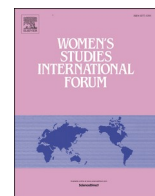


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Gender-responsive language in the National Policy Guidelines for Immunization in Kenya and changes in prevalence of tetanus vaccination among women, 2008–09 to 2014: A mixed methods study

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ABSTRACT

Global evidence suggests that maternal vaccination rates are partly related to intersectional gender-related disparities. Kenya recently eliminated maternal and neonatal tetanus, but previously had low rates of tetanus vaccination in many districts. Examining both national data and gender-responsive language in policies can potentially illuminate this progress. This study used mixed-methods approach: content analysis to identify gender-responsive language in Kenya's National Policy Guidelines for Immunization 2013, and logistic regression to analyze data from the Kenya Demographic and Health Surveys: 2008–09 (pre-policy) and 2014 (post-policy) to determine whether vaccination utilization significantly changed pre- and post-policy. Kenya's vaccine guidelines highlighted a comprehensive life-cycle approach with several mentions of targeted immunization sensitization interventions for diverse sub-populations of women and gatekeepers. Logistic regression suggested an association between year of survey administration and prevalence of tetanus vaccination, with greater adjusted odds post policy implementation (e.g., 2014). Further in-depth research, like elite interviews, might prove valuable.

1. Introduction

The World Health Organization (WHO) recently updated its guidance on the tetanus toxoid-containing vaccine (hereafter referred to as tetanus vaccine) for pregnant girls and women (World Health Organization, 2017). A systematic review of tetanus vaccination to reduce mortality from neonatal tetanus suggested that two “properly timed” doses can reduce neonatal tetanus-linked fatalities by around 94% (Blencowe et al., 2010). The first two doses of the vaccine are recommended during the woman's first pregnancy (the first dose provided at first contact with health services and the second dose at least four weeks later, and at least two weeks before delivery), with the third dose to be given at least six months after the second, followed by two boosters during subsequent pregnancies or at least a year later (World Health Organization, 2017).

In 2019, the WHO confirmed that Kenya had eliminated maternal and neonatal tetanus (e.g., fewer than 1 case per 1000 live births per

county) (World Health Organization, 2019). However, as summarized in Haile et al. (2013) from an earlier WHO report (2010), an estimated 11% to 50% of the country's districts had previously been at “high risk” from maternal and neonatal tetanus in the first decade of the new millennium (Haile et al., 2013; World Health Organization, 2019). Maternal and child risk included not only an overt absence of vaccination but also drop-outs from injection schedules (Maina, 2009). During the same period, tetanus was a major contributor to neonatal deaths in inpatient hospitals in Kenya (Mwaniki et al., 2010). As adeptly described in recent studies of neonatal tetanus in Kenya and Africa as a whole, the unmet need of tetanus immunization was a serious concern that affected women's and children's health (Ibinda et al., 2015; Ridpath et al., 2017), so examining the steps toward and context of Kenya's recent accomplishment provides an important touchpoint.

The Global Alliance for Vaccines and Immunization (GAVI) identified the most frequent gender-based barriers to female access to vaccination in a brief published in 2018, including lack of money for

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transportation, limited privacy at the health clinic, clash of clinic hours with women's working hours, lack of vaccination decision-making ability due to low levels of education or illiteracy, and male spouses/partners playing a vaccine-gatekeeping role at the household level (Global Alliance for Vaccines and Immunisation, 2018; World Health Organization, 2019). Other analyses of immunization uptake for vaccines have suggested that gender-related issues of social status, along with intersectionality of gender with race, class, education, and other factors, exacerbate gender inequities in immunization access and coverage (Branković et al., 2013; Merten et al., 2015; Tsawe et al., 2015). Further, a compelling case has been made that analysis of gender-related factors should contribute to development of health policies and programs (Vlassoff & Moreno, 2002).

