

# Knowledge and attitudes about vaccinations among adolescents

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## Key words

Vaccination • Adolescents • Primary care • Preventive medicine

## Summary

**Purpose.** *The aim of this study was to investigate among adolescents in Antwerp their knowledge about vaccination and to describe their information sources, motives and barriers for vaccination.*

**Methods.** *In March 2009, adolescents aged between 14 and 17 years from three schools with a mixed Belgian and immigrant population in Antwerp completed a written questionnaire concerning vaccination. The questionnaire was already used and validated in a study in five European countries: France, Italy, Spain, Germany and the United Kingdom.*

**Results.** *In total 186 adolescents completed the questionnaire. Most of them (93%) knew that vaccination is a method to prevent*

*disease. Most adolescents knew about the existence of vaccines against tetanus (94%), hepatitis B (91%) and human papillomavirus (87%). The most important sources for information were the family physician (83%), the school (79%) and the parents (70%). Their knowledge about vaccinations was not related to courses about vaccination at school.*

**Conclusions.** *The physician, the school and the parents play a key role in the vaccination of adolescents. Our results are in many aspects similar to those in the other European countries.*

## Introduction

Adolescents all over the world are a huge and vulnerable group for infectious and other diseases. A good view on their specific needs and their understanding of disease and prevention is necessary to adapt vaccination strategies for this group of people that is characterised by a constant change and evolution.

In general, adolescents are in good health: they avoided or survived all childhood diseases and are far away from their end of life. However, yearly almost 1.7 million people aged between 10 and 19 years die. Most of them die on the consequences of traffic accidents, suicide and violence. But some also die due to preventable or treatable diseases [1].

Some important diseases among adults - such as hepatitis and cervical cancer - have their origin in childhood or adolescence. This is important, since it means that the typical changes in behaviour that adolescents go through can also affect their health. Adolescents try to identify with the people who surround them, thus being influenced by their peers in matters as behaviour and social values. However, when health beliefs are concerned, it is the relation with their parents and family members that plays a key role.

Media, as well as legal, political, social and religious values affect the behaviour of adolescents. The economic situation and the accessibility of health care and schools also affect the development of adolescents. Campaigns

that intend to promote health among adolescents should cope with these values and characteristics.

As early as in 2003 at the Independent European Vaccination Experts Summit education of adolescents was identified as a crucial issue to improve health through vaccination in Europe [2].

The promotion of health and development of adolescents is one of the most important long term objectives in our society and is supported by the World Health Organisation (WHO) [3].

## IMPORTANCE OF VACCINATION

Many infectious diseases, such as meningococcal meningitis, pertussis, measles and mumps, have a not negligible morbidity and mortality among adolescents, despite that these diseases are preventable by vaccination. Vaccination of adolescents offers the opportunity to focus on three action points: basic vaccinations, booster vaccinations and catch-up vaccinations. Vaccination of adolescents not only protects the adolescents themselves, but the persons in their surroundings as well. For these reasons the cost/benefit ratio of vaccination of adolescents is even more favourable.

Vaccination also creates an opportunity for adolescents to discover health care facilities they can attend for problems such as smoking, family planning, contraception, diet and physical activity. This has a beneficial effect on their future health [4].

In a qualitative study in 2005 several determinants regarding adolescent immunization were identified. The

most important themes were: reimbursement, professional organization recommendations, disease and vaccine characteristics, school requirements, perception of physicians' recommendations, cost and insurance coverage, media reports and finally vaccine supply, ordering, timing and scheduling [5].

### PERCEPTION AND KNOWLEDGE

In Belgium, all vaccinations are available from family physicians, paediatricians and the governmental childcare centres. This guarantees an easy accessibility for parents and their children for all recommended vaccinations.

The degree of vaccination depends on several factors: accessibility of health care facilities, perception of vaccination, timing of the vaccination and follow-up of safety and activity of the vaccines [6].

