



BMJ Open Study protocol for assessing knowledge, attitudes and belief towards HPV vaccination of parents with children aged 9–14 years in rural communities of North West Cameroon: a qualitative study

Lorraine Elit ,^{1,2} Calvin Ngalla,³ Glen Mbah Afugchwi ,⁴ Eric Tum,⁵ Joël Fokom-Domgue,⁶ Elysée Nouvet⁷

To cite: Elit L, Ngalla C, Afugchwi GM, *et al.* Study protocol for assessing knowledge, attitudes and belief towards HPV vaccination of parents with children aged 9–14 years in rural communities of North West Cameroon: a qualitative study. *BMJ Open* 2022;**12**:e062556. doi:10.1136/bmjopen-2022-062556

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2022-062556>).

Received 07 March 2022
Accepted 08 August 2022



© Author(s) (or their employer(s)) 2022. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

For numbered affiliations see end of article.

Correspondence to
Dr Lorraine Elit;
elitl@mcmaster.ca

ABSTRACT

Introduction Despite human papilloma virus (HPV) vaccine being incorporated in the National Immunisation Programme in Cameroon in 2019, HPV vaccine uptake among eligible girls has been poor (5%). The barriers to HPV vaccination in this high-burden setting have not been previously studied, especially in rural areas. We propose to evaluate the knowledge, attitudes and beliefs of parents of girls aged 9–14 years regarding HPV vaccine.

Methods and analysis *Study design:* a qualitative descriptive study will be conducted using one-on-one semi-structured interviews with parents of girls aged 9–14 years from 3 health districts in Cameroon (Mbingo, Njinikom and Fundong) who can converse in English or Pidgin English. Enrolment will occur until thematic saturation—approximately 40 participants. *Analysis:* quantitative methods will be used to describe the interviewees. All interviews will be audio recorded, transcribed and loaded into a tool to facilitate analysis (ATLAS.ti). Transcripts will be coded and thematic analysis will be conducted. Analysis will occur concurrent with interviews.

Ethics and dissemination *Ethics:* institutional review board approval will be obtained from the Cameroon Baptist Convention Health Board (CBCHB), Cameroon and McMaster University, Hamilton, Canada. *Dissemination:* study findings will be presented via a report and webinar to the Ministry of Health, the funders, the CBCHB and in person to healthcare providers and interested members of the general population in the study region. Plans are to share findings internationally through peer-reviewed publication(s) and presentation(s).

Trial registration number NCT05325138.

INTRODUCTION

Infection with the human papilloma virus (HPV) is an important public health problem given that HPV is the major cause of preinvasive disease and/or cancer of the lower genital tract and/or oral cavity.^{1,2} The introduction

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The interview guide was developed and will be implemented by a predominantly Cameroon research team that has experience with medical anthropology, qualitative methods and analysis.
- ⇒ Analysis will be conducted by a predominantly Cameroon research team who has understanding of the anthropological nuances of the Kom people residing in this region.
- ⇒ Cameroon is a unique country setting and the region where the study was conducted is in a conflict zone; this may limit generalisability of findings.
- ⇒ This study is limited to the perceptions of one group of key decision-makers in vaccination in the region: those of parents.

of HPV vaccines prior to exposure to the virus has been shown to play a major role in lowering disease burden associated with the oncological types of this virus. The problem is that HPV vaccination uptake is still low in several countries.^{3,4} At least 179 countries have implemented various HPV National Immunisation Programmes. Currently, HPV vaccination coverage stands at 30% in low-income and lower middle-income countries, 55% in upper middle-income countries and 80% in high-income countries.^{4,5} In Cameroon, a West African Country, reports from the Ministry of Health indicate a lower HPV vaccination rate, with only 5% of eligible girls having received the vaccine in 2020.⁶ This is lower than reports for other childhood vaccinations like measles (8%)⁷ and in Fouban (neighbouring province), 28.6% for BCG, 22.8% for DPT-Hi+Hb3 and 14.3% for measles/rubella.⁸ Several factors may contribute to this low uptake: lack of



knowledge or awareness of healthcare providers and the general population⁹ and low acceptance of this vaccine among parents, guardians and adolescents themselves.¹⁰