Since it appears that substantive portions of unmet immunization-related need may result from gender-related disparities, examination of data and factors associated with these characteristics is an important analytic step to take. This is likely true not only for vaccination outcomes, but also for integration of community-based needs within broader policy documentation (Dutta et al., 2020). Given Kenya's success, there is value in examining trends in tetanus immunization and the nature of Kenya's vaccination policies as the country moved toward elimination (World Health Organization, 2019), since valuable lessons might be inferred. In order to do so, a reasonable first step is to simultaneously examine factors associated with women having at least one tetanus injection prior to pregnancy or live birth in nationally representative Kenyan datasets, as well as whether Kenya's immunization policy utilizes gender-responsive language (Keleher, 2004; Östlin et al., 2006).

This study is the first to identify specific articulation of gender-responsive language in Kenya's 2013 National Policy Guidelines for Immunization (Ministry of Health, Kenya, 2013). It simultaneously examines women's self-reported tetanus vaccination pre- and post-implementation of this policy. While this study approach does not allow for causal attribution, analyzing whether there is an association between year of administration for the Kenya Demographic Health Survey (KDHS), controlling for theoretically important covariates, may provide a preliminary sense of national trends occurring alongside the newly-implemented policy. Examination of the gender-inclusive language in the policy may also yield a theoretical basis for ways in which the policy may have been associated with increased vaccination among women in Kenya. Findings from this study might also be adapted to support policy and program strengthening for all vaccines in Kenya, and other Sub-Saharan African countries.

2. Methods

This study used a mixed-methods approach that combined both qualitative content analysis of Kenya's 2013 National Policy Guidelines for Immunization and quantitative analysis using de-identified data from the KDHS 2008–2009 (Kenya National Bureau of Statistics (KNBS) and ICF Macro, 2010) and 2014 (Kenya National Bureau of Statistics, Ministry of Health/Kenya, et al., 2015). The content analysis of the immunization policy guidelines was undertaken to identify any text in the document reflecting gender inclusivity. Then, a logistic regression was performed on KDHS data to examine if tetanus vaccination utilization was associated with the year of survey administration, pre- and post- the 2013 policy, controlling for covariates.

2.1. Qualitative data

For the qualitative analysis, the data source was Kenya's 2013 National Policy Guidelines for Immunization. This immunization policy guideline aimed to reverse the trends of sub-optimal immunization coverage in Kenya and was published by the Ministry of Health, Kenya, through its Unit of Vaccines and Immunization services. Financial and technical support for that document was provided by the WHO, United

Nations International Children's Emergency Fund (UNICEF) and United States Agency for International Development (USAID) - Maternal and Child Health Integrated Program, and collaborative support was from University of Nairobi and the Kenya Medical Research Institute (Ministry of Health, Kenya, 2013). This document was chosen because it was the latest immunization policy for which survey results were available on either side, chronologically, of the policy, and because the full text was available in English on the internet.

The National Policy Guidelines for Immunization document was read and re-read, and gender inclusive descriptive codes/categories were created from the language of the text. 1) 'communities'/'stakeholders', 2) 'women'/'girls' and 3) 'communication'/'media'. The first two categories of key words 'communities'/'stakeholders' and 'women'/'girls' were straightforward in explaining the target population the policy would address. In the absence of more direct expressions of gender factors in health policies, 'communication'/'media' was used, because screen-based media use and listening to the radio (Tsawe et al., 2015; Zamawe et al., 2016) have been identified by previous research as having both theoretical and research-driven linkages to women's autonomy, physical and social health, and vaccination uptake. Text from the policy document were coded manually. Descriptive statistics highlighting frequencies of the keywords by categories were computed to explain gender inclusivity in the policy language, or its lack thereof.

