MOROCCO

THE RISK PERCEPTION SURVEY QUESTIONNAIRE REPORT IN EL JADIDA, MOROCCO

2023

THE RISK PERCEPTION SURVEY QUESTIONNAIRE REPORT IN EL JADIDA, MOROCCO

University of Chouaib Doukkali

Morocco

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ACRONYMS AND ABBREVIATIONS PAGE

EU DG ECHO: European Civil Protection and Humanitarian Aid Operations

HCP: High Commission for Planning

ICG: Intergovernmental Coordination Group

IOC-UNESCO: The Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization.

NEAMTWS: North-East Atlantic, Mediterranean Tsunami Warning System

MAP OF THE COMMUNITY

The city of El Jadida located on the Moroccan Atlantic coast is chosen as a pilot city for the CoastWAVE project in Morocco. This city is part of the Doukkala plain, according to the latest official census of the population in Morocco in 2014 (HCP), the city of El Jadida has 194,934 inhabitants. In recent years, the city has undergone a major expansion, the current population is estimated to be well over 200,000 inhabitants.

Map of the community

INTRODUCTION

If Asia seems to be highly exposed to the risk of tsunami, this risk should not be underestimated on the Moroccan coast (Atlantic and Mediterranean) because Morocco is located on the northwestern edge of the African plate, which is in continuous movement of approach and collision with the Eurasian plate. This movement makes Morocco a country with moderate seismicity, and knowing that earthquakes are considered to be the first cause of tsunamis, we have tried in this study to develop a risk perception survey questionnaire in order to get a global vision on tsunami governance in Morocco focusing on El Jadida city and attempt to improve knowledge and management of this risk by focusing on the city of El Jadida. Starting from the hypothesis of an insufficient culture of this risk, and wishing to develop it in Morocco, a survey of 457 individuals was established, in order to study the degree of knowledge of the coastal populations, as well as their behavior of spontaneous evacuation in case of perception of a tsunami. If the survey highlights different levels of sensitivity depending on the country, it also underlines the particularities of the Moroccan site. Hence a better knowledge of the tsunami hazard, its best-known signs and a more accurate and nuanced representation of the landscape character of the risk could contribute to a better identification of this hazard.

Within the framework of the Intergovernmental Coordination Group for the North-Eastern Atlantic, the Mediterranean and Connected Seas Tsunami Early Warning and Mitigation System (ICG/NEAMTWS) and IOC EU DG ECHO CoastWAVE Project, IOC-UNESCO is carrying out a survey with selected Member States on the perception of coastal risks and preparedness to tsunami, storm surge and sea level rise to better understand how coastal populations perceive these natural hazards and risks and develop recommendations for enhanced risk communication strategies and products in the region.

The goal of the survey is to improve sea-level-related early warning and mitigation systems and preparedness in Morocco and in other countries from Mediterranean region in order to save lives, reduce losses and damages in the event of a natural disaster of that kind.

In this report we will first of all present the methodology used to conduct the questionnaire and then the results obtained for the city of El Jadida.

SURVEY METHODOLOGY

The methodology used to carry out this work consists firstly in answering a well detailed questionnaire, covering different aspects to understand and analyze the knowledge and expected reactions of people of different age groups in case of tsunamis.

This questionnaire was prepared by ICO UNESCO in full coordination with Chouaib Doukkali University and the other partners of the CoasWAVE project.

The questionnaire is carried out according to the norms for this type of study. It is a semi-direct type questionnaire with clear questions formulated in advance and classified in a logical order by theme. The sample population is chosen to contain different ages, men and women and various physical forms. The working methods ensure that all individuals interviewed will be interviewed under the same circumstances. The results will therefore be easily comparable.

Questionnaire is for people in the education sector (teachers, students etc.) except people under the age of 14, the tourism sector (restaurant-bar, store, and hotel owners, employees of these sectors, guides, etc.), the emergency responders (fire fighters, police, coast guard, civil protection agencies etc.) and the public.

It should be noted that all information provided in this survey is anonymous and confidential. The questionnaire takes about 15 minutes to be completed.

QUESTIONNAIRE :

The questionnaire used contains several sections, of which we mention:

- Awareness/Knowledge
    1. How does the understanding of hazards (its formation mechanisms, characteristics, risks, and impact) vary according to age/educational level /sector?
        a. Risks and impacts ranked as low/moderate/high vs education level, and age.
        b. Is it known/well understood (hazard is, formation characteristics and mechanism, and the impacts vs age, educational level and sector
- Exposure and sense of Exposure
    1. How does proximity to hazards (live or work) determine sense of exposure and action/preparedness to the hazard by age?
    2. What is the age/gender distribution of dependent people in the hazard zone?
- Preparedness and Response

    1. What and how are the levels of concern expressed / understood (Feelings vs Level of preparedness against hazards i.e.concerned but not prepared, concerned, and prepared etc. by age and education level?

    2. What is the level of preparedness vs first reactions to earthquake by age and education level

    3. What is the feeling of safeness across age and educational level towards mandated h governmental emergency responses

- Governance

    1.How do the modes and channels of communication channel used, compared with the level of importance of communication channels vs age, education level and sector

    2. How do people understand role and responsibilities of municipality for preparation to risks of hazards by age, education level and sector

These sections will help to better understand, analyze and propose appropriate scenarios in the event of a tsunami, noting very well the different age groups targeted.

SURVEY IMPLEMENTATION

Field work

The survey in El Jadida city was conducted over three months from November 2022 to January 2023.

In order to cover a broad spectrum of the Moroccan population, the questionnaire was prepared in Arabic and French. The questionnaire is then posted on the web to allow people to respond directly online.

The link shared with the respondent: https://survey.alchemer.eu/s3/90437417/New-Survey

After one month of starting the survey, we have observed that few people have responded to our online questionnaire, which has prompted us to conduct the survey face to face. In order to meet this need a team of fifteen surveyors were trained and mobilised.

The city of El Jadida was subdivided into several sectors in order to interview people from different districts from different working domains.

Data Processing

The answers obtained on paper are then reported on the Alchimer website. A total of 457 responses were collected in El Jadida.

The results of the questionnaire were gathered and organized by Alchemer, online Survey Software, each section responses were analysed as graphics to better understand the governance.

Response Rates

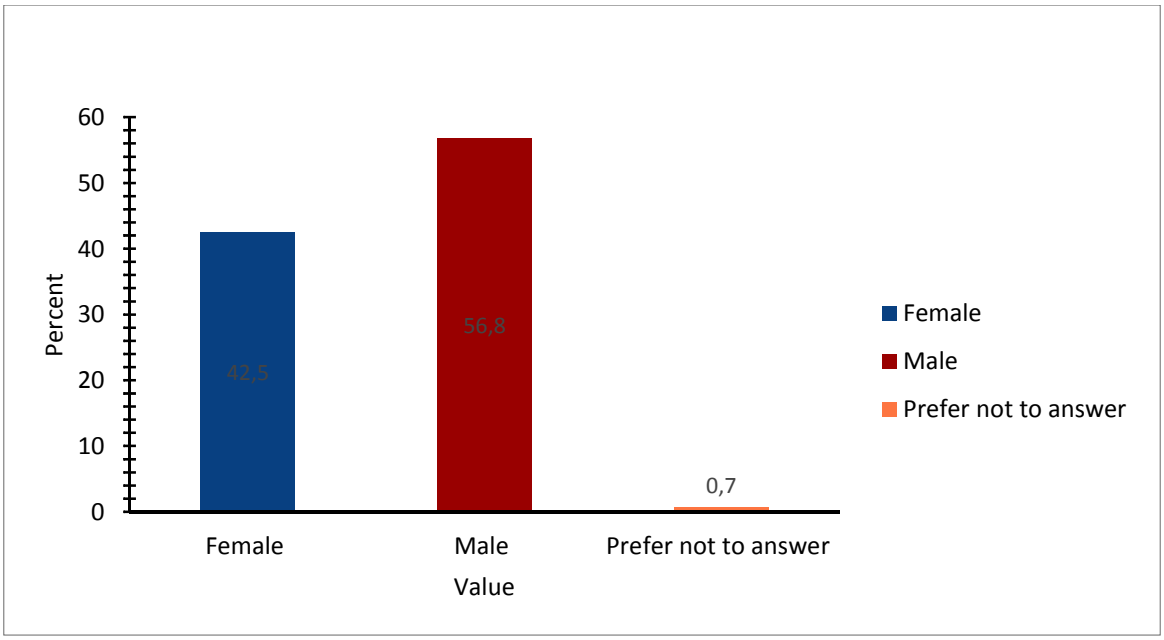
Given that we used a face-to-face survey, the response rate is high, we collected responses from all participants.

RESULTS

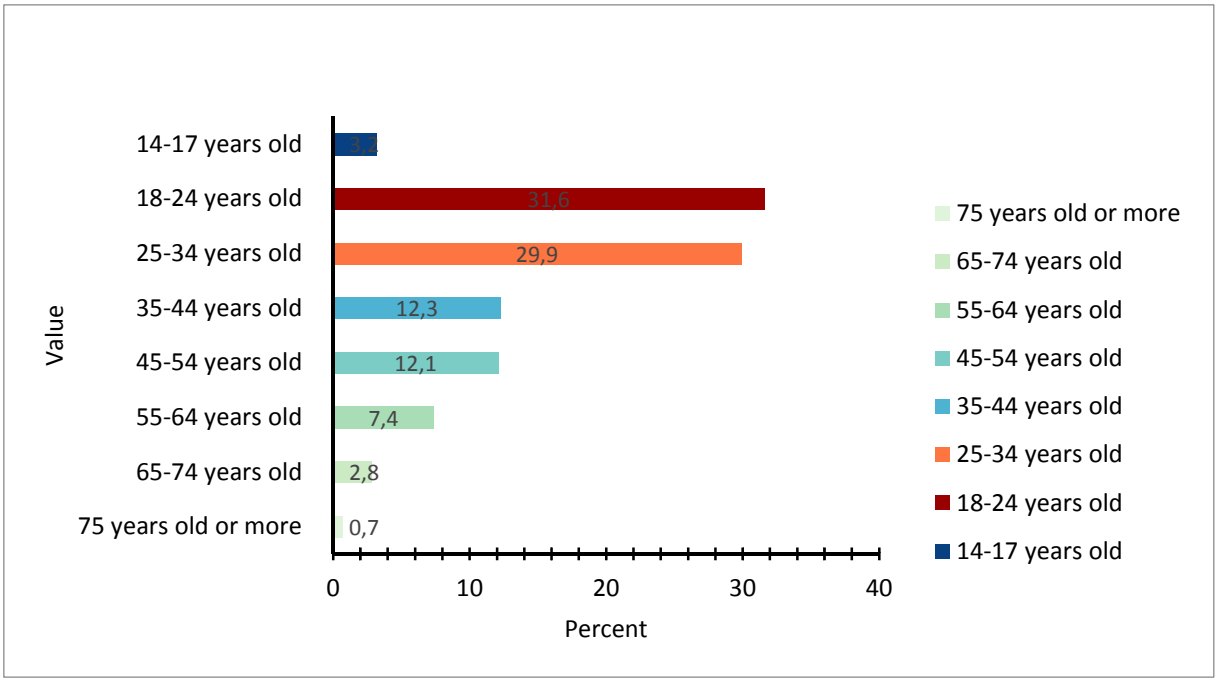
1- Personal Information

All participating people in this questionnaire live in El Jadida, 56.8% men and 53.2% women. The age varies between 14 to 75 years, with a majority of young people between 18 and 34 years. This shows that the most active population in El Jadida and which replied positively to our request to answer the questionnaire are the young people.

Living place of the people participating in the questionnaire

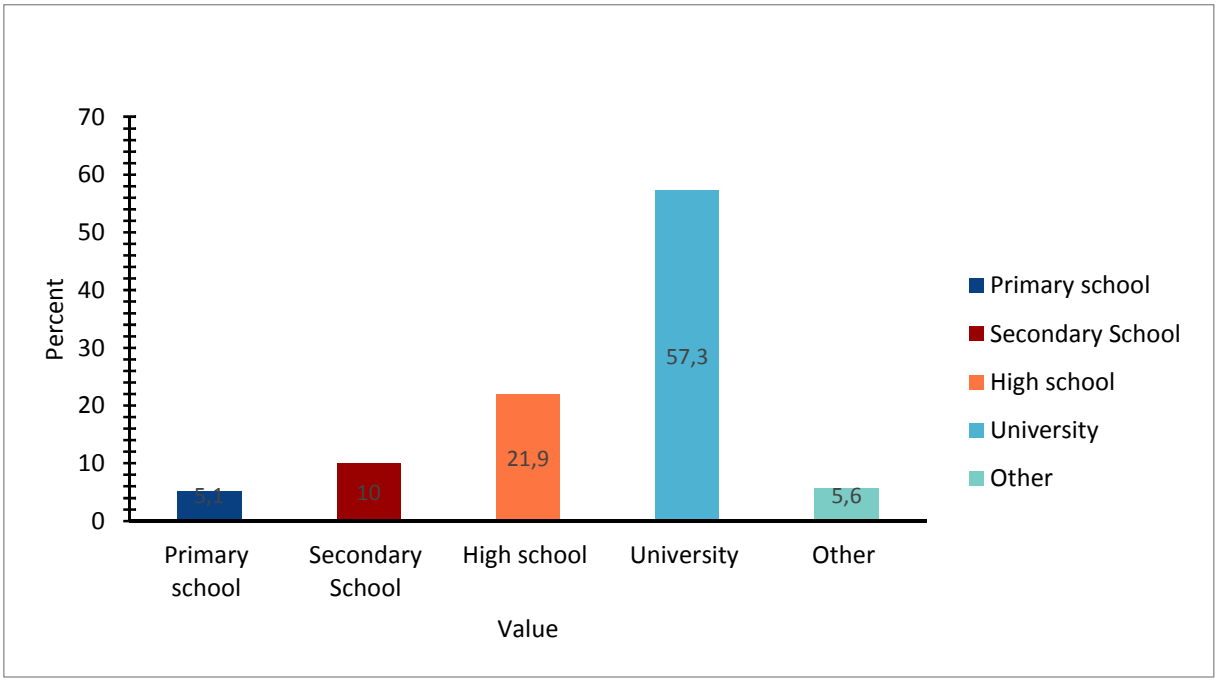


Gender of the people participating in the questionnaire



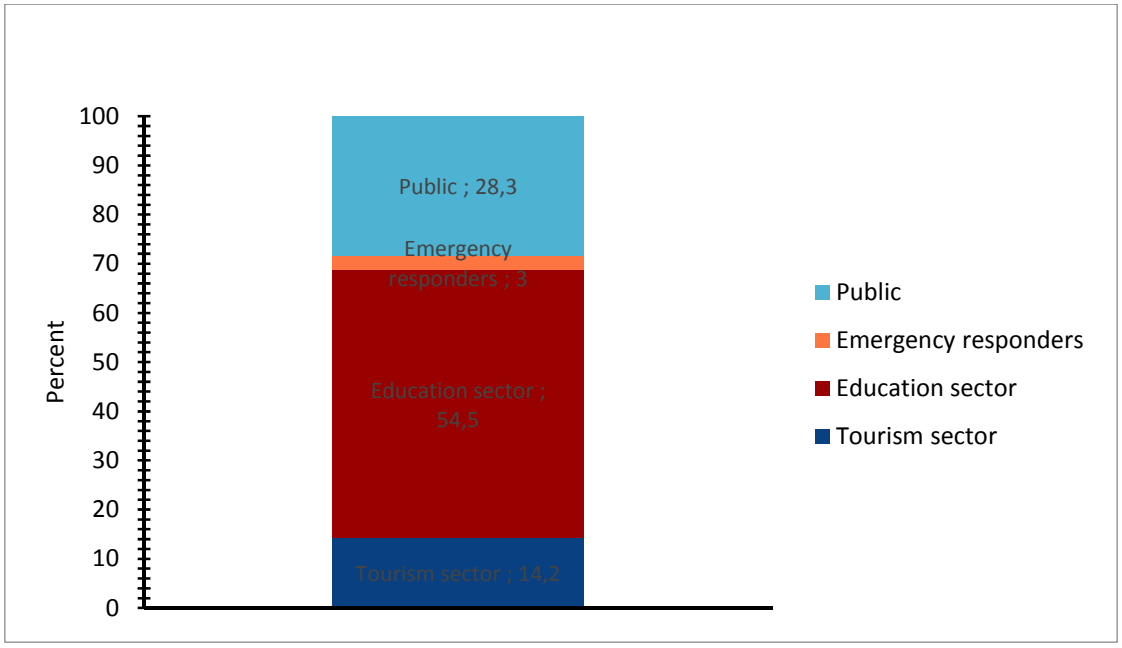
Age of the people participating in the questionnaire

The people who participated in this survey are from different educational backgrounds, with a dominance of university-level. This shows that the population that gave interest to our survey are people with a high level of education.



Highest level of school completed

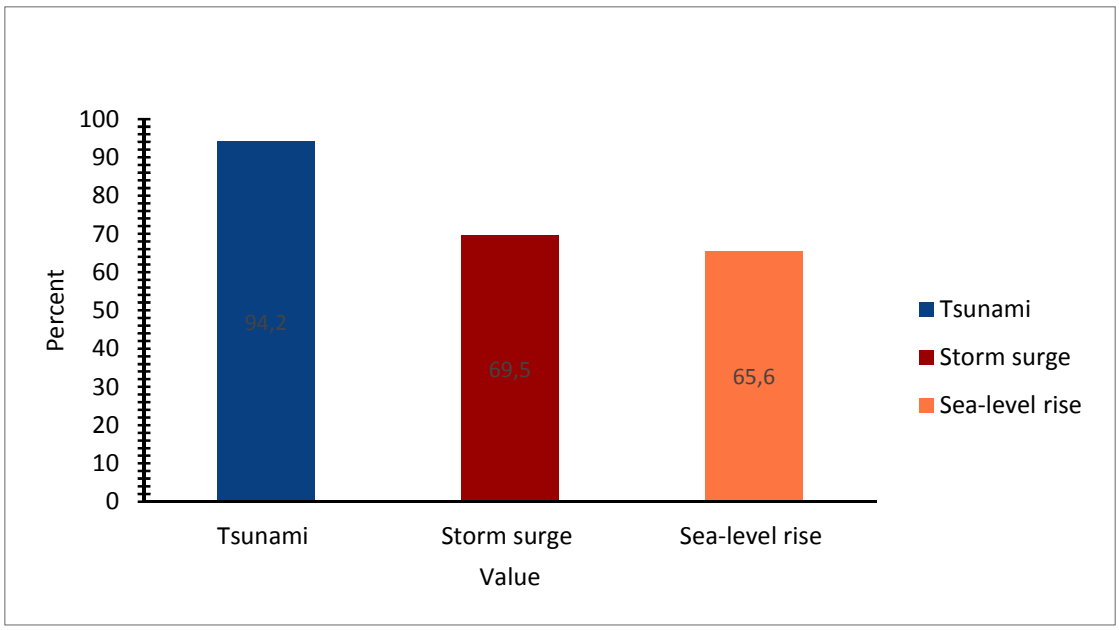
The survey has been covering all the social categories existing in El Jadida, with a majority of the education sector followed by the mass public, the tourism sector and finally the emergency actors.



