Non comunicable diseases

Awareness towards Cancer Attributable to Infections (CAI): A Lebanese study with a special focus on young adults, and adults

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Keywords

CAI • Vaccine • Awareness level • Socio-demographics • Middle East • Young adults • Adults

Summary

Introduction. *Around two million cancer cases per year are caused by infections. Currently, there is a lack of studies assessing awareness of the link between infections and cancer in Lebanon. This knowledge is essential for the effective prevention, early detection, and management of these cancers. Thus, the aim of this study was to determine the level of awareness of cancer attributable to infections (CAI) in Lebanon especially among young adults, and adults.*
Methods. *A cross-sectional, descriptive research study was conducted for two months in Beirut, Beqaa, Mount Lebanon, South Lebanon, and North Lebanon. A valid and reliable survey was distributed to participants. The survey was divided into two sections: socio-demographic information and awareness of CAI.*
Result. *Approximately 43.4% of participants knew that hepatitis B virus (HBV) and hepatitis C virus (HCV) cause liver cancer. Around 34.9% knew that human papillomavirus (HPV) causes cervical cancer. About 33.5% knew that stomach cancer is caused by Helicobacter pylori. Around 20% were aware of the association between Kaposi sarcoma-associated herpesvirus (KSHV) and Kaposi sarcoma, Epstein-Barr virus (EBV) and human T-cell lymphotropic virus type 1 (HTLV-1) and lymphoma. Around 27.7% of them had received the HBV vaccine. Only 11.8% of them had received the HPV vaccine.*
Conclusion. *In Lebanon, young adults, and adults did not demonstrate the same level of awareness regarding the various types of CAI. Awareness levels increased among females, Lebanese individuals, healthcare workers, highly educated individuals, and those with a middle family income.*

Introduction

Infection is emerging as a major risk factor for cancer worldwide. The International Agency for Research on Cancer (IARC) considers certain viruses, bacteria, and parasites to be carcinogenic to humans. *Helicobacter pylori* and the tumor viruses: human papillomavirus (HPV), and hepatitis B (HBV) and C (HCV) viruses, were among the top infectious agents associated with cancer cases based on the latest *GLOBOCAN* 2020 (http://gco.iarc.fr/). China, Egypt, South Africa, Romania, and some countries in South America had the highest rates of cancer attributable to infections (CAI) (≥ 27.8 per 100 000). In contrast, Australia, northern Europe, Canada, the United States of America (USA) and most of the countries in the Middle East and North Africa (MENA) region, such as Lebanon, had a low rate of CAI (< 15.8 per 100 000).
Infectious agents related to cancer can alter survival pathways and disrupt host cell genomic integrity through a variety of mechanisms, leading to malignancy rather than death [1, 2]. For example, the E6 and E7 oncoproteins produced by HPV could degrade the tumor suppressor p53 and pRb proteins, respectively, thereby disrupting cell cycle control and initiating cancer development [3]. Another example, the contribution of the Epstein-Barr virus nuclear antigen 1 (EBNA1) to tumorigenesis of infected epithelial cells [4].
Screening for pathogens associated with cancer would be a proactive strategy to reduce cancer incidence by eliminating the presence of these infections. Eradication of *Helicobacter pylori* is highly effective in preventing gastric cancer [5, 6]. Improvements in antiviral therapies for hepatitis B and C have reduced the incidence of liver cancer, as demonstrated by the successful use of direct-acting antivirals (DAAs) against HCV [7]. Unfortunately, available effective therapies don't cover all CAI types, and many are still in clinical trials [8]. Vaccination would be an alternative approach to CAI prevention and it is widely used worldwide. For example, HBV and HPV vaccines have shown to effectively reduce the risk of infection and development of hepatocellular carcinoma (HCC) and cervical cancer, respectively [9, 11]. Evidence also points to the possibility of herd immunity effects, with declining rates of HPV infection in unvaccinated people as a result of less transmission in vaccinated populations [12].
With the dramatic increase in CAI rates, especially in developing countries, there is an urgent need to educate people about the underlying link between infection and cancer development and management. In Lebanon, a small country that represents the middle east, people's

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awareness of CAI has very rarely been assessed [13]. This study therefore aimed to determine awareness level of CAI mainly among the young adults, and adults of the Lebanese population.

Methods

Study design

The study design was a descriptive cross-sectional study done between May 2023 and July 2023. The study was conducted in five main Lebanese districts Beirut, Beqaa, Mount Lebanon, South Lebanon, and North Lebanon.

Study procedure

A valid and reliable survey was distributed via social media and professional platforms including WhatsApp, Instagram, and LinkedIn since almost all Lebanese people primarily use these platforms for communication. The survey was divided into two sections: socio-demographic information and awareness related to CAI.

Data analysis and presentation

The data was manually entered into SPSS version 24 for Windows software. Descriptive statistics were used to present the socio-demographic characteristics of the participants. A chi-square test was used in order to identify the relationship between variables. A p-value < 0.05 was considered statistically significant. Additionally, binary logistic regression was used to examine the relationship between a few dependent variables and a number of independent variables.

Sample size and sampling

We used a convenient sampling method. The sample consists of 415 Lebanese residents mainly young adults, and adults (minimum required is 385, software sample size calculator). Females and males residing in Lebanon who are of age 18 and above were included in the study.

Study tool

The questionnaire was developed to assess the awareness of the population of infection-related cancers. The survey includes 10 questions about socio-demographic characteristics and 22 questions about infection-related cancer knowledge. Evidence for the reliability and validity of the measurement tool was measured by the Center of Applied Statistics (CAS) at Beirut Arab University.

Evidence for the reliability and validity of the measurement Model is available in Table S1.

Ethics approval

This study was performed according to the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of Beirut Arab University (No: 2023-H-0155-HS-M-0549).

Results

Socio-Demographics characteristics

A total of 415 participants completed the survey. Females made up 53.3% (n = 221) of the sample. The majority of participants, 68% (n = 282), were between 18 and 29 years old. 90.1% had tertiary education (n = 374), 66.5% were in non-health occupations (n = 276) (Tab. I). Furthermore, 26.7% (n = 111) of the participants lived in Beirut, 38.6% (n = 160) in Beqaa, 14.2% (n = 59) in Mount Lebanon, 10.6% (n = 44) in North Lebanon and 9.9% (n = 41) in South Lebanon. 27.5% were non-Lebanese (n = 114), while 72.5% were Lebanese (n = 301). In addition, 67.5% (n = 280) had a medium family income and 17.8% (n = 74) had a high family income. 28.4% (n = 118) were married and 67.7% (n = 281) were single. A total of 1.9% (n = 8) of participants reported a personal history of cancer, while 35.7% (n = 148) reported a family history of cancer.

Awareness about CAI

A high percentage of participants (59.3%) had not heard

Tab. I. Socio-demographic characteristics of participants.

Variables		Frequency (N = 415)	Percentage (%)
Age(years)	18-29	282	68%
	30-49	118	28.4%
	50-64	14	3.4%
	> 64	1	0.2%
Gender	Female	221	53.3%
	Male	194	46.7%
Education Level	Primary	3	0.7%
	Secondary	38	9.2%
	Tertiary	374	90.1%
Occupation	Non-healthcare	276	66.5%
	Healthcare	139	33.5%
Place of residence	Beirut Beqaa Mount Lebanon North Lebanon South Lebanon	111 160 59 44 41	26.7% 38.6% 14.2% 10.6% 9.9%
Nationality	Non- Lebanese Lebanese	114 301	27.5% 72.5%
Family income	Low Middle High	61 280 74	14.7% 67.5% 17.8%
Marital status	Divorced Married Single	16 118 281	3.9% 28.4% 67.7%
Diagnosed with cancer	Yes No	8 407	1.9% 98.1%
Family History of Cancer	Yes No	148 267	35.7% 64.3%

of some cancers associated with bacteria, 55.4% had not heard of some cancers associated with viruses, 74.5% had not heard of oncovirus, viruses that causes 12% of all human cancers [14], and 69.1% did not know that vaccines can prevent some cancers.

56.1% of participants had not heard of human papillomavirus, 65.1% did not know that HPV causes cervical cancer, 63.4% had not heard of the HPV vaccine, 70.1% did not know that HPV vaccines can prevent cervical cancer, and 88.2% had not received the HPV vaccine. The main sources of information for those who heard about the vaccine were distributed, 7.2% were from awareness campaigns, 36.8% were from doctors, 27% were from social media, and 29% were from other sources. The majority of people who have heard about HPV know that it causes cervical cancer and that a vaccine exists. While 81.75% of people who have heard of the vaccine know it is effective, only few of them have received it. The majority of participants (62.7%) had heard about hepatitis B and C viruses and 52.5% had heard about the HBV vaccine. However, 56.6% did not know that HBV and HCV cause liver cancer, 63.4% did not know that HBV vaccines can prevent liver cancer, and 72.3% had not received the HBV vaccine. About 70% of people who have heard about the vaccine are aware of its effectiveness, and 58.3% of those people have received it. 75.4% of participants had never heard of Kaposi's sarcoma herpesvirus (KSHV), and 80% did not know that KSHV causes Kaposi's sarcoma. 75.7% of participants had never heard of the Epstein-Barr virus (EBV), and 78.3% did not know that EBV causes lymphoma. In addition, 74.9% had never heard of HTLV-1 and 77.6% did not know that HTLV-1 causes lymphoma. 62.2% had never heard of *Helicobacter pylori* and 66.5% did not know that it causes stomach cancer (Tab. II).

Association between socio-demographic characteristics and awareness to CAI

The results show that there was no relationship between the difference in age and the level of awareness of CAI. However, female participants were more aware of CAI than males. Participants who are not married heard more about CAI than married and divorced people. Lebanese people showed a higher awareness level towards CAI than other nationalities. However, both Lebanese and non-Lebanese didn't show any difference in awareness level regarding EBV and HTLV1 as causes of lymphoma ($p > 0.05$) and both respondents didn't show any difference in HPV vaccine practice ($p = 0.063$). Surprisingly participants who had reached tertiary education level had more awareness only about oncoviruses ($p = 0.047$). However, they didn't show a higher knowledge about importance of vaccine in cancer

Tab. II. Awareness levels to CAI.

Question	YES		NO	
	N	%	N	%
Have you heard about some cancer types associated with bacteria?	169	40.7	246	59.3
Have you heard about some cancer types associated with viruses?	185	44.6	230	55.4
Have you heard of 'Oncovirus'?	106	25.5	309	74.5
Do you know that vaccines can prevent some cancer types?	158	38.1	257	61.9
Cervical Ca				
Have you heard about the human papillomavirus?	182	43.9	233	56.1
Do you know that HPV causes cervical cancer?	145	34.9	270	65.1
Have you heard of the HPV vaccine?	152	36.6	363	63.4
Do you know that the HPV vaccine can prevent cervical cancer?	124	29.9	291	70.1
Have you received the HPV vaccine?	49	11.8	366	88.2
Liver Ca				
Have you heard about the hepatitis B and C viruses?	260	62.7	155	37.3
Do you know that HBV and HCV cause liver cancer?	180	43.4	235	56.6
Have you heard of the HBV vaccine?	218	52.5	197	47.5
Do you know that the HBV vaccine can prevent liver cancer?	152	36.6	263	63.4
Have you received the HBV vaccine?	115	27.7	300	72.3
Kaposi Sarcoma				
Have you heard about the Kaposi sarcoma herpes virus?	102	24.6	313	75.4
Do you know that KSHV causes Kaposi sarcoma?	83	20	332	80
Lymphoma				
Have you heard about the Epstein-Barr virus?	101	24.3	314	75.7
Do you know that EBV causes lymphoma?	90	21.7	325	78.3
Have you heard about the HTLV-1?	104	25.1	311	74.9
Do you know that HTLV-1 causes lymphoma?	93	22.4	322	77.6
Gastric Ca				
Have you heard about the *Helicobacter pylori* bacteria?	157	37.8	258	62.2
Do you know that *Helicobacter pylori* causes stomach cancer?	139	33.5	276	66.5

Tab. III. Association between socio-demographic characteristics and awareness to CAI.

Item	Sex	Marital status	Nationality	Age	Education level	Occupation	Family Income	Diagnosed with cancer	Family history
	p-value								
Heard about some cancer types associated with bacteria	*0.003	*0.047	*0.000	0.251	*0.024	*0	*0	0.59	*0.042
Heard about some cancer types associated with viruses	*0	*0.006	*0.000	0.095	*0.007	*0	*0	0.303	*0.013
Heard of 'Oncovirus'	*0	0.071	*0.000	0.753	*0.047	*0	*0	0.434	*0.009
Vaccine can prevent some cancer types	*0	0.323	*0.000	0.548	*0.156	*0	*0	0.973	0.16

* ($p < 0.05$), statistically significant.

prevention and vaccine practice ($p > 0.05$). As expected, there was a significant relationship between occupation level and participants awareness towards CAI, where healthcare workers had shown a higher awareness level ($p = 0.000$). Participants who had middle family income had more awareness about CAI compared to participants who had low and high family income ($p = 0.000$). There was no relationship between place of residence and awareness to CAI. Surprisingly, people diagnosed with cancer didn't show a difference in their answers compared to healthy ones. Finally, a family history of cancer was associated with a higher awareness level to CAI except for the importance of vaccine in cancer prevention (Tab. III).

Cervical cancer and HPV

Females showed a much higher level of awareness regarding cervical cancer and HPV as the causative agent than males ($p = 0.000$). The results revealed no association between marital status and awareness level towards this type of CAI. Lebanese people were more aware about all aspects of the disease ($p = 0.000$) but have a low practice towards the HPV vaccine (13.6%) as other nationalities (7.0%). Place of residence and difference in age have no effect on participants results ($p > 0.05$). Importantly, a higher education level had a positive impact on awareness level towards this type of CAI ($p < 0.05$). The HPV vaccine practice was low even among people in higher education, with 13.2% of secondary school students and 11.8% of university students receiving the vaccine. Working in healthcare setting or having a middle income were associated with a better participants score ($p < 0.05$). Having a family history of cancer, but not a personal one, increased awareness of the disease and its causes. However, the practice of getting the HPV vaccine was significantly higher among people with a personal or family history of cancer ($p < 0.05$) (Tab. IV). Two participants diagnosed with cervical cancer had opposite different awareness levels to this CAI. Majority of participants with a family history of cervical cancer were aware to the disease and its prevention.

A detailed statistical analysis of the association between participants' characteristics and their awareness of CAI is available in Table S2, Table S3.

Liver cancer and HBV and HCV

Females also had a much higher level of awareness of liver cancer and related viruses compared to males ($p < 0.05$). However, the marital status didn't much affect

Tab. IV. Association between socio-demographic characteristics and awareness to cervical cancer and HPV.

Item	Sex	Marital status	Nationality	Age	Education level	Occupation	Family Income	Diagnosed with cancer	Family history
	p-value								
Heard of HPV	*0	0.179	*0	0.11	*0.02	*0	*0	0.724	*0
HPV infection causes cervical cancer	*0	0.223	*0	0.171	*0.033	*0	*0.001	0.367	*0
Heard of the HPV vaccine	*0	0.262	*0	0.208	80.043	*0	*0.002	0.428	*0
HPV vaccine can prevent cervical cancer	*0	0.762	*0.001	0.634	0.232	*0	*0.017	0.634	*0.002
you received HPV vaccine	*0	0.719	0.063	0.947	0.791	*0	*0.012	*0.001	*0.007

* ($p < 0.05$), statistically significant.

participants answers ($p > 0.05$). As with cervical cancer, Lebanese people were more aware of all aspects of the disease ($p = 0.000$). However, they were more likely to receive the hepatitis B vaccine (31.2%), which is significantly higher than the percentage of non-Lebanese people who received the vaccine (18.4%). Age difference was not associated with participants awareness to this type of CAI ($p > 0.05$). People of the North had the lowest scores regarding the infections causing the liver cancer (22.7%). Here, too, awareness increased significantly with higher education levels. However, the practice of getting the HBV vaccine was not affected by education level and remains low. Healthcare workers were very aware of all aspects of the disease. 53.2% of them had received the HBV vaccine. Middle income category had the highest level of awareness. Interestingly, the same pattern of association between personal and family history and awareness level was observed here as in cervical cancer. However, a family history of cancer only influenced HBV vaccine practices. Thirty-three percent of people with a family history of cancer received the vaccine, compared to 24.3% of people without a family history ($p = 0.04$) (Tab. V). Two of the three participants diagnosed with liver cancer were aware of the disease and causative infection but not towards the vaccine and practice. The majority of participants with a family history of liver cancer were aware about this CAI but their vaccine practice remains very low (5.3%).

A detailed statistical analysis of the association between participants' characteristics and their awareness of CAI is available in Table S2, Table S3.

Other types of CAI

Regarding Kaposi sarcoma, lymphoma, and gastric cancer, as well as their causative infections, females demonstrated a higher level of awareness of these CAI than males did ($p < 0.05$). There was no association between the difference in marital status and level of awareness to Kaposi sarcoma and cancer of the stomach ($p > 0.05$). Married people were the least aware of lymphoma caused by HTLV-1 or EBV, with 13.6% of them reporting this knowledge. Lebanese people had scored higher in questions about cancer of the stomach ($p = 0.002$) and lymphoma caused by HTLV-1 but not EBV ($p = 0.047$) compared to non-Lebanese. However, the difference in nationality didn't influence their knowledge that Kaposi sarcoma herpes virus causes Kaposi sarcoma ($p = 0.062$). Place of residence, education level, and age did not influence participants' scores ($p > 0.05$). However, people with a tertiary education level had better answers, especially regarding *Helicobacter pylori* (39.8%). Here is a clear association between occupational category with level of awareness of CAI. Working in a healthcare setting significantly increases awareness of all CAI ($p < 0.05$). The most aware of infections causing these diseases were middle-class families, as observed in cervical and liver cancers. Finally, having a family history of cancer, but not a personal one, increased awareness of the CAI mentioned here ($p < 0.05$). 33.3% of participants with stomach cancer had a better awareness level towards this CAI (Tab. VI). Around half of participants with a lymphoma family history were aware about this disease and related infections. Only one participant had a family history of Kaposi sarcoma and was not aware of the herpes virus that causes the disease.

A detailed statistical analysis of the association between participants' characteristics and their awareness of CAI is available in Table S2, Table S3.

Logistic regression analysis

We determined which of the socio-demographic characteristics predicts the 4 items of the awareness towards infection-associated cancers (1. Have you heard about some cancer types associated with bacteria? 2. Have you heard about some cancer types associated with virus? 3. Have you heard of "Oncovirus"? 4. Know that vaccine can prevent some cancer types?)**.** The two most significant variables in predicting awareness about cancer types associated with bacteria are nationality and occupation ($p = 0.001$ and < 0.001) respectively. Healthcare workers were 4 times as likely to be aware significant about

Tab. V. Association between socio-demographic characteristics and awareness to liver cancer and HBV and HCV.