A systematic review described how the effectiveness, applicability, economic impact, and barriers of selected population-based interventions improve vaccination coverage [7, 8]. The role of routine and mass vaccination campaigns on the immunization status of adolescents was described by Dinelli et al. [9]

Several efforts to stimulate the knowledge about vaccination have been studied in the past. Cassidy et al. designed an immunization program to educate parents and students about hepatitis B virus infection and vaccination using science class presentations and mailings [10]. The study of Valley investigated the acceptability of a film about human papillomavirus (HPV) vaccinations among parents and their school children [11].

Another important issue is the correlation between knowledge and attitude. It has been shown that knowledge of hepatitis B virus infection was significantly lower in adolescents in juvenile detention centers than in schools, but there was no difference between groups in attitude toward infection and vaccination [12].

A study on the perception and knowledge about vaccination among adolescents was performed in 2006 in five European countries (France, Italy, Spain, Germany and the United Kingdom) [13]. For Belgium no such data are available.

The aim of our actual study was to describe the perception of and knowledge about vaccination among adolescents in Antwerp and to compare our findings with the European data. Secondly, the study wanted to describe the information sources adolescents use and their motives and barriers for vaccination. Finally the investigators were interested in the effect of school courses on the knowledge and attitudes about vaccinations.

## Material and methods

### STUDY POPULATION

The study examined a sample population aged between 14 and 17 years in three schools run by the three different educational networks of the city of Antwerp, Belgium. Antwerp was chosen because of its great diversity among students permitting us to include adolescents from all social classes, including immigrants. The three selected schools

represent the most common types of education available in Antwerp and Belgium. Students from the third to the sixth year in general as well as technical classes were recruited during March 2009. In each school three classes of different educational levels were chosen randomly. All students from the nine classes participated. The participants were representative for the population of the concerned age group in Antwerp: 54% were women compared to 49% of the Antwerp population ( $p = 0.14$ ), 20% did not have the Belgian nationality compared to 15% of the Antwerp population ( $p = 0.09$ ) and 53% were immigrants compared to 46% of the Antwerp population ( $p = 0.08$ ). Immigrants were defined as persons who themselves or of whom the parents were not born in Belgium.

The questionnaire was presented to every student of the selected classes. All students handed in the completed questionnaire.

### QUESTIONNAIRE

For our research a validated questionnaire, taken from the above mentioned European study was used (see Appendix) [13]. It was translated from English to Dutch using the backward-forward method and additionally double checked by the authors and a translator. The questionnaire consisted of 17 questions inquiring about adolescents' general interest, knowledge and perception of vaccination. Also, these adolescents were asked what available information on vaccination they had and what their drivers and barriers to opting for vaccination were. Finally the type and importance of information channels were questioned. Six questions regarding demographic characteristics of the participants were included: sex, age, place of residence, branch of studies, country of origin and time residing in Belgium. Finally participation in thematic school courses about vaccinations was questioned among students and teachers.

In questions 4, 7, 8, 13 and 15 the degree of agreement was answered on a Likert-scale ranging from one to ten, going from total disagreement to total agreement.

The students completed the written questionnaire at the beginning of a class session that focussed on an interactive course about vaccination, sexual transmittable diseases and contraception. One of the investigators was available in the classroom to clarify unclear questions.

Data cleaning was performed in two steps: detection of errors in the dataset and correction of these errors. The data cleaning looked for missing data, typing errors on data entry, column shift on data entry, coding errors, systematic repetitive answers, discordant answers and errors related to misinterpretation of questions. Errors were detected by using descriptive statistics, scatter plots and histograms. Presence of systematic repetitive answers was considered when systematically the same option was answered in consecutive questions.

Since all questionnaires were fully completed, none of them had to be excluded.

### ETHICAL APPROVAL

The data collection for this study was part of a school course concerning vaccination. The boards of the par-

participating schools gave their permission for the testing of the students. There was no approval of our study by the ethical board of our institution because the participants were not subject to a medical intervention.

