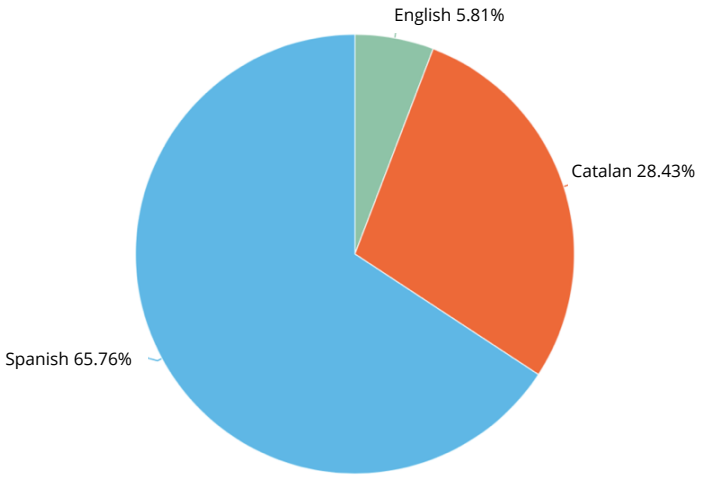
General Population Survey

|The Answers

Antibiotic Resistance Inference Array

GENERAL POPULATION SURVEY | ANSWERS

LANGUAGE

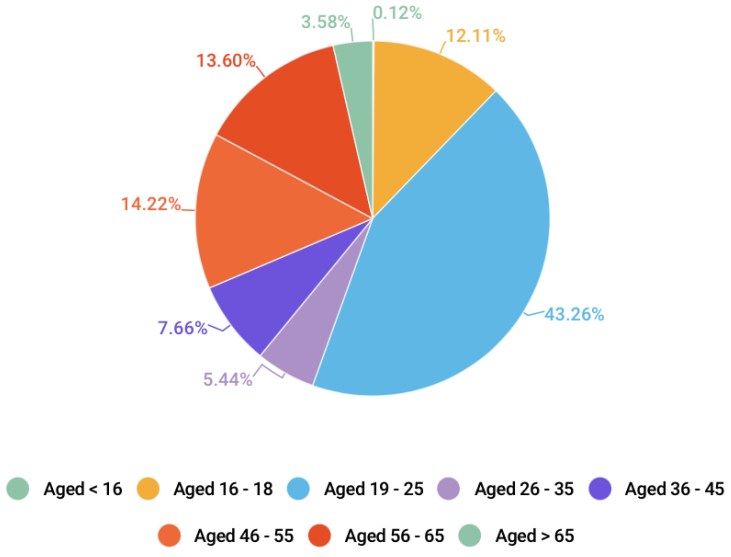


The survey has been answered by **809 people**. The majority, corresponding to a **65.75%,** are **Catalan speakers**, who are a total of 532 people. Another high percentage, **28.43%**, corresponds to 230 respondents who opted for **Spanish**. Only **5.81%** of participants, i.e., 47 people, chose to answer in **English**.

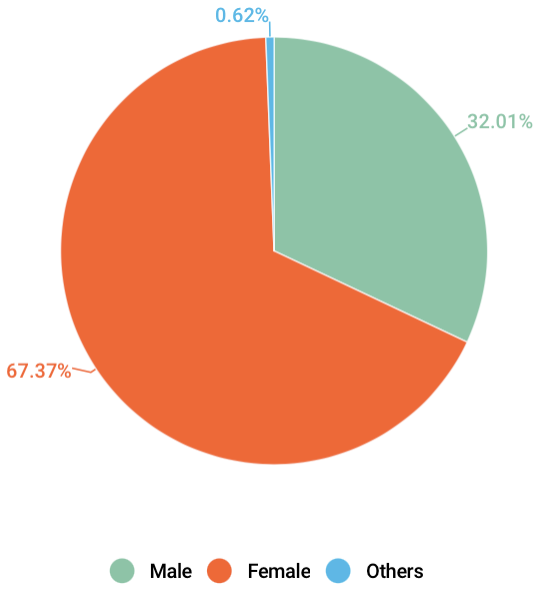
PERSONAL INFORMATION

Age

43.26% of respondents (350 people) are **between the ages of 19 and 25**. Next, the most predominant ages are the age ranges of **46 - 55 years** (115 people), **56 - 65 years** (110 people), and **16 - 18 years**, with **14.22%**, another **13.60%** and **12.11 %** (98 people), **respectively**.



