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# 'I trust them because my mum trusts them': Exploring the role of trust in HPV vaccination decision-making among adolescent girls and their mothers in France

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ABSTRACT

The success of vaccination programmes relies on high uptake and acceptance of vaccines, which is in part influenced by public trust in vaccines, providers, policy-makers and information. France is one of the countries in the world with the lowest confidence in vaccination, with parents expressing particular concerns about the human papillomavirus (HPV) vaccine. This qualitative study explored the role of trust in HPV vaccination decision-making among mothers and adolescent girls in France. Semi-structured interviews and focus groups were conducted with 15–16-year-old adolescent girls and their mothers in Paris. A thematic analysis based on deductive and inductive coding was conducted. HPV vaccination decision-making was described as a complex and uncertain process, a possible consequence of erosion of trust in the vaccine, in healthcare professionals and health authorities, and in information itself. Due to public criticism of the vaccine and conflicting advice received from medical professionals, the vaccine was perceived as controversial. The mothers' strong trust in doctors did not always increase HPV vaccine acceptance, as doctors themselves failed to recommend or recommended against the vaccine. Furthermore, the perceived mismanagement of previous health events tainted the mothers' trust in health authorities. Contrastingly, while adolescents expressed trust in doctors and health authorities, their trust in their own mothers was stronger. A lack of exposure to positive sources of information (e.g. from doctors, schools or media) contributed to low awareness about HPV vaccination among adolescent girls. While both mothers and girls discussed the importance of trusting themselves, they also acknowledged being influenced by others around them as well as information, often negative, from the internet. Adolescent girls also expressed mistrust about information in general, explaining that any information can be manipulated. Low confidence in HPV vaccination in France can be explained by broader trust issues, which will require long-term efforts to address.


## 1. Introduction

Vaccination has often been described as one of the most important public health achievements of the 20th century [1,2]. Yet, in a context where scientific knowledge is regularly being questioned by the public, some parents are becoming increasingly hesitant to vaccinate their children [3,4]. In 2016, France was identified as the country with the lowest level of confidence in vaccination in the world, building upon decades of erosion of public trust resulting from controversies around vaccines and government health decisions [5,6].

Consequently, France also has one of the lowest Human Papillomavirus (HPV) vaccine uptake rates in Western Europe, with only 32.7% of adolescent girls vaccinated with two doses in 2020 (girls born in 2004, at 16 years old) [7,8]. In France, the vaccine is recommended and prescribed by family doctors or paediatricians to girls aged 11 to 14 years old, with a catch-up campaign for those aged 15 to 19 [9]. Since 2020, the vaccine is also recommended to boys

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of the same age. Despite evidence showing the effectiveness of the HPV vaccine in preventing cervical cancer [10], mothers in France are hesitant to accept the vaccine because of concerns about vaccine safety or insufficient protection provided by the vaccine [4,11,12].

While mothers are the primary decision-makers around childhood vaccination and parental consent is required for vaccination, the role and influence of adolescent girls in HPV vaccination decision-making is increasingly being recognised [12,13].

### 1.1. The role of trust in vaccination decision-making

While vaccination decisions have often been described as the main consequence of an individual's representation of the risks and benefits of vaccination, these representations are also shaped by societal issues such as trust [1,2,12,14,15]. Trust expressed towards products (i.e. vaccines), providers (i.e. healthcare professionals) and policy-makers (i.e. health systems, governments, scientists) can constitute levers of vaccine acceptance [16]. Trust in information around vaccination does not only depend on information about the risks and benefits of vaccination but also on those who produce and share that information [16].

In comparison to confidence that is expressed in 'systems' that protect against uncertainty, trust is interpersonal and is typically expressed in individuals, groups or institutions and therefore depends on the parties' behaviours as well as their moral and affective competence [17]. Parents have therefore traditionally placed their trust in proximal sources such as doctors and health authorities rather than more distant ones such as health authorities [18,19]. Less evidence exists around who adolescents place their trust into as their contribution to vaccination decision-making has been more limited.

However, individuals are increasingly questioning the trustworthiness of scientific experts and information, which could be a consequence of the fragmentation of information: as information is now available from a multitude of sources, individuals are able to pick the ones that confirms their pre-existing beliefs [20]. This can lead to individuals turning to alternative sources of information such as peers or the internet, potentially exposing them to information discouraging vaccination [21,22]. While adolescents' use of the internet and social media is more frequent than other population groups [23] and they often have more close knit relationships with their peers, the full impact of these issues on their perceptions of vaccination remains uncertain.