2.2. Quantitative data

Data from the KDHS 2008–2009 and KDHS 2014, administration of which fell on either side of Kenya's 2013 policy guideline, were analyzed. The KDHS is a national survey conducted by the Ministry of Health, Government Agency for Official Statistics, with support from donor partners. It collects information on women's reproductive health, which encompasses issues of child health, maternal health and nutrition, fertility, sexual activity, utilization of vaccination such as tetanus, family planning, breastfeeding practices, domestic violence, and HIV awareness and status in Kenya. Both the KDHS 2008–2009 and 2014 administrations consisted of five surveys: 1) a full household survey, 2) a short household survey, 3) a full women's survey, 4) a short women's survey, and 5) a men's survey. The Women's Questionnaire in both the surveys captured information from all women age 15–49 years on their background characteristics (e.g., education, residential history, media exposure), sexual and reproductive health, and knowledge, attitude, behavior, and practice of family planning methods (Kenya National Bureau of Statistics (KNBS) and ICF Macro, 2010; Kenya National Bureau of Statistics, Ministry of Health/Kenya, et al., 2015).

Sample sizes for the two surveys differed due to the approaches used in administration. For the KDHS 2008–09, 8444 interviews were completed with women ages 15–49 selected from 400 sample points (clusters) throughout Kenya (Kenya National Bureau of Statistics (KNBS) and ICF Macro, 2010), whereas KDHS 2014 (the most recent survey DHS survey conducted in Kenya, though a 2021 survey is in preparation (The DHS Program, 2020)) collected data from 5360 clusters drawn with a stratified probability proportional to size sampling methodology from 96,251 enumeration areas. This resulted in 31,079 completed interviews with women ages 15–49 (Kenya National Bureau of Statistics, Ministry of Health/Kenya, et al., 2015). The 2008–09 and 2014 survey datasets were merged, with an additional dummy variable included to indicate the year of data collection (e.g., '0' for 2008–2009, '1' for 2014).

The outcome variable of interest for this study was 'receiving at least one maternal tetanus injection.' Thus, only women who participated in the full women's survey and were asked questions on maternal tetanus vaccination (eligibility based on recency of the most recent pregnancy resulting in a live birth (Kenya National Bureau of Statistics (KNBS) and ICF Macro, 2010; Kenya National Bureau of Statistics, Ministry of Health/Kenya, et al., 2015) were included in our study sample. As a result, there were 11,238 women in the final study sample ($n = 4073$ for 2008–2009 and $n = 7165$ for 2014).

This study used a copy of the KDHS 2008–09 and 2014 data files obtained from the Kenya National Bureau of Statistics. No ethical approval was sought from an institutional review board for this study since these data files contained anonymized and aggregated survey data made publicly available, and thus these secondary analyses did not constitute human subjects research.

2.3. Variables

Dependent variable: *Having received at least one tetanus injection either before or during the most recent pregnancy*. Eligible respondents were first asked whether they had received a tetanus injection *during* the most recent pregnancy, and if so, how many injections. Women who indicated 2 or more injections were not asked additional questions about tetanus vaccination. However, women who indicated 0 or 1 injection, or who responded that they didn't know, were then asked about tetanus injections *before* that pregnancy. These respondents were again able to indicate the number of injections they received, or that they didn't know. In both cases, per recommendations from the KDHS (Kenya National Bureau of Statistics (KNBS) and ICF Macro, 2010; Kenya National Bureau of Statistics, Ministry of Health/Kenya, et al., 2015), responses of "don't know" were treated as responses of 0. A dichotomized value was computed to indicate whether, either during or before the most recent pregnancy, eligible women had ever received at least 1 tetanus injection (Received no injections = 0, Received at least one injection = 1).

Independent variables: *Education level* (No education = 0, Incomplete primary education = 1, Complete primary education = 2, Incomplete secondary education = 3, Complete secondary education = 4, and Post-secondary education = 5), *religion* (Roman Catholic = 1, Protestant/Other Christian = 2, Muslim = 3 and Other/No Religion [combined response category] = 4), *place of residence* (Urban = 1 and Rural = 2), *year of survey administration* (2008–2009 = 0, 2014 = 1), and *frequency of mass media exposure*. This latter variable was derived from three separate questions asking about frequency of reading family planning messaging in newspapers or magazines, listening to family planning messaging on the radio, or watching family planning messaging on the television, each with the same response options (Not at all = 0, Less than once a week = 1, At least once a week = 2). A summed score for media exposure was calculated (ranging from 0 to 6) and was treated as a continuous variable in the regression analysis. Selection of these independent variables was based on previous studies that examined factors affecting utilization of maternal services [e.g., (Branković et al., 2013; Merten et al., 2015; Tsawe et al., 2015)].