Sectors of people participating in the survey

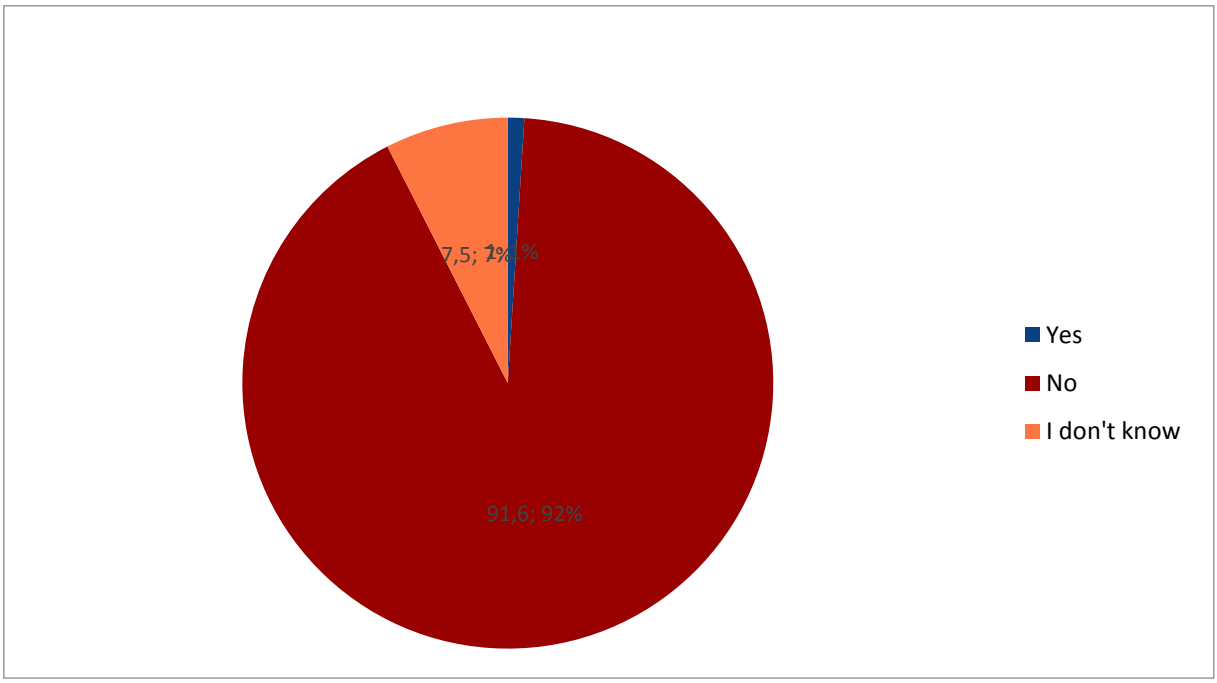
2- Awareness/Knowledge

From the survey results, it seems that 95% of people have already heared about tsunami hazard, but also more than 65% of respondents have already heard about storms and sea level rise. These results show that the population of El Jadida is hearing of the different coastal risks.

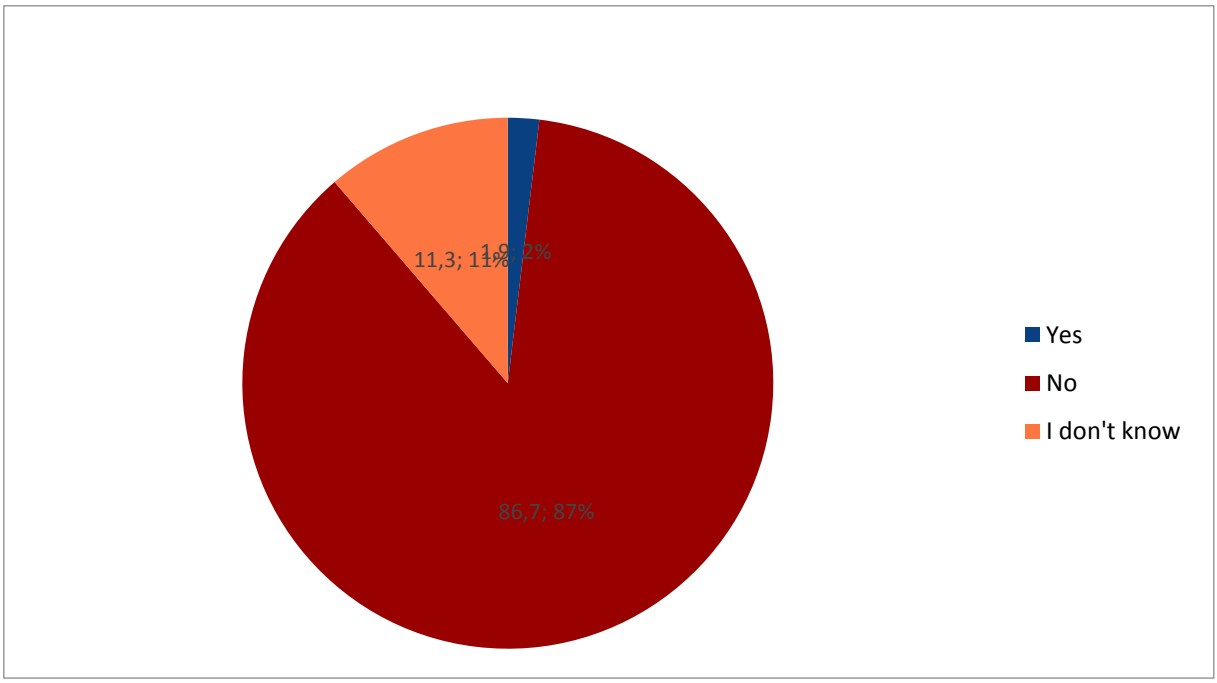


Hearing about coastal risks

The results show that the majority of El Jadida people have never experienced a tsunami or storm surge.



Tsunami experience



Storm surge experience

The table below shows the causes of the tsunami according to the survey results. These results show that the population confuses the causes of tsunami with the causes of other coastal hazards.

Response
earthquake
Marine earthquake
Global warming
Plate tectonics (earthquake)
Flash flooding of the mainland due to rising sea levels
Cyclonne
Volcanos
Mid-ocean ridge earthquake
tectonic wave
strong swell
natural disasters
Pollution
Tides
Underwater pressure
Earth disequilibrium and volcanoes
Water current
Sea level rise
Storm
Climate changes
Melting ice
Heavy rainfall
Hazard, risk
I don't know

The causes of Tsunami

Furthermore, the results obtained in the following table presenting the causes of storm surges show once again that the majority of the population of El Jadida confuse the causes of storms with other causes of coastal hazards.

Response
Changes in atmospheric pressures
Global warming and pollution
Strong winds of a cyclone
Winds
Earthquake wave under the sea
Pressure pushing water
Typhoon
Warm air flow from the sea and cold air flow from the land
Weather conditions
Storm
Cyclonne
Climate changes
Heavy rainfall
Coastal erosion
oceanic current
Pollution
Earthquake
Sea level rise
Bad weather
Plate tectonics (earthquake)
Climatic factors
Contact between warm and cold air
Pressure
Oceanic circulation
I don't know

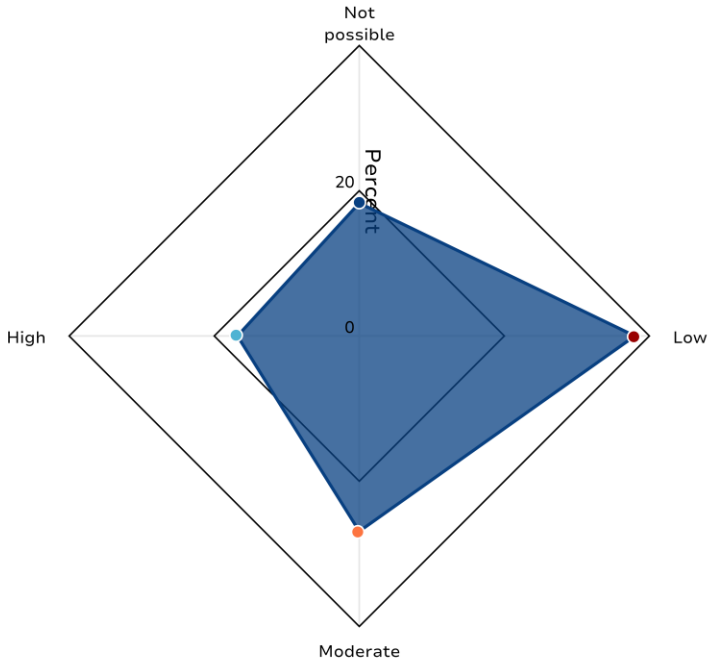
The causes of storm

According to the results of the table below which presents the causes of sea level rise, a large part of the population of El Jadida have linked this phenomenon to the increase in the temperature of the earth, but on the other hand many people confuse the causes of different coastal risks.

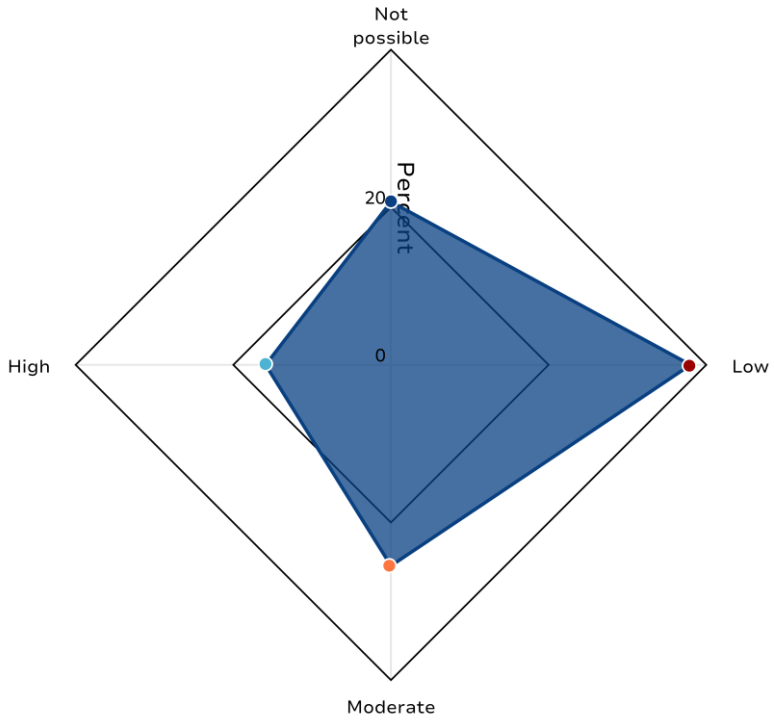
Response
Melting ice caused by global warming
Global warming and pollution
Global warming
Climate changes
Unusual wave height due to the storm surge or to an earthquake under the sea, which can lead to a tsunami.
Movement of the moon
Tornadoes
Alignment of the sun and moon
Tides
Thermal expansion
Winds
Earthquake
Storm
Heavy swell
Weather conditions
Coastal erosion
Volcanoes
Pollution
Greenhouse gases
Rainfall
Tide
Increase in temperature and pressure
I don't know

The cause of sea level rise

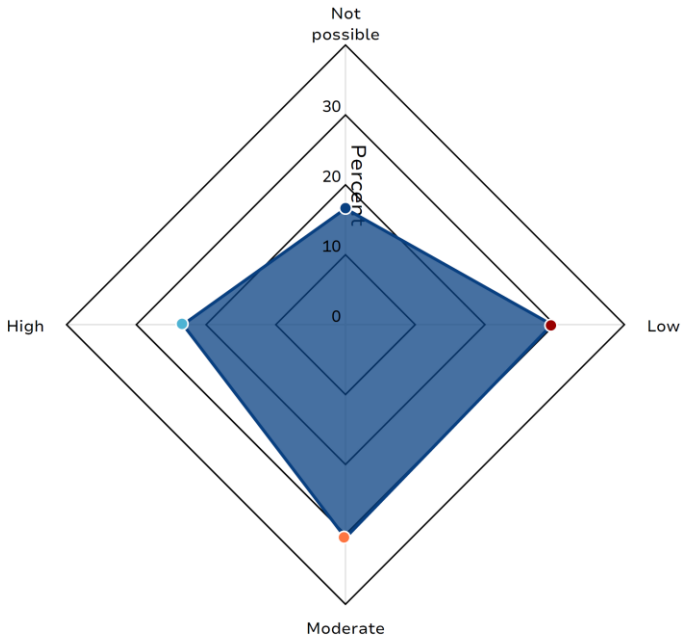
Responses on the likelihood of coastal areas in the Mediterranean can experience a tsunami, storm surge or sea level rise (See Graphics below) in the next 10 years were almost the same with a high percentage for low likelihood or not occurring.



How likely the coastal zones of the Mediterranean region can experience a tsunami in the next 10 years

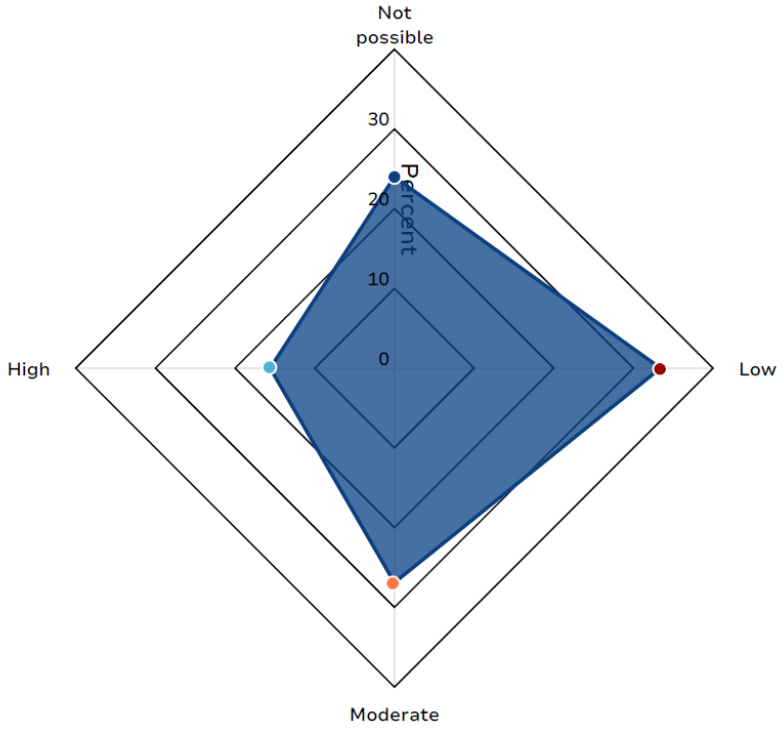


How likely the coastal zones of the Mediterranean region can experience a storm surge in the next 10 years

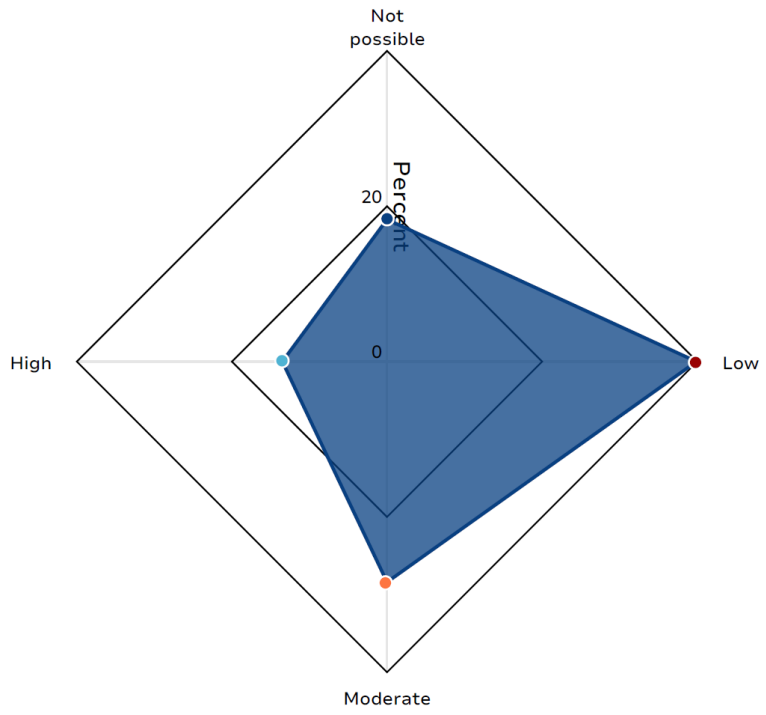


How likely the coastal zones of the Mediterranean region can experience a sea level rise in the next 10 years

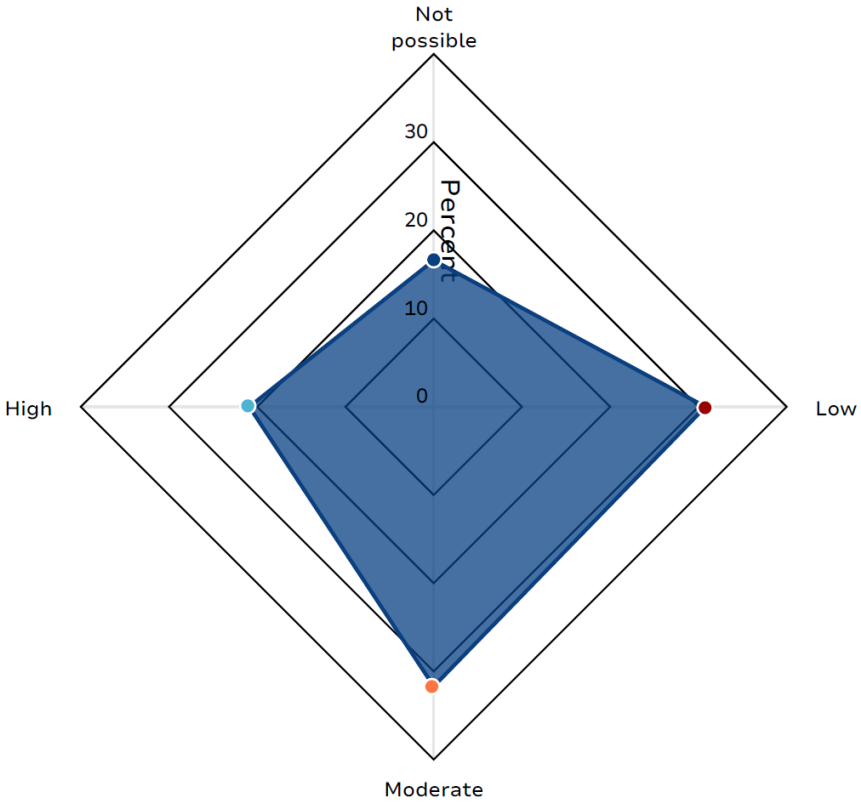
Responses on the likelihood of the coastal areas of El Jadida being faced with a tsunami, storm surge or sea level rise (See Graphics below) in the next 10 years were almost the same with a high percentage for low likelihood or not occurring. The percentages of responses are very close for all types of risk, which shows that the local population confuses the different coastal risks.