In fact, the role of trust in HPV vaccination decision-making, particularly among adolescents, has not been studied extensively [16]. Studies have shown that while trust increases with age, it stabilises in adolescence and can play a key role in vaccination decision-making for adolescents [24,25]. Understanding who they place their trust in for issues such as vaccination and how this compares to their mothers and influences the dynamics of decision-making is therefore essential. In fact, while adolescents need parental consent to get vaccinated, their beliefs and confidence can sometimes influence parents' decisions as was seen in Ireland or Colombia, where vaccine coverage dropped following reports of alleged vaccine side effects and anxieties among adolescents. Adolescence is also the first time individuals might be involved in vaccination decision-making, which could influence their future confidence in vaccination as the adults and parents of tomorrow. This study aims to explore the role of trust in HPV vaccination decision-making among mothers and adolescent girls in France, with the objective of answering the following questions: 1) how does trust in HPV vaccines, vaccine providers and policy-makers influence decision-making around HPV vaccination; and 2) how can trust in alternative sources of information (e.g. internet, family, peers) be characterised?

## 2. Methods

A qualitative methodology was employed to explore the role of trust in HPV vaccination decision-making among mothers and adolescent girls in France through semi-structured interviews and focus groups.

### 2.1. Setting and study participants

In order to obtain a diverse sample, the study was conducted within different *arrondissements* (local districts) of Paris, a city with varied socio-economic, religious and cultural backgrounds, as well as varying levels of confidence in vaccination.

Research participants consisted of vaccinated and unvaccinated 15–16 year old girls to target adolescents who had passed the age of receiving the vaccine (while still available for the catch-up campaign) and their mothers. Mothers were selected for this study as they are the most common household decision-makers around health and vaccination in France.

### 2.2. Data collection

Data collection was conducted in two stages between October 2018 and March 2019. In the first stage, adolescents were approached through their schools, based on a comprehensive list of *Lycées* (public, private and professionals) obtained from public registers, and with prior approval from school directors. Adolescent girls who took part in the study were asked to contact their mothers to invite them for a separate interview. As this method only yielded 4 interviews and 2 focus groups with adolescents and one interview with a mother, a second stage of data recruitment was organised using an existing panel of a local research agency specialised in behavioural research (BVA Group). The agency identified 20 mothers and their own daughters to take part in the study.

A total of 24 in-depth interviews were conducted with adolescent girls and 21 with mothers (three mothers were unavailable to take part in an interview). Two focus groups were conducted with 5 and 7 girls in each group, both groups comprising of girls from the same school class. The decision to combine semi-structured interviews with focus groups for adolescents was made to ensure conversations happened both in a private setting, in which girls might feel less intimidated and embarrassed to share their views on a vaccine against a sexually transmitted infection, and in a natural peer setting (schools), to capture how social group dynamics may influence individual perceptions and how adolescents talk about HPV and vaccination among their peers. Only 6 girls included in the in-depth interviews and 3 in focus group discussions were vaccinated against HPV.

Interviews (30–60 min) were conducted in participants' homes, or at a private place of their choosing and focus groups (60 min) took place in schools. Parents/caregivers were informed that interviews with adolescents would be conducted in a private manner. Interviews, audio-recorded with prior approval from participants, were conducted by the main researcher, fluent in both English and French and experienced in qualitative research. Topic guides, piloted with three participants (excluded from the analysis), focused on decision-making processes and trust but also included questions around knowledge, beliefs and perceptions about HPV vaccination as well as the influence of different sources of information about the vaccine. While the themes covered in the topic guides were the same for all interviews and focus groups, small adaptations were made for the topic guides with mothers and the guides for focus groups.

A few days before the interview, participants were handed a study information letter (with information about the study, confidentiality and anonymity), which was summarised verbally by the researcher at the beginning of each interview. Informed consent was required for all participants, with adolescents also required to obtain written consent from their parent or guardian. Participants were given an opportunity to ask questions and were informed of their right to withdraw from the study at any time.

Adolescents in the first stage of data collection were given the opportunity to enter a lottery to receive an Amazon voucher to thank them for their time, while participants (adolescents and mothers) recruited in stage two were compensated for their time as per the recruitment agency's compensation policy.

