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Défiance vaccinale : enquête sur les ressentis et croyances des parents autour de la vaccination de leurs enfants

Vaccine distrust: investigation of the views and attitudes of parents in regard to vaccination of their children

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TITRE COURANT: **Vaccines: parents' views and attitudes**

1 Abstract

2 **Background:** In France, many parents have lost confidence in vaccinations, which has a direct impact on
3 immunization coverage. Pharmacists, like other health professionals, often encounter parents exhibiting vaccine
4 distrust. **Methods:** Using a survey distributed in a school and in a number of volunteering pharmacies, the
5 objective of this study was to gain a better understanding of the views and the attitude of parents in regard to
6 vaccination of their children. **Results:** Our results show that the main concerns were in regard to vaccine
7 adjuvants, the risk of short- and long-term adverse effects, and the risk of developing a disease or a disability as a
8 result of vaccination. The parents, although they tended to express a degree of reluctance and apprehension, in
9 general, they were not opposed to vaccination, and they sought objective scientific information and full
10 transparency regarding all aspects of vaccine composition, adverse effects, and effectiveness. Cooperation of all
11 the parties involved in the health system on this subject is essential for a seamless chain of care and to improve
12 vaccination coverage. **Conclusion:** The information collected, combined with a review of the international
13 literature, allow avenues for dialogue adapted to parents' opinions to be established and thus assist health
14 professionals to communicate effectively regarding vaccines, which is a bona fide public health issue.

15 Keywords: Immunization coverage. Parents. Pharmacists. Vaccines. Vaccination refusal

16 Résumé

17 **Position du problème :** En France, de nombreux parents perdent confiance en la vaccination, ce qui impacte
18 directement la couverture vaccinale. Les pharmaciens d'officine, comme les autres professionnels de santé, sont
19 souvent confrontés à des parents montrant une défiance vaccinale. **Méthodes :** A l'aide d'une enquête diffusée
20 dans une école et au sein de pharmacies d'officine volontaires, l'objectif de cette étude était de mieux
21 comprendre le ressenti et les croyances des parents autour de la vaccination de leurs enfants. **Résultats :** Les
22 résultats montrent que les principales craintes concernaient les adjuvants vaccinaux, le risque d'effets
23 indésirables à court et à long terme ou encore le risque de développer une maladie ou un handicap après la
24 vaccination. Les parents, pour la plupart hésitants ou méfiants et non pas opposés à la vaccination, étaient
25 demandeurs d'informations scientifiques objectives et d'une transparence parfaite sur tout ce qui concerne la
26 composition des vaccins, leurs effets indésirables et leur efficacité. La coopération de tous les acteurs du système
27 de santé sur le sujet est primordiale pour assurer un maillage complet dans la chaîne de soins et améliorer la
28 couverture vaccinale. **Conclusion :** Les informations collectées, associées à une revue de la littérature

29 internationale, permettent d'établir des pistes de dialogue adaptées aux opinions des parents et d'aider ainsi les
30 professionnels de santé à communiquer sur les vaccins, véritable enjeu de santé publique.

31 Keywords: Couverture vaccinale. Hésitation vaccinale. Parent. Pharmacien. Vaccin

32

33

34 Introduction

35 Morbidity and infant mortality have decreased considerably with the progression of rudimentary immunizations
36 to widespread use of modern vaccines. Indeed, the World Health Organisation estimates that 2 to 3 million
37 human lives are saved each year through vaccination (1). However, there is a growing distrust of vaccination and
38 this is in fact now becoming a serious public health issue in most industrialised countries. According to the results
39 of the Vaccine Confidence Project (2), France has the highest rate of vaccine distrust, with no less than 41% of
40 people having doubts regarding the safety of vaccines and only 75% having favourable opinion of vaccination.
41 Since vaccination is a major public health issue that affects child health, there is ample reason to examine parents'
42 representations and fears regarding vaccination of their children. In France, pharmacists are increasingly involved
43 in public health measures, including immunizations. The purpose of this study was, through use of a survey, to
44 understand the mechanisms involved in vaccine mistrust and to assess the trust parents have in their pharmacist
45 for vaccination. Using these results and previous research on the subject, we present a tool for assisting health
46 professionals to communicate with parents regarding their views on vaccination.

