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# BMJ Open

## Assessing knowledge, attitudes and belief toward HPV vaccination of parents with children aged 9-14 years in rural communities of Northwest Cameroon: a qualitative study

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2  
3 1 Title: Assessing knowledge, attitudes and belief toward HPV vaccination of parents with children aged 9-  
4 2 14 years in rural communities of Northwest Cameroon: a qualitative study

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## 25 ABSTRACT

26 Background: Human papilloma virus (HPV) vaccination is essential for the WHO cervical cancer  
27 elimination initiative. In Cameroon, HPV vaccine uptake is currently 5%. To assess the knowledge, beliefs  
28 and attitudes of parents of young girls aged 9 to 14 years about HPV vaccines within rural communities  
29 in the Northwest Region of Cameroon.

30 Methods: During January to May, 2022, we conducted 45 one-on-one interviews using a semi-structured  
31 interview guide in the localities of Mbingo, Njinikom and Fundong. Participants were parents of girls  
32 aged 9-14 years who speak English or Pidgin English. Health care workers were excluded. The interviews  
33 were recorded, transcribed, and analyzed using ATLAS.ti 9. Member checking was conducted presenting  
34 our findings and getting feedback from a focus group of parents.

35 Results: Thirty-five mothers and ten fathers were interviewed with mean age of 42 years. Ninety-one  
36 percent of parents had ever been vaccinated. Seventy seven percent had no or only primary school  
37 education. Thirty-one parents (68.9%) had daughters who had not been vaccinated against HPV. The  
38 themes identified include: Awareness (knowledge of HPV related diseases, risk factors and prevention),  
39 Access (ability to get the vaccine and cost), Trust (the message, the messenger and support for the  
40 message), Decision Making in the home and consent (predominantly paternalistic), and  
41 Recommendations for uptake and Community engagement (use of village infrastructure including fons  
42 and the palace, village crier, health care worker presenting at the njangi house, schools and churches).  
43 Member checking with 30 women from two other communities confirmed our findings.

44 Conclusions: Lack of awareness concerning the availability and purpose of the HPV vaccination was  
45 prevalent. Use of mainstream media and top-down health education activities are not effective. Novel  
46 approaches should engage local community health workers and utilize established community social and  
47 leadership structures.

48 Trial registration: [clinicaltrials.gov](https://clinicaltrials.gov) NCT05325138. Posted 13Apr2022

49 Key words: HPV Vaccine, Parental perspective, qualitative study

## 50 Strengths

51 -The interview guide was developed and implemented by a predominantly Cameroon research team  
52 that has experience with medical anthropology, qualitative methods and analysis.

53 -Analysis was conducted by a predominantly Cameroon research team who has understanding of the  
54 anthropologic nuances of the Kom people residing in this region.

## 55 Limitations

56 -Cameroon is a unique country setting and the region where the study was conducted is in a conflict  
57 zone; this may limit generalizability of findings.

58 -This study is limited to the perceptions of parents, the key decision-makers for vaccination in the  
59 region.

60

## 61 BACKGROUND

62 Infection with the Human Papilloma Virus (HPV) is an important public health problem given that HPV is  
63 the major cause of preinvasive disease and/or cancer of the lower genital tract and/or oral cavity [1,2].  
64 The introduction of HPV vaccines prior to exposure to the virus has been shown to lower this disease  
65 burden. The problem is that HPV vaccination uptake is still low in several countries [1,2]. At least 179  
66 countries have implemented various HPV National Immunization Programs (NIP). Currently HPV  
67 vaccination coverage stands at 30% in low and low middle-income countries, 55% in upper middle-  
68 income countries and 80% in high income countries [2,3]. In 2020, Cameroon reported an HPV  
69 vaccination rate of 5% [4]. Several factors may contribute to this low uptake: lack of knowledge of health  
70 care providers and the general population [5,6] and low acceptance of this vaccine among parents and  
71 adolescents [7]. While there are many stakeholders involved in the process of HPV vaccination, parents'  
72 awareness and influence play a key role in the uptake of HPV vaccination among eligible adolescents [8].  
73 Little is known about parental perceptions about HPV vaccination in Cameroon. The aim of this study  
74 was to assess knowledge, beliefs and attitudes of parents of young girls aged 9 to 14 years about HPV  
75 vaccines within rural communities of Cameroon.

## 76 METHODS

### 77 Study Site and Population

78 This study was conducted in the Mbingo region of Northwest Cameroon during the period of  
79 civil unrest. Participants were involved from a region located between Mbingo (population 1,281),  
80 Njinikom (20,461), and Fundong (45,831). The radius is 24km; it takes 38 minute to drive and 6 hours to  
81 walk. The region is populated predominantly by the Kom tribe with a much smaller component of Fulbe  
82 herders. These groups rely on subsistence farming and herding respectively [9].

### 83 Study design and procedures

#### 84 One on one interviews

85 A detailed protocol for this study has been published [10]. Qualitative data was obtained  
86 through one-on-one interviews and quantitative data from a short interviewer-delivered survey tool.  
87 The interviews were conducted from January–May2022.

88 A semi-structured interview guide was used [10]. Written informed consent was obtained from each  
89 participant. Face to Face in depth interviews took place in a private office at the Mbingo hospital to

90 increase confidentiality (except in one situation where it was deemed not safe for the interviewee to  
91 present in person at the hospital). All interviews were audio-recorded in english or pidgin English. They  
92 were transcribed in english. Duration of consent was 5-15 min (mean 11.9min). Duration of the  
93 interview was 43-66 minutes (mean 52.4 min).

#### 94 Sampling strategy

95 Purposeful sampling allowed for maximum variation in the profile of parents interviewed. Snowball  
96 sampling increased the respondents' confidence in the research team. We aimed to interview 40  
97 parents of age eligible girls in the selected regions, including at 10 parents of HPV vaccinated (POVD)  
98 and 30 parents whose daughters were not vaccinated (PONVD).

#### 99 Data Analysis

100 Data gathering and analysis were a concurrent and iterative process. Raw data was processed in their  
101 textual form and coded to generate analytical categories of themes for further analysis with ATLAS.ti 9  
102 (1993-2021 Scientific Software Development, GmbH Berlin, Germany) [11]. Data analysis was performed  
103 using the thematic analysis approach proposed by Braun and Clarke [12]. Also informing our analysis  
104 was the theoretical framework of Acceptability [13]. The key factors were: perceived effectiveness of  
105 the HPV vaccine, affective behavior, access, intervention coherence, and ethicality. Two additional  
106 themes that did not fit into the framework were: decision making roles within the family and quality  
107 initiative suggestions. The author team met regularly to review the initial coding structure and its  
108 content. Significant overlap in the content of some of the codes was noted, and themes further refined  
109 and reduced to the five key themes presented below.

#### 110 Member checking

111 Thirty parents from Mbingo II and Mughu villages met at the culmination of the coding. In a 2-hour  
112 session, the interview guide and preliminary findings were presented to group by ET. The attendees  
113 were invited to comment on our findings. Following the interaction, field notes were compared  
114 (ET,CN,LE). The member-checking confirmed the completeness and accuracy of the findings and enabled  
115 parents to reiterate recommendations outlined in the interviews.

116

#### 117 Ethical Considerations

1  
2  
3 118 This study was approved by the ethical committee of Hamilton Integrated Research Ethics Board,  
4  
5 119 Hamilton, Canada (14022) and the Cameroon Baptist Convention Health Board Institutional Review  
6  
7 120 Board (IRB2021-75)

8  
9 121 The interviewees were identified by referral by a community health worker. Their eligibility was  
10  
11 122 confirmed, and an interview appointment was made by a study personnel. Interview schedules were  
12  
13 123 suspended during periods of gun fire or roadblocks to protect both the interviewer and interviewees  
14  
15 124 (4Jan2022, April 4-16, 2022). On one occasion, our interviewer had to pay a bribe both coming and  
16  
17 125 going from the interviews (Apr 2022). On one occasion, it was deemed unsafe for an interviewee to  
18  
19 126 attend, so that interview was completed by phone.

