

Supplementary material

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Supplement to: JKP Chu, CW Sing, Y Li, et al. Factors affecting human papillomavirus vaccine acceptance among parents of Primary 4 to 6 boys and girls in Hong Kong. *Hong Kong Med J* 2024 Oct;30(5):386-99. <https://doi.org/10.12809/hkmj2311144>.

Supplementary Table 1. Acceptance of the human papillomavirus vaccine for children according to study variables among parents of boys*

	No. (%)	Acceptance rate
Participants	345	73.0%
Socio-demographic characteristics		
Sex		
Male	135 (39.1%)	83.0%
Female	210 (60.9%)	66.7%
Age-group, y		
≤30	2 (0.6%)	50%
31-35	35 (10.1%)	42.9%
36-40	217 (62.9%)	85.3%
41-45	85 (24.6%)	56.5%
>45	6 (1.7%)	50%
Marital status		
Married	327 (94.8%)	75.2%
Single/separated/divorced/widowed	18 (5.2%)	33.3%
Highest education level completed		
Secondary school or below	90 (26.1%)	73.3%
Bachelor's degree/non-degree tertiary education	237 (68.7%)	74.7%
Master's/PhD	18 (5.2%)	50%
Monthly household income, HKD		
<20 000	9 (2.6%)	22.2%
20 000-39 999	159 (46.1%)	81.1%
40 000-59 999	139 (40.3%)	71.9%
>60 000	38 (11.0%)	55.3%
Occupation		
Architecture and engineering	29 (8.4%)	79.3%
Arts and entertainment	20 (5.8%)	65%
Business administration and management	54 (15.7%)	74.1%
Communications	37 (10.7%)	83.8%
Community and social services	22 (6.4%)	68.2%
Education	30 (8.7%)	60%
Science and technology	22 (6.4%)	63.6%
Installation repair and maintenance	21 (6.1%)	76.2%
Farming fishing and forestry	22 (6.4%)	86.4%

Government	24 (7.0%)	70.8%
Health and medicine	19 (5.5%)	57.9%
Law and public policy	15 (4.3%)	40%
Sales	21 (6.1%)	95.2%
Others	9 (2.6%)	100%
No. of child(ren) in Primary 4 to Primary 6		
1	238 (69.0%)	85.3%
2	88 (25.5%)	51.1%
≥3	19 (5.5%)	21.1%
Receipt of regular seasonal influenza vaccines		
Yes	85 (24.6%)	40%
No	217 (62.9%)	86.6%
Not sure	43 (12.5%)	69.8%
Receipt of HPV vaccine		
Yes	24 (7.0%)	50%
No	258 (74.8%)	79.8%
Not sure	63 (18.3%)	54%
Completion of Pap smear[†]		
Yes	21 (10.0%)	42.9%
No	135 (64.3%)	77.8%
Not sure	54 (25.7%)	48.1%
Child's school type		
Public local	214 (62.0%)	83.2%
Private	77 (22.3%)	46.8%
Aided	45 (13.0%)	71.1%
Direct Subsidy Scheme	9 (2.6%)	66.7%
Child's current year of enrolment		
Primary 4	93 (27.0%)	67.7%
Primary 5	156 (45.2%)	71.2%
Primary 6	96 (27.8%)	81.2%
Child's receipt of any vaccine under HKCIP		
Yes	93 (27.0%)	40.9%
No	196 (56.8%)	88.3%
Not sure	56 (16.2%)	73.2%
Child's receipt of regular seasonal influenza vaccines		
Yes	128 (37.1%)	46.9%
No	204 (59.1%)	89.2%

Not sure	13 (3.8%)	76.9%
Awareness and knowledge of HPV		
Heard of HPV vaccine		
Yes	278 (80.6%)	82.0%
No	67 (19.4%)	35.8%
HPV knowledge score	Accept: 7.04 ± 2.34 Decline: 5.34 ± 2.46	N/A
Discussion with child regarding prevention of STDs		
Yes	100 (29.0%)	49%
No	201 (58.3%)	80.6%
Not sure	44 (12.8%)	93.2%
Attitudes towards HPV and HPV vaccine		
I believe it's better for my child to receive the HPV vaccine before they become sexually active		
Strongly disagree	6 (1.7%)	0
Disagree	16 (4.6%)	6.2%
Neutral	130 (37.7%)	85.4%
Agree	184 (53.3%)	73.4%
Strongly agree	9 (2.6%)	55.6%
Age at which a child should receive the HPV vaccine, y		
Never	9 (2.6%)	11.1%
<9	0	N/A
9-10	6 (1.7%)	33.3%
11-12	35 (10.1%)	68.6%
13-14	92 (26.7%)	68.5%
15-16	91 (26.4%)	81.3%
17-18	104 (30.1%)	81.7%
>18	8 (2.3%)	37.5%
The HPV vaccine is too expensive		
Strongly disagree	2 (0.6%)	0
Disagree	4 (1.2%)	25%
Neutral	23 (6.7%)	21.7%
Agree	140 (40.6%)	80%
Strongly agree	176 (51.0%)	76.1%
HPV infection is very common		
Strongly disagree	8 (2.3%)	12.5%