47

48

49 Methodology

50

51 The survey consisted of 17 questions divided into 5 sections. It provided three free-expression fields. The
52 questionnaire, in paper format and accompanied by an information sheet, was provided to parents at multiple
53 locations in the Pays de la Loire region (in western France), according to two distinct methods:

54 - distribution to children at school (nursery school and public primary school) so that they could give it to their
55 parents when they got home. The parents could return the completed questionnaire to their child or directly to
56 the teachers who then forwarded them to us.

57 - distribution directly to the parents as part of their child's vaccination process at various volunteering pharmacies
58 throughout the city of Nantes.

59 The prerequisites for being included in the study were being a parent of one or more children from 0 to 18 years
60 of age and having an adequate level of understanding of the French language.

61 In all cases, the questionnaire was completed by the parents at home, knowing that they had the choice to return
62 it or not to the school or the pharmacy.

63

64 The survey was anonymous and voluntary. Prior to its diffusion, the survey was developed by a multidisciplinary
65 collaboration involving hospital pharmacists specialized in public health, a referring physician from a vaccination
66 center, and a biostatistician.

67

68 Several themes were selected to be addressed in the survey:

69 First, general information about the person who completed the questionnaire: parental status and number,
70 gender, and age of their child(ren). This category allowed to verify that the inclusion criteria were met and to
71 collect various relevant details regarding the participants.

72 The immunization status of the child(ren) was then requested. The parent was questioned on their knowledge of
73 diseases that are subject to mandatory vaccine prevention in France, and regarding the vaccination status of their
74 child(ren) in terms of mandatory and recommended vaccinations.

75 Part 3, "You and Vaccination", was the core element of the survey. Based on a global review of the literature and
76 in particular on the Australian Leask team survey (3), question to better define the opinion of the person
77 regarding vaccination was developed: convinced, somewhat apprehensive, reluctant, or opposed to it. Each
78 category was associated with an affirmation corresponding to a description of the feeling (for example
79 "vaccination scares me and I am reluctant to vaccinate my child"), the person being asked to choose the one best
80 matched their status. Categories 2 and 3 of the Australian study, which we deemed to be very similar, were
81 merged in our survey into a single category ("Somewhat apprehensive") to facilitate understanding by the
82 parents. The "Reluctant" classification thus accounting for category 4 of the Australian study - namely the
83 "selective vaccinators or latecomers". We then added several questions to determine the main sources of
84 information of the parents regarding vaccination and the elements that warranted improvement in regard to
85 communication about vaccines.

86 The person's perception of vaccines was evaluated: their level of confidence (from 0 to 10) regarding the most
87 widely used vaccines (i.e., Diphtheria Tetanus Poliomyelitis (DTP), Measles Mumps Rubella (MMR), Hepatitis B,
88 Meningitis, and Human Papillomavirus (HPV)) and whether the children had been vaccinated or not for each
89 valence. The last question in this section was open and very broad, dealing with fears about vaccination. The
90 answers were categorized and counted: at each evocation of one of the categories, 1 point was attributed to it in
91 order to weight the information obtained and to assign a growing order of the parents' fear of vaccination.

92 The 4th section entitled "You and your pharmacist", was intended to assess the level of confidence of the
93 respondents in their pharmacist about the information they can deliver about vaccination (on a scale of 0 to 10),
94 and to gauge the opinion of the parents on various possible engagements of the pharmacist for vaccination: the
95 establishment of a specific pharmaceutical interview, the possibility of reminding the person of their next
96 vaccination appointment, or the option to be vaccinated directly by the pharmacist.

97 The last section corresponded to a free-expression part: the interviewee could then raise subjects that seemed
98 necessary to them to explain or complete their answers by providing further details for example.

99 Informed consent was obtained from all the patients. The modalities for the collection of data were approved by
100 the ethics committee of the CHU (Nantes Ethics Group in the Area of Health, GNEDS).

101

102

103

104 Results

105 Ninety six people were included in the study (83 at the school and 13 through the pharmacies). The response rate
106 for the surveys distributed at the school was approximately 45% (83 responses out of the 186 distributed
107 questionnaires). The questionnaire was usually completed by the child's mother (91.67% vs 8.33% by the father).

108 It involved a total of 194 children (87 girls and 107 boys), with an average of 2.02 children per family. The average
109 age of the children was 7.4 years (standard deviation of 4.7 years).