### STATISTICAL PROCESSING

The data of the questionnaire were entered in an Excel sheet. Databases were stored with a central data manager at the Department of Family Medicine of the University of Brussels. Several control measures ensured data quality and limited missing data. Data cleaning and data analyses for this study were performed using SPSS17.0 (SPSS Inc, Chicago, IL). Only fully completed questionnaires were included. The questionnaires were checked for systematic repetitive answers and discordant answers, but none of the questionnaires had to be excluded for these reasons.

For the questions using the Likert scale, a score below five was interpreted as a disagreement with the position and five or more was interpreted as an agreement. The results were dichotomised to facilitate the statistical processing.

The standard Pearson chi square test was used to compare girls and boys (2 by 2 tables), students from the three school types (2 by 3 tables) and Antwerp adolescents with the European ones (2 by 2 tables). Only for the knowledge question (question 6) the independent-samples t-test was used to compare girls and boys, students from the three school types and Antwerp adolescents with the European ones. The Fisher exact test was used when less than 5 observations were concerned.

## Results

### GENERAL PERCEPTION

In total 186 adolescents (85 boys and 101 girls) participated in the study. They all completed the questionnaire. Not less than 93% of them knew that vaccination is a manner to avoid disease (question 3). The three most

frequent words on their minds when hearing the word “vaccination” were “syringe” (76%), “disease” (43%) and the name of a specific kind of vaccine (43%) (question 1). For 20% of the participants vaccination was associated with pain and this was more the case among girls than among boys ( $p = 0.011$ ).

Most of the participants considered vaccination an efficient (93%) and safe (87%) way to prevent disease (question 4). Most of them were interested in being vaccinated themselves (63%) (question 7). Especially the vaccines for hepatitis C (96%), meningitis (96%), genital herpes (91%) and HIV (91%) arose their interest, and 95% of the girls wanted the HPV vaccination.

In comparison to adolescents from other European countries [13], Antwerp adolescents are just as well informed about the fact that vaccination is a manner to avoid disease (93% vs. 90% in Europe) (question 3). But fewer Antwerp adolescents know that vaccination is not a way to treat disease ( $p = 0.04$ ). In question 1 they associate vaccination more frequently with danger ( $p < 0.001$ ), but less frequently with injections ( $p < 0.001$ ), needles ( $p < 0.001$ ) and fear/panic ( $p < 0.001$ ) and blood ( $p = 0.007$ ). Less Antwerp than European adolescents believe that vaccination is the safest way to prevent disease ( $p = 0.04$ ) (question 4).

In comparison to other European adolescents Antwerp adolescents are more interested in vaccinations (63% vs. 44%  $p < 0.001$ ) (question 7). They are very interested in a vaccine against HIV. Additionally, they are – compared to their European counterparts - more interested in the vaccines for meningitis ( $p = 0.03$ ), hepatitis C ( $p < 0.001$ ), genital herpes ( $p < 0.001$ ) and cervix cancer ( $p = 0.03$ ).

### KNOWLEDGE ABOUT VACCINATION

Girls gave more right answers to the ten knowledge questions than boys did (8 right answers out of 10 for girls and 7 for boys, respectively;  $p < 0.001$ ) (question 6). Most adolescents knew about the existence of vaccines against tetanus, hepatitis B, HPV, meningitis and flu (Tab. I). However, only 55% knew about the ex-

**Tab. I.** For which of the following diseases vaccines are available? (question 6) Comparison of the results from Antwerp with the European study by Hessel [13].

	Antwerp (n = 186)		Europe (n = 1530)		p-Value
	n	%	n	%	
Tetanus	175	94	1392	91	0.156
Flu	136	73	1377	90	< 0.001
Hepatitis B	169	91	1102	72	< 0.001
Meningitis	141	76	1010	66	0.007
Cervical cancer	162	87	184	12	< 0.001
Measles	102	55	1301	85	< 0.001
Polio	78	42	1086	71	< 0.001
HIV/AIDS	43	23	245	16	0.014
Diabetes	60	32	673	44	0.002
Obesity	26	14	306	20	0.050

istence of the measles vaccine, and 42% about the polio vaccine. Surprisingly many adolescents thought that a vaccine against diabetes (32%), HIV (23%) and obesity (14%) exists.