## 20 127 RESULTS

### 21 22 128 Demographics of the study population

23  
24 129 We interviewed 14 parents of vaccinated daughters from Mbingo (9), Njinikom (3), and Fundong  
25  
26 130 (2) and 31 parents of unvaccinated daughters from Mbingo (9), Njinikom (8) and Fundong (14). The  
27  
28 131 study population included 10 fathers and 35 mothers of vaccine eligible girls. The parents' ages ranged  
29  
30 132 from 27-72 years old (mean 41.9yo) (Table 1). Mothers were younger (mean 39.5yo) than the fathers  
31  
32 133 (mean 50.4yo). Parents reported between 1-34 children (mean 5). All parents met the inclusion criteria.  
33  
34 134 There is a convention in this society that if a child is born out of wedlock (before the bride's price is paid)  
35  
36 135 then the parent is the grandparent (and not the biologic mother). We had one instance of this situation.  
37  
38 136 Ninety-one percent of the parents had been vaccinated and all their children had been vaccinated (ie.,  
39  
40 137 measles). Parents had a difficult time recalling the names of the vaccines they or their children received  
41  
42 138 and there did not appear to be consistent documentation for vaccinations available to parents. Most of  
43  
44 139 the vaccines for adults were in pregnancy (ie., tetanus) and at the time of baby checkups. The prevailing  
45  
46 140 tribal group represented was Kom (42/45) unless the mother married a Kom husband or was Fulani.  
47  
48 141 Most parents identified as Christian. No one identified as African tribal but there appears to be  
49  
50 142 syncretism of African tribal with Christian beliefs. Predominantly the parents only had a grade school  
51  
52 143 education (76.7%). The most common job was farming (44.4%). Within the group, in addition to their  
53  
54 144 primary jobs, one identified as a traditional doctor and two as herbalists.

### 55 56 57 58 59 60 145 Themes



1  
2  
3 146 We provide an overview of five key themes: (1) awareness; (2) access; (3) trust; (4) decision making and  
4  
5 147 consent; and (5) recommendations for uptake and community engagement. Illustrative quotes are in  
6  
7 148 Table 2.

### 9 149 **1. Awareness/knowledge of HPV related diseases, risk factors, and prevention.**

10  
11 150 In the medical model of cervical cancer, the journey begins with an HPV sexually transmitted infection  
12  
13 151 (STI), development of preinvasive cervical disease which if untreated results in cervical cancer. To  
14  
15 152 prevent the HPV infection, there is the HPV vaccine. Identifying and treating preinvasive disease involves  
16  
17 153 cervical screening. Preventing death from cancer involves treatment with either radical surgery or  
18  
19 154 radiation.

20  
21 155 None of the parents had had cancer and about a third of them listed a close family member or friend  
22  
23 156 with cancer. No-one had experience with someone with cervical cancer. Generically they recognized  
24  
25 157 that cancer destroys “parts of the body” like the uterus (parent 38) causing suffering and potentially  
26  
27 158 death. A small number of parents (11%) knew that smoking and alcohol were risk factors for cancer. It  
28  
29 159 was recognized that the management of cancer can consume the family’s financial resources and  
30  
31 160 require long term care of the sick person (parent 33). There was limited knowledge of specifically  
32  
33 161 cervical cancer (13%) but amongst the minority of parents familiar with cervical cancer, these  
34  
35 162 recognized that persistent vaginal bleeding or discharge were symptoms of disease.

36  
37 163 A quarter of participants *knew* that cervical cancer could be prevented or identified early through  
38  
39 164 cervical screening (20%) (twice as many mothers and PONVD); but only 5 of the women had been  
40  
41 165 screened during their lifetime. While gonorrhoea, syphilis and HIV were spontaneously mentioned as  
42  
43 166 causes of STIs; only one parent recognized the term HPV, and none recognized the term genital warts.

44  
45 167 Everyone *knew* about vaccines in general but only 7 parents were aware that there is a vaccine that  
46  
47 168 could prevent a certain type of cancer. The group recognized that vaccines prevent those vaccinated  
48  
49 169 from certain illnesses or from a severe form of the illness. They translated this into less cost, as the child  
50  
51 170 would not require medical treatment. The benefits mentioned related to the HPV vaccine included not  
52  
53 171 getting cervical cancer, not dying from cervical cancer, and not needing a hysterectomy.

54  
55 172 Those who spoke about *safe experiences* with vaccines indicated that they themselves or their children  
56  
57 173 had not had any vaccine related side effects aside from the infant crying or pain with the injection site. A  
58  
59 174 few parents (10% (no difference by parental gender, 2 fold higher in PONVD)) shared stories that they  
60  
175 had heard of those outside of their immediate family developing complaints following vaccination.

1  
2  
3 176 These included individual reports of headaches, body swelling, buttock wound at the site of the  
4  
5 177 injection, difficulty walking and paralysis. One participant indicated that it is important to take the  
6  
7 178 vaccine if the positive outweighs the negative. Parents were clear that one needs to be convinced that  
8  
9 179 the vaccine will benefit the child (9%) and that the side effects should be low (2%).

10  
11 180 In terms of *the experience of receiving a vaccine*, most parents had a blurry recollection of the names of  
12  
13 181 the vaccine their babies/infants received. They struggled to name the diseases the vaccines were to  
14  
15 182 prevent. Several did recall not receiving counselling about potential side effects of the vaccine. In  
16  
17 183 general, parents were not provided with any documentation of the vaccine given to the baby. One  
18  
19 184 participant indicated it was compulsory for babies to be vaccinated. Given this context of vague  
20  
21 185 recollection or record-keeping of vaccines among parents, it was not surprising that when focusing on  
22  
23 186 the HPV vaccine, all the parents did not recognize the name (ie., Gardasil, Cervarix or HPV vaccine) or  
24  
25 187 potential side effects. For those who had heard about the “cancer prevention” (HPV) vaccine, awareness  
26  
27 188 was linked by the respondent to learning about the vaccine either through a consent form sent home  
28  
29 189 with a school aged child, their school aged daughter telling them about it, a community health care  
30  
31 190 worker talk, or lecture at the hospital. Some parents (66%) reported that if a vaccine could avoid future  
32  
33 191 distress for an individual or the family, they would be proponents of vaccination.

34  
35 192 While everyone interviewed had some knowledge about an experience with vaccines, we wanted to  
36  
37 193 understand if prevention is a concept within the Kom culture. “Sha’a” is the term for injection, and this  
38  
39 194 was the term repeatedly used by respondents concerning vaccination. Examples of the concept of  
40  
41 195 prevention included scarification (9%), charms or amulets (9%). One participant said that “prevention is  
42  
43 196 not uncommon in Kom, but western diseases made vaccination more common” (parent 41). There was  
44  
45 197 confusion between the purpose of an injection for an infection (like antibiotics) versus an injection to  
46  
47 198 prevent disease (like a vaccination). The other coherence issue was prevention before exposure to  
48  
49 199 infection (HPV vaccination) versus prevention of cervical cancer by identifying precancer (ie., already  
50  
51 200 exposed to HPV infection) through screening.

52  
53 201 Parents identified that health care workers are the ones who spread the message about vaccines. Over  
54  
55 202 60% of parents indicated that they do not listen to radio, 40% did not watch television and none read  
56  
57 203 the newspaper (lack of contact with media was 2-fold high in mothers and PONVD). Only 3 parents  
58  
59 204 recalled hearing messages about cervical screening as a way to prevent cervical cancer on radio or TV.

1  
2  
3 205 Most parents (83%) were clear that vaccination is a private issue, and this is not discussed with peers.  
4  
5 206 Many indicated they do not have time for such interactions. When conversations occur, they are not on  
6  
7 207 health or vaccination topics. The 5 parents who had been present for vaccination discussion had done so  
8  
9 208 in the context of women's groups at church.

## 10 209 **2. Access**

11  
12  
13 210 Parents identified two pathways to access a vaccine: 1) as needed, through hospitals or 2) episodic  
14  
15 211 access through mass vaccine campaigns organized out of local schools or after a church service.  
16  
17 212 Twenty-two percent said that vaccines were not available where they lived, and you had to travel to  
18  
19 213 another setting to get the vaccine. These parents claimed it was easier to wait for local vaccination  
20  
21 214 campaigns instead of taking time off work to travel to a hospital. One parent indicated that when you  
22  
23 215 hear gunshots, travelling to a hospital is a low priority. One parent indicated that sometimes you go to a  
24  
25 216 hospital, and they tell you the vaccine is not currently available (Parent 18). Related to the HPV vaccine,  
26  
27 217 parents were unaware of the vaccine being available in their community.

28  
29 218 Parents indicated that cost could hinder vaccine uptake. If the vaccine is too expensive, then they  
30  
31 219 cannot afford it for their daughters (16%) (no difference by gender or vaccination status). Some parents  
32  
33 220 recalled that they were charged 15,000 cfa (\$34USD) for the vaccine in the past or a user fee of 100-  
34  
35 221 200cfa (\$0.20-0.40USD). Only eight parents were aware that the HPV vaccine is now free.

## 36 222 **3. Trust**

37  
38 223 Controversies came up as reasons to not take any vaccine or at least not to take it now. Two-thirds of  
39  
40 224 the parents raised a concern about risks of sterility (two-fold higher in fathers and five-fold higher in  
41  
42 225 PONVDs). Such concerns have been reported previously in the literature from this region [14] and linked  
43  
44 226 to rumored sterility resulting from use of the tetanus vaccine in 1990s in Kombo which is located one  
45  
46 227 mountain range to the east from Mbingo. Another prevalent concern expressed was that vaccines are  
47  
48 228 an attempt by HICs to limit the size of the population. Parents pointed out that the HPV vaccine is only  
49  
50 229 for girls, and the HPV vaccine is given at the age of menarche. They did not understand the reasons for  
51  
52 230 this.