110 In terms of the parents' awareness of the French vaccination requirements, nearly 98% of the parents knew that
111 DTP vaccination was mandatory. They were a lot less sure of the recommended vaccinations: 61% of the parents
112 thought that MMR vaccination was mandatory, 49% for pertussis, whereas these vaccines were, in fact, only
113 recommended by the health agencies at the time of the survey.

114 Assessing the parents' awareness of the immunization status of their children, we noted that 100% of the parents
115 thought that their children were up to date with their mandatory vaccinations, even among those who were not

116 in favour of vaccination. By contrast, only 73% of the parents thought that their children were up to date with the
117 recommended vaccinations.

118

119 The purpose of the "You and Vaccination ..." section, was to evaluate the parents' opinion on the subject. The
120 results are detailed below with the following proportions for the affirmation "In terms of vaccination, you are ...":

121 - Convinced: 40.66%

122 - Somewhat apprehensive: 50.00%

123 - Reluctant: 7.29%

124 - Opposed: 2.08%.

125

126 The two main sources of information regarding immunization were health professionals and official websites,
127 although nearly one in six parents referred to unofficial websites or people they knew (Figure 1).

128 The level of satisfaction of the parents with the information they could obtain was mixed. Indeed, while nearly
129 34% of the respondents felt completely satisfied, the majority (44%) were only partially satisfied. Almost 12.5%
130 did not feel satisfied ("Not really" + "No, not at all"). Excluding people who did not answer this question (9%), and
131 combining the people who were not generally satisfied, we found that about 2/3 of the parents were not fully
132 satisfied with the information regarding vaccination.

133 The reasons provided by some in the free expression part for this dissatisfaction related to a variety of problems
134 that they encountered. What stood out most was the feeling of having information on the subject being hidden
135 from them (n=5). This was followed to equal extents by difficulty with finding objective information (n=4), the
136 contrast between information from official sites and anti-vaccine websites (n=4), and the degree to which the
137 issue is skewed as a result of lobbying by pharmaceutical companies (n=4). Their choices were also influenced by
138 problems stemming from the lack of availability of vaccines (n=3) and the contradictory information from
139 different health professionals (n=3). Finally, some parents mentioned difficulties understanding the medical
140 jargon (n=1).

141

142 To better understand vaccine distrust, we asked the parents about their level of confidence in regard to the major
143 vaccines in France (Figure 2). Two vaccines in particular (namely MMR and DTP) inspired considerable confidence
144 (a rate > 8) while others were associated with lower levels of confidence, like HPV and Hepatitis B vaccines.

145

146 The children's vaccination coverage rates according to the parents were higher than 80% for DTP and MMR, but
147 lower for Hepatitis B and meningitis (Figure 3). Of 38 girls aged 11 or over, 31.6% had been vaccinated against
148 HPV.

149 In terms of the parents' fears about vaccination, adjuvants, side effects and disabilities due to vaccine were the
150 most cited (Figure 4). The "Other" category was subdivided as follows: Doctor against immunization (4.5%),
151 withdrawal of vaccine lots (4.5%), Vaccine risk higher than risk of contracting the disease (4.5%), lack of
152 consideration of the patient's background (2.3%) and anti-vaccine petitions (2.3%).

153 Regarding the parents' level of confidence in their pharmacist's advice about vaccination (from 0 = "not at all
154 confident" to 10 = "entirely confident"), the average score obtained was 6.84/10 (standard deviation of 2.7/10).

155 Half the participants agree meeting their pharmacist to discuss vaccination, but only a third would allow
156 pharmacists to vaccinate patients (Table 1).

157 Being notified for upcoming appointments by e-mail was preferred (31.25%) over the use of text message
158 (20.83%) or postal service (12.50%). Furthermore, 18.75% of the parents agreed to be reminded during a visit to
159 the pharmacy.

160 In the free-expression category, 21.9% of respondents expressed an opinion. Several of the parents raised issues
161 regarding the questions that were asked, or they elaborated on their answers. Some parents expressed their
162 distrust of pharmaceutical companies and noted their feeling of sometimes being judged by health professionals
163 when they expressed doubts about vaccination. Finally, some participants came up with ideas for improving
164 immunization coverage and vaccine acceptability by the general public.