How likely the coastal zones of El Jadida can experience a tsunami in the next 10 years



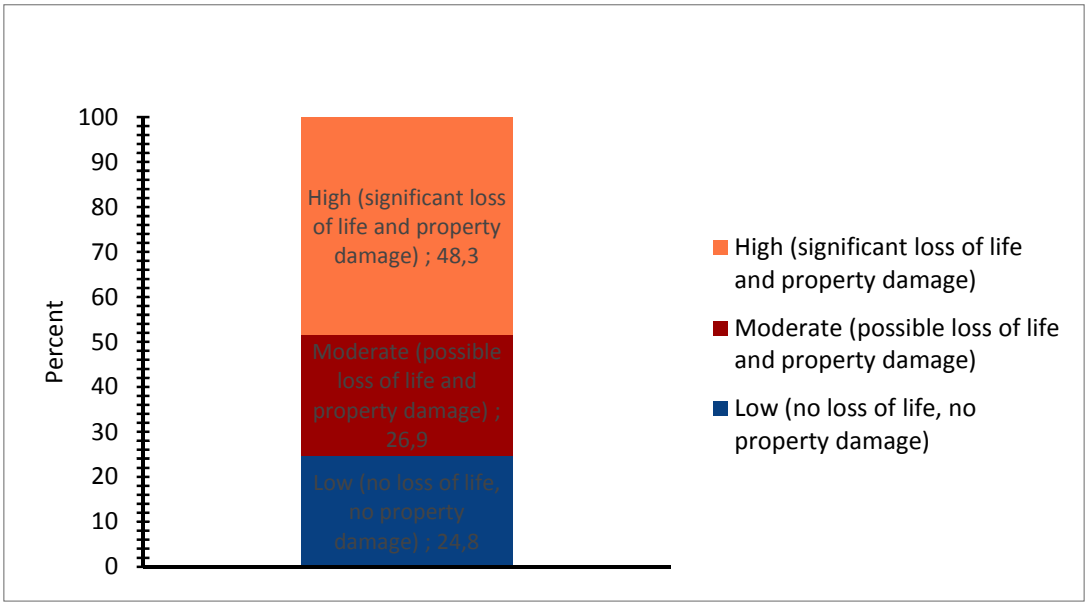
How likely the coastal zones of El Jadida can experience a storm surge in the next 10 years



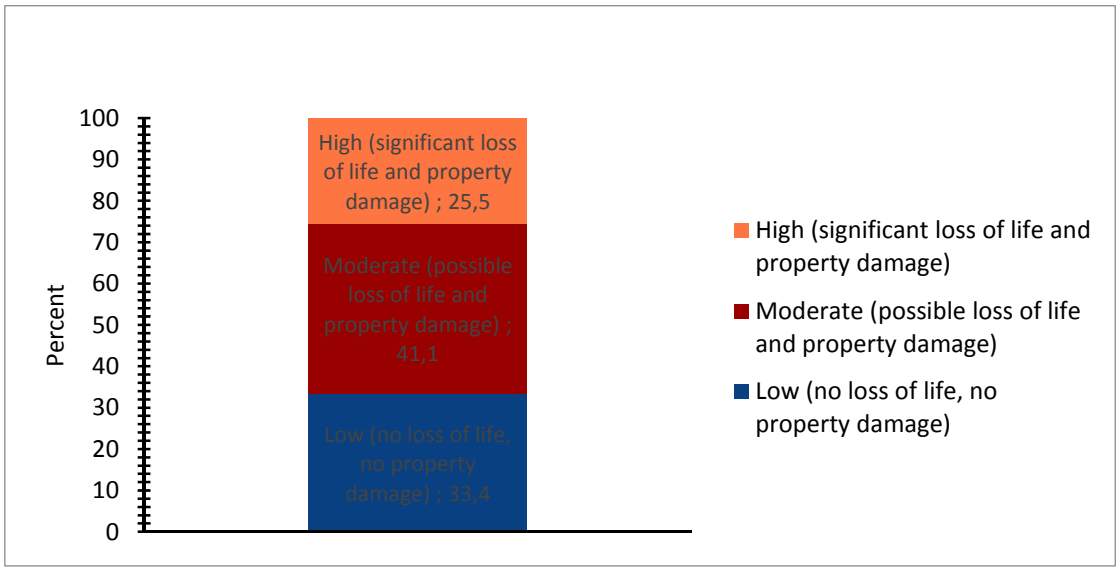
How likely the coastal zones of El Jadida can experience a sea level rise in the next 10 years

According to the survey results, the next graphics shows how could be the impacts of the tsunami, storm surge or the sea-level rise in coastal regions of the Northeastern Atlantic and Mediterranean.

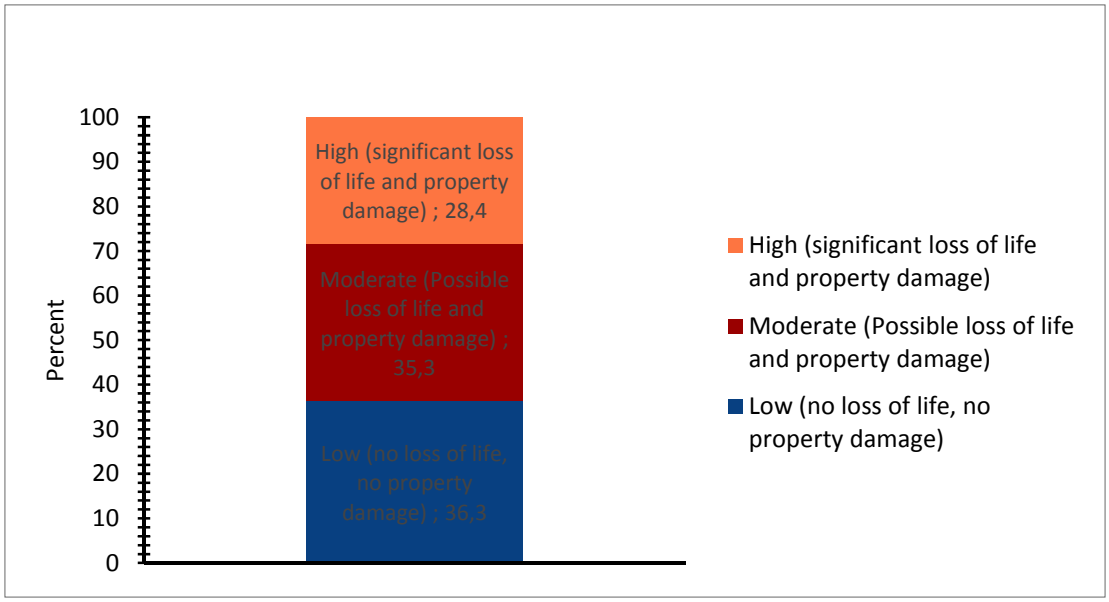
These results show that tsunamis can produce a high significant loss of life and property damage, moderate to low impact of storm surge and low to moderate impact of sea-level rise.



The impacts of the tsunami in coastal regions of the Northeastern Atlantic and Mediterranean according to the survey results



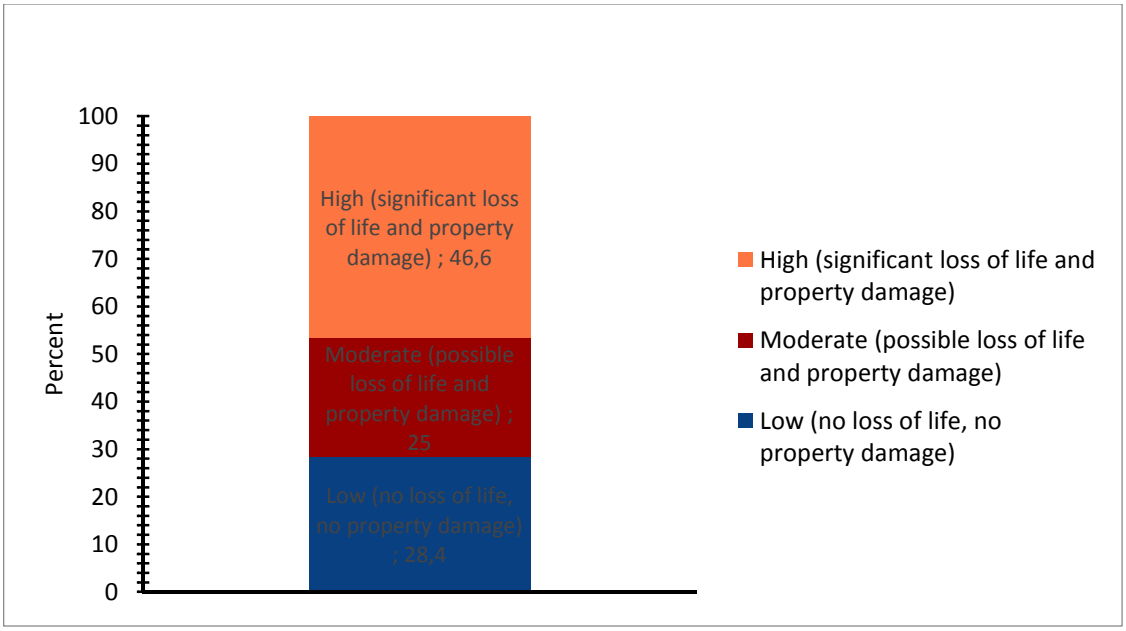
The impacts (loss of lives and property damages) of the storm surge in coastal regions of the North-eastern Atlantic and Mediterranean



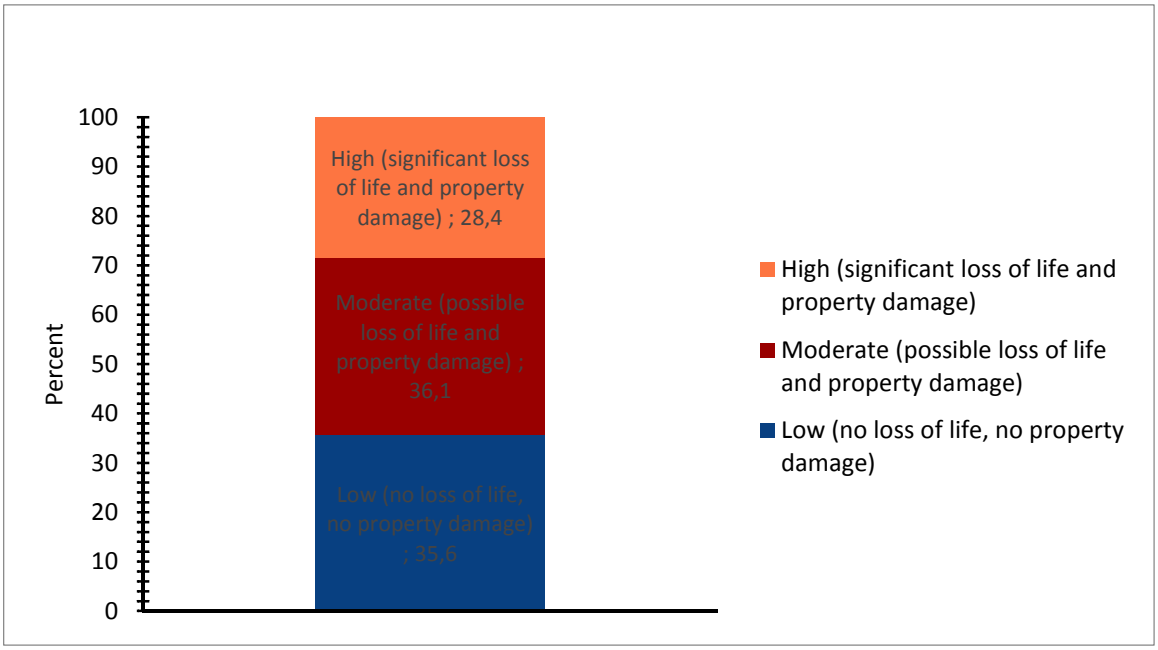
The impacts (loss of lives and property damages) of the sea-level rise in coastal regions of the North-eastern Atlantic and Mediterranean

The next graphics shows the degree of the impacts (loss of lives and property damages) of the tsunami, storm surge or the sea-level rise in coastal regions of El Jadida.

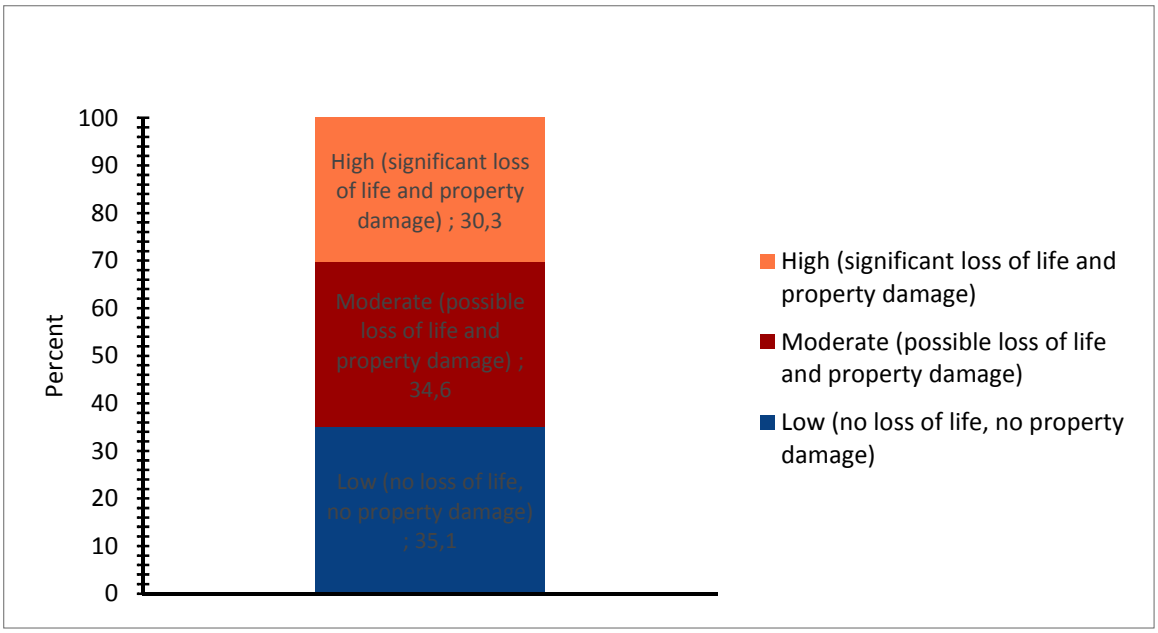
The results obtained are almost similar to those obtained for the Mediterranean region.



The impacts (loss of lives and property damages) of the tsunami in coastal regions of El Jadida



The impacts (loss of lives and property damages) of the storm surge in coastal regions of El Jadida



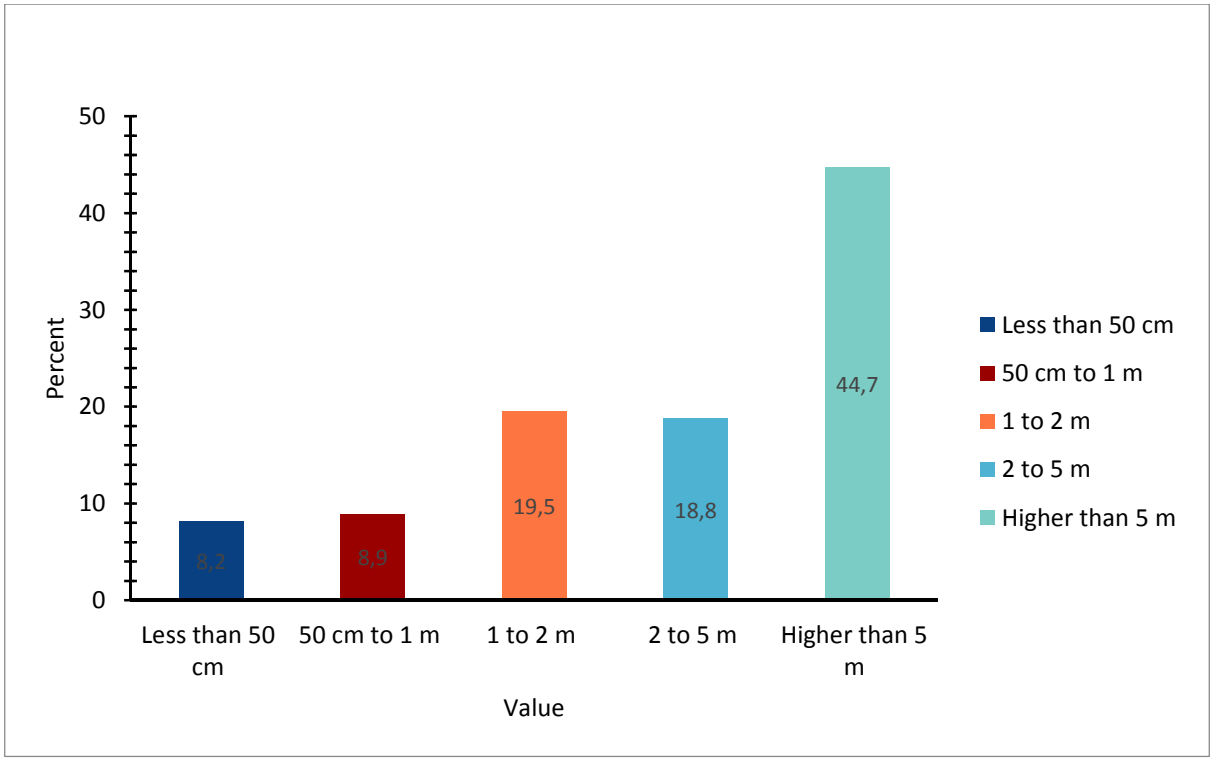
The impacts (loss of lives and property damages) of the sea-level rise in coastal regions of El Jadida

According to the participant, the next tables show the natural signs of a tsunami. The majority of the answers confuse the causes and signs of tsunami, few people answer with a sea retreat as a sign.