2.4. Data analysis

Descriptive statistics, including weighted and unweighted frequencies, as well as standard errors for unweighted frequencies, were computed for all variables using PROC SURVEYFREQ with WEIGHT, CLUSTER, and STRATUM. Logistic regression was conducted to examine the association between the date of survey administration (e.g., 2008–2009, before implementation of the 2013 National Policy Guidelines for Immunization, and 2014, afterward) and ever having received a tetanus injection among Kenyan women ages 15–49 with a recent pregnancy resulting in live birth (Kenya National Bureau of Statistics (KNBS) and ICF Macro, 2010; Kenya National Bureau of Statistics, Ministry of Health/Kenya, et al., 2015), controlling for the specified variables. The analysis adjusted for complex survey design using the PROC SURVEYLOGISTIC command in order to obtain nationally generalizable estimates. Missing data were excluded listwise due to the extremely low number of instances ($n = 19$). Adjusted odds ratios (AORs) and 95% confidence intervals (CIs) were reported. Statistical significance was set at $p < .05$. All analyses were conducted using SAS 9.4.

3. Results

3.1. Content analysis results

The 2013 National Policy Guidelines on Immunization Kenya contained 25,944 words. Findings from the content analysis are laid out in Tables 1, 2a, and 2b.

The document mentioned different sub-populations of 'women' and 'girls' throughout ($n = 34$, 13.16 per 10,000 words). Examples of some of these were: 'antenatal women', 'pregnant women', 'O-negative pregnant women', 'all women of child bearing ages at health facilities and outreach sites', 'mothers', 'women with abnormal pap smears', 'adolescent girls', 'adolescent girls aged 9-18 years', 'girls and women aged 9-26 years', 'girls and women aged between 10-45 years', 'older women/menopausal', and 'unreached children and pregnant women'.

Also, gender-inclusive community sensitization and mass-media communication strategies were evident. 'Communication'/'media' themes ($n = 16$, 6.17 per 10,000 words) recommended use of both the electronic and print media. Sensitization for vaccination uptake was expressed through the mention of the words such as: 'communication', 'media', 'media briefings/press releases/legal notices, print and electronic media', 'local publications & media stations', 'communication plan', 'communication strategy' and 'mother and child booklet'.

Additionally, 'Communities'/'stakeholders' themes appeared 19 times (7.32 per 10,000 words) times in the policy document. The words were 'community', 'social mobilization', 'individuals (gatekeepers and opinion leaders)', 'people', 'outreach sites', 'general public', 'stakeholder', 'chiefs barazas', 'schools' and 'religious gatherings'. Notably, ground level outreach and community sensitization were planned both for the target populations and for the gatekeepers. The words within the categories 'community/stakeholders' and 'communication' appeared almost together and were found in the last part of the policy document.

Table 1

Frequency of occurrence of gender inclusive keywords by categories in the National Policy Guidelines on Immunization of 2013, Kenya.

Communication ($n = 16$)	Community ($n = 19$)	Women and girls ($n = 34$)
<ul style="list-style-type: none"> • Communication (8) • Media (3) • Media briefings/Press releases/Legal notices, Print and electronic media (1) • Local publications & media stations (1) • Communication plan (1) • Communication strategy (1) • Mother and child booklet (1) 	<ul style="list-style-type: none"> • Community (9) • Social mobilization (1) • Individuals (gatekeepers and opinion leaders) (2) • People (1) • Outreach sites (1) • General public (2) • Stakeholder (1) • Chief's barazas, schools (1) • Religious gatherings (1) 	<ul style="list-style-type: none"> • Women (7) • Antenatal women (2) • Pregnant women (8) • O-negative pregnant women (1) • All women of child bearing age at health facilities and outreach sites (1) • Adolescent girls and or women of child bearing age (2) • Adolescent girls aged 9–18 years (2) • Women of child bearing age (2) • Mothers (1) • Gynecological (1) • Girls and women aged 9–26 years (1) • Girls and women aged between 10 and 45 years (1) • Unreached children and pregnant women (1) • Eligible women mentioned once (1) • Older women/menopausal (1) • Women with abnormal pap smears (1) • Mother-child health booklet (1)

Table 2a

Keywords in the text of National Policy Guidelines on Immunization of 2013, Kenya.