Disagree	24 (7.0%)	45.8%
Neutral	90 (26.1%)	62.2%
Agree	210 (60.9%)	82.4%
Strongly agree	13 (3.8%)	84.6%
I believe my child is at risk of HPV infection in the future		
Strongly disagree	9 (2.6%)	22.2%
Disagree	20 (5.8%)	45%
Neutral	45 (13.0%)	48.9%
Agree	266 (77.1%)	80.8%
Strongly agree	5 (1.4%)	80%
I believe the HPV vaccine is safe for my child		
Strongly disagree	1 (0.3%)	0
Disagree	7 (2.0%)	0
Neutral	23 (6.7%)	52.2%
Agree	155 (44.9%)	83.2%
Strongly agree	159 (46.1%)	69.8%
I believe my child can be protected from HPV without HPV vaccination		
Strongly disagree	1 (0.3%)	0
Disagree	270 (78.3%)	79.3%
Neutral	39 (11.3%)	59%
Agree	14 (4.1%)	78.6%
Strongly agree	21 (6.1%)	19%
I believe the HPV vaccine is effective in preventing HPV infection for my daughter/son		
Strongly disagree	2 (0.6%)	0
Disagree	4 (1.2%)	0
Neutral	23 (6.7%)	56.5%
Agree	286 (82.9%)	79.4%
Strongly agree	30 (8.7%)	40%
I think HPV vaccination will encourage my child to engage in early sexual activity		
Strongly disagree	11 (3.2%)	45.5%
Disagree	281 (81.4%)	77.6%
Neutral	32 (9.3%)	56.2%
Agree	17 (4.9%)	64.7%
Strongly agree	4 (1.2%)	0

I think HPV vaccination will encourage my child not to use protection during sex

Strongly disagree	32 (9.3%)	75%
Disagree	255 (73.9%)	77.3%
Neutral	38 (11.0%)	52.6%
Agree	14 (4.1%)	71.4%
Strongly agree	6 (1.7%)	16.7%

I think people will be labelled promiscuous if they are infected with HPV

Strongly disagree	81 (23.5%)	72.8%
Disagree	208 (60.3%)	80.3%
Neutral	28 (8.1%)	35.7%
Agree	23 (6.7%)	65.2%
Strongly agree	5 (1.4%)	20%

I am worried about the short-term side-effects (eg, headache, dizziness, and redness at the injection site) of the HPV vaccine

Strongly disagree	6 (1.7%)	50%
Disagree	36 (10.4%)	55.6%
Neutral	174 (50.4%)	73.6%
Agree	88 (25.5%)	71.6%
Strongly agree	41 (11.9%)	92.7%

I am worried that the HPV vaccine might affect adolescent development

Strongly disagree	7 (2.0%)	42.9%
Disagree	122 (35.4%)	72.1%
Neutral	150 (43.5%)	68.7%
Agree	59 (17.1%)	93.2%
Strongly agree	7 (2.0%)	42.9%

I am worried that the HPV vaccine might have unknown long-term side-effects

Strongly disagree	6 (1.7%)	33.3%
Disagree	136 (39.4%)	71.3%
Neutral	136 (39.4%)	72.8%
Agree	62 (18.0%)	83.9%
Strongly agree	5 (1.4%)	40%

I think it is difficult to explain the reason for HPV vaccination to my child

Strongly disagree	3 (0.9%)	33.3%
Disagree	57 (16.5%)	77.2%
Neutral	132 (38.3%)	74.2%
Agree	150 (43.5%)	72%
Strongly agree	3 (0.9%)	33.3%

Abbreviations: HKCIP = Hong Kong Childhood Immunisation Programme; HKD = Hong Kong dollars; HPV = human papillomavirus; N/A = not applicable; STD = sexually transmitted disease

* Data are shown as No. (%), %, or mean \pm standard deviation, unless otherwise specified

† Percentages were calculated among female participants (n=210)

Supplementary Table 2. Acceptance of the human papillomavirus vaccine for children according to study variables among parents of girls*

	No. (%)	Acceptance rate
Participants	451	89.6%
Socio-demographic characteristics		
Sex		
Male	134 (29.7%)	86.6%
Female	317 (70.3%)	90.9%
Age-group, y		
≤30	5 (1.1%)	100%
31-35	30 (6.7%)	86.7%
36-40	356 (78.9%)	92.7%
41-45	59 (13.1%)	71.2%
>45	1 (0.2%)	100%
Marital status		
Married	438 (97.1%)	89.7%
Single/separated/divorced/widowed	13 (2.9%)	84.6%
Highest education level completed		
Secondary school or below	78 (17.3%)	91%
Bachelor's degree/non-degree tertiary education	364 (80.7%)	89%
Master's/PhD	9 (2.0%)	100%
Monthly household income, HKD		
<20 000	17 (3.8%)	70.6%
20 000-39 999	234 (51.9%)	87.2%
40 000-59 999	175 (38.8%)	94.3%
>60 000	25 (5.5%)	92%
Occupation		
Architecture and engineering	24 (5.3%)	87.5%
Arts and entertainment	25 (5.5%)	92%
Business administration and management	53 (11.8%)	92.5%
Communications	53 (11.8%)	83%
Community and social services	38 (8.4%)	89.5%
Education	31 (6.9%)	87.1%
Science and technology	32 (7.1%)	96.9%
Installation repair and maintenance	33 (7.3%)	87.9%
Farming fishing and forestry	17 (3.8%)	100%