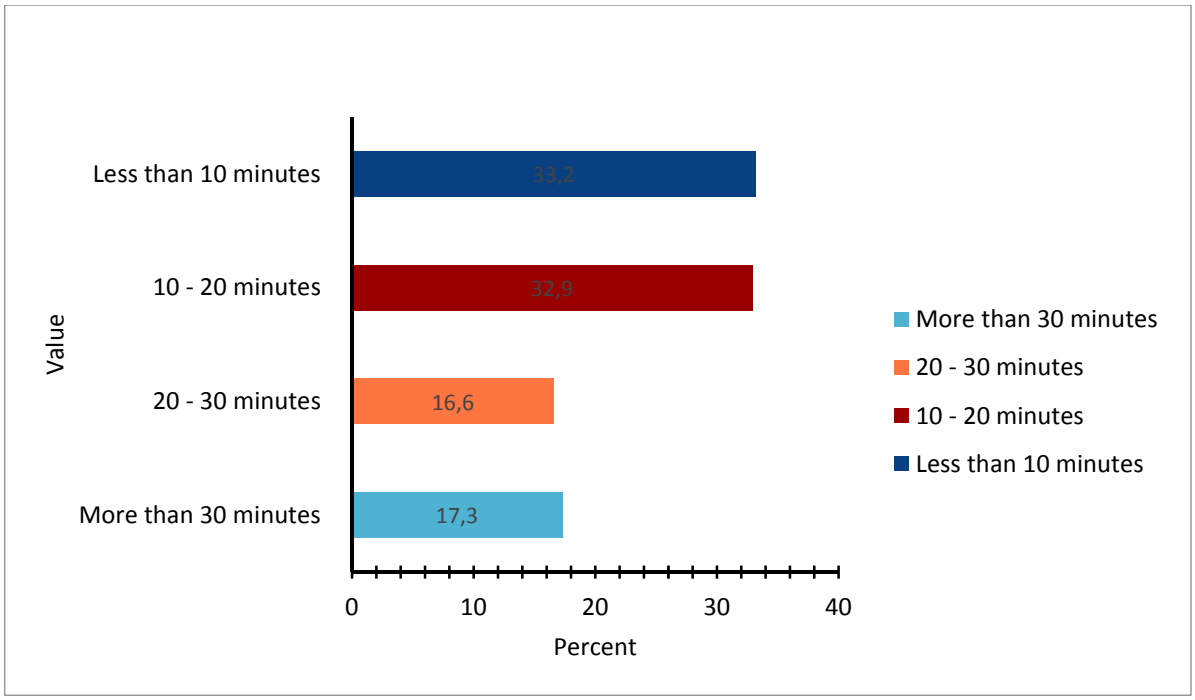
Response
Earthquake
sea retreat
Sea level rise
Tidal surge and very significant sea retreat
Strong Wind
Earthquake/landslide
Earthquake at ocean
Strong waves
Sea too turbulent
Sea retreat/ an unusual noise
Retreat followed by sea rise
Climate change and greenhouse effect
Rapid decrease in sea level
Series of giant waves
Strong earthquake/ heavy rainfall
Birds leaving
Storm
Volcanoes
Climate change
Storms/ meteorology
Storms/ submersion
I don't know

The next graphics show what would be the approximate height of a tsunami that can happen soon (e.g. in the next 10 years) in coastal regions of the North-eastern Atlantic and Mediterranean and how will take for a tsunami to arrive to the coastal region of El Jadida.

According to the survey results, The majority of the answers estimate that the height of the waves generated by a tsunami is close to or exceeds 5 m and that the arrival time of the tsunami in El Jadida is from 20 min to less than 10 min.

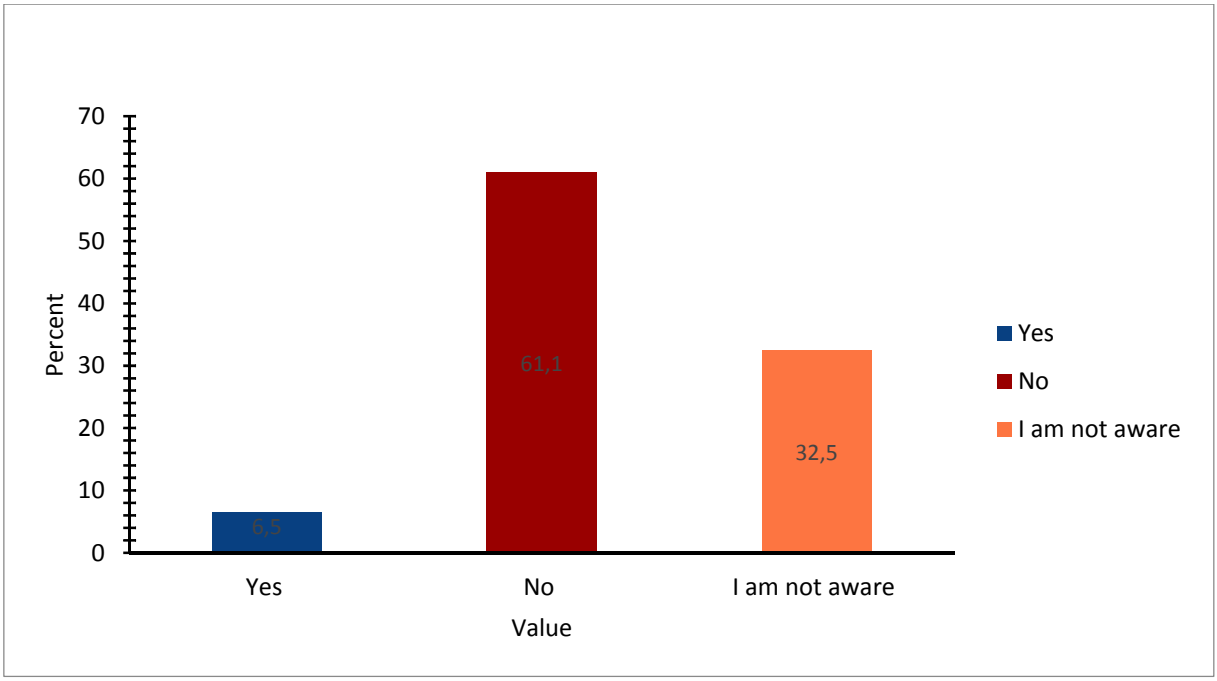


The approximate height of a tsunami that can happen soon

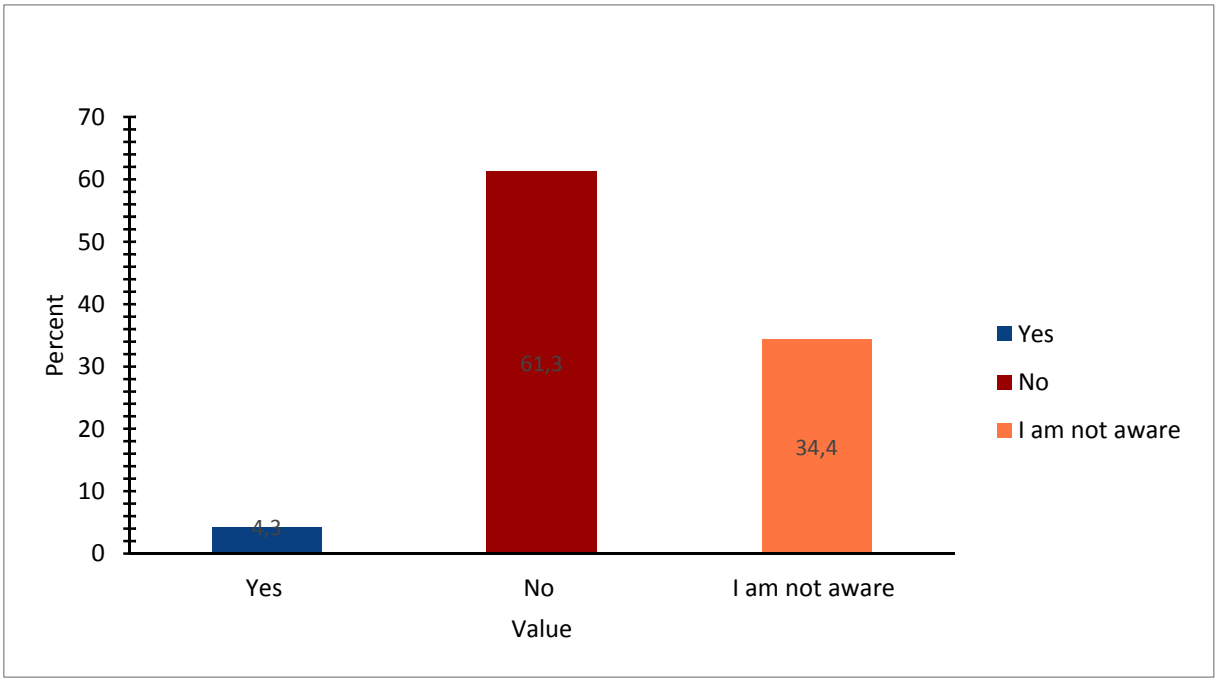


How long it will take for a tsunami to arrive to the coastal region

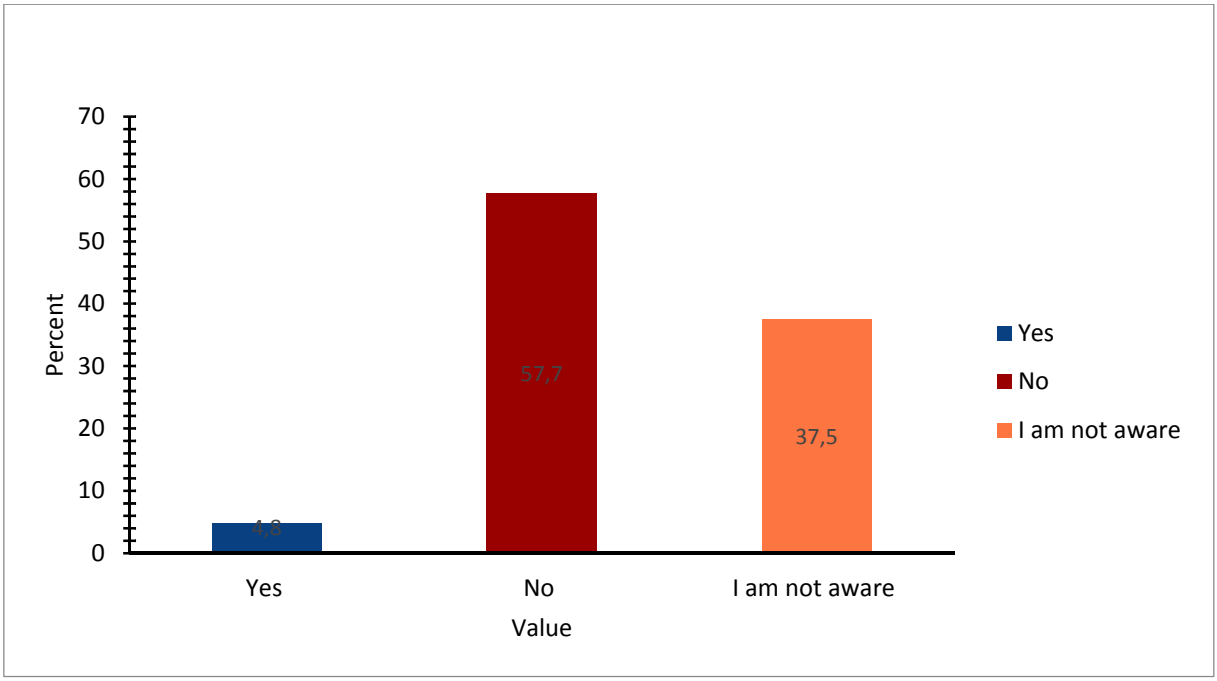
The survey results have showen also that people from El Jadida don't know if their municipality has the necessary capacities and infrastructure to alert and or inform the local population for earthquake, tsunami, storm surge or sea level rise.



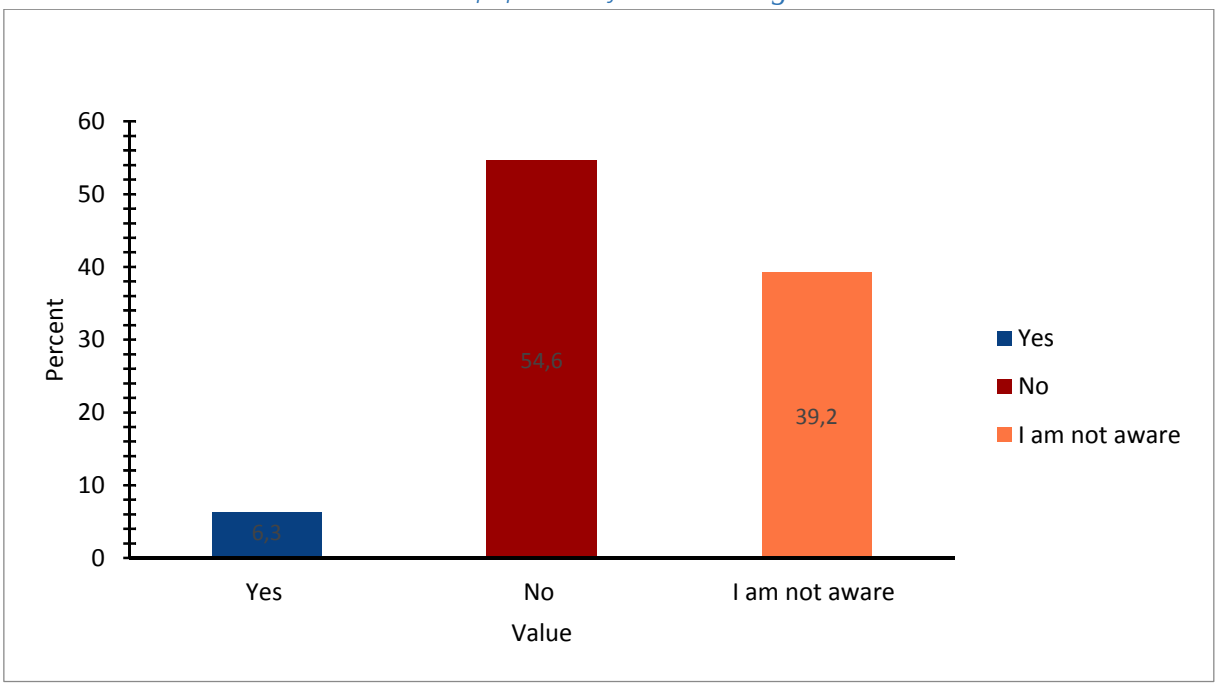
The municipality of El Jadida has the necessary capacities and infrastructure to alert and or inform the local population for earthquake



The municipality of El Jadida has the necessary capacities and infrastructure to alert and or inform the local population for ***tsunami***

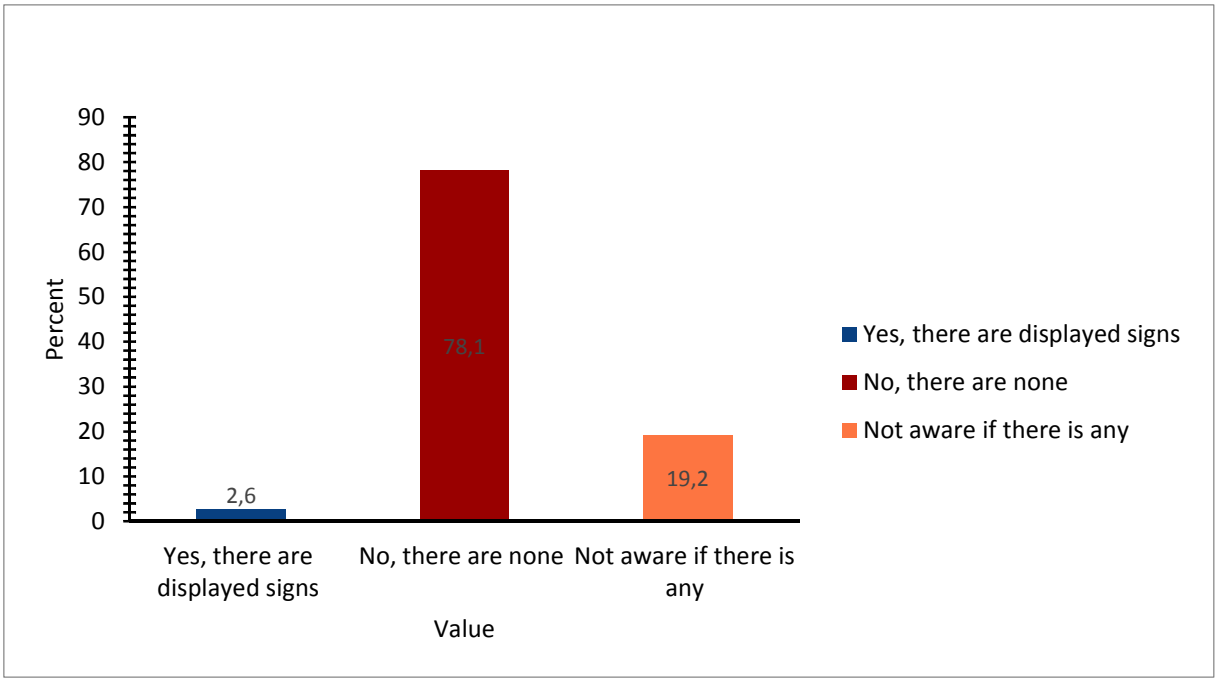


The municipality of El Jadida has the necessary capacities and infrastructure to alert and or inform the local population for ***storm surge***

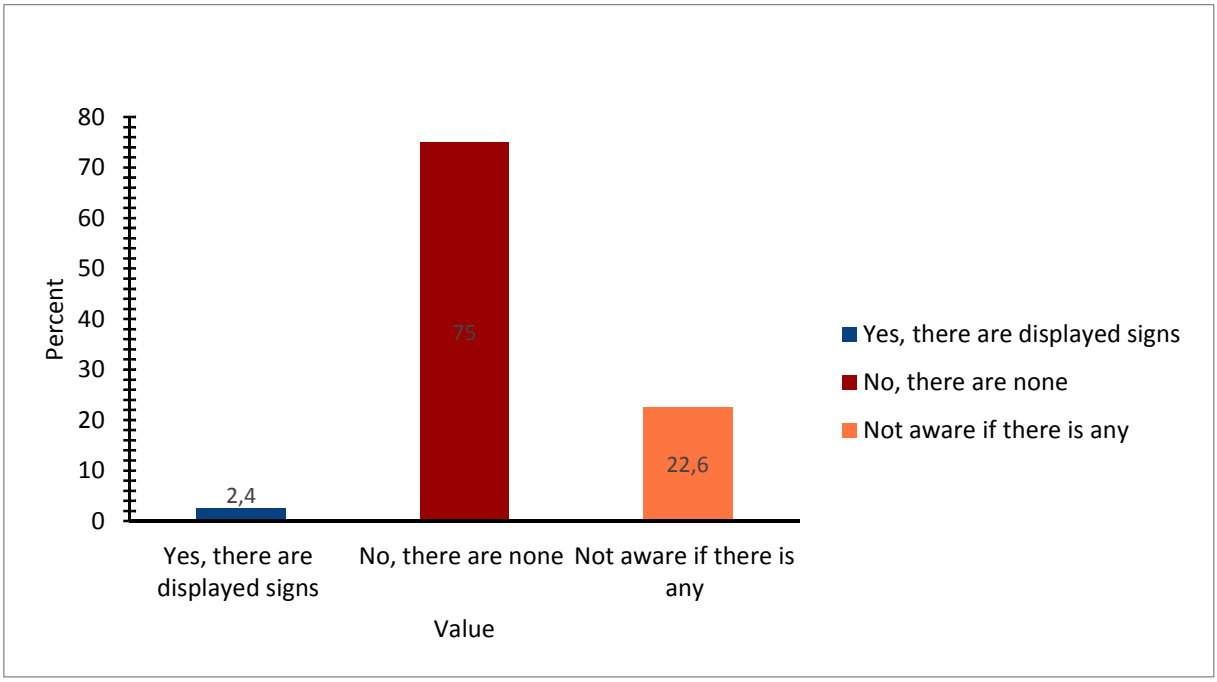


The municipality of El Jadida has the necessary capacities and infrastructure to alert and or inform the local population for ***sea level rise***

According to the graphs below, the majority of responses consider that the municipality of El Jadida doesn't have evacuation signs to indicate the best evacuation routes to take and or what to do in case of tsunami or storm surge.