1. Community and communication		
Sl. no.	Text in the National Policy Guidelines on Immunization, 2013, Kenya	Page No. in the policy document
1	Advocacy Communication and Social Mobilization (ACSM)	3
2	Communication for immunization services & linking immunization services with the community Using culturally acceptable, evidence based and appropriate communication channels and individuals (gatekeepers and opinion leaders), information on immunization services should routinely be availed to the community. In order to foster community ownership and utilization of immunization services, every effort should be made to involve the community through partnerships in the planning, implementation and monitoring of immunization services.	59
3	The Ministry of Health works towards facilitating change in health seeking behavior for vaccination services through advocacy and communication strategies that include providing information, persuasion, and motivation.	63
4	Justification: Even when services are accessible, affordable and available, communication is often necessary to make people aware of them and their usefulness.	63
5	Development of a communication plan.	65
	Do not address the media without facts. Refer the media to the head, UVIS.	25
	The need and urgency to conduct localized or nationwide supplemental immunization activities for the public good will be determined by the Ministry of Health and communicated to the general public by way of one or more of the following: Media briefings/Press releases/Legal notices, Print and electronic media.	61
	Localized Supplemental Immunization Activities: The authority in determining and implementation of localized SIAs will be the County coordinators of health and the DMOHs and communicated to the general public by way of: – Stakeholders fora e.g. meetings of departmental heads, chief's barazas, schools, religious gatherings, – Local publications & media stations.	61
6	National Health communication strategy (1999–2010) The division of health education 1998. Communication for child survival: United States Agency for International Development.	Bibliography

3.2. Descriptive statistics and logistic regression results

Descriptive statistics for study variables among women who were asked about tetanus toxoid injections are provided in Table 3. In general, for the combined sample, participants in both years more often: lived in a rural area (67.8%), had complete or incomplete primary education (57.6%), and were Protestant/other Christian (69.8%).

Table 4 shows the results from the complex survey logistic regression examining the association between time of survey administration and receiving at least one injection of the tetanus toxoid vaccine, controlling for selected variables including religion, education, residence, and frequency of media use. Participants who responded in 2014 (after implementation of the National Policy Guidelines for Immunization in 2013) had 1.590 times greater adjusted odds ($95\%_{LL} = 1.282$, $95\%_{UL} = 1.972$) of receiving at least one injection compared to those who responded in 2008–2009 ($p < .0001$). Compared to those with no education, women with incomplete primary (AOR = 2.400, $p < .0001$, $95\%_{LL} = 1.778$, $95\%_{UL} = 3.240$), complete primary (AOR = 4.618, $p <$

$.0001$, $95\%_{LL} = 3.226$, $95\%_{UL} = 6.610$), incomplete secondary (AOR = 2.476, $p < .0001$, $95\%_{LL} = 1.572$, $95\%_{UL} = 3.902$), complete secondary (AOR = 4.929, $p < .0001$, $95\%_{LL} = 2.731$, $95\%_{UL} = 8.897$), and more than secondary (AOR = 3.680, $p < .0001$, $95\%_{LL} = 2.105$, $95\%_{UL} = 6.435$) education had greater adjusted odds of receiving at least one injection.