More Antwerp adolescents (81%) than adolescents from other European countries (71%) claim that they are well informed about vaccinations ( $p = 0.006$ ) (question 13). For Antwerp, as well as for European adolescents, the objective knowledge about vaccinations was as well 7.5 on a scale of 10 (question 6). In that perspective, the existence of a tetanus vaccine was well-known by all European adolescents, whereas the hepatitis B vaccine ( $p < 0.001$ ), the HPV vaccine ( $p < 0.001$ ) and the meningitis vaccine ( $p = 0.007$ ) were better known by the Antwerp adolescents (Tab. I). It is striking that while the HPV vaccine was known by 87% of the Antwerp adolescents, merely 12% of the adolescents from the other European countries knew it exists ( $p < 0.001$ ).

Fewer Antwerp adolescents (73%) than European (90%) believed that a vaccine against flu exists ( $p < 0.001$ ). Only 55% of Antwerp adolescents compared to 85% of the adolescents from other European countries thought that a vaccine against measles exists ( $p < 0.001$ ) and only 42% of the Antwerp adolescents compared to 71% of the adolescents from other European countries thought that a vaccine against poliomyelitis exists ( $p < 0.001$ ).

There were also some misunderstandings. More Antwerp adolescents (23%) believed that a vaccine against HIV exists while only 16% of other European adolescents had the same misunderstanding ( $p = 0.01$ ). The existence of a diabetes vaccine, another misunderstanding, was believed by 32% of Antwerp adolescents, compared to 27% of Europeans of that age-group ( $p = 0.002$ ).

## SOURCES OF INFORMATION AND NEEDS FOR INFORMATION

According to our study family physicians played a key role for 83% of adolescents when it comes to information about vaccinations (question 15) (Tab. II). This score is remarkably higher than found for specialists (26%) and other health care workers (22%) ( $p < 0.001$ ). The school (79%) and parents and relatives (70%) played an important role too. The role of television (50%) and internet (38%) was less important.

More than three quarters of the adolescents (78%) were interested in obtaining more information about vaccination (question 16). They were interested in information about the benefits of vaccination (70%), the consequences of not getting vaccinated (69%) and new vaccines (58%). Girls were more interested than boys ( $p = 0.001$ ). They were also more interested than boys in the effects and safety of the vaccines ( $p = 0.017$ ) and the consequences of not being vaccinated ( $p = 0.003$ ). Boys were more interested than girls in celebrities receiving vaccines ( $p = 0.003$ ) and the mechanisms of vaccination ( $p = 0.005$ ).

More Antwerp adolescents (78%) than those from other European countries (62%) wanted more information on vaccination ( $p < 0.001$ ). In that view, Antwerp adolescents regarded their family physician as being the most important information source on vaccinations, followed by their school and parents (Tab. II). To adolescents from other European countries however, parents were the most important information source (62%) and were significantly more important than the family physician (56%) ( $p < 0.001$ ). Here, schools came third with 35%.

## ROLE OF SCHOOL COURSES

Most of the adolescents (79%) mentioned school as being an information source on vaccination (question 11).

**Tab. II.** What/who are your sources of information about vaccination (question 15)? Comparison of the results from Antwerp with the European study by Hessel [13].

	Antwerp (n = 186)		Europe (n = 1530)		p-Value
	n	%	n	%	
Radio	15	8	61	4	0.011
Newspapers, magazines	45	24	153	10	< 0.001
Internet	71	38	122	8	< 0.001
TV	93	50	337	22	< 0.001
Friends	50	27	107	7	< 0.001
Parents and family	130	70	949	62	0.036
Other healthcare professionals	41	22	107	7	< 0.001
Specialists (paediatricians....)	48	26	199	13	< 0.001
Leaflet in doctors surgery	50	27	15	1	< 0.001
Family physicians	154	83	857	56	< 0.001
School (doctor, nurse, course)	147	79	536	35	< 0.001
Other source of information	6	3	31	2	0.205
No specific source	7	4	46	3	0.573

**Tab. III.** What would be for yourself the reason with the highest impact on your decision to get vaccinated (question 9)? Comparison of the results from Antwerp with the European study by Hessel [13].