53  
54 231 The region of this study is in the heart of the Anglophone conflict with the central French Cameroonian  
55  
56 232 government. Twenty percent of fathers and 3% of mothers raised the concern that a vaccine endorsed  
57  
58 233 by the central government was seen as a means to reduce the life span or kill Anglophones. Some

234 parents feared anything new and were not aware that the HPV vaccine has been used for the last  
235 decade.

236 **Trust in health care providers** was discussed by half of the parents. The parents stated they would trust  
237 a doctor or nurse for information (two-fold higher in PONVDs). Other trusted sources for information  
238 included pharmacists and community health workers. Trusted non-health care sources of information  
239 included a knowledgeable neighbor, elderly mother, or friend; but participants had not themselves  
240 sought out information from these non-healthcare sources. What was important was if the person was  
241 trustworthy, known by the parent (7%) and could provide good information (2%).

242 **Trust in health institutions** providing the vaccine was discussed by 25% of parents. Referral hospitals like  
243 Mbingo hospital were valued as a reliable source of information because of their reputation for high-  
244 quality care delivery and on-site experts in the field. This was contrasted to rural clinics or local health  
245 centers. One parent clearly perceived provision of fake or expired medication (2%).

#### 246 4. Decision making and consent

247 Decision making (DM) in the homes of this study context was patriarchal (47%) or joint between mother  
248 and father (27%) (patriarchal DM was 7-fold higher in PONVDs). In the latter situation, the father was  
249 seen as the financial provider and the mother as the one navigating health care issues for the children.  
250 Those women in households with no husbands identified the maternal father (grandfather) or maternal  
251 elder brother as responsibility for healthcare decision (7%). That said, it was acknowledged that a  
252 mother may make decisions without consulting a man if she is widowed or a single parent. In the case of  
253 parents being unmarried, the mother's parents would normally be the decision-maker with respect to  
254 vaccination. This in part is related to the financial implications of a health care decision on the family.

255 Many parents voiced that the daughter has "no say" (22%, no difference by gender, 32% PONVDs) with  
256 one adding that the daughter cannot go contrary to a father's decision. Rarely did a parent acknowledge  
257 that a daughter might not want the vaccine (4%). A few parents indicated that they would allow their  
258 daughters to decide, stating that one should not force them (9%). Parents voiced that rarely would a  
259 daughter's hesitancy to be vaccinated win over the parents' decision (9%).

260 A few parents recalled that the school sent home a consent for their daughters to receive the HPV  
261 vaccine, but several parents reported not being provided with a written consent in advance of their  
262 daughter being vaccinated at school or hospital program. One parent reported illiteracy and one parent

1  
2  
3 263 chose not to read the consent. In those cases where written information was provided, parents  
4  
5 264 appreciated the information and the request for being asked to be part of the DM process. These  
6  
7 265 parents did not understand that this vaccine required multiple doses and or the timing of those doses.  
8

### 9 266 **Recommendations for uptake and Community engagement**

10  
11 267 All the parents had suggestions for ways in which to improve HPV vaccine uptake. Asked what could  
12  
13 268 increase HPV vaccination in their community, parents stressed that information about the vaccine  
14  
15 269 should be communicated by someone known and trusted in the community (good character and  
16  
17 270 reputation). Such individuals might be a community health worker, a nurse or doctor (15%). (Fathers  
18  
19 271 were 3 times more likely to recommend a doctor.) Asked who was untrustworthy, participants  
20  
21 272 identified “crooks – even if they are nurses” (parent 33), liars, flirts, or prostitutes.

22  
23 273 Parents identified several trusted people in the community who could play an important role in  
24  
25 274 reinforcing the message that HPV vaccination is important. These include the fon (regional tribal leader)  
26  
27 275 (3 fold higher in fathers) or a message from the palace (13%), Kwifon (a person who would consult with  
28  
29 276 the spirit world before telling the people to take a vaccine) (4%), quarter heads (local neighbor leader  
30  
31 277 (65%), religious authorities (40%), renowned traditional doctors (25%), elder men or women in the  
32  
33 278 community (20%), educational authorities like principals or headmasters (15%), traditional council (4%),  
34  
35 279 town crier (4%). The following suggestions came from fathers: ngambe man, sorcerer, president of the  
36  
37 280 njangi groups (community center), or sporting group leaders. Witch doctors should not give the message  
38  
39 281 (2%).

40  
41 282 Identified places where the message could be given included: church (74%), market place (37%), large  
42  
43 283 gatherings like death celebrations (21%) or marriage ceremonies (10%), schools (16%), hospitals (10%),  
44  
45 284 njangi house (meeting place) (26%), parent-teacher meetings (11%), house to house visit on ghost town  
46  
47 285 days (no work allowed on Mondays since civil war) or country Sundays (Kom calendar has an 8 day week  
48  
49 286 so when this off day falls on a Monday, the people can't work on the farm) (11%), social media like  
50  
51 287 facebook (11%), or placards in clinics. Some parents felt that the message should not be given at bars  
52  
53 288 (11%) or door to door home visits as many people are often away working on their farms (11%).

54  
55 289 Many parents noted that vaccination uptake in general was linked to understanding of benefits. As one  
56  
57 290 parent noted, HPV vaccine uptake would improve if parents had an understand of why this vaccine was  
58  
59 291 important for their daughters. Telling parents to vaccinate their daughters, in the absence of clear  
60  
292 explanation of the vaccine's benefit, would not work.

293

294 Discussion

295 Many of the themes identified in this work have been previously noted in other studies in sub-  
296 Saharan Africa (2008-2022), in both rural and urban contexts, in diverse countries (Eritrea, Ethiopia,  
297 Ghana, Kenya, Nigeria, Morocco, Senegal, Somalia, South Africa, Tanzania, Uganda) and using different  
298 research approaches (ie., cross-sectional-surveys, focus groups, pre and post intervention, systematic  
299 review). Specifically our findings echo those in the literature in noting that: 1) there exist gaps in vaccine  
300 target populations' awareness and knowledge concerning HPV related diseases and prevention ([15-  
301 22]); 2) fathers and mothers are key decision makers for children's vaccination, hence the need to target  
302 both in any educational endeavor [23]; 3) low vaccine cost is key to engaging in vaccination [19,24]; and  
303 4) receiving information from a trusted source is of central importance to vaccine uptake [24,25].

304 Where our findings differ from the literature is on some of the trusted sources of information. In  
305 a Morocco study [18], they found that value was placed on input from the Ministry of Health. In  
306 Northwest Cameroon (currently in civil conflict), trusted sources of information were known local health  
307 care providers. National government involvement was mentioned as a factor that would lead to mistrust  
308 especially among fathers. The other novel finding had to do with insights on what could constitute as  
309 effective health promotion communication strategies in this region. There was lack of access to sources  
310 of information like radio, television, and newspaper especially in mothers and PONVDs. Even in those  
311 instances where these information sources were accessed, these sources did not provide information on  
312 HPV or prevention. There does appear to be widespread access to cellular devices and how this can be  
313 used to improve knowledge about health-related issues or access to prevention strategies remains to be  
314 defined. This represents valuable information for guiding future health-promotion communications in  
315 the region.

316 The strengths of our work is a clear presentation of one tribe's (Kom) perspective on HPV vaccine  
317 drawing on rich qualitative data obtained through one-on-one interviews conducted in person by an  
318 experienced interviewer with anthropological training familiar with the setting and local languages.  
319 Interviews included both mothers and fathers of vaccinated and unvaccinated daughters. Within our  
320 sample, were included views of non-medical community healers who are also parents. (3 in our work  
321 and 12 in Nelson's work from S. Africa [20]). Some limitations include that circumstances of conflict in  
322 this region did limit our recruitment and interview options. For example, while we would have liked to



323 have had the interviewer meet with parents at any time of day and in any location of their choice, the  
 324 security situation was such that interviews did need to occur during daylight hours at Mbingo Hospital.  
 325 This may have limited the participation of otherwise interested and eligible parents unable to commit to  
 326 travel or unable to leave home/labor commitments for an interview. We only interviewed one Fulbe  
 327 parent in part due to difficulty with language restrictions for the project. Convenience sampling was  
 328 used and given Cameroon's complex and diverse political and social landscape; it is not clear to what  
 329 extent our findings are generalizable to all residents of Cameroon. We did not have a large sample size  
 330 and so we cannot comment on the impact of higher level of education or household income on  
 331 willingness to vaccinate [18,26,27]. This study focused on the experience and perceptions of parents.  
 332 Parents are a key stakeholder group in vaccination uptake in Cameroon given their central role and  
 333 socially normative power in healthcare DM for minors. While understanding of the knowledge, attitudes  
 334 and beliefs of this key stakeholder group is a strength of this study and pragmatic for our goal of  
 335 supporting effective future vaccine programs in the region, we acknowledge parents represent only one  
 336 of the many stakeholders whose attitudes may impact on vaccine uptake. Further research to clarify  
 337 whether, and to what extent local implementers of HPV vaccination and target populations (girls aged 9-  
 338 14 years) harbor attitudes that may limit vaccine uptake would be valuable.

