

Annex 10 to Deliverable 6.1 - Report on main determinants of HPV vaccine hesitancy at national level

Update 1 December 2023:

- Contribution from Estonia
- Contribution from Germany
- Contribution from Sweden

Report on main determinants of HPV vaccine hesitancy at national level



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Estonia

Introduction

Parents' QA and FGs with students, teachers and school nurses were carried out in autumn 2023 after obtaining approvals from the ethics committee requested to conduct studies among children and their parents.

The study protocol was approved by the Research Ethics Committee of the National Institute for Health Development in Estonia (Decision No. 1223, 20.07.2023).

Methods

Participating schools

To conduct the QA with parents and FG with students and teachers, 40 schools were randomly selected from all Estonian schools with at least 16 students studying in the 5th grade during the 2022/2023 school year. The selected schools were contacted in August 2023 and separate consent was requested for each part of the study (i.e., parents' QA, students' FG and teachers' FG). Of 40 schools selected, one was excluded from the sample because it had been united with another school by the 2023/2024 school year and no longer existed. Seven schools consented to parents' QA and students' FG; four of them also consented to teachers' FG. Ten schools declined to participate in any part of the study, while no reply was received from the remaining 22 schools.

Parents' QA

The parents' QA was conducted online in September – October 2023 among parents of children attending 6th grades in seven schools consenting to parents' QA. (Parents of 6th graders were chosen because most of the 6th graders are 12 years old at the beginning of the school year and in Estonia, this is the age when girls are vaccinated against HPV free of charge within the framework of the national immunisation schedule). The survey was prepared in three languages: Estonian, Russian, and English. The original questionnaire was modified independently by the Estonian team to meet the local situation. An invitation and two reminders to complete the survey was sent to the parents by school's contact person via schools' electronical communication system or email. The questionnaire was anonymous.

Students' FG

From the seven schools consenting to students' FG, four were selected by researchers for conducting students' face-to-face FGs. The schools were chosen to represent different regions of Estonia (the capital city Tallinn, its surroundings, South Estonia and East Estonia), areas with different population density, and schools with different language of instruction (Estonian vs. Russian). In total, eight students' FG interviews were performed with up to 4 students in each. In each school, boys and girls were interviewed separately.

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While participation was voluntary, recruitment of participating students was assisted by teachers. Informed consent to participate was obtained from the students and their parents. Participation in the FG was rewarded with a department store gift voucher worth 10 euros.

Teachers' FG

All the teachers from the four schools that consented to teachers' FG were invited to participate in an online FG interview. The invitation and two reminders to register to an online FG interview were delivered by the school's contact person via schools' electronical communication system or email. As none of the Russian-speaking schools consented to this part of the study, only one interview in Estonian was performed. Participation in the FG was rewarded with a department store gift voucher worth 20 euros.

School nurses' FG

School nurses all over Estonia were invited to participate in an online FG interview by email sent by a contact person in the Estonian Health Insurance Fund (*Tervisekassa*). An invitation and two reminders to register to an online FG interview were sent to approximately 400 school nurses. Two online FGs were held, one in Estonian, the other in Russian. Participation in the FG was rewarded with a department store gift voucher worth 20 euros.

Limitations

Participation rates were low both at the level of schools and individuals. The timing of contacting the schools in the end of August was probably unfortunate, as the schools were busy with preparations for the new school year, but also inevitable in order to meet the (already extended) deadline for the study results. Modest participation rates among parents, teachers and school nurses probably reflect general lack of time as well as low interest in the topic. Those who participated were likely to be better informed about HPV and to hold more positive attitudes towards vaccination than parents and teachers in general.

Results

Parents' QA

Many respondents started the questionnaire but did not complete it. To be included in the data analysis, at least the block of questions regarding the sources of information on HPV and HPV vaccination (questions presented in tables 4 to 8) had to be completed. For the parents' QA, after exclusions, 45 responses remained. All responses were in Estonian.

Table 1. Demographic information of the respondents

Question & answer		n	%
Who is answering the questionnaire?	One parent/legal guardian	45	100

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Both parents/legal guardians		0	0.0
Question		mean	median
		40.8	40.0
Please indicate your age in years.		min	max
		31	54
Question & answer		n	%
Please indicate your gender.	Male	0	0.0
	Female	45	100
What is your nationality?	Estonian	44	97.8
	Russian	0	0
	Other	1	2.2
	Primary/basic	0	0.0
What is the highest degree or level of education you have completed?	Secondary/secondary-vocational	10	22.2
	Bachelor's	25	55.6
	Master's	10	22.2
	Doctoral	0	0.0
What is your current employment status?	Employed	42	93.3
	Unemployed	2	4.4
	Other	1	2.2

Table 2. Additional questions for women

Question & answer		n	%
Have you ever participated in cervical cancer screening?	Yes, regularly	36	80.0
	Yes, at least once	6	13.3
	No, never	3	6.7

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How often do you visit the gynaecologist for check-ups?	I don't know	0	0.0
	Yearly	36	80.0
	Have visited at least once	7	15.6
	Never	0	0.0
	I don't know	2	4.4

In Estonia, we asked every parent “How many 6th grade children this questionnaire refers to do you have?” instead of asking every parent to respond separately for every child enrolled in this study. The last question of Table 3 “Do you agree that your children may be at risk of HPV infection in the future?” was asked for all children.

Table 3. Information regarding parents' 6th grade children

Question & answer		n	%
How many 6 th grade children this questionnaire refers to do you have?	1	42	93.3
	2	3	6.7
Question		mean	median
How old is your 6 th grade child this questionnaire refers to?		12.0	12.0
		min	max
		11	13
Question & answer		n	%
What is the gender of your 6 th grade child this questionnaire refers to?	Male	23	51.2
	Female	22	48.8
Has your 6 th grade child this questionnaire refers to been vaccinated against HPV?	Yes	5	10.6
	No	37	78.8
	I don't know	5	10.6

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Regardless of HPV vaccination, have your children been previously vaccinated under the national immunization schedule?	Yes, all vaccines covered in the national immunization programme have been administered	40	88.9
	Yes, but only some of the vaccines covered in the national immunization programme have been administered	3	6.7
	No	0	0.0
	I don't know	2	4.4

Continuation of table 3. Information regarding parents' 6th grade children

Question & answer		n	%
Do you have any other children in addition to the children this questionnaire refers to?	Yes	35	81.4
	No	8	18.6
How many children do you have in addition to the child included in the study?	1	19	54.3
	2	9	25.7
	3	6	17.1
	4	1	2.9

Question	mean	median
Please mark down the age of the other children.	13.4	13.3
	min	max
	2	33

Question & answer	n	%
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Please mark down the gender of the other children.	Male	35	59.3
	Female	24	40.7
Do you agree that your children may be at risk of HPV infection in the future?	Completely agree	16	37.2
	Rather agree	14	32.6
	Rather disagree	5	11.6
	Completely disagree	2	4.6
	I don't know	6	14.0

The next table represents the parents' willingness to vaccinate their children if they answered that they have not been vaccinated against HPV or against other vaccines included in the Estonian immunization programme. This question was asked overall and not separately for each child.

Table 3.1 Information regarding parents' vaccination decisions for those 6th grade children that have not been vaccinated against HPV nor with any other vaccines

Question & answer		n	%
Do you plan to vaccinate your child against HPV in the future? *	Yes, definitely	11	31.3
	Rather yes	5	14.3
	Undecided	8	22.9
	No, rather not	8	22.9
	Definitely not	3	8.6
In the future, do you plan to vaccinate your child with all the vaccines covered in the national immunization programme? *	Yes, definitely	2	66.7
	Rather yes	0	0.0
	Undecided	0	0.0
	No, rather not	1	33.3
	Definitely not	0	0.0

***All responses are from parents whose child was not vaccinated against HPV or all vaccines covered in the national immunization programme**

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Table 4. Sources of information from which respondents have received information on HPV and HPV vaccination

Please indicate the sources of information from which you have received information on HPV and HPV vaccination

	n	%*
General practitioner	9	20.0
Family nurse practitioner	7	15.6
Paediatrician	1	2.2
Gynaecologist	15	33.3
Other health care professionals	6	13.3
Pharmacist	0	0.0
Estonian Health Board (Terviseamet)	6	13.3
Estonian Health Insurance Fund (Tervisekassa)	3	6.7
Other websites excluding websites of Estonian Health Board and Estonian Health Insurance Fund	14	31.1
School	16	35.6
Other parents	2	4.4
Friends and familiars	12	26.7
Family members	1	2.2
Social media	12	26.7
Newspapers, leaflets and posters	13	28.9
Radio, television	16	35.6

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I have never heard of HPV infection before	0	0.0
I have never heard of HPV vaccination before	1	2.2
I don't know	1	2.2
Other	1	2.2

***Percentage of all responses**

For table 4, one respondent answered that because she herself is a working doctor, she has received HPV and HPV vaccination related information through work.



Table 5. Most reliable sources of information from which information on HPV vaccination can be obtained

Please indicate the most reliable sources of information for you from which information on HPV vaccination can be obtained. Please indicate up to three response options

	n	%*
General practitioner	31	68.9
Family nurse practitioner	13	28.9
Paediatrician	4	8.9
Gynaecologist	35	77.8
Other health care professionals	1	2.22
Pharmacist	0	0.0
Estonian Health Board (Terviseamet)	-	-
Estonian Health Insurance Fund (Tervisekassa)	8	17.8
Other websites excluding websites of Estonian Health Board and Estonian Health Insurance Fund	2	4.4
School	5	11.1
Other parents	0	0.0
Friends, familiars and relatives	1	2.2
Social media	0	0.0
Newspapers, leaflets and posters	4	8.9
Radio, television	1	2.2

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I don't know	1	2.2
Other	0	0.0

***Percentage of all responses**

Due to an error made in the insertion of the questionnaire into LimeSurvey, we could not get information on whether study participants think that the Estonian Health Board counts as a reliable source from which information on HPV vaccination can be obtained (Table 5).

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Table 6. Most important sources of information from which the respondents would like to receive information on HPV vaccination

Please indicate the most important sources of information for you from which you would like to receive information about HPV vaccination

	n	%*
General practitioner	34	75.6
Family nurse practitioner	17	37.8
Paediatrician	10	22.2
Gynaecologist	29	64.4
Other health care professionals	2	4.4
Pharmacist	1	2.2
Estonian Health Board (Terviseamet)	10	22.2
Estonian Health Insurance Fund (Tervisekassa)	5	11.1
Other websites excluding websites of Estonian Health Board and Estonian Health Insurance Fund	3	6.7
School	10	22.2
Other parents	0	0.0
Friends, familiars and relatives	0	0.0
Social media	3	6.7
Newspapers, leaflets and posters	5	11.1
Radio, television	7	15.6
I don't know	1	2.2

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Other

0

0.0

***Percentage of all responses**

Table 7. Knowledge needs on HPV vaccination

Question & answer		N	%
Do you feel sufficiently informed on HPV vaccination?	Yes, absolutely, and do not require additional information	15	34.9
	Yes, sufficiently, but would require more information	11	25.6
	Insufficiently	14	32.6
	Absolutely not	2	4.6
	I don't know	1	2.3

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Table 8. Social media usage

Question & answer		n	%*
Which social media platforms and webpages do you use daily or most often?	Facebook	37	82.2
	Instagram	17	37.8
	TikTok	3	6.7
	Reddit	0	0.0
	Snapchat	0	0.0
	Pinterest	7	15.6
	Twitter	0	0.0
	LinkedIn	1	2.2
	YouTube	13	28.9
	Blogs	1	2.2
	Vlogs (video blogs)	1	2.2
	Podcasts	1	2.2
	Wikipedia or other Wiki pages	8	17.8
	I do not use social media	3	6.7
	Other	0	0.0

***Percentage of all responses**

Table 9. Respondents' knowledge on HPV and HPV vaccines

Please indicate, whether you think the following claims are true or false		n	%
HPV may cause cancers of the cervix, vagina and vulva	True	38	100.0
	False	0	0.0
	I don't know	0	0.0
	True	19	50.0

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HPV may cause cancers of penis	False	4	10.5
	I don't know	15	39.5
	True	14	36.8
HPV may cause anal cancer	False	3	7.9
	I don't know	21	55.3
	True	15	39.5
HPV may cause cancers of the back of the throat, including the base of the tongue and tonsils	False	6	15.8
	I don't know	17	44.7
	True	27	71.0
HPV is a sexually transmitted disease	False	8	21.1
	I don't know	3	7.9
	True		



Continuation of table 9. Respondents' knowledge on HPV and HPV vaccines

Please indicate, whether you think the following claims are true or false		n	%
HPV may infect you without symptoms	True	28	73.7
	False	2	5.3
	I don't know	8	21.0
HPV infections are rare	True	1	2.6
	False	24	63.2
	I don't know	13	34.2
Most cervical cancers are not caused by HPV infections	True	8	21.6
	False	16	43.3
	I don't know	13	35.1
HPV vaccines work better if given before 15 years of age	True	31	81.6
	False	0	0.0
	I don't know	7	18.4
HPV vaccines protect against all HPV genotypes	True	8	21.1
	False	14	36.8
	I don't know	16	42.1
Early sexual intercourse increases the risk of contracting HPV	True	24	63.2
	False	4	10.5
	I don't know	10	26.3
HPV is treated with antibiotics	True	2	5.3
	False	14	36.8
	I don't know	22	57.9
HPV vaccines protect against all sexually transmitted diseases	True	0	0.0
	False	37	97.4
	I don't know	1	2.6

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HPV vaccines provide 100% protection against cervical cancer and anogenital warts	True	3	7.9
	False	26	68.4
	I don't know	9	23.7
HPV vaccines cause fertility problems	True	8	21.1
	False	19	50.0
	I don't know	11	28.9
Sometimes HPV infections can last years	True	22	5.3
	False	2	57.9
	I don't know	14	36.8
Only women can be infected by HPV	True	0	0.0
	False	31	81.6
	I don't know	7	18.4
Genital warts are caused by HPV	True	13	34.2
	False	3	7.9
	I don't know	22	57.9
Most HPV infections resolve spontaneously	True	4	10.6
	False	17	44.7
	I don't know	17	44.7

- All the questions presented in table 9 were gender-neutral, meaning that they were not only presented to respondents with specific gender.



Table 10. How HPV vaccination benefits the society

Question & answer		n	%*
What do you think are the benefits of HPV vaccination for the society? Please indicate all appropriate responses	Reduces cancer incidence	35	77.8
	Reduces cancer mortality	32	71.1
	Reduces potential complications arising from HPV	28	62.2
	No benefits exist	0	0.0
	Only pharmaceutical companies benefit from HPV vaccines	1	2.2
	I don't know	2	4.4

*** Percentage of all responses**

Some modifications in the order of questions, answers and their wording were made for questions in table 11. We modified the answer option "I don't know" to "I don't know or doesn't apply" so that respondents who are not able to resonate with some given statements, can answer accordingly.

Table 11. Reasons to or not to vaccinate against HPV

Question & answer		n	%
Fear of adverse effects restricts vaccinating	Completely agree	9	25.7
	Rather agree	8	22.9
	I don't know/doesn't apply	2	5.7
	Rather disagree	12	34.3
	Completely disagree	4	11.4
Fear of injection restricts vaccinating	Completely agree	3	8.6
	Rather agree	5	14.3
	I don't know/doesn't apply	1	2.8

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	Rather disagree	11	31.4
	Completely disagree	15	42.9
	Completely agree	5	14.3
	Rather agree	3	8.6
I have no confidence in HPV vaccines	I don't know/doesn't apply	3	8.6
	Rather disagree	11	31.4
	Completely disagree	13	37.1
	Completely agree	1	2.8
	Rather agree	5	14.3
	I don't know/doesn't apply	0	0.0
	Rather disagree	14	40.0
	Completely disagree	15	42.9
I have no confidence in vaccines in general	Completely agree	5	14.3
	Rather agree	8	22.9
	I don't know/doesn't apply	2	5.7
	Rather disagree	14	40.0
Information regarding HPV vaccination is confusing	Completely disagree	6	17.1

Continuation of table 11. Reasons to or not to vaccinate against HPV

Question & answer		n	%
Information regarding HPV vaccination is scarce	Completely agree	7	20.0
	Rather agree	9	25.7
	I don't know/doesn't apply	3	8.6
	Rather disagree	10	28.6
	Completely disagree	6	17.1

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Girls do not have to be vaccinated against HPV because cervical cancer can be prevented by regular screening	Completely agree	0	0.0
	Rather agree	2	5.7
	I don't know/doesn't apply	2	5.7
	Rather disagree	10	28.6
	Completely disagree	21	60.0
HPV vaccination is not necessary because our child is young and sexually inactive	Completely agree	1	2.9
	Rather agree	2	5.7
	I don't know/doesn't apply	5	14.3
	Rather disagree	9	25.7
	Completely disagree	18	51.4
HPV vaccination is not useful	Completely agree	0	0.0
	Rather agree	4	11.4
	I don't know/doesn't apply	8	22.9
	Rather disagree	6	17.1
	Completely disagree	17	48.6
HPV vaccination is not mandatory and therefore it is not necessary to vaccinate against HPV	Completely agree	1	2.9
	Rather agree	2	5.7
	I don't know/doesn't apply	5	14.3
	Rather disagree	11	31.4
	Completely disagree	16	45.7
General practitioners' advice is against HPV vaccination	Completely agree	0	0.0
	Rather agree	0	0.0
	I don't know/doesn't apply	16	45.7

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Other health care worker's advice is against HPV vaccination	Rather disagree	3	8.6
	Completely disagree	16	45.7
	Completely agree	0	0.0
	Rather agree	0	0.0
	I don't know/doesn't apply	16	45.7
Familiars or friends' advice is against HPV vaccination	Rather disagree	4	11.4
	Completely disagree	15	42.9
	Completely agree	0	0.0
	Rather agree	1	2.9
	I don't know/doesn't apply	11	31.4
	Rather disagree	7	20.0
	Completely disagree	16	45.7

Continuation of table 11. Reasons to or not to vaccinate against HPV

Question & answer		n	%
HPV vaccination is not promoted enough	Completely agree	6	17.1
	Rather agree	17	48.6
	I don't know/doesn't apply	4	11.4
	Rather disagree	7	20.0
	Completely disagree	1	2.9
HPV vaccination promotes riskier sexual behaviour	Completely agree	0	0.0
	Rather agree	3	8.6
	I don't know/doesn't apply	7	20.0
	Rather disagree	11	31.4
	Completely disagree	0	0.0

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HPV infection is not severe	Completely disagree	14	40.0
	Completely agree	0	0.0
	Rather agree	0	0.0
	I don't know/doesn't apply	7	20.6
Vaccination should not be given if contraindications to HPV vaccines have been confirmed by a doctor	Rather disagree	5	14.7
	Completely disagree	22	64.7
	Completely agree	9	25.7
	Rather agree	8	22.9
	I don't know/doesn't apply	9	25.7
	Rather disagree	5	14.3
	Completely disagree	4	11.4
	Completely agree	2	5.7
I support alternative approaches instead of vaccinations	Rather agree	2	5.7
	I don't know/doesn't apply	8	22.9
	Rather disagree	4	11.4
	Completely disagree	19	54.3
	Completely agree	0	0.0
The proposed HPV vaccination dates have not been suitable	Rather agree	1	2.9
	I don't know/doesn't apply	13	37.1
	Rather disagree	6	17.1
	Completely disagree	15	42.9
	Completely agree	4	11.4
	Rather agree	5	14.3

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I am not aware, that HPV vaccination is free of charge*	I don't know/doesn't apply	7	20.0
	Rather disagree	4	11.4
	Completely disagree	15	42.9
	Completely agree	0	0.0
	Rather agree	1	2.9
Religious restrictions prevent vaccination	I don't know/doesn't apply	4	11.4
	Rather disagree	3	8.6
	Completely disagree	27	77.1

* For girls aged 12 to 14 in Estonia

Continuation of table 11. Reasons to or not to vaccinate against HPV

Question & answer		n	%
The effectiveness of HPV vaccines is questionable, and they only benefit pharmaceutical companies	Completely agree	2	5.7
	Rather agree	4	11.4
	I don't know/doesn't apply	9	25.7
	Rather disagree	5	14.3
	Completely disagree	15	42.9

- All the questions presented in table 11 were gender-neutral meaning, that they were not only presented to respondents with specific gender.

Table 12. Advice given by medical professionals

What advice has your paediatrician, general practitioner or school nurse given you about HPV vaccination?	n	%*
Encouraged HPV vaccination	10	55.6
Discouraged HPV vaccination	0	0.0

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Didn't express any opinions about HPV vaccination	7	15.6
Suggested to delay HPV vaccination	0	0.0
Didn't address the topic of HPV vaccination at all	4	8.9
Encouraged HPV vaccination, but did not provide adequate information/clarifications	0	0.0
Different paediatrician/general practitioner gave us discordant opinion about HPV vaccine	0	0.0
We have not consulted with the paediatrician/general practitioner on the topic of HPV vaccination	12	26.7
I don't know	6	13.3

***Percentage of all responses**



Table 13. Vaccination servicing

Would you agree to have your child vaccinated against HPV...		n	%
At school	Yes	21	67.7
	No	7	22.6
	I don't know	3	9.7
At a pharmacy	Yes	5	18.5
	No	16	59.3
	I don't know	6	22.2
At your general practitioner	Yes	29	87.9
	No	1	3.0
	I don't know	3	9.1
At a private clinic or any other healthcare facility	Yes	12	46.2
	No	7	26.9
	I don't know	7	26.9

Students' FG

In total, 28 students (15 girls and 13 boys) participated in students' focus group interviews. All students were studying in the 6th grade and thus in age to be vaccinated against HPV in Estonia (for girls, free vaccination against HPV in Estonia starts at the age of 12, most students reach this age before the 6th grade).

Students' knowledge about sexually transmitted diseases and their consequences

Students' knowledge about STDs and HPV is generally modest. Girls are somewhat more informed about sexually transmitted diseases and their consequences than boys. Girls are especially more informed about HPV infection. Girls and boys are both aware of HIV and AIDS, its transmission, and that HPV is transmitted sexually and that it can cause cancer. Girls are also aware that HPV causes warts. Boys said that HPV related diseases are more common among girls and less common among boys. While girls mentioned that HPV causes cervical cancer, boys were less aware of it and mentioned that HPV may cause breast cancer.

Both genders mentioned condoms as a protective measure against sexually transmitted diseases. Girls mentioned HPV vaccination as a protective measure against HPV infection.

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In the only Russian speaking school participating in the study, girls don't know anything about sexually transmitted diseases nor has anyone ever told or educated them about it (including HPV). Sex related topics seem too taboo to speak about. Girls mention that they have heard the abbreviation HIV, but don't know anything about it. Boys, however, have heard of AIDS and have heard of HPV, but only because they had elder cousins, who have at some point, told them something about those topics. For both genders, knowledge regarding HPV was very limited. It is also important to note that in Russian, HPV abbreviation is ВПЧ and among Russian speaking people, this abbreviation has obtained a miswritten meaning – „вирус плохого человека“, or „bad human's virus“.

Students' knowledge about vaccination and HPV vaccination

While girls were aware of vaccination, especially HPV vaccination, boys' knowledge fluctuated from school to school, which depended on how much the teachers had been able to inform the boys before the focus group interviews took place. Both genders were aware that vaccines exist to prevent diseases among healthy populations.

Girls are not afraid of vaccines because of their potential side effects, but because of fear of injection. Girls who were vaccinated against HPV, said that vaccine side effects (if they happen), were minimal and nothing to worry of. Boys were also not afraid of vaccine side effects (nothing more than a swollen hand). According to girls, parents are much more concerned about HPV vaccination and its potential side effects than girls themselves and this argument is usually the most influential why parents tend not to give consent to vaccinate. Girls also mentioned that some parents are not familiar with their child's school matters and never have visited school information systems, and thus, miss the calls to vaccinate. Parents' who had personal experience with HPV infection or cancers caused by HPV, were more likely to give consent to vaccinate.

Both genders were aware, that HPV vaccines must be administered at a young age, before the start of sexual life and to protect girls, boys should also be vaccinated against HPV. Boys said that it is some-what unfair, that in Estonia, boys are not vaccinated against HPV free of charge. Boys were aware, that they can get vaccinated against HPV out of pocket at their local GP.

In the Russian speaking school, girls nor boys don't know much or anything about HPV or HPV vaccination. They, however, have heard and know a little bit about vaccination in general. Girls said that vaccines prevent the spread of diseases and are also administered to animals. Boys think that vaccines can be administered to healthy and sick individuals. Both girls and boys have heard of COVID-19 vaccines.

Sources to get information and advice on HPV vaccination

Children trust their parents more than anything and thus it is very important to inform parents about HPV and HPV vaccination. Instead of listening and getting information from teachers, children said that their parents would prefer more personalized approaches e.g., face-to-face group talks with professionals (doctors, nurses). Children would also prefer if doctors or nurses would come to lecture in schools about various health related issues or diseases in a simple and understandable language. Using exemplary tools (e.g. pictures) would greatly benefit the understanding of those topics. Since HPV and HPV vaccination is

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more of a private topic (more for girls but also for boys), and in the girl's opinion, boys tend to not take the topic as seriously, girls would like to be lectured separately from boys. Boys, however, would like to participate together with girls and such lectures should take place during school hours. Parents should be lectured separately from children.

While girls obtain HPV and HPV vaccination related information from school nurses, their mothers, elder friends, and friends who have been previously vaccinated against HPV, boys on the other hand, have received information mostly from their mothers. Both genders said that they would be ready to familiarize themselves with information if their mothers (boys & girls) or teachers (girls) would refer HPV and HPV vaccination related information.