4. Discussion

This study showed that adjusted odds of ever receiving at least one tetanus injection among women ages 15–49 years who had a recent live birth (Kenya National Bureau of Statistics (KNBS) and ICF Macro, 2010; Kenya National Bureau of Statistics, Ministry of Health/Kenya, et al., 2015) were higher in 2014, after the implementation of the vaccine policy with gender-inclusive language in Kenya, than in 2008–2009. Causal attribution to the vaccine policy itself is not appropriate, though the findings do not contradict the broader hypothesis that gender-responsive components in vaccine programming (Shankar & Dutta, 2010) might positively influence both vaccination outreach and a woman's vaccination decision for herself and her children (Gamble et al., 2010; Salmon et al., 2015). It should also be acknowledged that the gender-responsive components in the policy itself emerged from a broader national context (e.g., they were not likely added at random). It is therefore plausible that multiple factors, measured and unmeasured, may have been associated with both increases in vaccination likelihood and policymakers' use of gender-inclusive language. Further, it is important to recognize the wide variety of other significant events that may have contributed variability to women receiving a tetanus injection. For example, in 2014, Catholic bishops accused the Kenyan government, UNICEF, and the WHO of 'lacing' the tetanus vaccine doses with a fertility-inhibiting hormone (Ohlheiser, 2014), which one might theoretically expect to reduce vaccine uptake. On the other hand, beginning in 2001 through 2012, Kenya received substantial investment for "immunisation services support" through GAVI, which one might, in theory, expect to improve vaccine uptake (Global Alliance for Vaccines and Immunisation, 2020). Thus, while fewer women reported never having received at least one tetanus injection in 2014 compared to 2008–2009, the underlying causes are complex and cannot be disentangled by this cross-sectional study, especially given the ongoing politicization of vaccines (Olivier, 2016, Zimet et al., 2020).

Regarding the qualitative policy review, the 'lifecycle approach' evident in the Immunization Policy of Kenya is a potentially helpful strategy for increased tetanus vaccination rates among Kenyan women. This finding is supported by Yaya et al.'s study which recommends a "life-course - continuum of care approach" for better sexual and reproductive health outcomes among women in Sub-Saharan African countries (Yaya et al., 2020). Another noteworthy aspect of the language used in Kenya's National Immunization Policy is the mention of multi-pronged strategies for the general population of women of child-bearing ages (15–49 years), as well as targeting high-risk sub-populations of vaccine-eligible women within the antenatal care system. The approach echoes several health promotion documents which recommend continuum of care in maternal and child health through responsive health policies, and comprehensive systems and programs (Brumana et al., 2017; Kerber et al., 2007). However, despite this language highlighting a comprehensive sub-population-wise approach, it misses out on multi-stakeholder dialogues with female representatives from minority groups, public health, decision-making positions, and politicians at the policy making and program development stages, who could potentially identify gender-specific barriers and enablers for tetanus vaccination (Engmann et al., 2016).

Similarly, the longer-term gatekeeper engagement strategy mentioned in the guidelines resonates with other literature which reinforces that such engagement facilitates vaccination sensitization among gatekeepers (Emmel et al., 2007; Larson, 2015), promotes debate between vaccine supporters and gatekeepers, and leads to making

Table 2b

Keywords in the text of National Policy Guidelines on Immunization of 2013, Kenya.