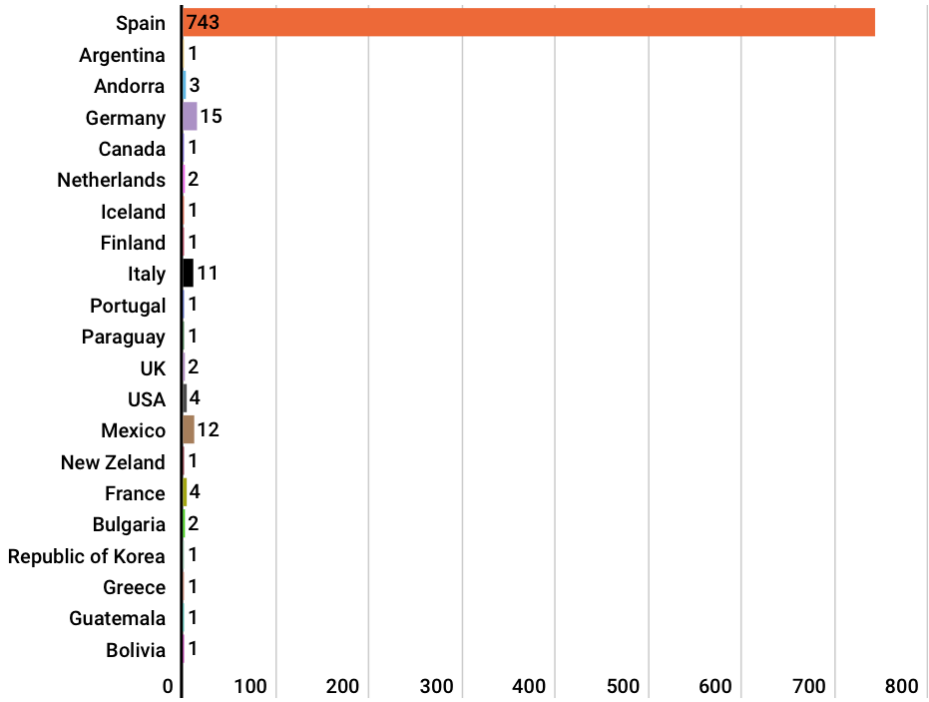
Gender



259 of the respondents identify with the **male gender**, **542** do so with the **female gender** and **5** with **other genders**.

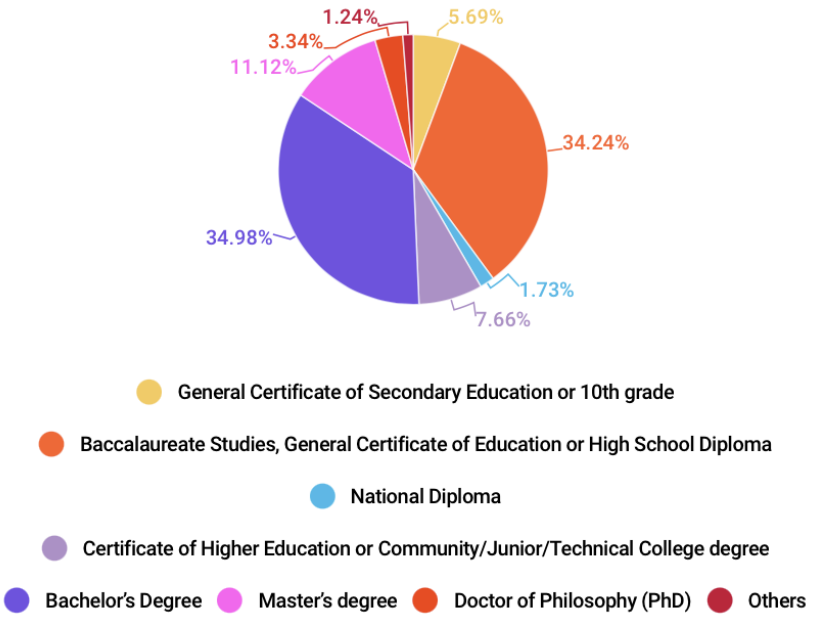
Country of residence

Almost the total number of respondents, **743 people**, live in **Spain**, and at least up to **66** responses have been received from **people living abroad**.