### 2.3. Data analysis

The researcher compiled field notes and analytical memos summarising the discussions, paying particular attention to the content, context, quality and feel of the exchange. Audio-recordings from the interviews and focus groups were transcribed by a local transcription company, respecting strict confidentiality rules by removing identifiers such as names or locations and using secured transfers with password-protected files. In this manuscript, each interview was allocated a letter (A for adolescent and M for mothers, FG for adolescents in focus groups) and a number, with vaccinated individuals complemented by the letter V (e.g. A5V). Transcripts were reviewed against the audio-recordings by the researcher and imported into NVivo® together with field notes and analytical memos.

An initial coding framework was developed by deductively drawing codes from the topic guides, theories around trust and decision-making and the analytical memos [26]. Four adolescent transcripts were coded using this framework, adding additional codes using an inductive process through close readings of the data. The revised framework was reviewed by a second researcher to enhance the validity and consistency of the codes and the final coding framework was used for the remaining transcripts. During the process, some codes were modified, merged, or removed to fit more closely with the data. Coded extracts were compared and contrasted to develop a list of themes, paying particular attention to the terminology used by participants to build categories and typologies and to start discussing the meaning of the data [27]. Transcripts were coded separately for mothers and adolescent girls to allow the analysis to pick up differences and similarities, and the themes identified as well as the language used by participants were compared between mothers and adolescent girls. Key themes were then identified across all interviews and focus groups. Those results were finally analysed within the context of existing literature and theory on decision-making and trust as well as the social and cultural context in which the study took place. In order to avoid losing some of the meaning of data due to translation issues, data analysis was conducted in French, with results written up in English and quotes translated by the main researcher.

### 2.4. ***Ethical*** *approval*

Ethics approval for this research was obtained from the London School of Hygiene & Tropical Medicine [Ref. 15320 3] and from Aix-Marseille Université [Ref. 2018–12-07–005].

## 3. Results

The thematic analysis identified four key themes and a range of sub-themes across all semi-structured interviews (mothers and adolescents) and focus groups: uncertainty around a mistrusted vaccine, navigating mistrust and influences from a negative information environment, the importance of trust and deferring decision-making to those perceived as more knowledgeable, and trusting oneself in the context of external influences on HPV vaccination decision-making. Table 1 provides a summary of the key characteristics of participants included in this research, together with their numerical identifier.

### 3.1. Uncertainty around a mistrusted vaccine

#### 3.1.1. HPV vaccination: A mistrusted and controversial vaccine?

While adolescent girls were rarely involved in HPV vaccination decision-making, mothers described decision-making as a difficult experience. This partly came from perceptions that HPV vaccination was different from other vaccines, less trusted and more controversial, thereby requiring more time to make what mothers qualified of as a '*serious decision*'. In French, mothers used the expression '*pas anodin*' to refer to their mistrust of the vaccine, which means both that it is not insignificant and that it does not come without risks.

Some mothers and adolescent girls believed that researchers, experts or doctors may not trust the vaccine and its safety either: "*There is a real debate among doctors (. . .) if all scientists had said, this vaccine is great, it works all the time, I think doctors would have said ok, we do it*" (A10). Exposure to questioning of vaccination, sometimes among experts, led to the feeling that it was a controversial vaccine. One mother called for the vaccine to be made mandatory to relieve parents from this difficult decision: "*At least, [if it was mandatory], I wouldn't be the one imposing it, it would be the State*" (M14).