	Antwerp (n = 186)		Europe (n = 1530)		p-Value
	n	%	n	%	
The fact that the vaccination is mandatory	17	9	61	4	0.001
The recommendation by a physician	37	20	214	14	0.031
The recommendation by your parents	7	4	153	10	0.006
The recommendation by your friends or relatives	2	1	31	2	0.571
The protection of people around you	28	15	122	8	0.001
To avoid costs related to the treatment	6	3	31	2	0.250
The seriousness of the disease	67	36	673	44	0.038
Being ill is unpleasant	6	3	107	7	0.050
Being ill disturbs me or makes me lose time	6	3	92	6	0.122
Don't know	0	0	15	1	0.394
Wrong answer	13	7	0	0	< 0.001

Although 42% of these adolescents thought that they had had a course on vaccinations (question 16), according to their teachers only 18% of the questioned adolescents had already received such a thematic course (question 17). Most of the courses were organised in the fourth year. There was no significant relationship between the knowledge of and attitudes towards the different vaccinations and the vaccinations courses organized at school. Neither was there a relationship between the interest in vaccinations and the courses.

The proportion of Antwerp adolescents declaring that they had attended courses about vaccinations (42%) was comparable with similar adolescents in other European countries (43%).

#### MOTIVES AND BARRIERS FOR VACCINATION

The three most important motives for vaccination were the seriousness of the disease (36%), the advice of a phy-

sician (20%) and the protection of relatives and friends (15%) (question 9) (Tab. III).

The most important reasons to refuse a vaccination were that not all vaccinations are necessary (21%), possible side effects of the vaccine (18%) and the favourable outcome after treatment of the concerned disease (13%) (question 10) (Tab. IV).

In Antwerp, as well as in the selected European countries, the family physicians, the parents and the school played an important role in the decision to get a vaccination (Tab. III). The motives with the highest impact on opting in or out a vaccination scheme were: the fact that a vaccination is mandatory ( $p = 0.001$ ) and care for the protection of relatives and friends ( $p = 0.001$ ). These factors were clearly more important to Antwerp adolescents than to their European counterparts. For the latter, most important motivation was the recommendation by the parents ( $p = 0.006$ ).

**Tab. IV.** What would be for you the most important reason for not getting vaccinated (question 10)? Comparison of the results from Antwerp with the European study by Hessel [13].

	Antwerp (n = 186)		Europe (n = 1530)		p-Value
	n	%	n	%	
Don't feel exposed for disease	22	12	92	6	0.003
Against vaccination	6	3	15	1	0.020
Afraid of the needle	20	11	474	31	< 0.001
Not all vaccines are necessary	39	21	138	9	< 0.001
Not recommended by the physician	20	11	184	12	0.612
The side-effects of vaccination	33	18	367	24	0.057
The easy treatment of the disease	24	13	138	9	0.087
The price of the vaccine	6	3	77	5	0.279
No arguments against vaccination	4	2	0	0	< 0.001
Wrong answer	11	6	0	0	< 0.001
No idea	0	0	46	3	0.007

Belgian and European barriers for vaccination were very alike (Tab. IV). But to adolescents from other European countries fear of the needle (31%) and the side effects of the vaccination (24%) were the most important barriers, whereas for Antwerp adolescents next to these another major barrier is that they didn't believe (all) vaccines are really necessary.

#### **INFLUENCE OF TYPE OF SCHOOL**

Students from general classes were more interested in information about vaccinations than those from technical classes ( $p = 0.042$ ). Students from general classes had a better knowledge about vaccinations than students from technical classes (8 right answers out of 10 for general classes and 7 for technical classes;  $p = 0.001$ ). Adolescents from technical classes received less education about vaccinations than adolescents from general classes ( $p < 0.001$ ).