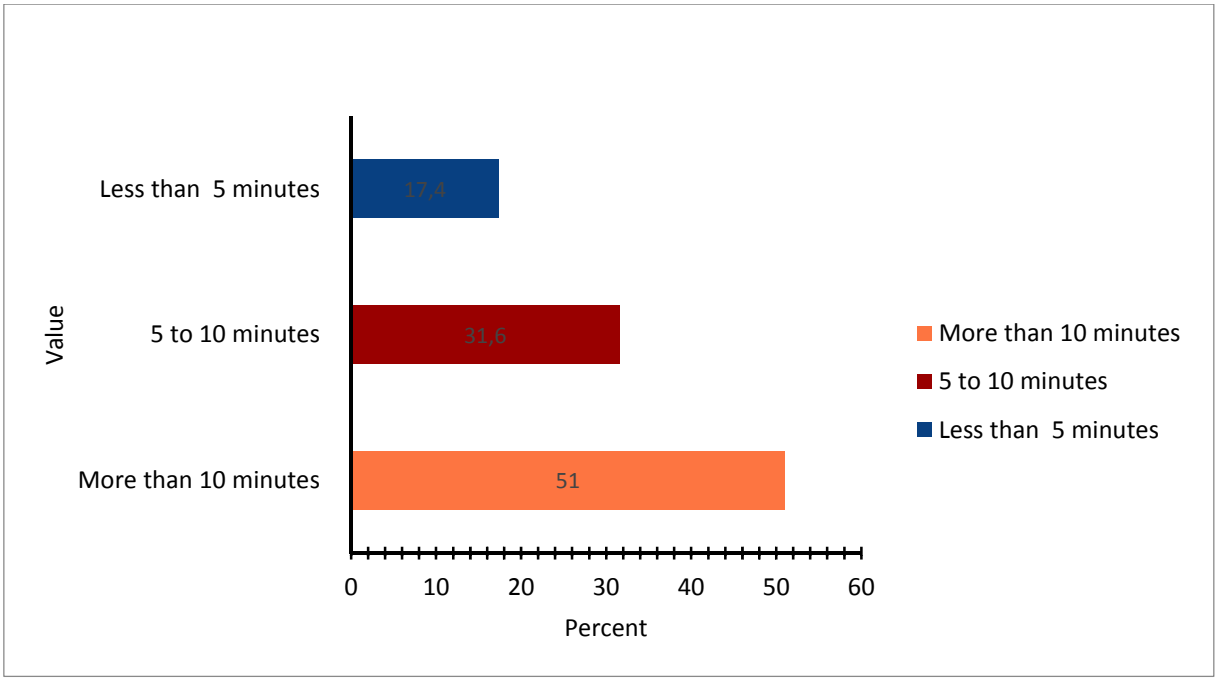
The municipality of El Jadida have evacuation signs to indicate the best evacuation routes to take and or what to do in case of tsunami



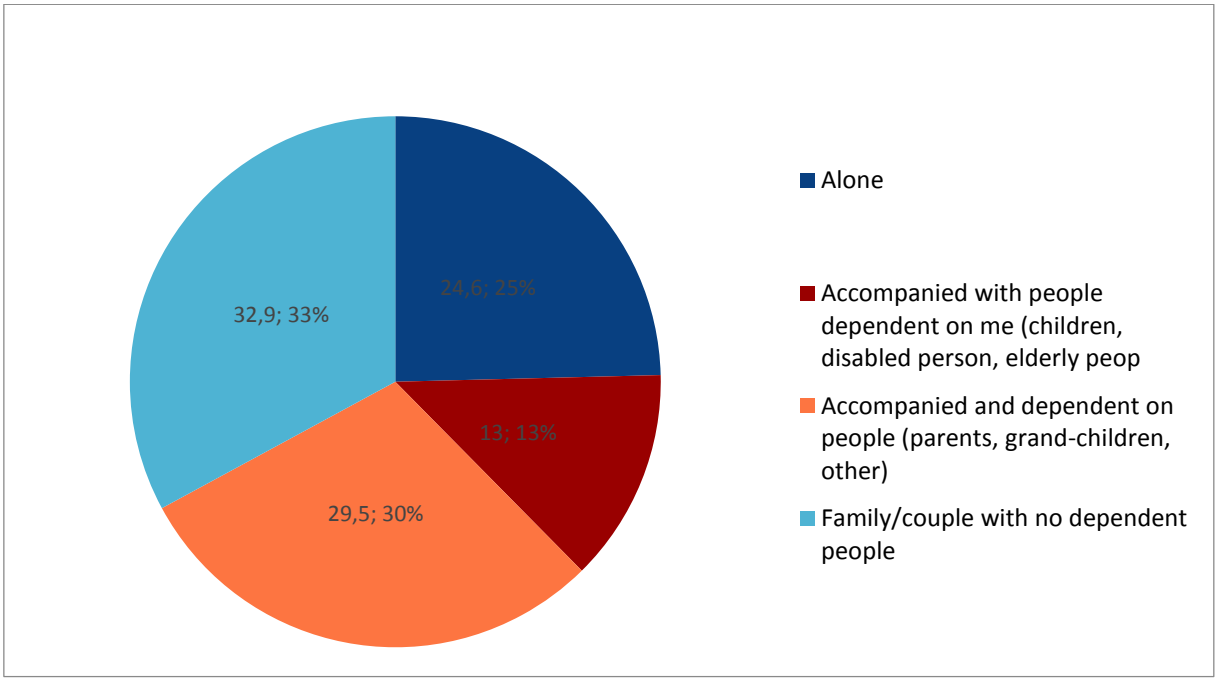
The municipality of El Jadida have evacuation signs to indicate the best evacuation routes to take and or what to do in case of storm surge.

3- Exposure and sense of Exposure

The results obtained from our survey (see graphs below) show that the majority of the surveyed population lives with their families and that almost half of them live within 10 minutes from the beach of El Jadida.

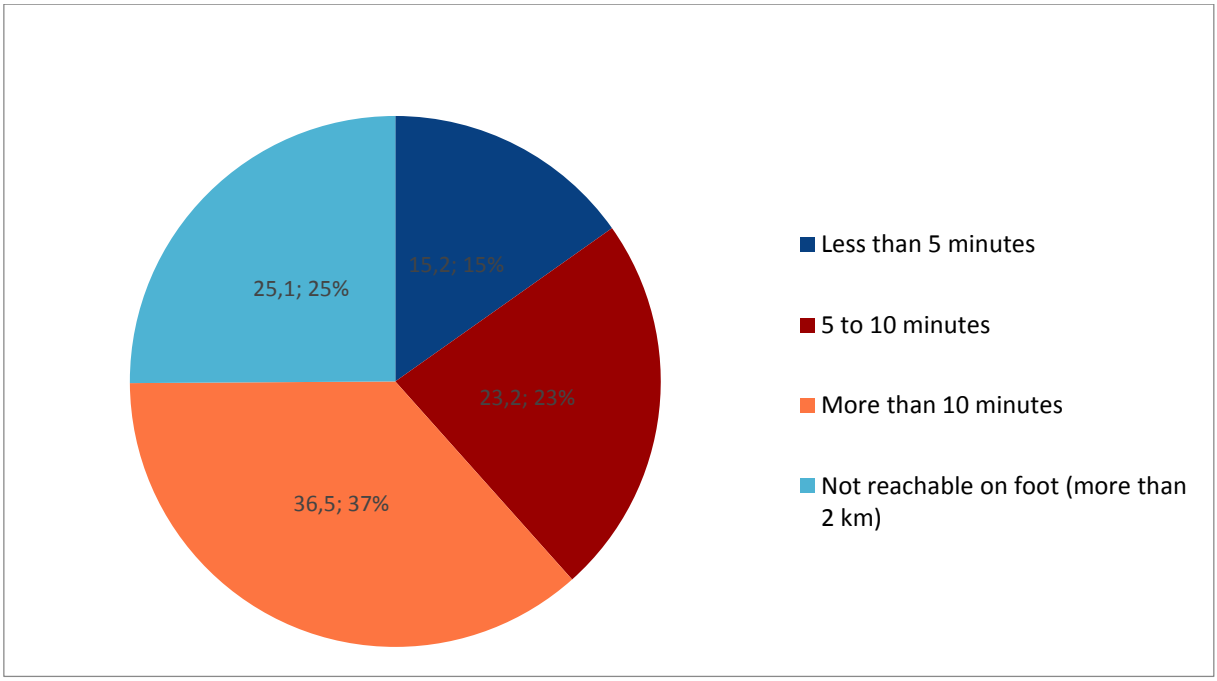


How far do you live from the seashore/coast on foot?

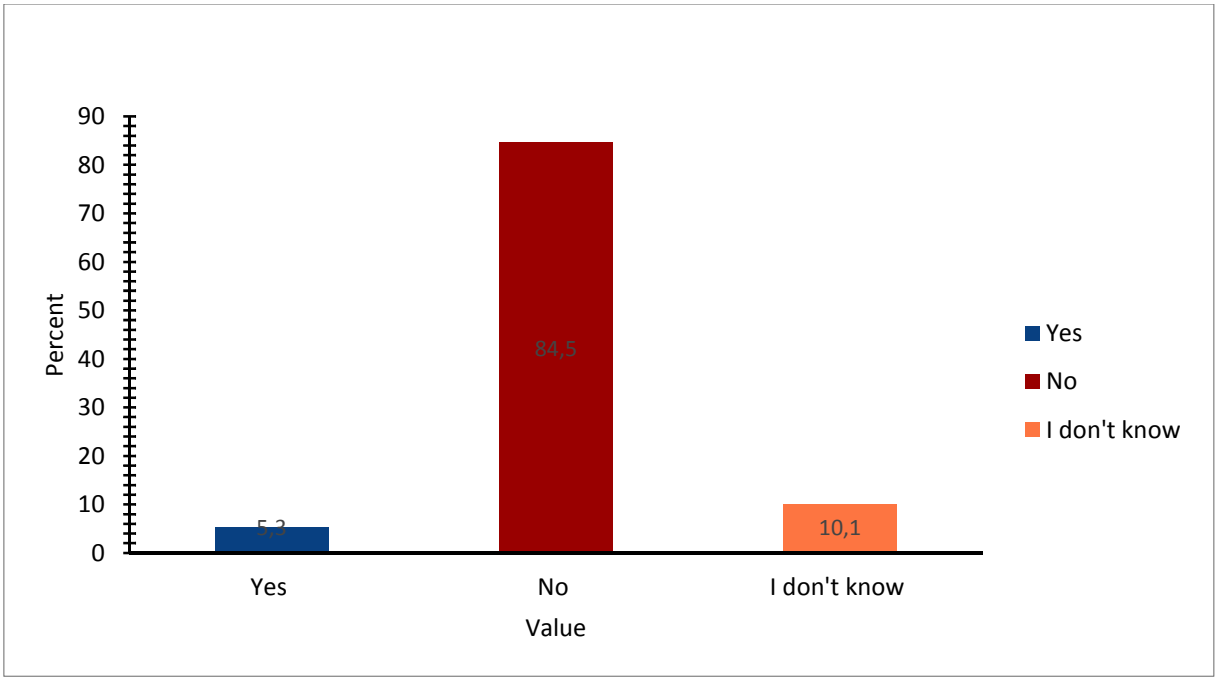


Who do you live with?

The results obtained show that 38% of the population surveyed work less than 10 minutes from the beach of El Jadida and the majority have no other property, except for their homes, within a 10-minute walk of the beach (See graphs below).



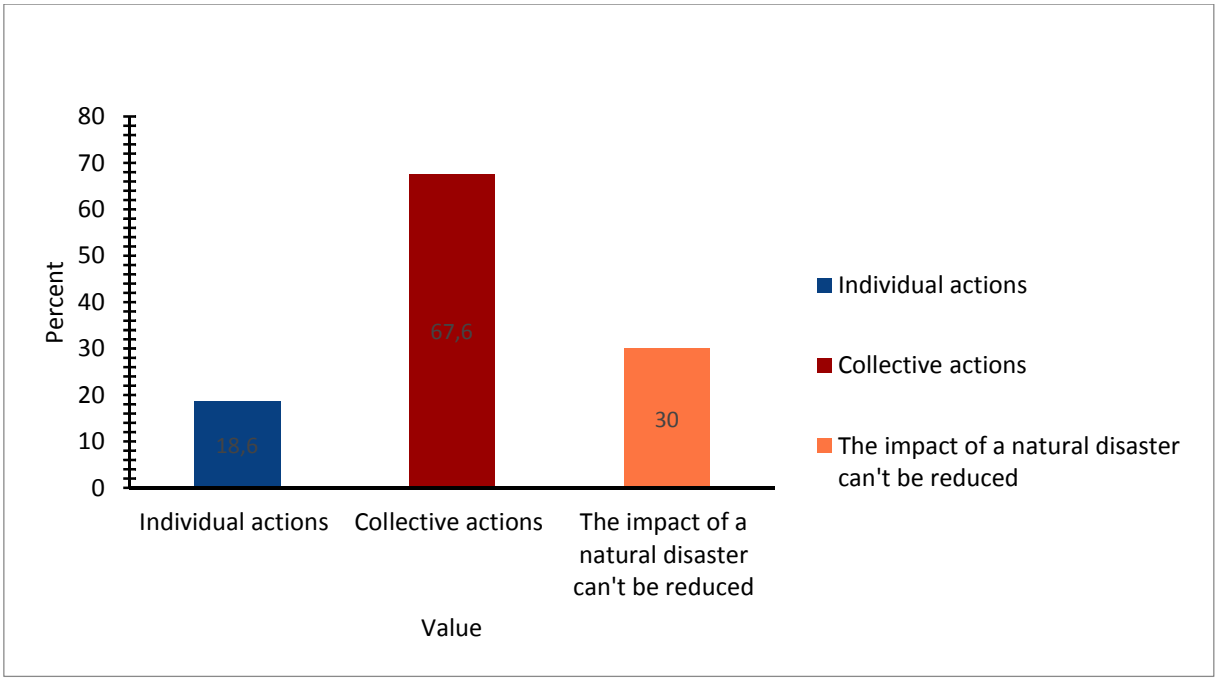
How far is your work place / school / university from the seashore / coast on foot?



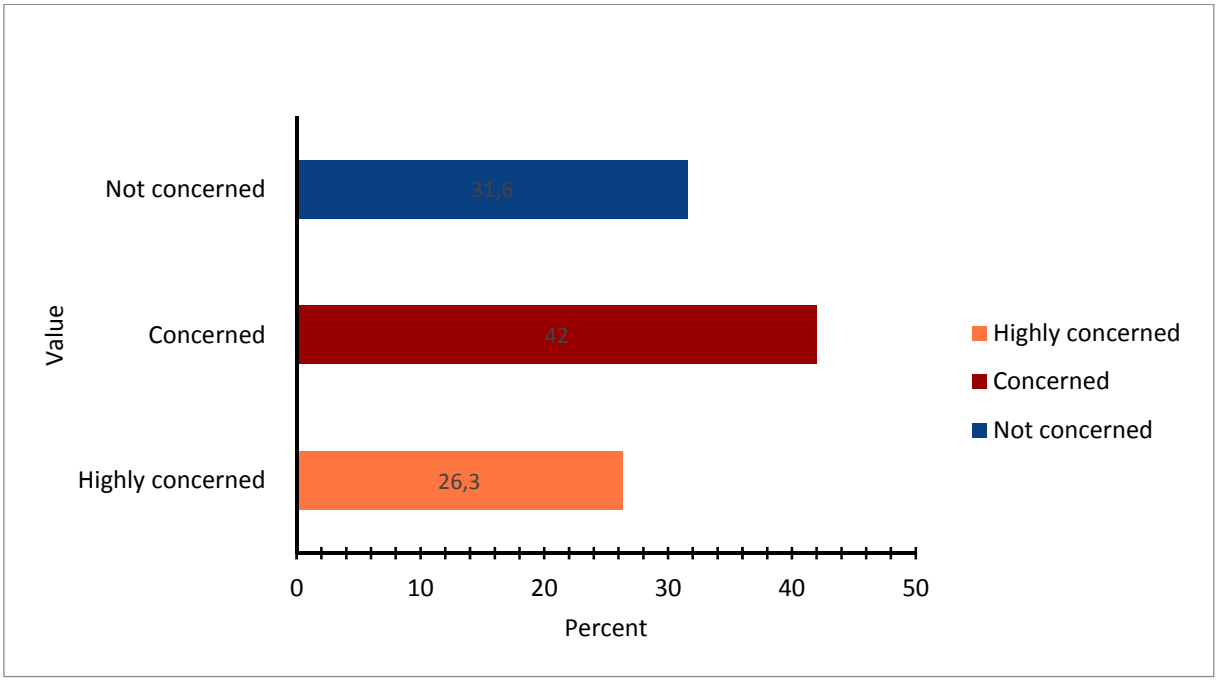
Do you have other properties within 10 minutes walking distance from the seashore/coast?