2. Women and girls		
Sl. no.	Text in the National Policy Guidelines on Immunization, 2013, Kenya	Page No. in the policy document
1	Over time KEPI incorporated new vaccines for childhood and a vaccination program for antenatal women.	Foreward
2	The Ministry of Health established The Kenya Expanded Programme on Immunization (KEPI) in 1980 with the main aim of providing immunization against six killer diseases of childhood, namely tuberculosis, polio, diphtheria, whooping cough, tetanus and measles to all children in the country before their first birthday, and tetanus toxoid vaccination to all pregnant women.	12
3	The portfolio of UVIS includes: Tetanus for pregnant women.	15
4	Anti-D sera for rhesus O-negative pregnant women.	15
5	Screening all women of child bearing age at health facilities and outreach sites for their vaccination status (esp. for tetanus toxoid).	19
6	Vaccinating special groups Pregnant Women Live vaccines administered to a pregnant woman pose a theoretical risk to the fetus; therefore, live, attenuated virus and live bacterial vaccines generally are contraindicated during pregnancy. No evidence exists of risk to the fetus from vaccinating pregnant women with inactivated virus or bacterial vaccines or toxoid. Nevertheless, for lack of safety data, with the exception of the tetanus vaccination, all other inactivated vaccines or toxoids shall be administered to a pregnant woman only if proved that the benefits of vaccination outweigh the potential risks, when the likelihood of disease exposure is high and when infection would pose a risk to the mother or fetus.	19
7	Newborns can be protected from neonatal tetanus during the first 6 weeks of life through vaccination of pregnant women using the 5-T.T. schedule. However additional preventive measures such as clean delivery and clean cord care practices have to be observed.	33
8	Prevention: The primary purpose of rubella vaccination is to prevent the occurrence of CRS. Two approaches are usually recommended, one is prevention of CRS only through immunization of adolescent girls and or women of child bearing age. The second, is elimination of rubella as well as CRS through universal vaccination of infants and young children (with or without mass campaigns) together with surveillance and assuring immunity of women of child bearing age (WCBA).	41
9	Global situation: Over 270,000 women die of cervical cancer worldwide. This is the leading gynecological cancer in sub-Saharan Africa. 493,000 women affected each year.	54
	HPV infections are sexually transmitted and are asymptomatic in most women and are only diagnosed during screening for cervical cancer. Target groups 1. The quadrivalent vaccine is recommended for girls and women aged 9–26 years for the prevention of both cervical cancer and genital warts. It can also be used in adolescent boys for the prevention of genital warts.	55
11	The bivalent HPV vaccine formulation is for girls and women aged between 10 and 45 years for the prevention of cervical cancer alone.	55
12	In view of the high prevalence of genital warts disease and the relatively high incidence of cervical cancers in Kenya, the Ministry of Health advocates for the use of the broadest spectrum HPV vaccine in girls and women of child bearing age, so as to benefit maximally from reduced morbidity and mortality from these two diseases.	55
	Other health sector players may prioritize broad spectrum HPV vaccines for optimal administration in adolescent girls and boys (ages 9–18 years) and narrower spectrum HPV vaccines for older women (19 years to menopause).	55
	Women with abnormal pap smears results can be treated by colposcopy, LEETZ, cryotherapy and hysterectomy.	55
13	Limiting missed opportunities: To limit missed opportunities, health workers should ensure the following; • Check children's and women's vaccination status every time they come into contact with health facilities or outreach sites, regardless of the reason for the visit. Sick children should always be screened for vaccination before they are discharged from the health facilities. Women receiving antenatal should be screened and, if eligible, vaccinated with tetanus toxoid. • Give children and women all vaccines due because vaccines are as safe and effective in combination as they are individually.	59
14	Give children and women all vaccines due because vaccines are as safe and effective in combination as they are individually.	59
15	Give children and women all vaccines due because vaccines are as safe and effective in combination as they are individually.	60

informed vaccination decisions and improved vaccination access among communities (Martin, 2016). Dutta et al.'s recent study also highlighted the importance of vaccination sensitization with local religious leaders in addressing vaccine hesitancy among communities in India (Dutta et al., 2020). In contrast to these emphases, however, the present study found that a woman's reported religion in data from KDHS 2008–2009 and 2014 was not associated with whether she had ever received one or more tetanus injections. This reflects Olivier's observation that religion and immunization bear 'frustrating complexities', and thus, assuming that members of a specific religion will fail to receive tetanus injections is likely an errant approach (Olivier et al., 2015).

In summary, the overall language in Kenya's vaccine policy reflects the principles of African Union's Charter of Rights of Women in Africa that mandates state provision of comprehensive sexual and reproductive health services (Ngwena, 2010) and shows a substantive and salutary contribution to the demand-related determinants for vaccination uptake. However, it is a passive form of 'vaccine demand', commonly referred to as acceptance of vaccines and vaccination services, rather than the emancipated form of 'active demand' ('individual demand of seeking vaccines' or 'community demand' as social support for vaccination as a norm) (Hickler et al., 2017). Such disempowered language, with verbs like 'provision and supply' rather than 'vaccine demand', may

reflect confidence challenges (both gender-specific and not) that have been observed for multiple vaccines and among many populations [e.g., (Daley et al., 2017; Pugliese-Garcia et al., 2018)]. However, it is not uncommon in vaccination and prevention planning documents (Dutta et al., 2018).