For pupils from the Russian speaking school, the main source of information on HPV vaccines is the internet. Girls tend to not ask any information from teachers, school nurses or parents and would like to obtain HPV related information from doctors or their mothers. It must be noted that girls are ready to talk with school nurses for HPV related information. Girls would also like for teachers to speak more about HPV. In addition to the internet, boys could get HPV related information from their mothers. Boys see little need in educating themselves about HPV.

Attitudes, beliefs and concerns regarding HPV vaccination

While girls tend to have great trust and confidence in vaccines (including HPV vaccines), boys on the other hand, show little distrust against vaccines (especially, distrust against vaccines developed in China). Boys say that not all vaccines can be trusted, since it is unknown, where they come from. Most vaccines, however, can be trusted. Boys have no knowledge about the safety of HPV vaccines.

Girls believe that vaccines are effective in preventing diseases. Boys were rather of the opinion that it is very unlikely that they would get HPV infection, and that it is also unlikely that they would get serious complications from the vaccine. Boys weren't afraid of vaccines, but if they don't see an immediate need for them, they won't get vaccinated.

Girls thought that parents need information or people to talk with about HPV and HPV vaccination. Girls were worried that despite all efforts, parents may stick to their already established opinions, and would require a lot of work before they change their minds about vaccination.

For pupils from the Russian speaking school, girls believe that there is nothing shameful or intimate about HPV vaccination. Girls are mostly afraid of vaccination because they fear potential serious side effects and getting sick. They trust vaccines used in Estonia (excluding COVID-19 vaccine). For boys, distrust against vaccines is two-sided: there are some, who believe vaccines are not to be trusted, since they are not made in Estonia and others, who have trust in vaccines, since they prevent sickness. Boys are aware, that vaccines have side effects.

Teachers' FG

In total, only 3 teachers took part in teachers' focus group interviews and thus they were only held in Estonian. Zero teachers registered to the Russian teachers' focus group interviews.

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Table 14. Teachers' focus group participant characteristics

Characteristic		<i>mean</i>	<i>median</i>
Age		43.8	43.5
		<i>min</i>	<i>max</i>
		34	54
Characteristic & answer option		<i>n</i>	
Gender	Male	0	
	Female	3	
Highest degree of education	Secondary/secondary-vocational	0	
	Bachelor's	0	
	Master's	3	
	Doctoral	0	
Occupation*	6 th class teacher	2	
	Biology teacher	1	
	Personal, social and health education teacher	1	

***It is possible for one teacher to teach multiple subjects**

Teachers say that children at this age (12 years old) are very curious about their bodies and thus are also susceptible to what they are told about diseases, viruses, and vaccination (which is a good age to grow good health related beliefs in children). At the same time, children mirror their home environment and parental beliefs, meaning these attitudes transfer over to children. This also includes (negative) attitudes and beliefs on vaccination and HPV vaccination.

In Estonian schools, the topic of HPV is covered very briefly, if not at all. Textbooks and different classes do not support the promotion of the subject at all. Talking and teaching pupils about HPV is more of a responsibility for school nurses, who must also stand for parents to sign letters of consent to vaccinate their children. Teachers emphasize the need for more parental education regarding which diseases can be prevented and how many lives can be saved with preventive activities (e.g., HPV vaccination). In the teacher's opinion, the best way to impact parents' decision-making, would-be through direct talks with parents.

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Teachers emphasize, that information materials should be written in an associative sense and be in understandable style and tone. Short video clips and videos (instead of lifeless texts) aimed at specific target groups (parents, children etc) would be good. Teachers also think that healthcare professionals should avoid using the abbreviation HPV and instead should use the word “papillomavirus” or “human papillomavirus”. Using too many abbreviations confuses people.

Lastly, teachers see a need for more and better health related curriculums in schools. They firmly believe that prevention is very important and long-lasting good health starts with preventive activities, which can and should start in schools at a young age.

School nurses’ FG

In total, 11 school nurses took part in the school nurses’ focus group interviews. In the Estonian school nurses’ focus groups, 9 school nurses participated. In the Russian school nurses’ focus groups, 2 school nurses participated.

Table 15. School nurses’ focus group participant characteristics

Characteristic		mean	median
Age		47.3	43
		min	max
		26	69
Characteristic & answer option		n	
Gender	Male	0	
	Female	11	
Highest degree of education	Secondary/secondary-vocational	2	
	Bachelor’s	9	
	Master’s	0	
	Doctoral	0	

School nurses understand very well how much HPV immunization prevents disease and how many lives can be saved.

In Estonian speaking schools, getting consent from parents to vaccinate students against HPV is harder than getting consent to vaccinate against other infections. HPV vaccines are more despised, and parents

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are more opposed to them. Some school nurses eagerly try to do as much as they can – together with teachers, they organize lectures to children and parents. However, they still feel very short-handed. School nurses can't do much to persuade parents who refuse to vaccinate. Parent's and family's opinion and beliefs are respected and a no means no. Parents who refuse to vaccinate their children lack information, do not know, and do not want to know anything about HPV or HPV vaccination. They also don't want their children to be told about HPV. Fear and ignorance are two keywords that school nurses use to describe parents who don't give consent to vaccinate.

In Russian speaking schools, HPV, HPV vaccination and talking about it is taboo. Everything related to sexual education is not a topic of discussion. At home, people prefer to not talk about sexual health at all. Even teachers prefer to ignore talking about sexual health. In Russian speaking schools, school nurses are not considered to be serious medical professionals – their opinion or knowledge is not trusted. Doctors, however, are very trusted. School nurses working in Russian speaking schools see and feel that young children (12 years old) don't care and quickly forget everything talked about HPV vaccination and thus think that parents should be the main target group, who should be educated. Communication with parents depends a lot on school management and so does the content of information, that is passed on to parents.

While obtaining consent to vaccinate from Estonian parents is hard and requires great effort, in Russian speaking schools, conservative and dismissive attitudes make talking about HPV and HPV vaccines hard, if not impossible, not to mention getting consent, which is even harder.

Summary

1. Web survey to parents and guardians

- Less than half of the respondents were convinced that they would vaccinate their child against HPV in the future.
- Two thirds of them would like to receive more information about HPV related diseases and HPV vaccination, the most preferred sources of information were GPs, family nurses, gynaecologists, school, the website of the Estonian Health Board and television.
- Information regarding HPV is scarce.
- The respondents were aware that HPV causes cervical cancer, but less aware about the duration of HPV infection and other cancers caused by HPV.
- Respondents' answers indicated that the biggest reason not to vaccinate against HPV was the fact that it is not promoted enough in the society.
- The preferred places for vaccination against HPV were schools, GPs, for some respondents also other health care practices (not pharmacies).

2. Focus group interviews with teachers, school nurses and students.

- Teachers wish more space for vaccination in general and HPV related topics in school curriculum. They also emphasize the need to give more information about HPV vaccination to parents. Instead

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of lifeless leaflets, lectures, videos, and easily understood materials with a human touch are needed.

- School nurses understand that HPV vaccination saves lives, but they feel short-handed and wish more support from doctors (both GPs and other specialists).
- Knowledge on HPV and HPV vaccination among Estonian children is modest and non-existent among Russian children.
- According to our study, sexual health, HPV and HPV vaccination is a taboo among Russian speaking families and schools, and not discussed.
- Knowledge about HPV, HPV related diseases and vaccination against HPV is lower among boys than among girls.
- Children say that their parents need to be educated too.
- Educating parents about HPV, HPV related diseases and vaccination appears to be the main key to increase the coverage of HPV vaccination in Estonia.

- **Germany**

Due to national regulations related to research among minors and their parents in the school setting and associated administrative preparation time, it is unfortunately not possible to conduct focus groups within the timelines of the PERCH project in Germany.

Regarding the parents questionnaire, the most suitable option in the German PERCH context is a mixed mode survey (half computer assisted telephone interviews, half online survey) among about 1000 parents of children aged in the range of the STIKO HPV-vaccine recommendation, which is in Germany from nine years up to 14 years inclusive. The survey will be conducted by an opinion research institute, on behalf of the BZgA. Results of the survey will be available in June 2023. The questionnaire was provided by the WP6 lead and agreed upon within the WP6 partners. It was then translated and adapted to the national context by the German PERCH partner institutions.

- **Sweeden**

Sweden could not perform the FG due to high costs and limited work resources for this task. Also, they will not be able to perform the survey via questionnaire. The five potential schools have been selected but they were not able to perform it in this short time line with results requested in the end of April. Moreover in Sweden the HPV vaccine is delivered in the school and the coverage is high, therefore the questions that the WP6 partners agreed to put in the questionnaire do not really fit into the Swedish setting. And finally authorizations are still pending to use the shared questionnaire because of data flow security issues.



In conclusion, because of the delays just listed above (such as lack of needed authorizations and unfavourable school calendar) it was impossible for some countries to perform all the tasks scheduled for this deliverable, and therefore this document would benefit from an update in the coming autumn after the beginning of the school year. Croatia Slovenia and Estonia will address all three target groups, students, parents and teachers, at latest in autumn 2023 after the beginning of the new school year. Germany will have the results of the parent's questionnaire in June, and Poland will be able to collect further answer to the questionnaires and conclude FG, analyse the results and finally analyse the results, since delays for need of authorizations slowly arriving and school holidays, the process is slowly ongoing. The possibility of an update will also give the opportunity to have a much clearer overall idea of differences and similarities between the participating MSs that could be precious to develop common tools and strategy to increase knowledge and awareness on HPV infection and vaccination.

December 2023 update of contributions of Estonia, Germany and Sweeden in Annex



Literature review

The aim of the literature review was to gather and summarise all peer-reviewed and grey literature published about determinants of HPV vaccine hesitancy in all partner countries involved in WP6 PERCH project.

The specific objective was to investigate national scenarios related to determinants of HPV vaccine hesitancy.

Both a peer-reviewed articles search and a grey literature search was performed to collect meaningful records pertaining to HPV vaccine hesitancy determinants in WP6 partner countries.

After the search, two grids, one for the peer-reviewed articles and one for the grey literature, were used to record the findings. The two grids (Annex 4 and Annex 5) were developed within the Immunium Project, (Grant Agreement N° 101018210 - a description of the drafting process of the two grids can be found in the immunium project website: <https://coalitionforvaccination.com/assets/content/Full%20report.pdf>), are completed by an explanatory addendum (Annex 6).

Methods

Peer-reviewed articles (First grid)

WP6 partner countries used a thematic literature search on HPV vaccine hesitancy determinants conducted across Medline, Embase, Biosis, Scisearch, Esbiobase electronic databases.

Inclusion criteria:

1. Articles pertaining to HPV hesitance determinants
2. Articles published in English and/or in the local languages
3. Articles published between 2012 and 2023

Grey literature (Second grid)

Inclusion criteria:

1. Documents pertaining to HPV hesitance determinants
2. Documents published in English and/or in local languages
3. Documents published between 2012 and 2023

We considered relevant grey literature produced by national and international organizations including, but not limited to, the World Health Organization (WHO), the European Centre for Disease Prevention and Control (ECDC), the European Commission (EC) websites.



Results

The results followed are presented country by country in order to illustrate the variations and the specific issues among the participating MSs. Each country presented its own results by following a suggested structure with additions considered as important. The publications mentioned are listed in the two Annexes 4 and 5.

CROATIA

A. Peer reviewed articles

Six studies are included in the literature review of the determinants of HPV vaccine hesitancy. All studies were cross-sectional and included either parents or health workers. The method used in all the analyzed studies was a questionnaire, either an online (self-administered) or a telephone survey.

Current and future physicians in Croatia generally have a positive attitude towards the HPV vaccine; one research showed that 83.3% of medical students believes that both sexes need to vaccinate against HPV, and 75% of 6th year students would recommend the vaccine to their child – an increase from 50% of 1st year students who would recommend it (Bubalo *et al.* 2019). In a study done in 2018 with primary health care workers from Northern Croatia, 70.7% of primary care doctors and 51.7% of primary care nurses would recommend the HPV vaccine to children attending 8th grade, and a similar percent of them would themselves get vaccinated for HPV, if they were in the target group (Tomljenovic *et al.* 2020). In research done on physicians in 2020, 91.6% of physicians in Croatia have a generally positive attitude regarding the HPV vaccine (Butorac *et al.* 2022). Even though these are relatively high percentages, there is a lot of room for improvement, especially in primary care physicians and nurses. In Croatia, school doctors are the medical specialty that performs HPV vaccination, but primary care teams are often in contact with parents and children and can influence their decision regarding the vaccine.

Attitudes and knowledge of parents and children on the HPV vaccine are not well known, so we used two master thesis and one research that was not published in a form of a scientific article, to try to summarize what we currently know about the topic. Both master theses were done in a form of an online questionnaire, while the research done by City of Zagreb was done by a telephone survey.

Research has shown that age and was significantly associated with HPV vaccine attitude and intention to vaccinate, with older participants having more positive attitude towards the HPV vaccine and being more likely to vaccinate their child (Delač *et al.* 2019). Older and more educated mothers also had higher levels of knowledge on HPV (Džubur *et al.* 2019). One research⁴ shown more positive attitudes towards HPV

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vaccine in parents with higher levels of education, somewhat contrary to the other research that show less intention to vaccinate in mothers with higher levels of education (Džubur *et al.* 2019). Belief in conspiracy theories was associated with negative attitudes and less intention to vaccinate, while belief in susceptibility to HPV infection and HPV efficacy was associated with positive attitudes and more intention to vaccinate (Delač *et al.* 2019). Parents are generally more inclined to vaccinate girls compared to boys (Džubur *et al.* 2019; Šitum *et al.* 2019).

In the above-mentioned telephone survey (Šitum *et al.* 2019), most common reasons for not being interested in the HPV vaccine were lack of information and trust, and the opinion that the vaccine is not researched enough. The same survey asked the participants about vaccines in general; findings regarding parent's beliefs show that 30% of parents believe that Croatian children are vaccinated with low quality vaccines and 19% believe that vaccines can cause autism. Regarding their knowledge on HPV, 42% of parents know nothing, or very little, about HPV, 40% of parents do not know that HPV vaccine is free and 71% of parents never received an invitation to parents meeting at the school regarding HPV vaccine (in Croatia, vaccination is carried out by school doctors- a medical specialty).

There is a lack of research on attitudes, intentions to vaccinate and knowledge on the HPV vaccine in Croatia. Due to relatively low proportion of vaccinated children in the target population, and general climate of low trust in healthcare institutions and vaccine hesitancy increased by the Covid-19 crisis, more research is needed to inform future public health campaigns and communication with parents and children in the target group.

ESTONIA

A. Peer reviewed articles

No systematic literature search was carried out for peer reviewed articles because, to our knowledge, there are no studies on this topic to this date.

B. Grey literature

For grey literature, all previously known studies were included, and a search of government and school e-libraries was conducted, which resulted in no additional studies found. As there have been no studies conducted on HPV vaccination determinants and hesitancy in Estonia, we were only able to provide one piece of literature which is a master's thesis titled "Preventing cervical cancer: the potential of digital interventions in supporting parents' decision-making for human papillomavirus vaccination". The main information found was:

- 1) Two-way communication between health care professionals and parents or teachers is crucial.
- 2) Communication strategies must be clear and consistent and be collaborated between all stakeholders.

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3) Information must be reliable and obtainable from several sources.

4) Combining digital interventions (applications like FightHPV) with education can be effective in increasing awareness among adolescents and their parents.

FRANCE

Literature Review

Methods

For this literature review we used Pubmed database. The search equation to identify articles was: "(HPV[tiab] OR "Human papillomavirus"[tiab] OR papillomavirus[tiab]) AND (vaccin*[tiab] OR immunization[tiab] OR prevent*[tiab])".

We have a continuous monitoring process to keep up to date with the latest articles and publications related with HPV vaccination. Each week, a search query is submitted with relevant articles and publications that have been published. We then screened and filtered those results.

A total of 33 articles, published between 2012 and 2022 were included in this literature review.

Main features of the records included (first and second grid)

Here are described the main features that appear as clear observations when reading and access the findings.

Lack of knowledge among young girls and mothers

We have observed that in most articles, one of the main elements contributing to vaccine hesitancy is the lack of knowledge regarding the HPV vaccine. It is found that girls and mothers who hesitate or refuse the vaccine are not necessarily against vaccination, but they are not sufficiently informed to accept it.

It is necessary to inform and engage dialogues with young girls so that they are aware of this vaccine and can participate in the decision-making process.

a) Target population and age recommended

The recommended population is not precisely known by adolescents and mothers. In fact, according to a study, 61% of high school students thought that this vaccine was only for girls, compared to 46% for girls and boys. The age for HPV vaccination is also not precisely known and is unknown to some mothers.

b) Cervical cancer

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It is also observed that only few women are aware that HPV infection is the main cause of cervical cancer. This is particularly important for low educated women.

c) HPV and sexual habits

The lack of information is also observed regarding the link between HPV and sexual habits, virginity. A study found that some mothers believe that the HPV vaccine eradicates all sexually transmitted diseases.

d) The lack of information linked to social inequalities

It turns out that adolescent girls living in urban areas had much more knowledge about HPV vaccination than those living in rural areas.

Source of Information on HPV vaccination

a) Media and internet

Media is a major source of information on HPV vaccination. An average of 55% of woman had heard of the vaccine through television. Internet have a negative impact on vaccination uptake. Studies found that mothers who search for vaccine information on internet was associated with a lower HPV vaccination by their daughters. Indeed, results on the internet can be confusing for mothers who found contradicting pieces of information. This leads to an unfavourable attitude, or discouragements towards vaccination.

b) Mothers

For girls, mothers are the main sources of information (80%). It is important to provide information to these girls outside of this source, in order to avoid repeating the mother's hesitations, in case she does not pass on a favourable attitude

c) Physicians, teachers and school nurse

A lack of information provided by the physicians constitutes a barrier for high school students.

Crucial role of physicians

Family physicians, play a crucial role in vaccine offer and acceptance. Young girls have better knowledge and information when they consulted their family physicians, which increase HPV vaccine uptake among them.

However, when physicians express doubts about the HPV vaccine, it raises doubts among young girls and mother. Moreover, some mothers didn't want to vaccinate their daughters because their GP was against it. Indeed, a strong trust in doctors can be barrier to vaccine acceptance, depending on the doctor position toward HPV vaccination. A study shows that 14.1% preferred to rely on their physician's decision and waited to know his opinion to make a decision. It seemed that, mothers from a low socio-economic

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background adhere more to their physician's opinion than mothers in a higher professional category who want to know their opinion but had a more critical point of view.

GP recommendation is very important in vaccine uptake. HPV vaccine initiation in girls aged 14 was a physician's recommendation. Parents justified the non-vaccination of their children by a non-proposal of their GP.

a) Reasons of hesitant physicians

Some doctors express a low confidence in the vaccine due to concerns about the risks and benefits of HPV vaccination. According to a study, some have an unfavourable perception of its risk-benefit balance (OR=0.13), doubts about vaccine utility in general (OR= 0.78). 60% considered that not enough is known about its risks

Moreover, there are statements against HPV vaccination, not based in science (insufficient effectiveness of the vaccine, fear that the vaccine would stop girls' growth...). We also observed, a lack of trust in the Ministry of Health and pharmaceutical industry which leads to doubts on this vaccine that they disclose to their patients. Some explain it by repeated public health scandals in France.

Some GP think also that a cervical cancer screening alone would be more feasible and efficient than HPV vaccination.

b) Organisational and relational barriers

A low vaccine proposal is also due to a low rate of adolescent's consultation, inappropriate reasons for consultation, and an incomplete vaccination schedule due to spaced-out consultations over time. The role of parental vaccine hesitancy is major in the low proposal rate.

c) Insufficient information provided by school medicine

It is necessary for school and university medicine to inform high school and college students about HPV vaccination. Studies have shown that providing information and brochures to students can significantly increase the percentage of girls vaccinated and intentions to vaccinate. In fact, the percentage of vaccinated girls was significantly higher after information (10.9% versus 3.2%) and there was a significant increase in the percentage of intentions to vaccinate after brochure distribution ($p < 0.001$).

Role of parents

The role of parents, especially mothers, was highlighted in studies. We observed a higher intention to vaccinate among mothers. They have an important role in promoting the vaccination to their children, even more when they have a health-related job, as they have a better understanding of benefits of vaccination. Studies found that information about the vaccine and discussions around sexuality were most effective when there was a trusting relationship between mother and daughter. In fact, adolescents who

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had such a relationship, were more likely to share misbeliefs and obstacles to vaccination, and were more likely to receive the anti-HPV vaccine.

Also, girls who had broken links with their parents were less likely to initiate vaccination.

Fear of side effects

Fear of side effects is a major barrier to vaccination against HPV. Many parents express potential adverse effects associated with the vaccine, particularly because it is a new vaccine and there is not enough experience to look back on (54.9% of parents cited it in a study). Mothers with low educational level, reported their fear that anti HPV vaccine could cause difficulties with pregnancy. Some mothers were concerned about the possible association between hepatitis B vaccination and multiple sclerosis, following a large-scale immunization campaign among adolescents in France in 1994 which sparked controversy.

HPV vaccine safety and effectiveness

The perception of vaccine safety and effectiveness is a major factor in vaccine hesitancy. According to a study, more than 60% of parents and EP considered HBV, HPV and SIV vaccines to be ineffective or unsafe. It is explained by a lack of scientific evidence around its safety and effectiveness. Students also expressed uncertainty regarding the safety of the HPV vaccine. Perceptions of risk play a significant role in HPV vaccine acceptance. Studies have reported unfavourable perceptions of the vaccine's risk-benefit balance, by parents and healthcare providers perceiving the vaccine's risks as outweighing its benefits. 60% of respondents in a survey believed that not enough was known about the vaccine's risks.

Sexuality

To increase acceptance of the HPV vaccine, it may be necessary to dissociate the vaccine from sexuality. Some mothers (5.6% in a study) found it challenging to discuss sexuality with their daughters, fearing it may encourage sexual activity. Religious factor is also not negligible, leading to the belief that vaccination can wait since it is forbidden to have sex before marriage in some religions. Adolescents themselves expressed concerns about the timing of vaccination in relation to sexual activity: the necessity of injection after the first or between two sexual activities. Also, confessing their sexual life to their parents is a source of concern. GP also have the fear of parents' reaction due to the association with sexuality.

Unfavourable opinion about vaccination in general

According to a study, those who refused the vaccine have an unfavourable opinion (or no opinion) about vaccination in general. (72.7% vs 28.0% among non-uniform respondents, $p < 0.001$) Mistrusted and controversial vaccine The HPV vaccine is often perceived as different from other vaccines and is therefore less trusted and more controversial. Additionally, there have been controversies surrounding the safety and effectiveness of the vaccine, which may contribute to vaccine hesitancy. There is a lack of trust in new

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vaccines and it is a major barrier to vaccine. Long-term exposure to such controversial information, especially during adolescence, could have lasting effects on the trust adolescents place in vaccines and public health recommendations.

Some parents wish the health authorities to make this vaccine mandatory as other child vaccine.

a) Media controversies

Internet and social media facilitate the spread of controversies, misinformation surrounding vaccines. This discourages acceptance and increase hesitancy. Trust in health authorities For example, some mothers had in mind the controversy over a possible link between hepatitis B vaccination and multiple sclerosis which affected France after a mass hepatitis B immunization campaign among adolescents in 1994. A study said: “a health system’s past performance can influence public trust in institutions, particularly around their competency and ability to deliver similar interventions or programmes”.

Vaccine hesitancy associated with socio-demographic characteristics

Vaccine hesitancy in general was associated with higher levels of education, low income in parents of adolescent girls, poor self-perceived health in elderly people, and more frequent among women than men (perhaps because they are often more involved in the medical follow-up of their children). A study shows that, vaccine hesitancy was highest in parents of adolescents (10-15 years) (48%) than parents of children aged 0-9 years (43%).

Those who were less likely to accept vaccination were also less likely to be in favor of vaccination in general, more likely to speak another language at home, and be unaware of their parents' education level, which may indicate a lower understanding of the study or be a proxy for lower socioeconomic status. While the socioeconomic status of parents, family composition, and tobacco use were found to be associated with HPV vaccine initiation in girls aged 15 and above.

Acceptance of HPV vaccine

a) Educational level

We observe more favourable attitude regarding the acceptance of HPV vaccine among LEL mothers than HEL mothers.

b) School location

HPV vaccine initiation rate was twice than in rural schools.

c) Socio economic status

Higher family incomes were associated with higher initiation rate

d) Religion

It appears that, there is a reduced acceptance among people who regularly practiced a religion.

e) New technologies, vaccination programs

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The use of new technologies in interventions appears to be well-suited for younger populations, easily replicable, and has the advantage of reaching numerous individuals at a low cost.

Implement vaccination programs in schools increases vaccine coverage and reduces social inequalities by reaching a larger population.

Favourable reasons

Mothers who were in favour of the HPV vaccine for their daughters often cited the opportunity to prevent their children from developing a severe and potentially fatal disease as their primary reason. This reason was mentioned by 72.7% of low education level (LEL) mothers, 65.7% of medium education level (MEL) mothers, and 47.0% of high education level (HEL) mothers.

Fear of cancer and the desire to prevent their daughters from telling them they have cervical cancer while a vaccine exists were also cited as important reasons for supporting vaccination. Genital warts don't generate higher acceptance.

Incomplete vaccine protocol (once vaccination had been initiated)

It appears that, among those who initiated their vaccination, girls who attended private school, who belonged to family higher outcomes, who live with a single parent and who smoke; don't complete their vaccination protocol.

Country specific considerations.

On the 28th February 2023, the French President announced the implementation of a vaccination campaign against HPV in school throughout the national territory, starting September 2023. This news led us to re-think the best way to lead the surveys and the deliverables expected within the framework of WP6. It therefore seems very complicated for us to carry out the surveys in the exact way it was planned, considering the latest news in our country and also the deadline: authorization needed couldn't match the deadlines (as we had the protocol very recently). Thus, we decided to use surveys carried out very recently by Judith Mueller's team on the subject.