### 339 CONCLUSION

340 Among parents of vaccine eligible girls in rural Cameroon, there was a pervasive lack of awareness  
 341 concerning the availability and purpose of the HPV vaccination. Use of mainstream media and top-down  
 342 health education activities appear not to be effective in this setting. Novel approaches should engage  
 343 trusted local community health workers and utilize established community social and leadership  
 344 structures.

345

### 346 ABBREVIATIONS

DM	Decision making
HPV	Human Papillomavirus
PONVDs	Parents of non-vaccinated daughters
POVDs	Parents of vaccinated daughters
STIs	Sexually Transmitted Infections
yo	Years old

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## 349 DECLARATIONS

350 Ethics approval and consent to participate: This study was approved by the ethical committee of  
351 Hamilton integrated Research Ethics Board, Hamilton, Canada (14022) and the Cameroon Baptist  
352 Convention Health Board Institutional Review Board (IRB2021-75)

353 Consent for publication: Not applicable

354 Availability of data and materials: The datasets generated and/or analysed during the current study are  
355 not publicly available due to conditions of civil conflict but are available from the corresponding author  
356 on reasonable request.

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362 this study.

363

364 Authors' contributions:

365 LE- the research team leader, wrote the protocol, involved in the day to day management of the study,  
366 arranged and ran team meetings, conducted the analysis and writing of the manuscript

367 CN-provided feasibility and cultural input into recruitment and design of the interview guide, recruited  
368 participants, involved in coding and final manuscript

369 GA- provided feasibility and cultural insight into recruitment, design of the interview guide. Led the  
370 coding, development of themes. Participated in the analysis and final manuscript

371 ET-provided cultural input into recruitment and design and reiterations of the interview guide,  
372 conducted the interviews and member checking meeting, and provided English version of the interview  
373 transcripts. Provided input into the analysis and final manuscript

374 J F-D- provided input into the background, rationale and cultural insight into recruitment and design of  
375 the interview guide. Was involved in the analysis and final manuscript.

376 EN – provided input into the background and rationale, and methods. Participated in the analysis and  
377 final manuscript

378

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388 Table 1 Demographics

Characteristic	
Gender of the parents	
Female (mothers)	35 (81.5%)
Male (fathers)	10 (18.5%)
Age	
Mean (years)	41.5
50 years old and less	36 (80%)
51 and older	9 (20%)
Number of children (range)	1-34
Mean	5
Parent ever vaccinated	
Yes	41 (91.1%)
No	4 ( 8.9%)
Children ever vaccinated	
Yes	45 (100%)
Languages	
Kom	44
Pidgin English	38
French	3
English	2
Kedjon	1
Religion	
Christian	46
Baptist	24
Catholic	17
Other Christian	5
Muslim	1
Parental Education (Question answered by 43/45)	
None	1
Primary (Class 1-7)	
Class 3-5	5
Class 6/7	27
Secondary School	
Form 1-6	6
Post Secondary school	2
Degree	2
Employment	
Farmer	20
Housewife	5
Tailor/seamstress	5
Teacher	4
Market place vendor/business	5
Other	6
Exposure to Cancer	
Personal history	0
Relative or close friend	10

389 Table 2. Theme and quotations

Awareness	
	A vaccine like the HPV vaccine, many people do not even know about it. (Parent 011)
	I was just trying to prevent the illnesses. I know that I come from a very poor background and as such I have to do everything possible to prevent myself from illnesses because my family would be unable to raise money to treat me if I am attacked by such illnesses. Besides I am a single mother since my husband is of late and as such I need to be very careful with my life. (Parent 015)
	Given what vaccines do, I would know that at least they are prevented. They would have lesser effects if maybe they are affected by cancer. Because at times the vaccine may not stop the disease from attacking you, but when it attacks you the intensity would not be that high. So I know that if my children are vaccinated, they are at a lesser risk of being attacked by the virus or even if they are attacked, they will not suffer much. (Parent 003)
	I got the information from Auntie XXX, of the Belo Health Center. She went to school and informed the children about the vaccine. The day we went for clinic, she equally informed us about the vaccine. She is a nurse at the Belo Health Center. (Parent 008)
	If a fish comes out from the river and is telling you that a crocodile is having only an eye, who are you to say no? Are you living in the river? I am not educated but my child is. Here teachers too are educated and as such they know whatever an injection is good or not. If they accept that a vaccine should be given in school, who am I to say no. (Parent 042)
	I did not go to school so I cannot read a newspaper. I equally have no interest in the television or to the radio. I am preoccupied with my farm and domestic duties. (Parent 018)
Access	
	No, vaccines are not available around my vicinity. We hear about them only when some health personnel do pass around to administer the vaccine. (Parent 011)
	Vaccines are not easy to find where I live except one pays a visit to the hospital. At times you even go to the hospital to be vaccinated but you are told that the vaccines are unavailable. (Parent 018)
	We are not refusing the vaccines. At times you plan to take your children to the hospital but at the sound of gunshots, you stay at home. Anyway it has not been long since I started hearing of an injection that prevents children against cancer. I am just waiting for the vaccine to be given to her in school. (Parent 017)
	Around our church premises at Baptist Church Njinikejom, nurses always come around and vaccinate people. It is always announced in church at least one week beforehand, that, a vaccine is going to be administered to Christians on a slated date, but usually a Sunday. The vaccination is always done after church service. (Parent 014)
	The only hindrance can be if the price is too expensive. Now that I have learned the HPV vaccine is free, nothing can hinder me from asking my daughter to take it. (Participant 029)
Trust (Beliefs)	
	If I am informed about it by the community health worker I would take the vaccine. Any vaccine coming from the Mbingo Baptist Hospital is good. (Parent 002)
	Any vaccine that is given through the hospital cannot be disadvantageous to the child. Hospitals such as the Mbingo Baptist Hospital know what is good as far as healthcare is concern. (Parent 011)
	There is always that belief that vaccines that are to be administered to young people are meant to sterilize them or they are meant to reduce the population of Africa. Some Anglophones are now scared of anything coming from the government of Cameroon such as vaccines because they have lost trust in the government. Some are afraid that some of the vaccines sent to the English speaking regions of Cameroon are meant to kill some of them. (Parent 035)
Decision making and consent	
	I have told my children that until I permit them they should not receive a vaccine. (Parent 002)

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4	I would just go and tell their father about the vaccine for he has the final say. I would tell him about the
5	advantage of taking the vaccine even though the final say is his. (Parent 006)
6	Whether they like to be vaccinated or not is not their problem. They are still little children so they have no
7	say. I am the one to decide together with their father. The children do not have a choice. Only their father
8	has the final say. (Parent 007)
9	
10	My daughter returned from school one day and told me that they have been asked to come and take the
11	injection in school on a day yet to be announced. Their teacher told them that cervical cancer is a very
12	dangerous illness, and girl children age 9 to 14 years should take the injection in order to be to prevent the
13	illness; that they would never be sick of cervical cancer if they do take the injection. (Parent 017)
14	
15	The children were informed in school to be vaccinated against cancer. A consent form was sent to their
16	parents at home for signatory. The information was given to me by first daughter who is schooling at
17	Cameroon Baptist School Mbingo 1. She is in Primary six. The consent form simply stated that if the parent
18	has agreed that her daughter should be vaccinated against cervical cancer, then the parent should sign. The
19	form made mention of the fact that cervical cancer affects the cervix and is a killer disease. It is transmitted
20	through sexual intercourse. The vaccine to prevent this type of cancer is available is given to girl children of
21	age nine to fourteen years old. I agreed that my daughter should take this vaccine because of its importance.
22	I do not want my daughter to be infected. (Parent 033)
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# BMJ Open

## Assessing knowledge, attitudes and belief toward HPV vaccination of parents with children aged 9-14 years in rural communities of Northwest Cameroon: a qualitative study

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3 1 Title: Assessing knowledge, attitudes and belief toward HPV vaccination of parents with children aged 9-  
4 2 14 years in rural communities of Northwest Cameroon: a qualitative study

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## 25 ABSTRACT

26 Background: Human papilloma virus (HPV) vaccination is essential for the WHO cervical cancer  
27 elimination initiative. In Cameroon, HPV vaccine uptake is currently 5%. To assess the knowledge, beliefs  
28 and attitudes of parents of young girls aged 9 to 14 years about HPV vaccines within rural communities  
29 in the Northwest Region of Cameroon.