Item	Sex	Marital status	Nationality	Age	Education level	Occupation	Family Income	Diagnosed with cancer	Family history
	p-value								
Heard of the hepatitis B and C viruses	*0	*0.014	*0	0.214	*0.004	*0	*0	0.466	*0
Hepatitis B and C viruses cause liver cancer	*0	0.271	*0	0.52	*0.024	*0	*0	0.068	*0.004
Heard of the hepatitis B vaccine	*0	0.076	*0	0.298	*0.004	*0	*0	0.569	*0
Hepatitis B vaccine can prevent liver cancer	*0	0.088	*0	0.335	0.152	*0	*0	0.428	*0
Received HBV vaccine	*0	0.482	*0.009	0.631	0.121	*0	*0	0.155	*0.04

* ($p < 0.05$), statistically.

Tab. VI. Association between socio-demographic characteristics and awareness to infections related to Kaposi sarcoma, lymphoma and cancer stomach.

Item	Sex	Marital status	Nationality	Age	Education level	Occupation	Family Income	Diagnosed with cancer	Family history
	p-value								
Heard of KSHV	*0.004	0.446	*0.021	0.758	0.134	*0	*0.007	0.391	*0.003
Kaposi sarcoma herpes virus causes Kaposi sarcoma	*0.002	0.429	0.062	0.758	0.204	*0	*0.004	0.211	*0.031
Heard of EBV	*0	0.177	0.084	0.58	0.259	*0	*0.001	0.381	*0.004
EBV causes lymphoma	*0	*0.034	0.073	0.352	0.136	*0	*0	0.273	*0.007
Heard of HTLV-1	*0	*0.014	*0.007	0.335	0.118	*0	*0.001	0.412	*0.01
HTLV-1 causes lymphoma	*0	*0.024	*0.047	0.481	0.113	*0	*0.004	0.301	*0.008
Heard of the bacteria *Helicobacter pylori*	*0	0.249	*0	0.756	*0.03	*0	*0	0.474	*0.034
Helicobacter pylori is associated to cancer of the stomach	*0	0.299	*0.002	0.635	0.052	*0	*0	0.318	*0.024

* ($p < 0.05$), statistically significant.

cancer types associated with bacteria when compared to non-healthcare workers. Similarly, Lebanese respondents were 2.5 times as likely as non-Lebanese respondents to be aware about cancer types associated with bacteria. The two most significant variables in predicting awareness about cancer types associated with viruses are Occupation and Family Income ($p < 0.001$ and 0.01) respectively. Healthcare workers were 1.7 times as likely to be aware about cancer types associated with viruses when compared to non-healthcare workers. Similarly, respondents with low and middle family incomes were 5.7 and 15.4 times as likely to be aware of cancers associated with viruses compared to respondents with high family incomes. The most significant variables in predicting awareness about 'Oncovirus' are Occupation, Nationality, Place of Residence, and Family Income, with corresponding *p*-values of < 0.001, 0.027, 0.01, and 0.018 respectively. Lebanese respondents were 2.6 times as likely to be aware about oncovirus when compared to non-Lebanese respondents. Similarly, healthcare workers were 17.5 times as likely to be aware of it as non-healthcare workers. In addition, respondents with low and middle family incomes were 0.187 and 1.047 times, respectively, likely to be aware of oncovirus when compared to respondents with high family income. Respondents from Beirut, Beqaa, Mount Lebanon, and North Lebanon were respectively 0.898, 0.309, 0.799, and 1.441 times as likely to be aware of 'Oncovirus' when compared to respondents from south Lebanon. The most significant variables in predicting awareness about vaccines being able to prevent some cancer types are gender and occupation. Female respondents were 2.75 times as likely to be aware about vaccines being able to prevent some types of cancer when compared to male respondents. Similarly, healthcare workers were 4.25 times as likely to be aware of it as non-healthcare workers.

The result of the logistic regression analysis is available in Table S4.

Discussion

Cancer continues to be a global health concern, with its incidence steadily rising over the years. Interestingly, a significant portion of cancer cases can be attributed to infections. Recent data shows that the number of cancer cases attributable to infections (CAI) has increased from 2.2 to 2.3 million between 2018 and 2020 worldwide [15]. They were distributed according to the type of infection as follows: *Helicobacter pylori* (36.3%), HPV (31.1%), HBV (16.4%), HCV (7.4 %) and other agents (8.9%) based on the latest GLOBOCAN 2020 data. Infection prevention and control strategies play a crucial role in reducing the incidence of CAI such as vaccination and safety precautions. Lebanon, a developing country of the middle east and with a low income, was ranked with high cancer rates in the region. Thus, the present study aimed to evaluate the awareness level of young adults, and adults residing in Lebanon with respect to CAI. By identifying any gaps in knowledge, we can implement targeted actions to enhance awareness, promote preventive measures, and mitigate the impact of cancer in Lebanon.

The majority of participants were young Lebanese who had completed their higher education degree. The sample includes a similar proportion of females and males. Less than half were aware about CAI and that vaccines can serve as a preventive measure against cancer. Additionally, a large number of respondents were not familiar with the term "Oncovirus." People in Lebanon had mainly heard of HBV and HCV, and knew that they cause liver cancer. They demonstrated moderate awareness of HPV and *Helicobacter pylori*, which cause cervical and gastric cancer, respectively. Unfortunately, their awareness of EBV, KSHV, and HTLV-1, as well

as their association with hematological malignancies, was poor. This could be explained by the fact that the local awareness campaigns focused primarily on HBV and HPV, and not on the lymphoma-related infections. More attention should be given to these other CAI types that have not been extensively studied in the Lebanese context [16-18].

In Lebanon, liver cancer, was mainly associated with HCV (40%) and HBV (28%) [19]. Vaccine preventive measure would be the most appropriate choice to reduce the liver cancer incidence. Despite the Lebanese government's recommendations for mandatory premarital screening in 1994 and hepatitis B vaccinations for newborns in 1998, only 36.6% of participants were aware that the hepatitis B vaccine is effective in preventing liver cancer and 27.7% had only been vaccinated. This result may be explained by the fact that a large percentage of participants were single (67.75%), and thus probably not educated about the hepatitis B virus (HBV) recommendations issued by Lebanese public health policies. Interestingly, the group of healthcare workers had the highest percentage of vaccinated participants which reflects Lebanese healthcare settings' adherence to the CDC's recommendation regarding vaccination for high-risk groups and explains the low prevalence of hepatitis locally [20]. The high percentage of unvaccinated people is alarming, especially since the HBV vaccine has been included in the national vaccination schedule since 1998 as mentioned above. Thus, regular visits to pediatricians are essential to keep track of vaccination progress. Also, only 11.8% of participants had received the HPV vaccine despite that 29.9% knew its effectiveness. The HPV vaccine is still considered too expensive in a country with a severe economic crisis, and a national guideline is still absent.

It was clear that females were significantly more aware than males towards all types of CAI, not only the one related to HPV and cervical cancer. Moreover, awareness toward CAI was significantly predicted by nationality. Interestingly, people who were Lebanese showed greater understanding of CAI than those who weren't. Furthermore, awareness of malignancies caused by viruses and bacteria was shown to be significantly influenced by occupation and income level, with healthcare professionals being much more likely to be aware of them than non-healthcare workers, and middle-income levels also being more aware. Additionally, the findings revealed some fascinating patterns about regional differences. Residence had a significant impact on respondents' awareness of "Oncovirus" ($p = 0.01$); respondents from North Lebanon, Mount Lebanon, Beqaa, and Beirut had varying degrees of awareness compared to those from South Lebanon. Surprisingly, having a family history of cancer significantly increased awareness of CAI. However, being diagnosed with cancer didn't affect the awareness level. On the other hand, age and marital status did not show a significant association with awareness levels.

Although this is the first report in Lebanon to focus exclusively on awareness level of CAI, some limitations deserve further attention. The convenience sampling method primarily reached young, highly educated people, while those with other levels of education were underrepresented. Furthermore, the two districts of South and North Lebanon were underrepresented. Therefore, it is not possible to generalize the findings to all people in Lebanon. However, the present study provides insight into the awareness level of educated young adults and adults in Lebanon towards CAI.

It is important to create and implement customized educational initiatives that consider differences in cultural origins, geographic regions, and socioeconomic status [21]. Stakeholders, such as the Ministry of Public Health, healthcare providers, and educational institutions, should provide the community with essential recommendations about CAI, preventive techniques, and the value of vaccination. Continuing medical education programs should emphasize the role of healthcare professionals as providers of accurate, trustworthy cancer prevention information, enhancing their ability to interact efficiently and effectively with patients and communities. Prioritizing the integration of cancer vaccine programs into national immunization schedules, while ensuring accessibility and affordability, is imperative for public health strategies. These findings underscore the necessity of comprehensive awareness campaigns and targeted educational programs to promote the use and acceptance of preventive vaccinations against cancer.

Conclusion

The Lebanese community, especially the young adults, and adults, demonstrated different levels of awareness of the different CAI types. The awareness level towards CAI was significantly impacted by the gender, nationality, occupation, education level, and family income of the participants. These findings highlight the need of focused health education campaigns that take certain sociodemographic groups into account.

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Conflict of interest

The authors have no conflict of interest to disclose.

Authors' contributions

S.M. designed the research work, analyzed the data and wrote the manuscript. F.Z. recruited participants and collected and analyzed the data.

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Supplementary material

Tab. S1. Evidence for the reliability and validity of the measurement model.

Reliability and Validity results					
	Factor loadings		***Cronbach's alpha***	***KMO***	***AVE***
Awareness of HPV association with cancer	HPV1	0.879	.899	.832	.712
	HPV2	0.918			
	HPV3	0.921			
	HPV4	0.88			
	HPV5	0.569			
Awareness of Hepatitis B and C association with cancer	HBV1	0.842	.890	.799	.693
	HBV2	0.858			
	HBV3	0.882			
	HBV4	0.85			
	HBV5	0.724			
Awareness of Kaposi sarcoma herpes virus association with cancer	KSHV1	0.958	.908	.500	.917
	KSHV2	0.958			
Awareness of Epstein-Barr virus association with cancer	EBV1	0.982	.962	.500	.964
	EBV2	0.982			
Awareness of Human T-Lymphotropic virus association with cancer	HTLV1	0.972	.941	.500	.944
	HTLV2	0.972			
Awareness of *Helicobacter pylori* bacteria association with cancer	HPYL1	0.977	.953	.500	.954
	HPYL2	0.977			

The measurement Model was tested for reliability and validity.
First, the Kaiser-Meyer-Olkin (KMO) measure was calculated for each construct. All values were found to be greater than 0.5, which is considered an acceptable value according to Norusis (2008), Field (2013), and Kaiser (1974). This indicates that the sample size is adequate for factor analysis.
Next, Cronbach's alpha values were obtained for each construct. All values were greater than 0.7, indicating high internal consistency and scale reliability. Confirmatory factor analysis was then used to obtain the factor loadings for each item. All obtained values were above 0.5, demonstrating that each item was statistically significant and significantly loaded onto its respective construct. This suggests that the items measure the intended constructs well.
Finally, Average Variance Extracted (AVE) was calculated for each measure. All AVE values were greater than the threshold of 0.5 (Fornell & Larcker, 1981), supporting the convergent validity of the measurement model. This means that the constructs explain a sufficient amount of the variance in the measures.
These results provide evidence for the reliability and validity of the measurement model, suggesting that the measures are appropriate for capturing the intended constructs.

Tab. S2. A detailed statistical analysis of the association between participants characteristics' and awareness towards CAI.

Relation	Test	Test statistic	Significance
Q2.1 (sex)x Q3.1 (Have you heard about some cancer types associated with bacteria?)	Pearson Chi-Square	9.025	0.003
Q2.1 (sex)x Q3.2 (Have you heard about some cancer types associated with viruses?)	Pearson Chi-Square	16.436	0
Q2.1 (sex)x Q3.3 (Have you heard of 'Oncovirus')	Pearson Chi-Square	21.497	0
Q2.1 (sex)x Q3.4 (Know that vaccine can prevent some cancer types)	Pearson Chi-Square	41.673	0
Q2.1 (sex)x Q4.1 (Have you heard of Human papillomavirus (HPV))	Pearson Chi-Square	51.173	0
Q2.1 (sex)x Q4.2 (Know that HPV infection causes cervical cancer)	Pearson Chi-Square	57.612	0
Q2.1 (sex)x Q4.3 (Have you ever heard of the HPV vaccine)	Pearson Chi-Square	51.246	0
Q2.1 (sex)x Q4.3.1 (main source of info)	Pearson Chi-Square	1.703	0.636
Q2.1 (sex)x Q4.4 (Know that HPV vaccine can prevent cervical cancer)	Pearson Chi-Square	31.15	0
Q2.1 (sex)x Q4.5 (Have you received HPV vaccine)	Pearson Chi-Square	20.654	0
Q2.1 (sex)x Q5.1 (Have you heard of the hepatitis B and C viruses)	Pearson Chi-Square	36.102	0
Q2.1 (sex)x Q5.2 Know that hepatitis B and C viruses cause liver cancer	Pearson Chi-Square	26.938	0
Q2.1 (sex)x Q5.3 Have you heard of the hepatitis B vaccine	Pearson Chi-Square	39.522	0

▶

Tab. S2. *(follows).*

Relation	Test	Test statistic	Significance
Q2.1 (sex)x Q5.3.1 main source of info	Pearson Chi-Square	3.58	0.311
Q2.1 (sex)x Q5.4 Know that Hepatitis B vaccine can prevent liver cancer	Pearson Chi-Square	24.131	0
Q2.1 (sex)x Q5.5 Have you received HBV vaccine	Pearson Chi-Square	22.878	0
Q2.1 (sex)x Q6.1 Heard of Kaposi sarcoma herpes virus (KSHV)	Pearson Chi-Square	8.398	0.004
Q2.1 (sex)x Q6.2 Know that Kaposi sarcoma herpes virus causes Kaposi sarcoma	Pearson Chi-Square	9.912	0.002
Q2.1 (sex)x Q7.1 Heard of Epstein Barr Virus (EBV)	Pearson Chi-Square	19.407	0
Q2.1 (sex)x Q7.2 Know that Epstein Barr virus causes lymphoma	Pearson Chi-Square	18.614	0
Q2.1 (sex)x Q7.3 Heard of Human T-lymphotropic virus 1 (HTLV-1)	Pearson Chi-Square	15.996	0
Q2.1 (sex)x Q7.4 Know that HTLV-1 causes lymphoma	Pearson Chi-Square	16.999	0
Q2.1 (sex)x Q8.1 Heard of the bacteria *Helicobacter pylori*	Pearson Chi-Square	35.556	0
Q2.1 (sex)x Q8.2 Know that *Helicobacter pylori* is associated to cancer of the stomach	Pearson Chi-Square	36.49	0
Q2.2 (marital status)x Q3.1 (Have you heard about some cancer types associated with bacteria?)	Pearson Chi-Square	6.116	0.047
Q2.2 (marital status)x Q3.2 (Have you heard about some cancer types associated with viruses?)	Pearson Chi-Square	10.227	0.006
Q2.2 (marital status)x Q3.3 (Have you heard of 'Oncovirus')	Pearson Chi-Square	5.296	0.071
Q2.2 (marital status)x Q3.4 (Know that vaccine can prevent some cancer types)	Pearson Chi-Square	2.26	0.323
Q2.2 (marital status)x Q4.1 (Have you heard of Human papillomavirus (HPV))	Pearson Chi-Square	3.44	0.179
Q2.2 (marital status)x Q4.2 (Know that HPV infection causes cervical cancer)	Pearson Chi-Square	3.001	0.223
Q2.2 (marital status)x Q4.3 (Have you ever heard of the HPV vaccine)	Pearson Chi-Square	2.677	0.262
Q2.2 (marital status)x Q4.3.1 (main source of info)	Pearson Chi-Square		
Q2.2 (marital status)x Q4.4 (Know that HPV vaccine can prevent cervical cancer)	Pearson Chi-Square	0.545	0.762
Q2.2 (marital status)x Q4.5 (Have you received HPV vaccine)	Pearson Chi-Square	0.659	0.719
Q2.2 (marital status)x Q5.1 (Have you heard of the hepatitis B and C viruses)	Pearson Chi-Square	8.48	0.014
Q2.2 (marital status)x Q5.2 Know that hepatitis B and C viruses cause liver cancer	Pearson Chi-Square	2.608	0.271
Q2.2 (marital status)x Q5.3 Have you heard of the hepatitis B vaccine	Pearson Chi-Square	5.157	0.076
Q2.2 (marital status))x Q5.3.1 main source of info	Pearson Chi-Square	6.069	0.415
Q2.2 (marital status)x Q5.4 Know that Hepatitis B vaccine can prevent liver cancer	Pearson Chi-Square	4.86	0.088
Q2.2 (marital status)x Q5.5 Have you received HBV vaccine	Pearson Chi-Square	1.461	0.482
Q2.2 (marital status)x Q6.1 Heard of Kaposi sarcoma herpes virus (KSHV)	Pearson Chi-Square	1.613	0.446
Q2.2 (marital status)x Q6.2 Know that Kaposi sarcoma herpes virus causes Kaposi sarcoma	Pearson Chi-Square	1.692	0.429
Q2.2 (marital status))x Q7.1 Heard of Epstein Barr Virus (EBV)	Pearson Chi-Square	3.468	0.177
Q2.2 (marital status)x Q7.2 Know that Epstein Barr virus causes lymphoma	Pearson Chi-Square	6.791	0.034
Q2.2 (marital status)x Q7.3 Heard of Human T-lymphotropic virus 1 (HTLV-1)	Pearson Chi-Square	8.583	0.014
Q2.2 (marital status)x Q7.4 Know that HTLV-1 causes lymphoma	Pearson Chi-Square	7.436	0.024
Q2.2 (marital status)x Q8.1 Heard of the bacteria *Helicobacter pylori*	Pearson Chi-Square	2.78	0.249
Q2.2 (marital status)x Q8.2 Know that *Helicobacter pylori* is associated to cancer of the stomach	Pearson Chi-Square	2.412	0.299
Q2.3 (nationality)x Have you heard about some cancer types associated with bacteria?	Pearson Chi-Square	22.996	0
Q2.3 (nationality)x Have you heard about some cancer types associated with viruses?	Pearson Chi-Square	15.544	0
Q2.3 (nationality)x Have you heard of 'Oncovirus'?	Pearson Chi-Square	14.535	0
Q2.3 (nationality)x Do you know that vaccine can prevent some cancer types?	Pearson Chi-Square	19.311	0
Q2.3 (nationality)x Have you heard of Human papillomavirus (HPV)?	Pearson Chi-Square	30.687	0