### **Discussion**

Antwerp adolescents are well informed about the fact that vaccination is a way to prevent disease. But fewer Antwerp than European adolescents believe that vaccination is the safest way to prevent disease, even though Antwerp adolescents are – compared to their European counterparts – more interested in information on vaccines.

The higher proportion of Antwerp adolescents knowing the HPV vaccine compared to the European average can most probably be explained by the fact that at the time of the European survey the vaccine was not yet launched. Its launch happened November 2006, one month after the survey, but in time for our study.

More European than Antwerp adolescents believed that a vaccine against flu exists. This difference could be explained by the fact that registration in Europe was done during the flu vaccination period of October whilst our registration in Antwerp was performed in March.

Antwerp adolescents regarded their family physician as being the most important information source on vaccinations. Parents were the most important information source to adolescents from other European countries.

According to their teachers, very few adolescents in Antwerp received a course on vaccination. However, the proportions of Antwerp and European adolescents declaring that they had attended such courses were comparable. Unfortunately, we can not compare the proportion of effective courses given by the teachers in our study and in the European study. The low number of courses as indicated by teachers could be biased as a result of adolescents switching schools or teachers not knowing the content of all courses. Anyway, in Antwerp, as is the case in the five European countries, knowledge and attitudes about vaccinations were not correlated with the presence of school courses about vaccinations.

The observed differences between Antwerp and the European countries could be explained by the variability in the results between the different European countries.

For example: Italian adolescents associated the first question, "Can you give the 3 words that come to your mind when I say vaccination?", most with blood and needles, while the other adolescents thought more about pain. Most likely, the differences between countries can be explained by differences in healthcare provision and in the accents in healthcare promotion. However, socio-cultural differences might also play a role.

#### **LIMITATIONS OF THE STUDY**

Our results are based on the answers to a written questionnaire. From similar studies we know that the results can be hampered by malicious misleading answers and misunderstanding of questions. The first problem was eliminated by data cleaning and the misunderstanding of the questions was limited by the fact that one of the investigators was available to help the participants with any unclearness while completing the questionnaire.

The study was performed in only three schools in one city (Antwerp). This could hamper the representativeness of the results. Thereupon, it was important to include all social classes. Unfortunately social class of the participants was not questioned. A Belgian study on 2423 medical school files of adolescents demonstrated that vaccination coverage for poliomyelitis, tetanus and mumps decreased progressively with decreasing social class [14]. However, the adolescents in our study were recruited from all three schools run by the three different educational networks of Antwerp guaranteeing the participation of students from general as well as from technical education. Using schools from Antwerp also guaranteed a great diversity among students permitting to include immigrants and adolescents from all social classes.

It is known that the proportion of immigrants is higher in big cities than it is for example in the countryside. Therefore it is unlikely that the results from Antwerp can be generalised to the whole of the Belgian adolescent population. Also, comparison with the study of Hessel in the five European countries can only be made with some precaution. The sample choice is not well described in the study of Hessel but it was also performed in major cities suggesting a high proportion of immigrant participants.

There was no procedure used that permitted to guarantee the representativeness of the sample compared to the Belgian or European population.

We need to stress that our study only included urban adolescents. Results for rural adolescents might differ. Findings from a study among rural adolescents suggest that perceived barriers and injunctive social norms may influence their vaccination acceptance [15].

The number of participants ( $n = 186$ ) was lower in our study compared to the European study where at least 300 adolescents per country participated. However, in our opinion, almost 200 study subjects were sufficient to provide representative results and allow comparisons between groups.

The questionnaires were presented at the beginning of a class session about vaccination, sexually transmitted diseases and contraception. The students' knowledge af-

ter the class sessions was not investigated because this was not the aim of our study.