**Table 1**
Participant characteristics.

| | Adolescents, n = 36 | Mothers, n = 21 |
|---|---|---|
| **Data collection method** | 24 semi-structured interviews<br>12 focus groups | 21 semi-structured interviews |
| **Age** | 15 year old: n = 20 (55.6%)<br>16 year old: n = 14 (38.9%)<br>n/a: n = 2 (5.6%) | 30–39 year old: n = 1 (4.8%)<br>40–49 year old: n = 16 (76.2%)<br>50–59 year old: n = 4 (19.0%) |
| **Vaccination status** | Vaccinated: n = 9 (25.0%)<br>Unvaccinated: n = 27 (75%) | |
| **Arrondissement** | 3: n = 1 (2.8%)<br>5: n = 1 (2.8%)<br>10: n = 2 (5.6%)<br>12: n = 4 (11.1%)<br>13: n = 3 (8.3%)<br>14: n = 1 (2.8%)<br>15: n = 3 (8.3%)<br>17: n = 1 (2.8%)<br>19: n = 8 (22.2%)<br>20: n = 7 (19.4%)<br>n/a: n = 5 (13.9%) | 3: n = 1 (4.8%)<br>5: n = 1 (4.8%)<br>10: n = 2 (9.5%)<br>12: n = 3 (14.3%)<br>13: n = 0 (0%)<br>14: n = 0 (0%)<br>15: n = 1 (4.8%)<br>17: n = 1 (4.8%)<br>19: n = 2 (9.5%)<br>20: n = 5 (23.8%)<br>n/a: n = 5 (23.8%) |
| **Marital status** | | Divorced/separated: n = 3 (14.3%)<br>In partnership: n = 6 (28.6%)<br>Married: n = 11 (52.4%)<br>Single: n = 1 (4.8%) |
| **Employment** | | Yes: n = 18 (85.7%)<br>No: n = 3 (14.3%) |
| **Number of children (total)** | | 1: n = 2 (9.5%)<br>2: n = 10 (47.6%)<br>3: n = 5 (23.8%)<br>4: n = 2 (9.5%)<br>6: n = 2 (9.5%) |

*3.1.2. Uncertainty and decision-making*

For some mothers, the feeling of uncertainty remained years after first being told about the vaccine, sometimes even after having vaccinated their daughters. Some explained that they were not entirely convinced of their decision from the beginning, while others reported influence from mothers who refused the vaccine and media controversies. One woman also expressed remorse for not vaccinating her daughter, feeling her daughter might blame her in the future: "*It's not a decision I am proud of. I'm not serene. I tell myself, my daughter will always be able to blame me if something happens to her*" (M16).

*3.1.3. For some, a highly trusted vaccine*

A small number of mothers but most adolescent girls expressed strong trust in the vaccine or talked about HPV vaccination as a straightforward decision, referring to the importance of disease prevention and the feeling of protection associated with the vaccine: "*I don't think it's useful to talk about it, I think we have to do it (. . .) it's obviously better to do it*" (A6).

*3.2. Navigating mistrust and influences from a negative information environment*

Participants who received information about HPV vaccination were often forced to navigate a mistrusted information environment, exposed to conflicting and negative information: "*It's terrible, to do it or not to do it? It's terrible, but both, both are terrible. You read things on both, and you're wrong. You do it, and then she gets cancer, for sure. You don't do it, and then she gets cancer, for sure. What do you do, what do you do then?*" (M14). Girls expressed the suspicion that any type of information can be manipulated, including social media and the internet as well as mainstream media, the news or even teachers and doctors. One mother described this mistrust as a French cultural trait, where citizens question everything. Findings are discussed in further details below by information sources and format.

*3.2.1. Information on the internet and social media*

Mothers who stated looking for additional information about HPV vaccination used search engines on the internet, official or medical websites or social media and forums. A couple of mothers explained that people often look for information that confirms their own beliefs: "*I think that on the internet, there is so much information that in general, you will look for information that confirms and feeds your own beliefs*" (M14). Online information was generally negative, recommending people not to accept the vaccine or discussing alleged side effects of the vaccine. Although girls did not report seeing information on social media, they believed it would be the best channel to reach their generation, particularly Instagram and Snapchat. While some mentioned the use of sponsored ads that can reach large numbers of users, one girl saw them as less trustworthy due to their commercial nature. Instead, many girls believed that influencers such as celebrities or public figures could have a strong impact by sharing their personal experiences: "*An influencer has a large number of followers, so we know that if she is giving us that message, it comes from her heart and it's to warn us*" (A23V).

However, despite using it, mothers and adolescent girls were extremely judgmental and mistrustful of information available on the internet and social media, describing it as too personal or negative: "*I don't read Doctissimo [French forums on health and well-being], because it's not, well, it's the worst (. . .). People only share negative experiences*" (M13V). Some mothers used very strong emotional language around social media, talking about it as '*atrocious*', '*depressing*' or '*alarming*', with one mother explaining that information on social media can trigger uncontrollable doubt and anxiety: "*It completely reactivated my uncertainty. I told myself: 'Damn, what should I do in the middle of all of this?' (. . .) Even if it's not rational, it prompts something intimate and dramatic*" (M19).