Tab. S2. *(follows).*

Relation	Test	Test statistic	Significance
Q2.3 (nationality)x Do you know that HPV infection causes cervical cancer?	Pearson Chi-Square	23.087	0
Q2.3 (nationality)x Have you ever heard of the HPV vaccine?	Pearson Chi-Square	20.333	0
Q2.3 (nationality)x main source of info?	Pearson Chi-Square		
Q2.3 (nationality)x Do you know that HPV vaccine can prevent cervical cancer?	Pearson Chi-Square	11.415	0.001
Q2.3 (nationality)x Have you received HPV vaccine?	Pearson Chi-Square	3.463	0.063
Q2.3 (nationality)x Have you heard of the hepatitis B and C viruses?	Pearson Chi-Square	51.03	0
Q2.3 (nationality)x Do you know that hepatitis B and C viruses cause liver cancer?	Pearson Chi-Square	22.647	0
Q2.3 (nationality)x Have you heard of the hepatitis B vaccine?	Pearson Chi-Square	32.496	0
Q2.3 (nationality)x main source of info?	Pearson Chi-Square	2.728	0.435
Q2.3 (nationality)xDo you know that Hepatitis B vaccine can prevent liver cancer?	Pearson Chi-Square	24.658	0
Q2.3 (nationality)x Have you received HBV vaccine?	Pearson Chi-Square	6.771	0.009
Q2.3 (nationality)x Have you heard of Kaposi sarcoma herpes virus (KSHV)?	Pearson Chi-Square	5.307	0.021
Q2.3 (nationality)x Do you know that Kaposi sarcoma herpes virus causes Kaposi sarcoma?	Pearson Chi-Square	3.495	0.062
Q2.3 (nationality)x Have you heard of Epstein Barr Virus (EBV)?	Pearson Chi-Square	2.988	0.084
Q2.3 (nationality)x Do you know that Epstein Barr virus causes lymphoma?	Pearson Chi-Square	3.219	0.073
Q2.3 (nationality)x Have you heard of Human T-lymphotropic virus 1 (HTLV-1)?	Pearson Chi-Square	7.193	0.007
Q2.3 (nationality)x Do you know that HTLV-1 causes lymphoma?	Pearson Chi-Square	3.962	0.047
Q2.3 (nationality)x Have you heard of the bacteria *Helicobacter pylori*?	Pearson Chi-Square	13.375	0
Q2.3 (nationality)x Do you know that *Helicobacter pylori* is associated to cancer of the stomach?	Pearson Chi-Square	9.436	0.002
Q2.4 (place of residence)x Have you heard about some cancer types associated with bacteria?	Pearson Chi-Square	7.065	0.132
Q2.4 (place of residence)x Have you heard about some cancer types associated with viruses?	Pearson Chi-Square	5.427	0.246
Q2.4 (place of residence)x Have you heard of 'Oncovirus'?	Pearson Chi-Square	3.383	0.496
Q2.4 (place of residence)x Do you know that vaccine can prevent some cancer types?	Pearson Chi-Square	5.011	0.286
Q2.4 (place of residence)x Have you heard of Human papillomavirus (HPV)?	Pearson Chi-Square	7.594	0.108
Q2.4 (place of residence)x Do you know that HPV infection causes cervical cancer?	Pearson Chi-Square	5.179	0.269
Q2.4 (place of residence)x Have you ever heard of the HPV vaccine?	Pearson Chi-Square	4.382	0.357
Q2.4 (place of residence)x main source of info?	Pearson Chi-Square	9.668	0.645
Q2.4 (place of residence)x Do you know that HPV vaccine can prevent cervical cancer?	Pearson Chi-Square	3.041	0.551
Q2.4 (place of residence)x Have you received HPV vaccine?	Pearson Chi-Square	3.218	0.522
Q2.4 (place of residence)x Have you heard of the hepatitis B and C viruses?	Pearson Chi-Square	11.226	0.024
Q2.4 (place of residence)x Do you know that hepatitis B and C viruses cause liver cancer?	Pearson Chi-Square	10.226	0.037
Q2.4 (place of residence)x Have you heard of the hepatitis B vaccine?	Pearson Chi-Square	8.167	0.086
Q2.4 (place of residence)x main source of info?	Pearson Chi-Square	16.561	0.167
Q2.4 (place of residence)xDo you know that Hepatitis B vaccine can prevent liver cancer?	Pearson Chi-Square	6.336	0.175
Q2.4 (place of residence) x Have you received HBV vaccine?	Pearson Chi-Square	4.551	0.337
Q2.4 (place of residence)x Have you heard of Kaposi sarcoma herpes virus (KSHV)?	Pearson Chi-Square	6.427	0.169
Q2.4 (place of residence)x Do you know that Kaposi sarcoma herpes virus causes Kaposi sarcoma?	Pearson Chi-Square	4.299	0.367
Q2.4 (place of residence)x Have you heard of Epstein Barr Virus (EBV)?	Pearson Chi-Square	4.337	0.362

Tab. S2. *(follows).*

Relation	Test	Test statistic	Significance
Q2.4 (place of residence)x Do you know that Epstein Barr virus causes lymphoma?	Pearson Chi-Square	6.232	0.182
Q2.4 (place of residence)x Have you heard of Human T-lymphotropic virus 1 (HTLV-1)?	Pearson Chi-Square	4.096	0.393
Q2.4 (place of residence)x Do you know that HTLV-1 causes lymphoma?	Pearson Chi-Square	6.478	0.166
Q2.4 (place of residence)x Have you heard of the bacteria *Helicobacter pylori*?	Pearson Chi-Square	4.291	0.368
Q2.4 (place of residence)x Do you know that *Helicobacter pylori* is associated to cancer of the stomach?	Pearson Chi-Square	3.224	0.521
Q2.5 (age)x Have you heard about some cancer types associated with bacteria?	Pearson Chi-Square	4.101	0.251
Q2.5 (age)x Have you heard about some cancer types associated with viruses?	Pearson Chi-Square	6.371	0.095
Q2.5 (age)x Have you heard of 'Oncovirus'?	Pearson Chi-Square	1.201	0.753
Q2.5 (age)x Do you know that vaccine can prevent some cancer types?	Pearson Chi-Square	2.118	0.548
Q2.5 (age)x Have you heard of Human papillomavirus (HPV)?	Pearson Chi-Square	6.032	0.11
Q2.5 (age)x Do you know that HPV infection causes cervical cancer?	Pearson Chi-Square	5.008	0.171
Q2.5 (age)x Have you ever heard of the HPV vaccine?	Pearson Chi-Square	4.543	0.208
Q2.5 (age)x main source of info?	Pearson Chi-Square	10.021	0.124
Q2.5 (age)x Do you know that HPV vaccine can prevent cervical cancer?	Pearson Chi-Square	1.713	0.634
Q2.5 (age)x Have you received HPV vaccine?	Pearson Chi-Square	0.366	0.947
Q2.5 (age)x Have you heard of the hepatitis B and C viruses?	Pearson Chi-Square	4.483	0.214
Q2.5 (age)x Do you know that hepatitis B and C viruses cause liver cancer?	Pearson Chi-Square	2.259	0.52
Q2.5 (age)x Have you heard of the hepatitis B vaccine?	Pearson Chi-Square	3.681	0.298
Q2.5 (age)x main source of info?	Pearson Chi-Square	6.905	0.33
Q2.5 (age)xDo you know that Hepatitis B vaccine can prevent liver cancer?	Pearson Chi-Square	3.395	0.335
Q2.5 (age)x Have you received HBV vaccine?	Pearson Chi-Square	1.728	0.631
Q2.5 (age)x Have you heard of Kaposi sarcoma herpes virus (KSHV)?	Pearson Chi-Square	1.181	0.758
Q2.5 (age)x Do you know that Kaposi sarcoma herpes virus causes Kaposi sarcoma?	Pearson Chi-Square	1.181	0.758
Q2.5 (age)x Have you heard of Epstein Barr Virus (EBV)?	Pearson Chi-Square	1.965	0.58
Q2.5 (age)x Do you know that Epstein Barr virus causes lymphoma?	Pearson Chi-Square	3.266	0.352
Q2.5 (age)x Have you heard of Human T-lymphotropic virus 1 (HTLV-1)?	Pearson Chi-Square	3.396	0.335
Q2.5 (age)x Do you know that HTLV-1 causes lymphoma?	Pearson Chi-Square	2.47	0.481
Q2.5 (age)x Have you heard of the bacteria *Helicobacter pylori*?	Pearson Chi-Square	1.187	0.756
Q2.5 (age)x Do you know that *Helicobacter pylori* is associated to cancer of the stomach?	Pearson Chi-Square	1.707	0.635
Q2.6 (education level)x Have you heard about some cancer types associated with bacteria?	Pearson Chi-Square	7.424	0.024
Q2.6 (education level)x Have you heard about some cancer types associated with viruses?	Pearson Chi-Square	9.847	0.007
Q2.6 (education level)x Have you heard of 'Oncovirus'?	Pearson Chi-Square	6.123	0.047
Q2.6 (education level)x Do you know that vaccine can prevent some cancer types?	Pearson Chi-Square	3.722	0.156
Q2.6 (education level)x Have you heard of Human papillomavirus (HPV)?	Pearson Chi-Square	7.783	0.02
Q2.6 (education level)x Do you know that HPV infection causes cervical cancer?	Pearson Chi-Square	6.804	0.033
Q2.6 (education level)x Have you ever heard of the HPV vaccine?	Pearson Chi-Square	6.272	0.043
Q2.6 (education level)x main source of info?	Pearson Chi-Square	3.272	0.352
Q2.6 (education level)x Do you know that HPV vaccine can prevent cervical cancer?	Pearson Chi-Square	2.922	0.232
Q2.6 (education level)x Have you received HPV vaccine?	Pearson Chi-Square	0.469	0.791
Q2.6 (education level)x Have you heard of the hepatitis B and C viruses?	Pearson Chi-Square	11.106	0.004
Q2.6 (education level)x Do you know that hepatitis B and C viruses cause liver cancer?	Pearson Chi-Square	7.459	0.024
Q2.6 (education level)x Have you heard of the hepatitis B vaccine?	Pearson Chi-Square	10.984	0.004

▶

Tab. S2. *(follows).*

Relation	Test	Test statistic	Significance
Q2.6 (education level)x main source of info?	Pearson Chi-Square	3.324	0.344
Q2.6 (education level)xDo you know that Hepatitis B vaccine can prevent liver cancer?	Pearson Chi-Square	3.764	0.152
Q2.6 (education level)x Have you received HBV vaccine?	Pearson Chi-Square	4.23	0.121
Q2.6 (education level)x Have you heard of Kaposi sarcoma herpes virus (KSHV)?	Pearson Chi-Square	4.023	0.134
Q2.6 (education level)x Do you know that Kaposi sarcoma herpes virus causes Kaposi sarcoma?	Pearson Chi-Square	3.176	0.204
Q2.6 (education level)x Have you heard of Epstein Barr Virus (EBV)?	Pearson Chi-Square	2.703	0.259
Q2.6 (education level)x Do you know that Epstein Barr virus causes lymphoma?	Pearson Chi-Square	3.994	0.136
Q2.6 (education level)x Have you heard of Human T-lymphotropic virus 1 (HTLV-1)?	Pearson Chi-Square	4.266	0.118
Q2.6 (education level)x Do you know that HTLV-1 causes lymphoma?	Pearson Chi-Square	4.366	0.113
Q2.6 (education level)x Have you heard of the bacteria *Helicobacter pylori*?	Pearson Chi-Square	7.016	0.03
Q2.6 (education level)x Do you know that *Helicobacter pylori* is associated to cancer of the stomach?	Pearson Chi-Square	5.931	0.052
Q2.7 (occupation)x Have you heard about some cancer types associated with bacteria?	Pearson Chi-Square	53.014	0
Q2.7 (occupation)x Have you heard about some cancer types associated with viruses?	Pearson Chi-Square	70.182	0
Q2.7 (occupation)x Have you heard of 'Oncovirus'?	Pearson Chi-Square	128.315	0
Q2.7 (occupation)x Do you know that vaccine can prevent some cancer types?	Pearson Chi-Square	63.081	0
Q2.7 (occupation)x Have you heard of Human papillomavirus (HPV)?	Pearson Chi-Square	73.999	0
Q2.7 (occupation)x Do you know that HPV infection causes cervical cancer?	Pearson Chi-Square	85.686	0
Q2.7 (occupation)x Have you ever heard of the HPV vaccine?	Pearson Chi-Square	74.899	0
Q2.7 (occupation)x main source of info?	Pearson Chi-Square	12.947	0.005
Q2.7 (occupation)x Do you know that HPV vaccine can prevent cervical cancer?	Pearson Chi-Square	68.662	0
Q2.7 (occupation)x Have you received HPV vaccine?	Pearson Chi-Square	25.242	0
Q2.7 (occupation)x Have you heard of the hepatitis B and C viruses?	Pearson Chi-Square	66.459	0
Q2.7 (occupation)x Do you know that hepatitis B and C viruses cause liver cancer?	Pearson Chi-Square	96.098	0
Q2.7 (occupation)x Have you heard of the hepatitis B vaccine?	Pearson Chi-Square	76.462	0
Q2.7 (occupation)x main source of info?	Pearson Chi-Square	13.898	0.003
Q2.7 (occupation)xDo you know that Hepatitis B vaccine can prevent liver cancer?	Pearson Chi-Square	98.996	0
Q2.7 (occupation)x Have you received HBV vaccine?	Pearson Chi-Square	67.985	0
Q2.7 (occupation)x Have you heard of Kaposi sarcoma herpes virus (KSHV)?	Pearson Chi-Square	62.919	0
Q2.7 (occupation)x Do you know that Kaposi sarcoma herpes virus causes Kaposi sarcoma?	Pearson Chi-Square	88.597	0
Q2.7 (occupation)x Have you heard of Epstein Barr Virus (EBV)?	Pearson Chi-Square	119.864	0
Q2.7 (occupation)x Do you know that Epstein Barr virus causes lymphoma?	Pearson Chi-Square	122.501	0
Q2.7 (occupation)x Have you heard of Human T-lymphotropic virus 1 (HTLV-1)?	Pearson Chi-Square	97.613	0
Q2.7 (occupation)x Do you know that HTLV-1 causes lymphoma?	Pearson Chi-Square	119.628	0
Q2.7 (occupation)x Have you heard of the bacteria *Helicobacter pylori*?	Pearson Chi-Square	121.583	0
Q2.7 (occupation)x Do you know that *Helicobacter pylori* is associated to cancer of the stomach?	Pearson Chi-Square	143.942	0
Q2.8 (family income)x Have you heard about some cancer types associated with bacteria?	Pearson Chi-Square	20.241	0
Q2.8 (family income)x Have you heard about some cancer types associated with viruses?	Pearson Chi-Square	20.107	0

▶

Tab. S2. *(follows).*

Relation	Test	Test statistic	Significance
Q2.8 (family income)x Have you heard of 'Oncovirus'?	Pearson Chi-Square	18.369	0
Q2.8 (family income)x Do you know that vaccine can prevent some cancer types?	Pearson Chi-Square	15.866	0
Q2.8 (family income)x Have you heard of Human papillomavirus (HPV)?	Pearson Chi-Square	15.552	0
Q2.8 (family income)x Do you know that HPV infection causes cervical cancer?	Pearson Chi-Square	14.555	0.001
Q2.8 (family income)x Have you ever heard of the HPV vaccine?	Pearson Chi-Square	12.004	0.002
Q2.8 (family income)x main source of info?	Pearson Chi-Square	12.297	0.056
Q2.8 (family income)x Do you know that HPV vaccine can prevent cervical cancer?	Pearson Chi-Square	8.11	0.017
Q2.8 (family income)x Have you received HPV vaccine?	Pearson Chi-Square	8.815	0.012
Q2.8 (family income)x Have you heard of the hepatitis B and C viruses?	Pearson Chi-Square	47.598	0
Q2.8 (family income)x Do you know that hepatitis B and C viruses cause liver cancer?	Pearson Chi-Square	37.241	0
Q2.8 (family income)x Have you heard of the hepatitis B vaccine?	Pearson Chi-Square	28.472	0
Q2.8 (family income)x main source of info?	Pearson Chi-Square	8.18	0.225
Q2.8 (family income)xDo you know that Hepatitis B vaccine can prevent liver cancer?	Pearson Chi-Square	24.454	0
Q2.8 (family income) x Have you received HBV vaccine?	Pearson Chi-Square	19.045	0
Q2.8 (family income)x Have you heard of Kaposi sarcoma herpes virus (KSHV)?	Pearson Chi-Square	9.909	0.007
Q2.8 (family income)x Do you know that Kaposi sarcoma herpes virus causes Kaposi sarcoma?	Pearson Chi-Square	10.958	0.004
Q2.8 (family income)x Have you heard of Epstein Barr Virus (EBV)?	Pearson Chi-Square	14.86	0.001
Q2.8 (family income)x Do you know that Epstein Barr virus causes lymphoma?	Pearson Chi-Square	15.69	0
Q2.8 (family income)x Have you heard of Human T-lymphotropic virus 1 (HTLV-1)?	Pearson Chi-Square	13.803	0.001
Q2.8 (family income)x Do you know that HTLV-1 causes lymphoma?	Pearson Chi-Square	11.002	0.004
Q2.8 (family income)x Have you heard of the bacteria *Helicobacter pylori*?	Pearson Chi-Square	41.983	0
Q2.8 (family income)x Do you know that *Helicobacter pylori* is associated to cancer of the stomach?	Pearson Chi-Square	31.305	0
Q2.9 (have you been diagnosed with cancer)x Have you heard about some cancer types associated with bacteria?	Pearson Chi-Square	0.291	0.59
Q2.9 (have you been diagnosed with cancer)x Have you heard about some cancer types associated with viruses?	Pearson Chi-Square	1.06	0.303
Q2.9 (have you been diagnosed with cancer)x Have you heard of 'Oncovirus'?	Pearson Chi-Square	0.613	0.434
Q2.9 (have you been diagnosed with cancer)x Do you know that vaccine can prevent some cancer types?	Pearson Chi-Square	0.001	0.973
Q2.9 (have you been diagnosed with cancer)x Have you heard of Human papillomavirus (HPV)?	Pearson Chi-Square	0.125	0.724
Q2.9 (have you been diagnosed with cancer)x Do you know that HPV infection causes cervical cancer?	Pearson Chi-Square	0.814	0.367
Q2.9 (have you been diagnosed with cancer)x Have you ever heard of the HPV vaccine?	Pearson Chi-Square	0.629	0.428
Q2.9 (have you been diagnosed with cancer)x main source of info?	Pearson Chi-Square	6.115	0.106
Q2.9 (have you been diagnosed with cancer)x Do you know that HPV vaccine can prevent cervical cancer?	Pearson Chi-Square	0.226	0.634
Q2.9 (have you been diagnosed with cancer)x Have you received HPV vaccine?	Pearson Chi-Square	11.427	0.001
Q2.9 (have you been diagnosed with cancer)x Have you heard of the hepatitis B and C viruses?	Pearson Chi-Square	0.532	0.466
Q2.9 (have you been diagnosed with cancer)x Do you know that hepatitis B and C viruses cause liver cancer?	Pearson Chi-Square	3.322	0.068
Q2.9 (have you been diagnosed with cancer)x Have you heard of the hepatitis B vaccine?	Pearson Chi-Square	0.325	0.569
Q2.9 (have you been diagnosed with cancer)x main source of info?	Pearson Chi-Square	4.719	0.194