Government	50 (11.1%)	88%
Health and medicine	17 (3.8%)	94.1%
Law and public policy	20 (4.4%)	85%
Sales	31 (6.9%)	80.6%
Others	27 (6.0%)	100%
No. of child(ren) in Primary 4 to Primary 6		
1	320 (71.0%)	94.4%
2	112 (24.8%)	82.1%
≥3	19 (4.2%)	52.6%
Receipt of regular seasonal influenza vaccines		
Yes	62 (13.7%)	80.6%
No	286 (63.4%)	89.2%
Not sure	103 (22.8%)	96.1%
Receipt of HPV vaccine		
Yes	14 (3.1%)	71.4%
No	391 (86.7%)	90%
Not sure	46 (10.2%)	91.3%
Completion of Pap smear [†]		
Yes	5 (1.6%)	80%
No	267 (84.2%)	91%
Not sure	45 (14.2%)	91.1%
Child's school type		
Public local	273 (60.5%)	96.3%
Private	103 (22.8%)	81.6%
Aided	66 (14.6%)	74.2%
Direct Subsidy Scheme	9 (2.0%)	88.9%
Child's current year of enrolment		
Primary 4	141 (31.3%)	90.8%
Primary 5	195 (43.2%)	86.7%
Primary 6	115 (25.5%)	93%
Child's receipt of any vaccine under the HKCIP		
Yes	85 (18.8%)	60%
No	320 (71.0%)	96.9%
Not sure	46 (10.2%)	93.5%
Child's receipt of regular seasonal influenza vaccines		
Yes	83 (18.4%)	61.4%
No	336 (74.5%)	96.1%

Not sure	32 (7.1%)	93.8%
Awareness and knowledge of HPV		
Heard of HPV vaccine		
Yes	350 (77.6%)	91.4%
No	101 (22.4%)	83.2%
HPV knowledge score	Accept: 6.12 ± 2.68 Decline: 5.13 ± 3.02	N/A
Discussion with child regarding prevention of STDs		
Yes	53 (11.8%)	88.7%
No	340 (75.4%)	88.8%
Not sure	58 (12.9%)	94.8%
Attitudes towards HPV and HPV vaccine		
I believe it's better for my child to receive the HPV vaccine before they become sexually active		
Strongly disagree	14 (3.1%)	35.7%
Disagree	23 (5.1%)	65.2%
Neutral	235 (52.1%)	93.6%
Agree	172 (38.1%)	92.4%
Strongly agree	7 (1.6%)	71.4%
Age at which a child should receive the HPV vaccine, y		
Never	10 (2.2%)	10%
<9	1 (0.2%)	100%
9-10	6 (1.3%)	66.7%
11-12	42 (9.3%)	85.7%
13-14	108 (23.9%)	90.7%
15-16	121 (26.8%)	89.3%
17-18	154 (34.1%)	95.5%
>18	9 (2.0%)	100%
The HPV vaccine is too expensive		
Strongly disagree	3 (0.7%)	33.3%
Disagree	24 (5.3%)	58.3%
Neutral	51 (11.3%)	60.8%
Agree	187 (41.5%)	97.9%
Strongly agree	186 (41.2%)	94.1%
HPV infection is very common		
Strongly disagree	15 (3.3%)	33.3%

Disagree	30 (6.7%)	46.7%
Neutral	135 (29.9%)	90.4%
Agree	263 (58.3%)	97.7%
Strongly agree	8 (1.8%)	75%
I believe my child is at risk of HPV infection in the future		
Strongly disagree	9 (2.0%)	11.1%
Disagree	34 (7.5%)	55.9%
Neutral	90 (20.0%)	84.4%
Agree	315 (69.8%)	97.5%
Strongly agree	3 (0.7%)	33.3%
I believe the HPV vaccine is safe for my child		
Strongly disagree	2 (0.4%)	50%
Disagree	18 (4.0%)	72.2%
Neutral	46 (10.2%)	71.7%
Agree	249 (55.2%)	98.4%
Strongly agree	136 (30.2%)	82.4%
I believe my child can be protected from HPV without HPV vaccination		
Strongly disagree	4 (0.9%)	100%
Disagree	328 (72.7%)	96.6%
Neutral	72 (16.0%)	87.5%
Agree	17 (3.8%)	76.5%
Strongly agree	30 (6.7%)	23.3%
I believe the HPV vaccine is effective in preventing HPV infection for my daughter/son		
Strongly disagree	1 (0.2%)	0%
Disagree	16 (3.5%)	75%
Neutral	51 (11.3%)	78.4%
Agree	349 (77.4%)	97.7%
Strongly agree	34 (7.5%)	32.4%
I think HPV vaccination will encourage my child to engage in early sexual activity		
Strongly disagree	11 (2.4%)	63.6%
Disagree	337 (74.7%)	95%
Neutral	73 (16.2%)	87.7%
Agree	14 (3.1%)	50%
Strongly agree	16 (3.5%)	37.5%

I think HPV vaccination will encourage my child not to use protection during sex		
Strongly disagree	26 (5.8%)	69.2%
Disagree	325 (72.1%)	95.4%
Neutral	76 (16.9%)	86.8%
Agree	9 (2.0%)	77.8%
Strongly agree	15 (3.3%)	20%
I think people will be labelled promiscuous if they are infected with HPV		
Strongly disagree	90 (20.0%)	96.7%
Disagree	287 (63.6%)	95.8%
Neutral	55 (12.2%)	65.5%
Agree	8 (1.8%)	50%
Strongly agree	11 (2.4%)	18.2%
I am worried about the short-term side-effects (eg, headache, dizziness, and redness at the injection site) of the HPV vaccine		
Strongly disagree	4 (0.9%)	50%
Disagree	60 (13.3%)	85%
Neutral	241 (53.4%)	90.5%
Agree	132 (29.3%)	95.5%
Strongly agree	14 (3.1%)	50%
I am worried that the HPV vaccine might affect adolescent development		
Strongly disagree	14 (3.1%)	85.7%
Disagree	184 (40.8%)	95.7%
Neutral	185 (41.0%)	88.6%
Agree	55 (12.2%)	81.8%
Strongly agree	13 (2.9%)	53.8%
I am worried that the HPV vaccine might have unknown long-term side-effects		
Strongly disagree	3 (0.7%)	66.7%
Disagree	186 (41.2%)	96.8%
Neutral	182 (40.4%)	88.5%
Agree	65 (14.4%)	83.1%
Strongly agree	15 (3.3%)	46.7%
I think it is difficult to explain the reason for HPV vaccination to my child		