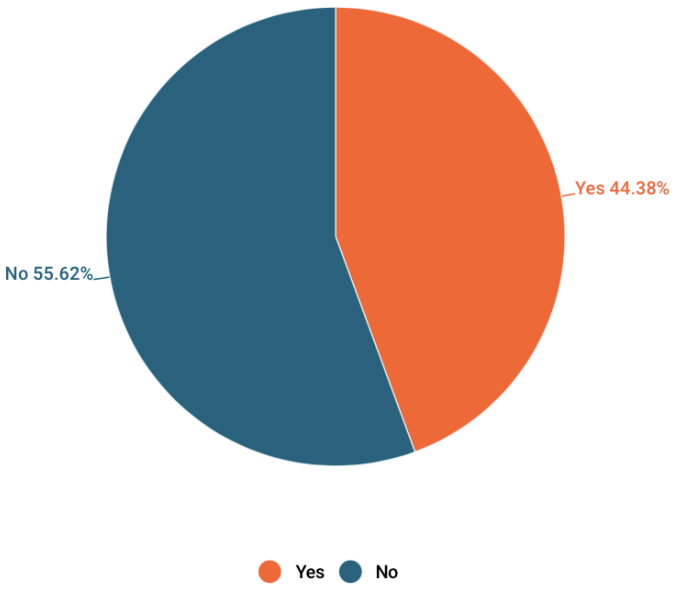


Maximum level of education achieved

There are two predominant groups in terms of the respondents' level of education. The largest number is people who have completed a **bachelor's degree**, which consists of 283 people **(34.98%)**. The second largest group is students who have completed **baccalaureate** studies, a total of 278 people **(34.24%)**.



Student or professional related to health sciences

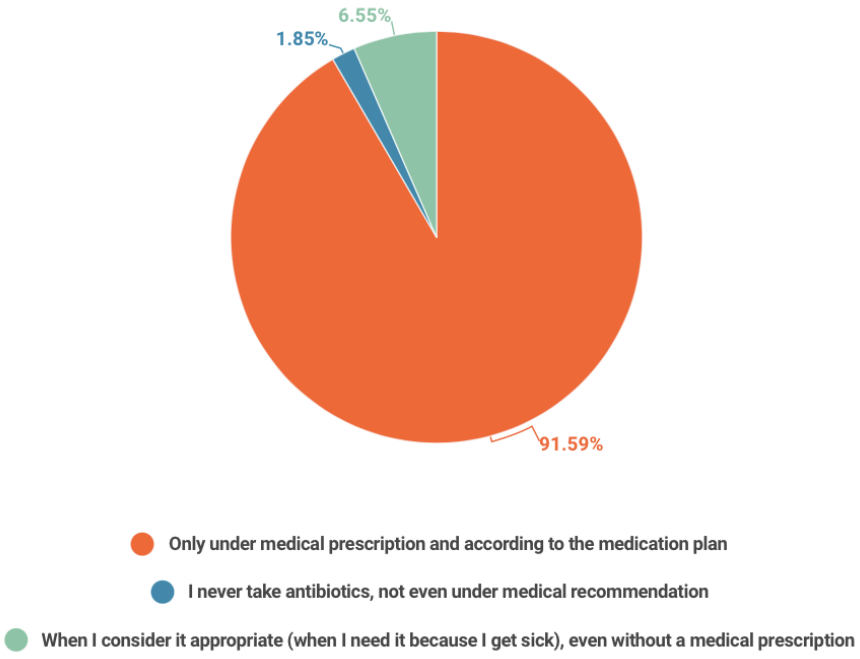


In this case, the percentages are quite tight. **55.62%** of respondents (450 people) do **not** study or work in the **scientific field**, **while 44.38%** (359 people) **do**. Given that in many of the academic curricula of scientific degrees, notions of microbiology and/or infectious diseases are given, we wanted to find out if there was a correlation between this fact and the general knowledge of **antibiotic resistance (AR)**.

