school community and relatives
3. Collect the answers
4. Obtain the results.
5. Analyse the results



**TXERTOAK - VACUNAS**

Kaixo, gu DBH4-ko ikasle batzuk gara eta txertoel buruzko lan bat egiten ari gara Zientzia Azokarako eta zuen laguntza behar dugu. Mesedez erantzun galdera hone!

Hola, nosotros somos alumnos de 4º ESO y estamos haciendo un trabajo sobre vacunas para Zientzia azoka y necesitamos vuestra ayuda. Por favor, conteste a estas preguntas.

\* Derrigorrezkoa

Choose your age \*

0-18

19-30

31-60

61+

Noizbait txertoren bat jarri duzu? / ¿Alguna vez te has vacunado? \*

Yes

no

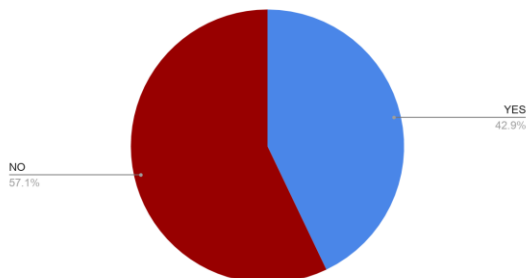
Image 1: part of the quest sent to the school community

## Results

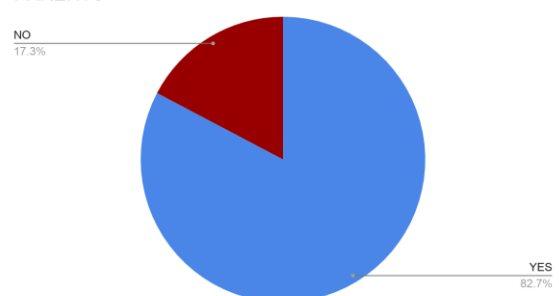


According to the answers we received, we could see that the majority of the adult people (64%) know **what a vaccine is** but teenagers didn't know (58.4%).

STUDENTS



PARENTS



PEOPLE THAT REALLY KNOW = 41.6%

PEOPLE THAT REALLY KNOW = 64%

The key question of this survey has been whether they know **how vaccines work** and what they know about them.

84.5% of adults answered yes. We received 175 responses on what they know about vaccines. Most of them know how they work (64%), for example, we have received responses such as:

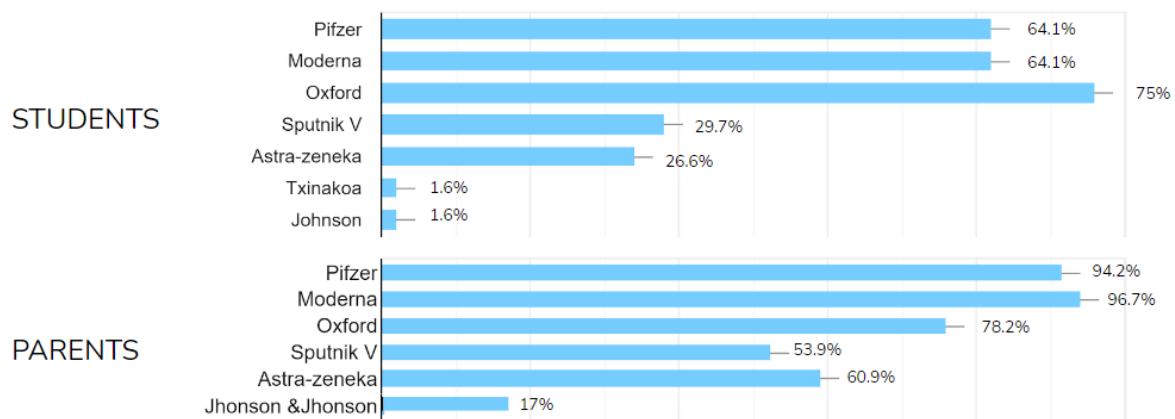
*"The deactivated virus or some protein from it is injected so that the body identifies it and creates antibodies to fight against it. This way the next time you identify the same virus, the immune response will be faster and more effective!"*

More than half of the students don't know it works, only 42% (which is good for us because this way we can make them learn about it).

Regarding to the **COVID-19 vaccine**, adults know more how it works than young people.