Strongly disagree	4 (0.9%)	75%
Disagree	64 (14.2%)	90.6%
Neutral	168 (37.3%)	86.9%
Agree	202 (44.8%)	96.5%
Strongly agree	13 (2.9%)	15.4%

Abbreviations: HKCIP = Hong Kong Childhood Immunisation Programme; HKD = Hong Kong dollars; HPV = human papillomavirus; N/A = not applicable; STD = sexually transmitted disease

* Data are shown as No. (%), %, or mean \pm standard deviation, unless otherwise specified

† Percentages were calculated among female participants (n=317)

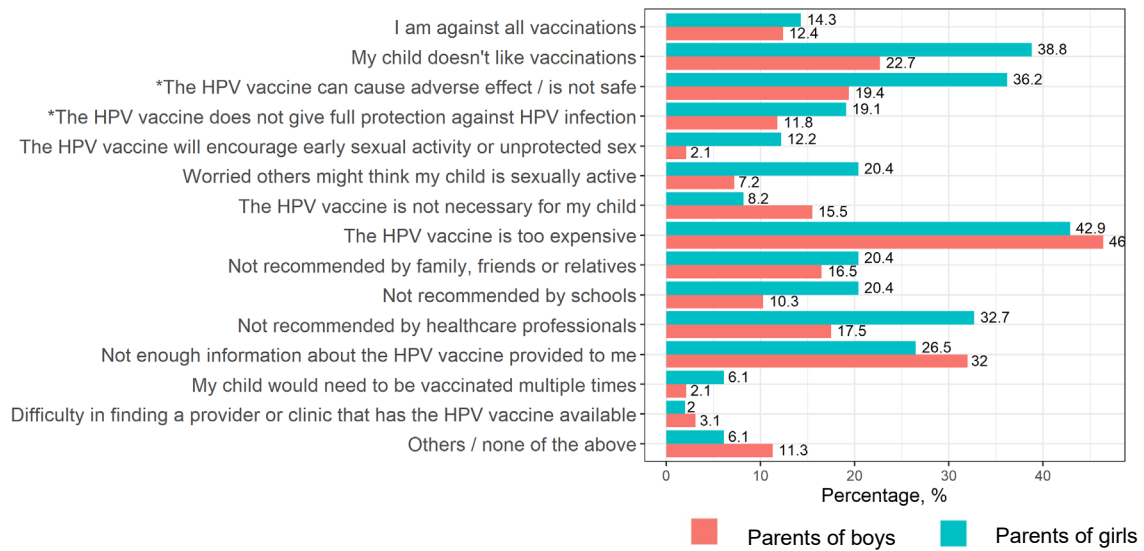
Supplementary Table 3. Awareness and knowledge of human papillomavirus in parents of boys*

	Response to the statement ‘I am worried that the HPV vaccine might affect adolescent development’			P value
	Agree/Strongly agree (n=66)	Neutral (n=129)	Disagree/Strongly disagree (n=150)	
Heard of HPV vaccine	62 (93.9%)	94 (72.9%)	122 (81.3%)	0.002
HPV knowledge score	7.59 ± 2.46	6.40 ± 2.44	6.30 ± 2.43	0.001

Abbreviation: HPV = human papillomavirus

* Data are shown as No. (%) or mean ± standard deviation

Supplementary Figure. Reasons for declining human papillomavirus vaccination for their child among parents of boys (n=97) and parents of girls (n=49)



Abbreviation: HPV = human papillomavirus

* The denominators were 93 and 47 for parents of boys and parents of girls, respectively, because participants whose children received the HPV vaccine were unable to choose a reason for declining

Appendix 1. English version of the survey

Factors contributing to the acceptance of HPV vaccine among parents of primary school students in Hong Kong in 2021

Section 1: Sociodemographics

1. What is your gender?
 Male Female

2. What is your age?
 ≤30 31–35 36–40 41–45 >45

3. What is your marital status?
 Single Married Separated / Divorced / Widowed

4. What is the highest level of education you have attained?
 Below Primary School Primary school Secondary school
 Non-degree Tertiary Education Bachelor's degree Master's/PhD

5. What is your occupation?
 Architecture and Engineering
 Arts and Entertainment
 Business, Administration and Management
 Communications
 Community and Social Services
 Education
 Science and Technology
 Installation, Repair and Maintenance
 Farming, Fishing and Forestry
 Government
 Health and Medicine
 Law and Public Policy
 Sales
 Others/none of the above

6. What is your district of residence?

- | | | | |
|--|---------------------------------------|---------------------------------------|----------------------------------|
| <input type="checkbox"/> Central & Western
Chai | <input type="checkbox"/> Eastern | <input type="checkbox"/> Southern | <input type="checkbox"/> Wan |
| <input type="checkbox"/> Kowloon City | <input type="checkbox"/> Kwun Tong | <input type="checkbox"/> Sham Shui Po | <input type="checkbox"/> Islands |
| <input type="checkbox"/> Yau Tsim Mong | <input type="checkbox"/> Wong Tai Sin | <input type="checkbox"/> Kwai Tsing | <input type="checkbox"/> North |
| <input type="checkbox"/> Sai Kung | <input type="checkbox"/> Sha Tin | <input type="checkbox"/> Tsuen Wan | <input type="checkbox"/> Tai Po |
| <input type="checkbox"/> Tuen Mun | <input type="checkbox"/> Yuen Long | | |

7. What is your monthly household income?

- <10,000 HKD
 10,000–19,999 HKD
 20,000–39,999 HKD
 40,000–59,999 HKD
 60,000–79,999 HKD
 >80,000 HKD

8. Do you receive seasonal influenza vaccine on a regular basis?

- Yes No Not sure

9. Have you received the HPV vaccine before?

- Yes No Not sure

10. **(For female respondents ONLY)** Have you taken a pap smear before?