ANTIBIOTIC RESISTANCE-RELATED QUESTIONS

1. How often do you take antibiotics?

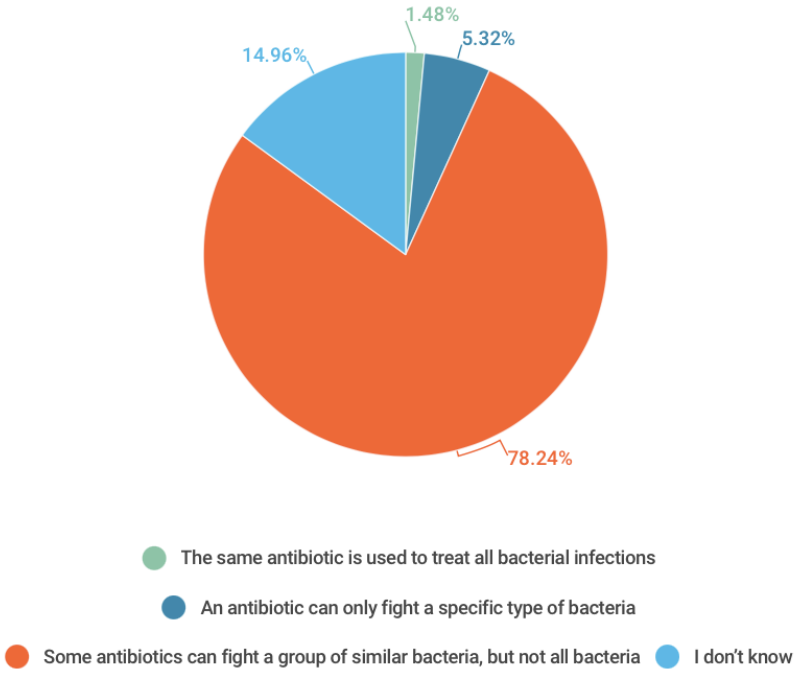
91.59% (741 people) of the respondents state that they take antibiotic drugs only **under medical recommendation**, which is a preventive factor against antibiotic resistance [1]. At least **6.55%** of respondents, equivalent to 53 people, take them **without a prescription**. This is problematic because they can take antibiotics in cases where there is no infection; they can take antibiotics that are not specific for the bacteria that cause the infection; or they can abuse broad-spectrum antibiotics. This misuse of antibiotics is a factor that favors the emergence of AR [2].



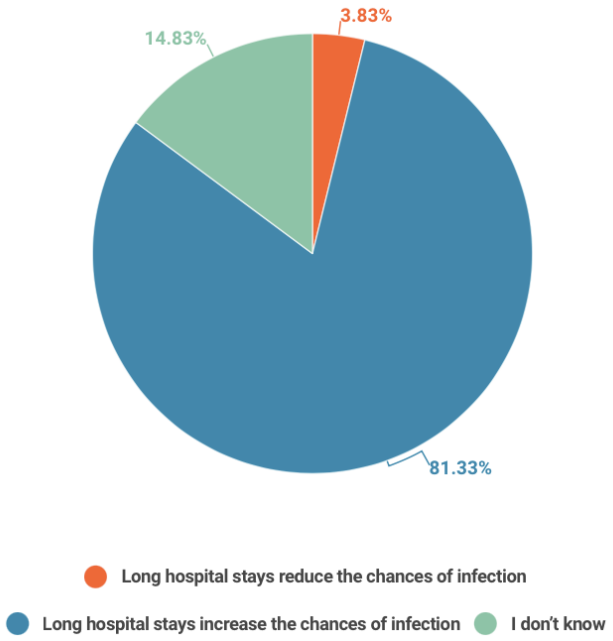
2. Is the same antibiotic used to treat different bacteria?

78.24% of respondents (633 people) voted for the option **'Some antibiotics can fight a group of similar bacteria, but not all bacteria'**, which is in fact correct, and refers to **broad-spectrum antibiotics**. On the other hand, **5.32%** of respondents, i.e., 43 people, have chosen the option **'An antibiotic can only fight a specific type of bacteria'**, which is also true if we refer to **specific antibiotics [3]**. However, this option excludes broad-spectrum antibiotics.

121 people, **14.96%**, admit **not knowing the answer** to the truth. **1.48%**, corresponding to 12 people, think that **the same antibiotic can be used to treat all bacterial infections**. This is incorrect, as not even broad-spectrum antibiotics can be effective against all bacteria.