*3.2.2. Information in the media*

Mothers were also exposed to negative information about vaccination in the mainstream media on television, radio or magazines and the feminine press: "*It really impacted me, hearing about negative consequences of this vaccine on the radio*" (M1V). One woman described being strongly affected by an article in a national newspaper reporting alleged side effects of the vaccine: "*I remember really alarmist articles with terrible things, multiple sclerosis. I remember in [a newspaper], the testimony of a mother that had innocently vaccinated her daughter and then of course, always the stories of doubt in the medical profession, that denies it.*" (M19).

*3.2.3. Information from schools*

Although adolescent girls did not report receiving information from schools, both girls and mothers believed it would be a trustworthy mean of informing girls. Visits from external speakers, for example during sexual health classes, or discussions with school nurses were seen as appropriate ways of informing adolescents around HPV vaccination. Mothers explained that information would be more objective in schools and it would allow more serious and informed discussions with their daughters at home.

*3.2.4. The importance of how information is presented*

In addition to the sources of information, the way in which information is presented was also seen as important by mothers and adolescent girls. While most girls expressed a preference for information around HPV vaccination to be presented in the form of personal testimonies, particularly through videos, mothers showed a small preference for statistical facts, expressing distrust of subjective opinions. Adolescents raised the importance of understanding people's experiences, describing personal stories as more trustworthy as well as more touching, memorable and meaningful than data: "*I would be more interested in their experiences, as numbers (. . .) don't tell you how they lived it, how it happened*" (A15).

*3.2.5. A need for more information*

A large number of participants reported a lack of information about HPV vaccination, with mothers raising the need for more in-depth information, particularly from their doctors, and girls showing a complete lack of awareness about HPV and cervical cancer: "*I'm surprised, well, I'm shocked (. . .) we discover new viruses every day, but the fact that this was a virus that already existed and that I just didn't know about it, it surprises me*" (A3).

*3.3. Blind trust and deference to epistemic authority*

Deferring decision-making to those with more expertise and knowledge, also referred to as epistemic authorities, was a recurring theme, with girls deferring the decision to their mothers and mothers placing their trust in their doctors. However, the nature of the trusting relationship between girls and mothers and mothers and doctors was relatively different.

*3.3.1. Adolescent girls' trust in their mothers*

Adolescent girls' decisions and opinions around HPV vaccination were strongly influenced by their mothers, described as reassuring '*protectors*', while involvement of fathers in decision-making was not reported. Despite interviews being conducted in private, some girls shared the same arguments, and sometimes the same language, as their mothers but without necessarily understanding what they meant. One girl repeated some of the concerns her mother had about vaccination but was not able to explain what

she was concerned about specifically, and instead asked the interviewer why her mother did not want her to get vaccinated. Adolescent girls passively followed their mothers' decisions and opinions showing blind but strong trust. A lack of alternative positive influencers about HPV vaccination was identified, related to a lack of information provided from schools, doctors or other networks. Mothers expected their daughters to trust and listen to them. In the case of vaccine hesitant mothers, this created a barrier, where girls would be '*protected*' from the vaccine by their mothers, remaining ignorant but '*safe*'.

*3.3.2. Doctors: A strong trust relationship with mothers*

Mothers showed very strong trust in their doctors and often deferred HPV vaccination decision-making to them: "*We don't ask ourselves too many questions, we trust the medical body*" (M1V). While some described trust as a consequence of expertise and scientific knowledge, others believed these traits could lead to arrogance and disrespect: "*Doctors in France, I don't know if it's different elsewhere, they always have a very professional side, as "what we say, it's the truth, etc." They think we don't know anything*" (M10). Instead, many mothers described trusting doctors who know them for a long time and who have a reassuring, comforting presence. The way the vaccine was offered was particularly important, with mothers valuing doctors who listened to them and explained or advised rather than pressured or judged them: "*He tells me "I suggest this", I suggest. I think it's really good. Other doctors will tell you, "Ok, we have to do this vaccine" and they give you the prescription. There is a difference between suggesting and giving*" (M7).

Doctors' personal beliefs around vaccination and their intentions as to whether they would vaccinate their own daughters was important for mothers, who described doctors in their parenting role as even more reliable, trustworthy and honest: "*This was the argument that convinced me: if she, as a doctor, would vaccinate her daughter, well then I will vaccinate mine*" (M22V). Similarly, some mothers expressed strong trust in friends or family members working in the medical environment as they were seen as more objective: "*It has a lot of weight, the fact that doctors, in their personal lives, don't vaccinate their daughters. (. . .) They are well informed, if they don't do it, there must be a reason*" (M16).