GERMANY

Introduction

The Federal Centre for Health Education (BZgA) and the Robert Koch-Institut (RKI) are collaborative partners in the PERCH funded by the European Health and Digital Executive Agency (HaDEA). A total of 18 European countries and 34 partner organizations are involved in this project. The project supports the implementation of "Europe's Beating Cancer Plan", which aims, among other things, to increase HPV

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vaccination rates in EU member states in order to reduce cases of cervical cancer and other HPV-associated cancers in the population.

The Federal Centre for Health Education is leader of work package 7 “Training and Support in Vaccine Communication for Healthcare Professionals” and a partner and contributor to work package 6 “Improving knowledge and awareness to increase vaccine uptake in target communities”. In the scope of this collaboration, a literature review is provided and a survey on vaccine hesitancy determinants among parents will be conducted in Germany.

Background:

Based on data from the Centre for Cancer Registry, about 6,250 women and about 1,600 men develop HPV-related carcinomas each year in Germany (RKI 2018). Vaccination coverage for HPV is comparably low and there are vast differences in coverage between girls and boys. The national coverage for a full HPV vaccination series with two doses of vaccine was 54.0% among 15-year-old girls and 26.5% among 15-year-old boys at the end of 2021 (RKI 2022).

The German standing committee on vaccination (STIKO) develops national recommendations for the use of licensed vaccines. It recommends the HPV vaccine for boys and girls aged 9 to 14 years old. Catch-up vaccination is possible up to the 18th birthday. Statutory Health insurance covers the HPV vaccination for these age groups (9-17 years inclusive) (RKI 2023).

Although most people feel well informed about vaccines in general, the HPV vaccination is less known among parents. About 79 % of parents of girls aged 9-14 years know the STIKO recommendation for the HPV vaccine. Only 37 % of parents of boys know it (BZgA 2021).

Besides limited knowledge among parents, other determinants for hesitancy can be identified which are described in the following paragraphs.

Methods

Systematic literature review:

A systematic literature review was conducted to identify factors for HPV-vaccine hesitancy in Germany. A predefined search strategy was used in the PubMed database to find relevant literature in German or English language that was published between 2012 and 2023. In addition, a search for grey literature was performed in the databases of the Robert Koch-Institut and the Federal Centre for Health Education (BZgA).

After searching and screening the literature, eight articles were selected from the systematic search in the Pubmed database. Additionally, six publications were added from the grey literature search.

Relevant determinants were selected and summarized in two grids that were provided by the WP6 lead.

Results

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A. Literature review

Thirteen publications were selected in the literature search. These included eight peer-reviewed articles and six publications classified as grey literature.

PubMed database search (Grid 1)

The peer reviewed articles were published between 2012 and 2020 and included five cross-sectional studies, one randomized controlled trial (RCT) and one observational multicentre study. Study samples included parents, students, female social media users, German males and German gynaecologists with sample sizes ranging from 105 to 1837 study participants. All articles targeted attitudes, knowledge or acceptance related to the HPV vaccination.

Gynaecologists had much knowledge and showed rather positive attitudes related to the HPV vaccination. Reasons against vaccination were children's ages outside of the recommendation or lack of cost coverage for boys at the time of the study. Further reasons for not vaccinating boys were: HPV-associated diseases mainly affect females, side effects (Kolben *et al.* 2016).

The majority of parents in Germany had rather positive attitudes towards the HPV-vaccine in the conducted study (Lee Mortensen *et al.* 2015). Seventy percent were in favour of vaccinating males to reduce the transmission of HPV. Parents had a greater need for information from health care professionals and public health authorities compared to countries with active vaccination policies. Rejecting parents were generally sceptical towards vaccination and feared side effects.

Female students in Germany showed low risk knowledge and high levels of misconceptions about cervical cancer risk and HPV vaccination (Steckelberg *et al.* 2013). A leaflet including numerical information improved risk knowledge compared to a standard information leaflet. Another sample of school students found that vaccine uptake was rather low and both physicians and parents were major information sources related to the HPV-vaccination decision (Stöcker *et al.* 2013). Barriers included dissuasion by parents, fear of side-effects, bad experiences with vaccines or doctors advising against a vaccine. At the time of the study, there were also concerns about vaccine safety as the HPV vaccine was rather new.

A study among men aged 15 to 25 years found that acceptance of male HPV vaccination was high. The majority of men would agree to receive the HPV vaccine. However, education about HPV was low and most participants never had been informed about it before (Schwarz *et al.* 2016).

The majority of a sample of women aged 18 to 25 years felt well informed about HPV. The main information source were physicians followed by parents. Unvaccinated and vaccinated women showed significant differences regarding their attitude towards vaccination (Remschmidt *et al.* 2014).

Another study found that most students aged 18 to 25 years were more aware about cervical cancer than the HPV vaccine (Blödt *et al.* 2012). This was even less the case for male students. Knowledge was generally poor. Female students were more likely to agree to get vaccinated than male students.

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Demographic variables or sexual history were no predictors of the willingness to receive the HPV vaccine. Medical students in Germany, Switzerland and Austria aged 20 to 25 years showed highly positive attitudes towards vaccination in general. Their knowledge on HPV recommendations increased significantly with the number of semesters of medical studies (Sanftenberg *et al.* 2020).

B. Grey literature search (Grid 2).

Six publications were identified by searching the databases of the RKI and BZgA. Four of those were peer-reviewed articles (partly not PubMed-listed) and two publications were research reports. The documents were published between 2018 and 2021.

It was found that the explanation of safety and effectiveness, shared decision-making, motivational interviewing, the presentation of the HPV-vaccination as standard vaccination, being up to date on misinformation and using specific vaccination reminders are factors that can increase vaccination uptake (Heinemeier *et al.* 2021).

Another study from 2018 showed that there is low HPV vaccination coverage: with only about half of all girls or their parents/legal guardians, respectively, decide for an HPV- vaccination. There was no increase in vaccination coverage compared to five years ago. There was no association between HPV vaccination coverage and socioeconomic status anymore (Poethko-Müller *et al.* 2018). In addition, another study found that girls with migration history are less likely to be vaccinated against HPV than girls of the same age without migration history at ages 11 to 17 (Poethko-Müller *et al.* 2019)

An article published in 2020 issued new immunization strategies in general. Most relevant factors are to achieve equity in vaccination coverage across and within countries, the participation of communities, a better understanding of vaccine acceptance and hesitancy, the expansion of vaccination across the life course, approaches to improve immunization in middle-income countries, the enhanced use of data and possible financial and non-financial incentives for vaccination (Mantel and Cherian 2020).

A research report on increasing vaccination coverage showed that knowledge of HPV and HPV vaccination among parents and adolescents was low (IGES 2021). Knowledge about HPV-associated cancer in boys was even lower. Many parents did not know the recommended age of children for HPV vaccination. One of the reasons they gave for not scheduling vaccination was that their child was too young, even though the child was in the age recommendation. Digital vaccination scheduling could improve the vaccine uptake.

Physicians mainly give the impulse for vaccination and their recommendation is accepted in the majority of cases.

There were significantly lower information rates among parents with a background of migration and, as a result, significantly lower reported vaccination rates. Physicians cite difficulties in reaching parents with language barriers or those who are vaccine critical.

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Another study by the Federal Centre for Health Education assessed the knowledge, attitudes and behavior of the population aged 16 to 85 years on the subject of infection protection through vaccination (BZgA 2021).

About two-thirds of parents (from children 0-13 years) considered the HPV vaccines absolutely necessary for their child. Almost 80 percent of parents were aware of HPV vaccination recommendation in Germany. Mothers were more aware of the recommendation than fathers. Thirty-seven percent of parents were aware of the HPV recommendation for boys.

Reasons against vaccination outlined by parents were: the child had an infection or was not feeling well at the time of the vaccination, a rather skeptical attitude toward vaccination, evaluating the vaccination was unnecessary, fear of the vaccination, not wanting to put too much physical strain on their child, fear of side effects, fear of vaccine damage, the doctor's advice against the vaccination, having forgotten to vaccinate their child in the rush of everyday life, organizational reasons, at midwife's advice against vaccination.

C. Final conclusions

The literature showed that a manifold of determinants related to HPV vaccine hesitancy were present in German studies. Attitudes were mixed but participants' knowledge about HPV and the HPV vaccine was rather low. This was not the case for a sample of gynaecologists and advanced medical students.

Reported barriers related to the HPV vaccine were: fear of side effects or concern related to vaccine safety, doctors or midwives advising against the vaccine, bad experiences with vaccines in general, fear of the vaccine, a lack of cost coverage, lacking knowledge about age recommendations and the feeling that the child was too young for HPV vaccination.

Knowledge related to vaccination recommendations was lower for boys compared to girls and one study also found that some parents did not perceive their sons at risk because cervical cancer only affects women to their knowledge.

Organizational problems with scheduling the vaccination at the doctor's practice were reported as well as language barriers when doctors inform patients with migration background about vaccines.

GREECE

Ten publications have been selected in the literature research. These included five peer-reviewed articles and five publications classified as grey literature.

The peer reviewed articles (1st grid) have been published between 2016 and 2022 and included one cross-sectional study, one survey, one prospective study, one intervention study and one systematic review.

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The grey literature (2nd grid) includes articles published between 2013 and 2022 and included one PHD Thesis, one Public Document -recommendation and three articles.

A) Peer reviewed articles:

Cross-sectional studies:

This study was conducted among Students of the Technological Educational Institute of Patras, Greece, during March 2013, the chosen population was 500 female students (0% / 100%), age (Mean / SD) 21.1/ 2.06. The primary aim of this study was to assess HPV vaccination coverage rates among female students from health and non-health sciences in a Greek city. A secondary aim was to evaluate their level of knowledge regarding cervical cancer, HPV and Papanicolaou test (Pap test).

Tools: A novel questionnaire was developed by the research team after thorough review of the literature (18 items, closed-type, self-administrated).

Findings: Only 31.7% of the students had a high level (> 66%) of total knowledge. The majority (70.4%) had not been vaccinated against HPV. Students who achieved low and moderate total knowledge scores were less likely to be vaccinated against HPV. (Jelastopulu *et al.* 2016.)

Survey:

The Survey was conducted among general population of parents of girls aged 11-18, the sample size (M / F %) was 1,000 persons (1.0%/ 99.0%), the age (Mean / SD) 45.56/ 5.005. The Survey was conducted to investigate knowledge, perceptions and practices of parents of girls aged 11–18 years old in Greece toward HPV vaccination, and determine which factors are associated with parents' decision to vaccinate their daughters.

Tools: A close-end questionnaire was constructed and telephone interviews were conducted upon informed consent.

The main finding was that 99.4% of the parents knew what HPV is and 98.8% knew there is a vaccine available against HPV. Furthermore, 47% of the parents stated that their daughters had been vaccinated against HPV, while further analysis revealed that only 35% had received all the recommended doses. As Secondary findings is the logistic regression analysis, the following variables had a statistically significant association with HPV vaccination: perceived ease of contracting HPV (OR = 1.105), level of trust in medical profession regarding information on prevention (OR = 1.205), overall perception regarding importance of children's vaccination (OR = 0.618), internet/social media as a source of parent information regarding HPV (OR = 0.886), participant (parent) age (OR = 1.125), and daughter's treating physician's recommendation for HPV vaccination (OR = 7.319). (Naoum *et al.* 2022)

Prospective study:

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The Study has been conducted between May 2011 and November 2016, among Caucasian women who attended the Outpatient Gynaecological Clinic of St. Savvas Regional Anticancer Oncology Hospital of Athens, Greece. the sample size (M / F %) was 2,417 (0%/ 100%) and the age (Mean / SD) was 32.6 (18.0-71.0).

This study gives an insight into recent trends for Human papillomavirus (HPV)-specific infection and its fluctuation over the years 2011-2016. A total of 2,417 Caucasian women between the age of 18 and 71 years underwent their annual gynaecologic examination at the Outpatient Gynaecological Clinic in the study period.

Findings: The results showed that the percentage of the participants who stated that they “do not know” what HPV is decreased from 44.4% (first phase), to 1.6% (second phase), and 8.1% (third phase). Similarly, the willingness to accept the HPV vaccine increased from 71% (first phase), to 89.1% (second phase), and 83.5% (third phase). (Argyri *et al.* 2018)

Intervention Study:

The Study has been conducted in the school year 2018/2019, among High school students from all public and private schools of Trikala, which is a midsize town in the Greek province. The sample size (M / F %) was 573 and the response rate was 76.26% (n=434, M/F=33.4%/ 66.6%).

The purpose of this paper is to evaluate the role of health education among young adolescents, regarding their level of knowledge about the HPV and the acceptance of the HPV vaccination, with the aim of increasing vaccination coverage, in Trikala city, mainland of Greece.

Tools: Questionnaires related to knowledge regarding the HPV infection and HPV vaccination were administered in three phases.

Findings: The results show that the percentage of the participants who stated that they “do not know” what HPV is decreased from 44.4% (first phase), to 1.6% (second phase), and 8.1% (third phase). Similarly, the willingness to accept the HPV vaccine increased from 71% (first phase), to 89.1% (second phase), and 83.5% (third phase). (Thanasas *et al.* 2022)

Systematic review:

The review was made, November-December 2019. This review examined studies that explore awareness about HPV among adolescents and young adults, as well as their attitudes and willingness towards the HPV vaccine.

Findings: The review revealed low to moderate levels of awareness and knowledge regarding HPV (10 studies), while a more favorable attitude towards the HPV vaccine (3 studies). The role of health professionals was ineffective (4 studies), while studies focused on the impact of health education



interventions showed a positive impact on knowledge and awareness of HPV (4 studies). (Iliadou *et al.* 2021)

B) Grey literature:

PhD Thesis:

National and Kapodistrian University of Athens-Faculty of Nursing, in the year 2013, published a PhD Thesis under the title “Comparative study of the compliance predictors for the vaccination against HPV among young women”. The targeted population was young women and in general, the main objective was to estimate the awareness, the levels of knowledge, the perceptions and the attitudes, the vaccination barriers, the vaccine coverage of HPV vaccination and the factors related to contraceptive methods among Greek female higher educational level students.

Results through this PhD Thesis: The number of women who were vaccinated was 25.8% (95% CI:24.3-27.4). Vaccination coverage was 27.3% and 24.9% for health sciences and non-health sciences students respectively ($p < 0.01$). Being vaccinated was positively and significantly associated with a high level of knowledge among the total sample (OR 1.64 95% CI 1.38-1.95), among health sciences students (OR 1.34 95% CI 1.01-1.78).

Recommendations through this PhD Thesis: Urgent and wide-ranging strategies must be implemented to improve vaccination adherence (eg. educational campaign state-wide TV campaigns)

Public Document- Recommendation:

Greek Ministry of Health/ National Immunization Committee (2022): Recommendation of the National Immunization Committee on the vaccination of boys and girls against human papillomavirus. During the period 2017-2021, the mean vaccination coverage in girls and boys is 55.4% and 43.8%, respectively. (<https://www.moh.gov.gr/articles/health/dieythynsh-dhmosias-ygieinhs/emboliasmoi/ethniko-programma-emboliasmwn-epe-paidiwn-kai-efhbwn/10314-systash-ths-ethnikhs-epitrophs-emboliasmwn-gia-ton-emboliasmo-agoriwn-kai-koritsiwn-enanti-toy-ioy-twn-anthrwpinwn-thhlwmatwn>)

Articles:

1st Article:

2022, title “Knowledge and Perceptions of Greek Students about Human Papilloma Virus, Vaccination and Cervical Cancer Screening” (Koutrakou *et al.* 2022). The targeted population was Greek Students. The purpose of this study was to investigate knowledge pertaining to HPV, cervical cancer screening, and

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vaccination among students in the Nursing Department and Department of Social Work of the Hellenic Mediterranean University of Crete, Greece.

Results through this article: Only 22.1% of students knew all the ways of HPV transmission and only 5.9% knew the whole spectrum of cancers that HPV could cause. The vaccination rate for HPV was 33.7%. The majority of students used the Internet as the main source of information (62.3%). Students' sociodemographic characteristics, including age, marital status, and Department of studies were associated with knowledge about HPV.

Recommendations through this article: The present study highlights knowledge gaps and indicates the need for thorough health education strategies on HPV, targeting families and young people.

2nd Article:

2018, "Personal and parental acceptance of human papillomavirus vaccination prior to and during the economic crisis among women in Greece" (Vagia Siamanta *et al.* 2018). The targeted population were women in Greece, to assess personal and parental human papillomavirus (HPV) vaccination acceptance and how it is influenced by demographic factors prior to (2005-2010) and during (2011-2016) the economic crisis in Greece.

Results through this article: Women's intention to get vaccinated before the economic crisis was higher (86.2%) than during it (82.8%). In addition, the intention of women to vaccinate their children was higher for girls during 2005-2010 (78.3%), while there was no statistically significant difference concerning boys. HPV vaccination acceptance per year showed a statistically significant variation. The initially high acceptance decreased following vaccine's release, mainly due to fear of side effects, increased following objective public education, and declined again. Demographic characteristics affected HPV vaccination acceptance at the time period before the economic crisis in Greece, but not during it.

Conclusion through this article: Demographic factors affecting a woman's attitude towards vaccination prior to the economic crisis in Greece, stopped playing a significant role during the crisis, reflecting its devastating effect on most parts of the population.

3rd Article:

2022, "The Effect of Health Education on Adolescents' Awareness of HPV Infections and Attitudes towards HPV Vaccination in Greece" (Thanasas *et al.* 2022) The targeted population was young adolescents. The purpose of this paper is to evaluate the role of health education among young adolescents, regarding their level of knowledge about the HPV and the acceptance of the HPV vaccination, with the aim of increasing vaccination coverage, in Trikala city, mainland of Greece.

Conclusions through this article: The present study shows that targeted interactive informational interventions in the school environment leads to a statistically significant increase in both the level



knowledge about HPV and the willingness of young adolescent students to be vaccinated against cervical cancer.

ITALY

The literature review yielded (120 total number) of peer-reviewed and grey literature articles. After duplicate records removed and title and abstract review based on the inclusion criteria, 45 of which were excluded. From 75 full text articles screened, 52 (47 peer reviewed +5 grey literature articles) were included in the final analysis

A) Peer reviewed articles

While publication years are 2012-2023, most articles and reports were published after 2018 (28/47, 60%).

A considerable number of articles were cross-sectional studies (20/ 47; 43%) and 23 % (11/47) were literature reviews and retrospective studies.

Analyzing the investigated population, most studies were conducted with adolescents or young adults (17/47; 36%) and with parents (13/47; 28%). Moreover, 8 studies (17%) were conducted with healthcare workers (medical doctors, care professionals, nursing and medical students) and 2 studies (4%) with migrants and refugees adults and random sample of lesbian, gay men and bisexual women and men.

These thematic categories of determinants of HPV hesitancy were identified across the literature:

- Information issues
- Safety and potential side effects of HPV vaccination
- Issues of trust
- Effectiveness of the vaccine
- Influencers
- Issues related to sexual behaviour
- Against all or to many vaccines
- Access barriers
- Perceived need for the vaccine and risk of disease

Across the studies the most prevalent determinants were: insufficient and inadequate information about HPV vaccination; potential side effects of the vaccine; mistrust of health authorities, healthcare workers and new vaccine; low HPV vaccine effectiveness.

Moreover, different studies reported concerns about vaccination in general, issues related to sexual health aspects and perception of low risk of HPV/ cervical cancer.

B) Grey literature

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For grey literature, 5 studies have been included (1 graduate thesis; 1 EDCD report, 1 publication and 2 Ministry of Health reports).

As reported by the Ministry of Health, in 2021 the national and regional HPV vaccination coverage data in female and male populations (birth cohorts 1997-2009) confirms an improving trend on single birth cohorts but continues to show very low values on the punctual detections in the primary targets of the vaccination intervention.

Both organizational and educational strategies have to be implemented to improve the vaccination coverage goals.

C) Final conclusions

In Italy, vaccination against HPV started since 2007 and was initially recommended and offered free of charge to 12-year-old girls as the primary target. Later, other cohorts were introduced such as >25-year-old women, women who already underwent cervical surgery and other subjects entitled to free vaccination. Finally, the 2017-2019 National Immunisation Program (NIP) has included both sexes as primary targets for vaccination against HPV in adolescence, preferably before sexual debut.

As reported by Ministry of Health, an increase in vaccination coverage has been observed from 2007 to 2021, even if the 95% target set by NIP has not been achieved. It is important to underline a wide variability between the Regions for all cohorts, so targeted interventions would be necessary in specific geographical contexts, bearing in mind that the anti-HPV vaccination, even though it is not one of the mandatory ones, is an Essential Level of Assistance and as such should be offered actively and free of charge.

Literature review identified 52 articles on determinants of HPV hesitancy in Italy. The inadequate and partial information, the perceived low efficacy of the vaccine, possible side effects and lack of trust in health authorities are identified as the main causes of HPV vaccine hesitancy. The role of general practitioners and pediatricians appears to be very important as they are the health professional who first come into contact with adolescents and their parents.

For the future health programs, it will be essential to implement a wider diffusion of evidence-based information both on vaccines in general and on primary prevention of cancer and other HPV-related diseases through HPV vaccination in both girls and boys.



LITHUANIA

The Human Papillomavirus (HPV) vaccination was introduced into the national immunization program in Lithuania in September 2016. Since then, girls from the age of 11 have been vaccinated, and starting from February 2023, boys from the age of 11 years are also being vaccinated [7].

In a survey to assess women's awareness of cervical cancer risk factors and the HPV vaccine, 71.4 % of women regularly undergo cervical cancer tests (Ivasko *et al.* 2017). Another survey's results showed that only 65 % respondents use a free selective cervical cancer screening program. It was used less frequently by respondents aged 51–60, unemployed with lower than higher education and unmarried respondents (Mesceriakova *et al.* 2021). 41.6 % of family doctors believe that the cervical cancer prevention program is effectively implemented only in the major regions of Lithuania. A community nurse is considered to be the most appropriate person to inform women about the ongoing preventive program (87 %), and this done most often during the consultation (94.6 %). Family doctors score their participation in the prevention program at 7 out of 10. Statistically significantly more representatives of the younger generation believe that the effectiveness of the program is mainly determined by the passivity and reluctance of women to go for examinations [8]. The main reason for not participating in the cervical cancer program is the lack of information or a call from a family doctor (53.5 %). 71.4 % respondents consider that participation in a selective cervical cancer screening program should be compulsory (Mesceriakova *et al.* 2021).

Most often parents know contamination risk factors of HPV and its prevention but they do not have enough knowledge about symptoms and treatment, possibility to vaccinate boys. Parents who did not vaccinate boys usually did not have enough knowledge about HPV treatment, symptoms, possibility to vaccinate boys while parents who vaccinated their children more often did not have knowledge that HPV vaccine is suitable not for all types of treatment of preventive measures and symptoms [9].

Medical and nursing students knew how the virus spreads: 94.3 % chose sexual transmission, 21.8 % – vertical, 35.7 % – close contact (Bainaityte *et al.* 2022). 80 % of parents named sexual intercourse as the only way to get infected with HPV, 46 % correctly indicated other ways of infection. The largest number of respondents did not know or did not answer correctly to the following statements: 'HPV can cause cancer of the mouth, anus and penis' (46 %), and 'HPV infection can be treated with antibiotics' (51 %) [10].

86.6 % of medical and nursing students have heard about HPV vaccine. More than half (54.2 %) of the respondents agreed that both men and women can be vaccinated against HPV, and 58.2 % knew that it is recommended to vaccinate before first sexual contact (Bainaityte *et al.* 2022). In average, more than a half of the women (64.1 %) know that in Lithuania, all girls aged 11 years or more are vaccinated against HPV for free (Ivasko *et al.* 2017) [11]. In the other study, where parents were interviewed, one third of parents had not heard about the compensated vaccination for 11 years old girls [12]. Other research

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carried out, of the 88.4 % parents who were aware of the possibility of vaccinating their daughter against HPV, 77.6 % vaccinated their daughter against HPV at the age of 11–12, and the remaining 22.4 % did not [13]. This is how the other survey evaluated the respondents' attitude towards vaccinating boys with HPV vaccines: 69 % of parents believe that boys should also have the opportunity to be vaccinated with the HPV vaccine [10].

93.2 % of medical and nursing students know that HPV causes cervical cancer, however only 35.1 % knew about penile cancer and 23.3 % chose warts as an option (Bainaityte *et al.* 2022). Overall, 86.8 % women raising the girls knew that HPV infection is a risk factor for cervical cancer and 70 % of women raising the girls in the study reported having plans to vaccinated their daughters [11]. In the other study, only 29.6 % women were aware that primary prevention of cervical cancer is vaccination against HPV infection. Although 68 % respondents were aware that HPV is a major risk factor for cervical cancer, but none of the respondents had been vaccinated against it and only 11.8 % the interviewees had vaccinated their daughters (Mesceriakova *et al.* 2021). The majority of women (71.9%) taking part in the survey were against their daughter's vaccination against HPV vaccine, those being senior aged women (Ivasko *et al.* 2017). Respondents aged 25–39 and 40–50 and having higher education vaccinated their daughters more often. Although even 84.2 % respondents clearly do not have enough information about the HPV vaccine, 36.4 % respondents were against these vaccines (Mesceriakova *et al.* 2021). Low-income and lower-educated parents have less knowledge of HPV and more often chose not to vaccinate their girls against HPV [12]. Only 11.6 % of the medical and nursing students are vaccinated against HPV. 23.8 % unvaccinated men and 45.1 % women are planning to do so in the future. 78 % of the respondents who will vaccinate their children, men, and upperclassmen (4-6th year) are more willing to do so. Year 4-6th students had better knowledge and were more in favor of the HPV vaccine (Bainaityte *et al.* 2022). If HPV vaccination was free of charge, approximately one third of respondents would refuse to vaccinate their 11-year-olds, and if HPV vaccination wasn't free, almost two-thirds of girls would not have been vaccinated [12]. Only 54.2 % parents aged 29–36 vaccinate their daughters with the HPV vaccine. Parents with a university degree and those who have enough income to live for a month are more likely to vaccinate their daughters with the HPV vaccine without much difficulty. Only a small proportion of respondents agree that their daughter has a higher risk of developing cervical cancer than their other peers. Parents who have vaccinated their daughters against HPV are more aware of the benefits of HPV vaccination, have more confidence in their daughters being vaccinated against HPV, and are more likely to promote a healthy lifestyle for their daughters than those who have not been vaccinated. Also, parents who did not vaccinate their daughters were more likely to see a variety of barriers to vaccinating their daughters than those who did vaccinate [13].