- Yes No Not sure

11. How many child(ren) do you have in Primary 4 to Primary 6?

- 1 2 3 >3

In the following parts, please fill in the survey for the [OLDEST] child only if you have more than one child attending primary 4-6.

12. What is your child's gender?

- Male Female

13. What is your child's school type?

- Public local school Private schools
 Aided schools Direct Subsidy Scheme (DSS) schools

14. What district is your child's school in?

- | | | | |
|--|---------------------------------------|---------------------------------------|----------------------------------|
| <input type="checkbox"/> Central & Western
Chai | <input type="checkbox"/> Eastern | <input type="checkbox"/> Southern | <input type="checkbox"/> Wan |
| <input type="checkbox"/> Kowloon City | <input type="checkbox"/> Kwun Tong | <input type="checkbox"/> Sham Shui Po | <input type="checkbox"/> Islands |
| <input type="checkbox"/> Yau Tsim Mong | <input type="checkbox"/> Wong Tai Sin | <input type="checkbox"/> Kwai Tsing | <input type="checkbox"/> North |
| <input type="checkbox"/> Sai Kung | <input type="checkbox"/> Sha Tin | <input type="checkbox"/> Tsuen Wan | <input type="checkbox"/> Tai Po |
| <input type="checkbox"/> Tuen Mun | <input type="checkbox"/> Yuen Long | | |

15. What is your child's school grade?

- Primary 4 Primary 5 Primary 6

16. Has your child received any of the vaccines recommended under the Hong Kong Childhood Immunisation Programme (HKCIP) subsidised by the government?

- Yes No Not sure

17. Does your child receive the seasonal influenza vaccine on a regular basis?

- Yes No Not sure

18. Has your child received the HPV vaccine before?

- Yes No (**Go to Question 20**) Not sure (**Go to Question 20**)

19. Was your child vaccinated for HPV vaccine through the HKCIP?

- Yes No Not sure

20. Do you discuss about the prevention of sexually transmitted diseases (STDs) with your child?

- Yes No Not sure

Section 2: Awareness and knowledge about human papillomavirus (HPV) and HPV vaccine

21. Have you heard of the HPV Vaccine?

- Yes No (**Go to Question 23**)

22. What was your source of information on the HPV Vaccine? (Tick all that apply)

- | | | |
|---|--|---|
| <input type="checkbox"/> Child's school | <input type="checkbox"/> Healthcare provider | <input type="checkbox"/> Advertisement |
| <input type="checkbox"/> Internet | <input type="checkbox"/> News | <input type="checkbox"/> Government promotion |
| <input type="checkbox"/> Others/none of the above | | |

23. HPV can be transmitted by:
 Females Males Both Unsure
24. How can HPV be transmitted? (Tick all that apply)
 Physical Contact (e.g. hand shaking) Aerosol / Air Droplet
 Sexual contact Blood
 Contact with inanimate objects (eg. chairs, tables)
 Mother-to-child
25. What measures could be used to protect against HPV? (Tick all that apply)
 Abstinence Condoms HPV Vaccination
 Alcohol Sanitisation Surgical Mask Washing with soap
 Others/none of the above
26. HPV infection can occur without signs or symptoms.
 True False Unsure
27. HPV can cause harm to females only, while males would not be affected.
 True False Unsure
28. HPV can cause sexually transmitted diseases (STDs).
 True False (**Go to Question 30**) Unsure (**Go to Question 30**)
29. What sexually transmitted diseases (STDs) can be caused by HPV? (Tick all that apply)
 Genital Warts
 Gonorrhoea
 Syphilis
 Acquired immunodeficiency syndrome (AIDS)
 Chlamydia
30. HPV can cause cancers.
 True False (**Go to Question 32**) Unsure (**Go to Question 32**)
31. What types of cancers can be caused by HPV? (Tick all that apply)
 Cervical Cancer

- Anal Cancer
- Penile Cancer
- Vulvar Cancer
- Vaginal Cancer
- Head and Neck cancer
- All of the above

32. The purpose of a pap smear is to detect which of the below: (Tick all that apply)

- Cervical cancer
- HPV
- Sexually transmitted diseases
- All of the above

33. There are many subtypes of HPV.

- True
- False
- Unsure

34. If a patient has already been infected with HPV, he/she should still receive the HPV vaccine.

- True
- False
- Unsure

35. My child can be infected with HPV from receiving the HPV vaccine.

- True
- False
- Unsure

36. HPV infection can be treated with antibiotics.

- True
- False
- Unsure

37. HPV infection can be cured.

- True
- False
- Unsure

Section 3: Attitude towards HPV Vaccination

38. I believe it is better to vaccinate my child with HPV vaccine before his/ her sexual debut of becoming sexually active.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