165

166 Discussion

167 In order to collect as much information as possible from parents without introducing a bias by suggesting answers
168 that they would not have thought of spontaneously, the survey provided three free-expression fields. One of
169 these, regarding fears and representations about vaccination, was a deliberate choice to obtain a high diversity of
170 answers and especially not to skew the results by a list of predefined elements, which would have been
171 counterproductive given our objectives.

172 In terms of vaccination coverage rates for different diseases, the declarative data obtained with our questionnaire
173 are comparable to those of Public Health France 2014 (4).

174 The statistical power of our questionnaire would be obviously improved by a greater number of responses and a
175 greater geographical diversity of its dissemination. Nevertheless, it appears that the results that we obtained are

176 comparable to those of the national and international literature. In 2016, a 67-country survey conducted by the
177 Vaccine Confidence Project found that the European region had lower confidence in the safety of vaccines than
178 other world regions (5). Moreover, the European region accounted for seven of the ten countries with the lowest
179 levels of safety-based confidence issues, four of which (France, Greece, Slovenia, and Italy) are in the European
180 Union (EU). Vaccine refusal has been increasing in many EU member states: between 2000 and 2017, routine
181 immunisation coverage of the first dose of a measles-containing vaccine has decreased in nine EU member states
182 and since 2010, it has increased to 12. In 2017, the number of confirmed measles cases was at their highest levels
183 since 2010. Of the 9,420 cases recorded in 2010, 86% were recorded in France, Greece, Italy, Romania, or the UK,
184 countries whose first-dose measles immunisation rates are below the threshold required to achieve herd
185 immunity (93- 95%) (6).

186

187 In the section "You and vaccination ...", which seeks to evaluate the parents' opinion on the subject, the results
188 obtained are consistent with those of an Australian study in 2012 (3).

189 The French parents in our sample were broadly distributed in the same proportions as the Australian parents.
190 Nearly 60% of the parents exhibited a degree of mistrust of vaccination. This figure is above the 41%
191 disagreement in France with the notion that "overall, vaccines are safe" determined by the Vaccine Confidence
192 Project 2016 (2). These results are weighted by the fact that the parents who responded to the optional survey
193 are more likely to have had doubts in regard to immunization than the general population. Indeed, this bias is
194 known in marketing and can be applied to any study based on volunteering. Respondents who suffered a bad
195 interaction are more likely to share it on social media, online reviews or in surveys than those who had good
196 experiences. That's particularly problematic when the majority of respondents who have read negative reviews
197 claims that the information impacted their future decision. Hence, it is reasonable to assume that in vaccination
198 surveys, the proportion of people with a negative opinion will be higher than in the general population, and that
199 they will contribute to the spread of reluctance to be vaccinated. It should also be considered that the Vaccine
200 Confidence Project was only concerned with the safety aspect of vaccination to define lack of confidence in
201 vaccines, while our survey had a broader approach (i.e., it assessed confidence, safety, and efficiency) which can
202 thus include more people in this category.

203

204 Regarding the parents' sources of information on vaccination, it was clearly the doctor who gained the trust of
205 parents with nearly 90% of them having sought information from their physician. This point is reassuring because

206 it shows that parents trusted their doctor (General Practitioner or Paediatrician) and discussed vaccination with
207 them. They also often obtained information from official sources (e.g., the vaccination schedule or official
208 websites). Use of these sources of reliable information is encouraging. What is a concern, however, is the
209 proportion of parents relying on information from relatives.

210 A US study from 2017 (7) found that parents reluctant or opposed to vaccination categories more often had a
211 relative with a child that had experienced a severe reaction to a vaccine or whose parents were reluctant or
212 opposed to vaccination. A large proportion of these same parents admitted to choosing a doctor who authorizes
213 them to delay or refuse certain vaccines.

214 Here we could measure the influence of the relational environment of the parents: individuals who associate with
215 people who distrust vaccines are more likely to similarly question vaccination (e.g., the benefits, risks, ...). This
216 phenomenon is also very noticeable on social networks, where a "bubble effect" plays a major role in the increase
217 in vaccine distrust (8).

218 Nearly 15% of the respondents stated they obtained much of their information from these sources, which are
219 often a long way from being objective and reliable. These people are therefore at risk of consulting sites that
220 display erroneous or anxiety-provoking information about certain vaccines and immunization in general.

221 It should be noted that just over 7% of the parents never sought information on vaccination. These people often
222 trust their doctor and they tend to diligently follow the vaccination recommendations for their children.