Study shows that, the majority of women found out about the cervical cancer risk factors from their doctors (family doctor, gynecologist or an obstetrician) (42.9%), about the HPV vaccine – from the media (67.8 %) (Ivasko *et al.* 2017). In the parental knowledge study, 70.9 % respondents had heard about HPV

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vaccination from a family doctor [13]. Those who received the information from the medical staff were 5.31 times more likely to approve the vaccination (Ivasko *et al.* 2017).

The respondents realize that the HPV is dangerous, but not everyone knows who spreads this virus, how it can be contracted, and what the effects of HPV are. They don't know that if you want to prevent this disease, you can get the HPV vaccine. Unvaccinated people would like to get vaccinated and know more information about this disease, which they should get from specialists, because it is difficult to talk to parents about sexual life issues. After clarifying the situation of the respondents, it is possible to identify the lack of program management, which is a lack of awareness [14].

Studies show that, the most common causes to refuse vaccination were (average): lack of information about the vaccination against HPV vaccine (51.6 %); fear of the side effects (19.2 %); did not know that such vaccination exists (10.3 %); vaccine is unsafe; distrust in effectiveness of vaccine (Ivasko *et al.* 2017) [9, 11, 12, 13, 15]. More than 70 % of the Medical and nursing students agreed that they lack knowledge about HPV and its vaccine and would like to know more (Banaityte *et al.* 2022). Parents who chose not to vaccinate considered the vaccine as unsafe significantly more often than those who were willing to vaccinate. In addition, these respondents were significantly less aware of the characteristics of HPV infection and its manifestation of symptoms, caused pathologies, etiology of cervical cancer, epidemiology, peculiarities of treatment, immuno-prophylaxis against HPV, its conditions and peculiarities of treatment for HPV infection [12]. Misconceptions about vaccines are usually a result of misinterpretation and false logic. The main tactics used of well-known anti-vaxxers to spread vaccine hesitancy are scaring people with fake stories about vaccine side effects, encouragement of distrust and conspiracy theories. While more and more people look for health information on the internet they rarely check the reliability of the internet sources that leads to acquiring false beliefs about vaccination. Such public beliefs are usually a result of miscommunication between the scientists and the society [15].

Because of the causes to refuse vaccination, it is essential to motivate personal and public health professionals to more inform parents about HPV and vaccination opportunities. It is recommended to consider the influence of sociodemographic indicators and the clinical relevance of information [12]. Studies shows that parents of girls with more knowledge about HPV and vaccination are more likely to believe that HPV vaccination is necessary. Parents need to be given more information to increase their activity in vaccinating their daughters [16]. A sufficient, evidence based scientific information about vaccination against HPV and availability of free vaccination can increase vaccination coverage. Relevant to give more information about the possibility to vaccinate boys, to conduct more scientific research connected with HPV and HPV vaccination for boys [9]. Still, 61.6 % respondents think that HPV vaccination should be mandatory and free for women of all ages (Mesceriakova *et al.* 2021).

When examining the parents' knowledge, the group that evaluated the HPV vaccine showed the strongest correlation with positive attitudes towards vaccines, compared to other vaccines in the preventive vaccination calendar for children in the Republic of Lithuania. The informative video has been viewed 309

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times on the YouTube platform. For 91.6 % of respondents, the educational video provided useful information. 42.1 % had decided to vaccinate their children with the HPV vaccine even before watching the video; after watching the video: 35.8 % decided to vaccinate their children with the HPV vaccine, 12.6 % still lack information to decide, 9.5 % decided not to vaccinate their children with the HPV vaccine [10].

SLOVENIA

Methods

The literature was searched in Cobiss (Co-operative Online Bibliographic System and Services). Also has been found -in the yearly lectures collection of ZORA- (Slovenian cervical cancer screening program and registry). We received quite a few hits, which we narrowed down to 8 based on the research criteria. These articles and research refer to the attitude to vaccination in the Slovenian area. Gray literature was found on the website of the National Institute of Public Health and among contributions to scientific conferences. Contributions were prepared by medical students, epidemiologists and experts from local health centers.

In addition, research focused on PubMed Literature (National Library of Medicine), but it was not found any literature related to the attitude to vaccination in the Slovenian area.

A. Peer reviewed articles

- The analysis of reporting by Slovenian media on vaccination shows that journalistic contributions are markedly in favor of vaccination. In traditional media, more than half of the posts on vaccination are positive, and only one-eighth of journalistic contributions are negative. The number of positive posts about vaccination has been increasing in recent years, while the number of negative contributions has been decreasing during the same period.
The decrease in positive and increase in negative contributions on the topic of vaccination are sporadic and usually associated with an individual or an event.
- Less than 50% of Slovenian mothers trust in vaccination and vaccines. Slovenian mothers trust doctors the most as a source of information about vaccination and vaccines. The proportion of mothers who have ever hesitated to vaccinate their children is 16%.
- Doctors are increasingly facing the problem of (non)vaccination in their work. (More and more parents are not vaccinating their children or are having doubts about vaccination; parents require more and more information, particularly about the side effects of vaccination). Parents are using different methods to avoid vaccination. The concept of the duty to inform and report unvaccinated individuals to the Health Inspectorate of the Republic of Slovenia needs to be reviewed. There is a lack of consensus regarding vaccination within the healthcare profession. There is a need for the development

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of new approaches and training for healthcare workers regarding communication skills when working with parents.

- 92% of Slovenian doctors trust in vaccination and vaccines. Slovenian doctors trust Slovenian experts who specialize in vaccination the most as a source of information on vaccination and vaccines. 93% of Slovenian doctors support the current regulation that makes vaccination against certain infectious diseases mandatory in Slovenia. 52% of Slovenian doctors regularly get vaccinated against the flu, and 24% occasionally.
- The knowledge of medical students about vaccination was not satisfactory. Medical students do not attach as much importance to vaccination and vaccines as would be satisfactory for the profession. More emphasis should be placed on the topic of vaccination in medical school curricula.
- Among the medical staff in gynecological clinics, there is a prevailing positive attitude towards vaccination, which is more prevalent among gynecologists than among nurses. However, some concerns about the safety and efficacy of HPV vaccination are present among nurses and gynecologists. A comparison between the two professions showed that there are more concerns among nurses. The most common concern was that we do not know how long the protection will last, whether there will be genotype replacement, and the increased risky sexual behavior of the vaccinated population and their non-participation in screening tests.

SWEEDEN

A. Peer reviewed articles

18 articles were significant for the subject vaccine hesitancy and acceptance due to HPV vaccination. The search was performed according to the pre defined search terms and the articles were found by searching in the following databases: PubMed, Cinahl, Web of Science, Embase , SwePub.

Main features of the articles included were the important role of the school nurse as the main information channel and the need of information in several forms and channels. Also, many of the parents as responders to performed surveys answered that they let their child being vaccinated both for the sake of the individual child and for others. Also Main features of the articles were also that most parent were acceptors to the HPV-vaccination but there were also a rather large share of questioning acceptors. The main reasons for questioning or refusing a vaccine (all vaccines in the program) were worry over adverse events, negative information or lack of information. Positive attitudes were described of offering HPV-vaccine to both girls and boys. Many of the interviewed parents were in favour of agender-neutral vaccination programme for HPV. Also, initiating HPV vaccination before sexual debut was described as

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important. Also, the school-based vaccination programme is convenient for parents, and the school nurse was described having an important role in bridging information gaps.

B. Grey literature

No grey literature were found.

Country specific considerations

In summary, keys for trust in HPV vaccinations were in the Swedish literature review described in summary as trust in the national immunization program and also in the school health based administration and information of the HPV-vaccine. The close relation to school health and the school nurse were a crucial determinants for acceptance. Many of the included articles concluded that the decision making process of HPV-vaccination is complexed and is would be facilitated by several channels of information.



Parents' questionnaires

The principal target to be addressed are the parents of children in age of potentially being vaccinated for HPV. Since HPV vaccination is recommended between 9-12 years old depending on the country, it is the parents that will decide and take care of providing HPV vaccination for their children.

Methods

We developed and agreed within WP6 participants upon a questionnaire for parents to be delivered online in an anonymous way, with the aim of getting information on a list of HPV-related aspects. We started from the questionnaire developed by:

- knowledge on HPV infection and vaccination
- participation to HPV-related cancer screening
- attitude to vaccination
- sources of information
- vaccination status of their children
- will to vaccinate
- barriers and difficulties of taking their children to get the vaccine

The parents involved are those of children in those schools and classes that have been selected to collaborate in the whole project with WP6.

The questions have been agreed within WP6 partners and put in a definitive English version. This version was then translated by all countries using the questionnaire. ISS then created online links to be delivered to the parents. The answers are completely anonymous.

These questionnaire proposed to the parents is attached as Annex 7 (in certain countries very small changes were made to adapt to local situation).

Results

Here the results of the records in the different participating countries:



Greece

Demographic information - 748 participants		Frequencies	Frequencies %
Who is answering the questionnaire	One parent/legal guardian	75.00	10.03% (93.75%)
	Both parents/legal guardians	5.00	0.67% (6.25%)
		Mean	median
Age of parent 1/legal guardian 1:		47.25	47.00
Age of parent 1/legal guardian 2:		48.40	48.00
		Frequencies	Frequencies %
Gender of parent 1/legal guardian 1:	Female	66.00	8.82% (84.62%)
	Male	12.00	1.60% (15.38%)
	Other	0	0
Gender of parent 1/legal guardian 2:	Female	5.00	0.67% (100.00%)
	Male	0	0
	Other	0	0
Parent 1/legal guardian 1 - What is the highest degree or level of education you have completed?	Mandatory School	0	0
	High School	41.00	5.48% (51.90%)
	Bachelor's degree	23.00	3.07% (29.11%)
	Ph.D. or higher	14.00	1.87% (17.72%)
	Prefer not to say	1.00	0.13% (1.27%)
Parent 2/legal guardian 2 - What is the highest degree or level of education you have completed?	Mandatory School	0	0
	High School	1.00	0.13%
	Bachelor's degree	4.00	0.53%
	Ph.D. or higher	0	0
	Prefer not to say	0	0
Parent 1/legal guardian 1 – Are you currently employed?	Yes	64.00	8.56% (81.01%)
	No	5.00	0.67% (6.33%)
	Prefer not to say	10.00	1.34% (12.66%)
Parent 2/legal guardian 2 - Are you currently employed?	Yes	5.00	0.67% (100.00%)
	No	0	0
	Prefer not to say	0	0

For Mothers only		Frequencies	Frequencies %
Do you participate in the cervical cancer screening programme (pap-test/LBC/HPV-DNA test)?	Yes, yearly	49.00	6.55% (66.22%)
	Underwent at least once	7.00	0.94% (9.46%)
	No, never	18.00	2.41% (24.32%)
	I don't know	0	0
	Prefer not to say	0	0
How often do you go to gynecologist for check-ups?	Yes, yearly	65.00	8.69% (89.04%)
	Went at least once	7.00	0.94% (9.59%)
	No, never	1.00	0.13% (1.37%)
	I don't know	0	0
	Prefer not to say	0	0

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Child information		Mean	Median
What is the age of the son/daughter this questionnaire is referring to?		13.54	14.00
		Frequencies	Frequencies %
What is the gender of the son/daughter this questionnaire is referring to?	Male	37.00	4.95% (46.25%)
	Female	43.00	5.75% (53.75%)
	Other	0	0
Do you have any other children?	Yes	69.00	9.22% (86.25%)
	No	11.00	1.47% (13.75%)

Sources of information		Frequencies	Frequencies %
Which are your sources of information on HPV infection and HPV vaccination?	Paediatrician/general practitioner	70.00	9.36%
	Gynaecologist	44.00	5.88%
	Vaccination services	5.00	0.67%
	Pharmacist	2.00	0.27%
	Mother and child health centres	1.00	0.13%
	Government/Public health agency/central institutions	8.00	1.07%
	School	3.00	0.40%
	Friends	12.00	1.60%
	Family members	6.00	0.80%
	Websites of official public health institutions/government agencies	19.00	2.54%
	Other websites	8.00	1.07%
	Social media	6.00	0.80%
	Newspapers/leaflets/poster	9.00	1.20%
	Radio/television	10.00	1.34%
	I don't know	0	0
	I prefer not to say	0	0
	Never heard of HPV infection before	0	0
Which information source do you think is most reliable to get sufficient information on HPV vaccine?	Paediatrician/general practitioner	70.00	9.36%
	Gynaecologist	44.00	5.88%
	Vaccination services	5.00	0.67%
	Pharmacist	2.00	0.27%
	Mother and child health centres	1.00	0.13%
	Government/Public health agency/central institutions	8.00	1.07%
	School	3.00	0.40%
	Friends/family members	12.00	1.60%
	Websites of official public health institutions/government agencies	6.00	0.80%
	Social media	19.00	2.54%
	Newspapers/leaflets/poster	8.00	1.07%

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Do you feel sufficiently informed on HPV vaccination?	Radio/television	6.00	0.80%
	I don't know	9.00	1.20%
	Absolutely yes	13.00	1.74%
	Sufficiently	30.00	4.01%
	I don't know	3.00	0.40%
	Insufficiently	21.00	2.81%
Which social media platforms and webpages do you use daily or most often?	Absolutely not	12.00	1.60%
	Facebook	55.00	7.35%
	Instagram	37.00	4.95%
	TikTok	3.00	0.40%
	Reddit	0	0
	Snapchat	0	0
	Pinterest	7.00	0.94%
	Twitter	3.00	0.40%
	LinkedIn	9.00	1.20%
	YouTube	17.00	2.27%
	Podcasts	1.00	0.13%
	Wikipedia, other Wiki pages	19.00	2.54%

Knowledge on HPV infection and vaccination		Frequencies	Frequencies %
HPV may cause cancer of cervix, vagina, vulva? (T)	True	71.00	9.49% (89.87%)
	False	2.00	0.27% (2.53%)
	I don't know	6.00	0.80% (7.59%)
HPV may cause cancers of penis (T)	True	41.00	5.48% (51.90%)
	False	11.00	1.47% (13.92%)
	I don't know	27.00	3.61% (34.18%)
HPV may cause anal cancer (T)	True	33.00	4.41% (42.31%)
	False	11.00	1.47% (14.10%)
	I don't know	34.00	4.55% (43.59%)
HPV may cause cancers of the back of the throat, including the base of the tongue and tonsils (T)	True	35.00	4.68%
	False	11.00	1.47%
	I don't know	32.00	4.28%
HPV is a sexually transmitted disease (T)	True	70.00	9.36%
	False	1.00	0.13%
	I don't know	7.00	0.94%
HPV may infect you without symptoms (T)	True	54.00	7.22%
	False	4.00	0.53%
	I don't know	19.00	2.54%
HPV infections are rare (F)	True	2.00	0.27%
	False	56.00	7.49%
	I don't know	20.00	2.67%
Most cervical cancers are not caused by HPV infections (F)	True	7.00	0.94%
	False	37.00	4.95%
	I don't know	34.00	4.55%

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HPV vaccines work better if given before 15 years of age (T)	True	63.00	8.42%
	False	3.00	0.40%
	I don't know	12.00	1.60%
HPV vaccines protect against all HPV types (F)	True	20.00	2.67%
	False	26.00	3.48%
	I don't know	32.00	4.28%
Early sexual intercourse increases the risk of contracting HPV (T)	True	43.00	5.75%
	False	5.00	0.67%
	I don't know	30.00	4.01%
HPV is treated with antibiotics (F)	True	7.00	0.94%
	False	43.00	5.75%
	I don't know	28.00	3.74%
HPV vaccines protect against all sexually transmitted diseases (F)	True	8.00	1.07%
	False	53.00	7.09%
	I don't know	17.00	2.27%
HPV vaccines provide 100 % protection against cancer and anogenital warts (F)	True	16.00	2.14%
	False	29.00	3.88%
	I don't know	33.00	4.41%
HPV vaccines cause fertility problems (F)	True	3.00	0.40%
	False	47.00	6.28%
	I don't know	28.00	3.74%
Sometimes HPV infections can last years (T)	True	51.00	6.82%
	False	1.00	0.13%
	I don't know	26.00	3.48%
Only women can be infected by HPV (F)	True	4.00	0.53%
	False	68.00	9.09%
	I don't know	6.00	0.80%
Genital warts are caused by HPV (T)	True	41.00	5.48%
	False	7.00	0.94%
	I don't know	30.00	4.01%
Most HPV infections resolve spontaneously (F)	True	11.00	1.47%
	False	47.00	6.28%
	I don't know	20.00	2.67%

		Frequencies	Frequencies %
What do you think are the benefits of HPV vaccination for the society?	Reduces the incidence of cancer	69.00	9.22% (84.15%)
	Reduces cancer mortality	53.00	7.09% (64.63%)
	Reduces potential complications	25.00	3.34% (30.49%)
	No benefits	0	0
	Benefits are only for pharmaceutical companies	2.00	0.27% (2.44%)
	I don't know	1.00	0.13% (1.22%)

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Vaccination status of the child for whom you are/are responding to the questionnaire		Frequencies	Frequencies %
Has your son/daughter been vaccinated against HPV?	Yes	51.00	6.82% (65.38%)
	No	27.00	3.61% (34.62%)
If your son/daughter has not received HPV vaccination, do you plan to have him/her vaccinated for HPV in the future?	Definitely vaccinate	14.00	1.87% (51.85%)
	Rather vaccinate	5.00	0.67% (18.52%)
	I don't know	7.00	0.94% (25.93%)
	Rather not vaccinate	1.00	0.13% (3.70%)
	Definitely not vaccinate	0	0
Regardless of HPV vaccination, your son/daughter received:	All the recommended paediatric vaccinations	72.00	9.63%
	Only mandatory vaccinations	5.00	0.67%
	Only some of the recommended paediatric vaccinations	1.00	0.13%
	I don't know	0	0
If your son/daughter has not received all the recommended vaccinations, do you plan to have him/her vaccinated in the future?	Definitely vaccinate	17.00	2.27%
	Rather vaccinate	5.00	0.67%
	I don't know	4.00	0.53%
	Rather not vaccinate	1.00	0.13%
	Definitely not vaccinate	0	0
Do you agree that your son/daughter may be at risk of HPV infection in the future?	Completely agree	46.00	6.15%
	Partially agree	15.00	2.01%
	I don't know	15.00	2.01%
	Completely disagree	1.00	0.13%
	Partially disagree	1.00	0.13%

Reasons for NOT getting HPV vaccination					
	Completely agree	Partially agree	I don't know	Partially disagree	Completely disagree
Fear of adverse event	2.00 0.27%	8.00 1.07%	6.00 0.80%	4.00 0.53%	7.00 0.94%
No confidence in HPV vaccine	2.00 0.27%	4.00 0.53%	8.00 1.07%	4.00 0.53%	9.00 1.20%
Confusing information on HPV vaccination	6.00 0.80%	0	4.00 0.53%	2.00 0.27%	8.00 1.07%
Scarce information on HPV vaccination	6.00 0.80%	9.00 1.20%	5.00 0.67%	3.00 0.40%	4.00 0.53%
No confidence in vaccinations in general	0	3.00 0.40%	3.00 0.40%	6.00 0.80%	15.00 2.01%
Only for girls: No need to get vaccinated because regular pap-test/HPV-DNA test can prevent cervical cancer	0	1.00 0.13%	3.00 0.40%	4.00 0.53%	11.00 1.47%

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No need to get vaccinated because our child is young and not sexually active	2.00 0.27%	6.00 0.80%	2.00 0.27%	4.00 0.53%	13.00 1.74%
HPV vaccination is not useful	1.00 0.13%	1.00 0.13%	2.00 0.27%	9.00 1.20%	14.00 1.87%
HPV vaccination is not mandatory	4.00 0.53%	7.00 0.94%	4.00 0.53%	4.00 0.53%	8.00 1.07%
Family's doctor's advice against HPV vaccination	3.00 0.40%	2.00 0.27%	8.00 1.07%	4.00 0.53%	10.00 1.34%
Other health care worker's advice against HPV vaccination	1.00 0.13%	5.00 0.67%	7.00 0.94%	4.00 0.53%	10.00 1.34%
Familiars/friends' advice against HPV vaccination	1.00 0.13%	6.00 0.80%	6.00 0.80%	5.00 0.67%	9.00 1.20%
Scarce promotion of HPV vaccination	8.00 1.07%	8.00 1.07%	3.00 0.40%	4.00 0.53%	4.00 0.53%
HPV vaccination promotes risky sexual behaviours	2.00 0.27%	4.00 0.53%	4.00 0.53%	0	17.00 2.27%
Fear of injection	1.00 0.13%	1.00 0.13%	2.00 0.27%	6.00 0.80%	17.00 2.27%
HPV infection is not severe	1.00 0.13%	1.00 0.13%	2.00 0.27%	4.00 0.53%	19.00 2.54%
Child has contraindications to HPV vaccine, as confirmed by his/her doctor	1.00 0.13%	1.00 0.13%	13.00 1.74%	0	12.00 1.60%
Alternative medical approach, not including vaccinations	13.00 1.74%	13.00 1.74%	5.00 0.67%	5.00 0.67%	13.00 1.74%
We were not able to respect the date	1.00 0.13%	1.00 0.13%	8.00 1.07%	7.00 0.94%	10.00 1.34%
We did not know that HPV vaccination was free of charge	3.00 0.40%	2.00 0.27%	5.00 0.67%	4.00 0.53%	13.00 1.74%
It is difficult to get a date for vaccination	0	1.00 0.13%	10.00 1.34%	3.00 0.40%	13.00 1.74%
Vaccination service is difficult to reach	0	4.00 0.53%	11.00 1.47%	1.00 0.13%	11.00 1.47%
Religious concerns	0	0	2.00 0.27%	2.00 0.27%	23.00 3.07%
The effectiveness of vaccine is questionable and their popularity only benefits pharmaceutical companies	1.00 0.13%	3.00 0.40%	7.00 0.94%	6.00 0.80%	10.00 1.34%

		Frequencies	Frequencies %
What suggestions did the pediatrician/general practitioner/school nurse/school doctor give	Encouraged HPV vaccination	67.00	8.96% (84.81%)
	Discouraged HPV vaccination	0	0
	Didn't express opinion about HPV vaccination	2.00	0.27% (2.53%)
	Suggested to delay HPV vaccination	0	0
	Didn't address the topic of HPV vaccination	2.00	0.27% (2.53%)

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you about HPV vaccination?	Encouraged HPV vaccination, but did not provide adequate information/clarifications	1.00	0.13% (1.27%)
	Different pediatrician/general practitioner gave us discordant opinion about HPV vaccine	0	0
	We did not consult the pediatrician/general practitioner	3.00	0.40% (3.80%)
	I don't know	1.00	0.13% (1.27%)
	I prefer not to say	3.00	0.40% (3.80%)

Vaccination modalities		Frequencies	Frequencies %
How long does it take to get your son/daughter vaccinated (make an appointment + get the vaccine administered)	Less than 1 hour	55.00	7.35%
	1 to 2 hours	9.00	1.20%
	I don't know	9.00	1.20%
	>2 to 4 hours	1.00	0.13%
	More than 4 hours	4.00	0.53%
How far from your home do you have to go to vaccinate your son/daughter	more than 6 km	6.00	0.80%
	less than 2 km	50.00	6.68%
	>2 to 6 km	17.00	2.27%
	I don't know	5.00	0.67%
Would you agree to have your child vaccinated against HPV at school	Yes	34.00	4.55%
	No	27.00	3.61%
	Yes, but only if the doctor has prescribed it	13.00	1.74%
	I don't know	1.00	0.13%
	I prefer not to say	3.00	0.40%
Would you agree to have your child vaccinated against HPV at a pharmacy	Yes	25.00	3.34%
	No	38.00	5.08%
	Yes, but only if the doctor has prescribed it	12.00	1.60%
	I don't know	1.00	0.13%
	I prefer not to say	2.00	0.27%
Would you agree to have your child vaccinated against HPV in vaccination hub in a shopping mall	Yes	16.00	2.14%
	No	48.00	6.42%
	Yes, but only if the doctor has prescribed it	10.00	1.34%
	I don't know	1.00	0.13%
	I prefer not to say	3.00	0.40%
Would you agree to have your child vaccinated against HPV by general practitioner	Yes	46.00	6.15%
	No	17.00	2.27%
	Yes, but only if the doctor has prescribed it	12.00	1.60%
	I don't know	0	0
	I prefer not to say	3.00	0.40%

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Survey period: 03/29/2023 – 05/02/2023

Places: Athens- Attica, Tripoli- Peloponnesus, Rethymno- Crete Island, Anafi (Chora)- Anafi Island/ GREECE

Schools: High School of New Psychiko's Athens College (Attica), Junior High School of New Psychiko's Athens College (Attica), Junior High School of New Penteli (Attica), Experimental Junior High School of Tripoli (Peloponnesus), Experimental Junior High School of Rethymno (Crete Island), Junior High School of Anafi (Anafi Island)

The responders to the questionnaire had mean age of 47.25 years and 84.62% of them were female. Almost all the responders (98.73%) had a High School or a higher degree (46.83% a Bachelor's or a higher degree). 81.01% of them were currently employed.