▶

Tab. S2. *(follows).*

Relation	Test	Test statistic	Significance
Q2.9 (have you been diagnosed with cancer)xDo you know that Hepatitis B vaccine can prevent liver cancer?	Pearson Chi-Square	0.629	0.428
Q2.9 (have you been diagnosed with cancer)x Have you received HBV vaccine?	Pearson Chi-Square	2.023	0.155
Q2.9 (have you been diagnosed with cancer)x Have you heard of Kaposi sarcoma herpes virus (KSHV)?	Pearson Chi-Square	0.735	0.391
Q2.9 (have you been diagnosed with cancer)x Do you know that Kaposi sarcoma herpes virus causes Kaposi sarcoma?	Pearson Chi-Square	1.561	0.211
Q2.9 (have you been diagnosed with cancer)x Have you heard of Epstein Barr Virus (EBV)?	Pearson Chi-Square	0.767	0.381
Q2.9 (have you been diagnosed with cancer)x Do you know that Epstein Barr virus causes lymphoma?	Pearson Chi-Square	1.201	0.273
Q2.9 (have you been diagnosed with cancer)x Have you heard of Human T-lymphotropic virus 1 (HTLV-1)?	Pearson Chi-Square	0.672	0.412
Q2.9 (have you been diagnosed with cancer)x Do you know that HTLV-1 causes lymphoma?	Pearson Chi-Square	1.068	0.301
Q2.9 (have you been diagnosed with cancer)x Have you heard of the bacteria *Helicobacter pylori*?	Pearson Chi-Square	0.514	0.474
Q2.9 (have you been diagnosed with cancer)x Do you know that *Helicobacter pylori* is associated to cancer of the stomach?	Pearson Chi-Square	0.998	0.318
Q2.9.1 (what type?)x Have you heard about some cancer types associated with bacteria?	Pearson Chi-Square	3.056	0.383
Q2.9.1 (what type?)x Have you heard about some cancer types associated with viruses?	Pearson Chi-Square	3.254	0.354
Q2.9.1 (what type?)x Have you heard of 'Oncovirus'?	Pearson Chi-Square	4.048	0.256
Q2.9.1 (what type?)x Do you know that vaccine can prevent some cancer types?	Pearson Chi-Square	4.048	0.256
Q2.9.1 (what type?)x Have you heard of Human papillomavirus (HPV)?	Pearson Chi-Square	1.333	0.721
Q2.9.1 (what type?)x Do you know that HPV infection causes cervical cancer?	Pearson Chi-Square	1.333	0.721
Q2.9.1 (what type?)x Have you ever heard of the HPV vaccine?	Pearson Chi-Square	1.333	0.721
Q2.9.1 (what type?)x main source of info?	Pearson Chi-Square	2.4	0.494
Q2.9.1 (what type?)x Do you know that HPV vaccine can prevent cervical cancer?	Pearson Chi-Square	3.75	0.29
Q2.9.1 (what type?)x Have you received HPV vaccine?	Pearson Chi-Square	2.014	0.57
Q2.9.1 (what type?)x Have you heard of the hepatitis B and C viruses?	Pearson Chi-Square	0.972	0.808
Q2.9.1 (what type?)x Do you know that hepatitis B and C viruses cause liver cancer?	Pearson Chi-Square	0.972	0.808
Q2.9.1 (what type?)x Have you heard of the hepatitis B vaccine?	Pearson Chi-Square	1.333	0.721
Q2.9.1 (what type?)x main source of info?	Pearson Chi-Square	10	0.125
Q2.9.1 (what type?)xDo you know that Hepatitis B vaccine can prevent liver cancer?	Pearson Chi-Square	1.333	0.721
Q2.9.1 (what type?) x Have you received HBV vaccine?	Pearson Chi-Square	1.333	0.721
Q2.9.1 (what type?)x Have you heard of Kaposi sarcoma herpes virus (KSHV)?	Pearson Chi-Square	3.75	0.29
Q2.9.1 (what type?)x Do you know that Kaposi sarcoma herpes virus causes Kaposi sarcoma?	Pearson Chi-Square	3.75	0.29
Q2.9.1 (what type?)x Have you heard of Epstein Barr Virus (EBV)?	Pearson Chi-Square	3.75	0.29
Q2.9.1 (what type?) x Do you know that Epstein Barr virus causes lymphoma?	Pearson Chi-Square	3.75	0.29
Q2.9.1 (what type?)x Have you heard of Human T-lymphotropic virus 1 (HTLV-1)?	Pearson Chi-Square	3.75	0.29
Q2.9.1 (what type?)x Do you know that HTLV-1 causes lymphoma?	Pearson Chi-Square	3.75	0.29
Q2.9.1 (what type?) x Have you heard of the bacteria *Helicobacter pylori*?	Pearson Chi-Square	1.333	0.721
Q2.9.1 (what type?)x Do you know that *Helicobacter pylori* is associated to cancer of the stomach?	Pearson Chi-Square	1.333	0.721
Q2.10 (family history of cancer)x Have you heard about some cancer types associated with bacteria?	Pearson Chi-Square	4.119	0.042

Tab. S2. *(follows).*

Relation	Test	Test statistic	Significance
Q2.10 (family history of cancer)x Have you heard about some cancer types associated with viruses?	Pearson Chi-Square	6.146	0.013
Q2.10 (family history of cancer)x Have you heard of 'Oncovirus'?	Pearson Chi-Square	6.924	0.009
Q2.10 (family history of cancer)x Do you know that vaccine can prevent some cancer types?	Pearson Chi-Square	1.972	0.16
Q2.10 (family history of cancer)x Have you heard of Human papillomavirus (HPV)?	Pearson Chi-Square	18.978	0
Q2.10 (family history of cancer)x Do you know that HPV infection causes cervical cancer?	Pearson Chi-Square	13.81	0
Q2.10 (family history of cancer)x Have you ever heard of the HPV vaccine?	Pearson Chi-Square	19.561	0
Q2.10 (family history of cancer)x main source of info?	Pearson Chi-Square	2.099	0.552
Q2.10 (family history of cancer)x Do you know that HPV vaccine can prevent cervical cancer?	Pearson Chi-Square	9.516	0.002
Q2.10 (family history of cancer)x Have you received HPV vaccine?	Pearson Chi-Square	7.33	0.007
Q2.10 (family history of cancer)x Have you heard of the hepatitis B and C viruses?	Pearson Chi-Square	14.993	0
Q2.10 (family history of cancer)x Do you know that hepatitis B and C viruses cause liver cancer?	Pearson Chi-Square	8.152	0.004
Q2.10 (family history of cancer)x Have you heard of the hepatitis B vaccine?	Pearson Chi-Square	19.028	0
Q2.10 (family history of cancer)x main source of info?	Pearson Chi-Square	0.74	0.864
Q2.10 (family history of cancer)xDo you know that Hepatitis B vaccine can prevent liver cancer?	Pearson Chi-Square	12.759	0
Q2.10 (family history of cancer) x Have you received HBV vaccine?	Pearson Chi-Square	4.235	0.04
Q2.10 (family history of cancer)x Have you heard of Kaposi sarcoma herpes virus (KSHV)?	Pearson Chi-Square	9.029	0.003
Q2.10 (family history of cancer)x Do you know that Kaposi sarcoma herpes virus causes Kaposi sarcoma?	Pearson Chi-Square	4.631	0.031
Q2.10 (family history of cancer)x Have you heard of Epstein Barr Virus (EBV)?	Pearson Chi-Square	8.186	0.004
Q2.10 (family history of cancer)x Do you know that Epstein Barr virus causes lymphoma?	Pearson Chi-Square	7.352	0.007
Q2.10 (family history of cancer)x Have you heard of Human T-lymphotropic virus 1 (HTLV-1)?	Pearson Chi-Square	6.657	0.01
Q2.10 (family history of cancer)x Do you know that HTLV-1 causes lymphoma?	Pearson Chi-Square	7.089	0.008
Q2.10 (family history of cancer)x Have you heard of the bacteria *Helicobacter pylori*?	Pearson Chi-Square	4.474	0.034
Q2.10 (family history of cancer)x Do you know that *Helicobacter pylori* is associated to cancer of the stomach?	Pearson Chi-Square	5.128	0.024
Q2.10.1 (what type)x Have you heard about some cancer types associated with bacteria?	Pearson Chi-Square	13.136	0.285
Q2.10.1 (what type)x Have you heard about some cancer types associated with viruses?	Pearson Chi-Square	17.993	0.082
Q2.10.1 (what type)x Have you heard of 'Oncovirus'?	Pearson Chi-Square	15.381	0.166
Q2.10.1 (what type)x Do you know that vaccine can prevent some cancer types?	Pearson Chi-Square	16.004	0.141
Q2.10.1 (what type)x Have you heard of Human papillomavirus (HPV)?	Pearson Chi-Square	12.988	0.294
Q2.10.1 (what type)x Do you know that HPV infection causes cervical cancer?	Pearson Chi-Square	19.238	0.057
Q2.10.1 (what type)x Have you ever heard of the HPV vaccine?	Pearson Chi-Square	11.521	0.401
Q2.10.1 (what type)x main source of info?	Pearson Chi-Square	68.555	0
Q2.10.1 (what type)x Do you know that HPV vaccine can prevent cervical cancer?	Pearson Chi-Square	17.152	0.103
Q2.10.1 (what type)x Have you received HPV vaccine?	Pearson Chi-Square	20.376	0.04
Q2.10.1 (what type)x Have you heard of the hepatitis B and C viruses?	Pearson Chi-Square	13.031	0.291
Q2.10.1 (what type)x Do you know that hepatitis B and C viruses cause liver cancer?	Pearson Chi-Square	8.342	0.682
Q2.10.1 (what type)x Have you heard of the hepatitis B vaccine?	Pearson Chi-Square	9.878	0.541

Tab. S2. *(follows).*

Relation	Test	Test statistic	Significance
Q2.10.1 (what type)x main source of info?	Pearson Chi-Square	36.414	0.195
Q2.10.1 (what type)xDo you know that Hepatitis B vaccine can prevent liver cancer?	Pearson Chi-Square	9.416	0.584
Q2.10.1 (what type)x Have you received HBV vaccine?	Pearson Chi-Square	22.056	0.024
Q2.10.1 (what type)x Have you heard of Kaposi sarcoma herpes virus (KSHV)?	Pearson Chi-Square	16.667	0.118
Q2.10.1 (what type)x Do you know that Kaposi sarcoma herpes virus causes Kaposi sarcoma?	Pearson Chi-Square	18.577	0.069
Q2.10.1 (what type)x Have you heard of Epstein Barr Virus (EBV)?	Pearson Chi-Square	20.631	0.037
Q2.10.1 (what type)x Do you know that Epstein Barr virus causes lymphoma?	Pearson Chi-Square	16.372	0.128
Q2.10.1 (what type)x Have you heard of Human T-lymphotropic virus 1 (HTLV-1)?	Pearson Chi-Square	17.663	0.09
Q2.10.1 (what type)x Do you know that HTLV-1 causes lymphoma?	Pearson Chi-Square	10.763	0.463
Q2.10.1 (what type)x Have you heard of the bacteria *Helicobacter pylori*?	Pearson Chi-Square	9.279	0.596
Q2.10.1 (what type) Do you know that *Helicobacter pylori* is associated to cancer of the stomach?	Pearson Chi-Square	8.915	0.63

($p < 0.05$), statistically significant.

Tab. S3. Cross-tabulation of participants characteristics and awareness levels to CAI.

Have you heard about some cancer types associated with bacteria?					Total
			No	Yes	
Sex	Male	Count	130	64	194
		%	67.0%	33.0%	100.0%
	Female	Count	116	105	221
		%	52.5%	47.5%	100.0%
Total		Count	246	169	415
		%	59.3%	40.7%	100.0%
Have you heard about some cancer types associated with viruses?					**Total**
			No	**Yes**	
Sex	Male	Count	128	66	194
		%	66.0%	34.0%	100.0%
	Female	Count	102	119	221
		%	46.2%	53.8%	100.0%
Total		Count	230	185	415
		%	55.4%	44.6%	100.0%
Have you heard of 'Oncovirus'					**Total**
			No	**Yes**	
Sex	Male	Count	165	29	194
		%	85.1%	14.9%	100.0%
	Female	Count	144	77	221
		%	65.2%	34.8%	100.0%
Total		Count	309	106	415
		%	74.5%	25.5%	100.0%
Know that vaccine can prevent some cancer types					**Total**
			No	**Yes**	
Sex	Male	Count	152	42	194
		%	78.4%	21.6%	100.0%
	Female	Count	105	116	221
		%	47.5%	52.5%	100.0%
Total		Count	257	158	415
		%	61.9%	38.1%	100.0%

Tab. S3 (*follows*).

Have you heard of Human papillomavirus (HPV)					Total
			No	Yes	
Sex	Male	Count	145	49	194
		%	74.7%	25.3%	100.0%
	Female	Count	88	133	221
		%	39.8%	60.2%	100.0%
Total		Count	233	182	415
		%	56.1%	43.9%	100.0%
Know that HPV infection causes cervical cancer					**Total**
			No	**Yes**	
Sex	Male	Count	163	31	194
		%	84.0%	16.0%	100.0%
	Female	Count	107	114	221
		%	48.4%	51.6%	100.0%
Total		Count	270	145	415
		%	65.1%	34.9%	100.0%
Have you ever heard of the HPV vaccine					**Total**
			No	**Yes**	
Sex	Male	Count	158	36	194
		%	81.4%	18.6%	100.0%
	Female	Count	105	116	221
		%	47.5%	52.5%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Know that HPV vaccine can prevent cervical cancer					**Total**
			No	**Yes**	
Sex	Male	Count	162	32	194
		%	83.5%	16.5%	100.0%
	Female	Count	129	92	221
		%	58.4%	41.6%	100.0%
Total		Count	291	124	415
		%	70.1%	29.9%	100.0%
Have you received HPV vaccine					**Total**
			No	**Yes**	
Sex	Male	Count	186	8	194
		%	95.9%	4.1%	100.0%
	Female	Count	180	41	221
		%	81.4%	18.6%	100.0%
Total		Count	366	49	415
		%	88.2%	11.8%	100.0%
Have you heard of the hepatitis B and C viruses					**Total**
			No	**Yes**	
Sex	Male	Count	102	92	194
		%	52.6%	47.4%	100.0%
	Female	Count	53	168	221
		%	24.0%	76.0%	100.0%
Total		Count	155	260	415
		%	37.3%	62.7%	100.0%
Know that hepatitis B and C viruses cause liver cancer					**Total**
			No	**Yes**	
Sex	Male	Count	136	58	194
		%	70.1%	29.9%	100.0%
	Female	Count	99	122	221
		%	44.8%	55.2%	100.0%
Total		Count	235	180	415
		%	56.6%	43.4%	100.0%

Tab. S3 (*follows*).

Have you heard of the hepatitis B vaccine					Total
			No	Yes	
Sex	Male	Count	124	70	194
		%	63.9%	36.1%	100.0%
	Female	Count	73	148	221
		%	33.0%	67.0%	100.0%
Total		Count	197	218	415
		%	47.5%	52.5%	100.0%
Know that Hepatitis B vaccine can prevent liver cancer					**Total**
			No	**Yes**	
Sex	Male	Count	147	47	194
		%	75.8%	24.2%	100.0%
	Female	Count	116	105	221
		%	52.5%	47.5%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Have you received HBV vaccine					**Total**
			No	**Yes**	
Sex	Male	Count	162	32	194
		%	83.5%	16.5%	100.0%
	Female	Count	138	83	221
		%	62.4%	37.6%	100.0%
Total		Count	300	115	415
		%	72.3%	27.7%	100.0%
Heard of Kaposi sarcoma herpes virus (KSHV)					**Total**
			No	**Yes**	
Sex	Male	Count	159	35	194
		%	82.0%	18.0%	100.0%
	Female	Count	154	67	221
		%	69.7%	30.3%	100.0%
Total		Count	313	102	415
		%	75.4%	24.6%	100.0%
Know that Kaposi sarcoma herpes virus causes Kaposi sarcoma					**Total**
			No	**Yes**	
Sex	Male	Count	168	26	194
		%	86.6%	13.4%	100.0%
	Female	Count	164	57	221
		%	74.2%	25.8%	100.0%
Total		Count	332	83	415
		%	80.0%	20.0%	100.0%
Heard of Epstein Barr Virus (EBV)					**Total**
			No	**Yes**	
Sex	Male	Count	166	28	194
		%	85.6%	14.4%	100.0%
	Female	Count	148	73	221
		%	67.0%	33.0%	100.0%
Total		Count	314	101	415
		%	75.7%	24.3%	100.0%
Know that Epstein Barr virus causes lymphoma					**Total**
			No	**Yes**	
Sex	Male	Count	170	24	194
		%	87.6%	12.4%	100.0%
	Female	Count	155	66	221
		%	70.1%	29.9%	100.0%
Total		Count	325	90	415
		%	78.3%	21.7%	100.0%

Tab. S3 (*follows*).

Heard of Human T-lymphotropic virus 1 (HTLV-1)					Total
			No	Yes	
Sex	Male	Count	163	31	194
		%	84.0%	16.0%	100.0%
	Female	Count	148	73	221
		%	67.0%	33.0%	100.0%
Total		Count	311	104	415
		%	74.9%	25.1%	100.0%
Know that HTLV-1 causes lymphoma					**Total**
			No	**Yes**	
Sex	Male	Count	168	26	194
		%	86.6%	13.4%	100.0%
	Female	Count	154	67	221
		%	69.7%	30.3%	100.0%
Total		Count	322	93	415
		%	77.6%	22.4%	100.0%
Heard of the bacteria *Helicobacter pylori*					**Total**
			No	**Yes**	
Sex	Male	Count	150	44	194
		%	77.3%	22.7%	100.0%
	Female	Count	108	113	221
		%	48.9%	51.1%	100.0%
Total		Count	258	157	415
		%	62.2%	37.8%	100.0%
Know that *Helicobacter pylori* is associated to cancer of the stomach					**Total**
			No	**Yes**	
Sex	Male	Count	158	36	194
		%	81.4%	18.6%	100.0%
	Female	Count	118	103	221
		%	53.4%	46.6%	100.0%
Total		Count	276	139	415
		%	66.5%	33.5%	100.0%
Have you heard about some cancer types associated with bacteria?					**Total**
			No	**Yes**	
Marital status	Divorced/ widowed	Count	11	5	16
		%	68.8%	31.3%	100.0%
	Married	Count	80	38	118
		%	67.8%	32.2%	100.0%
	Single	Count	155	126	281
		%	55.2%	44.8%	100.0%
Total		Count	246	169	415
		%	59.3%	40.7%	100.0%
Have you heard about some cancer types associated with viruses?					**Total**
			No	**Yes**	
Marital status	Divorced/ widowed	Count	12	4	16
		%	75.0%	25.0%	100.0%
	Married	Count	77	41	118
		%	65.3%	34.7%	100.0%
	Single	Count	141	140	281
		%	50.2%	49.8%	100.0%
Total		Count	230	185	415
		% s	55.4%	44.6%	100.0%

Tab. S3 (*follows*).