4- Assessment, Preparedness and Response

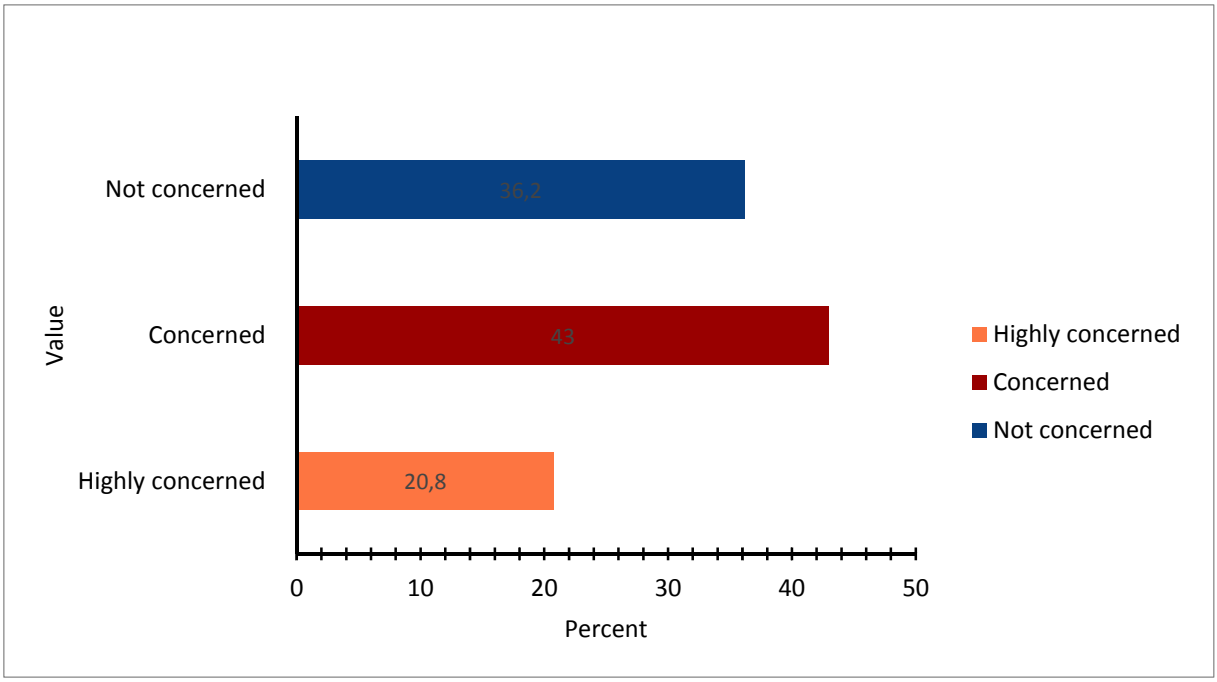
The majority of respondents believe that with collaborative action we can reduce the impact of sea level risks and they believe that are concerned about tsunami, storm surge and sea level rise risks and impact (See graphs below).



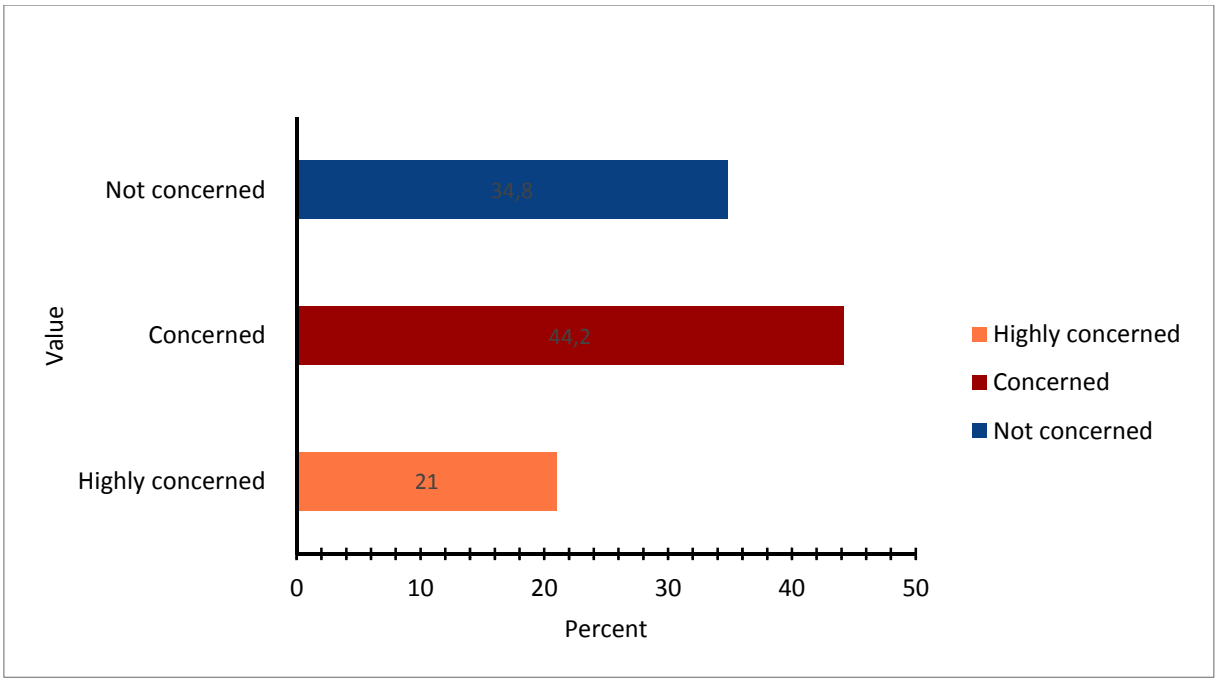
The impact of sea level related disasters could be reduced or avoided by? Please, select one or more



How do you feel about the risk and impact of a tsunami in El Jadida?

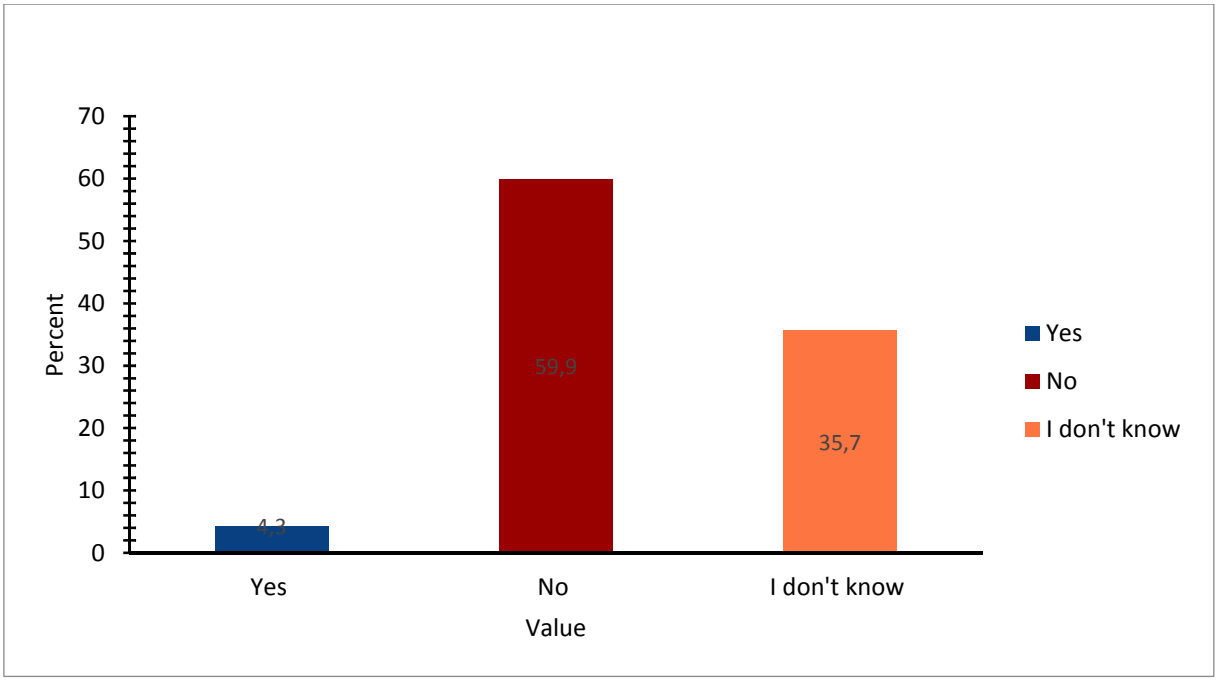


How do you feel about the risk and impact of storm surge in El Jadida?

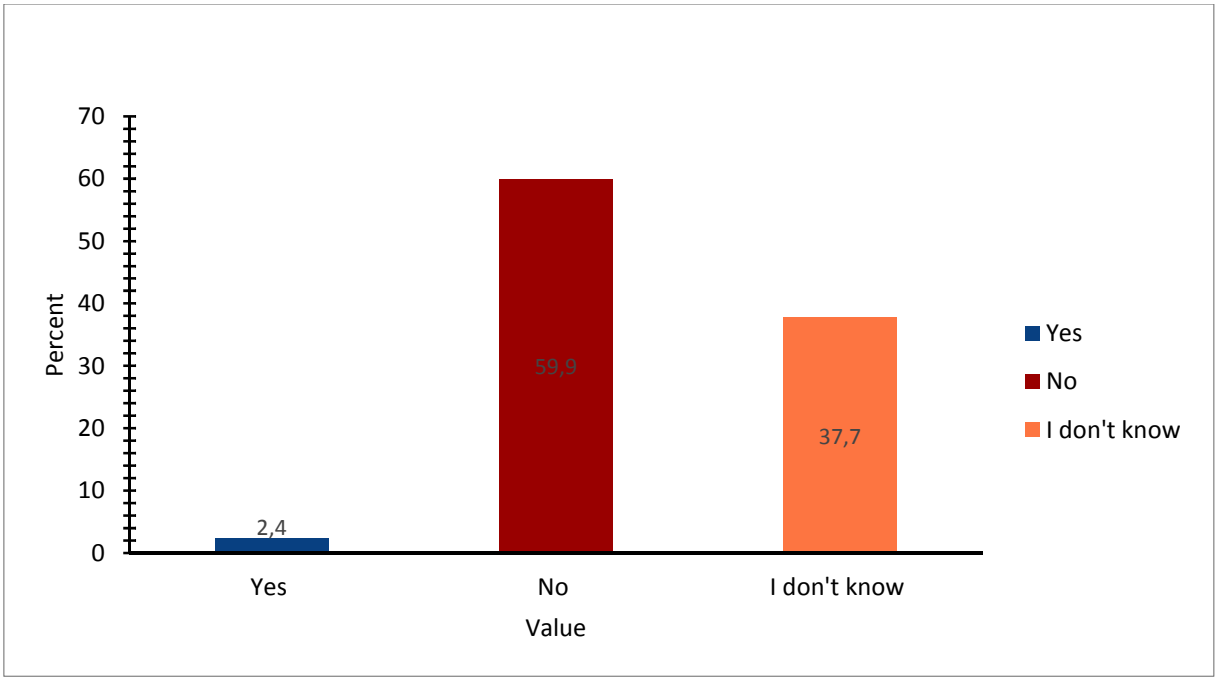


How do you feel about the risk and impact of sea-level rise in El Jadida?

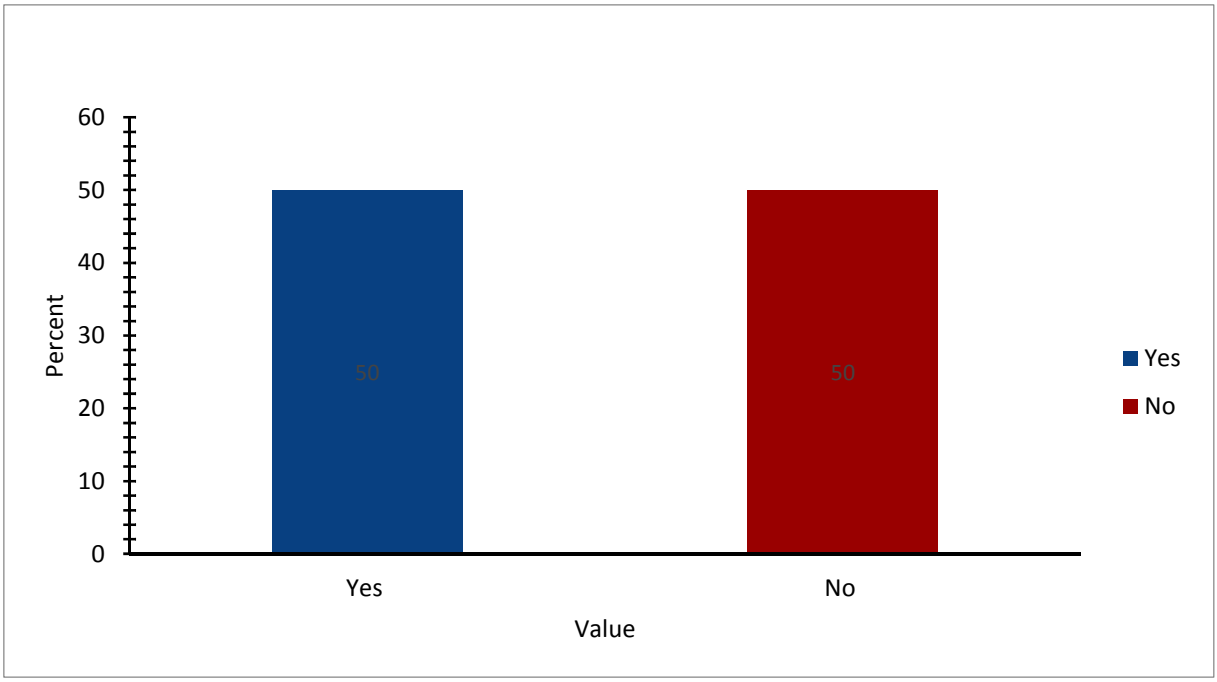
The majority of responses consider that the municipality of El Jadida does not have an evacuation or relocation plan in place for tsunamis or storm surges, except in the case of sea level rise.



Do you know if your municipality has an evacuation or resettlement plan in place for tsunamis,?

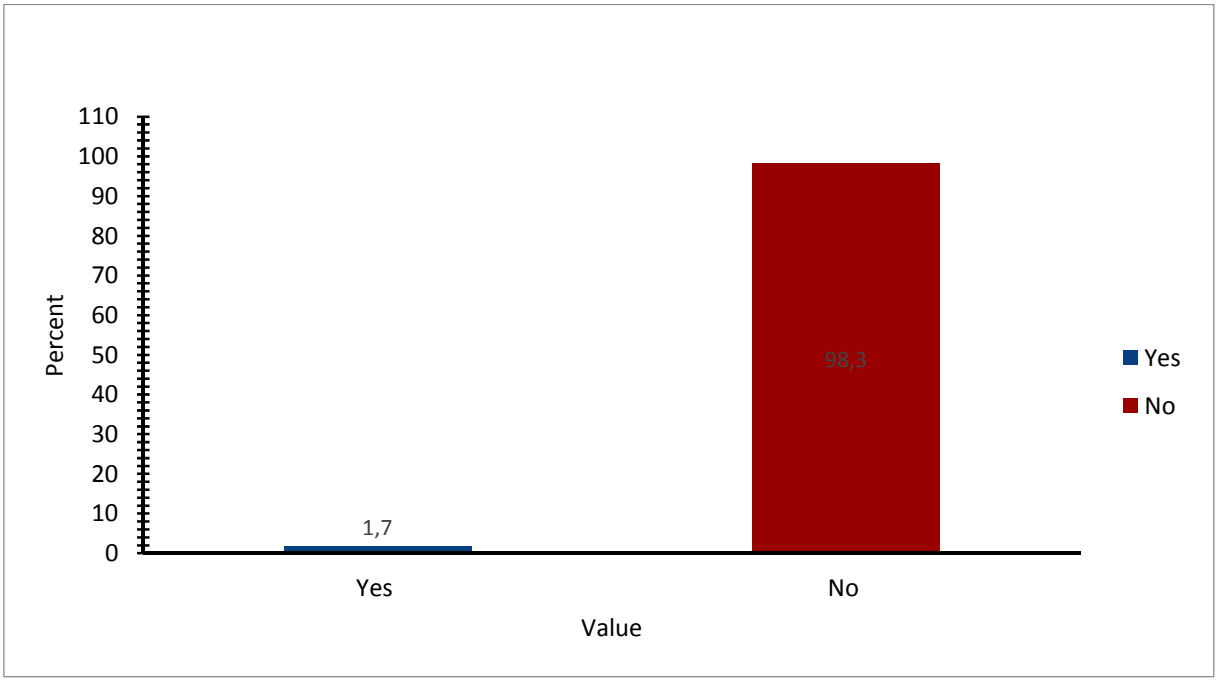


Do you know if your municipality has an evacuation or resettlement plan in place for storm surge?

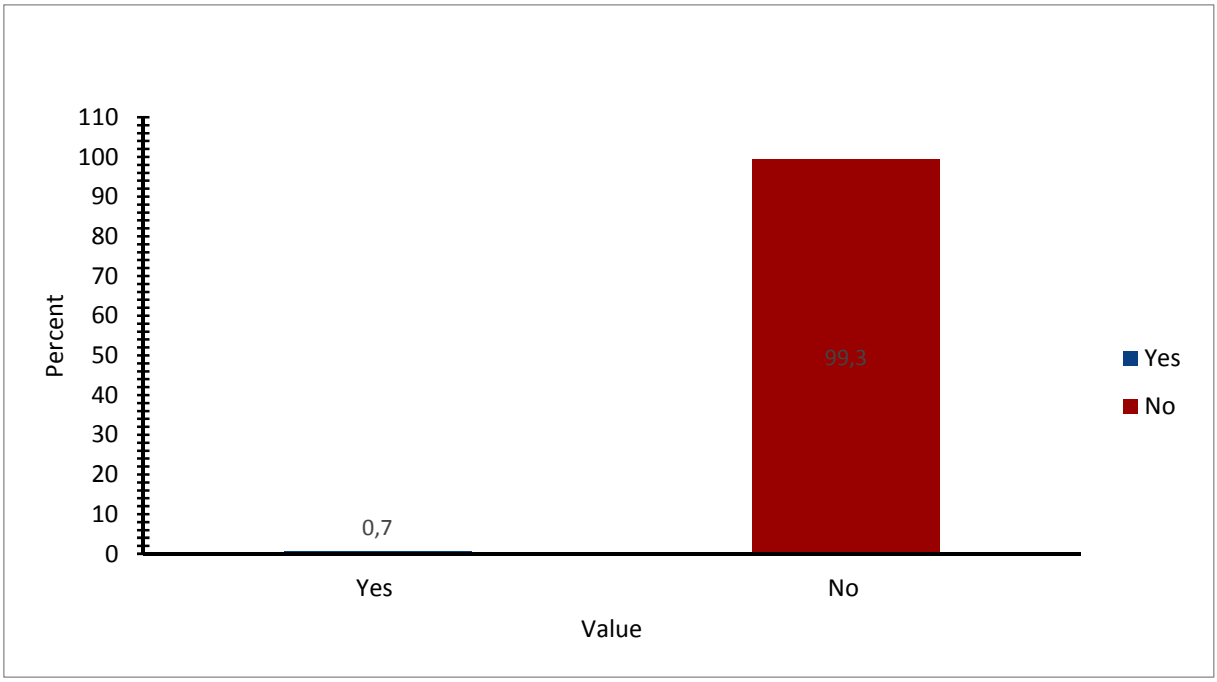


Do you know if your municipality has an evacuation or resettlement plan in place for sea level rise?