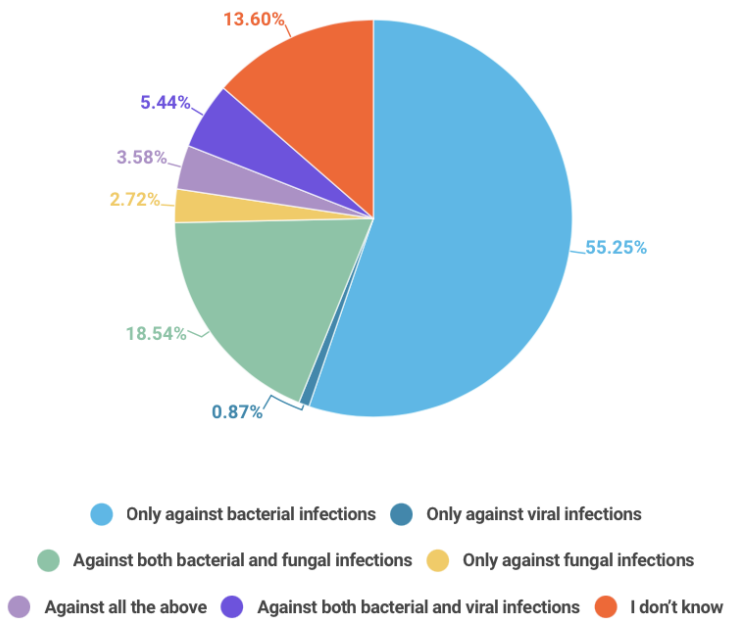
3. Do long stays in the hospital increase the chances of infection or reduce them?



Long-term hospital stays lead to more chances of infection due to exposure to pathogens and because of the causes of admission that usually lead to a more immunosuppressed system. It is estimated that each day of hospitalization increases the chances of infection by 1.6% [4]. Infections acquired during hospitalization are the so-called nosocomial infections and are a predominant cause of death worldwide. Of the patients admitted to hospitals for causes other than infections, 8.4% of them end up contracting a nosocomial infection during their admission [5].

This was stated by **81.33%** of respondents, 658 people. At least **3.83%**, 31 people, mistakenly believe **the opposite**, that long stays in the hospital reduce the infection. 120 people say they do **not know the answer**, equivalent to **14.83%** of respondents.

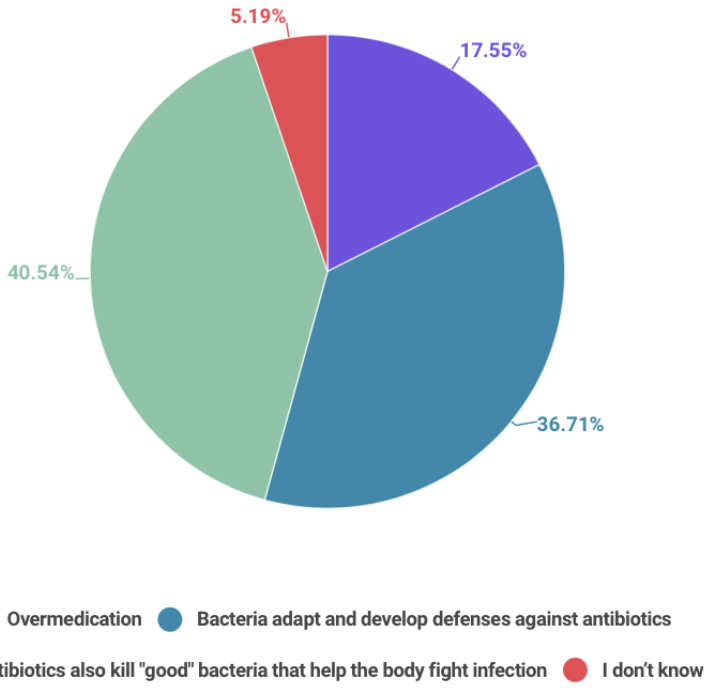
4. Do antibiotics work against bacterial, viral or fungal infections?