Have you heard of 'Oncovirus'					Total
			No	Yes	
Marital status	Divorced/ widowed	Count	14	2	16
		%	87.5%	12.5%	100.0%
	Married	Count	95	23	118
		%	80.5%	19.5%	100.0%
	Single	Count	200	81	281
		%	71.2%	28.8%	100.0%
Total		Count	309	106	415
		%	74.5%	25.5%	100.0%
Know that vaccine can prevent some cancer types					**Total**
			No	**Yes**	
Marital status	Divorced/ widowed	Count	12	4	16
		%	75.0%	25.0%	100.0%
	Married	Count	77	41	118
		%	65.3%	34.7%	100.0%
	Single	Count	168	113	281
		%	59.8%	40.2%	100.0%
Total		Count	257	158	415
		%	61.9%	38.1%	100.0%
Have you heard of Human papillomavirus (HPV)					**Total**
			No	**Yes**	
Marital status	Divorced/ widowed	Count	10	6	16
		%	62.5%	37.5%	100.0%
	Married	Count	74	44	118
		%	62.7%	37.3%	100.0%
	Single	Count	149	132	281
		%	53.0%	47.0%	100.0%
Total		Count	233	182	415
		%	56.1%	43.9%	100.0%
Know that HPV infection causes cervical cancer					**Total**
			No	**Yes**	
Marital status	Divorced/ widowed	Count	11	5	16
		%	68.8%	31.3%	100.0%
	Married	Count	84	34	118
		%	71.2%	28.8%	100.0%
	Single	Count	175	106	281
		%	62.3%	37.7%	100.0%
Total		Count	270	145	415
		%	65.1%	34.9%	100.0%
Have you ever heard of the HPV vaccine					**Total**
			No	**Yes**	
Marital status	Divorced/ widowed	Count	10	6	16
		%	62.5%	37.5%	100.0%
	Married	Count	82	36	118
		%	69.5%	30.5%	100.0%
	Single	Count	171	110	281
		%	60.9%	39.1%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%

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Tab. S3 (*follows*).

Know that HPV vaccine can prevent cervical cancer					Total
			No	Yes	
Marital status	Divorced/ widowed	Count	12	4	16
		%	75.0%	25.0%	100.0%
	Married	Count	85	33	118
		%	72.0%	28.0%	100.0%
	Single	Count	194	87	281
		%	69.0%	31.0%	100.0%
Total		Count	291	124	415
		%	70.1%	29.9%	100.0%
Have you received HPV vaccine					**Total**
			No	**Yes**	
Marital status	Divorced/ widowed	Count	15	1	16
		%	93.8%	6.3%	100.0%
	Married	Count	105	13	118
		%	89.0%	11.0%	100.0%
	Single	Count	246	35	281
		%	87.5%	12.5%	100.0%
Total		Count	366	49	415
		%	88.2%	11.8%	100.0%
Have you heard of the hepatitis B and C viruses					**Total**
			No	**Yes**	
Marital status	Divorced/ widowed	Count	5	11	16
		%	31.3%	68.8%	100.0%
	Married	Count	57	61	118
		%	48.3%	51.7%	100.0%
	Single	Count	93	188	281
		%	33.1%	66.9%	100.0%
Total		Count	155	260	415
		%	37.3%	62.7%	100.0%
Know that hepatitis B and C viruses cause liver cancer					**Total**
			No	**Yes**	
Marital status	Divorced/ widowed	Count	8	8	16
		%	50.0%	50.0%	100.0%
	Married	Count	74	44	118
		%	62.7%	37.3%	100.0%
	Single	Count	153	128	281
		%	54.4%	45.6%	100.0%
Total		Count	235	180	415
		%	56.6%	43.4%	100.0%
Have you heard of the hepatitis B vaccine					**Total**
			No	**Yes**	
Marital status	Divorced/ widowed	Count	10	6	16
		%	62.5%	37.5%	100.0%
	Married	Count	64	54	118
		%	54.2%	45.8%	100.0%
	Single	Count	123	158	281
		%	43.8%	56.2%	100.0%
Total		Count	197	218	415
		%	47.5%	52.5%	100.0%

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Tab. S3 (*follows*).

Know that Hepatitis B vaccine can prevent liver cancer					Total
			No	Yes	
Marital status	Divorced/ widowed	Count	11	5	16
		%	68.8%	31.3%	100.0%
	Married	Count	84	34	118
		%	71.2%	28.8%	100.0%
	Single	Count	168	113	281
		%	59.8%	40.2%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Have you received HBV vaccine					**Total**
			No	Yes	
Marital status	Divorced/ widowed	Count	12	4	16
		%	75.0%	25.0%	100.0%
	Married	Count	90	28	118
		%	76.3%	23.7%	100.0%
	Single	Count	198	83	281
		%	70.5%	29.5%	100.0%
Total		Count	300	115	415
		%	72.3%	27.7%	100.0%
Heard of Kaposi sarcoma herpes virus (KSHV)					**Total**
			No	Yes	
Marital status	Divorced/ widowed	Count	12	4	16
		%	75.0%	25.0%	100.0%
	Married	Count	94	24	118
		%	79.7%	20.3%	100.0%
	Single	Count	207	74	281
		%	73.7%	26.3%	100.0%
Total		Count	313	102	415
		%	75.4%	24.6%	100.0%
Know that Kaposi sarcoma herpes virus causes Kaposi sarcoma					**Total**
			No	Yes	
Marital status	Divorced/ widowed	Count	12	4	16
		%	75.0%	25.0%	100.0%
	Married	Count	99	19	118
		%	83.9%	16.1%	100.0%
	Single	Count	221	60	281
		%	78.6%	21.4%	100.0%
Total		Count	332	83	415
		%	80.0%	20.0%	100.0%
Heard of Epstein Barr Virus (EBV)					**Total**
			No	Yes	
Marital status	Divorced/ widowed	Count	13	3	16
		%	81.3%	18.8%	100.0%
	Married	Count	96	22	118
		%	81.4%	18.6%	100.0%
	Single	Count	205	76	281
		%	73.0%	27.0%	100.0%
Total		Count	314	101	415
		%	75.7%	24.3%	100.0%

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Tab. S3 (*follows*).

Know that Epstein Barr virus causes lymphoma					Total
			No	Yes	
Marital status	Divorced/ widowed	Count	13	3	16
		%	81.3%	18.8%	100.0%
	Married	Count	102	16	118
		%	86.4%	13.6%	100.0%
	Single	Count	210	71	281
		%	74.7%	25.3%	100.0%
Total		Count	325	90	415
		%	78.3%	21.7%	100.0%
Heard of Human T-lymphotropic virus 1 (HTLV-1)					**Total**
			No	Yes	
Marital status	Divorced/ widowed	Count	12	4	16
		%	75.0%	25.0%	100.0%
	Married	Count	100	18	118
		%	84.7%	15.3%	100.0%
	Single	Count	199	82	281
		%	70.8%	29.2%	100.0%
Total		Count	311	104	415
		%	74.9%	25.1%	100.0%
Know that HTLV-1 causes lymphoma					**Total**
			No	Yes	
Marital status	Divorced/ widowed	Count	12	4	16
		%	75.0%	25.0%	100.0%
	Married	Count	102	16	118
		%	86.4%	13.6%	100.0%
	Single	Count	208	73	281
		%	74.0%	26.0%	100.0%
Total		Count	322	93	415
		%	77.6%	22.4%	100.0%
Heard of the bacteria *Helicobacter pylori*					**Total**
			No	Yes	
Marital status	Divorced/ widowed	Count	11	5	16
		%	68.8%	31.3%	100.0%
	Married	Count	80	38	118
		%	67.8%	32.2%	100.0%
	Single	Count	167	114	281
		%	59.4%	40.6%	100.0%
Total		Count	258	157	415
		%	62.2%	37.8%	100.0%
Know that *Helicobacter pylori* is associated to cancer of the stomach					**Total**
			No	Yes	
Marital status	Divorced/ widowed	Count	11	5	16
		%	68.8%	31.3%	100.0%
	Married	Count	85	33	118
		%	72.0%	28.0%	100.0%
	Single	Count	180	101	281
		%	64.1%	35.9%	100.0%
Total		Count	276	139	415
		%	66.5%	33.5%	100.0%

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Tab. S3 (*follows*).

Have you heard about some cancer types associated with bacteria?					Total
			No	Yes	
Nationality	Non-Lebanese	Count	89	25	114
		%	78.1%	21.9%	100.0%
	Lebanese	Count	157	144	301
		%	52.2%	47.8%	100.0%
Total		Count	246	169	415
		%	59.3%	40.7%	100.0%
Have you heard about some cancer types associated with viruses?					**Total**
			No	**Yes**	
Nationality	Non-Lebanese	Count	81	33	114
		%	71.1%	28.9%	100.0%
	Lebanese	Count	149	152	301
		%	49.5%	50.5%	100.0%
Total		Count	230	185	415
		%	55.4%	44.6%	100.0%
Have you heard of 'Oncovirus'					**Total**
			No	**Yes**	
Nationality	Non-Lebanese	Count	100	14	114
		%	87.7%	12.3%	100.0%
	Lebanese	Count	209	92	301
		%	69.4%	30.6%	100.0%
Total		Count	309	106	415
		%	74.5%	25.5%	100.0%
Know that vaccine can prevent some cancer types					**Total**
			No	**Yes**	
Nationality	Non-Lebanese	Count	90	24	114
		%	78.9%	21.1%	100.0%
	Lebanese	Count	167	134	301
		%	55.5%	44.5%	100.0%
Total		Count	257	158	415
		%	61.9%	38.1%	100.0%
Have you heard of Human papillomavirus (HPV)					**Total**
			No	**Yes**	
Nationality	Non-Lebanese	Count	89	25	114
		%	78.1%	21.9%	100.0%
	Lebanese	Count	144	157	301
		%	47.8%	52.2%	100.0%
Total		Count	233	182	415
		%	56.1%	43.9%	100.0%
Know that HPV infection causes cervical cancer					**Total**
			No	**Yes**	
Nationality	Non-Lebanese	Count	95	19	114
		%	83.3%	16.7%	100.0%
	Lebanese	Count	175	126	301
		%	58.1%	41.9%	100.0%
Total		Count	270	145	415
		%	65.1%	34.9%	100.0%
Have you ever heard of the HPV vaccine					**Total**
			No	**Yes**	
Nationality	Non-Lebanese	Count	92	22	114
		%	80.7%	19.3%	100.0%
	Lebanese	Count	171	130	301
		%	56.8%	43.2%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%

Tab. S3 (*follows*).

Know that HPV vaccine can prevent cervical cancer					Total
			No	Yes	
Nationality	Non-Lebanese	Count	94	20	114
		%	82.5%	17.5%	100.0%
	Lebanese	Count	197	104	301
		%	65.4%	34.6%	100.0%
Total		Count	291	124	415
		%	70.1%	29.9%	100.0%
Have you received HPV vaccine					**Total**
			No	**Yes**	
Nationality	Non-Lebanese	Count	106	8	114
		%	93.0%	7.0%	100.0%
	Lebanese	Count	260	41	301
		%	86.4%	13.6%	100.0%
Total		Count	366	49	415
		%	88.2%	11.8%	100.0%
Have you heard of the hepatitis B and C viruses					**Total**
			No	**Yes**	
Nationality	Non-Lebanese	Count	74	40	114
		%	64.9%	35.1%	100.0%
	Lebanese	Count	81	220	301
		%	26.9%	73.1%	100.0%
Total		Count	155	260	415
		%	37.3%	62.7%	100.0%
Know that hepatitis B and C viruses cause liver cancer					**Total**
			No	**Yes**	
Nationality	Non-Lebanese	Count	86	28	114
		%	75.4%	24.6%	100.0%
	Lebanese	Count	149	152	301
		%	49.5%	50.5%	100.0%
Total		Count	235	180	415
		%	56.6%	43.4%	100.0%
Have you heard of the hepatitis B vaccine					**Total**
			No	**Yes**	
Nationality	Non-Lebanese	Count	80	34	114
		%	70.2%	29.8%	100.0%
	Lebanese	Count	117	184	301
		%	38.9%	61.1%	100.0%
Total		Count	197	218	415
		%	47.5%	52.5%	100.0%
Know that Hepatitis B vaccine can prevent liver cancer					**Total**
			No	**Yes**	
Nationality	Non-Lebanese	Count	94	20	114
		%	82.5%	17.5%	100.0%
	Lebanese	Count	169	132	301
		%	56.1%	43.9%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Have you received HBV vaccine					**Total**
			No	**Yes**	
Nationality	Non-Lebanese	Count	93	21	114
		%	81.6%	18.4%	100.0%
	Lebanese	Count	207	94	301
		%	68.8%	31.2%	100.0%
Total		Count	300	115	415
		%	72.3%	27.7%	100.0%

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Tab. S3 (*follows*).

Heard of Kaposi sarcoma herpes virus (KSHV)					Total
			No	Yes	
Nationality	Non-Lebanese	Count	95	19	114
		%	83.3%	16.7%	100.0%
	Lebanese	Count	218	83	301
		%	72.4%	27.6%	100.0%
Total		Count	313	102	415
		%	75.4%	24.6%	100.0%
Know that Kaposi sarcoma herpes virus causes Kaposi sarcoma					Total
			No	Yes	
Nationality	Non-Lebanese	Count	98	16	114
		%	86.0%	14.0%	100.0%
	Lebanese	Count	234	67	301
		%	77.7%	22.3%	100.0%
Total		Count	332	83	415
		%	80.0%	20.0%	100.0%
Heard of Epstein Barr Virus (EBV)					Total
			No	Yes	
Nationality	Non-Lebanese	Count	93	21	114
		%	81.6%	18.4%	100.0%
	Lebanese	Count	221	80	301
		%	73.4%	26.6%	100.0%
Total		Count	314	101	415
		%	75.7%	24.3%	100.0%
Know that Epstein Barr virus causes lymphoma					Total
			No	Yes	
Nationality	Non-Lebanese	Count	96	18	114
		%	84.2%	15.8%	100.0%
	Lebanese	Count	229	72	301
		%	76.1%	23.9%	100.0%
Total		Count	325	90	415
		%	78.3%	21.7%	100.0%
Heard of Human T-lymphotropic virus 1 (HTLV-1)					Total
			No	Yes	
Nationality	Non-Lebanese	Count	96	18	114
		%	84.2%	15.8%	100.0%
	Lebanese	Count	215	86	301
		%	71.4%	28.6%	100.0%
Total		Count	311	104	415
		%	74.9%	25.1%	100.0%
Know that HTLV-1 causes lymphoma					Total
			No	Yes	
Nationality	Non-Lebanese	Count	96	18	114
		%	84.2%	15.8%	100.0%
	Lebanese	Count	226	75	301
		%	75.1%	24.9%	100.0%
Total		Count	322	93	415
		%	77.6%	22.4%	100.0%
Heard of the bacteria *Helicobacter pylori*					Total
			No	Yes	
Nationality	Non-Lebanese	Count	87	27	114
		%	76.3%	23.7%	100.0%
	Lebanese	Count	171	130	301
		%	56.8%	43.2%	100.0%
Total		Count	258	157	415
		%	62.2%	37.8%	100.0%

Tab. S3 (*follows*).

Know that *Helicobacter pylori* is associated to cancer of the stomach					Total
			No	Yes	
Nationality	non-Lebanese	Count	89	25	114
		%	78.1%	21.9%	100.0%
	Lebanese	Count	187	114	301
		%	62.1%	37.9%	100.0%
Total		Count	276	139	415
		%	66.5%	33.5%	100.0%
Have you heard about some cancer types associated with bacteria?					**Total**
			No	**Yes**	
Place of residence	Beirut	Count	62	49	111
		%	55.9%	44.1%	100.0%
	Bekaa	Count	88	72	160
		%	55.0%	45.0%	100.0%
	mount Lebanon	Count	36	23	59
		%	61.0%	39.0%	100.0%
	north Lebanon	Count	33	11	44
		%	75.0%	25.0%	100.0%
	south Lebanon	Count	27	14	41
		%	65.9%	34.1%	100.0%
Total		Count	246	169	415
		%	59.3%	40.7%	100.0%
Have you heard about some cancer types associated with viruses?					**Total**
			No	**Yes**	
Place of residence	Beirut	Count	63	48	111
		%	56.8%	43.2%	100.0%
	Bekaa	Count	83	77	160
		%	51.9%	48.1%	100.0%
	mount Lebanon	Count	30	29	59
		%	50.8%	49.2%	100.0%
	north Lebanon	Count	31	13	44
		%	70.5%	29.5%	100.0%
	south Lebanon	Count	23	18	41
		%	56.1%	43.9%	100.0%
Total		Count	230	185	415
		%	55.4%	44.6%	100.0%
Have you heard of 'Oncovirus'					**Total**
			No	**Yes**	
Place of residence	Beirut	Count	80	31	111
		%	72.1%	27.9%	100.0%
	Bekaa	Count	124	36	160
		%	77.5%	22.5%	100.0%
	mount Lebanon	Count	43	16	59
		%	72.9%	27.1%	100.0%
	north Lebanon	Count	35	9	44
		%	79.5%	20.5%	100.0%
	south Lebanon	Count	27	14	41
		%	65.9%	34.1%	100.0%
Total		Count	309	106	415
		%	74.5%	25.5%	100.0%

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Tab. S3 (*follows*).