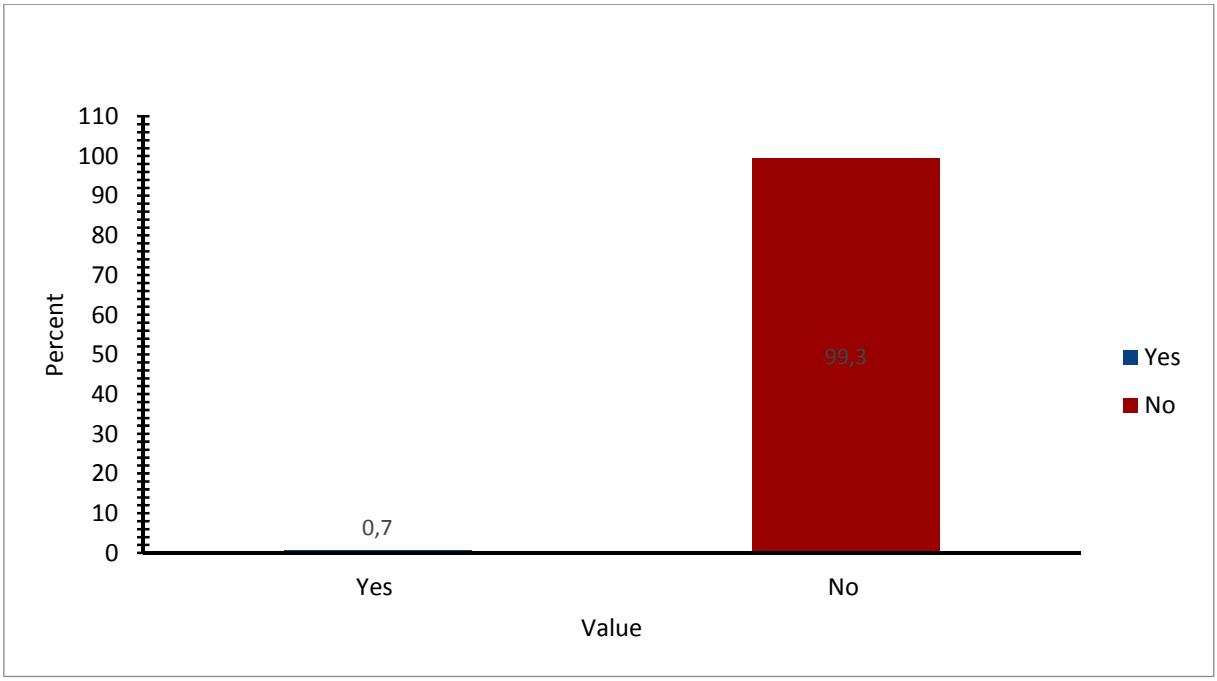
The great majority (about 99%) of the population feel that they have taken precautions or taken any precautions or measures themselves to protect against one or more of these hazards. Even though they have never heard or participated in evacuation exercises or had risk insurance related to tsunami, storm surge and sea level rise.



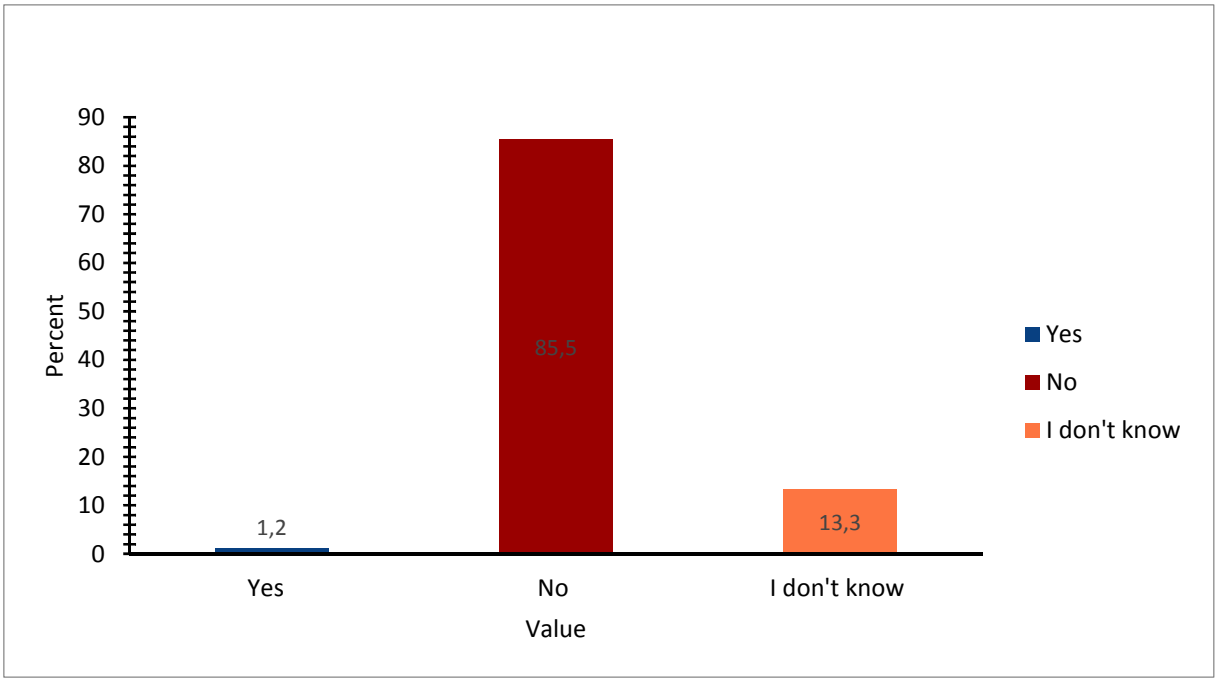
Have you taken any precautions or measures on your own against tsunamis?



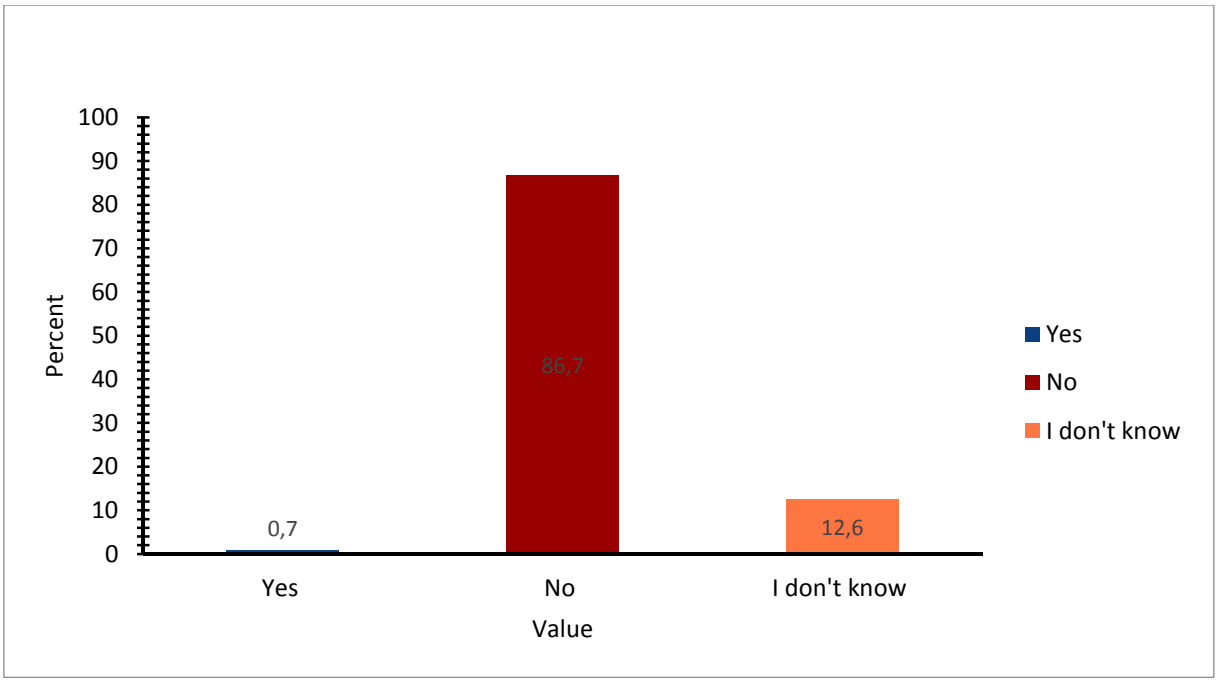
Have you taken any precautions or measures of your own against any of storm surge?



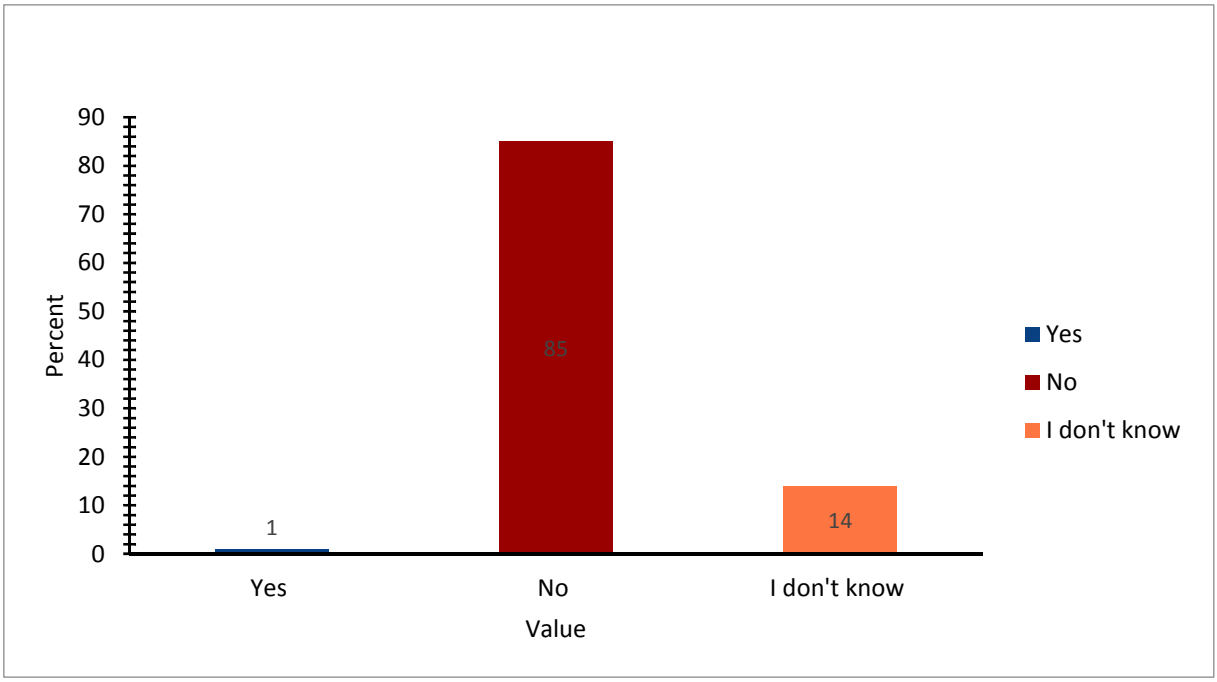
Have you taken any precautions or measures of your own against sea level rise?



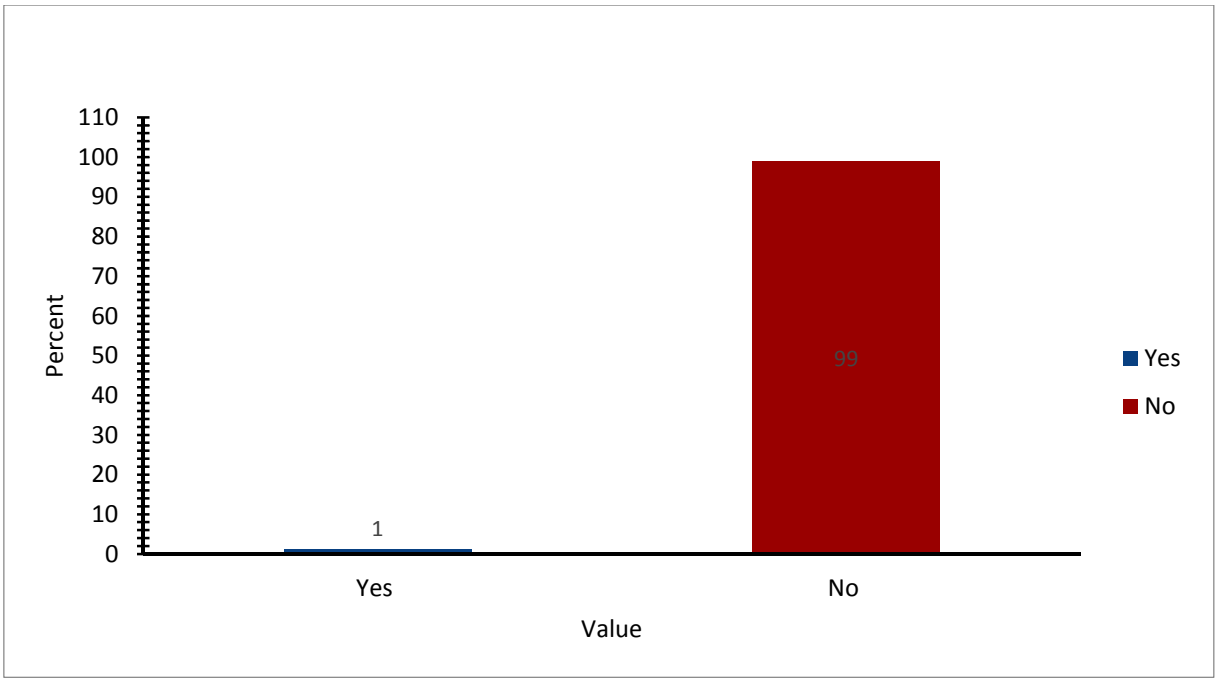
Do you have any kind of insurance against tsunamis?



Do you have any kind of insurance against storm surge?



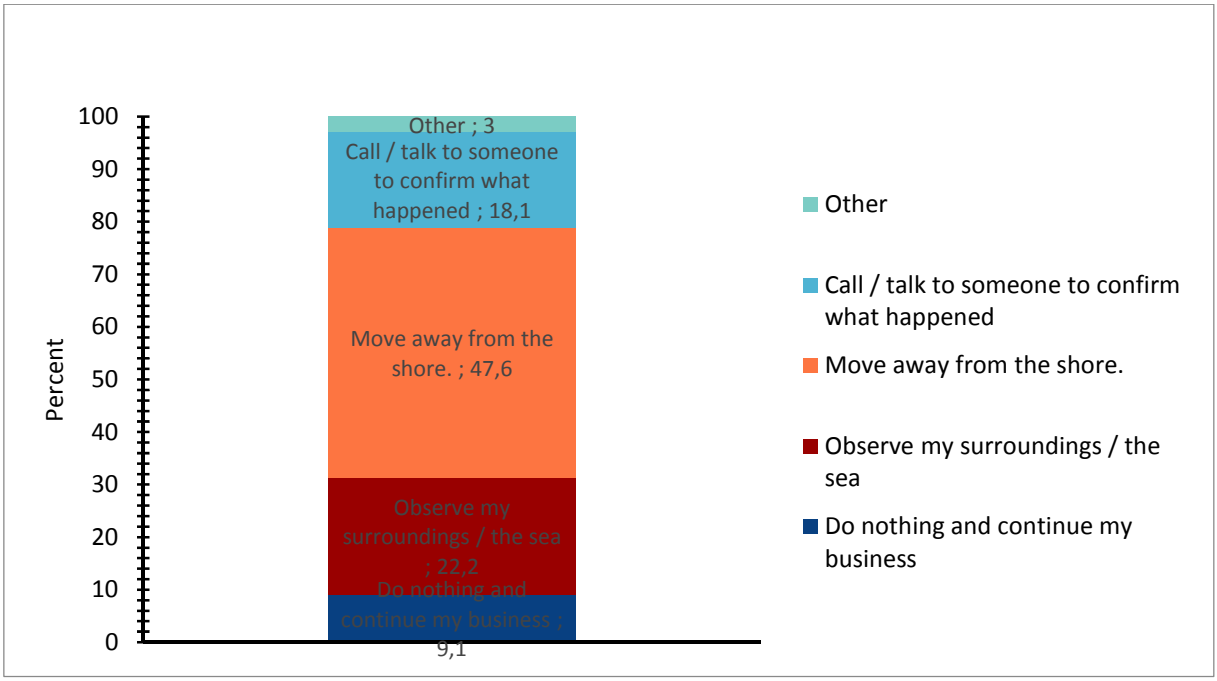
Do you have any kind of insurance against sea level rise?