39. At what age do you think a child should receive the HPV vaccination.

- Never
- <9
- 9–10
- 11–12
- 13–14

15–16 17–18 >18

40. The HPV vaccine is too expensive.

Strongly agree Agree Neutral Disagree Strongly disagree

41. HPV infection is very common.

Strongly agree Agree Neutral Disagree Strongly disagree

42. I believe my child is at risk of HPV infection in the future.

Strongly agree Agree Neutral Disagree Strongly disagree

43. I believe the HPV vaccine is safe for my child.

Strongly agree Agree Neutral Disagree Strongly disagree

44. I believe my child can be protected from HPV without HPV vaccination.

Strongly agree Agree Neutral Disagree Strongly disagree

45. I believe the HPV vaccine is effective in preventing HPV infection for my daughter/son.

Strongly agree Agree Neutral Disagree Strongly disagree

46. I think HPV vaccination will encourage my child to engage in early sexual activity.

Strongly agree Agree Neutral Disagree Strongly disagree

47. I think HPV vaccination will encourage my child not to use protection during sex.

Strongly agree Agree Neutral Disagree Strongly disagree

48. I think people will be labelled as promiscuous for having been infected with HPV.

Strongly agree Agree Neutral Disagree Strongly disagree

49. I am worried about the short-term side effects (e.g. headache, dizziness, and redness in injection site) of the HPV vaccine. **(Skipped if parent answers “Yes” to Question 18)**

Strongly agree Agree Neutral Disagree Strongly disagree

50. I am worried that the HPV vaccine might affect adolescent development. **(Skipped if parent answers “Yes” to Question 18)**

Strongly agree Agree Neutral Disagree Strongly disagree

51. I am worried that the HPV vaccine might have unknown long-term side effects. **(Skipped if parent answers “Yes” to Question 18)**

Strongly agree Agree Neutral Disagree Strongly disagree

52. I think it is difficult to explain the reason for HPV vaccination to the child.

Strongly agree Agree Neutral Disagree Strongly disagree

Section 4: Acceptability of HPV Vaccination

53. Will you accept your child to receive the HPV vaccine?

Yes **(Go to Question 54)** No **(Go to Question 55)**

54. What are the reasons for your decision? (Tick all that apply)

- I am worried my child(ren) getting HPV infection
- I am worried my child(ren) getting genital cancer
- I am worried my child(ren) getting genital warts
- I am convinced of the efficacy in preventing HPV infection
- My religion or culture supports vaccination
- Recommended by health authorities
- Recommended by schools
- Recommended by family, friends or relatives
- Recommended by healthcare professionals
- Promoted by advertisement
- Others/none of the above

55. What are the reasons for your decision? (Tick all that apply)

- I am against all vaccinations
- My child doesn't like vaccinations
- The HPV vaccine can cause adverse effect / is not safe

(Skipped if parent answers "Yes" to Question 18)

- The HPV vaccine does not give full protection against HPV infection

(Skipped if parent answers "Yes" to Question 18)

- The HPV vaccine will encourage early sexual activity or unprotected sex
- Worried others might think my child is sexually active
- The HPV vaccine is not necessary for my child (please select all that apply from

below if this option is selected)

- HPV will not affect males (**only for parent of male student**)
- It is too early to think about preventing cancer
- The HPV vaccine is too expensive
- Not recommended by family, friends or relatives
- Not recommended by schools
- Not recommended by healthcare professionals
- Not enough information about the HPV vaccine provided to me
- My child would need to be vaccinated multiple times
- Difficulty in finding a provider or clinic that has the HPV vaccine available
- Others/none of the above

56. Will you accept your child to take the HPV vaccine if it were subsidised under the Hong Kong Childhood Immunisation Programme (HKCIP) by the Hong Kong SAR Government?

- Yes (**Go to question 57**)
- No (**End of Survey**)

57. What is the reason for your decision? (Tick all that applies)

- The cost is covered by the government
- It will be provided at school
- It is included in the HKCIP
- I am worried my child(ren) getting HPV infection
- I am worried my child(ren) getting genital cancer
- I am worried my child(ren) getting genital warts
- I am convinced of the efficacy in preventing HPV infection
- My religion or culture supports vaccination
- Recommended by schools

- Recommended by family, friends or relatives
- Recommended by healthcare professionals
- Promoted by advertisement
- Others/none of the above

This is the end of the survey. Thank you for your participation.

Appendix 2. Chinese version of the survey

2021年香港小學生家長對人類乳頭瘤病毒(HPV)疫苗接受程度的影響因素

第一部分：基本資料

1. 你的性別是什麼？
男 女

2. 你的年齡是什麼？
≤30 31–35 36–40 41–45 > 45

3. 你的婚姻狀況是什麼？
單身 已婚 分居/離異/喪偶

4. 你達到的最高學歷是甚麼？
小學以下
小學
中學
非學位高等教育
學士學位
碩士/博士

5. 你的職業是什麼？
建築與工程
藝術與娛樂
商業、行政和管理
通訊
社區和社會服務
教育
科學與技術
安裝、維修和保養
農業、漁業和林業
公務員
醫療
法律與公共政策
銷售
其他/以上皆不是

6. 你的居所位於哪一區？

- 中西區
- 東區
- 南區
- 灣仔區
- 九龍城區
- 觀塘區
- 深水埗區
- 離島區
- 油尖旺區
- 黃大仙區
- 葵青區
- 北區
- 西貢區
- 沙田區
- 荃灣區
- 大埔區
- 屯門區
- 元朗區

7. 你的家庭每月收入是多少？

- < 港幣 \$10,000
- 港幣 \$10,000 – 19,999
- 港幣 \$20,000 – 39,999
- 港幣 \$40,000 – 59,999
- 港幣 \$60,000 – 79,999
- > 港幣 \$80,000

8. 你有定期接種季節性流感疫苗嗎？

- 有
- 沒有
- 不確定

9. 你曾接受 HPV 疫苗注射嗎？

- 是
- 否
- 不確定

10. (只限女性回答) 你曾接受子宮頸抹片(柏氏抹片)檢查嗎？

- 是
- 否
- 不確定

11. 你有多少位孩子正在就讀小學四年級到小學六年級？

- 1 2 3 > 3

如果你有多於一個孩子正在就讀小學四年級到小學六年級，請以[最年長]的孩子為準，填寫以下部分。

12. 你孩子的性別是甚麼？

- 男 女

13. 你的孩子就讀的小學類型是甚麼？

- 官立小學 私立學校
資助小學 直接資助計劃小學(直資學校)