High trust in doctors also meant that some mothers did not vaccinate their daughters because their family doctors had not recommended the vaccine or recommended against it, sometimes because of concerns about side effects. Some mothers believed their doctors lacked information: "*And my doctor, what's strange, is that he doesn't talk about it; and the paediatrician either. So, I tell myself, it's, strange, I feel like in France, it's not something really developed*" (M8). Mothers and girls were also surprised and conflicted when hearing contradictory opinions from different doctors: "*It's even more perturbing when doctors can't agree, how can we make a decision if even doctors don't know whether or not it should be done*?" (A10).

While many girls expressed trust in their doctors around health and HPV vaccination, they did not report a significant direct influence from their doctors in the same way as mothers. Some girls reported that their doctors had not discussed the vaccine with them, and instead only addressed their mothers. Others explicitly explained they would follow their mothers' advice over their own doctors' advice: "*If the doctor would recommend it to me? I would still say no, because my mum decided, and I trust her, so the doctor wouldn't change my mind*" (A7).

*3.3.3. Trust in health authorities: A more complex relationship*

While mothers described trusting health authorities, they also described events that made them question their trustworthiness, such as beliefs that the hepatitis B vaccine caused multiple sclerosis, concerns about the way the H1N1 vaccination campaign was handled, or reports of the blood contamination scandal of the 1980 s: "*I remember we had the blood contamination scandal, it was just a catastrophe. They killed many, many people. And they know the blood was contaminated, it didn't bother them. They were high-level people. So yes, I think that, if it happened once, it can happen a second time*" (M9). These type of events tainted mothers' trust in official sources. Some also discussed reluctantly feeling it is better to trust experts, or feeling '*naïve*' for trusting them. While adolescent girls' trust in health authorities was generally more positive, some relied on their mothers to assess whether or not they should place their trust in them: "*I trust them because my mum trusts them*" (A13V). Some mothers also discussed financial or objectivity concerns around health authorities and pharmaceutical companies.

*3.4. Trusting oneself in the context of external influences and social norms*

Both mothers and girls described the importance of trusting oneself while acknowledging the sometimes unavoidable influence of others around them. One girl described decision-making around HPV vaccination as a process entirely dependent on external influences: "*It's a question of influence: (. . .) If I had only seen doctors who had told me yes, I would have done it; and if I had only seen doctors who had told me no, I wouldn't have done it but because I heard from both, I'm in the middle, asking myself what do I do*?" (A10).

*3.4.1. Influences from friends and family*

Influences from family and friends were mostly discussed in a positive way by mothers and girls, reflecting a need to hear a range of opinions as well as an opportunity to obtain more information. Many mothers reported hearing negative stories, views or controversies about the vaccine from their friends, instilling doubt and anxiety in their decision.

Mothers and girls also acknowledged that their friends often shared the same beliefs and values as them, which could explain why influences are reported in a positive way: "*with my friends, we more or less have the same thoughts, it's a little, we're not connected but often, on topics, we have the same opinion*" (A5V).

*3.4.2. Social influences and social norms*

Social norms were important, as one mother explained that diverging from group opinions was frowned upon and others described worries about being judged for their decisions. One mother also described taking the decision to vaccinate their daughters as a group decision with her friends, following one of her friend's diagnosis with cervical cancer. Guilt and anxiety was also found to be associated with the social meaning of good parenting, particularly in the face of cancer: "*There's always that moralising aspect of telling myself, oh my god, I might be putting my daughter in danger, I'm really an unworthy mother*" (M14).

*3.4.3. Being wary of others' opinions and prioritising one's own intuition*

Despite acknowledging influences from others, some mothers showed a wariness of others' beliefs and perceptions: "*I listen to what people say and I look around to see what others do, but I make my own opinion. I try to not be influenced.*" (M22V). Both mothers and adolescent girls described HPV vaccination as a personal decision, despite mothers making the decision for their daughters, stressing the importance of one's own intuition, beliefs and decision: "*If friends told me, we don't want to get vaccinated against this, I would tell them it's a shame, and well it's their decision. (. . .) It wouldn't influence my decision in the sense that, I already know what I think and nobody will change my mind*" (A22V). Some girls also described their own role as influencers, and the importance of

warning their friends about the danger of diseases, explaining they may try to convince others around them like their friends to get vaccinated against HPV: "*It's cancer (. . .) I think it's our role to warn others, it's an important topic so we need to discuss it with our friends. Maybe they don't know [about it]. (. . .) It's true that maybe I should have talked to friends about it, and they would have talked to other friends and more people would have been aware and would have gotten vaccinated*" (A24).