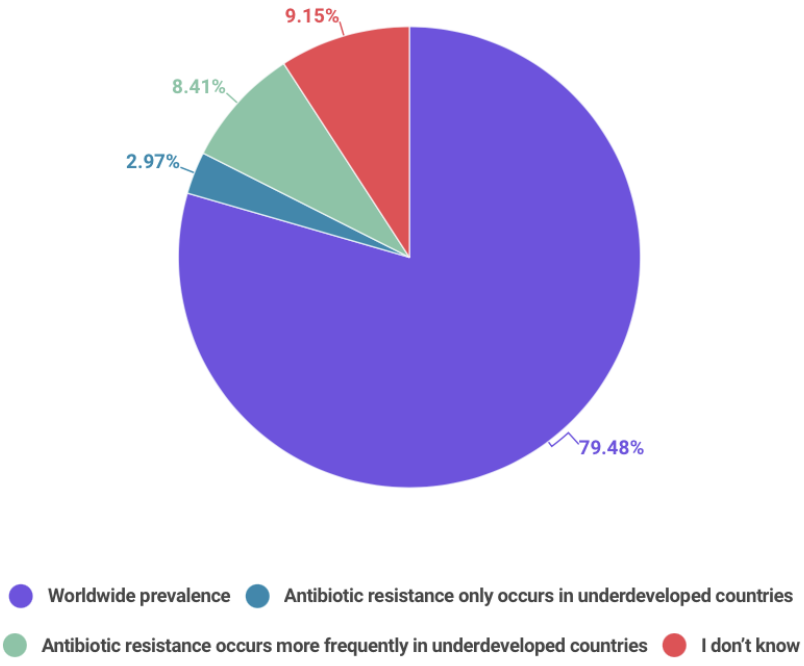
Antibiotics are specific drugs to fight bacterial infections [2]. This option was chosen correctly by 55.25% of respondents (447 people). At the very least, there is a widespread notion that this is not true, and it is that antibiotics can also work to treat fungi. It has been the choice of 18.54% of respondents (150 people).

5. People who take antibiotics regularly can develop resistance to antibiotics. What is it due to?

The response that was most welcomed was '**Bacteria adapt and develop defenses against antibiotics'**, with **36.71%** of the total (297 people). At the very least, antibiotic resistance can also occur due to **overmedication** with antibiotics, which has had a reception of **17.55%** (142 people). The answer **'Antibiotics also kill "good" bacteria that help the body fight infection'** is not the cause *per se* of AR, but it can favor it [1][2][4]. This option received 328 responses, **40.54% of the total**.



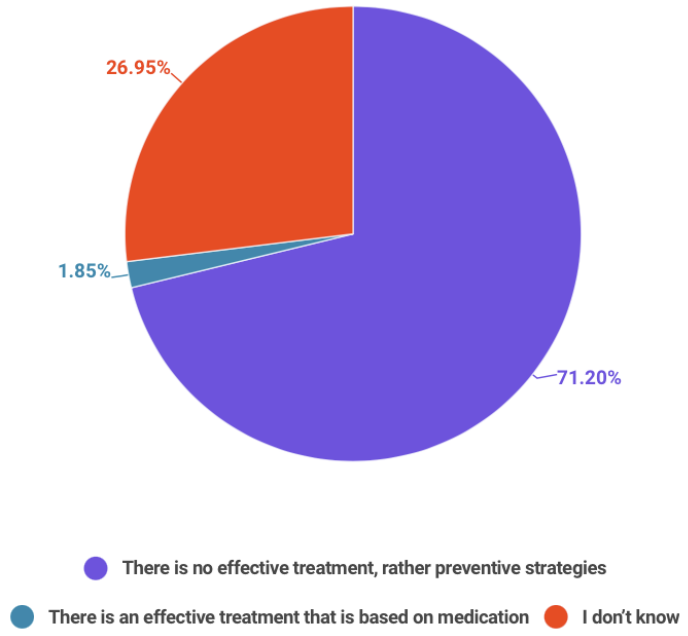
6. Do you think that resistance to antibiotics is a health problem with worldwide prevalence, or that it occurs only in underdeveloped countries?



Most people think that AR is a global prevalence problem, which achieves a **79.48%** of answers (643 people). A 9.15% of respondents do not know the real answer (74 people). The

truth is that there are **no consistent studies of what the differences in prevalence between developed and underdeveloped countries are**, but it is thought the higher availability of antibiotics in developed countries has a direct relationship with risk factors for AR, such as the case with overmedication, which can lead to a higher prevalence in countries with more resources [6].