30 Methods: During January to May, 2022, we conducted 45 one-on-one interviews using a semi-structured  
31 interview guide in the localities of Mbingo, Njinikom and Fundong. Participants were parents of girls  
32 aged 9-14 years who speak English or Pidgin English. Health care workers were excluded. The interviews  
33 were recorded, transcribed, and analyzed using ATLAS.ti 9. Member checking was conducted presenting  
34 our findings and getting feedback from a focus group of parents.

35 Results: Thirty-five mothers and ten fathers were interviewed with mean age of 42 years. Ninety-one  
36 percent of parents had ever been vaccinated. Seventy seven percent had no or only primary school  
37 education. Thirty-two parents (71.12%) had daughters who had not been vaccinated against HPV. The  
38 themes identified include: Perceived effectiveness of the HPV vaccine, affective behavior (how they feel  
39 about the vaccine), accessibility (ability to get the vaccine), intervention coherence, ethicality (including  
40 parental informed consent), opportunity cost (future potential financial implications of cancer  
41 prevention), decision making in the home (predominantly paternalistic), self-efficacy (extent to which  
42 education initiatives were effective) and quality initiatives (use of village infrastructure including fons/  
43 qwifons, village crier, health care worker presenting at the njangi house, schools and churches).  
44 Member checking with 30 women from two other communities confirmed our findings.

45 Conclusions: Lack of awareness concerning the availability and purpose of the HPV vaccination was  
46 prevalent. Use of mainstream media and top-down health education activities are not effective. Novel  
47 approaches should engage local community health workers and utilize established community social and  
48 leadership structures.

## 49 Strengths and Limitations

50 -Interviews included both mothers and fathers of vaccinated and unvaccinated daughters.

51 -Views of non-medical community healers who are also parents were included.

52 -One-on-one interviews conducted in person by an experienced interviewer with anthropological  
53 training familiar with the setting and local languages.

54 -Circumstances of conflict in this region did limit our recruitment and interview options. It is not clear to  
55 what extent our findings are generalizable to all residents of Cameroon.

56 -Parents represent only one of the many stakeholders whose attitudes may impact on vaccine uptake.

57

58 Trial registration: [clinicaltrials.gov](https://clinicaltrials.gov) NCT05325138. Posted 13Apr2022

59 Key words: HPV Vaccine, Parental perspective, qualitative study

60

## 61 BACKGROUND

62 Infection with the Human Papilloma Virus (HPV) is an important public health problem given that HPV is  
63 the major cause of preinvasive disease and/or cancer of the lower genital tract and/or oral cavity [1,2].  
64 The introduction of HPV vaccines prior to exposure to the virus has been shown to lower this disease  
65 burden. The problem is that HPV vaccination uptake is still low in several countries [1,2]. At least 179  
66 countries have implemented various HPV National Immunization Programs (NIP). Currently HPV  
67 vaccination coverage stands at 30% in low and low middle-income countries, 55% in upper middle-  
68 income countries and 80% in high income countries (HIC) [2,3]. In 2020, Cameroon reported an HPV  
69 vaccination rate of 5% [4]. As of 2022, the Cameroon NIP made HPV vaccine available free of charge for  
70 9 yo girls. Given this context, several factors may contribute to low uptake: lack of knowledge of health  
71 care providers and the general population [5,6], low acceptance of this vaccine among parents and  
72 adolescents [7], and local supply problems or out of pocket expenses. While there are many  
73 stakeholders involved in the process of HPV vaccination, parents' awareness and influence play a key  
74 role in the uptake of HPV vaccination among eligible adolescents [8]. Little is known about parental  
75 perceptions about HPV vaccination in Cameroon in general and specifically in the rural setting. The aim  
76 of this study was to assess knowledge, beliefs and attitudes of parents of young girls aged 9 to 14 years  
77 about HPV vaccines within rural communities of Cameroon.

## 78 METHODS

### 79 Study Site and Population

80 This study was conducted in the Mbingo region of Northwest Cameroon during the period of  
81 civil unrest. Participants were involved from a region located between Mbingo (population 1,281),  
82 Njinikom (20,461), and Fundong (45,831). The radius is 24km; it takes 38 minute to drive and 6 hours to  
83 walk. The region is populated predominantly by the Kom tribe with a much smaller component of Fulbe  
84 herders. These groups rely on subsistence farming and herding respectively [9].

### 85 Study design and procedures

#### 86 One on one interviews

87 A detailed protocol for this study has been published [10]. Qualitative data was obtained  
88 through one-on-one interviews and quantitative data from a short interviewer-delivered survey tool.  
89 The interviews were conducted from January–May2022. To be included the individual must be a parent

90 of a daughter aged 9 to 14 years living in Mbingo, Njinikom and Fundong health areas. Individuals were  
91 excluded if they are a health worker or working in any health institution, unwillingness to provide  
92 consent to participate, or inability to converse in the language of the interviewer (English or Pidgin  
93 English).

94 A semi-structured interview guide was used [10]. Written informed consent was obtained from each  
95 participant. Face to Face in depth interviews took place in a private office at the Mbingo hospital to  
96 increase confidentiality (except in one situation where it was deemed not safe for the interviewee to  
97 present in person at the hospital). All interviews were audio-recorded in English or pidgin English. They  
98 were transcribed in English. Duration of consent was 5-15 min (mean 11.9min). Duration of the  
99 interview was 43-66 minutes (mean 52.4 min).

#### 100 Sampling strategy

101 Purposeful sampling allowed for maximum variation in the profile of parents interviewed. Snowball  
102 sampling increased the respondents' confidence in the research team. We aimed to interview 40  
103 parents of age eligible girls in the selected regions, including at 10 parents of HPV vaccinated (POVD)  
104 and 30 parents whose daughters were not vaccinated (PONVD).

#### 105 Data Analysis

106 Data gathering and analysis were a concurrent and iterative process. Raw data was processed in their  
107 textual form and coded to generate analytical categories of themes for further analysis with ATLAS.ti 9  
108 (1993-2021 Scientific Software Development, GmbH Berlin, Germany) [11]. Data analysis was performed  
109 using the thematic analysis approach proposed by Braun and Clarke [12]. Also informing our analysis  
110 was the theoretical framework of Acceptability [13]. The key factors were perceived effectiveness of the  
111 HPV vaccine, affective behavior, access, intervention coherence, and ethicality. Two additional themes  
112 that did not fit into the framework were: decision making roles within the family and quality initiative  
113 suggestions. The author team met regularly to review the initial coding structure and its content.  
114 Significant overlap in the content of some of the codes was noted, and themes further refined and  
115 reduced to the five key themes presented below.

#### 116 Member checking

117 Thirty parents from Mbingo II and Mughu villages met at the culmination of the coding. In a 2-hour  
118 session, the interview guide and preliminary findings were presented to group by ET. The attendees

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2  
3 119 were invited to comment on our findings. Following the interaction, field notes were compared  
4  
5 120 (ET,CN,LE). The member-checking confirmed the completeness and accuracy of the findings and enabled  
6  
7 121 parents to reiterate recommendations outlined in the interviews.

## 8 9 122 Ethical Considerations

10  
11 123 This study was approved by the ethical committee of Hamilton Integrated Research Ethics Board,  
12  
13 124 Hamilton, Canada (14022) and the Cameroon Baptist Convention Health Board Institutional Review  
14  
15 125 Board (IRB2021-75)

16  
17 126 The interviewees were identified by referral by a community health worker. Their eligibility was  
18  
19 127 confirmed, and an interview appointment was made by a study personnel. Interview schedules were  
20  
21 128 suspended during periods of gun fire or roadblocks to protect both the interviewer and interviewees  
22  
23 129 (4Jan2022, April 4-16, 2022). On one occasion, our interviewer had to pay a bribe both coming and  
24  
25 130 going from the interviews (Apr 2022). On one occasion, it was deemed unsafe for an interviewee to  
26  
27 131 attend, so that interview was completed by phone.

## 28 132 Patient and Public Involvement

29  
30 133 This study was designed to foreground the voices of parents approached for consent to have their  
31  
32 134 daughters vaccinated in the NIP [10]. Cameroon healthcare professionals familiar with the study region  
33  
34 135 and ultimately responsible for vaccination supported the design and recruitment strategy. Member  
35  
36 136 checking was completed as described above.