## 4. Discussion

This study explored the role of trust in decision-making processes around HPV vaccination among mothers and adolescent girls in France. Trust has been described as a means of reducing uncertainty and facilitating decision-making [18,28,29]. In this study, HPV vaccination was described by mothers as a highly difficult decision that requires time and serious consideration, which could indicate important trust issues. Four key themes were identified: 1) uncertainty around a mistrusted vaccine, 2) navigating mistrust and influences from a negative information environment; 3) the importance of trust and deferring decision-making to epistemic authorities; and 4) trusting oneself in the context of external influences on HPV vaccination decision-making.

### *4.1. HPV vaccination: A mistrusted and controversial vaccine*

Mothers' description of the HPV vaccine as 'controversial' and their tendency to distinguish it from other childhood vaccines could be a consequence of years of criticism and questioning of the vaccine by some public figures and members of the medical community in the French media [12]. While this was not visible among adolescent girls in this study, it is possible that long-term exposure to such controversial information, especially when children are growing up could have long-lasting effects on who adolescents place their trust into. The vaccine has also been described in this study and others as eliciting mistrust because of a perceived lack of scientific evidence around its safety and effectiveness [12,30]. This feeling was reinforced when mothers and girls received conflicting advice from doctors or experts which could result in long-term trust erosion and delays in HPV vaccine acceptance [31,32].

In response to growing childhood vaccine hesitancy in France, authorities made 11 childhood vaccines mandatory in 2018. While HPV vaccination was not part of these 11 vaccines, it would be interesting to conduct further research to understand the possible impact of such legislation on parental attitudes, especially as one mother reported reassurance associated with mandated vaccines.

### *4.2. Deferring vaccine decision-making: The central role of health professionals and mothers*

Strong trusting relationships between parents and healthcare professionals can help alleviate doubts and concerns around vaccination [33]. When making decisions around HPV vaccination, mothers in this study were found to place their trust in doctors, confirming findings from previous research [12,30,34]. Doctors' trustworthiness was described as a consequence of their expertise and scientific knowledge as well as personal and long-term relationships, confirming findings from a previous study showing that trust in proximal actors is stronger than trust in more distant actors [18]. Consequently, mistrust was expressed towards doctors who judged or pressured mothers into accepting vaccination. The characterisation of trust based on personal relationships was also highlighted by the desire to know whether doctors would vaccinate their own children and by mothers seeking advice from doctors in their personal networks to obtain what they described as more trustworthy and honest guidance. These findings highlight the need to strengthen dialogues between parents and healthcare professionals, with a focus on listening and understanding of parental concerns, for example through motivational interviewing techniques [35] or presumptive recommendation approaches [36].

However, strong trust in doctors can constitute a barrier to vaccination if doctors themselves are hesitant to vaccinate their patients against HPV. A survey conducted in France showed that a substantial proportion of general practitioners express low confidence in the vaccine due to concerns about the risks and benefits of HPV vaccination and questioning of its utility [11]. These findings explain why mothers in our study commonly reported not having received a recommendation to vaccinate or having received a recommendation against HPV vaccination by doctors. Mothers' inability to rely on doctors to help navigate decision-making around HPV vaccination could increase their uncertainty and hesitancy to vaccinate their daughters.

While adolescent girls also expressed some trust in healthcare professionals, they were less influential than mothers in their decision-making. Deferral of decision-making to epistemic authorities is common, with doctors often playing this role for health-related decisions [37], as was seen with mothers in this study. While adolescents are known to rely on their parents for important decisions [38], this study showed that their trust in mothers could make adolescents disregard guidance received from healthcare professionals. If mothers who question HPV vaccination are the only source of information for adolescent girls, this could contribute to the creation of a future generation of vaccine hesitant individuals. Mothers have been shown to play a key role in transmitting their own health behaviours, beliefs and values to their children [13]. Furthermore, the lack of awareness about HPV vaccination among adolescent girls identified in this study highlights the urgency of informing girls outside the home, such as in schools as they were seen as a highly trusted environment by both mothers and girls. Finding more opportunities for adolescents to meet with their doctors and discuss HPV vaccination could also help build a stronger relationship between doctors and adolescent girls.