## Conclusions

Almost all adolescents understand that vaccination is a preventive measure and not a treatment. Knowledge about the existence of vaccinations against tetanus, hepatitis B, HPV, meningitis and flu is high. However, some misunderstandings exist about the existence of vaccines

against HIV and diabetes. The family physician, school and parents play a key role in the vaccination of adolescents. The three most important motives for vaccination are the seriousness of the disease, the advices from a physician and the protection of relatives and friends. The lack of information about the necessity of a vaccination and the side effects of the vaccine are the most important reasons to refuse it. Courses don't affect the knowledge and attitudes of the adolescents with regard to vaccinations. The results from our study are partly in line with those from other European countries.

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# Questionnaire for the study on knowledge about vaccination in Europe

## Personal information:

- Boy / Girl
- Age:
- Branch of studies and class:
- Place of residence:
- Land of origin (if not Belgian) for yourself and your parents:
- How long do you live in Belgium (if not born in Belgium):

- Cervical cancer Yes / No
- Diabetes Yes / No
- Obesity Yes / No
- Hepatitis B Yes / No
- Polio Yes / No
- Meningitis Yes / No
- HIV/AIDS Yes / No
- Tetanus Yes / No

## Vaccination questionnaire:

### QUESTION 1: CAN YOU GIVE THE 3 WORDS THAT COME TO YOUR MIND WHEN I SAY "VACCINATION"?

- 
- 
- 

### QUESTION 2: HOW INTERESTED ARE YOU IN THE VACCINATION TOPIC?

- Not interested at all
- Not very interested
- Somewhat interested
- Very interested

### QUESTION 3: ACCORDING TO YOU, VACCINATION IS...:

- A manner to treat disease when it occurs
- A manner to avoid disease
- I have no idea

### QUESTION 4: HOW MUCH DO YOU PERSONALLY AGREE WITH EACH OF THE FOLLOWING STATEMENTS?

Give a mark on a scale from 1 to 10: 1 meaning you don't agree at all - 10 you strongly agree

- There are still important discoveries to be made in the field of vaccination, important vaccines to create
- Vaccination is truly a major asset/discovery for healthcare of humanity
- Vaccination is the best way to prevent diseases because it is efficient
- Vaccination is the safest way to prevent diseases
- Vaccination is synonymous of innovation
- There has not been major progress in the vaccination field since 20 years

### QUESTION 5: DO YOU THINK THAT YOU ARE BETTER PROTECTED THANKS TO VACCINATION, COMPARED WITH:

- Your grand-parents' generation Yes / No
- Your parents' generation Yes / No
- Teenagers in developing countries? Yes / No

### QUESTION 6: I AM GOING TO MENTION SOME DISEASES. FOR EACH, TELL ME IF ACCORDING TO YOU WHICH VACCINES ARE AVAILABLE IN YOUR COUNTRY?

- Flu Yes / No
- Measles Yes / No

### QUESTION 7: IN THE NEXT 5 YEARS, VACCINES WILL BE AVAILABLE TO PROTECT AGAINST THE FOLLOWING DISEASE. WOULD YOU BE INTERESTED TO GET THE FOLLOWING VACCINATIONS?

For each of them give a mark on a scale from 1 to 10: 1 meaning you would not be interested at all to get vaccinated and 10 that you would be very interested to get vaccinated.

- Avian flu
- HIV
- All types of meningitis
- Hepatitis C
- Genital herpes
- Cervical cancer (to female respondents only)

### QUESTION 8: FOR EACH OF THE FOLLOWING STATEMENTS ABOUT THE MAIN BENEFITS OF VACCINATION, HOW MUCH DO YOU PERSONALLY AGREE USING A SCALE FROM 1 TO 10; 1 MEANING YOU DO NOT AGREE AT ALL AND 10 MEANING YOU STRONGLY AGREE.

- Vaccination enables me to get protected against diseases
- Vaccination enables my family to get protected against diseases
- Vaccination enables my friends, relatives to get protected against diseases
- Vaccination avoids epidemics, saves lives and makes diseases disappear in my country
- Vaccination avoids epidemics, saves lives and makes diseases disappear in the world

### QUESTION 9: WHAT WOULD BE FOR YOURSELF THE 3 FIRST REASONS THAT WOULD HAVE THE HIGHEST IMPACT ON YOUR DECISION TO GET VACCINATED?