Regarding the mothers, 66.22% of them participated yearly in the cervical cancer screening program (PAP-test, etc.) and another 9.46% of them underwent at least once a relevant test (total: 75.68%). Moreover, 89.04% of the mothers went yearly to gynecologist for a check-up and another 9.59% of them went at least once (total: 98.63%).

The children the questionnaire was referring to had mean age of 13.54 years and 53.75% of them were female. The majority of them (65.38%) has been vaccinated against HPV. Moreover, if not vaccinated, 51.85% will definitely be in the future.

Regarding the knowledge on HPV infection and HPV vaccination, the responders show to have gaps in information and certain wrong information. For example, 34.18% of them don't know if HPV causes anal cancer. In the contrast to this, regarding the benefits of HPV vaccination, 84.15% of the responders correctly believe that reduces the incidence of cancer.

Regarding the suggestions the healthcare professionals (pediatrician, school nurse, etc.) gave the responders about HPV vaccination, 84.81% of them encouraged HPV vaccination. None of them discouraged HPV vaccination.



Italy

Demographic information – 207 filled questionnaires		Frequencies	Frequencies %
Who is answering the questionnaire	Group 1: One parent/legal guardian	180	87.00%
	Group2: Both parents/legal guardians	27	13.00%
		Mean	median
Age group 1:		Female: 43.8 (n: 168) Male: 47.7% (n:11)	Female: 44.0 (n: 168) Male: 49% (n:11)
Age group 2:		Female: 45.9 (n:27) Male: 48.3 (n:27)	Female 46.0 (n:27) Male: 48.0 (n:27)
		Frequencies	Frequencies %
Gender total sample: (group 1 and group2)	Female	195	83.3%
	Male	38	16.2%
	Missing	1	0.4%
Gender group 1:	Female	168	93.3%
	Male	11	6.1%
	Missing	1	0.6%
Gender group 2:	Female	27	
	Male	27	
Group 1 (female): What is the highest degree or level of education you have completed?	Mandatory School	21	12.5%
	High School	82	48.8%
	Bachelor's degree	24	14.3%
	Ph.D. or higher	36	21.4%
	Prefer not to say	4	2.4%
	Missing	1	0.6%
Group 1 (male): What is the highest degree or level of education you have completed?	Mandatory School	3	27.3%
	High School	5	45.5%
	Bachelor's degree	2	18.2%
	Ph.D. or higher	0	0.0%
	Prefer not to say	1	9.1%
Group 2 (female): What is the highest degree or level of	Mandatory School	2	7.4%
	High School	13	48.4%
	Bachelor's degree	5	18.5%
	Ph.D. or higher	7	25.9%

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education you have completed?	Prefer not to say	0	0.0%
Group 2 (male) What is the highest degree or level of education you have completed?	Mandatory School	5	18.5%
	High School	15	55.5%
	Bachelor's degree	3	11.1%
	Ph.D. or higher	4	14.8%
	Prefer not to say	0	0.0%
Group 1 (female): Are you currently employed?	Yes	109	64.9%
	No	51	30.4%
	Prefer not to say	8	4.8%
Group 1 (male) Are you currently employed?	Yes	11	100.0%
	No	0	0.0%
	Prefer not to say	0	0.0%
Group 2 (female) Are you currently employed?	Yes	16	59.3%
	No	10	37.0%
	Prefer not to say	0	0.0%
	Missing	1	3.7%
Group 2 (male): Are you currently employed?	Yes	26	96.3
	No	1	3.7%
	Prefer not to say	0	0.0%

For Mothers only		Frequencies	Frequencies %
Do you participate in the cervical cancer screening programme (pap-test/LBC/HPV-DNA test)?	Yes, yearly	78	40.0%
	Underwent at least once	56	28.7%
	No, never	54	27.7%
	I don't know	2	1.0%
	Prefer not to say	5	2.6%
How often do you go to gynecologist for check-ups?	Yes, yearly	117	60.0%
	Went at least once	48	24.6%
	No, never	9	4.6%
	I don't know	16	8.2%
	Prefer not to say	0	0%
	NA	5	2.6%

Child information		Mean	Median
What is the age of the son/daughter this questionnaire is referring to?		12.3 10-18 (minmax)	12.0
		Frequencies	Frequencies %
What is the gender of the son/daughter this questionnaire is referring to?	Male	112	54.1%
	Female	94	45.4%
	NA	1	0.5%
Do you have any other children?	Yes	173	83.6%
	No	33	15.9%

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Sources of information		Frequencies	Frequencies %
Which are your sources of information on HPV infection and HPV vaccination?	Paediatrician/general practitioner	131	63.3%
	Gynaecologist	86	41.5%
	Vaccination services	60	29.0%
	Pharmacist	2	1.0%
	Mother and child health centres	3	0.39%
	Government/Public health agency/central institutions	17	8.2%
	School	26	12.64%
	Friends	16	7.7%
	Family members	24	11.6%
	Websites of official public health institutions/government agencies	34	16.4%
	Other websites	22	10.6%
	Social media	23	11.1%
	Newspapers/leaflets/poster	14	6.8%
	Radio/television	22	10.6%
	I don't know	1	0.5%
	I prefer not to say	0	0.0%
	Never heard of HPV infection before	1	0.5%
Which information source do you think is most reliable to get sufficient information on HPV vaccine?	Paediatrician/general practitioner	156	75.4%
	Gynaecologist	130	62.8%
	Vaccination services	61	29.5%
	Pharmacist	2	1.0%
	Mother and child health centres	9	4.3%
	Government/Public health agency/central institutions	20	9.7%
	School	14	6.8%
	Friends/family members	1	0.5%
	Websites of official public health institutions/government agencies	17	8.2%
	Social media	6	2.9%
	Newspapers/leaflets/poster	2	1.0%
	Radio/television	5	2.4%
	I don't know	4	1.9%
Do you feel sufficiently informed on HPV vaccination?	Absolutely yes	15	7.2%
	Sufficiently	73	35.3%
	I don't know	17	8.2%
	Insufficiently	87	42.0%
	Absolutely not	14	6.8%
	NA	1	0.5%
	Facebook	134	64.7%
	Instagram	85	41.1%

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Which social media platforms and webpages do you use daily or most often?	TikTok	15	7.2%
	Reddit	1	0.5%
	Snapchat	1	0.5%
	Pinterest	20	9.7%
	Twitter	4	1.9%
	LinkedIn	5	2.4%
	YouTube	57	27.5%
	Podcasts	3	1.4%
	Wikipedia, other Wiki pages	59	28.5%

Knowledge on HPV infection and vaccination		Frequencies	Frequencies %
HPV may cause cancer of cervix, vagina, vulva?	True	168	81.2%
	False	5	2.4%
	I don't know	32	15.5%
	NA	2	1.0%
HPV may cause cancers of penis	True	100	48.3%
	False	24	11.6%
	I don't know	82	39.6%
	NA	1	0.5%
HPV may cause anal cancer	True	67	32.4%
	False	41	19.8%
	I don't know	95	45.9%
	NA	4	1.9%
HPV may cause cancers of the back of the throat, including the base of the tongue and tonsils	True	60	29.0%
	False	43	20.8%
	I don't know	103	49.8%
	NA	1	0.5%
HPV is a sexually transmitted disease	True	142	68.6%
	False	22	10.6%
	I don't know	41	19.8%
	NA	2	1.0%
HPV may infect you without symptoms	True	126	60.9%
	False	10	4.8%
	I don't know	69	33.3%
	NA	2	1.0%
HPV infections are rare	True	9	4.3%
	False	136	65.7%
	I don't know	61	29.5%
	NA	1	0.5%
Most cervical cancers are not caused by HPV infections	True	28	13.5%
	False	78	37.7%
	I don't know	100	48.3%
	NA	1	0.5%
	True	139	67.1%

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HPV vaccines work better if given before 15 years of age	False	11	5.3%
	I don't know	56	27.1%
	NA	1	0.5%
HPV vaccines protect against all HPV types	True	47	22.7%
	False	46	22.2%
	I don't know	112	54.1%
	NA	2	1.0%
Early sexual intercourse increases the risk of contracting HPV	True	92	44.4%
	False	39	18.8%
	I don't know	75	36.2%
	NA	1	0.5%
HPV is treated with antibiotics	True	26	12.6%
	False	64	30.9%
	I don't know	116	56.04%
	NA	1	0.5%
HPV vaccines protect against all sexually transmitted diseases	True	10	4.8%
	False	132	63.8%
	I don't know	64	30.9%
	NA	1	0.5%
HPV vaccines provide 100 % protection against cancer and anogenital warts	True	23	11.1%
	False	88	42.5%
	I don't know	93	44.9%
	NA	3	1.4%
HPV vaccines cause fertility problems	True	17	8.3%
	False	127	61.4%
	I don't know	61	29.5%
	NA	2	1.0%
Sometimes HPV infections can last years	True	108	52.2%
	False	4	1.9%
	I don't know	93	44.9%
	NA	2	1.0%
Only women can be infected by HPV	True	13	6.3%
	False	159	76.8%
	I don't know	32	15.5%
	NA	3	1.4%
Genital warts are caused by HPV	True	83	40.1%
	False	25	12.1%
	I don't know	97	46.9%
	NA	2	1.0%
Most HPV infections resolve spontaneously	True	21	10.1%
	False	123	59.4%
	I don't know	61	29.5%
	NA	2	1.0%

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		Frequencies	Frequencies %
What do you think are the benefits of HPV vaccination for the society?	Reduces the incidence of cancer	172	83.1%
	Reduces cancer mortality	84	40.6%
	Reduces potential complications	84	40.6%
	No benefits	1	0.5%
	Benefits are only for pharmaceutical companies	2	1.0%
	I don't know	11	5.3%

Vaccination status of the child for whom you are/are responding to the questionnaire		Frequencies	Frequencies %
Has your son/daughter been vaccinated against HPV?	Yes	111	53.6%
	No	94	45.4%
	NA	2	1.0%
If your son/daughter has not received HPV vaccination, do you plan to have him/her vaccinated for HPV in the future?	Definitely vaccinate	50	53.2%
	Rather vaccinate	21	22.3%
	I don't know	20	21.3%
	Rather not vaccinate	1	1.1%
	Definitely not vaccinate	2	2.1%
Regardless of HPV vaccination, your son/daughter received:	All the recommended paediatric vaccinations	182	87.9%
	Only mandatory vaccinations	17	8.2%
	Only some of the recommended paediatric vaccinations	4	1.9%
	I don't know	1	0.5%
	NA	3	1.4%
If your son/daughter has not received all the recommended vaccinations, do you plan to have him/her vaccinated in the future?	Definitely vaccinate	59	61.7%
	Rather vaccinate	15	16.0%
	I don't know	9	9.6%
	Rather not vaccinate	5	5.3%
	Definitely not vaccinate	0	0.0%
	NA	7	7.4%
Do you agree that your son/daughter may be at risk of HPV infection in the future?	Completely agree	126	60.9%
	Partially agree	37	17.9%
	I don't know	27	13.0%
	Completely disagree	12	5.8%
	Partially disagree	2	1.0%
	NA	3	1.4%

Reasons for NOT getting HPV vaccination					
	Completely agree	Partially agree	I don't know	Partially disagree	Completely disagree
Fear of adverse event	26.6%	9.6%	28.7%	22.3%	11.7%
No confidence in HPV vaccine	45.7%	10.6%	20.2%	12.8%	8.5%

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Confusing information on HPV vaccination	21.3%	12.8%	24.5%	26.6%	12.8%
Scarce information on HPV vaccination	21.3%	13.8%	11.7%	29.8%	21.3%
No confidence in vaccinations in general	53.2%	10.6%	8.5%	13.8%	10.6%
Only for girls: No need to get vaccinated because regular pap-test/HPV-DNA test can prevent cervical cancer	52.1%	6.4%	13.8%	5.3%	2.1%
No need to get vaccinated because our child is young and not sexually active	61.7%	7.4%	12.8%	9.6%	5.3%
HPV vaccination is not useful	60.6%	9.6%	16.0%	6.4%	4.3%
HPV vaccination is not mandatory	26.6%	11.7%	25.5%	14.9%	18.1%
Family's doctor's advice against HPV vaccination	47.9%	6.4%	27.7%	7.4%	7.4%
Other health care worker's advice against HPV vaccination	44.7%	9.6%	29.8%	8.5%	3.2%
Familiars/friends' advice against HPV vaccination	40.4%	13.8%	26.6%	8.5%	6.4%
Scarce promotion of HPV vaccination	24.5%	11.7%	17.0%	23.4%	19.1%
HPV vaccination promotes risky sexual behaviours	51.1%	10.6%	22.3%	8.5%	3.2%
Fear of injection	55.3%	6.4%	20.2%	8.5%	5.3%
HPV infection is not severe	69.1%	6.4%	13.8%	4.3%	21%
Child has contraindications to HPV vaccine, as confirmed by his/her doctor	35.1%	6.4%	39.4%	7.4%	6.4%
Alternative medical approach, not including vaccinations	46.8%	5.3%	33.0%	7.4%	3.2%
We were not able to respect the date	37.2%	11.7%	24.5%	17.0%	4.3%
We did not know that HPV vaccination was free of charge	55.3%	6.4%	18.1%	7.4%	7.4%
It is difficult to get a date for vaccination	45.7%	5.3%	29.8%	12.8%	1.1%
Vaccination service is difficult to reach	62.8%	9.6%	17.0%	2.1%	2.1%
Religious concerns	73.4%	4.3%	11.7%	2.1%	3.2%
The effectiveness of vaccine is questionable and their popularity only benefits pharmaceutical companies	42.6%	13.8%	21.3%	13.8%	3.2 %

		Frequencies	Frequencies %
What suggestions did the pediatrician/general practitioner/school nurse/school doctor give you about HPV vaccination?	Encouraged HPV vaccination	138	66.7%
	Discouraged HPV vaccination	1	0.5%
	Didn't express opinion about HPV vaccination	13	6.3%
	Suggested to delay HPV vaccination	0	0%
	Didn't address the topic of HPV vaccination	18	8.7%
	Encouraged HPV vaccination, but did not provide adequate information/clarifications	6	2.9%

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	Different pediatrician/general practitioner gave us discordant opinion about HPV vaccine	1	0.5%
	We did not consult the pediatrician/general practitioner	13	6.3%
	I don't know	6	2.9%
	I prefer not to say	5	2.4%
	NA	6	2.9%

Vaccination modalities		Frequencies	Frequencies %
How long does it take to get your son/daughter vaccinated (make an appointment + get the vaccine administered)	Less than 1 hour	68	32.9%
	1 to 2 hours	57	27.5%
	I don't know	34	16.4%
	>2 to 4 hours	21	10.1%
	More than 4 hours	20	9.7%
	NA	7	3.4%
How far from your home do you have to go to vaccinate your son/daughter	more than 6 km	69	33.3%
	less than 2 km	66	31.9%
	>2 to 6 km	61	29.5%
	I don't know	4	1.9%
	NA	7	3.4%
Would you agree to have your child vaccinated against HPV at school	Yes	77	37.2%
	No	65	31.4%
	Yes, but only if the doctor has prescribed it	27	13.0%
	I don't know	27	13.0%
	I prefer not to say	5	2.4%
	NA	6	2.9%
Would you agree to have your child vaccinated against HPV at a pharmacy	Yes	87	42.0%
	No	60	29.0%
	Yes, but only if the doctor has prescribed it	30	14.5%
	I don't know	17	8.2%
	I prefer not to say	7	3.4%
	NA	6	2.9%
Would you agree to have your child vaccinated against HPV in vaccination hub in a shopping mall	Yes	45	21.7%
	No	120	58.0%
	Yes, but only if the doctor has prescribed it	9	4.3%
	I don't know	22	10.6%
	I prefer not to say	4	1.9%
	NA	7	3.4%
	Yes	126	60.9%
	No	29	14.0%

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Would you agree to have your child vaccinated against HPV by general practitioner	Yes, but only if the doctor has prescribed it	22	10.6%
	I don't know	18	8.7%
	I prefer not to say	6	2.9%
	NA	6	2.9%

207 questionnaires were completed of which 180 by one parent only while 27 by both parents. 83% of the responders were female, mostly with high degree education level and largely more than half employed.

Only 40% of the mothers participated yearly to cervical cancer screening program but another 29% underwent at least once the test. Whereas 60% declare to go regularly to the gynecologist or having been at least once.

Children had mean age of 12 and were 54.1% male, 45.4% female and 84% had brothers or sisters.

Sources of information were multiple with predominance of the pediatrician (63.3%) or gynecologist (41.5%), also considered both more reliable sources. 35% of the respondents declared they felt sufficiently informed while 42% not enough. Among the social media platforms, 64.7% of the respondents mainly use Facebook to obtain information.

When asked some informations on HPV infection and vaccination to test their knowledge on this issues, the responders show to have many gaps in information and certain wrong informations. Although 83.1% correctly think that the benefits of HPV vaccination are in reducing the incidence of cancer.

The children of the responders were in 54% of cases vaccinated towards HPV infection, and if not vaccinated, 53% will definitely be in the future. 61% were aware that their child might be at risk of HPV infection in the future.

For those not willing to vaccinate, the main reasons were scarce and confusing information, scarce promotion of HPV vaccine and HPV vaccination not being mandatory.

68% were suggested to get the vaccination by their pediatrician. Although 9% of pediatrician did not address the topic of HPV vaccination.

Difficulty of access to vaccination centres does not seem to be a relevant issue, and as regards the alternative location for the vaccination only 37% chose the school while 42% preferred the pharmacy.



Lithuania

Demographic information - participants		Frequencies	Frequencies %
Who is answering the questionnaire	One parent/legal guardian	846	93.79%
	Both parents/legal guardians	56	6.21%
		Mean	median
Age of parent 1/legal guardian 1:		41.00	40.0
Age of parent 1/legal guardian 2:		43.31	43.0
		Frequencies	Frequencies %
Gender of parent 1/legal guardian 1:	Female	868	96.88%
	Male	27	3.01%
	Other	1	0.11%
Gender of parent 1/legal guardian 2:	Female	7	12.5%
	Male	48	85.71%
	Other	1	1.79%
Parent 1/legal guardian 1 - What is the highest degree or level of education you have completed?	Secondary education	93	10.37%
	Ph.D. or higher	2	0.22%
	Bachelor's degree	240	26.76%
	Master's degree	195	21.74%
	Collegiate education	191	21.29%
	Vocational education	144	16.05%
	Prefer not to say	32	3.57%
Parent 1/legal guardian 1 – Are you currently employed?	Yes	781	86.97%
	No	60	6.68%
	Prefer not to say	57	6.35%

For Mothers only		Frequencies	Frequencies %
Do you participate in the cervical cancer screening programme (pap-test/LBC/HPV-DNA test)?	Yes, yearly	542	61.52%
	Underwent at least once	291	33.03%
	No, never	27	3.06%
	I don't know	4	0.45%
	Prefer not to say	17	1.93%
How often do you go to gynecologist for check-ups?	Yes, yearly	729	83.41%
	Went at least once	80	9.15%
	No, never	18	2.06%
	I don't know	47	5.38%

Child information		Mean	Median
What is the age of the son/daughter this questionnaire is referring to?		12.05	12.00
		Frequencies	Frequencies %
	Male	417	46.33%
	Female	482	53.56%

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What is the gender of the son/daughter this questionnaire is referring to?	Other	1	0.11%
Do you have any other children?	Yes	719	79.89%
	No	181	20.11%

Sources of information		Frequencies	Frequencies %
Which are your sources of information on HPV infection and HPV vaccination?	Paediatrician/general practitioner	517	57.32%
	Gynaecologist	408	45.23%
	Vaccination services	77	8.54%
	Pharmacist	11	1.22%
	Mother and child health centres	10	1.11%
	Government/Public health agency/central institutions	129	14.30%
	School	68	7.54%
	Friends	90	9.98%
	Family members	67	7.43%
	Websites of official public health institutions/government agencies	199	22.06%
	Other websites	284	31.49%
	Social media	298	33.04%
	Newspapers/leaflets/poster	150	16.63%
	Radio/television	184	20.40%
	I don't know	18	2.00%
	I prefer not to say	7	0.78%
	Never heard of HPV infection before	11	1.22%
	Never heard about vaccination against HPV	26	2.88%
	Other: personal interest, scientific articles (5); workshop (1); medical education (5); workplace (2); not interested because has sons (1); not enough information (1)	15	1.66%
Which information source do you think is most reliable to get sufficient information on HPV vaccine?	Paediatrician/general practitioner	673	74.61%
	Gynaecologist	535	59.31%
	Vaccination services	113	12.53%
	Pharmacist	13	1.44%
	Mother and child health centres	16	1.77%
	Government/Public health agency/central institutions	201	2.28%
	School	44	4.88%

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	Friends/family members	13	1.44%
	Websites of official public health institutions/government agencies	204	22.62%
	Other websites	41	4.55%
	Social media	61	6.76%
	Newspapers/leaflets/poster	25	2.77%
	Radio/television	44	4.88%
	I don't know	20	2.22%
	Other: scientific articles (3)	11	1.22%
Do you feel sufficiently informed on HPV vaccination?	Sufficiently	372	42.81%
	I don't know	122	14.03%
	Insufficiently	375	43.15%
Which social media platforms and webpages do you use daily or most often?	Facebook	845	93.68%
	Instagram	323	10.941%
	TikTok	53	35.81%
	Reddit	1	0.11%
	Snapchat	12	1.33%
	Pinterest	77	8.54%
	Twitter	8	0.89%
	LinkedIn	29	3.22%
	YouTube	265	29.38%
	Blogs	6	0.67%
	Vlogs	2	0.22%
	Podcasts	11	1.22%
	Wikipedia, other Wiki pages	189	20.95%

Knowledge on HPV infection and vaccination		Frequencies	Frequencies %
HPV may cause cancer of cervix, vagina, vulva? (T)	True	785	87.32%
	False	14	1.56%
	I don't know	100	11.12%
HPV may cause cancers of penis (T)	True	442	49.28%
	False	118	13.15%
	I don't know	337	37.57%
HPV may cause anal cancer (T)	True	330	36.83%
	False	184	20.54%
	I don't know	382	42.63%
HPV may cause cancers of the back of the throat, including the base of the tongue and tonsils (T)	True	268	30.04%
	False	223	25.00%
	I don't know	401	44.96%
HPV is a sexually transmitted disease (T)	True	692	77.32%
	False	102	11.40%
	I don't know	101	11.28%
HPV may infect you without symptoms (T)	True	554	62.04%
	False	100	11.20%

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	I don't know	239	26.76%
HPV infections are rare (F)	True	58	6.48%
	False	601	67.15%
	I don't know	236	26.37%
Most cervical cancers are not caused by HPV infections (F)	True	157	17.52%
	False	392	43.75%
	I don't know	347	38.73%
HPV vaccines work better if given before 15 years of age (T)	True	582	65.25%
	False	47	5.27%
	I don't know	263	29.48%
HPV vaccines protect against all HPV types (F)	True	263	29.45%
	False	237	26.54%
	I don't know	393	44.01%
Early sexual intercourse increases the risk of contracting HPV (T)	True	637	71.09%
	False	62	6.92%
	I don't know	197	21.99%
HPV is treated with antibiotics (F)	True	123	13.79%
	False	313	35.09%
	I don't know	456	51.12%
HPV vaccines protect against all sexually transmitted diseases (F)	True	72	8.09%
	False	614	68.99%
	I don't know	204	22.92%
HPV vaccines provide 100 % protection against cancer and anogenital warts (F)	True	105	11.77%
	False	449	50.34%
	I don't know	338	37.89%
HPV vaccines cause fertility problems (F)	True	135	15.12%
	False	404	45.24%
	I don't know	354	39.64%
Sometimes HPV infections can last years (T)	True	537	60.54%
	False	31	3.49%
	I don't know	319	35.96%
Only women can be infected by HPV (F)	True	65	7.28%
	False	661	74.02%
	I don't know	167	18.70%
Genital warts are caused by HPV (T)	True	417	46.85%
	False	77	8.65%
	I don't know	396	44.49%
Most HPV infections resolve spontaneously (F)	True	76	8.53%
	False	649	72.84%
	I don't know	166	18.63%

	Frequencies	Frequencies %
Reduces the incidence of cancer	671	74.39%

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What do you think are the benefits of HPV vaccination for the society?	Reduces cancer mortality	492	54.55%
	Reduces potential complications	469	52.0%
	No benefits	27	2.99%
	Benefits are only for pharmaceutical companies	79	8.76%
	I don't know	96	10.64%

Vaccination status of the child for whom you are/are responding to the questionnaire		Frequencies	Frequencies %
Has your son/daughter been vaccinated against HPV?	Yes	358	40.13%
	No	534	59.87%
If your son/daughter has not received HPV vaccination, do you plan to have him/her vaccinated for HPV in the future?	Definitely vaccinate	100	18.80%
	Rather vaccinate	53	9.96%
	I don't know	288	54.14%
	Rather not vaccinate	25	4.70%
	Definitely not vaccinate	66	12.41%
Regardless of HPV vaccination, your son/daughter received:	All the recommended paediatric vaccinations	769	86.02%
	Only mandatory vaccinations	89	9.96%
	I don't know	36	4.03%
If your son/daughter has not received all the recommended vaccinations, do you plan to have him/her vaccinated in the future?	Yes	23	25.27%
	No	28	30.77%
	I don't know	40	43.96%
Do you agree that your son/daughter may be at risk of HPV infection in the future?	Completely agree	339	37.96%
	Partially agree	314	35.16%
	I don't know	167	18.70%
	Completely disagree	39	4.37%
	Partially disagree	34	3.81%