223

224 By comparing the fears raised by the parents to those found in the literature, we found that there was a lack of
225 information on the subject or the feeling of information not being disclosed in some studies, as also noted in a
226 2017 US study that surveyed parents for HPV vaccination (9). This study also highlighted the pharmacist's
227 potential role in increasing adolescent immunization coverage in Alabama, a region suffering from significant
228 medical desertification, where pharmacists are authorized to vaccinate adolescents against papillomavirus.

229 Another interesting study, carried out in 2014 (10), made it possible to look for the main causes of international
230 vaccine hesitancy. The same concerns were encountered as in our survey: fear of a disproportionate risk/benefit
231 ratio (with a significant fear of side effects); problems relating to knowledge of and information on vaccination;
232 but also, ideological, cultural, or religious issues (which we did not find in our study).

233 In regard to the parents' level of confidence in the various vaccines, the public no longer harbours doubts
234 regarding the safety and the benefits of the oldest vaccines. Newer vaccines such as those for meningitis or
235 hepatitis B are more controversial. In France, the latter is particularly controversial because of its purported link

236 with an increase in cases of multiple sclerosis in a study dating back to 1998 (11), despite the fact that this has
237 since been disproven by many studies presented in the report by the Haut Conseil de la Santé Publique (HCSP)
238 (12). There is a high level of suspicion regarding the papillomavirus vaccine, with the lowest level of confidence
239 among parents in our survey. Its vaccination coverage is also the lowest of all of the vaccines used in France, with
240 only 18% of girls aged 16 receiving a dose in 2014 according to Public Health France (4).

241 Regarding vaccination rates against different diseases, it is clear that the lower the level of confidence, the lower
242 the vaccination coverage. We observed a correlation between these two parameters, which further proves that
243 mistrust of certain vaccines has a direct impact on immunization coverage and thus their preventive efficacy
244 against these diseases. Regarding the prevention of cervical cancer in young girls, we decided to weight the
245 results by focusing only on families that had at least one girl. This question was probably misunderstood by some
246 parents who responded when they did not have any girls in the family. We only considered girls aged 11 years and
247 over to determine the vaccination coverage of this group, the only one concerned by the vaccination
248 recommendation.

249 Here we measured the importance of rebuilding people's trust in these vaccines to increase individual and
250 collective protection against these diseases that are still responsible for many medical complications resulting in
251 hospitalization, disability, or even death.

252

253 Parents are actively seeking more objectivity about the sources of information: avoiding the positive or negative is
254 paramount. The benefits and potential risks of vaccines need to be addressed clearly so that parents can regain
255 confidence and make informed choices. Official communications from institutions are fundamental and need to
256 be prepared and argued for. The lack of coherence or transparency sometimes displayed by governments may
257 have been one of the reasons for the reluctance to be vaccinated. Faced with authorities whose opinions may
258 sometimes seem too clear-cut and lacking in nuance, discussions that consider the benefits but also the risks of
259 vaccination would seem more acceptable. To be more persuasive, official communications should use scientific
260 information that is already available or can be quickly obtained. Strong scientific information already existed to
261 counter the claims of the anti-vaccine lobbyists for several of the vaccine-related scare stories that have emerged
262 in recent years, but the information was not used effectively at the outset. Authorities should study all available
263 literature without prejudice, in order to demystify vaccines and how they work — an important step towards
264 building trust and gaining the confidence of opinion leaders.

265 As health professionals, we need to provide an objective perspective on this subject: clearly pointing out the
266 individual and collective benefits of the vaccines while explaining the possible undesirable effects and their
267 frequency is a top priority. We also need to be open to discussing topics of considerable concern to parents, such
268 as the use of aluminium adjuvants or the occurrence of rare diseases such as multiple sclerosis, macrophage
269 myofascitis, or Guillain-Barré syndrome. There have been many studies on the subject to date and full
270 transparency can often dispel doubts and fears of parents, thereby making them more confident about
271 vaccination. These views should be adopted by all health professionals to increase immunization coverage.

272

273 In the part "You and your pharmacist", the average level of trust the parents had for their pharmacist's
274 vaccination advice was 6.84/10. The respondents pointed out in the free-expression section a considerable
275 variability in the quality of the advice depending on the person who took care of them at the pharmacy. This
276 result showed that people generally have confidence in their pharmacist, but that there is nonetheless ample
277 room for improvement in our professional practice.