- The fact that an illness is serious
- The fact that a physician recommends you to get vaccinated
- The fact that your parents recommend you to get vaccinated against a disease
- The fact that getting vaccinated also means protecting people around
- The fact that being ill is unpleasant
- The fact that being ill could disturb or make you lose time in your daily life
- The fact that a vaccination is mandatory by public health authorities
- To be vaccinated can avoid costs related to the treatment of the disease
- The fact that a friend, a relative recommends you to get vaccinated against a disease
- Don't know



**QUESTION 10: AND WHAT WOULD BE FOR YOU THE 3 MAIN REASONS FOR NOT GETTING VACCINATED?**

- The side effects of the vaccine
- The injection / fear of the needle
- Your physician did not mention the necessity of getting vaccinated
- Not all vaccinations are necessary
- The fact that the disease can be easily treated
- You do not feel at risk
- The cost of the vaccine
- You are against vaccination
- Don't know

**QUESTION 11: DO YOU HAVE IN YOUR EDUCATION PROGRAM, LESSONS ABOUT VACCINATION OR HAVE YOU EVER BEEN TOLD ABOUT AND/OR BEEN GIVEN INFORMATION ABOUT VACCINATION AT SCHOOL?**

- Yes, once
- Yes, several times
- No
- Don't know

**QUESTION 12: ARE YOU INTERESTED IN MORE INFORMATION ABOUT VACCINATIONS?**

- No, not at all
- No, rather not
- Yes, rather
- Yes, surely

**QUESTION 13: ON A SCALE FROM 1 TO 10 INDICATE HOW WELL INFORMED YOU CONSIDER YOU ARE ABOUT VACCINATION. 1 MEANING YOU ARE NOT INFORMED AT ALL AND 10 YOU ARE VERY WELL INFORMED.**

- 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10

**QUESTION 14: IN GENERAL CAN YOU TELL ME WHAT/WHO YOUR SOURCES OF INFORMATION ABOUT VACCINATION ARE?**

- Parents, family
- GPs
- School (doctor, nurse, education program)
- TV
- Specialists (paediatricians, ...)
- Other healthcare professionals
- Newspapers / magazine
- Friends

- Radio
- Internet
- Leaflet in GP surgery (UK only)
- Other source of information
- No specific source
- Don't know

**QUESTION 15: FOR EACH OF THE FOLLOWING ATTRIBUTES INDICATE ON A SCALE FROM 1 TO 10 HOW STRONG THEY WOULD INFLUENCE YOU TO GET VACCINATED: 1 MEANING NO INFLUENCE AT ALL AND 10 VERY STRONG INFLUENCE.**

- Your doctor's recommendation
- Your parents' recommendation
- The school recommendation
- Rapid disease outbreak in European countries
- Rapid disease outbreak in non-European countries
- News in media
- Campaign from health authority on TV, radio, press
- Campaign from health authority on internet
- Campaign from manufacturers on TV, radio, press
- Campaign from manufacturers on internet

**QUESTION 16: WHAT KIND OF INFORMATION ABOUT VACCINATION WILL BE OF INTEREST FOR YOU?**

- The new vaccines
- Your own vaccinations status
- Vaccine side effects
- Consequences of not getting vaccinated
- The vaccinations that should be done for teenagers
- Vaccine efficiency/benefits
- R&D on vaccination, future vaccines
- The vaccines that require booster
- The existing vaccinations and diseases related
- Successful consequences of vaccination
- Educational information on vaccine mechanism
- Vaccination campaigns in developing countries
- testimonials of very famous people who support vaccination
- None
- Don't know

**QUESTION 17: OBJECTIVE CHECK WITH THE TEACHER: DID THIS STUDENT EVER RECEIVED SPECIFIC COURSES ABOUT VACCINATIONS AT THIS SCHOOL?**

- Yes / No