7. Is there a cure or treatment for antibiotic resistance?

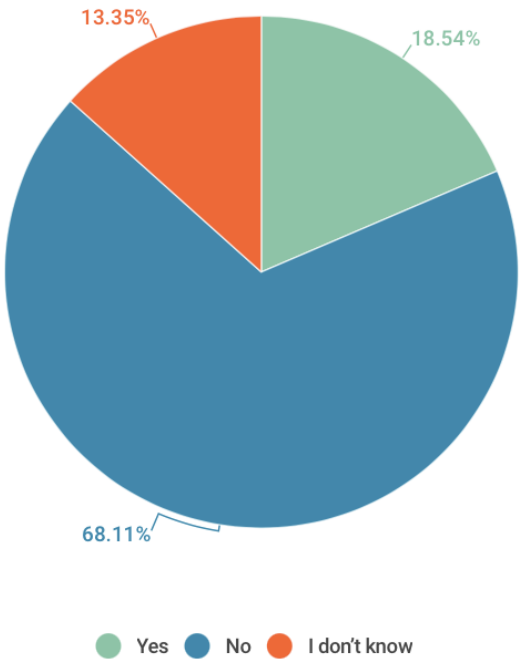


This is one of the questions that presents the highest percentage of 'I don't know', reaching 26.95% (218 people). At least **71.20%** of respondents (576 people) believe that **preventive strategies exist rather than effective treatments against AR**. A 1.85% (15 people) believe that there is a successful medication-based treatment.

The truth is that the treatment to deal with AR will vary depending on the resistance pattern and the state of health of each individual patient. Other types of antibiotics are usually tested, which are more aggressive or broader in scope. At the very least, treatment should be decided carefully because it can lead to even more resistance.

In cases where the resistance is irreversible, if the infection is localized, amputation or removal will be performed if feasible, or palliative treatment will be offered [7].

8. Is antibiotic resistance contagious?



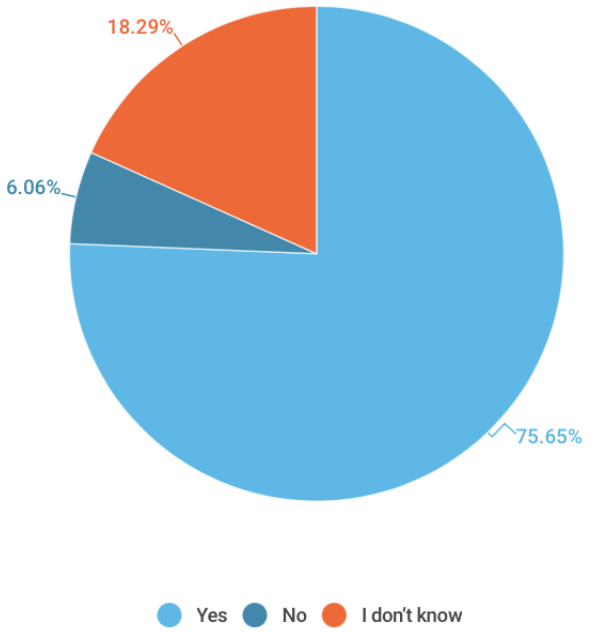
18.54% of the population (150 people) consider AR to be **contagious**. **13.35%** (108 people) **do not know the answer** and **68.11%** (551 people) consider that AR is **not contagious**.

AR is not a contagious factor *per se*. However, we say that a patient suffers from AR when the bacteria in their body become resistant to antibiotics that cease to be effective. What can happen is that one person comes in contact with another person's resistant biological samples, and then these resistant bacteria pass into their body.

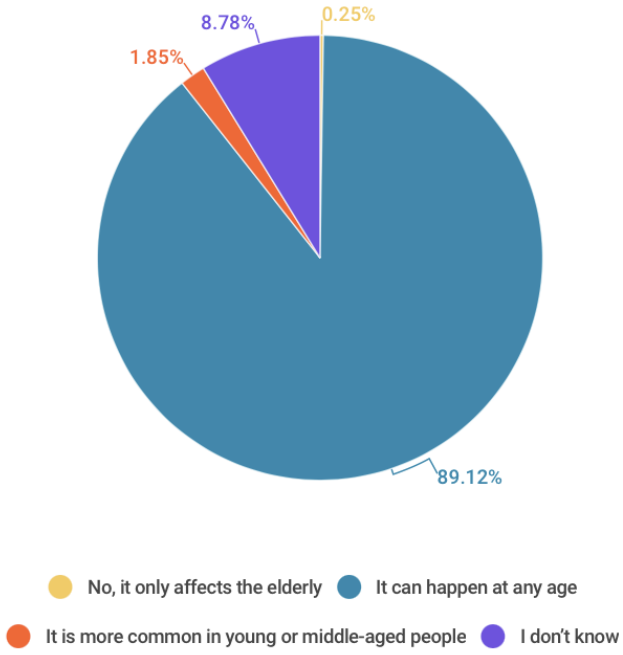
9. Can antibiotic resistance lead to death?