In Africa, cervical cancer is the second leading cause of cancer mortality in women.⁹ According to GLOBOCAN, 2020, the age-standardised incidence and mortality rate of cervical cancer in Western African countries including Cameroon is 33.7 per 100 000 and 16.6 per 100 000, respectively.^{5 11} While other HPV-related cancers include oropharyngeal (Age Standardized Incidence/Age Standardized Mortality per 100 000 is 2.21/1.55 (men), 0.38/0.14 (women)), anal (0.62/0.46 (men), 0.70/0.49 (women)) and other male or female lower genital tract sites (0.67/0.44 (vulva), 0.63/0.38 (vaginal), 0.14/0.06 (penile)), disease-specific incidence and mortality rates appear low in part due to a lack of systematic cancer reporting in Cameroon.⁶ WHO has proposed a 90-70-90 cervical cancer reduction goal by 2030. This envisions achieving a 90% world vaccination rate for all girls by age 15 years, screening 70% of women at age 35 years and again at 45 years by a high-performance test and delivering appropriate treatment to 90% of those with disease.¹² The global goal is a cervical cancer incidence rate of <4 per 100 000. Unfortunately, there is a paucity of population-based cancer statistics in much of the world, including Cameroon. Currently, Cameroon reports cervical cancer as the second most common of all cancers (representing 13.8% of all cancer diagnoses).¹³ Cervical screening uptake is very low with just 4% of women having access to screening services.^{14 15}

There have been two previous pay for HPV vaccination projects in Cameroon. In 2009, the National Committee for the Fight Against Cancer approved the use of Gardasil in Cameroon for the vaccination of girls aged 9–26 years (although emphasis was made on girls aged 9–13 years).^{16 17} As a result, the Cameroon Baptist Convention Health Services (CBCHS), a large faith-based private health services organisation in Cameroon, vaccinated 6851 girls from 2010 to 2012.¹⁷ There was a fee to cover administration of the doses (US\$8/dose). Uptake was highest in the North West and South West regions of Cameroon but poor in Yaoundé. Eighty-five per cent of girls received all three doses. In 2017, the Cervarix vaccine (a bivalent vaccine produced by GlaxoSmithKline against HPV 16 and HPV 18 was approved for use in Cameroon by the Ministry of Health.¹⁶ This pay for vaccine was used for Cameroonian women aged 9 through 55 years. Results of this opportunity in terms of number of Cervarix doses administered or number of cycles completed are not available.

In 2019, Gardasil 4 was incorporated into the national (Expanded Programme of Immunization) vaccine programme for Cameroon for girls aged 9 years. There has been poor communication concerning availability of doses both to healthcare providers and the community.^{11 18} In North West Cameroon, the CBCHS has made a supply of free Gardasil 4 for girls aged 9–14 years, the 2021 supply expired before use. Despite CBCHS

campaigns to promote vaccination against HPV-related diseases, the uptake of the HPV vaccination has been low. There exists no evidence-based explanation for this low uptake for the Cameroonian context.

Parents conventionally play a key role in non-adults' healthcare decision-making in this part of Cameroon, thus our hypothesis is that the uptake of the HPV vaccine depends in part on the public's comprehension of implications of an HPV infection and their understanding of the benefits of the HPV vaccine in preventing lower genital tract and oral cancer.¹⁹ The aim of this study is to assess knowledge, beliefs and attitudes of parents of young girls aged 9–14 years about HPV vaccines within some rural communities in the North West Region of Cameroon served by three well attended hospitals. These are Mbingo Baptist Hospital, St Martin de Porres Catholic Hospital Njinikom and Fundong District Hospital. We wish to understand from a public perspective the reasons for this low uptake. While there are many stakeholders involved in the process of HPV vaccination (like Ministry of Health, Ministry of Education, hospitals, pharmaceutical companies, schools, community leaders (like Fons, Chiefs, quarter heads, pastors, public, girls aged 9–14 years), understanding the perspectives of parents with girls aged 9–14 years (who may or may not provide consent for vaccination) is essential to improve HPV vaccine uptake. The above listed hospitals have been conducting activities related to primary prevention (vaccination) since as early as 2016 and secondary prevention (screening) for cervical cancer since 2007. We also know that communities served by these hospitals are in the region in which CBCHS organises HPV vaccine promotion campaigns. While these sites are in a zone of conflict, the area has been more stable in the recent 2 years as compared with 2018. We recognise the presence of COVID-19 in the region since March 2020 with COVID-19 vaccinations for health workers and the public being available as of April 2021.

The aim of this study is to assess knowledge, beliefs and attitudes of parents to young girls aged 9–14 years about HPV vaccines within some rural communities in the North West Region of Cameroon served by three hospitals in that area. The specific objectives of this evaluation are to evaluate the knowledge, beliefs and attitudes of parents of young girls aged 9–14 years regarding the vaccine and to obtain learning on possible intervention to improve acceptance of HPV vaccine by parents of young girls aged 9–14 years in the area of study.