Know that vaccine can prevent some cancer types					Total
			No	Yes	
Place of residence	Beirut	Count	67	44	111
		%	60.4%	39.6%	100.0%
	Bekaa	Count	93	67	160
		%	58.1%	41.9%	100.0%
	mount Lebanon	Count	36	23	59
		%	61.0%	39.0%	100.0%
	north Lebanon	Count	33	11	44
		%	75.0%	25.0%	100.0%
	south Lebanon	Count	28	13	41
		% e	68.3%	31.7%	100.0%
Total		Count	257	158	415
		%	61.9%	38.1%	100.0%
Have you heard of Human papillomavirus (HPV)					Total
			No	Yes	
Place of residence	Beirut	Count	57	54	111
		%	51.4%	48.6%	100.0%
	Bekaa	Count	87	73	160
		%	54.4%	45.6%	100.0%
	mount Lebanon	Count	33	26	59
		%	55.9%	44.1%	100.0%
	north Lebanon	Count	33	11	44
		%	75.0%	25.0%	100.0%
	south Lebanon	Count	23	18	41
		%	56.1%	43.9%	100.0%
Total		Count	233	182	415
		%	56.1%	43.9%	100.0%
Know that HPV infection causes cervical cancer					Total
			No	Yes	
Place of residence	Beirut	Count	71	40	111
		%	64.0%	36.0%	100.0%
	Bekaa	Count	101	59	160
		%	63.1%	36.9%	100.0%
	mount Lebanon	Count	39	20	59
		%	66.1%	33.9%	100.0%
	north Lebanon	Count	35	9	44
		%	79.5%	20.5%	100.0%
	south Lebanon	Count	24	17	41
		%	58.5%	41.5%	100.0%
Total		Count	270	145	415
		%	65.1%	34.9%	100.0%
Have you ever heard of the HPV vaccine					Total
			No	Yes	
Place of residence	Beirut	Count	69	42	111
		%	62.2%	37.8%	100.0%
	Bekaa	Count	97	63	160
		%	60.6%	39.4%	100.0%
	mount Lebanon	Count	38	21	59
		%	64.4%	35.6%	100.0%
	north Lebanon	Count	34	10	44
		%	77.3%	22.7%	100.0%
	south Lebanon	Count	25	16	41
		%	61.0%	39.0%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%

Tab. S3 (*follows*).

Know that HPV vaccine can prevent cervical cancer					Total
			No	Yes	
Place of residence	Beirut	Count	80	31	111
		%	72.1%	27.9%	100.0%
	Bekaa	Count	105	55	160
		%	65.6%	34.4%	100.0%
	mount Lebanon	Count	43	16	59
		%	72.9%	27.1%	100.0%
	north Lebanon	Count	34	10	44
		%	77.3%	22.7%	100.0%
	south Lebanon	Count	29	12	41
		%	70.7%	29.3%	100.0%
Total		Count	291	124	415
		%	70.1%	29.9%	100.0%
Have you received HPV vaccine					**Total**
			No	**Yes**	
Place of residence	Beirut	Count	98	13	111
		%	88.3%	11.7%	100.0%
	Bekaa	Count	141	19	160
		%	88.1%	11.9%	100.0%
	mount Lebanon	Count	50	9	59
		%	84.7%	15.3%	100.0%
	north Lebanon	Count	42	2	44
		%	95.5%	4.5%	100.0%
	south Lebanon	Count	35	6	41
		%	85.4%	14.6%	100.0%
Total		Count	366	49	415
		%	88.2%	11.8%	100.0%
Have you heard of the hepatitis B and C viruses					**Total**
			No	**Yes**	
Place of residence	Beirut	Count	43	68	111
		%	38.7%	61.3%	100.0%
	Bekaa	Count	54	106	160
		%	33.8%	66.3%	100.0%
	mount Lebanon	Count	18	41	59
		%	30.5%	69.5%	100.0%
	north Lebanon	Count	26	18	44
		%	59.1%	40.9%	100.0%
	south Lebanon	Count	14	27	41
		%	34.1%	65.9%	100.0%
Total		Count	155	260	415
		%	37.3%	62.7%	100.0%
Know that hepatitis B and C viruses cause liver cancer					**Total**
			No	**Yes**	
Place of residence	Beirut	Count	63	48	111
		%	56.8%	43.2%	100.0%
	Bekaa	Count	85	75	160
		%	53.1%	46.9%	100.0%
	mount Lebanon	Count	34	25	59
		%	57.6%	42.4%	100.0%
	north Lebanon	Count	34	10	44
		%	77.3%	22.7%	100.0%
	south Lebanon	Count	19	22	41
		%	46.3%	53.7%	100.0%
Total		Count	235	180	415
		%	56.6%	43.4%	100.0%

Tab. S3 (*follows*).

Have you heard of the hepatitis B vaccine					Total
			No	Yes	
Place of residence	Beirut	Count	54	57	111
		%	48.6%	51.4%	100.0%
	Bekaa	Count	67	93	160
		%	41.9%	58.1%	100.0%
	mount Lebanon	Count	27	32	59
		%	45.8%	54.2%	100.0%
	north Lebanon	Count	29	15	44
		%	65.9%	34.1%	100.0%
	south Lebanon	Count	20	21	41
		%	48.8%	51.2%	100.0%
Total		Count	197	218	415
		%	47.5%	52.5%	100.0%
Know that Hepatitis B vaccine can prevent liver cancer					**Total**
			No	Yes	
Place of residence	Beirut	Count	72	39	111
		%	64.9%	35.1%	100.0%
	Bekaa	Count	92	68	160
		%	57.5%	42.5%	100.0%
	mount Lebanon	Count	39	20	59
		%	66.1%	33.9%	100.0%
	north Lebanon	Count	34	10	44
		%	77.3%	22.7%	100.0%
	south Lebanon	Count	26	15	41
		%	63.4%	36.6%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Have you received HBV vaccine					**Total**
			No	Yes	
Place of residence	Beirut	Count	75	36	111
		%	67.6%	32.4%	100.0%
	Bekaa	Count	114	46	160
		%	71.3%	28.8%	100.0%
	mount Lebanon	Count	44	15	59
		% place	74.6%	25.4%	100.0%
	north Lebanon	Count	37	7	44
		%	84.1%	15.9%	100.0%
	south Lebanon	Count	30	11	41
		%	73.2%	26.8%	100.0%
Total		Count	300	115	415
		%	72.3%	27.7%	100.0%
Heard of Kaposi sarcoma herpes virus (KSHV)					**Total**
			No	Yes	
Place of residence	Beirut	Count	75	36	111
		%	67.6%	32.4%	100.0%
	Bekaa	Count	125	35	160
		%	78.1%	21.9%	100.0%
	mount Lebanon	Count	46	13	59
		%	78.0%	22.0%	100.0%
	north Lebanon	Count	37	7	44
		%	84.1%	15.9%	100.0%
	south Lebanon	Count	30	11	41
		%	73.2%	26.8%	100.0%
Total		Count	313	102	415
		%	75.4%	24.6%	100.0%

Tab. S3 (*follows*).

Know that Kaposi sarcoma herpes virus causes Kaposi sarcoma					Total
			No	Yes	
Place of residence	Beirut	Count	84	27	111
		%	75.7%	24.3%	100.0%
	Bekaa	Count	132	28	160
		%	82.5%	17.5%	100.0%
	mount Lebanon	Count	48	11	59
		%	81.4%	18.6%	100.0%
	north Lebanon	Count	38	6	44
		%	86.4%	13.6%	100.0%
	south Lebanon	Count	30	11	41
		%	73.2%	26.8%	100.0%
Total		Count	332	83	415
		%	80.0%	20.0%	100.0%
Heard of Epstein Barr Virus (EBV)					**Total**
			No	Yes	
Place of residence	Beirut	Count	80	31	111
		%	72.1%	27.9%	100.0%
	Bekaa	Count	127	33	160
		%	79.4%	20.6%	100.0%
	mount Lebanon	Count	43	16	59
		%	72.9%	27.1%	100.0%
	north Lebanon	Count	36	8	44
		%	81.8%	18.2%	100.0%
	south Lebanon	Count	28	13	41
		%	68.3%	31.7%	100.0%
Total		Count	314	101	415
		%	75.7%	24.3%	100.0%
Know that Epstein Barr virus causes lymphoma					**Total**
			No	Yes	
Place of residence	Beirut	Count	82	29	111
		%	73.9%	26.1%	100.0%
	Bekaa	Count	132	28	160
		%	82.5%	17.5%	100.0%
	mount Lebanon	Count	46	13	59
		%	78.0%	22.0%	100.0%
	north Lebanon	Count	37	7	44
		%	84.1%	15.9%	100.0%
	south Lebanon	Count	28	13	41
		%	68.3%	31.7%	100.0%
Total		Count	325	90	415
		%	78.3%	21.7%	100.0%
Heard of Human T-lymphotropic virus 1 (HTLV-1)					**Total**
			No	Yes	
Place of residence	Beirut	Count	84	27	111
		%	75.7%	24.3%	100.0%
	Bekaa	Count	120	40	160
		%	75.0%	25.0%	100.0%
	mount Lebanon	Count	45	14	59
		%	76.3%	23.7%	100.0%
	north Lebanon	Count	36	8	44
		%	81.8%	18.2%	100.0%
	south Lebanon	Count	26	15	41
		%	63.4%	36.6%	100.0%
Total		Count	311	104	415
		%	74.9%	25.1%	100.0%

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Tab. S3 (*follows*).

Know that HTLV-1 causes lymphoma					Total
			No	Yes	
Place of residence	Beirut	Count	85	26	111
		%	76.6%	23.4%	100.0%
	Bekaa	Count	126	34	160
		%	78.8%	21.3%	100.0%
	mount Lebanon	Count	48	11	59
		%	81.4%	18.6%	100.0%
	north Lebanon	Count	37	7	44
		%	84.1%	15.9%	100.0%
	south Lebanon	Count	26	15	41
		%	63.4%	36.6%	100.0%
Total		Count	322	93	415
		%	77.6%	22.4%	100.0%
Heard of the bacteria *Helicobacter pylori*					Total
			No	Yes	
Place of residence	Beirut	Count	71	40	111
		%	64.0%	36.0%	100.0%
	Bekaa	Count	94	66	160
		%	58.8%	41.3%	100.0%
	mount Lebanon	Count	36	23	59
		%	61.0%	39.0%	100.0%
	north Lebanon	Count	33	11	44
		%	75.0%	25.0%	100.0%
	south Lebanon	Count	24	17	41
		%	58.5%	41.5%	100.0%
Total		Count	258	157	415
		%	62.2%	37.8%	100.0%
Know that *Helicobacter pylori* is associated to cancer of the stomach					Total
			No	Yes	
Place of residence	Beirut	Count	74	37	111
		%	66.7%	33.3%	100.0%
	Bekaa	Count	103	57	160
		%	64.4%	35.6%	100.0%
	mount Lebanon	Count	40	19	59
		%	67.8%	32.2%	100.0%
	north Lebanon	Count	34	10	44
		%	77.3%	22.7%	100.0%
	south Lebanon	Count	25	16	41
		%	61.0%	39.0%	100.0%
Total		Count	276	139	415
		%	66.5%	33.5%	100.0%
Have you heard about some cancer types associated with bacteria?					Total
			No	Yes	
Age	18-29 years	Count	160	122	282
		%	56.7%	43.3%	100.0%
	30-49 years	Count	77	41	118
		%	65.3%	34.7%	100.0%
	50-64 years	Count	9	5	14
		%	64.3%	35.7%	100.0%
	64+ years	Count	0	1	1
		%	0.0%	100.0%	100.0%
Total		Count	246	169	415
		%	59.3%	40.7%	100.0%

Tab. S3 (*follows*).

Have you heard about some cancer types associated with viruses?					Total
			No	Yes	
Age	18-29 years	Count	146	136	282
		%	51.8%	48.2%	100.0%
	30-49 years	Count	75	43	118
		% e	63.6%	36.4%	100.0%
	50-64 years	Count	9	5	14
		%	64.3%	35.7%	100.0%
	64+ years	Count	0	1	1
		%	0.0%	100.0%	100.0%
Total		Count	230	185	415
		%	55.4%	44.6%	100.0%
Have you heard of 'Oncovirus'					Total
			No	Yes	
Age	18-29 years	Count	206	76	282
		%	73.0%	27.0%	100.0%
	30-49 years	Count	91	27	118
		%	77.1%	22.9%	100.0%
	50-64 years	Count	11	3	14
		%	78.6%	21.4%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	309	106	415
		%	74.5%	25.5%	100.0%
Know that vaccine can prevent some cancer types					Total
			No	Yes	
Age	18-29 years	Count	172	110	282
		%	61.0%	39.0%	100.0%
	30-49 years	Count	77	41	118
		%	65.3%	34.7%	100.0%
	50-64 years	Count	7	7	14
		%	50.0%	50.0%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	257	158	415
		%	61.9%	38.1%	100.0%
Have you heard of Human papillomavirus (HPV)					Total
			No	Yes	
Age	18-29 years	Count	149	133	282
		%	52.8%	47.2%	100.0%
	30-49 years	Count	72	46	118
		%	61.0%	39.0%	100.0%
	50-64 years	Count	11	3	14
		%	78.6%	21.4%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	233	182	415
		%	56.1%	43.9%	100.0%

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Tab. S3 (*follows*).

Know that HPV infection causes cervical cancer					Total
			No	Yes	
Age	18-29 years	Count	174	108	282
		%	61.7%	38.3%	100.0%
	30-49 years	Count	84	34	118
		%	71.2%	28.8%	100.0%
	50-64 years	Count	11	3	14
		%	78.6%	21.4%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	270	145	415
		%	65.1%	34.9%	100.0%
Have you ever heard of the HPV vaccine					Total
			No	Yes	
Age	18-29 years	Count	170	112	282
		%	60.3%	39.7%	100.0%
	30-49 years	Count	81	37	118
		%	68.6%	31.4%	100.0%
	50-64 years	Count	11	3	14
		%	78.6%	21.4%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Know that HPV vaccine can prevent cervical cancer					Total
			No	Yes	
Age	18-29 years	Count	193	89	282
		%	68.4%	31.6%	100.0%
	30-49 years	Count	86	32	118
		%	72.9%	27.1%	100.0%
	50-64 years	Count	11	3	14
		%	78.6%	21.4%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	291	124	415
		%	70.1%	29.9%	100.0%
Have you received HPV vaccine					Total
			No	Yes	
Age	18-29 years	Count	250	32	282
		%	88.7%	11.3%	100.0%
	30-49 years	Count	103	15	118
		%	87.3%	12.7%	100.0%
	50-64 years	Count	12	2	14
		%	85.7%	14.3%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	366	49	415
		%	88.2%	11.8%	100.0%

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Tab. S3 (*follows*).

Have you heard of the hepatitis B and C viruses					Total
			No	Yes	
Age	18-29 years	Count	99	183	282
		%	35.1%	64.9%	100.0%
	30-49 years	Count	51	67	118
		%	43.2%	56.8%	100.0%
	50-64 years	Count	4	10	14
		%	28.6%	71.4%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	155	260	415
		%	37.3%	62.7%	100.0%
Know that hepatitis B and C viruses cause liver cancer					Total
			No	Yes	
Age	18-29 years	Count	155	127	282
		%	55.0%	45.0%	100.0%
	30-49 years	Count	72	46	118
		%	61.0%	39.0%	100.0%
	50-64 years	Count	7	7	14
		%	50.0%	50.0%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	235	180	415
		%	56.6%	43.4%	100.0%
Have you heard of the hepatitis B vaccine					Total
			No	Yes	
Age	18-29 years	Count	126	156	282
		%	44.7%	55.3%	100.0%
	30-49 years	Count	63	55	118
		%	53.4%	46.6%	100.0%
	50-64 years	Count	7	7	14
		%	50.0%	50.0%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	197	218	415
		%	47.5%	52.5%	100.0%
Know that Hepatitis B vaccine can prevent liver cancer					Total
			No	Yes	
Age	18-29 years	Count	171	111	282
		%	60.6%	39.4%	100.0%
	30-49 years	Count	82	36	118
		%	69.5%	30.5%	100.0%
	50-64 years	Count	9	5	14
		%	64.3%	35.7%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%

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Tab. S3 (*follows*).

Have you received HBV vaccine					Total
			No	Yes	
Age	18-29 years	Count	203	79	282
		%	72.0%	28.0%	100.0%
	30-49 years	Count	84	34	118
		%	71.2%	28.8%	100.0%
	50-64 years	Count	12	2	14
		%	85.7%	14.3%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	300	115	415
		%	72.3%	27.7%	100.0%
Heard of Kaposi sarcoma herpes virus (KSHV)					**Total**
			No	**Yes**	
Age	18-29 years	Count	211	71	282
		%	74.8%	25.2%	100.0%
	30-49 years	Count	89	29	118
		%	75.4%	24.6%	100.0%
	50-64 years	Count	12	2	14
		%	85.7%	14.3%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	313	102	415
		%	75.4%	24.6%	100.0%
Know that Kaposi sarcoma herpes virus causes Kaposi sarcoma					**Total**
			No	**Yes**	
Age	18-29 years	Count	222	60	282
		%	78.7%	21.3%	100.0%
	30-49 years	Count	97	21	118
		%	82.2%	17.8%	100.0%
	50-64 years	Count	12	2	14
		%	85.7%	14.3%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	332	83	415
		%	80.0%	20.0%	100.0%
Heard of Epstein Barr Virus (EBV)					**Total**
			No	**Yes**	
Age	18-29 years	Count	208	74	282
		%	73.8%	26.2%	100.0%
	30-49 years	Count	94	24	118
		%	79.7%	20.3%	100.0%
	50-64 years	Count	11	3	14
		%	78.6%	21.4%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	314	101	415
		%	75.7%	24.3%	100.0%

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Tab. S3 (*follows*).

Know that Epstein Barr virus causes lymphoma					Total
			No	Yes	
Age	18-29 years	Count	214	68	282
		%	75.9%	24.1%	100.0%
	30-49 years	Count	98	20	118
		%	83.1%	16.9%	100.0%
	50-64 years	Count	12	2	14
		%	85.7%	14.3%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	325	90	415
		%	78.3%	21.7%	100.0%
Heard of Human T-lymphotropic virus 1 (HTLV-1)					**Total**
			No	Yes	
Age	18-29 years	Count	204	78	282
		%	72.3%	27.7%	100.0%
	30-49 years	Count	95	23	118
		%	80.5%	19.5%	100.0%
	50-64 years	Count	11	3	14
		%	78.6%	21.4%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	311	104	415
		%	74.9%	25.1%	100.0%
Know that HTLV-1 causes lymphoma					**Total**
			No	Yes	
Age	18-29 years	Count	213	69	282
		%	75.5%	24.5%	100.0%
	30-49 years	Count	96	22	118
		%	81.4%	18.6%	100.0%
	50-64 years	Count	12	2	14
		%	85.7%	14.3%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	322	93	415
		%	77.6%	22.4%	100.0%
Heard of the bacteria *Helicobacter pylori*					**Total**
			No	Yes	
Age	18-29 years	Count	175	107	282
		%	62.1%	37.9%	100.0%
	30-49 years	Count	72	46	118
		%	61.0%	39.0%	100.0%
	50-64 years	Count	10	4	14
		%	71.4%	28.6%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	258	157	415
		%	62.2%	37.8%	100.0%
Know that *Helicobacter pylori* is associated to cancer of the stomach					**Total**
			No	Yes	
Age	18-29 years	Count	184	98	282
		%	65.2%	34.8%	100.0%
	30-49 years	Count	80	38	118
		%	67.8%	32.2%	100.0%
	50-64 years	Count	11	3	14
		%	78.6%	21.4%	100.0%
	64+ years	Count	1	0	1
		%	100.0%	0.0%	100.0%
Total		Count	276	139	415
		%	66.5%	33.5%	100.0%

Tab. S3 (*follows*).