We also asked which were the most known pharmaceuticals that are manufacturing the Covid-19 vaccines.

Here are shown the results:



The most known brands for both students and parents are Pfizer, Moderna and Oxford. Most of the parents also find familiar Sputnik V and Astra-Zeneka, which are less known around the students. Lastly, Johnson's vaccine and the Chinese vaccines are the less known ones.

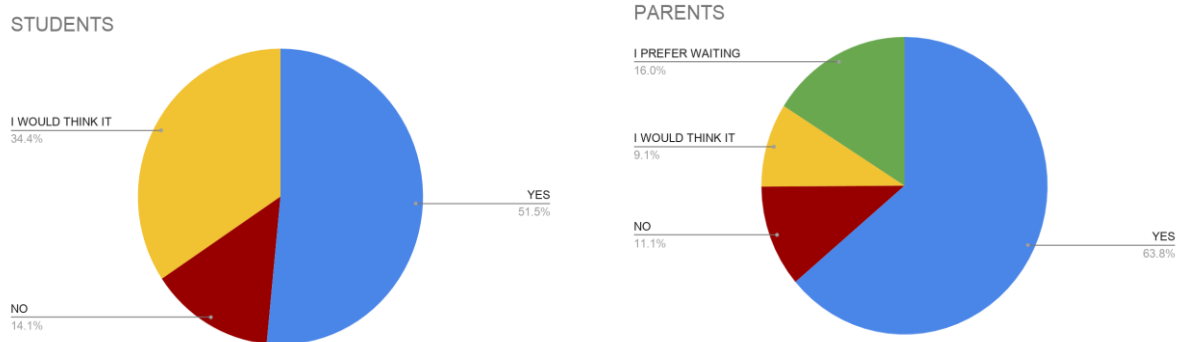
Finally, we asked the people **if they would take the current Covid-19 vaccine**. The possibilities were,

- yes,
- no,
- I need to think about it or
- I'd rather wait.

More than half of the students would take the vaccine, very similar to the parents' answers, in their case, 64% of the people would take it.

Between 10% and 15% of the people in both groups would not take it. The main reasons for not vaccinating are the lack of confidence, unsafeness and misconceptions about the short time used to create the vaccine. Nearly 35% of the students would have to think about it first before making the decision.

A quarter of the parents either prefer waiting (16%) or have to think about it (9%).



## Discussion

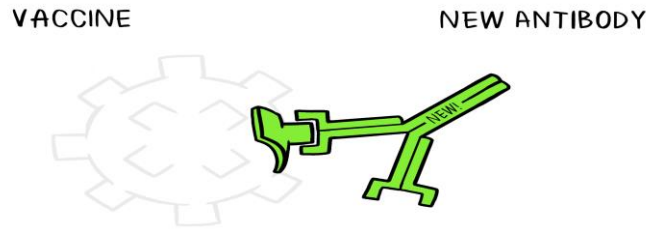


Since we have seen that some people do not know how vaccines work, we wish to explain what they are, how they work and we add more concepts such as types of immunity response, the impact of vaccines against several diseases and the importance of the vaccines in the healthcare of the population (herd immunity).

## Description of what a vaccine is and how it works

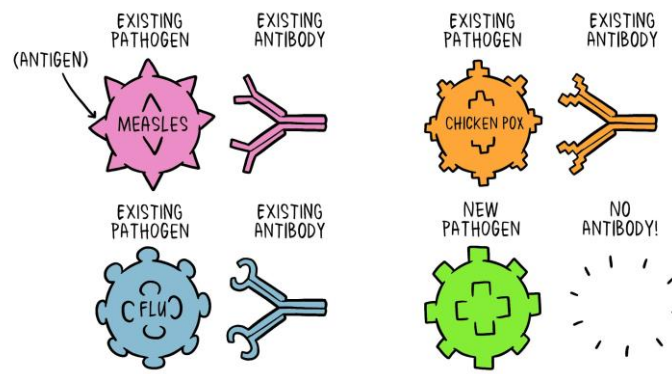
The aim of the vaccine is not to make people healthier, is to keep you away from getting sick, and this is done by teaching your body how to fight against viruses.

A good comparison is a seatbelt on cars, you will be safe every time you wear it on. So the vaccine is a tiny weakened non-dangerous fragment of the harmful organism (virus or bacteria) and includes parts of the antigen. Then if the body encounters the real antigen later, as part of the real organism, it already knows how to defeat it.