278 Concerning the potential new pharmacist engagements regarding vaccination, the proposal for a pharmaceutical
279 interview about vaccination was fairly well received by the parents with 52% of the responses in favour. A
280 pharmaceutical interview project regarding vaccination could be a solution to provide more information.

281 The notion that the pharmacist can remind patients of the date of upcoming immunization appointments was well
282 received (54%). Indeed, thanks to modern dispensary software, all of this information can now readily be
283 recorded in a secure manner. Clearly, a degree of remuneration for these pharmaceutical interviews or reminder
284 for vaccination appointments would be useful to increase participation in these professional activities, as has
285 been the case for anti-coagulants and asthma treatments.

286 We also asked parents how they felt about pharmacists being able to vaccinate under special circumstances. The
287 results indicated a high level of opposition to this, with 58% of negative replies ("Do not agree at all" + "Mostly
288 disagree"). The parents mostly saw this procedure as being something that should mainly only be carried out by
289 doctors or paediatricians. On the other hand, others parents welcomed this initiative as time-saving and reducing
290 the backlog common to medical practices.

291 In an IFOP survey conducted in 2016 (13), 92% of French people trusted their pharmacist and 65% of them
292 thought that progression of the pharmacist profession towards providing more services and advice would be a
293 step forward. In the same study, 66% of French people were in favour of the idea that pharmacists would be
294 allowed to vaccinate against influenza (13% being fully opposed). These results are higher than in our survey

295 where 42% of the parents were in favour of vaccination by the pharmacist. According to IFOP, the French people
296 most in favour of vaccination at the pharmacy are seniors with nearly 68% having a favourable opinion. Those
297 under 35 were more resistant to this idea, with 58% expressing a favourable opinion. Our results can be compared
298 with this figure because it is likely that a number of our respondents, parents of children with a majority under the
299 age of 11, belong to this group.

300 Regarding vaccination by pharmacists, the question is probably subject to a significant bias as in France it only
301 concerns annual influenza prevention in adults with specific indications (14). This trial, which came into effect in
302 the winter of 2017-2018 in some pilot regions, and will be generalized to the whole country from winter 2019,
303 does not provide for any authorization to vaccinate the paediatric population. The way the question was framed
304 in our survey, the parents may well have thought that it included the vaccination of children by pharmacists,
305 which introduces a bias in favour of rejection of this measure.

306

307

308 Conclusion

309

310 This study provides insightful information on parents' views and attitude in regard to vaccination. While many
311 parents were not sure about vaccination, there was, in fact, little genuine opposition to vaccination. They often
312 suffered from a lack of objective information. Many were looking for reliable data on the risks of vaccines and
313 particularly regarding their effectiveness, their safety (e.g., disease risks or disability), their composition (e.g.,
314 questions regarding aluminium adjuvants in particular), and their tolerance (e.g., side effects and immune
315 reactions). There is obviously a need for a strong collaboration between all health professionals to provide
316 information, listening and reliable advice, as this is essential for promoting public health.

317

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322

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360 Table 1 : Parent's level of confidence in their pharmacist's role about vaccination

	Do not agree at all	Mostly disagree	Mostly agree	Fully agree	No answer
<i>"I would like to be able to meet with my pharmacist in a confidential setting suitable for discussing vaccination if I feel the need."</i>					
	18.75%	27.08%	51.04%	1.04%	2.08%
<i>"Regarding the bill that would allow pharmacists to vaccinate patients, I am:"</i>					
	26.04%	32.29%	32.29%	6.25%	3.13%
<i>"I would like my pharmacist to remind me of upcoming immunization appointments"</i>					
	18.75%	25.00%	40.63%	13.54%	2.08%

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- 363 Figure 1: The parents' sources of information regarding immunization
- 364 Figure 2: The parents' level of confidence in regard to the major vaccines (out of 10)
- 365 Figure 3: Declarative data of vaccination coverage in our sample
- 366 Figure 4: Parents fears about vaccination