Have you heard about some cancer types associated with bacteria?					Total
			No	Yes	
Education level	Primary	Count	1	2	3
		%	33.3%	66.7%	100.0%
	Secondary	Count	30	8	38
		%	78.9%	21.1%	100.0%
	Tertiary	Count	215	159	374
		%	57.5%	42.5%	100.0%
Total		Count	246	169	415
		%	59.3%	40.7%	100.0%
Have you heard about some cancer types associated with viruses?					**Total**
			No	**Yes**	
Education level	Primary	Count	1	2	3
		%	33.3%	66.7%	100.0%
	Secondary	Count	30	8	38
		%	78.9%	21.1%	100.0%
	Tertiary	Count	199	175	374
		%	53.2%	46.8%	100.0%
Total		Count	230	185	415
		%	55.4%	44.6%	100.0%
Have you heard of 'Oncovirus'					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	34	4	38
		%	89.5%	10.5%	100.0%
	Tertiary	Count	272	102	374
		%	72.7%	27.3%	100.0%
Total		Count	309	106	415
		%	74.5%	25.5%	100.0%
Know that vaccine can prevent some cancer types					**Total**
			No	**Yes**	
Education level	Primary	Count	2	1	3
		%	66.7%	33.3%	100.0%
	Secondary	Count	29	9	38
		%	76.3%	23.7%	100.0%
	Tertiary	Count	226	148	374
		%	60.4%	39.6%	100.0%
Total		Count	257	158	415
		%	61.9%	38.1%	100.0%
Have you heard of Human papillomavirus (HPV)					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	28	10	38
		%	73.7%	26.3%	100.0%
	Tertiary	Count	202	172	374
		%	54.0%	46.0%	100.0%
Total		Count	233	182	415
		%	56.1%	43.9%	100.0%

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Tab. S3 (*follows*).

Know that HPV infection causes cervical cancer					Total
			No	Yes	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	31	7	38
		%	81.6%	18.4%	100.0%
	Tertiary	Count	236	138	374
		%	63.1%	36.9%	100.0%
Total		Count	270	145	415
		%	65.1%	34.9%	100.0%
Have you ever heard of the HPV vaccine					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	30	8	38
		%	78.9%	21.1%	100.0%
	Tertiary	Count	230	144	374
		%	61.5%	38.5%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Know that HPV vaccine can prevent cervical cancer					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	30	8	38
		%	78.9%	21.1%	100.0%
	Tertiary	Count	258	116	374
		%	69.0%	31.0%	100.0%
Total		Count	291	124	415
		%	70.1%	29.9%	100.0%
Have you received HPV vaccine					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	33	5	38
		%	86.8%	13.2%	100.0%
	Tertiary	Count	330	44	374
		%	88.2%	11.8%	100.0%
Total		Count	366	49	415
		%	88.2%	11.8%	100.0%
Have you heard of the hepatitis B and C viruses					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	21	17	38
		% l	55.3%	44.7%	100.0%
	Tertiary	Count	131	243	374
		%	35.0%	65.0%	100.0%
Total		Count	155	260	415
		%	37.3%	62.7%	100.0%

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Tab. S3 (*follows*).

Know that hepatitis B and C viruses cause liver cancer					Total
			No	Yes	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	28	10	38
		%	73.7%	26.3%	100.0%
	Tertiary	Count	204	170	374
		%	54.5%	45.5%	100.0%
Total		Count	235	180	415
		%	56.6%	43.4%	100.0%
Have you heard of the hepatitis B vaccine					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	26	12	38
		%	68.4%	31.6%	100.0%
	Tertiary	Count	168	206	374
		%	44.9%	55.1%	100.0%
Total		Count	197	218	415
		%	47.5%	52.5%	100.0%
Know that Hepatitis B vaccine can prevent liver cancer					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	28	10	38
		%	73.7%	26.3%	100.0%
	Tertiary	Count	232	142	374
		%	62.0%	38.0%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Have you received HBV vaccine					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	32	6	38
		%	84.2%	15.8%	100.0%
	Tertiary	Count	265	109	374
		%	70.9%	29.1%	100.0%
Total		Count	300	115	415
		%	72.3%	27.7%	100.0%
Heard of Kaposi sarcoma herpes virus (KSHV)					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	33	5	38
		%	86.8%	13.2%	100.0%
	Tertiary	Count	277	97	374
		%	74.1%	25.9%	100.0%
Total		Count	313	102	415
		%	75.4%	24.6%	100.0%

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Tab. S3 (*follows*).

Know that Kaposi sarcoma herpes virus causes Kaposi sarcoma					Total
			No	Yes	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	34	4	38
		%	89.5%	10.5%	100.0%
	Tertiary	Count	295	79	374
		%	78.9%	21.1%	100.0%
Total		Count	332	83	415
		%	80.0%	20.0%	100.0%
Heard of Epstein Barr Virus (EBV)					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	32	6	38
		%	84.2%	15.8%	100.0%
	Tertiary	Count	279	95	374
		%	74.6%	25.4%	100.0%
Total		Count	314	101	415
		%	75.7%	24.3%	100.0%
Know that Epstein Barr virus causes lymphoma					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	34	4	38
		%	89.5%	10.5%	100.0%
	Tertiary	Count	288	86	374
		%	77.0%	23.0%	100.0%
Total		Count	325	90	415
		%	78.3%	21.7%	100.0%
Heard of Human T-lymphotropic virus 1 (HTLV-1)					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	33	5	38
		%	86.8%	13.2%	100.0%
	Tertiary	Count	275	99	374
		%	73.5%	26.5%	100.0%
Total		Count	311	104	415
		%	74.9%	25.1%	100.0%
Know that HTLV-1 causes lymphoma					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	34	4	38
		%	89.5%	10.5%	100.0%
	Tertiary	Count	285	89	374
		%	76.2%	23.8%	100.0%
Total		Count	322	93	415
		%	77.6%	22.4%	100.0%

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Tab. S3 (*follows*).

Heard of the bacteria *Helicobacter pylori*					Total
			No	Yes	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	30	8	38
		%	78.9%	21.1%	100.0%
	Tertiary	Count	225	149	374
		%	60.2%	39.8%	100.0%
Total		Count	258	157	415
		%	62.2%	37.8%	100.0%
Know that *Helicobacter pylori* is associated to cancer of the stomach					**Total**
			No	**Yes**	
Education level	Primary	Count	3	0	3
		%	100.0%	0.0%	100.0%
	Secondary	Count	31	7	38
		%	81.6%	18.4%	100.0%
	Tertiary	Count	242	132	374
		%	64.7%	35.3%	100.0%
Total		Count	276	139	415
		%	66.5%	33.5%	100.0%
Have you heard about some cancer types associated with bacteria?					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	198	78	276
		%	71.7%	28.3%	100.0%
	Healthcare	Count	48	91	139
		%	34.5%	65.5%	100.0%
Total		Count	246	169	415
		%	59.3%	40.7%	100.0%
Have you heard about some cancer types associated with viruses?					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	193	83	276
		%	69.9%	30.1%	100.0%
	Healthcare	Count	37	102	139
		%	26.6%	73.4%	100.0%
Total		Count	230	185	415
		%	55.4%	44.6%	100.0%
Have you heard of 'Oncovirus'					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	253	23	276
		%	91.7%	8.3%	100.0%
	Healthcare	Count	56	83	139
		%	40.3%	59.7%	100.0%
Total		Count	309	106	415
		%	74.5%	25.5%	100.0%
Know that vaccine can prevent some cancer types					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	208	68	276
		%	75.4%	24.6%	100.0%
	Healthcare	Count	49	90	139
		%	35.3%	64.7%	100.0%
Total		Count	257	158	415
		%	61.9%	38.1%	100.0%

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Tab. S3 (*follows*).

Have you heard of Human papillomavirus (HPV)					Total
			No	Yes	
Occupation	Non-healthcare	Count	196	80	276
		%	71.0%	29.0%	100.0%
	Healthcare	Count	37	102	139
		%	26.6%	73.4%	100.0%
Total		Count	233	182	415
		%	56.1%	43.9%	100.0%
Know that HPV infection causes cervical cancer					**Total**
			No	Yes	
Occupation	Non-healthcare	Count	222	54	276
		%	80.4%	19.6%	100.0%
	Healthcare	Count	48	91	139
		%	34.5%	65.5%	100.0%
Total		Count	270	145	415
		%	65.1%	34.9%	100.0%
Have you ever heard of the HPV vaccine					**Total**
			No	Yes	
Occupation	Non-healthcare	Count	215	61	276
		%	77.9%	22.1%	100.0%
	Healthcare	Count	48	91	139
		%	34.5%	65.5%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Know that HPV vaccine can prevent cervical cancer					**Total**
			No	Yes	
Occupation	Non-healthcare	Count	230	46	276
		%	83.3%	16.7%	100.0%
	Healthcare	Count	61	78	139
		%	43.9%	56.1%	100.0%
Total		Count	291	124	415
		%	70.1%	29.9%	100.0%
Have you received HPV vaccine					**Total**
			No	Yes	
Occupation	Non-healthcare	Count	259	17	276
		%	93.8%	6.2%	100.0%
	Healthcare	Count	107	32	139
		%	77.0%	23.0%	100.0%
Total		Count	366	49	415
		%	88.2%	11.8%	100.0%
Have you heard of the hepatitis B and C viruses					**Total**
			No	Yes	
Occupation	Non-healthcare	Count	141	135	276
		%	51.1%	48.9%	100.0%
	Healthcare	Count	14	125	139
		%	10.1%	89.9%	100.0%
Total		Count	155	260	415
		%	37.3%	62.7%	100.0%
Know that hepatitis B and C viruses cause liver cancer					**Total**
			No	Yes	
Occupation	Non-healthcare	Count	203	73	276
		%	73.6%	26.4%	100.0%
	Healthcare	Count	32	107	139
		%	23.0%	77.0%	100.0%
Total		Count	235	180	415
		%	56.6%	43.4%	100.0%

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Tab. S3 (*follows*).

Have you heard of the hepatitis B vaccine					Total
			No	Yes	
Occupation	Non-healthcare	Count	173	103	276
		%	62.7%	37.3%	100.0%
	Healthcare	Count	24	115	139
		%	17.3%	82.7%	100.0%
Total		Count	197	218	415
		%	47.5%	52.5%	100.0%
Know that Hepatitis B vaccine can prevent liver cancer					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	221	55	276
		%	80.1%	19.9%	100.0%
	Healthcare	Count	42	97	139
		%	30.2%	69.8%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Have you received HBV vaccine					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	235	41	276
		%	85.1%	14.9%	100.0%
	Healthcare	Count	65	74	139
		%	46.8%	53.2%	100.0%
Total		Count	300	115	415
		%	72.3%	27.7%	100.0%
Heard of Kaposi sarcoma herpes virus (KSHV)					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	241	35	276
		%	87.3%	12.7%	100.0%
	Healthcare	Count	72	67	139
		%	51.8%	48.2%	100.0%
Total		Count	313	102	415
		%	75.4%	24.6%	100.0%
Know that Kaposi sarcoma herpes virus causes Kaposi sarcoma					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	257	19	276
		%	93.1%	6.9%	100.0%
	Healthcare	Count	75	64	139
		%	54.0%	46.0%	100.0%
Total		Count	332	83	415
		%	80.0%	20.0%	100.0%
Heard of Epstein Barr Virus (EBV)					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	254	22	276
		%	92.0%	8.0%	100.0%
	Healthcare	Count	60	79	139
		%	43.2%	56.8%	100.0%
Total		Count	314	101	415
		%	75.7%	24.3%	100.0%
Know that Epstein Barr virus causes lymphoma					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	260	16	276
		%	94.2%	5.8%	100.0%
	Healthcare	Count	65	74	139
		%	46.8%	53.2%	100.0%
Total		Count	325	90	415
		%	78.3%	21.7%	100.0%

Tab. S3 (*follows*).

Heard of Human T-lymphotropic virus 1 (HTLV-1)					Total
			No	Yes	
Occupation	Non-healthcare	Count	248	28	276
		%	89.9%	10.1%	100.0%
	Healthcare	Count	63	76	139
		%	45.3%	54.7%	100.0%
Total		Count	311	104	415
		%	74.9%	25.1%	100.0%
Know that HTLV-1 causes lymphoma					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	258	18	276
		%	93.5%	6.5%	100.0%
	Healthcare	Count	64	75	139
		%	46.0%	54.0%	100.0%
Total		Count	322	93	415
		%	77.6%	22.4%	100.0%
Heard of the bacteria *Helicobacter pylori*					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	223	53	276
		%	80.8%	19.2%	100.0%
	Healthcare	Count	35	104	139
		%	25.2%	74.8%	100.0%
Total		Count	258	157	415
		%	62.2%	37.8%	100.0%
Know that *Helicobacter pylori* is associated to cancer of the stomach					**Total**
			No	**Yes**	
Occupation	Non-healthcare	Count	238	38	276
		%	86.2%	13.8%	100.0%
	Healthcare	Count	38	101	139
		%	27.3%	72.7%	100.0%
Total		Count	276	139	415
		%	66.5%	33.5%	100.0%
Have you heard about some cancer types associated with bacteria?					**Total**
			No	**Yes**	
Family income	Low	Count	47	14	61
		%	77.0%	23.0%	100.0%
	Middle	Count	145	135	280
		%	51.8%	48.2%	100.0%
	High	Count	54	20	74
		%	73.0%	27.0%	100.0%
Total		Count	246	169	415
		%	59.3%	40.7%	100.0%
Have you heard about some cancer types associated with viruses?					**Total**
			No	**Yes**	
Family income	Low	Count	47	14	61
		%	77.0%	23.0%	100.0%
	Middle	Count	135	145	280
		%	48.2%	51.8%	100.0%
	High	Count	48	26	74
		%	64.9%	35.1%	100.0%
Total		Count	230	185	415
		%	55.4%	44.6%	100.0%

Tab. S3 (*follows*).

Have you heard of 'Oncovirus'					Total
			No	Yes	
Family income	Low	Count	57	4	61
		%	93.4%	6.6%	100.0%
	Middle	Count	192	88	280
		%	68.6%	31.4%	100.0%
	High	Count	60	14	74
		%	81.1%	18.9%	100.0%
Total		Count	309	106	415
		%	74.5%	25.5%	100.0%
Know that vaccine can prevent some cancer types					**Total**
			No	**Yes**	
Family income	Low	Count	47	14	61
		%	77.0%	23.0%	100.0%
	Middle	Count	155	125	280
		%	55.4%	44.6%	100.0%
	High	Count	55	19	74
		%	74.3%	25.7%	100.0%
Total		Count	257	158	415
		%	61.9%	38.1%	100.0%
Have you heard of Human papillomavirus (HPV)					**Total**
			No	**Yes**	
Family income	Low	Count	45	16	61
		%	73.8%	26.2%	100.0%
	Middle	Count	139	141	280
		%	49.6%	50.4%	100.0%
	High	Count	49	25	74
		%	66.2%	33.8%	100.0%
Total		Count	233	182	415
		%	56.1%	43.9%	100.0%
Know that HPV infection causes cervical cancer					**Total**
			No	**Yes**	
Family income	Low	Count	49	12	61
		%	80.3%	19.7%	100.0%
	Middle	Count	165	115	280
		%	58.9%	41.1%	100.0%
	High	Count	56	18	74
		%	75.7%	24.3%	100.0%
Total		Count	270	145	415
		%	65.1%	34.9%	100.0%
Have you ever heard of the HPV vaccine					**Total**
			No	**Yes**	
Family income	Low	Count	48	13	61
		%	78.7%	21.3%	100.0%
	Middle	Count	162	118	280
		%	57.9%	42.1%	100.0%
	High	Count	53	21	74
		%	71.6%	28.4%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%

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Tab. S3 (*follows*).

Know that HPV vaccine can prevent cervical cancer					Total
			no	yes	
Family income	Low	Count	51	10	61
		%	83.6%	16.4%	100.0%
	Middle	Count	185	95	280
		%	66.1%	33.9%	100.0%
	High	Count	55	19	74
		%	74.3%	25.7%	100.0%
Total		Count	291	124	415
		%	70.1%	29.9%	100.0%
Have you received HPV vaccine					Total
			no	yes	
Family income	Low	Count	59	2	61
		%	96.7%	3.3%	100.0%
	Middle	Count	238	42	280
		%	85.0%	15.0%	100.0%
	High	Count	69	5	74
		%	93.2%	6.8%	100.0%
Total		Count	366	49	415
		%	88.2%	11.8%	100.0%
Have you heard of the hepatitis B and C viruses					Total
			No	Yes	
Family income	Low	Count	42	19	61
		%	68.9%	31.1%	100.0%
	Middle	Count	74	206	280
		%	26.4%	73.6%	100.0%
	High	Count	39	35	74
		%	52.7%	47.3%	100.0%
Total		Count	155	260	415
		%	37.3%	62.7%	100.0%
Know that hepatitis B and C viruses cause liver cancer					Total
			No	Yes	
Family income	Low	Count	50	11	61
		%	82.0%	18.0%	100.0%
	Middle	Count	130	150	280
		%	46.4%	53.6%	100.0%
	High	Count	55	19	74
		%	74.3%	25.7%	100.0%
Total		Count	235	180	415
		%	56.6%	43.4%	100.0%
Have you heard of the hepatitis B vaccine					Total
			No	Yes	
Family income	Low	Count	45	16	61
		%	73.8%	26.2%	100.0%
	Middle	Count	109	171	280
		%	38.9%	61.1%	100.0%
	High	Count	43	31	74
		%	58.1%	41.9%	100.0%
Total		Count	197	218	415
		%	47.5%	52.5%	100.0%

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Tab. S3 (*follows*).