## 37 137 Results

### 38 39 40 138 Demographics of the study population

41  
42 139 We interviewed 14 parents of vaccinated daughters from Mbingo (9), Njinikom (3), and Fundong  
43  
44 140 (2) and 31 parents of unvaccinated daughters from Mbingo (9), Njinikom (8) and Fundong (14). The  
45  
46 141 study population included 10 fathers and 35 mothers of vaccine eligible girls; there was no relationship  
47  
48 142 between interviewees. The parents' ages ranged from 27-72 years old (mean 41.9yo) (Table 1). Mothers  
49  
50 143 were younger (mean 39.5yo) than the fathers (mean 50.4yo). Parents reported between 1-34 children  
51  
52 144 (mean 5). All parents met the inclusion criteria. There is a convention in this society that if a child is born  
53  
54 145 out of wedlock (before the bride's price is paid) then the parent is the grandparent (and not the biologic  
55  
56 146 mother). We had one instance of this situation. Ninety-one percent of the parents had been vaccinated  
57  
58 147 and all their children had been vaccinated (ie., measles). Parents had a difficult time recalling the name

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2  
3 148 of the vaccines they or their children received and there did not appear to be consistent documentation  
4 149 for vaccinations available to parents. Most of the vaccines for adults were in pregnancy (ie., tetanus) and  
5 150 at the time of baby checkups. The prevailing tribal group represented was Kom (42/45) unless the  
6 151 mother married a Kom husband or was Fulani. Most parents identified as Christian. No one identified as  
7 152 African tribal but there appears to be syncretism of African tribal beliefs with Christian. Predominantly  
8 153 the parents only had a grade school education (76.7%). The most common job was farming (44.4%).  
9 154 Within the group, in addition to their primary jobs, one identified as a traditional doctor and two as  
10 155 herbalists.

## 17 156 Themes

19 157 We provide an overview of five key themes: (1) awareness; (2) access; (3) trust; (4) decision making and  
20 158 consent; and (5) recommendations for uptake and community engagement. Illustrative quotes are in  
21 159 Table 2.

### 25 160 **1. Awareness/knowledge of HPV related diseases, risk factors, and prevention.**

27 161 In the medical model of cervical cancer, the journey begins with an HPV sexually transmitted infection  
28 162 (STI), development of preinvasive cervical disease which if untreated results in cervical cancer. To  
29 163 prevent the HPV infection, there is the HPV vaccine. Identifying and treating preinvasive disease involves  
30 164 cervical screening. Preventing death from cancer involves treatment with either radical surgery or  
31 165 radiation.

33 166 None of the parents had had cancer and about a third of them listed a close family member or friend  
34 167 with cancer. No-one had experience with someone with cervical cancer. Generically they recognized  
35 168 that cancer destroys “parts of the body” like the uterus (parent 38) causing suffering and potentially  
36 169 death. Five parents knew that smoking and alcohol were risk factors for cancer. It was recognized that  
37 170 the management of cancer can consume the family’s financial resources and require long term care of  
38 171 the sick person (parent 33). There was limited knowledge of specifically cervical cancer (6) but amongst  
39 172 the minority of parents familiar with cervical cancer, these recognized that persistent vaginal bleeding or  
40 173 discharge were symptoms of disease.

42 174 Ten participants *knew* that cervical cancer could be prevented or identified early through cervical  
43 175 screening (twice as many mothers and PONVD); but only 5 of the women had been screened during  
44 176 their lifetime. While gonorrhoea, syphilis and HIV were spontaneously mentioned as causes of STIs; only  
45 177 one parent recognized the term HPV, and none recognized the term genital warts.

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2  
3 178 Everyone *knew* about vaccines in general but only 7 parents were aware that there is a vaccine that  
4  
5 179 could prevent a certain type of cancer. The group recognized that vaccines prevent those vaccinated  
6  
7 180 from certain illnesses or from a severe form of the illness. They translated this into less cost, as the child  
8  
9 181 would not require medical treatment. The benefits mentioned related to the HPV vaccine included not  
10  
11 182 getting cervical cancer, not dying from cervical cancer, and not needing a hysterectomy.

12 183 Those who spoke about *safe experiences* with vaccines indicated that they themselves or their children  
13  
14 184 had not had any vaccine related side effects aside from the infant crying or pain with the injection site. A  
15  
16 185 four parents (no difference by parental gender, 2 fold higher in PONVD) shared stories that they had  
17  
18 186 heard of those outside of their immediate family developing complaints following vaccination. These  
19  
20 187 included individual reports of headaches, body swelling, buttock wound at the site of the injection,  
21  
22 188 difficulty walking and paralysis. One participant indicated that it is important to take the vaccine if the  
23  
24 189 positive outweighs the negative. Four parents were clear that one needs to be convinced that the  
25  
26 190 vaccine will benefit the child and that the side effects should be low.

27 191 In terms of *the experience of receiving a vaccine*, most parents had a blurry recollection of the names of  
28  
29 192 the vaccine their babies/infants received. They struggled to name the diseases the vaccines were to  
30  
31 193 prevent. Several did recall not receiving counselling about potential side effects of the vaccine. In  
32  
33 194 general, parents were not provided with any documentation of the vaccine given to the baby. One  
34  
35 195 participant indicated it was compulsory for babies to be vaccinated. Given this context of vague  
36  
37 196 recollection or record-keeping of vaccines among parents, it was not surprising that when focusing on  
38  
39 197 the HPV vaccine, all the parents did not recognize the name (i.e. Gardasil, Cervarix or HPV vaccine) or  
40  
41 198 potential side effects. For those who had heard about the “cancer prevention” (HPV) vaccine, awareness  
42  
43 199 was linked by the respondent to learning about the vaccine either through a consent form sent home  
44  
45 200 with a school aged child, their school aged daughter telling them about it, a community health care  
46  
47 201 worker talk, or lecture at the hospital. Two-thirds of parents reported that if a vaccine could avoid future  
48  
49 202 distress for an individual or the family, they would be proponents of vaccination.

50 203 While everyone interviewed had some knowledge about an experience with vaccines, we wanted to  
51  
52 204 understand if prevention is a concept within the Kom culture. “Sha’a” is the term for injection, and this  
53  
54 205 was the term repeatedly used by respondents concerning vaccination. Examples of the concept of  
55  
56 206 prevention included scarification, charms or amulets. One participant said that “prevention is not  
57  
58 207 uncommon in Kom, but western diseases made vaccination more common” (parent 41). There was  
59  
60 208 confusion between the purpose of an injection for an infection (like antibiotics) versus an injection to



209 prevent disease (like a vaccination). The other coherence issue was prevention before exposure to  
210 infection (HPV vaccination) versus prevention of cervical cancer by identifying precancer (ie., already  
211 exposed to HPV infection) through screening.

212 Parents identified that health care workers are the ones who spread the message about vaccines. Over  
213 60% of parents indicated that they do not listen to radio, 40% did not watch television and none read  
214 the newspaper (lack of contact with media was 2 fold high in mothers and PONVD). Only 3 parents  
215 recalled hearing messages about cervical screening as a way to prevent cervical cancer on radio or TV.

216 Most parents (83%) were clear that vaccination is a private issue and this is not discussed with peers.  
217 Many indicated they do not have time for such interactions. When conversations occur, they are not on  
218 health or vaccination topics. The 5 parents who had been present for vaccination discussion had done so  
219 in the context of women's groups at church.

## 220 **2. Access**

221 Parents identified two pathways to access a vaccine: 1) as needed, through hospitals or 2) episodic  
222 access through mass vaccine campaigns organized out of local schools or after a church service.  
223 Twenty-two percent said that vaccines were not available where they lived, and you had to travel to  
224 another setting to get the vaccine. These parents claimed it was easier to wait for local vaccination  
225 campaigns instead of taking time off work to travel to a hospital. One parent indicated that when you  
226 hear gunshots, travelling to a hospital is a low priority. One parent indicated that sometimes you go to a  
227 hospital, and they tell you the vaccine is not currently available (Parent 18). Related to the HPV vaccine,  
228 parents were unaware of the vaccine being available in their community.

229 Seven parents indicated that cost could hinder vaccine uptake. If the vaccine is too expensive, then they  
230 cannot afford it for their daughters (no difference by gender or vaccination status). Some parents  
231 recalled that they were charged 15,000 cfa (\$34USD) for the vaccine in the past or a user fee of 100-  
232 200cfa (\$0.20-0.40USD). Only eight parents were aware that the HPV vaccine is now free.

## 233 **3. Trust**

234 Controversies came up as reasons to not take any vaccine or at least not to take it now. Two-thirds of  
235 the parents raised a concern about risks of sterility (two-fold higher in fathers and five-fold higher in  
236 PONVDs). Such concerns have been reported previously in the literature from this region [14] and linked  
237 to rumored sterility resulting from use of the tetanus vaccine in 1990s in Kombo, which is located one

1  
2  
3 238 mountain range to the east from Mbingo. Another prevalent concern expressed was that vaccines are  
4  
5 239 an attempt by HICs to limit the size of the population. Parents pointed out that the HPV vaccine is only  
6  
7 240 for girls, and the HPV vaccine is given at the age of menarche. They did not understand the reasons for  
8  
9 241 this.