AR is a very serious problem that can lead to death, which **75.65%** of respondents (612 people) believe. In contrast, **18.29%** of them (218 people) are **unaware** that this is a reality and **6.06%** () 49 people) say that AR does **not cause death**.

The reality is that AR can be lethal. In the United States alone, it is believed to cause more than 35,000 deaths each year [8].



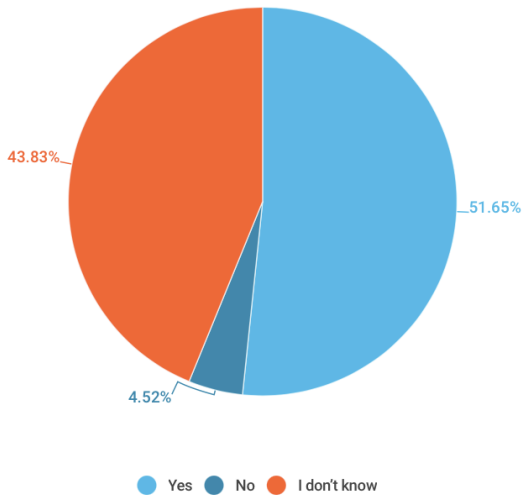
10. Can antibiotic resistance affect people at any stage of life?



AR does not depend on age, **although it can be a factor that harms or favors the conditions of the patient who suffers from it**. **It can happen at any age**, as **89.12%** of respondents (721 people) correctly believe. At least in some cases, it has been observed that in people aged 71 to

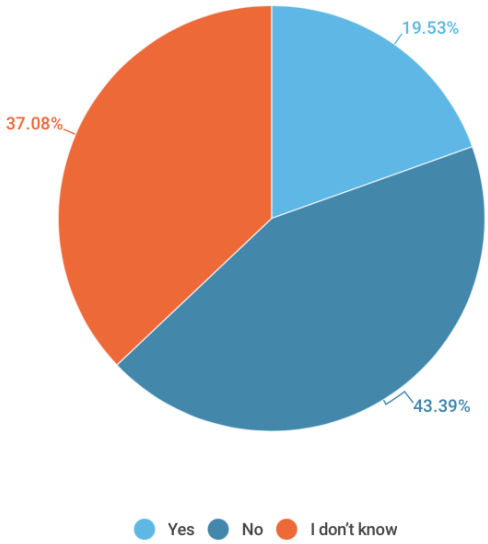
80 it is more common [9], perhaps due to the longer use of medication and the parasitic force of bacteria.

11. Do you think antibiotic resistance can arise from food?



This is the first question with the highest percentage of '**I don't know**', a **43.83%** (252 people). There are **51.65%** "**Yes**" answers (297 people) and **4.52%** "**No**" answers (26 people). The truth is that AR can come from food; especially from contact with **food in poor condition** [10].

12. Can antibiotic resistance be inherited?



This is the second question with the highest percentage of '**I don't know**', reaching **37.08%** (300 people). This is surpassed by **43.39%** of '**No**' answers (351 people). The '**Yes**' has a percentage of **19.53%** (158 people). The truth is that a certain **genetic predisposition** to AR can be inherited.

GENERAL CONCLUSION

In most cases, a correlation has been observed between the number of correct answers and the respondents who are students or workers in the scientific sector, since they answered more general knowledge answers correctly than the respondents not related to science careers. We also see many responses belonging to the option "I do not know." We believe that this lack of knowledge affects attitudinal behaviors, such as the misuse of antibiotics. In fact, people who abuse or do not take antibiotics even under a medical prescription tend to select the "I don't know" option. This fact reaffirms our belief that it is necessary to establish bridges of knowledge between science and society. Information can be a very useful tool in the fight against antibiotic resistance.

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