Reasons for NOT getting HPV vaccination					
	Completely agree	Partially agree	I don't know	Partially disagree	Completely disagree
Fear of adverse event	13.49%	19.65%	31.4%	7.9%	27.55%
No confidence in HPV vaccine	14.26%	20.23%	25.05%	11.37%	29.09%
Confusing information on HPV vaccination	18.88%	32.95%	22.16%	8.86%	17.15%
Scarce information on HPV vaccination	28.93%	33.98%	12.43%	10.49%	14.17%
No confidence in vaccinations in general	7.83%	17.22%	12.13%	17.42%	45.40%

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Only for girls: No need to get vaccinated because regular pap-test/HPV-DNA test can prevent cervical cancer	4.32%	17.51%	36.21%	10.55%	31.41%
No need to get vaccinated because our child is young and not sexually active	16.28%	27.52%	20.16%	10.85%	25.19%
HPV vaccination is not useful	7.89%	10.41%	37.13%	11.2%	33.4%
HPV vaccination is not mandatory	39.84%	17.77%	26.37%	7.62%	8.4%
Family's doctor's advice against HPV vaccination	3.52%	3.71%	28.13%	4.3%	60.35%
Other health care worker's advice against HPV vaccination	3.34%	4.72%	26.92%	4.52%	60.51%
Familiars/friends' advice against HPV vaccination	4.93%	8.48%	23.27%	7.69%	55.62%
Scarce promotion of HPV vaccination	15.05%	33.27%	26.14%	8.12%	17.43%
HPV vaccination promotes risky sexual behaviours	3.94%	9.65%	37.8%	6.89%	41.73%
Fear of injection	7.47%	20.04%	24.95%	6.68%	40.86%
HPV infection is not severe	1.98%	5.94%	28.91%	10.30%	52.87%
Child has contraindications to HPV vaccine, as confirmed by his/her doctor	2.18%	5.16%	42.66%	2.18%	47.82%
Alternative medical approach, not including vaccinations	6.71%	13.02%	28.62%	10.26%	43.20%
We were not able to respect the date	4.98%	5.58%	34.66%	4.38%	50.40%
We did not know that HPV vaccination was free of charge	21.51%	13.75%	25.7%	3.78%	35.26%
It is difficult to get a date for vaccination	2.99%	5.58%	48.61%	4.98%	37.85%
Vaccination service is difficult to reach	3.20%	6.0%	40.80%	5.80%	44.20%
Religious concerns	2.20%	1.40%	19.36%	2.40%	74.65%
The effectiveness of vaccine is questionable and their popularity only benefits pharmaceutical companies	14.29%	19.25%	32.14%	7.74%	26.59%

		Frequencies	Frequencies %
What suggestions did the pediatrician/general practitioner/school nurse/school doctor give you about HPV vaccination?	Encouraged HPV vaccination	339	38.79%
	Discouraged HPV vaccination	12	1.37%
	Didn't express opinion about HPV vaccination	76	8.7%
	Suggested to delay HPV vaccination	5	0.57%
	Didn't address the topic of HPV vaccination	181	20.71%
	Encouraged HPV vaccination, but did not provide adequate information/clarifications	45	5.15%
	Different pediatrician/general practitioner gave us discordant opinion about HPV vaccine	8	0.92%

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	We did not consult the pediatrician/general practitioner	108	12.36%
	I don't know	40	4.58%
	I prefer not to say	60	6.87%

Vaccination modalities		Frequencies	Frequencies %
Would you agree to have your child vaccinated against HPV at school	Yes	138	15.81%
	No	509	58.31%
	Yes, but only if the doctor has prescribed it	118	13.52%
	I don't know	83	9.51%
	I prefer not to say	25	2.86%
Would you agree to have your child vaccinated against HPV at a pharmacy	Yes	113	12.91%
	No	568	64.91%
	Yes, but only if the doctor has prescribed it	107	12.23%
	I don't know	75	8.57%
	I prefer not to say	12	1.37%
Would you agree to have your child vaccinated against HPV in vaccination hub in a shopping mall	Yes	68	7.75%
	No	673	76.65%
	Yes, but only if the doctor has prescribed it	67	7.63%
	I prefer not to say	16	1.82%
	I don't know	54	6.15%

96% of the responders were female with Bachelor's degree as education level and 86% employed. Most of the mothers participated yearly to cervical cancer screening and go regularly to the gynecologist for check-ups. The children the questionnaire was referring to had mean age of 12 and were 46.33% male, 53.56% female and 79.89% had brothers or sisters.

Sources of information were multiple with predominance of the pediatrician or gynecologist, also considered the more reliable sources. Around half of the responders declared to feel enough informed.

When asked some informations on HPV infection and vaccination to test their knowledge on this issues, the responders show to have many gaps in information and uncertainties in responding.

The children of the responders were in 40% of cases vaccinated towards HPV infection, and for half of the non vaccinated, parents were not sure if they will be in the future even if 86% were vaccinated with the recommended paediatric vaccinations, and even if 73% were aware that their child might be at risk of HPV infection in the future. For those not willing to vaccinate, the main reasons were scarce and confusing information, scarce promotion of HPV vaccine and not mandatory indication. Moreover the young age of the children presumed not sexually active was seen as a reason not to vaccinate.

Only in 38% of cases the parents were suggested to get the HPV vaccination by their pediatrician. When asked what could be an accepted alternative location for the vaccination, schools were chosen only by 15.81% while preferring pharmacy of GP.

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Poland

Demographic information - participants		Frequencies	Frequencies %
Who is answering the questionnaire	One parent/legal guardian	17	89.474%
	Both parents/legal guardians	2	10.526%
		Mean	median
Age of parent 1/legal guardian 1:		45.00	46.5
Age of parent 1/legal guardian 2:		40.00	40.0
		Frequencies	Frequencies %
Gender of parent 1/legal guardian 1:	Female	18	94.737%
	Male	1	5.263%
	Other	0	0%
Gender of parent 1/legal guardian 2:	Female	0	0%
	Male	2	100%
	Other	0	0%
Parent 1/legal guardian 1 - What is the highest degree or level of education you have completed?	Mandatory School	0	0%
	High School	19	100%
	Bachelor's degree	0	0%
	Ph.D. or higher	0	0%
	Prefer not to say	0	0%
Parent 2/legal guardian 2 - What is the highest degree or level of education you have completed?	Mandatory School	0	0%
	High School	2	100%
	Bachelor's degree	0	0%
	Ph.D. or higher	0	0%
	Prefer not to say	0	0%
Parent 1/legal guardian 1 – Are you currently employed?	Yes	19	100%
	No	0	0%
	Prefer not to say	0	0%
Parent 2/legal guardian 2 - Are you currently employed?	Yes	2	100%
	No	0	0%
	Prefer not to say	0	0%

For Mothers only		Frequencies	Frequencies %
Do you participate in the cervical cancer screening programme (pap-test/LBC/HPV-DNA test)?	Yes, yearly	6	31.579%
	Underwent at least once	4	21.052%
	No, never	8	42.106%
	I don't know	1	5.263%
	Prefer not to say	0	0%
How often do you go to gynecologist for check-ups?	Yes, yearly	19	100%
	Went at least once	0	0%
	No, never	0	0%
	I don't know	0	0%
	Prefer not to say	0	0%

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Child information		Mean	Median
What is the age of the son/daughter this questionnaire is referring to?		13.947	13.5
		Frequencies	Frequencies %
What is the gender of the son/daughter this questionnaire is referring to?	Male	7	36.842%
	Female	12	63.158%
	Other	0	0%
Do you have any other children?	Yes	7	36.842%
	No	12	63.158%

Sources of information		Frequencies	Frequencies %
Which are your sources of information on HPV infection and HPV vaccination?	Paediatrician/general practitioner	5	26.315%
	Gynaecologist	8	42.105%
	Vaccination services	4	21.052%
	Pharmacist	0	0.0%
	Mother and child health centres	3	15.789%
	Government/Public health agency/central institutions	7	36.842%
	School	3	15.789%
	Friends	5	26.315%
	Family members	2	10.526%
	Websites of official public health institutions/government agencies	10	52.631%
	Other websites	7	36.842%
	Social media	9	47.368%
	Newspapers/leaflets/poster	6	31.579%
	Radio/television	4	21.052%
	I don't know	0	0%
	I prefer not to say	0	0%
	Never heard of HPV infection before	0	0%
Which information source do you think is most reliable to get sufficient information on HPV vaccine?	Paediatrician/general practitioner	11	57.894%
	Gynaecologist	12	63.158%
	Vaccination services	1	5.263%
	Pharmacist	0	0%
	Mother and child health centres	5	26.316%
	Government/Public health agency/central institutions	4	21.053%
	School	3	15.789%
	Friends/family members	1	5.263%
	Websites of official public health institutions/government agencies	8	42.105%
	Social media	0	0.0%

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	Newspapers/leaflets/poster	0	0.0%
	Radio/television	0	0.0%
	I don't know	0	0.0%
Do you feel sufficiently informed on HPV vaccination?	Absolutely yes	8	42.105%
	Sufficiently	6	31.579%
	I don't know	4	21.053%
	Insufficiently	1	5.263%
	Absolutely not	1	5.263%
Which social media platforms and webpages do you use daily or most often?	Facebook	15	78.947%
	Instagram	8	42.105%
	TikTok	0	0.0%
	Reddit	0	0.0%
	Snapchat	0	0.0%
	Pinterest	2	10.526%
	Twitter	2	10.526%
	LinkedIn	2	10.526%
	YouTube	6	31.579%
	Podcasts	1	5.263%
	Wikipedia, other Wiki pages	5	26.316%

Knowledge on HPV infection and vaccination		Frequencies	Frequencies %
HPV may cause cancer of cervix, vagina, vulva? (T)	True	18	94.737%
	False	0	0%
	I don't know	1	5.263%
HPV may cause cancers of penis (T)	True	14	73.684%
	False	2	10.526%
	I don't know	3	15.789%
HPV may cause anal cancer (T)	True	15	78.947%
	False	1	5.263%
	I don't know	3	15.789%
HPV may cause cancers of the back of the throat, including the base of the tongue and tonsils (T)	True	16	84.210%
	False	0	0%
	I don't know	3	15.789%
HPV is a sexually transmitted disease (T)	True	15	78.947%
	False	2	10.526%
	I don't know	1	5.263%
HPV may infect you without symptoms (T)	True	17	89.474%
	False	2	10.526%
	I don't know	0	0%
HPV infections are rare (F)	True	0	0%
	False	17	89.474%
	I don't know	2	10.526%
Most cervical cancers are not caused by HPV infections (F)	True	4	21.053%
	False	12	31.818%

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	I don't know	3	15.789%
HPV vaccines work better if given before 15 years of age (T)	True	15	78.947%
	False	2	10.526%
	I don't know	2	10.526%
HPV vaccines protect against all HPV types (F)	True	2	10.526%
	False	10	52.163%
	I don't know	7	36.842%
Early sexual intercourse increases the risk of contracting HPV (T)	True	16	84.211%
	False	1	5.263%
	I don't know	2	10.526%
HPV is treated with antibiotics (F)	True	0	0%
	False	17	89.474%
	I don't know	2	10.526%
HPV vaccines protect against all sexually transmitted diseases (F)	True	1	5.263%
	False	17	89.474%
	I don't know	1	5.263%
HPV vaccines provide 100 % protection against cancer and anogenital warts (F)	True	4	21.053%
	False	12	31.818%
	I don't know	3	15.789%
HPV vaccines cause fertility problems (F)	True	0	0%
	False	17	89.474%
	I don't know	2	10.526%
Sometimes HPV infections can last years (T)	True	17	89.474%
	False	0	0%
	I don't know	2	10.526%
Only women can be infected by HPV (F)	True	0	0%
	False	17	89.474%
	I don't know	2	10.526%
Genital warts are caused by HPV (T)	True	15	78.947%
	False	0	0%
	I don't know	4	21.053%
Most HPV infections resolve spontaneously (F)	True	7	36.842%
	False	9	47.368%
	I don't know	3	15.789%

		Frequencies	Frequencies %
What do you think are the benefits of HPV vaccination for the society?	Reduces the incidence of cancer	18	94.737%
	Reduces cancer mortality	16	84.210%
	Reduces potential complications	13	68.421%
	No benefits	0	0%
	Benefits are only for pharmaceutical companies	0	0%
	I don't know	1	5.263%

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Vaccination status of the child for whom you are/are responding to the questionnaire		Frequencies	Frequencies %
Has your son/daughter been vaccinated against HPV?	Yes	6	31.579%
	No	13	68.421%
If your son/daughter has not received HPV vaccination, do you plan to have him/her vaccinated for HPV in the future?	Definitely vaccinate	6	31.579%
	Rather vaccinate	5	26.316%
	I don't know	8	42.105%
	Rather not vaccinate	0	0%
	Definitely not vaccinate	0	0%
Regardless of HPV vaccination, your son/daughter received:	All the recommended paediatric vaccinations	13	68.421%
	Only mandatory vaccinations	4	21.053%
	Only some of the recommended paediatric vaccinations	2	10.526%
	I don't know	0	0%
If your son/daughter has not received all the recommended vaccinations, do you plan to have him/her vaccinated in the future?	Definitely vaccinate	9	47.368%
	Rather vaccinate	2	10.526%
	I don't know	8	42.105%
	Rather not vaccinate	0	0%
	Definitely not vaccinate	0	0%
Do you agree that your son/daughter may be at risk of HPV infection in the future?	Completely agree	18	94.737%
	Partially agree	0	0%
	I don't know	0	0%
	Completely disagree	1	5.263%
	Partially disagree	0	0%

Reasons for NOT getting HPV vaccination					
	Completely agree	Partially agree	I don't know	Partially disagree	Completely disagree
Fear of adverse event	-	(5) 38.461%	-	-	(8) 61.538%
No confidence in HPV vaccine	-	-	(1) 7.692%	(3) 23.077%	(9) 69.231%
Confusing information on HPV vaccination	(1) 7.692%	(2) 15.384%	(1) 7.692%	(2) 15.384%	(7) 53.846%
Scarce information on HPV vaccination	(2) 15.384%	(6) 46.154%	-	-	(5) 38.461%
No confidence in vaccinations in general	(3) 23.077%	(3) 23.077%	(1) 7.692%	-	(6) 46.154%
Only for girls: No need to get vaccinated because regular pap-test/HPV-DNA test can prevent cervical cancer	-	(1) 8.333%	(1) 8.333%	-	(10) 76.923%

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No need to get vaccinated because our child is young and not sexually active	-	(1) 7.692%	(1) 7.692%	(2) 15.384%	(9) 69.231%
HPV vaccination is not useful	-	(1) 8.333%	(1) 8.333%	-	(10) 76.923%
HPV vaccination is not mandatory	(8) 61.538%	-	(2) 15.384%	-	(3) 23.077%
Family's doctor's advice against HPV vaccination	-	-	(3) 25%	-	(9) 75%
Other health care worker's advice against HPV vaccination	-	(1) 8.333%	(2) 16.667%	-	(9) 75%
Familiars/friends' advice against HPV vaccination	-	-	(4) 33.333%	-	(8) 66.667%
Scarce promotion of HPV vaccination	(3) 25%	(3) 25%	(1) 8.333%	(3) 25%	(2) 16.667%
HPV vaccination promotes risky sexual behaviours	-	-	-	-	(12) 100%
Fear of injection	-	(2) 16.667%	-	-	(10) 83.333%
HPV infection is not severe	(1) 8.333%	-	(1) 8.333%	-	(10) 83.333%
Child has contraindications to HPV vaccine, as confirmed by his/her doctor	(2) 16.667%	-	(6) 50%	-	(4) 33.333%
Alternative medical approach, not including vaccinations	-	-	(3) 25%	(1) 8.333%	(8) 66.667%
We were not able to respect the date	-	-	(4) 33.333%	(1) 8.333%	(7) 58.333%
We did not know that HPV vaccination was free of charge	(2) 16.667%	(3) 25%	(1) 8.333%	(1) 8.333%	(5) 41.667%
It is difficult to get a date for vaccination	-	(1) 8.333%	(4) 33.333%	(2) 16.667%	(5) 41.667%
Vaccination service is difficult to reach	-	(1) 8.333%	(4) 33.333%	(1) 8.333%	(6) 50%
Religious concerns	(1) 8.333%	-	(1) 8.333%	-	(10) 83.333%
The effectiveness of vaccine is questionable and their popularity only benefits pharmaceutical companies	-	(1) 8.333%	-	(1) 8.333%	(10) 83.333%

		Frequencies	Frequencies %
What suggestions did the pediatrician/general practitioner/school nurse/school doctor give you about HPV vaccination?	Encouraged HPV vaccination	8	44.444%
	Discouraged HPV vaccination	0	0%
	Didn't express opinion about HPV vaccination	2	11.111%
	Didn't address the topic of HPV vaccination	3	16.667%
	Encouraged HPV vaccination, but did not provide adequate information/clarifications	0	0%

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	Different pediatrician/general practitioner gave us discordant opinion about HPV vaccine	0	0%
	We did not consult the pediatrician/general practitioner	5	27.778%
	I don't know	0	0%
	I prefer not to say	0	0%

Vaccination modalities		Frequencies	Frequencies %
How long does it take to get your son/daughter vaccinated (make an appointment + get the vaccine administered)	Less than 1 hour	11	61.111%
	1 to 2 hours	3	16.667%
	I don't know	2	11.111%
	>2 to 4 hours	0	0%
	More than 4 hours	2	11.111%
How far from your home do you have to go to vaccinate your son/daughter	more than 6 km	3	16.667%
	less than 2 km	7	38.889%
	>2 to 6 km	6	33.333%
	I don't know	2	11.111%
Would you agree to have your child vaccinated against HPV at school	Yes	7	38.889%
	No	7	38.889%
	Yes, but only if the doctor has prescribed it	4	22.222%
	I don't know	0	0%
	I prefer not to say	0	0%
Would you agree to have your child vaccinated against HPV at a pharmacy	Yes	5	27.778%
	No	9	50%
	Yes, but only if the doctor has prescribed it	3	16.667%
	I don't know	1	5.555%
	I prefer not to say	0	0%
Would you agree to have your child vaccinated against HPV in vaccination hub in a shopping mall	Yes	1	5.555%
	No	14	77.778%
	Yes, but only if the doctor has prescribed it	3	16.667%
	I don't know	0	0%
	I prefer not to say	0	0%
Would you agree to have your child vaccinated against HPV by general practitioner	Yes	16	88.889%
	No	0	0%
	Yes, but only if the doctor has prescribed it	0	0%
	I don't know	2	11.111%
	I prefer not to say	0	0%

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94% responders to the questionnaire were female, with high school degree education level and employed. Only 31% of the mothers participated yearly to cervical cancer screening program but another 21% underwent at least once the test. Whereas 100% declare to go regularly to the gynecologist or have been at least once.

The children the questionnaire was referring to had mean age of 14 and were 63% female and 36% had brothers or sisters.

Sources of information were multiple and the more reliable sources appear to be gynecologist, pediatrician/GP and also websites of official public health institutions/government agencies.

70% of the responders declared to feel enough informed and when asked some informations on HPV infection and vaccination, the responders showed a good level of knowledge on this issues.

Nevertheless only 31% of the children of the responders were in 53% of cases vaccinated towards HPV infection, and of the not vaccinated, 57% will be in the future (to be noted that the restant responded not to know but nobody declare not to be willing to vaccinate in the future). 61% were aware that their child might be at risk of HPV infection in the future.

For those not willing to vaccinate, the main reasons were scarce information and HPV vaccine not being mandatory.

44% were suggested to get the vaccination by their pediatrician.

Difficulty of access to vaccination centres does not seem to be a relevant issue, and as for alternative location for the vaccination, school was chosen only by 38% while preferring GP.



Slovak Republic

Demographic information - participants		Frequencies	Frequencies %
Who is answering the questionnaire	One parent/legal guardian	2119	92,94%
	Both parents/legal guardians	161	7,06%
		Mean	median
Age of parent 1/legal guardian 1:		41,98	42
Age of parent 1/legal guardian 2:		44,26	44
		Frequencies	Frequencies %
Gender of parent 1/legal guardian 1:	Female	2112	92,63%
	Male	162	7,11%
	Other	3	0,13%
	N/A	3	0,13%
Gender of parent 1/legal guardian 2:	Female	42	26,25%
	Male	114	71,25%
	Other	4	2,5%
Parent 1/legal guardian 1 - What is the highest degree or level of education you have completed?	Mandatory School	18	0,79%
	High School	942	41,32%
	Bachelor's degree	1184	51,93%
	Ph.D. or higher	102	4,47%
	Prefer not to say	26	1,14%
	N/A	8	0,35%
Parent 2/legal guardian 2 - What is the highest degree or level of education you have completed?	Mandatory School	71	3,11%
	High School	7	0,31%
	Bachelor's degree	77	3,38%
	Ph.D. or higher	0	0,00%
	Prefer not to say	5	0,22%
	N/A	2120	92,98%
Parent 1/legal guardian 1 – Are you currently employed?	Yes	2107	92,41%
	No	128	5,61%
	Prefer not to say	42	1,84%
	N/A	3	0,13%
Parent 2/legal guardian 2 - Are you currently employed?	Yes	150	6,58%
	No	2	0,09%
	Prefer not to say	8	0,35%
	N/A	2120	92,98%

For Mothers only		Frequencies	Frequencies %
Do you participate in the cervical cancer screening programme (pap-test/LBC/HPV-DNA test)?	Yes, yearly	1604	70,35%
	Underwent at least once	244	10,70%
	No, never	171	7,50%
	I don't know	125	5,48%

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How often do you go to gynecologist for check-ups?	Prefer not to say	28	1,23%
	N/A	108	4,74%
	Yes, yearly	2002	87,81%
	Went at least once	121	5,31%
	No, never	11	0,48%
	I don't know	33	1,45%
	Prefer not to say	0	0%
	N/A	113	4,96%

Child information		Mean	Median
What is the age of the son/daughter this questionnaire is referring to?		11,67	
		Frequencies	Frequencies %
What is the gender of the son/daughter this questionnaire is referring to?	Male	979	42,94%
	Female	1295	56,80%
	Other	3	0,13%
	N/A	3	0,13%
Do you have any other children?	Yes	1802	79,04%
	No	475	20,83%
	N/A	3	0,13%

Sources of information		Frequencies	Frequencies %
Which are your sources of information on HPV infection and HPV vaccination?	Paediatrician/general practitioner	1147	50,31%
	Gynaecologist	1276	55,96%
	Vaccination services	67	2,94%
	Pharmacist	43	1,89%
	Mother and child health centres	28	1,23%
	Government/Public health agency/central institutions	166	7,28%
	School	96	4,21%
	Friends	396	17,37%
	Family members	282	12,37%
	Websites of official public health institutions/government agencies	627	27,50%
	Other websites	630	27,63%
	Social media	611	26,80%
	Newspapers/leaflets/poster	525	23,03%
	Radio/television	690	30,26%
	I don't know	32	1,40%
	I prefer not to say	10	0,44%
	Never heard of HPV infection before	18	0,79%
	Never heard of HPV vaccination before	22	0,96%

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Which information source do you think is most reliable to get sufficient information on HPV vaccine?	Paediatrician/general practitioner	1775	77,85%
	Gynaecologist	1757	77,06%
	Vaccination services	91	3,99%
	Pharmacist	92	4,04%
	Mother and child health centres	89	3,90%
	Government/Public health agency/central institutions	268	11,75%
	School	180	7,89%
	Friends/family members	83	3,64%
	Websites of official public health institutions/government agencies	495	21,71%
	Social media	85	3,73%
	Newspapers/leaflets/poster	116	5,09%
	Radio/television	96	4,21%
	I don't know	182	7,98%
Do you feel sufficiently informed on HPV vaccination?	Absolutely yes	398	17,46%
	Sufficiently	921	40,39%
	I don't know	267	11,71%
	Insufficiently	421	18,46%
	Absolutely not	260	11,40%
	N/A	13	0,57%
Which social media platforms and webpages do you use daily or most often?	Facebook	1792	78,60%
	Instagram	723	31,71%
	TikTok	68	2,98%
	Reddit	1	0,04%
	Snapchat	15	0,66%
	Pinterest	185	8,11%
	Twitter	25	1,10%
	LinkedIn	136	5,96%
	YouTube	672	29,47%
	Podcasts	161	7,06%
	Wikipedia, other Wiki pages	31	1,36%

Knowledge on HPV infection and vaccination		Frequencies	Frequencies %
HPV may cause cancer of cervix, vagina, vulva? (T)	True	2150	94,30%
	False	27	1,18%
	I don't know	94	4,12%
	N/A	9	0,39%
HPV may cause cancers of penis (T)	True	1141	50,04%
	False	334	14,65%
	I don't know	788	34,56%
	N/A	17	0,75%
HPV may cause anal cancer (T)	True	961	42,15%