Know that Hepatitis B vaccine can prevent liver cancer					Total
			No	Yes	
Family income	Low	Count	51	10	61
		%	83.6%	16.4%	100.0%
	Middle	Count	155	125	280
		%	55.4%	44.6%	100.0%
	High	Count	57	17	74
		%	77.0%	23.0%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Have you received HBV vaccine					**Total**
			No	Yes	
Family income	Low	Count	56	5	61
		%	91.8%	8.2%	100.0%
	Middle	Count	185	95	280
		%	66.1%	33.9%	100.0%
	High	Count	59	15	74
		%	79.7%	20.3%	100.0%
Total		Count	300	115	415
		%	72.3%	27.7%	100.0%
Heard of Kaposi sarcoma herpes virus (KSHV)					**Total**
			No	Yes	
Family income	Low	Count	55	6	61
		%	90.2%	9.8%	100.0%
	Middle	Count	200	80	280
		%	71.4%	28.6%	100.0%
	High	Count	58	16	74
		%	78.4%	21.6%	100.0%
Total		Count	313	102	415
		%	75.4%	24.6%	100.0%
Know that Kaposi sarcoma herpes virus causes Kaposi sarcoma					**Total**
			No	Yes	
Family income	Low	Count	58	3	61
		%	95.1%	4.9%	100.0%
	Middle	Count	214	66	280
		%	76.4%	23.6%	100.0%
	High	Count	60	14	74
		%	81.1%	18.9%	100.0%
Total		Count	332	83	415
		%	80.0%	20.0%	100.0%
Heard of Epstein Barr Virus (EBV)					**Total**
			no	yes	
Family income	Low	Count	57	4	61
		%	93.4%	6.6%	100.0%
	Middle	Count	198	82	280
		%	70.7%	29.3%	100.0%
	High	Count	59	15	74
		%	79.7%	20.3%	100.0%
Total		Count	314	101	415
		%	75.7%	24.3%	100.0%

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Tab. S3 (*follows*).

Know that Epstein Barr virus causes lymphoma					Total
			no	yes	
Family income	Low	Count	58	3	61
		%	95.1%	4.9%	100.0%
	Middle	Count	205	75	280
		%	73.2%	26.8%	100.0%
	High	Count	62	12	74
		%	83.8%	16.2%	100.0%
Total		Count	325	90	415
		%	78.3%	21.7%	100.0%
Heard of Human T-lymphotropic virus 1 (HTLV-1)					Total
			no	yes	
Family income	Low	Count	57	4	61
		%	93.4%	6.6%	100.0%
	Middle	Count	198	82	280
		%	70.7%	29.3%	100.0%
	High	Count	56	18	74
		%	75.7%	24.3%	100.0%
Total		Count	311	104	415
		%	74.9%	25.1%	100.0%
Know that HTLV-1 causes lymphoma					Total
			no	yes	
Family income	Low	Count	57	4	61
		%	93.4%	6.6%	100.0%
	Middle	Count	207	73	280
		%	73.9%	26.1%	100.0%
	High	Count	58	16	74
		%	78.4%	21.6%	100.0%
Total		Count	322	93	415
		%	77.6%	22.4%	100.0%
Heard of the bacteria *Helicobacter pylori*					Total
			No	Yes	
Family income	Low	Count	57	4	61
		%	93.4%	6.6%	100.0%
	Middle	Count	146	134	280
		%	52.1%	47.9%	100.0%
	High	Count	55	19	74
		%	74.3%	25.7%	100.0%
Total		Count	258	157	415
		%	62.2%	37.8%	100.0%
Know that *Helicobacter pylori* is associated to cancer of the stomach					Total
			No	Yes	
Family income	Low	Count	57	4	61
		%	93.4%	6.6%	100.0%
	Middle	Count	163	117	280
		%	58.2%	41.8%	100.0%
	High	Count	56	18	74
		%	75.7%	24.3%	100.0%
Total		Count	276	139	415
		%	66.5%	33.5%	100.0%

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Tab. S3 (*follows*).

Have you heard about some cancer types associated with bacteria?					Total
			No	Yes	
Have you been diagnosed with cancer	No	Count	242	165	407
		%	59.5%	40.5%	100.0%
	Yes	Count	4	4	8
		%	50.0%	50.0%	100.0%
Total		Count	246	169	415
		%	59.3%	40.7%	100.0%
Have you heard about some cancer types associated with viruses?					**Total**
			No	**Yes**	
Have you been diagnosed with cancer	No	Count	227	180	407
		%	55.8%	44.2%	100.0%
	Yes	Count	3	5	8
		%	37.5%	62.5%	100.0%
Total		Count	230	185	415
		%	55.4%	44.6%	100.0%
Have you heard of 'Oncovirus'					**Total**
			No	**Yes**	
Have you been diagnosed with cancer	No	Count	304	103	407
		%	74.7%	25.3%	100.0%
	Yes	Count	5	3	8
		%	62.5%	37.5%	100.0%
Total		Count	309	106	415
		%	74.5%	25.5%	100.0%
Know that vaccine can prevent some cancer types					**Total**
			No	**Yes**	
Have you been diagnosed with cancer	No	Count	252	155	407
		%	61.9%	38.1%	100.0%
	Yes	Count	5	3	8
		%	62.5%	37.5%	100.0%
Total		Count	257	158	415
		%	61.9%	38.1%	100.0%
Have you heard of Human papillomavirus (HPV)					**Total**
			No	**Yes**	
Have you been diagnosed with cancer	No	Count	229	178	407
		%	56.3%	43.7%	100.0%
	Yes	Count	4	4	8
		%	50.0%	50.0%	100.0%
Total		Count	233	182	415
		%	56.1%	43.9%	100.0%
Know that HPV infection causes cervical cancer					**Total**
			No	**Yes**	
Have you been diagnosed with cancer	No	Count	266	141	407
		%	65.4%	34.6%	100.0%
	Yes	Count	4	4	8
		%	50.0%	50.0%	100.0%
Total		Count	270	145	415
		%	65.1%	34.9%	100.0%
Have you ever heard of the HPV vaccine					**Total**
			No	**Yes**	
Have you been diagnosed with cancer	No	Count	259	148	407
		%	63.6%	36.4%	100.0%
	Yes	Count	4	4	8
		%	50.0%	50.0%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%

Tab. S3 (*follows*).

Know that HPV vaccine can prevent cervical cancer					Total
			No	Yes	
Have you been diagnosed with cancer	No	Count	286	121	407
		%	70.3%	29.7%	100.0%
	Yes	Count	5	3	8
		%	62.5%	37.5%	100.0%
Total		Count	291	124	415
		%	70.1%	29.9%	100.0%
Have you received HPV vaccine					**Total**
			No	**Yes**	
Have you been diagnosed with cancer	No	Count	362	45	407
		%	88.9%	11.1%	100.0%
	Yes	Count	4	4	8
		%	50.0%	50.0%	100.0%
Total		Count	366	49	415
		%	88.2%	11.8%	100.0%
Have you heard of the hepatitis B and C viruses					**Total**
			No	**Yes**	
Have you been diagnosed with cancer	No	Count	153	254	407
		%	37.6%	62.4%	100.0%
	Yes	Count	2	6	8
		%	25.0%	75.0%	100.0%
Total		Count	155	260	415
		%	37.3%	62.7%	100.0%
Know that hepatitis B and C viruses cause liver cancer					**Total**
			No	**Yes**	
Have you been diagnosed with cancer	No	Count	233	174	407
		%	57.2%	42.8%	100.0%
	Yes	Count	2	6	8
		%	25.0%	75.0%	100.0%
Total		Count	235	180	415
		%	56.6%	43.4%	100.0%
Have you heard of the hepatitis B vaccine					**Total**
			No	**Yes**	
Have you been diagnosed with cancer	No	Count	194	213	407
		%	47.7%	52.3%	100.0%
	Yes	Count	3	5	8
		%	37.5%	62.5%	100.0%
Total		Count	197	218	415
		%	47.5%	52.5%	100.0%
Know that Hepatitis B vaccine can prevent liver cancer					**Total**
			No	**Yes**	
Have you been diagnosed with cancer	No	Count	259	148	407
		%	63.6%	36.4%	100.0%
	Yes	Count	4	4	8
		%	50.0%	50.0%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Have you received HBV vaccine					**Total**
			No	**Yes**	
Have you been diagnosed with cancer	No	Count	296	111	407
		%	72.7%	27.3%	100.0%
	Yes	Count	4	4	8
		%	50.0%	50.0%	100.0%
Total		Count	300	115	415
		%	72.3%	27.7%	100.0%

Tab. S3 (*follows*).

Heard of Kaposi sarcoma herpes virus (KSHV)					Total
			No	Yes	
Have you been diagnosed with cancer	No	Count	308	99	407
		%	75.7%	24.3%	100.0%
	Yes	Count	5	3	8
		%	62.5%	37.5%	100.0%
Total		Count	313	102	415
		%	75.4%	24.6%	100.0%
Know that Kaposi sarcoma herpes virus causes Kaposi sarcoma					**Total**
			No	Yes	
Have you been diagnosed with cancer	No	Count	327	80	407
		%	80.3%	19.7%	100.0%
	Yes	Count	5	3	8
		%	62.5%	37.5%	100.0%
Total		Count	332	83	415
		%	80.0%	20.0%	100.0%
Heard of Epstein Barr Virus (EBV)					**Total**
			No	Yes	
Have you been diagnosed with cancer	No	Count	309	98	407
		%	75.9%	24.1%	100.0%
	Yes	Count	5	3	8
		%	62.5%	37.5%	100.0%
Total		Count	314	101	415
		%	75.7%	24.3%	100.0%
Know that Epstein Barr virus causes lymphoma					**Total**
			No	Yes	
Have you been diagnosed with cancer	No	Count	320	87	407
		%	78.6%	21.4%	100.0%
	Yes	Count	5	3	8
		%	62.5%	37.5%	100.0%
Total		Count	325	90	415
		%	78.3%	21.7%	100.0%
Heard of Human T-lymphotropic virus 1 (HTLV-1)					**Total**
			No	Yes	
Have you been diagnosed with cancer	No	Count	306	101	407
		%	75.2%	24.8%	100.0%
	Yes	Count	5	3	8
		%	62.5%	37.5%	100.0%
Total		Count	311	104	415
		%	74.9%	25.1%	100.0%
Know that HTLV-1 causes lymphoma					**Total**
			No	Yes	
Have you been diagnosed with cancer	No	Count	317	90	407
		%	77.9%	22.1%	100.0%
	Yes	Count	5	3	8
		%	62.5%	37.5%	100.0%
Total		Count	322	93	415
		%	77.6%	22.4%	100.0%
Heard of the bacteria *Helicobacter pylori*					**Total**
			No	Yes	
Have you been diagnosed with cancer	No	Count	254	153	407
		%	62.4%	37.6%	100.0%
	Yes	Count	4	4	8
		%	50.0%	50.0%	100.0%
Total		Count	258	157	415
		%	62.2%	37.8%	100.0%

Tab. S3 (*follows*).

Know that *Helicobacter pylori* is associated to cancer of the stomach					Total
			No	Yes	
Have you been diagnosed with cancer	No	Count	272	135	407
		%	66.8%	33.2%	100.0%
	Yes	Count	4	4	8
		%	50.0%	50.0%	100.0%
Total		Count	276	139	415
		%	66.5%	33.5%	100.0%
Have you heard about some cancer types associated with bacteria?					**Total**
			No	**Yes**	
Family history of cancer	No	Count	168	99	267
		%	62.9%	37.1%	100.0%
	Yes	Count	78	70	148
		%	52.7%	47.3%	100.0%
Total		Count	246	169	415
		%	59.3%	40.7%	100.0%
Have you heard about some cancer types associated with viruses?					**Total**
			No	**Yes**	
Family history of cancer	No	Count	160	107	267
		%	59.9%	40.1%	100.0%
	Yes	Count	70	78	148
		%	47.3%	52.7%	100.0%
Total		Count	230	185	415
		%	55.4%	44.6%	100.0%
Have you heard of 'Oncovirus'					**Total**
		no	**Yes**		
Family history of cancer	No	Count	210	57	267
		%	78.7%	21.3%	100.0%
	Yes	Count	99	49	148
		%	66.9%	33.1%	100.0%
Total		Count	309	106	415
		%	74.5%	25.5%	100.0%
Know that vaccine can prevent some cancer types					**Total**
			No	**Yes**	
Family history of cancer	No	Count	172	95	267
		%	64.4%	35.6%	100.0%
	Yes	Count	85	63	148
		%	57.4%	42.6%	100.0%
Total		Count	257	158	415
		%	61.9%	38.1%	100.0%
Have you heard of Human papillomavirus (HPV)					**Total**
			No	**Yes**	
Family history of cancer	No	Count	171	96	267
		%	64.0%	36.0%	100.0%
	Yes	Count	62	86	148
		%	41.9%	58.1%	100.0%
Total		Count	233	182	415
		%	56.1%	43.9%	100.0%
Know that HPV infection causes cervical cancer					**Total**
			No	**Yes**	
Family history of cancer	No	Count	191	76	267
		%	71.5%	28.5%	100.0%
	Yes	Count	79	69	148
		%	53.4%	46.6%	100.0%
Total		Count	270	145	415
		%	65.1%	34.9%	100.0%

Tab. S3 (*follows*).

Have you ever heard of the HPV vaccine					Total
			No	Yes	
Family history of cancer	no	Count	190	77	267
		%	71.2%	28.8%	100.0%
	yes	Count	73	75	148
		%	49.3%	50.7%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%
Know that HPV vaccine can prevent cervical cancer					**Total**
			No	**Yes**	
Family history of cancer	no	Count	201	66	267
		%	75.3%	24.7%	100.0%
	yes	Count	90	58	148
		%	60.8%	39.2%	100.0%
Total		Count	291	124	415
		%	70.1%	29.9%	100.0%
Have you received HPV vaccine					**Total**
			No	**Yes**	
Family history of cancer	no	Count	244	23	267
		%	91.4%	8.6%	100.0%
	yes	Count	122	26	148
		%	82.4%	17.6%	100.0%
Total		Count	366	49	415
		%	88.2%	11.8%	100.0%
Have you heard of the hepatitis B and C viruses					**Total**
			No	**Yes**	
Family history of cancer	no	Count	118	149	267
		%	44.2%	55.8%	100.0%
	yes	Count	37	111	148
		%	25.0%	75.0%	100.0%
Total		Count	155	260	415
		%	37.3%	62.7%	100.0%
Know that hepatitis B and C viruses cause liver cancer					**Total**
			No	**Yes**	
Family history of cancer	no	Count	165	102	267
		%	61.8%	38.2%	100.0%
	yes	Count	70	78	148
		%	47.3%	52.7%	100.0%
Total		Count	235	180	415
		%	56.6%	43.4%	100.0%
Have you heard of the hepatitis B vaccine					**Total**
			No	**Yes**	
Family history of cancer	no	Count	148	119	267
		%	55.4%	44.6%	100.0%
	yes	Count	49	99	148
		%	33.1%	66.9%	100.0%
Total		Count	197	218	415
		%	47.5%	52.5%	100.0%
Know that Hepatitis B vaccine can prevent liver cancer					**Total**
			No	**Yes**	
Family history of cancer	no	Count	186	81	267
		%	69.7%	30.3%	100.0%
	yes	Count	77	71	148
		%	52.0%	48.0%	100.0%
Total		Count	263	152	415
		%	63.4%	36.6%	100.0%

Tab. S3 (*follows*).

Have you received HBV vaccine					Total
			No	Yes	
Family history of cancer	No	Count	202	65	267
		%	75.7%	24.3%	100.0%
	Yes	Count	98	50	148
		%	66.2%	33.8%	100.0%
Total		Count	300	115	415
		%	72.3%	27.7%	100.0%
Heard of Kaposi sarcoma herpes virus (KSHV)					**Total**
			No	**Yes**	
Family history of cancer	No	Count	214	53	267
		%	80.1%	19.9%	100.0%
	Yes	Count	99	49	148
		%	66.9%	33.1%	100.0%
Total		Count	313	102	415
		%	75.4%	24.6%	100.0%
Know that Kaposi sarcoma herpes virus causes Kaposi sarcoma					**Total**
			No	**Yes**	
Family history of cancer	No	Count	222	45	267
		%	83.1%	16.9%	100.0%
	Yes	Count	110	38	148
		%	74.3%	25.7%	100.0%
Total		Count	332	83	415
		%	80.0%	20.0%	100.0%
Heard of Epstein Barr Virus (EBV)					**Total**
			No	**Yes**	
Family history of cancer	No	Count	214	53	267
		%	80.1%	19.9%	100.0%
	Yes	Count	100	48	148
		%	67.6%	32.4%	100.0%
Total		Count	314	101	415
		%	75.7%	24.3%	100.0%
Know that Epstein Barr virus causes lymphoma					**Total**
			No	**Yes**	
Family history of cancer	No	Count	220	47	267
		%	82.4%	17.6%	100.0%
	Yes	Count	105	43	148
		%	70.9%	29.1%	100.0%
Total		Count	325	90	415
		%	78.3%	21.7%	100.0%
Heard of Human T-lymphotropic virus 1 (HTLV-1)					**Total**
			No	**Yes**	
Family history of cancer	No	Count	211	56	267
		%	79.0%	21.0%	100.0%
	Yes	Count	100	48	148
		%	67.6%	32.4%	100.0%
Total		Count	311	104	415
		%	74.9%	25.1%	100.0%
Know that HTLV-1 causes lymphoma					**Total**
			No	**Yes**	
Family history of cancer	No	Count	218	49	267
		%	81.6%	18.4%	100.0%
	Yes	Count	104	44	148
		%	70.3%	29.7%	100.0%
Total		Count	322	93	415
		%	77.6%	22.4%	100.0%

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Tab. S3 (*follows*).

Heard of the bacteria *Helicobacter pylori*					Total
			No	Yes	
Family history of cancer	No	Count	176	91	267
		%	65.9%	34.1%	100.0%
	Yes	Count	82	66	148
		%	55.4%	44.6%	100.0%
Total		Count	258	157	415
		% r	62.2%	37.8%	100.0%
Know that *Helicobacter pylori* is associated to cancer of the stomach					Total
			No	Yes	
Family history of cancer	No	Count	188	79	267
		%	70.4%	29.6%	100.0%
	Yes	Count	88	60	148
		%	59.5%	40.5%	100.0%
Total		Count	276	139	415
		%	66.5%	33.5%	100.0%

Tab. S4. Logistic regression results.

Variables	df	Sig.	Exp(B)
Have you heard about some cancer types associated with bacteria?			
Nationality	1	.001	.405
Occupation	1	.000	.240
Constant	1	.000	2.153
Have you heard about some cancer types associated with virus?			
Occupation	1	.000	.173
Family income (low)	1	.174	.570
Family income (middle)	1	.140	1.539
Constant	1	.023	2.054
Have you heard of "Oncovirus"?			
Nationality	1	.027	.383
Occupation	1	.000	.057
POR (Beirut)	1	.838	.898
POR (Bekaa)	1	.022	.309
POR (Mount Lebanon)	1	.705	.799
POR (North Lebanon)	1	.593	1.441
Family Income 1	1	.019	.187
Family Income 2	1	.917	1.047
Constant	1	.065	3.385
Do you know that vaccine can prevent some cancer types?			
Nationality	1	.001	.405
Occupation	1	.000	.240
Constant	1	.000	2.153