### *4.3. Characterisation of trust towards the government and health authorities*

Trust expressed towards governments, health authorities or scientific experts was more nuanced than trust in healthcare professionals. While both mothers and adolescent girls described trusting health authorities, mothers also criticised the management of previous events in France. Interestingly, and perhaps because adolescent girls were too young to remember these events, their trust in health authorities was stronger. These events have previously been described as influential in parental hesitancy to vaccinate [12], confirming the notion that a health system's past performance can influence public trust in institutions, particularly around their competency and ability to deliver similar interventions or programmes [16]. This context of mistrust of authority combined with the perception that scientific expertise should be trusted and listened to led to what some mothers described as 'reluctant trust' [39]. Rebuilding trust in authorities may take a long time, but should start with an acknowledgment of previous mistakes and a reviews of lessons learnt from past events.

### *4.4. Trustworthiness of different sources of information and the importance of trusting oneself*

Trust is relied on to determine which experts to believe, especially when they offer conflicting recommendations [40]. This study confirms previous findings that while mothers and adoles-

cent girls mistrust online information, this does not prevent them from acessing it [12,41]. This could be a consequence of the mistrust expressed towards official sources of information as well as evidence of the important role of the internet in today's information environment. However, internet and social media can facilitate the spread of misinformation and information discouraging vaccination, especially as individuals tend to engage more commonly with negative rather than positive information online [42]. Mothers in this study reported being affected by information discouraging vaccination online, as well as in mainstream media such as national television and radio or the feminine press which could have contributed to their uncertainty and hesitancy to accept HPV vaccination. Additionally, despite adolescents describing social media as an essential tool to inform young people, they also raised the concern that all information can be manipulated. This could be an effect of a generation growing-up in a world constantly discussing the effects of misinformation [43], leading to adolescents becoming more suspicious, even when information comes from credible sources. Exploring the impact of this change in attitudes towards information is essential to prepare and adapt communication strategies. Improving education on the evaluation of information as well as providing information through additional trusted sources, such as schools, will also be important to restore confidence in HPV vaccination.

Despite accepting information from others, most particularly female peers [18], both mothers and adolescent girls raised the importance of making decisions around HPV vaccination independently, free of external influences. The uncertainty and low awareness identified around HPV vaccination could mean that the desire to remain in control of decision-making is associated with psychological empowerment rather than health literacy or conviction in one's own decision-making capacities [44]. Empowering adolescent girls to make decisions about HPV vaccination could be particularly important as they expressed strong certainty about the benefits of the vaccine and its essential role in preventing cancer.

### 4.5. Limitations

There are some limitations to this study. Due to the low HPV vaccine uptake rates in France, only a small number of vaccinated participants were included in the study, which could have skewed some of the findings. The study was also conducted in Paris, which may not be representative of the rest of France and only included mothers which may have limited findings from families in which fathers or other guardians are responsible for vaccination decision-making. The two recruitment and compensation mechanisms may have also affected the results. The fact that the interviews were conducted in French and reported in English could mean some concepts might have been lost in translation. This was partly mitigated by the researcher, fluent in English and French, analysing data in French and explaining concepts that could not be easily translated in more details.

## 5. Conclusion

This study found that HPV vaccination decision-making in France is a complex and uncertain process, which could be a consequence of erosion of trust in the vaccine, healthcare professionals, health authorities and information itself. As HPV vaccination has now become available to boys, these dynamics will need to be explored further among all adolescents, with future quantitative research also needed to provide more representative and generalizable findings. Furthermore, a controversial environment and healthcare professionals' own uncertainty and failure to recommend HPV vaccination could also lead mothers to question the trustworthiness of the vaccine. This study therefore highlights the need for further research to evaluate the effects of long-term trust building strategies focusing on HPV vaccination, vaccine providers, policy-makers and other sources of information.

### CRediT authorship contribution statement

**E. Karafillakis:** Conceptualization, Methodology, Validation, Formal analysis, Investigation, Writing – original draft. **P. Peretti-Watel:** Conceptualization, Methodology, Supervision, Writing – review & editing. **P. Verger:** Conceptualization, Methodology, Writing – review & editing. **T. Chantler:** Conceptualization, Methodology, Writing – review & editing. **H.J. Larson:** Conceptualization, Methodology, Supervision, Writing – review & editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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