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	False	237	10,39%
	I don't know	1060	46,49%
	N/A	22	0,96%
HPV may cause cancers of the back of the throat, including the base of the tongue and tonsils (T)	True	237	10,39%
	False	237	10,39%
	I don't know	237	10,39%
	N/A	237	10,39%
HPV is a sexually transmitted disease (T)	True	1732	75,96%
	False	281	12,32%
	I don't know	250	10,96%
	N/A	17	0,75%
HPV may infect you without symptoms (T)	True	1792	78,60%
	False	75	3,29%
	I don't know	386	16,93%
	N/A	27	1,18%
HPV infections are rare (F)	True	135	5,92%
	False	1478	64,82%
	I don't know	638	27,98%
	N/A	29	1,27%
Most cervical cancers are not caused by HPV infections (F)	True	289	12,68%
	False	1094	47,98%
	I don't know	874	38,33%
	N/A	23	1,01%
HPV vaccines work better if given before 15 years of age (T)	True	1837	80,57%
	False	82	3,60%
	I don't know	337	14,78%
	N/A	24	1,05%
HPV vaccines protect against all HPV types (F)	True	574	25,18%
	False	730	32,02%
	I don't know	949	41,62%
	N/A	27	1,18%
Early sexual intercourse increases the risk of contracting HPV (T)	True	1357	59,52%
	False	225	9,87%
	I don't know	675	29,61%
	N/A	23	1,01%
HPV is treated with antibiotics (F)	True	195	8,55%
	False	1129	49,52%
	I don't know	929	40,75%
	N/A	27	1,18%
HPV vaccines protect against all sexually transmitted diseases (F)	True	103	4,52%
	False	1732	75,96%
	I don't know	420	18,42%
	N/A	25	1,10%
	True	448	19,65%

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HPV vaccines provide 100 % protection against cancer and anogenital warts (F)	False	1003	43,99%
	I don't know	802	35,18%
	N/A	27	1,18%
HPV vaccines cause fertility problems (F)	True	200	8,77%
	False	1366	59,91%
	I don't know	688	30,18%
	N/A	26	1,14%
Sometimes HPV infections can last years (T)	True	1561	68,46%
	False	24	1,05%
	I don't know	662	29,04%
	N/A	33	1,45%
Only women can be infected by HPV (F)	True	120	5,26%
	False	1844	80,88%
	I don't know	286	12,54%
	N/A	30	1,32%
Genital warts are caused by HPV (T)	True	1286	56,40%
	False	142	6,23%
	I don't know	818	35,88%
	N/A	34	1,49%
Most HPV infections resolve spontaneously (F)	True	210	9,21%
	False	1344	58,95%
	I don't know	696	30,53%
	N/A	30	1,32%

		Frequencies	Frequencies %
What do you think are the benefits of HPV vaccination for the society?	Reduces the incidence of cancer	2011	88,20%
	Reduces cancer mortality	1576	69,12%
	Reduces potential complications	1352	59,30%
	No benefits	42	1,84%
	Benefits are only for pharmaceutical companies	88	3,86%
	I don't know	128	5,61%

Vaccination status of the child for whom you are/are responding to the questionnaire		Frequencies	Frequencies %
Has your son/daughter been vaccinated against HPV?	Yes	750	32,89%
	No	1511	66,27%
	N/A	19	0,83%
If your son/daughter has not received HPV vaccination, do you plan to have him/her vaccinated for HPV in the future?	Definitely vaccinate	558	24,47%
	Rather vaccinate	338	14,82%
	I don't know	436	19,12%
	Rather not vaccinate	85	3,73%
	Definitely not vaccinate	80	3,51%

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	N/A	783	34,34%
Regardless of HPV vaccination, your son/daughter received:	All the recommended paediatric vaccinations	1426	62,54%
	Only mandatory vaccinations	590	25,88%
	Only some of the recommended paediatric vaccinations	219	9,61%
	I don't know	24	1,05%
	N/A	21	0,92%
If your son/daughter has not received all the recommended vaccinations, do you plan to have him/her vaccinated in the future?	Definitely vaccinate	626	27,46%
	Rather vaccinate	327	14,34%
	I don't know	319	13,99%
	Rather not vaccinate	83	3,64%
	Definitely not vaccinate	48	2,11%
	N/A	877	38,46%
Do you agree that your son/daughter may be at risk of HPV infection in the future?	Completely agree	985	43,20%
	Partially agree	649	28,46%
	I don't know	515	22,59%
	Completely disagree	51	2,24%
	Partially disagree	59	2,59%
	N/A	21	0,92%

Reasons for NOT getting HPV vaccination					
	Completely agree	Partially agree	I don't know	Partially disagree	Completely disagree
Fear of adverse event	5,35%	14,12%	13,73%	6,10%	22,28%
No confidence in HPV vaccine	3,73%	8,42%	13,82%	8,51%	27,02%
Confusing information on HPV vaccination	3,07%	11,05%	16,14%	7,32%	23,73%
Scarce information on HPV vaccination	6,71%	16,54%	10,61%	8,77%	18,55%
No confidence in vaccinations in general	3,46%	8,29%	8,73%	9,17%	31,54%
Only for girls: No need to get vaccinated because regular pap-test/HPV-DNA test can prevent cervical cancer	1,14%	4,34%	11,45%	4,91%	22,89%
No need to get vaccinated because our child is young and not sexually active	3,42%	6,10%	7,76%	8,64%	35,39%
HPV vaccination is not useful	2,19%	2,59%	12,28%	8,42%	35,53%
HPV vaccination is not mandatory	25,48%	7,85%	9,82%	3,82%	14,08%
Family's doctor's advice against HPV vaccination	7,19%	7,06%	22,59%	3,38%	20,53%
Other health care worker's advice against HPV vaccination	5,44%	7,02%	23,51%	2,85%	21,49%
Familiars/friends' advice against HPV vaccination	3,90%	9,17%	23,46%	3,82%	19,87%
Scarce promotion of HPV vaccination	8,82%	9,08%	19,78%	4,39%	18,03%

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HPV vaccination promotes risky sexual behaviours	1,80%	3,42%	14,25%	4,78%	35,92%
Fear of injection	1,84%	6,84%	8,33%	4,82%	38,38%
HPV infection is not severe	0,96%	1,23%	8,73%	7,54%	41,67%
Child has contraindications to HPV vaccine, as confirmed by his/her doctor	1,54%	1,67%	26,54%	2,37%	27,81%
Alternative medical approach, not including vaccinations	1,36%	3,03%	22,37%	4,30%	28,64%
We were not able to respect the date	2,19%	2,15%	20,00%	2,41%	32,63%
We did not know that HPV vaccination was free of charge	8,38%	5,66%	12,37%	3,60%	29,87%
It is difficult to get a date for vaccination	0,66%	1,58%	26,14%	2,59%	28,77%
Vaccination service is difficult to reach	0,39%	1,32%	22,89%	3,03%	31,97%
Religious concerns	0,61%	0,75%	8,16%	2,06%	48,11%
The effectiveness of vaccine is questionable and their popularity only benefits pharmaceutical companies	2,81%	7,72%	16,89%	8,33%	24,21%
I don't want to respond	2,50%	1,97%	22,28%	2,68%	29,78%

		Frequencies	Frequencies %
What suggestions did the pediatrician/general practitioner/school nurse/school doctor give you about HPV vaccination?	Encouraged HPV vaccination	1169	51,27%
	Discouraged HPV vaccination	6	0,26%
	Didn't express opinion about HPV vaccination	272	11,93%
	Didn't address the topic of HPV vaccination		
	Encouraged HPV vaccination, but did not provide adequate information/clarifications	75	3,29%
	Different pediatrician/general practitioner gave us discordant opinion about HPV vaccine	35	1,54%
	We did not consult the pediatrician/general practitioner	438	19,21%
	He suggests to delay vaccination	11	0,48%
	I don't know	67	2,94%
	I prefer not to say	37	1,62%

Vaccination modalities		Frequencies	Frequencies %
How long does it take to get your son/daughter vaccinated (make an appointment + get the vaccine administered)	Less than 1 hour	992	43,51%
	1 to 2 hours	133	5,83%
	I don't know	980	42,98%
	>2 to 4 hours	28	1,23%
	More than 4 hours	82	3,60%
	N/A	65	2,85%
How far from your home do you have to go to vaccinate your son/daughter	more than 6 km	455	19,96%
	less than 2 km	926	40,61%

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	>2 to 6 km	566	24,82%
	I don't know	278	12,19%
	N/A	57	2,50%
Would you agree to have your child vaccinated against HPV at school	Yes	561	24,61%
	No	1177	51,62%
	Yes, but only if the doctor has prescribed it	261	11,45%
	I don't know	190	8,33%
	I prefer not to say	37	1,62%
	N/A	54	2,37%
Would you agree to have your child vaccinated against HPV at a pharmacy	Yes	423	18,55%
	No	1408	61,75%
	Yes, but only if the doctor has prescribed it	225	9,87%
	I don't know	156	6,84%
	I prefer not to say	15	0,66%
	N/A	53	2,32%
Would you agree to have your child vaccinated against HPV in vaccination hub in a shopping mall	Yes	1499	65,75%
	No	389	17,06%
	Yes, but only if the doctor has prescribed it	168	7,37%
	I don't know	153	6,71%
	I prefer not to say	17	0,75%
	N/A	54	2,37%
Would you agree to have your child vaccinated against HPV by general practitioner	Yes	1926	84,47%
	No	96	4,21%
	Yes, but only if the doctor has prescribed it	123	5,39%
	I don't know	55	2,41%
	I prefer not to say	31	1,36%
	N/A	49	2,15%

93% of the responders were female, mostly employed and with High School or Bachelor's degree as education level. 70% of the mothers participated yearly to cervical cancer screening and 88% go regularly to the gynecologist for check-ups.

The children the questionnaire was referring to had mean age of 11,7 and were 43% male, 57% female and 79% had brothers or sisters.

Sources of information were multiple but mostly pediatrician or gynecologist, also considered by far the more reliable sources. Around half of the responders declared to feel sufficiently informed.

When asked some informations on HPV infection and vaccination to test their knowledge on this issues, and the responders show to have sufficient knowledge although with some gaps.

The children of the responders were in 33% of cases vaccinated towards HPV infection, and 40% of the non vaccinated will be vaccinated in the future. 63% were vaccinated with the recommended paediatric vaccinations, and 72% were aware that their child might be at risk of HPV infection in the future.

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For those not willing to vaccinate, the main reasons were scarce and confusing information, scarce promotion of HPV vaccine and HPV vaccination not being mandatory.

Only in 51% of cases the parents were suggested to get the HPV vaccination by their pediatrician. When asked what could be an accepted alternative location for the vaccination, schools were refused by 52% while preferring GP.

Conclusions

In conclusion, the responders are in all the countries mostly female and presumably those taking care of health issues regarding the children.

Although in all countries women generally declare to go regularly to the gynecologist for check-ups, not everywhere they participate regularly to cervical cancer screening program.

Regarding sources of information, responders indicated multiple sources but in all the countries, pediatrician and gynecologist appear to be those mostly consulted and also, by far, the more reliable ones.

Generally half of the responders considered to be sufficiently informed on HPV infection and vaccination, and when asked to answer specific questions on this topics, gaps, uncertainties and certain wrong beliefs.

Approximately half of the children of the responders were vaccinated towards HPV infection, even if a much higher % were vaccinated with recommended vaccines. Nevertheless 50-60% declared their will to vaccinate their childre for HPV in the future. In some countries like poland and Lithuania, pediatrician didn't suggest vaccination in more than 50% of cases.

For those not willing to vaccinate, the main reasons appears to be in all countries were scarce and confusing information, scarce promotion of HPV vaccine and HPV vaccination not being mandatory

In all countries parents do not support the idea of proposing vaccination in the schools but rather only accept GP's as vaccine delivery location.

From these questionnaires we can conclude that generally a common European policy on HPV vaccine promotion should definitively increase the level of information and making it more simple and user friendly and with collabotratiion of GPs and gynecologist. Benefits should be highly emphasized to overcome the fact that HPV vaccine is not mandatory.

The idea of vaccinating in schools, that is in place in some countreis with high coverage like sweeden, seems not very well accepted by parents and therefore needs to be very well explained and very well organized to gain the parents trust.



Focus Groups

To address the students and the teachers, we decided to perform FG in selected schools within each WP6 participating country. We decided to go directly in the school setting since the HPV vaccine is principally directed at school-age children, age range from 9-14 depending on the country. The school setting is the most adequate to capture this target. Moreover in the same environment, teachers opinions can be captured and are important reference figures, that have the tools to transmit knowledge and health education and capture how best to convey it to students.

Our aim was to understand to which extent both students and teachers are informed about HPV infection and HPV vaccine, and STD in general, and what sources of information they use to get information. Especially with the students, this should also be a first approach to understand which are the favorite sources of information and which is the most appealing and attractive way to catch their interest. We also want to get information about students and teachers attitude towards HPV vaccine and if they are informed of both benefits and side effects in a correct way. From the teachers we would also like to understand the willingness to get involved in health education and their willingness to help parents in being correctly informed to be able to take ponderate decisions concerning their children's health.

We agreed within WP6 partners on a very brief list of issues to be investigated in the FG:

Focus Group with students

We suggest maximum 2 hours discussion to perform at school, following the following points:

- explore the students knowledge about STD in general and in particular HPV infection and its consequences;
- explore the students knowledge about vaccination in general and HPV vaccination in particular;
- explore the sources of informations used;
- explore students attitudes, beliefs and concerns about vaccines in general and HPV vaccine in particular;
- explore which tools and information are deemed useful for a better understanding of the topic on HPV infection and vaccine.

Focus Group with teachers

We suggest maximum 2 hours discussion to perform at school, following the following points:

- explore the teachers knowledge about STD in general and in particular HPV infection and its consequences;
- explore the teachers knowledge about vaccination in general and in particular HPV vaccination;
- explore the sources of informations used;
- explore teachers attitudes, beliefs and concerns about vaccines in general and HPV in particular;
- explore which tools and information they use for HPV infection and vaccine, and health topics in general.

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- Explore if they ever address health topics in class especially on vaccination in general and HPV vaccination specifically. If not, explore if they would be favourable to talk about HPV vaccine in class with their students
- Explore if favourable to participate in training courses to improve knowledge on HPV infection and vaccination and on how to deal the topic in class with the students

FG is a method of qualitative research involving a small group of people (usually six to eight participants) who are assembled to participate in a discussion, guided by a moderator, about a specific topic. It is a very useful method to gain insight into the experiences and perspectives of specific stakeholders of interest and explore the group's opinion, generate ideas, identify potential barriers or problems and test solutions, on a variety of different issues.

FG are able to provide a richer understanding than than a personal one to one interview or a survey, leading to more contextualised and developed answers. FG also have the additional benefit to allow to capture nonverbal information which may be important, and to understand the causal link between why people behave in a certain way or hold a certain set of beliefs.

However in FG the sample size remains very small and selective and are used to generate personal opinions and attitudes, not appropriate to be turned in terms of numbers or statistics. Therefore it is good to support FG with a complementary survey and a mixed method (using both qualitative and quantitative) approach.

We report the descriptions and results of the FGs conducted with students and teachers in selected schools in Greece, Italy, Lithuania, and Slovenia, investigating on the knowledge, attitudes, and perceptions regarding HPV vaccination among students and teachers or public health specialists working in schools for Lithuania.



Greece

Report on knowledge, attitudes, and perceptions regarding HPV vaccination among students and teachers

Performed by: Lina Michala PhD, FRCOG, Associate Professor, Paediatric and Adolescent Gynaecology
1st Department of Obstetrics and Gynaecology, National and Kapodistrian University of Athens
Alexandra General Hospital linamichala@med.uoa.gr Tel: +306974478865 (Integral report as Annex 8)

Summary of findings

This qualitative study aimed to identify attitudes towards HPV vaccination among young adolescents and their teachers in Greece.

The study was conducted by a group of gynecologists specialized in pediatric and adolescent gynecology who provide sexual and relations education (SRE) to secondary schools. The researchers approached two public secondary schools that requested SRE from the team in 2023. Sixteen adolescents (10 girls and 6 boys) participated in the study groups, divided into two groups of 8, and 15 teachers (10 women and 5 men) participated in two teacher's study groups.

The study found that the general knowledge on STDs was deemed inadequate by both students and teachers. HIV and HPV were the commonest STDs mentioned, and students relied on biology courses and friends for information. Teachers recalled lectures on STDs during their late school years, 20 years ago.

In terms of HPV, the majority of students had received the vaccine, but they did not know exactly what it was for. Older students knew that there were multiple types of HPV and that it causes cancer, but they did not know the link with genital warts. Most students felt that HPV affected only women and that men are carriers. Two teachers knew that HPV causes cancer of the mouth and pharynx in both sexes.

Regarding opportunities for SRE at school, the study found that skills workshops were directed towards other topics, and that Home Economics had a curriculum for SRE. However, both students and teachers felt that SRE was underdeveloped and that their knowledge base was deficient. Teachers also felt that they would not be able to answer student's questions on the subject adequately. However, they would gladly introduce SRE to their students, provided they received adequate training and support from both Ministry of Health and Education.

Methods

This qualitative study was conducted by a group of gynecologists specialized in pediatric and adolescent gynecology. They have experience in providing Sexual and Relationship Education (SRE) to secondary schools and conduct an average of four lectures per month for children and adolescents aged 11-15. The study is supported by the 1st Department of Obstetrics and Gynecology at the National and Kapodistrian

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University of Athens, in collaboration with the First Health Authority of Athens. The aim of the study was to identify attitudes towards HPV vaccination among young adolescents and their teachers.

For this study, we approached two public secondary schools, the “Musical Secondary School of Alexandroupoli” (MSSA) and the “Secondary School of Anafi” (SSA), which had requested Sexual and Relationship Education (SRE) lectures from our team in 2023. We provided written information in Greek about the study and the requirements for participation to both students and their teachers. At MSSA, a teacher approached the school's group of student representatives to recruit adolescents, while all teachers from both schools were informed about the project via email.

Participants were given the option of two sessions to choose from, outside of their school hours. All teachers completed a written consent form. For students, consent was obtained from their guardian or parent. Demographic information was collected using a simple electronic form on GoogleForms® (Annex 2). The online work group was conducted using the Zoom video communications platform®, and for privacy reasons, student cameras were turned off. The conversation was recorded, transcribed using the online Microsoft Word 365 application, and manually assessed for accuracy. Participants' names were not recorded to preserve anonymity, instead they were represented by their Initials.

The texts resulting from the study group discussions were uploaded to the computer-assisted qualitative data analysis software (CAQ-DAS) Taguette® to facilitate the highlighting of relevant quotes and identification of themes.

Participants Demographics:

16 adolescents (10 girls and 6 boys) participated in the student's study groups, divided in two groups of 8. Their median age was 13 (range 12-17). (Table 1)

15 Teachers (10 women and 5 men) participated in two teacher's study groups (7 and 8 persons). Their median age was 44 years (35-50). (Table 2)

Results

The main themes that emerged from the discussions are presented below:

1. Knowledge on Sexually Transmitted Diseases (STDs)

- General knowledge on STDs was deemed inadequate, both by students and teachers.
- Students aged 15 and above were more knowledgeable.
- HIV and HPV were the commonest STDs mentioned.
- Sources of knowledge were biology courses and friends for students.
- Teachers recalled lectures on STDs during their late school years, 20 years back.

Both students and teachers expressed that their general knowledge on STDs was inadequate. Students stated that they obtained information about STDs mainly from their biology courses and their friends, while teachers recalled learning about STDs during their own school years, which were approximately 20 years ago. Older students, aged 15 and above, showed more knowledge on STDs and were able to name other examples of STDs besides HIV and HPV, such as hepatitis and syphilis.

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Regarding the transmission of STDs, both students and teachers recognized that they are serious and can be transmitted from men to women. Protection was acknowledged as being important. While some students mentioned chlamydia and gonorrhea, most of them mentioned HIV/AIDS and HPV as the most common STDs. One 17-year-old student showed knowledge about vertical and blood-borne transmission, while a 13-year-old student wondered about the transmission of STDs in homosexual female relationships, suggesting that they may be mainly transmitted in heterosexual relationships. Teachers mentioned HIV as the most known STD, followed by HPV as a cause of warts. Some also knew about chlamydia, gonorrhea, hepatitis, and syphilis. They expressed concern about their own deficient knowledge on the subject, both as teachers and parents, and felt that they would not be able to answer students' questions adequately.

2. Knowledge on HPV

- Little information from school
- Aware of latent infection, multiple HPV types, causative link with cancer of the cervix
- Most felt that it affected only women and that men are carriers, although two teachers knew that HPV causes cancer of the mouth and pharynx in both sexes.
- Most students had had the vaccine, without exactly knowing what it was for

Nine out of ten girls, but none of the boys had had the vaccine. In most cases, girls said that they had had the vaccine, without really knowing what it was for. However, older students knew that there were multiple types of HPV, that there is a carrier state during which, people can unknowingly transmit the virus. Some had heard information from school, whereas others not.

Interestingly, they knew that HPV causes cancer but did not know the link with genital warts.

Teachers on the other hand were aware of the high prevalence of HPV, that it can be transmitted by hands and fomites and that it causes cancer to men and women, although mostly women. One teacher also knew that the immune system plays an important role in the manifestation of the HPV infection.

3. Opportunities for SRE at school

- Underdeveloped entity
- Skills workshops directed to other topics, such as robotics
- Home Economics has a brief chapter in Relations Education
- Biology in 8th, 10th and 11th grade has information on STDs

The opportunities for Sex and Relationships Education (SRE) at school were found to be underdeveloped. While some older students recalled learning about STDs in their Biology course, this was not a compulsory topic in younger years. Additionally, some biology teachers did not fully cover the topic, while others took extra time to discuss it with their students. Home Economics also briefly touched upon Relationships Education in Year 7. It was noted that Skills Workshops on other topics, such as robotics, were more commonly offered than SRE workshops. Teachers themselves acknowledged feeling awkward about SRE

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discussions and preferred to invite specialists to cover the subject. This contrasted with other risky behaviors such as drug abuse. They gave the example of a chemistry teacher in one of the schools, who was comfortable presenting information on substance abuse, to students as part of his course.

4. Attitude to vaccination in general

- In general, students had a positive view on vaccination.
- They did not question the vaccination programme. Decisions were taken from parents, according to pediatrician's advice.
- There was a tendency to overestimate side effects.
- Teachers in general were also positive with regards to vaccination.
- They stressed the importance of research, information and long term follow up on vaccines.
- They also mentioned that some vaccines are obligatory for children to start school.

All participants had a generally positive attitude toward vaccination. One student mentioned that vaccines represented progress and had saved humanity from devastating diseases and epidemics.

In most cases students did not question what vaccines had to be done. In fact, they were not aware of what vaccines they had done, as vaccination was driven by their parents- usually their mother- who followed their pediatrician's counselling. Students tended to overestimate the side effects of vaccination. One 12-year-old girl mentioned side effects affecting 20% of vaccinated individuals, but still, did not question that vaccines are necessary. Finally, they emphasized the importance of research being conducted before a vaccine is widely circulated.

Teachers tended to be more hesitant, although they acknowledged the necessity of vaccination. They preferred vaccines that had been in circulation for many years and had been tested on at least one generation. Two teachers mentioned having doubts about vaccination when their children developed Type 1 Diabetes, and some doctors suggested during initial hospitalization that the disease may have been a response to vaccination. However, none of them were certain that there was a causative relation. In fact, one of them fully vaccinated their other younger child.

COVID-19 had affected people's views on vaccination. Discussions around the efficacy and side effects of COVID-19 vaccines made some doubt vaccines in general. Others appreciated the research that backed "standard and older" vaccines.

It was mentioned that vaccination of a child is mandatory before starting primary school, but this does not apply to secondary school admissions. When asked about their position on vaccinating children at school, they spontaneously answered that it primarily helped ethnic minority children, such as Roma minorities. Upon further discussion, they acknowledged that this could be a good idea, even for the general population, particularly for remote places or small islands like the island of Anafi.

Teachers commented on how a vaccination during adolescence should consider the child's opinion. They said that this could work both ways, with adolescents declining or requesting a vaccination that their parent was proposing.

5. Knowledge and Attitudes towards HPV vaccination

- Vaccination was a joint decision between the parent and the pediatrician.

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- None of the boys had had the vaccine and were not aware that they were entitled to it.
- Although student's attitude was generally positive, they did not know the recommended age HPV vaccine should be performed.
- Some teachers knew that boys were entitled to the HPV vaccine.
- They knew that the vaccine ideally had to be done early.

All the girls were aware of the HPV vaccine, although they were not clear on what it did. Some knew it as "the vaccine against Cervical Cancer." None of the boys knew that they were entitled to the vaccine. In fact, one boy felt it was unfair that he couldn't receive it, as he too could be affected or carry the virus. There was confusion about the ideal age for vaccination. Teachers mentioned that it should be done early, ideally before sexual relations start. One teacher, who had also studied pharmaceuticals, knew that the immune response was better if the vaccine was administered early. Some teachers knew that boys were entitled to the vaccination.

One teacher mentioned a sad story of a colleague whose daughter had died in her twenties, supposedly after she had been vaccinated. She did not have the details of the death but had felt distraught at the time and was certain that the vaccine should not be administered in adulthood.

Although pediatricians were the driving force behind vaccination, teachers felt that they were not promoting HPV vaccination enough, particularly when compared with other vaccines such as the Meningitis B vaccine, which is not financially covered by the National Health System. Some thought that HPV vaccination was optional.

6. Ways to improve knowledge on HPV vaccination

- All suggested the importance of having expert information regarding HPV vaccination at schools.
- Leaflets on HPV vaccination.
- Students stressed how the internet and social media could play a role.
- Having Child Health Booklets that include the vaccination schedule for HPV.

The students expressed a strong desire for experts to come to their schools and discuss HPV vaccination. They also suggested using social media platforms such as TikTok, Instagram, and Snapchat to reach adolescents, as well as creating YouTube videos for primary school children. One girl suggested using aggressive advertising techniques, such as showing images of women affected by cancer, to persuade young people to get vaccinated.