METHODS

This is a qualitative descriptive study as described by Sandelowski,²⁰ which is a suitable method for advancing understanding of questions related to healthcare seeking. The theoretical framework of acceptability (TFA) will serve as a guide for this study.²¹ The TFA provides a reflection of how much healthcare interventions are considered appropriate by providers and receivers based on real

or perceived understanding and emotional implications of the intervention. The TFA assesses acceptability of interventions by looking at seven domains, which include perceived effectiveness, burden, affective attitude, intervention coherence, self-efficacy, ethicality and opportunity cost.

This study involves the collection and analysis of approximately 40 one-on-one semi-structured interviews with parent(s) of one or more female children (aged 9–14 years) living in rural communities in North West Cameroon. More specifically they live within Fundong, Njinikom or Mbingo health areas. Interviews are being conducted between January and November 2022.

Sampling will involve a quota sampling method for parent(s) consent to participate in the interviews. Given a study objective is to clarify motivations driving HPV vaccination or its avoidance in this district, sampling will include purposively seeking a balance between parents who have at the time of interview opted in or out of HPV vaccination for their girl(s) with maximum variation (eg, level of parental education, occupation). We will include up to 10 parents of girls who received HPV vaccine and 30 parents of girls who did not receive the HPV vaccine. Potential parent participants will be identified from HPV vaccination registry at the Mbingo Baptist Hospital women's health programme office (for girls who received the vaccine). Regarding families who did not receive the vaccine, potential parent participants will be those who respond to word-of-mouth advertisements by health area community mobilisers.

To be invited for an interview, the individual must be a parent of a daughter aged 9–14 years living in Mbingo, Njinikom and Fundong health areas. Individuals will be excluded if they are a health worker or working in any health institution. It is our assumption that the knowledge, attitudes and beliefs of healthcare worker differ from those of the general public. This study is focused on advancing understanding of these from a public perspective as they pertain to HPV vaccination. Other exclusion criteria include unwillingness to provide consent to participate, inability to converse in the language of the interviewer (English or Pidgin English). Pidgin English otherwise known as Cameroonian Creole or Kamtok is the main language spoken in the North West and South West regions of Cameroon. There is a small per cent of the population who only communicate in Fula. Also, an older segment of the population (beyond the age of the parents on whom we focus here) who have not been exposed to formal education may only speak their tribal language. We do not anticipate exclusion of these linguistic minorities impacting on our ability to recruit sufficient participants. Enrolment will be continued until we reach thematic saturation (ie, the point when new data do not add new thematic information to what has been learnt from completed interviews).

All parents who agree to participate in the study will be invited to Mbingo Baptist Hospital at a date and time convenient to them for the interview with the interviewer.

We understand that this may limit participation of some individuals but by allowing participants to dictate their preferred timing for the interview, by reimbursing transportation and meal costs and by offering a small token for their time (in the form of soap), we have tried to optimise participation. Interviews will be conducted by a medical anthropologist with postgraduate training in qualitative research.

An interview guide has been created addressing knowledge, attitudes and behaviours towards vaccination in general, sexually transmitted diseases, cervical cancer and HPV vaccination (online supplemental table). The guide contains open-ended questions with probes. The guide will be pilot tested with five parents for comprehension and flow. The interviews will last between 45 and 60 min and will be audio recorded. The interviewer will use an electronic tablet with recording application. All the interviews will be verbatim transcribed into English. All recorded audio files will be saved on password-protected computers and backed up on to Mbingo Baptist Hospital servers. Only study investigators and the interviewer will have access to the saved files.

Patient and public involvement

This study is designed to foreground the voices of parents approached for consent to have their daughters vaccinated within Cameroon's National Vaccination Programme. Cameroonian healthcare professionals familiar with the study region, and ultimately responsible for vaccination in the region supported the design and recruitment strategies. Member checking will be conducted using a focus group within the community to discuss themes identified in the individual interviews.

ANALYSIS

Data will be analysed concurrently with the interviews. A four-step thematic content analysis will be conducted including data familiarisation, theme identification, data coding and organisation of codes and themes using the framework method. Through an iterative process, transcripts will be coded and analysed for description and interpretive themes. All transcribed interviews will be inputted into ATLAS.ti9, a programme widely used by social scientists to facilitate organisation and analysis of qualitative data. Two study personnel (CN, GMA) will code each of the first two interviews, with the goal of identifying key beliefs and attitudes that could clarify a participant's or wider society hesitancy to seek out HPV vaccination. Codes will be compared and discrepancies resolved in dialogue with the study co-leads (LE, JF-D, EN). Sequential groups of two interviews will be double coded until agreement is achieved. Thereafter, an interview will only need to be coded by one member of the study team. An individual external to the team (EH) will conduct an audit coding of all the coded content once all the interviews have been coded, towards verifying the accuracy and coherence of the coding process. The



research team will meet regularly to discuss and reach consensus on the themes identified and their implications in relation to the study question.