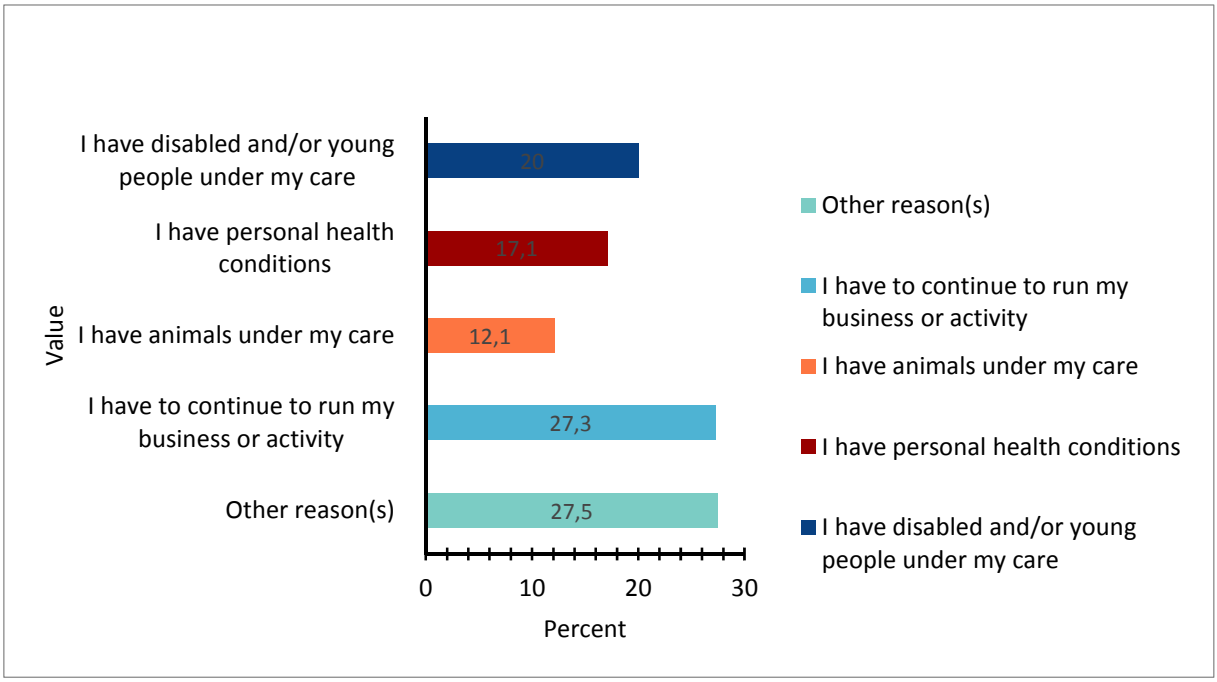
Have you ever heard of, or participated in an evacuation exercise, drill or other actions related to tsunami, storm surge and sea level rise?

When asked if you were on the coast, what would be your first reaction if you felt strong tremors due to an earthquake, the majority said they would move from the coast, some preferred to observe the sea.

With varying percentages, the population believe that their business or their activities or other reasons can affect their ability to evacuate to a safe area.



Imagine you are on the coast. What would you do first if you feel a strong shaking due to an earthquake?



What could affect your ability to evacuate to a safe area? Please, select all that apply.

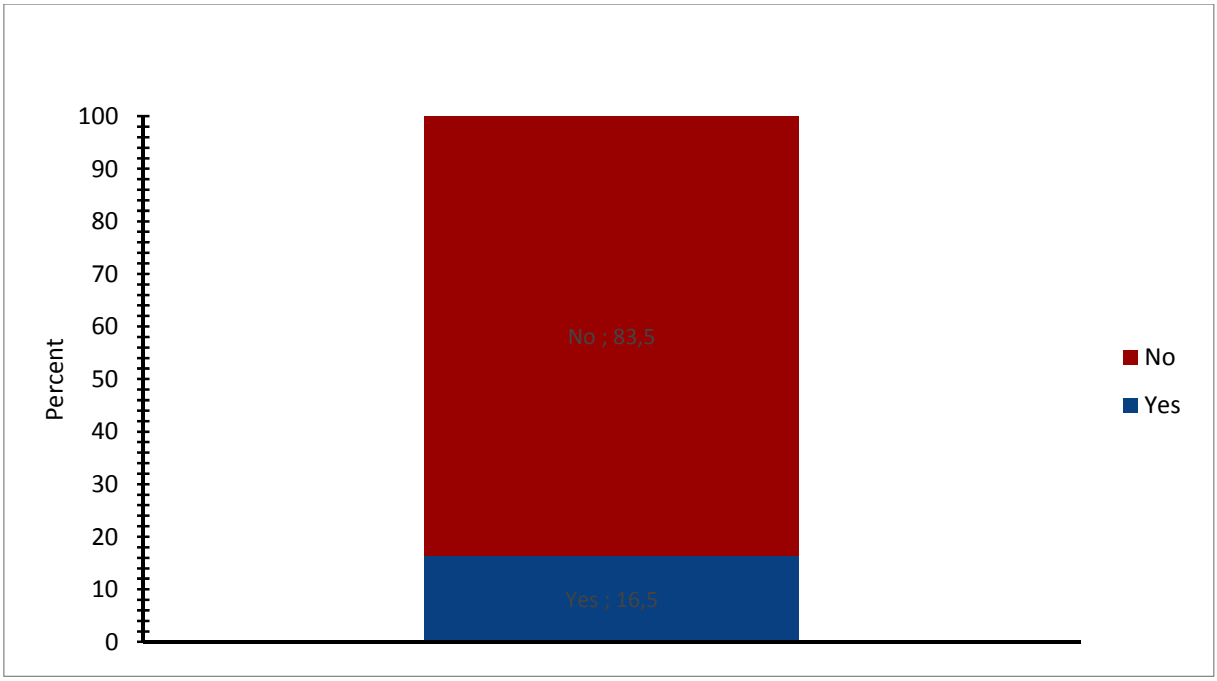
5- Gouvernance

The surveyed population prefers to receive alert messages by different means; which are in descending order: Audible alerts (sirens, loudspeakers), Internet (social media), Television, Radio, SMS and E-mail.

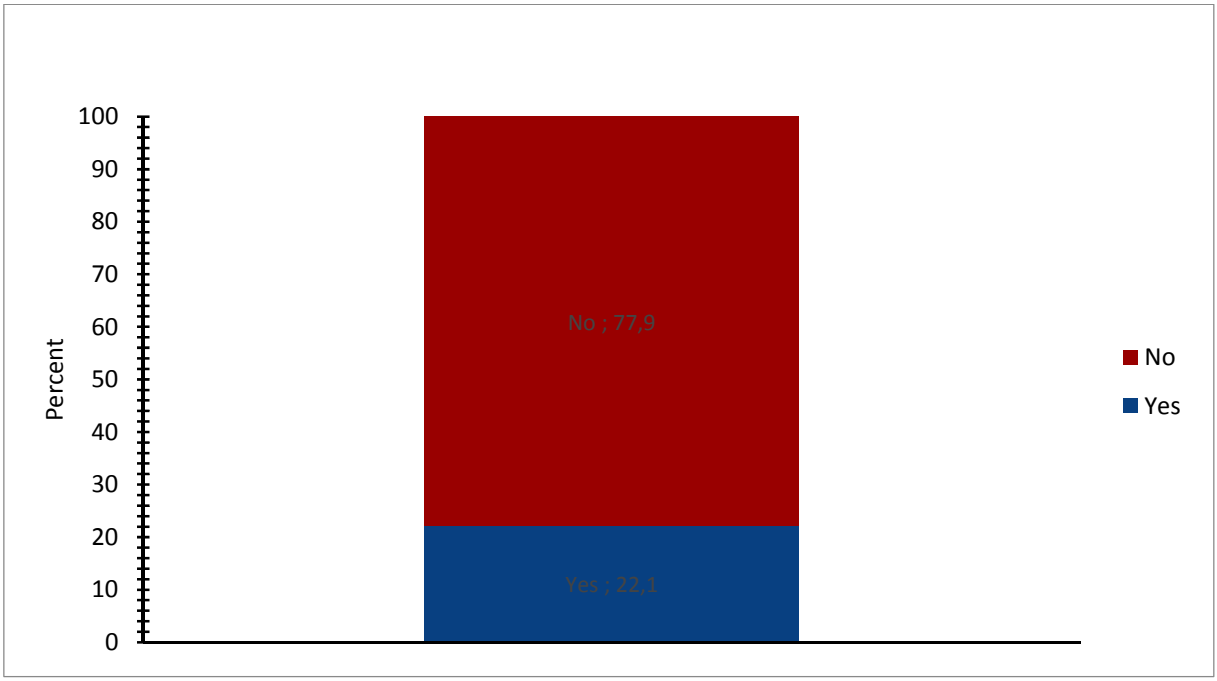
	Television	Radio	Internet (social media)	Audible alerts (sirens, loudspeakers)	SMS	E-mail	Responses
	Row %	Row %	Row %	Row %	Row %	Row %	
1	29.9%	4.1%	25.8%	31.0%	7.3%	1.9%	368
2	22.6%	21.1%	23.3%	16.7%	11.9%	4.4%	318
3	16.4%	20.1%	20.7%	20.1%	16.4%	6.4%	299
4	18.2%	16.9%	11.0%	15.7%	24.6%	13.6%	236
5	15.2%	26.3%	7.1%	7.1%	31.8%	12.6%	198
6	6.3%	17.8%	3.4%	15.9%	4.3%	52.4%	208
Totals							1627

Which communication channel would you prefer for receiving alert messages? Please order from most important to least important (1 is the most important, 6 is the least important

The great majority of the population feel that municipality is not able to manage emergency response operations during a possible tsunami, storm surge or sea level rise.

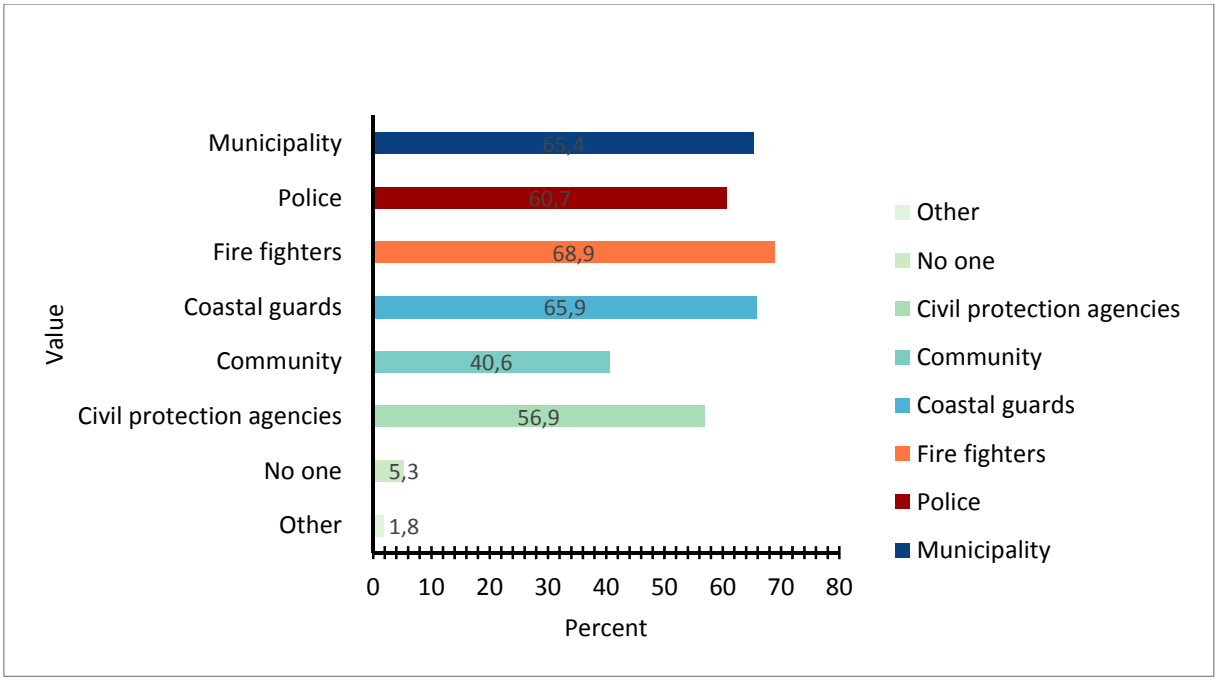


Do you feel that your municipality is able to manage emergency response operations during a possible tsunami?

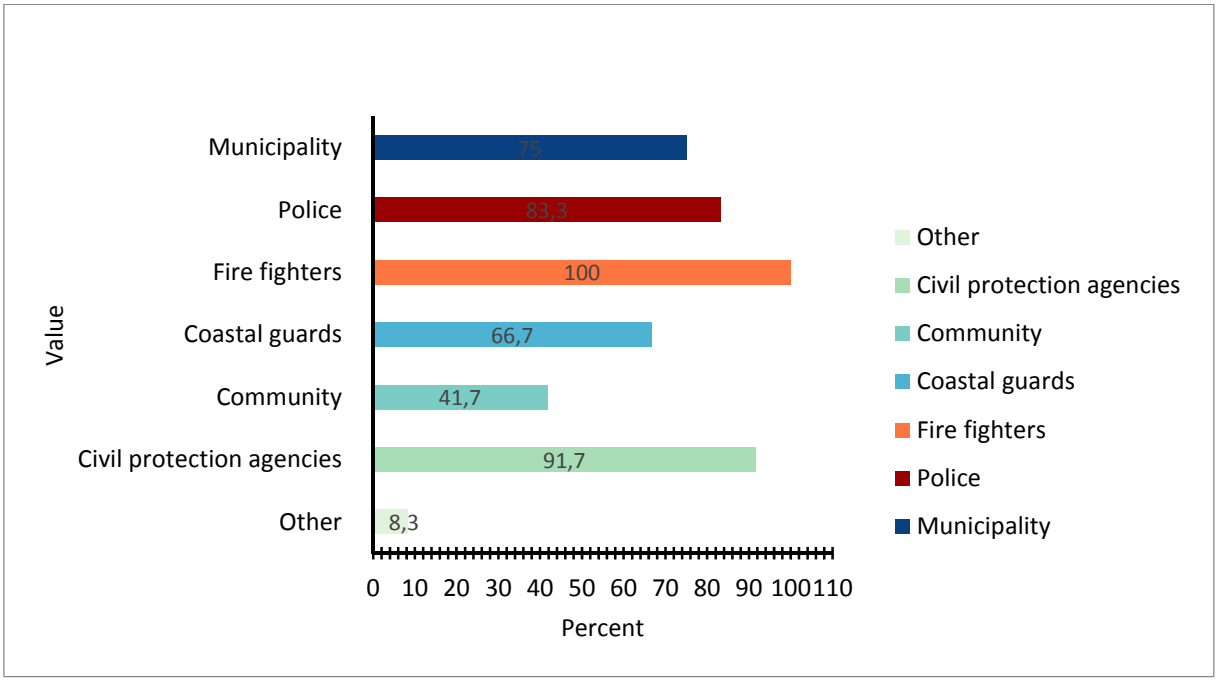


Do you feel that your municipality is able to manage emergency response operations during storms?

The majority of the population feel that Fire fighters or police are responsible for managing the crisis in El Jadida city and they are involved in the emergency response or disaster risk management and reduction.

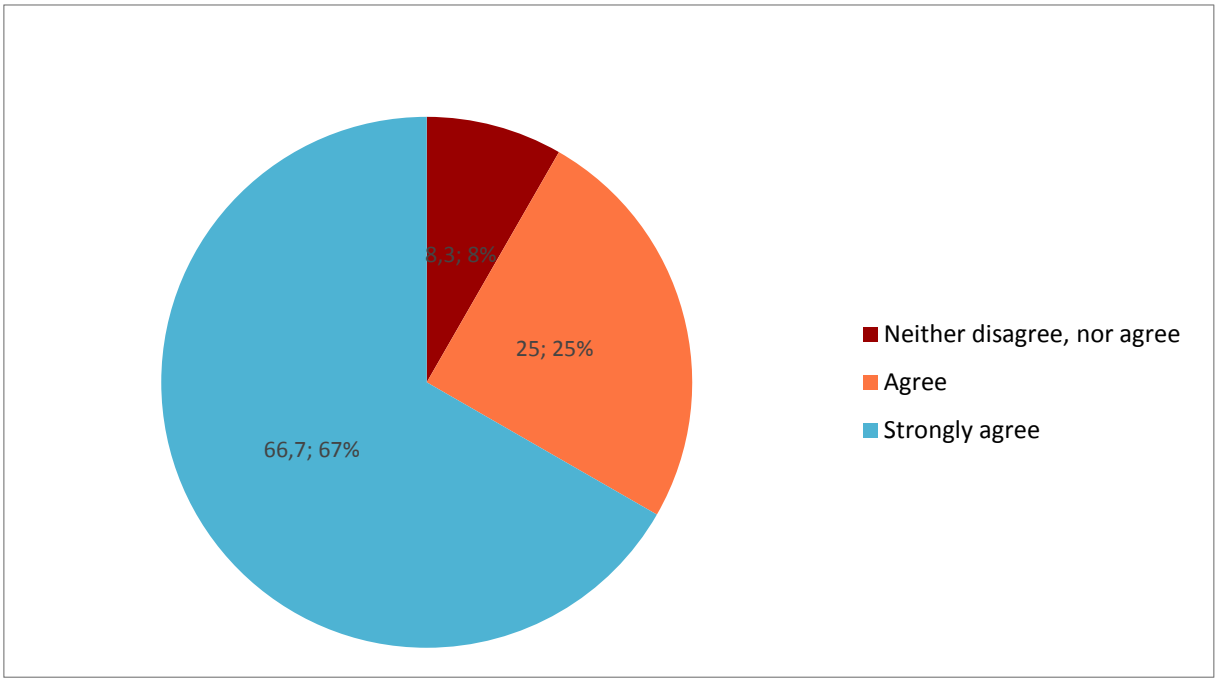


In case of a sea-level-related hazard, who do you think is responsible for managing the crisis in El Jadida? You can select more than one answer.



In your opinion, besides your agency, who is currently involved in the emergency response or disaster risk management and reduction? You can select more than one answer.

The majority of the population considers that the impact of different hazards is considered in decision-making processes.



What do you believe regarding the following statement: "The impact of different hazards is considered in decision-making processes"?

KEY FINDINGS

- ✓ The majority of respondents are young people between 18 and 34 years old.
- ✓ The majority of respondents who agreed to answer our questionnaire are people who have a high level of education, the other classes of the population do not know much about tsunami risks or other coastal risks.
- ✓ The majority have already heard of the tsunami
- ✓ The majority are not able to differentiate between tsunami, storm or sea level rise.
- ✓ The majority of the population surveyed lives less than 20 minutes from the coast.
- ✓ The majority believes that the municipality is not capable of managing crises related to marine risks.
- ✓ The most preferred means of communication in the event of coastal danger are the serens and social networks.

DISCUSSION

The survey carried out in El Jadida shows that the majority of the local population and even people with a high level of education do not know much about coastal risks. the population confuses between tsunamis, storms, sea level rise. The causes and signs of tsunamis are the same for them.

The city of El Jadida has experienced several storms over the past decades, but no tsunami has been declared. Although the city of El Jadida is exposed to tsunami risk for the local population, this risk is low.

The population of El Jadida do not know much about the coastal risks that the city can experience and especially the tsunami risk.

The inhabitants of the city of El Jadida believe that the municipality does not have an evacuation plan or the means to put people in safety. Most say that evacuation in case of risk is a matter for civil protection, the police and the Ministry of the Interior.

According to these results, an awareness campaign and evacuation exercises are necessary to bring the population up to speed in coordination with the local authorities. This awareness-raising work must be carried out by all means (face-to-face meeting, flayers, social networks, press and others).

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APPENDIX

Questionnaire in french and arabic