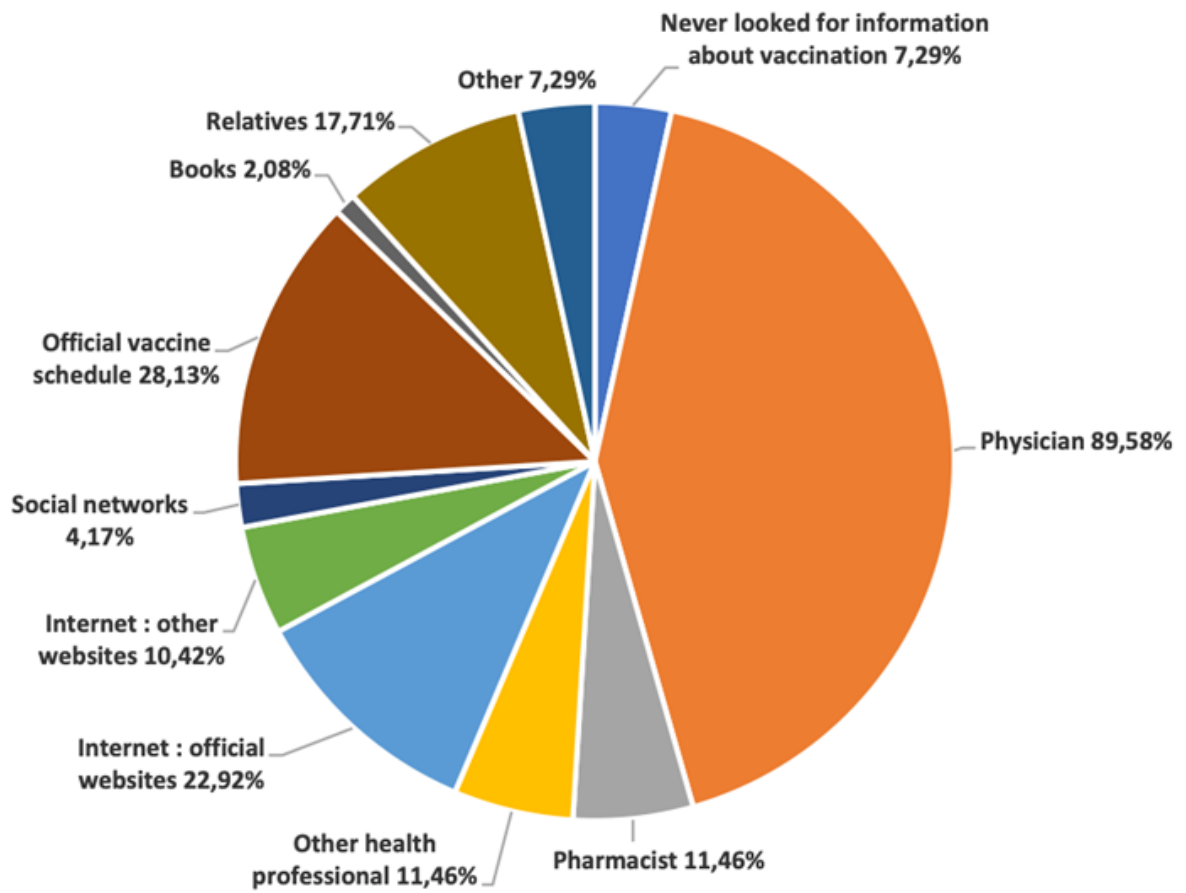


Figure 1: The parents' sources of information regarding immunization

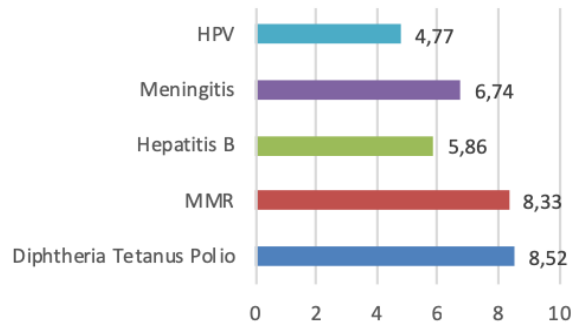


Figure 2: The parents' level of confidence in regard to the major vaccines (out of 10)