ETHICS AND DISSEMINATION

Institutional ethics approval has been obtained both in Canada at McMaster University and through the Cameroon Baptist Convention Health Board. Participant information and informed consent documents will be read and explained to potential participants prior to participating in the interviews. The consent describes in detail the study intervention, study procedures, benefits, risks, compensation, voluntary participation, confidentiality, right as a participant and ability to withdraw from the study. Those who opt into the study will be asked to sign the consent form. A copy of the signed informed consent document will be stored in the participant's research record and another signed copy retained by the consenting participant. Consent forms will be kept separate from the data collected and no identifying information will be included in the transcription of the interview.

Any information that is obtained during this study will be kept confidential. All participant information will have a research code number (and no personal identifying information). These documents will be stored in encrypted and password-protected computer files. Only the principal investigator (PI) and other investigators will have access. These files will be backed up at Mbingo Baptist Hospital secure servers. The identifiers and other data will be destroyed 7 years after study completion.

Direct benefits to study participants are unlikely; however, information garnered from this study will be used to determine the knowledge, beliefs and attitudes of parents of young girls aged 9–14 years regarding the HPV vaccine and identify possible interventions to improve acceptance of HPV vaccine by parents of young girls aged 9–14 years in the area of study.

We anticipate minimal risks for participants in this study. A few risks will involve travelling up to about 30 km to Mbingo Baptist Hospital for the interviews. There has been a waxing and waning civil conflict in this region since 2018. If in the opinion of local hospital administration and/or CBCHS that people should not travel to the hospital on a given day, the interviews will be cancelled that day and/or the study will be put on hold. Other risks include the possible discomfort in expressing personal perceptions in response to some interview questions. To mitigate these, interviews will be arranged for dates and times that are suitable for the participants and participants shall be informed prior to the start of interviews not to provide names or personal identifiers on recordings.

Participants will be free to withdraw from the study at any time on request. If they choose to leave the study after data have been collected, they will be able to request a withdrawal of collected information.

If the study is prematurely terminated or suspended, the PI will promptly inform the Research Ethics Committee

at McMaster University and the Cameroon Baptist Convention Health Board and the study sponsors and funders (Merck), providing the reason(s) for the termination or suspension. Any amendment to the protocol will be submitted to various ethics committees before the changes are implemented to the study.

The PI and study team will conduct the study in compliance with the approved protocol. The PI and study team will not implement any deviation from or changes to the protocol without prior review and documented approval from the ethics committee. Any unintentional deviations from the protocol will be reported to the ethics committee.

Results will be disseminated to the funders, to CBCHB, Cameroon Ministry of Health and interested parties like the EPI vaccine programme. Presentation locally at the internal medicine and surgery residents rounds of the Baptist Institute of Health Sciences is anticipated. A peer-review publication and presentation at peer-reviewed meeting(s) are planned.

EXPECTED OUTCOMES

At the end of this study, we hope to better understand the perspective of parents and their knowledge, attitudes and beliefs about HPV vaccinations for their young daughters. This is the first study of its kind in rural communities in the North West Region, Cameroon. This information will help us understand if there are knowledge gaps that could be addressed through education, or negative attitudes that could be challenged through peer communication. We anticipate this project could serve as a stepping stone to similar projects in other regions of Cameroon or intervention projects based on the findings of this study.

Author affiliations

- ¹Department of Surgery, Baptist Institute for Health Sciences, Mbingo, Cameroon
- ²Department of Obstetrics and Gynecology, McMaster University, Hamilton, Ontario, Canada
- ³Women's Health Program, Mbingo Hospital, Mbingo, Cameroon
- ⁴Department of Pediatric Oncology, Baptist Institute for Health Science, Mbingo, Cameroon
- ⁵Information and Vocational Orientation Centre, Bamenda, Cameroon
- ⁶Department of Obstetrics and Gynecology, Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Yaounde, Cameroon
- ⁷School of Health Studies, Western University, London, Ontario, Canada

Contributors LE: the research team leader and wrote the protocol. CN: provided feasibility and cultural input into recruitment and design of the interview guide. GMA: provided feasibility and cultural insight into recruitment, design of the interview guide and analysis. ET: provided cultural input into recruitment and design and reiterations of the interview guide. JF-D: provided input into the background, rationale and cultural insight into recruitment and design of the interview guide. EN: provided input into the background and rationale, methods and analysis.