10  
11 242 The region of this study is in the heart of the Anglophone conflict with the central French Cameroonian  
12  
13 243 government. Two of ten fathers and one of thirty-five mothers raised the concern that a vaccine  
14  
15 244 endorsed by the central government was seen as a means to reduce the life span or kill Anglophones.  
16  
17 245 Some parents feared anything new and were not aware that the HPV vaccine has been used for the last  
18  
19 246 decade.

20  
21 247 **Trust in health care providers** was discussed by half of the parents. The parents stated they would trust  
22  
23 248 a doctor or nurse for information (two-fold higher in PONVDs). Other trusted sources for information  
24  
25 249 included pharmacists and community health workers. Trusted non-health care sources of information  
26  
27 250 included a knowledgeable neighbor, elderly mother, or friend; but participants had not themselves  
28  
29 251 sought out information from these non-healthcare sources. What was important was if the person was  
30  
31 252 trustworthy, known by the parent and could provide good information.

32  
33 253 **Trust in health institutions** providing the vaccine was discussed by 25% of parents. Referral hospitals like  
34  
35 254 Mbingo hospital were valued as a reliable source of information because of their reputation for high-  
36  
37 255 quality care delivery and on-site experts in the field. This was contrasted to rural clinics or local health  
38  
39 256 centers. One parent clearly perceived provision of fake or expired medication.

#### 38 257 **4. Decision making and consent**

40  
41 258 Decision making (DM) in the homes of this study context was patriarchal (47%) or joint between mother  
42  
43 259 and father (27%) (patriarchal DM was 7-fold higher in PONVDs). In the latter situation, the father was  
44  
45 260 seen as the financial provider and the mother as the one navigating health care issues for the children.  
46  
47 261 Those women in households with no husbands identified the maternal father (grandfather) or maternal  
48  
49 262 elder brother as responsibility for healthcare decision. That said, it was acknowledged that a mother  
50  
51 263 may make decisions without consulting a man if she is widowed or a single parent. In the case of parents  
52  
53 264 being unmarried, the mother's parents would normally be the decision-maker with respect to  
54  
55 265 vaccination. This in part is related to the financial implications of a health care decision on the family.



266 Some parents voiced that the daughter has “no say” (22%, no difference by gender, 32% PONVDs) with  
267 one adding that the daughter cannot go contrary to a father’s decision. Two parents acknowledged that  
268 a daughter might not want the vaccine. Four parents indicated that they would allow their daughters to  
269 decide, stating that one should not force them. **Four** parents voiced that rarely would a daughter’s  
270 hesitancy to be vaccinated win over the parents’ decision.

271 A few parents recalled that the school sent home a consent for their daughters to receive the HPV  
272 vaccine, but several parents reported not being provided with a written consent in advance of their  
273 daughter being vaccinated at school or hospital program. One parent reported illiteracy and one parent  
274 chose not to read the consent. In those cases where written information was provided, parents  
275 appreciated the information and the request for being asked to be part of the DM process. These  
276 parents did not understand that this vaccine required multiple doses and or the timing of those doses.

### 277 **Recommendations for uptake and Community engagement**

278 All the parents had suggestions for ways in which to improve HPV vaccine uptake. Asked what could  
279 increase HPV vaccination in their community, parents stressed that information about the vaccine  
280 should be communicated by someone known and trusted in the community (good character and  
281 reputation). Such individuals might be a community health worker, a nurse or doctor. (Fathers were 3  
282 times more likely to recommend a doctor.) Asked who was untrustworthy, participants identified  
283 “crooks – even if they are nurses” (parent 33), liars, flirts, or prostitutes.

284 Parents identified several trusted people in the community who could play an important role in  
285 reinforcing the message that HPV vaccination is important. These include the fon (regional tribal leader)  
286 (3 fold higher in fathers) or a message from the palace (13%), Kwifon (a person who would consult with  
287 the spirit world before telling the people to take a vaccine) (4%), quarter heads (local neighbor leader)  
288 (65%), religious authorities (40%), renowned traditional doctors (25%), elder men or women in the  
289 community (20%), educational authorities like principals or headmasters (15%), traditional council (4%),  
290 town crier (4%). The following suggestions came from fathers: ngambe man, sorcerer, president of the  
291 njangi groups (community center), or sporting group leaders. Witch doctors should not give the message  
292 (2%).

293 Identified places where the message could be given included: church (74%), market place (37%), large  
294 gatherings like death celebrations (21%) or marriage ceremonies (10%), schools (16%), hospitals (10%),  
295 njangi house (meeting place) (26%), parent-teacher meetings (11%), house to house visit on ghost town

296 days (no work allowed on Mondays since civil war) or country Sundays (Kom calendar has an 8 day week  
297 so when this off day falls on a Monday, the people can't work on the farm) (11%), social media like  
298 facebook (11%), or placards in clinics. Some parents felt that the message should not be given at bars  
299 (11%) or door to door home visits as many people are often away working on their farms (11%).

300 Many parents noted that vaccination uptake in general was linked to understanding of benefits. As one  
301 parent noted, HPV vaccine uptake would improve if parents had an understand of why this vaccine was  
302 important for their daughters. Telling parents to vaccinate their daughters, in the absence of clear  
303 explanation of the vaccine's benefit, would not work.

304

## 305 Discussion

306 Many of the themes identified in this work have been previously noted in other studies in sub-  
307 Saharan Africa (2008-2022), in both rural and urban contexts, in diverse countries (Eritrea, Ethiopia,  
308 Ghana, Kenya, Nigeria, Morocco, Senegal, Somalia, South Africa, Tanzania, Uganda) and using different  
309 research approaches (ie., cross-sectional-surveys, focus groups, pre and post intervention, systematic  
310 review). Specifically our findings echo those in the literature in noting that: 1) there exist gaps in vaccine  
311 target populations' awareness and knowledge concerning HPV related diseases and prevention ([15-  
312 22]); 2) fathers and mothers are key decision makers for children's vaccination, hence the need to target  
313 both in any educational endeavor [23]; 3) low vaccine cost is key to engaging in vaccination [19,24]; and  
314 4) receiving information from a trusted source is of central importance to vaccine uptake [24,25].

315 Where our findings differ from the literature is on some of the trusted sources of information. In  
316 a Morocco study [18], they found that value was placed on input from the Ministry of Health. In  
317 Northwest Cameroon (currently in civil conflict), trusted sources of information were known local health  
318 care providers. National government involvement was mentioned as a factor that would lead to mistrust  
319 especially among fathers. The other novel finding had to do with insights on what could constitute as  
320 effective health promotion communication strategies in this region. There was lack of access to sources  
321 of information like radio, television and newspaper especially in mothers and PONVDs. Even in those  
322 instances where these information sources were accessed, these sources did not provide information on  
323 HPV or prevention. There does appear to be widespread access to cellular devices and how this can be  
324 used to improve knowledge about health-related issues or access to prevention strategies remains to be  
325 defined. These findings represent valuable and previously undocumented information important for

1  
2  
3 326 guiding future health-promotion communications in the region. Other actionable items from this work  
4  
5 327 include the inclusion of local community leaders in the implementation of any new program like HPV  
6  
7 328 vaccination. It is important to educate 9-14 year old girls both for themselves and as a conduit of  
8  
9 329 information for their families. Written educational pamphlets and individual specific vaccination  
10  
11 330 documentation would help reinforce messages.

12 331 The strengths of our work is a clear presentation of one tribe's (Kom) perspective on HPV  
13  
14 332 vaccine drawing on rich qualitative data obtained through one-on-one interviews conducted in person  
15  
16 333 by an experienced interviewer with anthropological training familiar with the setting and local  
17  
18 334 languages. Interviews included both mothers and fathers of vaccinated and unvaccinated daughters.  
19  
20 335 Within our sample, were included views of non-medical community healers who are also parents. (3 in  
21  
22 336 our work and 12 in Nelson's work from S. Africa [20]). Some limitations include that circumstances of  
23  
24 337 conflict in this region did limit our recruitment and interview options. For example, while we would have  
25  
26 338 liked to have had the interviewer meet with parents at any time of day and in any location of their  
27  
28 339 choice, the security situation was such that interviews did need to occur during daylight hours at  
29  
30 340 Mbingo Hospital. This may have limited the participation of otherwise interested and eligible parents  
31  
32 341 unable to commit to travel or unable to leave home/labor commitments for an interview. We only  
33  
34 342 interviewed one Fulbe parent in part due to difficulty with language restrictions for the project.  
35  
36 343 Convenience sampling was used and given Cameroon's complex and diverse political and social  
37  
38 344 landscape; it is not clear to what extent our findings are generalizable to all residents of Cameroon. We  
39  
40 345 did not have a large sample size and so we cannot comment on the impact of higher level of education  
41  
42 346 or household income on willingness to vaccinate [18,26,27]. This study focused on the experience and  
43  
44 347 perceptions of parents. Parents are a key stakeholder group in vaccination uptake in Cameroon given  
45  
46 348 their central role and socially normative power in healthcare DM for minors. While understanding of the  
47  
48 349 knowledge, attitudes and beliefs of this key stakeholder group is a strength of this study and pragmatic  
49  
50 350 for our goal of supporting effective future vaccine programs in the region, we acknowledge parents  
51  
52 351 represent only one of the many stakeholders whose attitudes may impact on vaccine uptake. Further  
53  
54 352 research to clarify whether, and to what extent local implementers of HPV vaccination and target  
55  
56 353 populations (girls aged 9-14 years) harbor attitudes that may limit vaccine uptake would be valuable.