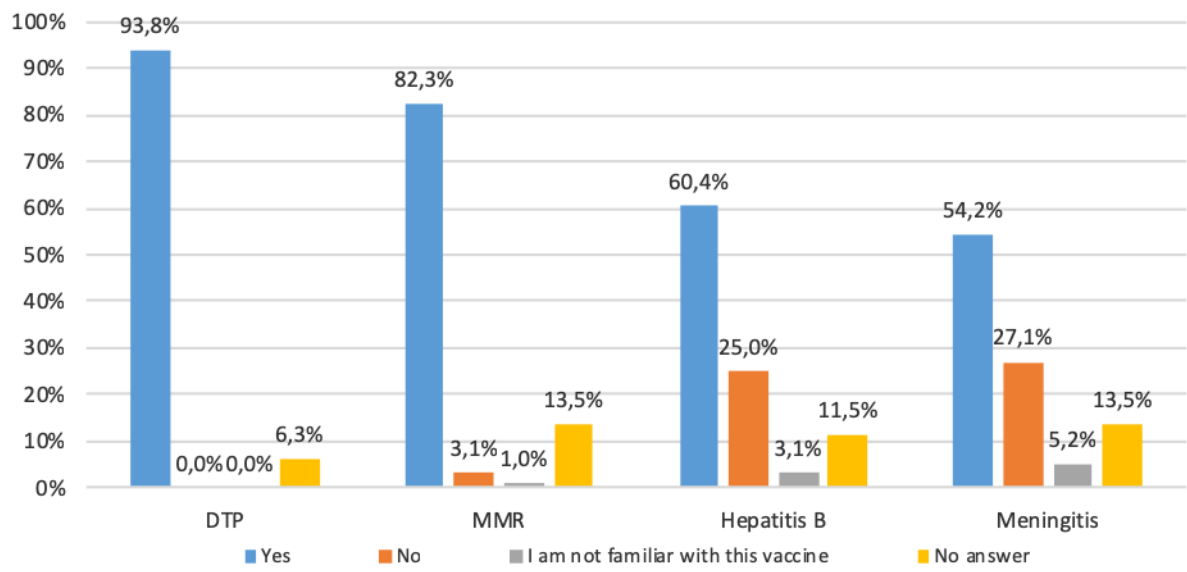


Figure 3: Declarative data of vaccination coverage in our sample

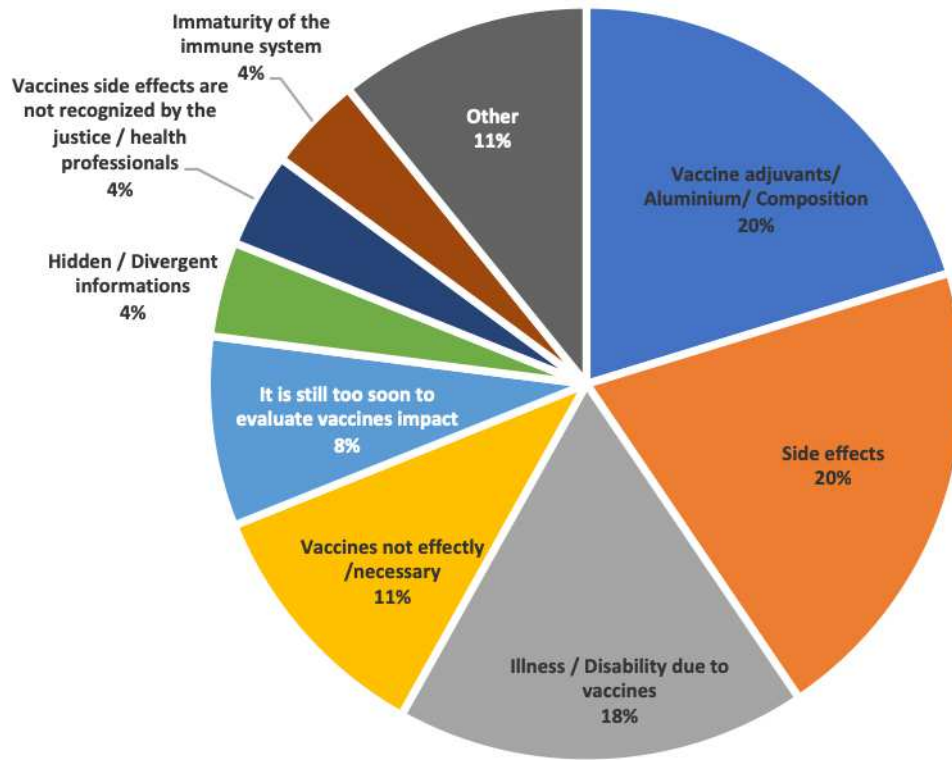


Figure 4: Parents fears about vaccination