Funding This work was supported by Merck grant number 100035 (Elit 13 October 2021).

Disclaimer Merck had no role in the study design, implementation, data collection, interpretation and dissemination of the findings of this study.

Competing interests None declared.

Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the 'Methods' section for further details.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

Lorraine Elit <http://orcid.org/0000-0001-8966-1937>

Glen Mbah Afugchwi <http://orcid.org/0000-0002-5512-9624>

REFERENCES

- de Martel C, Georges D, Bray F, *et al*. Global burden of cancer attributable to infections in 2018: a worldwide incidence analysis. *Lancet Glob Health* 2020;8:e180–90.
- Arbyn M, Weiderpass E, Bruni L, *et al*. Estimates of incidence and mortality of cervical cancer in 2018: a worldwide analysis. *Lancet Glob Health* 2020;8:e191–203.
- Lei J, Ploner A, Elfström KM, *et al*. HPV vaccination and the risk of invasive cervical cancer. *N Engl J Med* 2020;383:1340–8.
- PATH Global HPV vaccine introduction overview, 2019. Available: <https://www.path.org/resources/global-hpv-vaccine-introduction-overview/> [Accessed Feb 2020].
- Lemp JM, De Neve J-W, Bussmann H, *et al*. Lifetime prevalence of cervical cancer screening in 55 low- and middle-income countries. *JAMA* 2020;324:1532–42.
- HPV Facts. 2021 for cameroon ICO/IARC information centre on HPV and cancer. Available: <https://hpvcentre.net/statistics/reports/CMR.pdf> [Accessed 13 Jul 2022].
- Cameroon humanitarian situation report no 6, 2020. Available: <https://reliefweb.int/report/cameroon/unicef-cameroon-humanitarian-situation-report-n0-6-mid-year-report-january-june-2020> [Accessed 13 Jul 2022].
- Ateudjieu J, Yakum MN, Goura AP, *et al*. EPI immunization coverage, timeliness and dropout rate among children in a West Cameroon health district: a cross sectional study. *BMC Public Health* 2020;20:228.
- WHO. WHO/ICO information centre on HPV and cervical cancer (HPV information centre). human papillomavirus and related cancers in Cameroon. Summary Report 2010 2010 www.who.int/hpvcentre
- Shelton RC, Snavely AC, De Jesus M, *et al*. HPV vaccine decision-making and acceptance: does religion play a role? *J Relig Health* 2013;52:1120–30.
- 2020 Cameroon country data. Available: www.who.int [Accessed 16 Feb 2022].
- Global strategy to accelerate the elimination of cervical cancer, 2020. Available: www.who.int [Accessed 21 Feb 2022].
- pp.Enow Oroock GE, Ndom P, Doh AS. Current cancer incidence and trends in Yaounde, Cameroon. *Onc Gas Hep Rep* 2012;1:58–63.
- World Health Organization. *Cervical cancer screening in developing countries: report of a WHO consultation*. Geneva: World Health Organization, 2002.
- Okyere J, Duodu PA, Aduse-Poku L, *et al*. Cervical cancer screening prevalence and its correlates in Cameroon: secondary data analysis of the 2018 demographic and health surveys. *BMC Public Health* 2021;21:1071–9.
- Wamai RG, Ayissi CA, Oduwo GO, *et al*. Assessing the effectiveness of a community-based sensitization strategy in creating awareness about HPV, cervical cancer and HPV vaccine among parents in North West Cameroon. *J Community Health* 2012;37:917–26.
- Ogembo JG, Manga S, Nulah K, *et al*. Achieving high uptake of human papillomavirus vaccine in Cameroon: lessons learned in overcoming challenges. *Vaccine* 2014;32:4399–403.
- Cameroon: nationwide vaccination against cervical cancer to begin soon. Available: <https://www.journalducameroun.com/en/cameroonnationwide-vaccination-against-cervical-cancer-to-begin-soon> [Accessed 15 Apr 2021].
- Marlow LAV, Waller J, Wardle J. Public awareness that HPV is a risk factor for cervical cancer. *Br J Cancer* 2007;97:691–4.
- Sandelowski M. Whatever happened to qualitative description? *Res Nurs Health* 2000;23:334–40.
- Sekhon M, Cartwright M, Francis JJ. Acceptability of healthcare interventions: an overview of reviews and development of a theoretical framework. *BMC Health Serv Res* 2017;17:88.