## 57 354 CONCLUSION

58 355 Among parents of vaccine eligible girls in rural Cameroon, there was a pervasive lack of  
59  
60 356 awareness concerning the availability and purpose of the HPV vaccination. Use of mainstream media

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3 357 and top-down health education activities appear not to be effective in this setting. Novel approaches  
4  
5 358 should engage trusted local community health workers and utilize established community social and  
6  
7 359 leadership structures.  
8

9 360

10  
11 361 ABBREVIATIONS

12	DM	Decision making
13	HIC	High Income Countries
14	HPV	Human Papillomavirus
15	PONVDs	Parents of non-vaccinated daughters
16	POVDs	Parents of vaccinated daughters
17	STIs	Sexually Transmitted Infections
18	yo	Years old

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24  
25 364 DECLARATIONS

26  
27 365 Ethics approval and consent to participate: This study was approved by the ethical committee of  
28 366 Hamilton integrated Research Ethics Board, Hamilton, Canada (14022) and the Cameroon Baptist  
29 367 Convention Health Board Institutional Review Board (IRB2021-75)

30  
31 368 Consent for publication: Not applicable

32  
33 369 Availability of data and materials: No data sets are available.

34  
35 370 Competing interests: This is an investigator initiated research project which has been funded by Merck.  
36 371 Merck does not have access to any of the original material but will be provided with any manuscripts  
37 372 that result from this work for review prior to publication.

38  
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40 374 in the study design, implementation, data collection. Interpretation and dissemination of the findings of  
41 375 this study.

42  
43 376

44  
45 377 Authors' contributions:

46  
47 378 LE- the research team leader, wrote the protocol, involved in the day to day management of the study,  
48 379 arranged and ran team meetings, conducted the analysis and writing of the manuscript

49  
50 380 CN-provided feasibility and cultural input into recruitment and design of the interview guide, recruited  
51 381 participants, involved in coding and final manuscript

52  
53 382 GA- provided feasibility and cultural insight into recruitment, design of the interview guide. Led the  
54 383 coding, development of themes. Participated in the analysis and final manuscript

1  
2  
3 384 ET-provided cultural input into recruitment and design and reiterations of the interview guide,  
4 385 conducted the interviews and member checking meeting, and provided English version of the interview  
5 386 transcripts. Provided input into the analysis and final manuscript

7 387 J F-D- provided input into the background, rationale and cultural insight into recruitment and design of  
8 388 the interview guide. Was involved in the analysis and final manuscript.

10 389 EN – provided input into the background and rationale, and methods. Participated in the analysis and  
11 390 final manuscript

13 391

15 392

17 393 Acknowledgements-not applicable

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402 Table 1 Demographics

Characteristic	
Gender of the parents	
Female (mothers)	35 (81.5%)
Male (fathers)	10 (18.5%)
Age	
Mean (years)	41.5
50 years old and less	36 (80%)
51 and older	9 (20%)
Number of children (range)	1-34
Mean	5
Parent ever vaccinated	
Yes	41 (91.1%)
No	4 ( 8.9%)
Children ever vaccinated	
Yes	45 (100%)
Languages	
Kom	44
Pidgin English	38
French	3
English	2
Kedjon	1
Religion	
Christian	46
Baptist	24
Catholic	17
Other Christian	5
Muslim	1
Parental Education (Question answered by 43/45)	
None	1
Primary (Class 1-7)	
Class 3-5	5
Class 6/7	27
Secondary School	
Form 1-6	6
Post Secondary school	2
Degree	2
Employment	
Farmer	20
Housewife	5
Tailor/seamstress	5
Teacher	4
Market place vendor/business	5
Other	6
Exposure to Cancer	
Personal history	0
Relative or close friend	10



403 Table 2. Theme and quotations

Awareness	
	A vaccine like the HPV vaccine, many people do not even know about it. (Parent 011)
	I was just trying to prevent the illnesses. I know that I come from a very poor background and as such I have to do everything possible to prevent myself from illnesses because my family would be unable to raise money to treat me if I am attacked by such illnesses. Besides I am a single mother since my husband is of late and as such I need to be very careful with my life. (Parent 015)
	Given what vaccines do, I would know that at least they are prevented. They would have lesser effects if maybe they are affected by cancer. Because at times the vaccine may not stop the disease from attacking you, but when it attacks you the intensity would not be that high. So I know that if my children are vaccinated, they are at a lesser risk of being attacked by the virus or even if they are attacked, they will not suffer much. (Parent 003)
	I got the information from Auntie XXX, of the Belo Health Center. She went to school and informed the children about the vaccine. The day we went for clinic, she equally informed us about the vaccine. She is a nurse at the Belo Health Center. (Parent 008)
	If a fish comes out from the river and is telling you that a crocodile is having only an eye, who are you to say no? Are you living in the river? I am not educated but my child is. Here teachers too are educated and as such they know whatever an injection is good or not. If they accept that a vaccine should be given in school, who am I to say no. (Parent 042)
	I did not go to school so I cannot read a newspaper. I equally have no interest in the television or to the radio. I am preoccupied with my farm and domestic duties. (Parent 018)
Access	
	No, vaccines are not available around my vicinity. We hear about them only when some health personnel do pass around to administer the vaccine. (Parent 011)
	Vaccines are not easy to find where I live except one pays a visit to the hospital. At times you even go to the hospital to be vaccinated but you are told that the vaccines are unavailable. (Parent 018)
	We are not refusing the vaccines. At times you plan to take your children to the hospital but at the sound of gunshots, you stay at home. Anyway it has not been long since I started hearing of an injection that prevents children against cancer. I am just waiting for the vaccine to be given to her in school. (Parent 017)
	Around our church premises at Baptist Church Njinikejom, nurses always come around and vaccinate people. It is always announced in church at least one week beforehand, that, a vaccine is going to be administered to Christians on a slated date, but usually a Sunday. The vaccination is always done after church service. (Parent 014)
	The only hindrance can be if the price is too expensive. Now that I have learned the HPV vaccine is free, nothing can hinder me from asking my daughter to take it. (Participant 029)
Trust (Beliefs)	
	If I am informed about it by the community health worker I would take the vaccine. Any vaccine coming from the Mbingo Baptist Hospital is good. (Parent 002)
	Any vaccine that is given through the hospital cannot be disadvantageous to the child. Hospitals such as the Mbingo Baptist Hospital know what is good as far as healthcare is concern. (Parent 011)
	There is always that belief that vaccines that are to be administered to young people are meant to sterilize them or they are meant to reduce the population of Africa. Some Anglophones are now scared of anything coming from the government of Cameroon such as vaccines because they have lost trust in the government. Some are afraid that some of the vaccines sent to the English speaking regions of Cameroon are meant to kill some of them. (Parent 035)
Decision making and consent	
	I have told my children that until I permit them they should not receive a vaccine. (Parent 002)

1 2 3 4 5	I would just go and tell their father about the vaccine for he has the final say. I would tell him about the advantage of taking the vaccine even though the final say is his. (Parent 006)
6 7 8 9	Whether they like to be vaccinated or not is not their problem. They are still little children so they have no say. I am the one to decide together with their father. The children do not have a choice. Only their father has the final say. (Parent 007)
10 11 12 13	My daughter returned from school one day and told me that they have been asked to come and take the injection in school on a day yet to be announced. Their teacher told them that cervical cancer is a very dangerous illness, and girl children age 9 to 14 years should take the injection in order to be to prevent the illness; that they would never be sick of cervical cancer if they do take the injection. (Parent 017)
14 15 16 17 18 19 20 21 22	The children were informed in school to be vaccinated against cancer. A consent form was sent to their parents at home for signatory. The information was given to me by first daughter who is schooling at Cameroon Baptist School Mbingo 1. She is in Primary six. The consent form simply stated that if the parent has agreed that her daughter should be vaccinated against cervical cancer, then the parent should sign. The form made mention of the fact that cervical cancer affects the cervix and is a killer disease. It is transmitted through sexual intercourse. The vaccine to prevent this type of cancer is available is given to girl children of age nine to fourteen years old. I agreed that my daughter should take this vaccine because of its importance. I do not want my daughter to be infected. (Parent 033)

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