One teacher questioned why pediatricians did not emphasize the importance of HPV vaccination to parents, as much as they did for other vaccines. They gave the example of meningitis B, where their pediatrician had strongly recommended the vaccine due to the severity of the disease. The teacher suggested that pediatricians should treat HPV vaccination as equally important as other vaccines. Another teacher and mother of two older boys stated that she had never heard of the vaccine, and that the Child Health Booklet for her children did not include information about it. She felt that having new Child Health Booklets which included HPV vaccination, would increase uptake and make it sound "less optional".



6. SRE Implementation

- All were positive for SRE to be included at schools.
- Most mentioned that the program should be compulsory.
- Lessons could be done by a teacher, preferably a biologist.
- However, any teacher could take up the role, provided they had relevant training.
- Television, the internet and social media from official policymakers could also promote information.

With regards to sex and relationship education (SRE), all students expressed a desire to have regular lessons included in their curriculum, taking place once or twice a month. Students felt that the most appropriate teacher for this class would be a biologist, but this was not a requirement. They would prefer the class to be small, with a maximum of 10 students, so that everyone would be attentive and engaged. Although they wondered whether it would be better to make these classes optional, they ultimately agreed that it would be best to include all students in the discussion.

An interesting idea was for older high school students to advise younger students.

Students also liked the idea of a doctor coming to schools once or twice a year to provide them with extra information.

Other sources for information on STD and Relationships Education would be television, the internet, and social media. Students felt that their doctor and parents could also give them more information. Regarding social media, they stressed the importance of the source of the clips. Students preferred the information to come from official scientific accounts. They preferred to have pictures or small videos. They also suggested quizzes to make the information interactive. Some suggested the idea of a celebrity making the video, while others preferred doctors to take on the role.

Some teachers were willing to deliver SRE, provided they received proper training. Still, they stressed how their schedule was tight and that there should be incentives for them to be trained and participate. Each school could nominate one or two teachers to provide SRE. This could be a biologist or physical education teacher, although not exclusively so. They felt that this should be compulsory for all schools, with a framework jointly built by the Ministry of Education and Ministry of Health. Having an official program was deemed important, as they felt that otherwise, some parents would object to the course.

Teachers proposed that their nominated colleagues would have internet-based training to begin with, culminating in a live workshop. They acknowledged that webinars were useful but felt they could be quite tiresome, particularly as they were inundated with them.

Another idea was for nurses or primary care doctors in neighboring health centers to provide SRE to students after receiving relevant training.

Other ideas to promote SRE was to include medical students in schools, as their age is closer to schoolchildren, and they are more likely to relate to them. One teacher also suggested volunteering from medical and paramedical groups that visited remote areas of the country to provide health support. These groups could also offer SRE to schools.

Finally, a teacher suggested exchanges between schools- potentially even on an international level- or events/student fora to enhance knowledge.

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Conclusion

In conclusion, this study highlights the need for improved SRE in schools to increase awareness and knowledge of STDs and HPV, which could lead to more informed decisions about vaccination. All students showed a vivid interest in the discussions, which confirmed the impression of our team when providing relevant information to schools.

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Italy

Study was performed by Eva Benelli e Alessandra Craus from the journalistic and editorial agency Zadig, located in Rome. Zadig is today formed by a core group of specialists, around which operates a network of journalists, physician, researchers, computer scientists, creatives and innovators specialized in medicine, health, science and environment.

Methods

In Italy five FG were conducted. All participants were contacted by a project contact person and a written invitation followed. The FG were facilitated by two moderators, experts in institutional health communication, using a grid of questions (Annex 9). In the same Annex 9 all the transcriptions of the FG conducted are detailed. All meetings were audio-recorded, subject to informed consent from the participants. In addition, a written questionnaire on sociodemographic data was administered anonymously. Finally, students, as minors, were given a parent/guardian release form for permission to participate in the FG (all informations and authorization forms visible in Annex 9).

Five FG were conducted from March 22 to April 5, 2023, in online mode. Students (22, 29/03 and 3/04) and teachers (27/03 and 5/04) participated. All participants attending, students and teachers, were recruited within secondary schools of I and II degrees located in Northern, Southern and Central Italy. The participating regions were: Piemonte, Lazio, Basilicata, Puglia and Calabria.

A total of 37 participants were present in total in the five FG: 29 students (14 girls and 15 boys) and 9 teachers (all female). Table 1 describes the participants characteristics: there is a prevalence of students vs teachers (29 and 9 respectively).

Tabel 1. Participants characteristics

Region	School	N. participants	Role	Gender (students)	Age (students)	N. vaccinated (students)
Piemonte	1 (secondary school I degree)	5	4 students, 1 teacher	3 F, 1 M	14	4
Lazio	2 (secondary school II degree)	14	13 students, 1 teacher	5 F, 8 M	14-16	13
Basilicata	1 (secondary school II degree)	3	2 students, 1 teacher	1 F, 1 M	14	2

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Puglia	2 (secondary school II degree)	3	2 students, 1 teacher	1 F, 1 M	14	0
Calabria	4 (secondary school I and II degree)	12	8 students, 5 teachers	5 F, 3 M	12-15	5

Questions used to guide the discussion:

Students

1. Have you ever heard of the HPV?
2. If yes, how did you learn about it?
3. If yes, do you know what can be caused by an HPV infection in women and men?
4. Do you know how HPV can be transmitted from person to person?
5. Do you know of any other infections that is transmitted through sexual intercourse?
6. In your opinion, how can these infections be avoided?
7. In your opinion, how can HPV infection be prevented?
8. Do you know that there is a vaccine against HPV?
9. Have any of you been vaccinated? If no, why?
10. Do you think it is necessary to talk more about HPV infection and vaccine?
11. Who do you think should give you information about HPV infection and HPV vaccine?

Teachers

1. Do you all know about HPV and what it can cause in women and men?
2. Do you also know the way of transmission from person to person?
3. What kind of screening is done to diagnose cervical cancer in time?
4. In what ways can HPV infection be prevented?
5. Are you aware of the existence of the HPV vaccine?
6. Have you ever discussed this in class with your students?
7. If yes, how did you approach the topic?
8. In your opinion, would it be important to devote school time to the topic of STD prevention?
9. Which figures should be involved?
10. As teachers, do you feel you can contribute?
11. What feelings and emotions do you have about the role you could play in the future health of students?
12. How do you feel about an in-school vaccination service?

Results

1) Students

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The 29 students, 14 girls and 15 boys with an average age of 14, are mostly attend the first year of secondary school (high school). Most of them did not know about the HPV or had only heard of it. The HPV vaccination rate, limited to the FG participants, was higher in North-Central Italy students than in Southern Italy (17 and 6 vaccinated respectively). It is noteworthy however, that a teacher from a school in the Calabria region (south) reported that in that area there is a strong adherence to HPV vaccination and that almost all of her students are vaccinated. A minority of students (even among the vaccinated) had poor and superficial knowledge about HPV infection and HPV vaccination, in certain cases had incorrect information.

It is noteworthy to enlighten that students from one of the schools in northern Italy, instead demonstrated to have greater and more accurate knowledge of this issue than the other participants.

Perceived obstacles related to the promotion of HPV vaccination in young people were:

- Poor knowledge of HPV and more generally of STD and their prevention
- Poor communication and information coming from official institutions and reference figures: pediatrician, general practitioner, family, school
- Absence of a sexual education class in school hours
- Insufficient time to address issues related to sexuality and health education during school time
- Scarce attitude to health prevention
- Fake news circulating among adults and young people
- Lack of information in parents
- Doubts, uncertainties and fears among parents
- Difficulty in involving families in initiatives organized by the schools
- Difficulty in involving peers and stimulating their interest in this issue
- Embarrassment in dealing with of sexuality-related topics
- Insufficient communication between parents, children, health personnel and teachers.

The main favorable factors that could facilitate the promotion of HPV vaccination in young people emerging from the discussion were:

- Implementation of initiatives and projects on the topic
- Utility of organizing a sexual education class at school
- Enthusiasm, participation and willingness to get involved after the participation in the FG
- Involvement of students in peer education programs
- Collaboration between school, family and health professionals
- Informative and education meetings for parents, students and teachers conducted with the support health professionals
- Opportunities to liaise with their parents to promote HPV vaccination
- Use of digital technologies as a communication and information channel
- Awareness of the importance of health education
- Being able to recognize appropriate scientific sources to properly inform themselves
- Participation in projects involving FG

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2) Teachers

All 9 teachers participating in the FG were female, and in predominantly teaching in the first year of secondary school. Most of them were familiar with the HPV and among them those who were parents all had their child vaccinated. All of the teachers had devoted during the school classes, some lessons to topics related to health education, and as for the science and biology teachers, they also mentioned STD and their prevention. It should be highlighted that more than one teacher reported that their students, immediately after the FG experience, reacted with great enthusiasm, promoting among their classmates and in other classes the importance of HPV vaccination through claims and initiatives to be spread and shared with students and teachers. In addition, teachers from a school in the Calabria Region reported that the descriptive questionnaire addressed to the students participating in the FG was also distributed to other classes in the school at class councils.

Finally, it should be noted that it was not possible to conduct the FG with teachers from Central Italy schools.

Percieved obstacles by teachers, related to the promotion of HPV vaccination in young people were:

- Lack of adequate information and training in the topic addressed
- Poor collaboration between families and school staff
- Difficulty in involving parents of students in extracurricular activities
- Poor communication between parents and health facilities
- Difficulty relating to parents of students on issues related to sexuality
- Difficulty in responding comprehensively to students' questions and requests on issues related to sexuality
- Students' embarrassment in dealing with the topic of sexuality
- Insuficcient time to address health education topics, prevention of STD and vaccinations
- Absence of a sexual education class
- Difficulty in organizing initiatives, meetings and projects at school with parents, students and health personnel
- Fake news circulating among adults and young people
- Poor health literacy

The main favorable factors that could facilitate the promotion of HPV vaccination in young people, that emerged from the discussion with teachers were:

- Implementation of initiatives and projects on the topic
- Importance of organizing a sexual education class at school
- Enthusiasm, participation and willingness to get involved by students after participating in the FG
- Involvement of students in peer education programs
- Collaboration between school, families and health professionals
- Informative and education meetings for parents, students and teachers conducted with the support of health professionals
- Opportunities for students to liaise with their parents to promote HPV vaccination

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- Use of digital technologies as a communication and information channel
- Awareness of the importance of health education
- Possibility of having a medical practice in the schools, for medical consultations and possibly to carry out anti-HPV vaccination
- Participation in projects involving FG

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Lithuania

Methods

Target group, type of FG, consent

On the 21th of April 2023 two FG sessions was conducted online. Target group was public health specialists working in schools who are mostly involved in health issues at schools and have direct contact with students.

The first meeting was attended by 12 school-based public health professionals and the second by 9. Participants provided their consent for participation in the FG sessions electronically.

Discussion topics

The FG discussion was guided by a set of questions prepared in advance. First of all was explained the aim of the group discussion. The main objective of the focus group sessions was to collect the impressions of public health specialists regarding the proposed vaccination against the papilloma virus:

- to identify doubts and fears
- to focus on the reasons for possible mistrust
 - to identify aspects of communication that can be improved and facilitations for access to the vaccination offer.

Moderator was free to direct the discussions based on the group dynamics or the circumstances of the discussion asking the questions mostly appropriate. Moderator focused on the main goals of the discussion.

Duration of the FG sessions

The duration of each FG session was approximately an hour.

Data analysis

All FG sessions were recorded and transcribed as analysis was conducted based on these transcriptions.

Results

1. In the first discussion, participants expressed concerns about the insufficient information available regarding HPV and its consequences. They indicated that they relied on validated and scientific literature sources, as well as the European vaccination website, to obtain necessary information. Participants suggested that the National Public Health Centre under the Ministry of Health or the Ministry of Health of The Republic of Lithuania should create standardized guidelines for all public health specialists working in schools.

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During the second discussion, however, participants expressed a contrasting opinion. They claimed that they did not feel a lack of information and were able to locate scientifically credible sources of information when necessary. Also, they emphasized the importance of inter-institutional cooperation. Public health specialists have expressed a desire to participate in training sessions to update their knowledge. Practical training (face-to-face) would be the preferred method of learning. E-learning where you can choose your learning time is also actual.

2. According to the public health specialists who participated in the discussion, they organize talks for children on sex education, which also cover the topic of HPV vaccination, depending on the type of school they work in (primary, pro-gymnasium, gymnasium). This information is usually introduced to children between the ages of 10 and 11 years old. The specialists also integrate topics related to sexuality into biology and ethics classes. Information on vaccination is also provided to parents. An electronic diary is the most popular channel for disseminating information for parents. Class meetings where participate parents, public health specialists are rarely attended, as the lack of time allocated for speaking is not considered to be an effective way of presenting information.
3. Overall, the participants emphasized that both vaccination and sexuality are highly sensitive topics. The image of vaccination has been negatively affected by the COVID-19 pandemic. Public health specialists expressed their need for a standardized training framework to prepare lessons and activities for students in schools. They noted that although some parents are interested in these vaccinations and some children are already vaccinated, it can be challenging to convince parents with controversial opinions to vaccinate their children against HPV. In this regard, general practitioners play a crucial role in promoting vaccination acceptance. As frontline workers, they have direct contact with parents and can provide information, suggest vaccinations, and answer questions.
4. The participants demonstrated confidence in all vaccines recommended by the national immunization program in Lithuania, including those for HPV infection. However, they also expressed concerns regarding the potential difficulties of organizing and managing the flow of students if vaccinations were to be administered in schools. As a result, public health professionals working in schools expressed their disagreement with the possibility to incorporate vaccination into the school curriculum.

Poland

Methods

We conducted one session group among students and one among teachers using questionnaire. At the date of deadline of this report, we are in the process on preparing and analysing data on first round session and preparing to draw next schools. Below a very short information about the first round results containing demographic characteristic of the groups.

The process is delayed but slowly ongoing, because conducting the research requires the consent of the university authorities, which unfortunately involves waiting for a decision.

- Total number of participants in the FG sessions was: 34 and teachers: 4
- Method that was used for the data collection was a dedicated questionnaire, which was provided in the classroom, among students and in a different classroom among teachers, not in the same time, but in the same day. Each participant was obligatorily familiarized with the consent form to participate in the study and, before commencing to fill in the questionnaire, agreed by signing the form.
- A table showing the demographics and a paragraph containing a short description of the demographic characteristics (age, sex, school grade...).

Demographics students data

Sex	Age group	Number	Education
Female	19 y.o.	6	Secondary education
	20-24 y.o.	11	Secondary education
	47 y.o.	1	Secondary education
Man	19 y.o.	1	Secondary education
	20-24 y.o.	15	Secondary education

Demographics teachers data

Sex	Age	Number	Education
Female	34	1	Higher education
	42	1	Higher education
	47	1	Higher education
	51	1	Higher education

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Slovenia

Methods

Through FG analysis we will try to determine how well teachers are informed about sexually transmitted infections in general and specifically about HPV infection and its consequences. In particular, we will be interested in what sources of information are available to them and what are their attitudes, beliefs and concerns about vaccination. We want to find out whether health topics are ever discussed in the classroom, whether vaccinations are discussed and whether teachers would participate in training to improve their knowledge about HPV infection and how to address this topic in the classroom. With the FG, we will try to develop a conversation that will lead us to the desired information.

We will conduct four FG, the first on April 20, 2023, the others will follow during the course of the project. Up to 5 teachers of 6th grade primary school or students of upper primary school grades will participate in each FG. Teachers and pupils in primary schools are an important source of information on HPV, as HPV vaccination takes place at a general health check-up in the 6th grade.

FGs will be organized with the support of the Healthy Schools Network, coordinated by the National Institute of Public Health. We invited schools from different parts of Slovenia, from urban and rural environments, to participate.

Results

Conclusions for FG 1 – performed in Ljubljana, the 20th April 2023 – 5 participants, women aged 45-55

1. Attitudes towards vaccination

One FG participant believes that as a biology teacher she has sufficient knowledge of health topics, but is aware that teachers of other subjects do not have this knowledge. She considers vaccination of children and adults as important, and follows the advice of the professionals. She trusts in the safety and effectiveness of vaccines, so she and her close ones are vaccinated according to the regular schedule, as well as at their own expense (vaccination against tick-borne meningoencephalitis).

The second participant feels that she does not have enough knowledge about health topics. Due to her lack of knowledge, she invites experts from the local health care centre to the sixth grade parent-teacher meetings. She is not convinced of the safety and effectiveness of vaccines, and she and her family members are not vaccinated according to the regular schedule.

2. Communication with pupils

The biology curriculum does not cover infectious diseases and vaccination. Therefore, in the last two grades of primary school, the teacher voluntarily teaches about the mechanism of vaccination. In the sixth grade, she uses interactive contents to mention the possibility of cancer prevention through vaccines for the first time. As a result, she has a negative experience with pupils' parents. When talking to sixth graders,

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she focuses only on cervical cancer, avoiding questions about various unconventional sexual practices. She also introduces throat and prostate cancers to older pupils (eighth and ninth grade). She covers these topics during class and does not devote extra hours to them. She presents the contents at a cellular level, most often when the curriculum covers the genital organs. She believes that conversations about these topics are extremely useful, especially if they can help prevent cancer. Part of her role as a teacher is to inform children about these topics, but she leaves the decision to vaccinate to the pupils' parents.

The second participant does not talk about these topics with the pupils. She does not cover the content on infectious diseases and vaccination within the class or the curriculum, but rather leaves these topics to the experts. Health professionals present these topics to parents in the form of a lecture prior to the parent-teacher meeting. She believes that this information is more important for parents than for pupils, as the parents decide on behalf of their children to vaccinate them.

3. Communication with parents

Both participants communicate with pupils' parents during the parent-teacher meetings, before the periodic systematic examination. The biology teacher estimates that she has sufficient knowledge and tools to communicate with parents, as this is the area in which she has trained. The second participant feels that it is important that an expert is present, as she does not feel competent enough in the field herself. Both participants receive professional material from the health care centre. They forward the material to parents via the E-Assistant, or they physically distribute it to the children who take it to their parents. One school organises a lecture for parents in cooperation with the health care centre, while another school leaves it to the teachers. Both participants agree that their role in parents' decision to vaccinate their children is small and they leave it to the parents.

4. Training, sources of information

During class, they obtain most information about vaccine-preventable diseases and vaccination (including HPV vaccination) from the Internet, mainly from Wikipedia.org, as well as from primary school textbooks. Both agree that it is better to have experts introduce these topics to pupils, as education would be an additional burden on already overburdened school staff. Also, they feel that lectures on sexually transmitted diseases are inappropriate for younger children and thus are more suitable for the secondary school age group. Nonetheless, both of them would have attended the training. One of the participants considers it important that the event is organized online, and that the keynote speaker, in addition to being an expert, is also a good rhetorician. The method of implementation is not important to the other participant, however, she would like that a representative of alternative medicine is also present in addition to a medical professional.



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Germany

Background:

In the scope of WP6, participating countries were asked to assess main determinants of HPV vaccine hesitancy at national level. For this purpose, a survey to address the families of target girls and boys was planned in order to investigate their level of knowledge on HPV, HPV infection-related diseases, HPV vaccines, their opinion on HPV vaccine and the vaccination status of their child. As participating partner, Germany conducted a national survey among parents of children that were not (yet) vaccinated against HPV.

Methods:

The survey was conducted by an opinion research institute, on behalf of the Federal Centre for Health Education (BZgA). The questionnaire was provided by the WP6 lead and agreed upon within the WP6 partners. It was then translated and adapted to the national context by the German PERCH partner institutions.

The larger recruited sample consisted of 1439 parents of children aged nine to 15 years in Germany. Parents of children who were already vaccinated against HPV were screened out after a few selected questions. The core sample consisted of 1000 parents of children that were not (yet) vaccinated against HPV.

The interviews were held from End of May to mid-July 2023. The data collection took place in a mixed mode design (computer assisted telephone interviews, online survey). Participants' telephone numbers for the interviews were selected randomly from a registry of mobile and landline numbers in Germany. Participants from the online-survey were members of an actively recruited online access-panel.

Results:

Parents' intention to vaccinate against HPV

Slightly more than one in three parents intend (definitely/rather yes) to have their own child vaccinated against HPV in the future (38%). If the child is between 9 and 12 years old, the intention to vaccinate is 47%, and for 13- to 15-year-olds, it is 25%. The proportion of undecided parents whose native language is not German is significantly higher than the overall average (32% vs. 21% total).

One in eight parents plans to have the child (rather) not or definitely not (12%) vaccinated against HPV. The lower the risk of HPV infection among adolescents is perceived by the parents, the lower the willingness to vaccinate.

Recommendation by doctors

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Parents equally experienced encouragement to vaccinate their child against HPV (42%) and a lack of active advice from doctors about the vaccine (40%). Significantly less often, vaccination was recommended for a later age of the child (15%) or there has been a recommendation without any additional information provided (8%) or different recommendations by different doctors. Only in very few cases parents were given negative advice (3%).

General willingness to vaccinate

Seven in ten parents report that their child has received all recommended childhood and adolescent vaccines (69%). One in six children has incomplete immunization coverage (17%), and another one in ten is only vaccinated against measles (9%), which is the only mandatory vaccine in Germany.

Non-native speakers (20%) and HPV vaccine-hesitant respondents (17%) more frequently reported that their child had only the compulsory measles vaccination.

One-third of respondents whose children have not (yet) received all recommended vaccinations intend to catch up on them in any case/rather yes (33%). Two-thirds are undecided (22%), opposed (17%), or make the decision based on the type of pending vaccination (28%).

Parents (with incomplete vaccination coverage for their children) who refuse HPV vaccination are also opposed to other recommended vaccinations for children (43%).

Overall, the willingness to vaccinate is very high in the population: three quarters of parents with still HPV-unvaccinated children are (rather) in favor of vaccination in general (48% in favor, 29% rather in favor). Only 7% are (rather) opposed.

Parents' reported reasons against HPV vaccination

Overall, only a few strong arguments against vaccination became evident in the survey among parents. The main reason against HPV vaccination is the perceived lack of public education on the topic (59% strongly agree/strongly agree). Other more frequently mentioned concerns include the current non-necessity of vaccination due to the child's age (45%), the fear of side effects or the support of the child's own decision-making authority at an older age (39% each). All other reasons mentioned play a minor role.



Sweeden

Background:

In Sweden, HPV-vaccination is administered in schools by the school health nurses by the age of 11-12 years with high coverage in both girls and boys.

Since 2010 girls have been offered the HPV-vaccine in the national immunization program with possible catch up vaccination until 18 years of age and since 2020 also boys have been included in the program if born 2009 or later.

All vaccinations included in the program are registered in the national vaccine registry, the data is updated once a year. The vaccine coverage of HPV were reported as 92% and 88 % by 2022 for girls at least 1 dose and 2 doses respectively and 88 % and 83 % for boys respectively.

Aim: Assess parental vaccine acceptance concerning the national immunization program and explore factors contributing to the high vaccine acceptance in Sweden using a qualitative study design. The purpose of exploring these factors was to gain insights of the main drivers for vaccination, in order to inform the implementation of and communication about the national immunization program, including HPV vaccination.

Methods: The Swedish PERCH team has chosen to present relevant results from a previous study which included parents of both children 1-2 years and 8-12 years of age. The entire study is presented here: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10500778/pdf/12889_2023_Article_16678.pdf

Within the scope of the PERCH project and WP D6.1 we present the results from three focus group discussions (FGDs) of parents of children aged 8-12 years performed in 2019 as an example from a Swedish perspective. The study:

Parents of children 8-12 years were recruited to the study through purposive sampling. Participating parents had a child aged 8–12 years who had been offered NIP vaccinations, including HPV vaccination for girls, in school health services. The three FGDs were held in different geographical regions, one FGD was conducted in each of the respective parts, the southern (Göteborg), middle (Svealand) and northern (Norrbotten) part of the country.

In total, 25 parents (13 mothers and 12 fathers) participated in the three FGDs. The FGDs were analyzed using qualitative content analysis. Written informed consent to participate in the study was obtained from all participants before the start of the FGDs. The study was approved by the Swedish Ethical Review Authority (Dnr 2019–00122). Data collected was anonymized to ensure that no individual could be identified.

The number of participants varied from 4 to 11 in the 3 FGDs.

The FGD guide covered topics including experiences of childhood vaccinations generally, vaccine preventable diseases (VPDs), experiences of vaccination appointments for children, decision-making as a parent, information for informed decisions and trust in information sources and also additional questions included experiences with HPV vaccination. In relation to HPV-vaccination, parents were

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asked about what they know about childhood vaccination, their experiences and decision-making regarding childhood vaccinations as well as information in relation to vaccinations.

Results: For parents to children aged 8–12 years, the overall themes from the FGDs were; vaccinate to do good for the individual and society; a foundation of trust is built at child health centers for decisions later on; decisions for vaccination become more complex as children get older; communication on vaccination changes as children get older and need to be explicit and tailored to the situation. The themes and underlying categories are presented in table 1.

In conclusion, both individual and societal perspectives were shown to influence the vaccination decision for childhood immunizations, as manifested in parental reflections and experiences. As nurses have a key role, it is important to provide them with continued support and tools to facilitate their support for parents in making informed decisions. Continuous work for supporting driving factors for vaccination over time is needed to maintain high vaccine acceptance in Sweden.

Table 1. Overall results from 3 FGDs with parents of children aged 8–12 years

Theme	Category
Vaccinate to do good for the individual and society	<ul style="list-style-type: none"> -Contribution to the community to protect the health of the individual and others -Protect against serious diseases -“We against them” mentality”
A foundation of trust is built at CHC for decisions later on Decisions for vaccination become more complex as children get older	Safety and trust in the national immunization program (NIP) and child health care (CHC)
Communication changes as children get older and need to be explicit and tailored to the situation	<ul style="list-style-type: none"> -Need for transparent information for everyone -Parents prefer and relate differently to information sources -The child is a primary transmitter of information, especially for HPV vaccination

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