Source: WORLD HEALTH ORGANISATION

When a new pathogen or disease enters our body, it introduces a new antigen. For every new antigen, our body needs to build a specific antibody that can grab onto the antigen and defeat the pathogen.



Source: WORLD HEALTH ORGANISATION

## Types of immunity response

Active immunisation- the body generates some defences (antibodies and special cells) to protect against infections. It takes longer to get full protection against the virus.

Passive immunisation- the antibodies are passed directly to immunised people. This allows for immediate protection, but this doesn't immunise you for a long time, only a few weeks or months. but these antibodies are passed from mother to child to protect the child for a time.

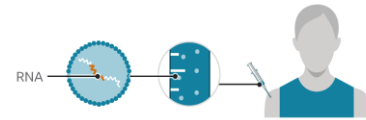
## How vaccines act against several diseases

Vaccines trick the immune system into thinking that an infection has entered the body, but it is only a dead one or a very weak one, so the immune system reacts creating antibodies acquiring this way an immune memory that will allow the body to recognize that infection or virus the next time that a real infection enters the body

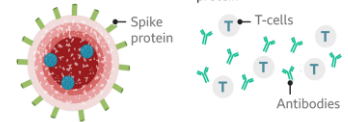
An RNA vaccine consists of an **mRNA strand** that codes for a disease antigen. So the cells use this genetic information and antigens distributed in the cell surface so they are recognised by the immune system.

### How an RNA vaccine works

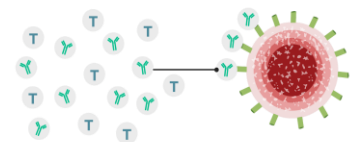
- 1 Scientists take part of the virus's genetic code and turn it into a vaccine that is injected into the patient



- 2 The vaccine enters the cells and tells them to produce the coronavirus spike protein
- The body's immune system reacts, produces antibodies and activates T-cells to destroy cells with the spike protein



- 3 If the patient later catches coronavirus, the antibodies and T-cells are triggered to fight the virus



Source: BBC NEWS

Source: Nature

BBC

## Importance of the vaccines in the health of the population (herd immunity)

Vaccines protect individuals and the whole community alike.

There are people who can't be vaccinated, due to some health issues they suffer. These people can still be protected, if a lot of people in their community are vaccinated, so if the people are immune, the pathogen won't circulate.

That's another reason to vaccinate, the more people who are vaccinated, the more protected the whole community is. This concept is called **herd immunity**.



A vaccine protects an individual...



Community vaccination protects the whole community, even those who can't vaccinate.

## Conclusion

Overall, the project was difficult to carry out because we had to search for a lot of information and clarify our ideas. We also had to work well as a team, all the time fearing to be confined but the topic we chose was ideal to continue doing the project even if this should happen and this was a key point.

Regarding to our topic, we mainly have focused on how vaccines trigger the immune system, because this way, we can show people that vaccines are not harmful to the population.

It has also been very important to discover the different kinds of vaccines that we can find in the market and their manufacturing process.

We would also like to encourage people to take part in the mass vaccination campaigns that are being carried out as this is the only way to protect us as a society. Maybe, we could have done something different, but we thought that this was more interesting and with this project, we could also help the people.

Besides, the time we had was limited and we were rushing to get everything in time. If we had more time we could have improved some details.

In conclusion, our main difficulties were the lack of time and the large investigation this project carried. But, as we work well as a team we managed to complete all of our tasks and we are proud of our work.

## Acknowledgements



Thank you all for taking the time to see our work, thanks to our mentor Itziar Urizar that helped us, thank you also to our teacher, Zorione, that helped us a lot to organize all the work and help us when we didn't know how to continue.

Thanks also to ZIENTZIA AZOKA for giving us a second opportunity, as last year we couldn't finish our project due to the COVID-19.

Besides, thanks to all the parents, teachers and students that spent time to answer our questions.

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<https://www.youtube.com/watch?v=DCk7LyMslxo>

<https://www.youtube.com/watch?v=5DGwOJXSxqg>

<https://www.youtube.com/watch?v=aONG3AFYMbA&t=9s>

[https://youtu.be/\\_OUIsRjrGI4](https://youtu.be/_OUIsRjrGI4)