14. 你的孩子的學校位於哪一區？

- | | | | |
|-------------------------------|-------------------------------|-------------------------------|------------------------------|
| <input type="checkbox"/> 中西區 | <input type="checkbox"/> 東區 | <input type="checkbox"/> 南區 | <input type="checkbox"/> 灣仔區 |
| <input type="checkbox"/> 九龍城區 | <input type="checkbox"/> 觀塘區 | <input type="checkbox"/> 深水埗區 | <input type="checkbox"/> 離島區 |
| <input type="checkbox"/> 油尖旺區 | <input type="checkbox"/> 黃大仙區 | <input type="checkbox"/> 葵青區 | <input type="checkbox"/> 北區 |
| <input type="checkbox"/> 西貢區 | <input type="checkbox"/> 沙田區 | <input type="checkbox"/> 荃灣區 | <input type="checkbox"/> 大埔區 |
| <input type="checkbox"/> 屯門區 | <input type="checkbox"/> 元朗區 | | |

15. 你的孩子正在就讀哪一年級？

- 小四 小五 小六

16. 你的孩子有接種過政府資助的香港兒童免疫接種計劃所建議的疫苗嗎？

- 有 沒有 不確定

17. 你的孩子有定期接種季節性流感疫苗嗎？

- 有 沒有 不確定

18. 你的孩子曾接受 HPV 疫苗注射嗎？

- 是 否 (請前往第20題) 不確定 (請前往第20題)

19. 你孩子的 HPV 疫苗是透過香港兒童免疫接種計劃注射的嗎？

- 是 否 不確定

20. 你會與孩子討論有關預防性傳染病的話題嗎？

- 會 不會 不確定

第二部分：有關HPV及其疫苗的認知

21. 你有聽說過 HPV 疫苗嗎？
有 沒有（請前往第23題）
22. 你從甚麼渠道接收有關 HPV 的資訊？（可選多於一項）
孩子的學校 醫護人員 廣告
互聯網 新聞 政府宣傳
其他/以上皆不是
23. HPV 可以透過以下性別傳播：
女性 男性 兩性皆可 不確定
24. 以下哪一些選項為 HPV 的傳播方式？（可選多於一項）
身體接觸（例如握手） 空氣傳播 / 飛沫傳播
性接觸 血液傳播
與物件接觸（例如椅子、桌子等）
母嬰傳播
25. 以下哪些措施能夠預防 HPV 感染？（可選多於一項）
性禁慾 使用避孕套 接種HPV疫苗
酒精消毒 配戴口罩 用肥皂清洗
其他/以上皆不是
26. 感染 HPV 未必會出現任何症狀。
正確 錯誤 不確定
27. HPV 只會損害女性健康，男性則不受影響。
正確 錯誤 不確定
28. HPV 可以引致性傳染病。
正確 錯誤（請前往第30題） 不確定（請前往第30題）
29. HPV 可引起以下哪些性傳染病？（可選多於一項）
生殖器疣
淋病

- 梅毒
- 後天免疫力缺乏症（愛滋病）
- 衣原體感染

30. HPV 可以引致癌症。

- 正確 錯誤（請前往第32題） 不確定（請前往第32題）

31. HPV 可以引起哪些類型的癌症？（可選多於一項）

- 子宮頸癌
- 肛門癌
- 陰莖癌
- 外陰癌
- 陰道癌
- 頭頸癌
- 以上皆是

32. 子宮頸抹片(柏氏抹片)檢查的目的是檢測：（可選多於一項）

- 子宮頸癌
- HPV
- 性傳染病
- 以上皆是

33. HPV 有多種類型。

- 正確 錯誤 不確定

34. 如果患者已經感染 HPV，他/她仍應該接種 HPV 疫苗。

- 正確 錯誤 不確定

35. 接種 HPV 疫苗可導致 HPV 的感染。

- 正確 錯誤 不確定

36. 抗生素能夠治療 HPV 的感染。

- 正確 錯誤 不確定

37. HPV 的感染可被根治。

- 正確 錯誤 不確定

第三部分：對HPV疫苗接種的態度

38. 我認為我的孩子應在首次性行為前接種 HPV 疫苗。
非常同意 同意 中立 不同意 非常不同意
39. 你認為你的孩子應該在多少歲接種 HPV 疫苗？
永不 <9 9-10 11-12 13-14
15-16 17-18 > 18
40. HPV 疫苗太貴了。
非常同意 同意 中立 不同意 非常不同意
41. HPV 感染很普遍。
非常同意 同意 中立 不同意 非常不同意
42. 我認為我的孩子將有感染 HPV 的風險。
非常同意 同意 中立 不同意 非常不同意
43. 我認為 HPV 疫苗是安全的。
非常同意 同意 中立 不同意 非常不同意
44. 我相信我的孩子即使沒有注射 HPV 疫苗，也能夠預防 HPV。
非常同意 同意 中立 不同意 非常不同意
45. 我認為 HPV 疫苗有效預防我的孩子感染 HPV。
非常同意 同意 中立 不同意 非常不同意
46. 我認為 HPV 疫苗接種會鼓勵我的孩子過早進行性行為。
非常同意 同意 中立 不同意 非常不同意
47. 我認為 HPV 疫苗接種會鼓勵我的孩子進行「不安全性行為」。
非常同意 同意 中立 不同意 非常不同意
48. 我認為感染 HPV 的人會被標籤為性濫交。
非常同意 同意 中立 不同意 非常不同意
49. (如果你的孩子未曾接種 HPV 疫苗, 請回答) 我擔心 HPV 疫苗的短期副作用(如頭痛、頭暈、接種部位紅腫)。
非常同意 同意 中立 不同意 非常不同意

50. (如果你的孩子未曾接種 HPV 疫苗, 請回答) 我擔心 HPV 疫苗可能會影響青少年發育。

非常同意 同意 中立 不同意 非常不同意

51. (如果你的孩子未曾接種 HPV 疫苗, 請回答) 我擔心該 HPV 疫苗可能具有未知的長期副作用。

非常同意 同意 中立 不同意 非常不同意

52. 我認為自己難以向孩子解釋接種 HPV 疫苗的原因。

非常同意 同意 中立 不同意 非常不同意

第四部分：對HPV疫苗的接受程度

53. 你會接受你的孩子接種 HPV 疫苗嗎？

會（請前往第54題） 不會（請前往第55題）

54. 接受孩子接種 HPV 疫苗的原因是什麼？（可選多於一項）

- 我擔心孩子感染HPV
- 我擔心孩子患上生殖器癌症
- 我擔心孩子患上生殖器疣
- 我相信疫苗預防HPV感染的效用
- 我的宗教或文化支持接種疫苗
- 衛生部門建議接種
- 學校建議接種
- 家人、親友建議接種
- 醫護人員建議接種
- 廣告推廣疫苗接種
- 其他/以上皆不是

55. 不接受孩子接種 HPV 疫苗的原因是什麼？（可選多於一項）

- 我反對所有疫苗的接種
- 我的孩子不喜歡接種疫苗
- HPV疫苗可能引起不良反應/不安全 (只向孩子曾接種HPV疫苗的家長顯示此選項)
- HPV疫苗不能完全預防HPV感染 (只向孩子曾接種HPV疫苗的家長顯示此選項)
- 接種HPV疫苗會鼓勵過早發生性行為或不安全性行為

- 擔心別人會認為我的孩子已進行過性行為
- HPV疫苗並非必要 (如選擇此選項，請從下列選擇原因)
 - HPV不會影響男性 (只向孩子為男性的家長顯示此選項)
 - 沒有預防癌症的迫切性
 - 其他/以上皆不是
- HPV疫苗過於昂貴
- 家人、親友沒有建議接種
- 學校沒有建議接種
- 醫護人員沒有建議接種
- 沒有得到足夠資訊
- 我的孩子需要進行多次疫苗注射
- 難以找到提供HPV疫苗接種的地方或診所
- 其他/以上皆不是

56. 如獲得香港特區政府「香港兒童免疫接種計劃」的資助，你會接受你的孩子接種 HPV 疫苗嗎？

- 會 (請前往第57題) 不會 (問卷結束)

57. 接受孩子接種 HPV 疫苗的原因是什麼？ (可選多於一項)

- 費用得到政府資助
- 到校接種疫苗的服務很方便
- HPV疫苗被納入香港兒童免疫接種計劃
- 我擔心孩子感染HPV
- 我擔心孩子患上生殖器癌症
- 我擔心孩子患上生殖器疣
- 我相信疫苗預防HPV感染的效用
- 我的宗教或文化支持接種疫苗
- 學校建議接種
- 家人、親友建議接種
- 醫護人員建議接種
- 廣告推廣疫苗接種
- 其他/以上皆不是

問卷完結。感謝您的參與。

Appendix 3. Description of the survey sections

Section 1: Socio-demographic characteristics

The survey collected data regarding participants' socio-demographic characteristics, namely, sex, age-group, marital status, education level, occupation, district of residence, and income level. Other variables included the number of children in Primary 4 to 6, whether they had discussed sexually transmitted diseases with children, their receipt (or non-receipt) of seasonal influenza vaccines and human papillomavirus (HPV) vaccine, and (for female respondents only) their completion (or non-completion) of a Pap smear examination. Information was also collected regarding the child's sex, school type, school district, school grade, history of vaccination under the Hong Kong Childhood Immunisation Programme, and receipt (or non-receipt) of seasonal influenza vaccines and HPV vaccine. If a participant had multiple children in Primary 4 to 6, only the oldest child's information was collected.

Section 2: Awareness and knowledge of human papillomavirus and the vaccine

Participants were asked about their awareness of the HPV vaccine and sources of information about it. Knowledge of HPV and the HPV vaccine was assessed via 14 questions, where each correct answer received one point. A maximum of 20 points was possible because some questions had multiple correct answers; the total score was used for analysis.

Section 3: Attitudes towards vaccination

The survey included 15 statements to measure participants' attitudes towards HPV vaccination, covering concerns about HPV infection, vaccine cost, safety, efficacy, and impact on their child's sexual activity. Participants rated their agreement on a five-item Likert scale. These statements addressed factors in the Health Belief Model,¹ namely, perceived susceptibility, perceived severity, perceived benefits, and perceived barriers.

Section 4: Acceptance of vaccination

Participants were asked about their acceptance of HPV vaccination for their child, followed by a question to determine reasons for accepting or declining the vaccine. Multiple reasons were allowed, and options were provided. Participants were also asked if they would accept the vaccine if it were subsidised under the Hong Kong Childhood Immunisation Programme. Those who answered 'yes' were asked to select their reasons again.

Reference

1. Jones CL, Jensen JD, Scherr CL, Brown NR, Christy K, Weaver J. The Health Belief Model as an explanatory framework in communication research: exploring parallel, serial, and moderated mediation. *Health Comm* 2015;30:566-76.