Consistent with earlier literature, our study indicated that women's education was associated with greater adjusted odds of reporting at least one tetanus injection. Extant literature also highlights that this covariate is likely associated with autonomy, and that such autonomy has a positive association with women's health seeking behavior. For example, a study in India found a positive association between women's autonomy and reproductive health care seeking, including tetanus vaccination (Sahu et al., 2016). Similarly, a noteworthy strand of literature examined various pathways reinforcing the idea that women's education is vital to improving likelihood of immunization for themselves or their children (Delrieu et al., 2015; Glatman-Freedman & Nichols, 2012; Jejeebhoy, 1995).

Finally, in Kenya, media campaigns have been implemented, such as the radio program 'Know your Rights Hour', to address tetanus vaccine rumors (Mixcloud, 2014). Some evidence might suggest that exposure to media potentially empowers women to question their social position and gender norms and develops more liberal views pertaining gender roles

Table 3
Descriptive statistics of the study sample; Kenya Demographic Health Survey 2008–09 and Kenya Demographic Health Survey 2014.

Variable	2008–2009 KDHS (n = 4073)			2014 KDHS (n = 7165)		
	N	Weighted N	SE (Wgt N)	N	Weighted N	SE (Wgt N)
Residence						
Urban	1091	821	91.4	2510	2672	84.9
Rural	2982	3145	166.1	4655	4194	102.9
Educational attainment						
None	745	438	57.7	1328	671	37.6
Incomplete primary	1235	1259	78.2	1998	1901	65.7
Complete primary	1057	1223	92.9	1791	1853	64.0
Incomplete secondary	335	360	32.9	723	840	40.7
Complete secondary	446	476	41.4	815	987	48.8
Post-Secondary	255	209	26.6	510	614	42.9
Religion						
Roman Catholic	748	818	64.7	1401	1338	57.8
Protestant/Other Christian	2452	2695	155.0	4511	4863	109.8
Muslim	719	316	36.8	1038	472	29.4
No Religion or Other	148	135	31.0	213	192	21.5
Tetanus injections						
At least 1 injection	3655	3641	179.5	6703	6512	128.8
No Injections	418	325	27.7	462	354	24.2
Media consumption ^a						
Reading newspaper or magazine						
Not at all (0)	2657	2495	126.4	5294	4789	103.9
Less than once/week (1)	722	781	60.0	1101	1176	53.7
At least once/week (2)	689	686	63.5	768	899	44.6
Listening to radio						
Not at all (0)	848	607	48.1	1913	1382	51.7
Less than once/week (1)	359	363	34.7	916	876	46.0
At least once/week (2)	2864	2994	161.7	4336	4608	101.4
Watching television						
Not at all (0)	2546	2419	140.2	4459	3677	91.8
Less than once/week (1)	421	447	36.3	844	813	42.0
At least once/week (2)	1106	1100	89.9	1860	2374	84.4

Note: SE stands for “standard error”; SD stands for “standard deviation.”

^a Data are presented separately by media type for transparency. However, analyses use overall media intake frequency (summed score from 0 to 6). For 2008–2009, unweighted mean = 2.657 (SD = 1.85). For 2014, mean = 2.343 (SD = 1.78).

(Jensen & Oster, 2009; Kottak, 2016). That said, Dutta et al. (2020), as well as Jackson et al.'s (2017) work with mobile communities, reported mixed reactions on the usefulness of vaccine related information gained through the media, social media, and related sources, wherein some people perceived it as biased (or not even as part of the community), and others as accurate. The latter two studies more closely mirror our findings than the others listed herein, as frequency of consumption of health

Table 4
Logistic regression of the combined study sample (n = 11,219); Kenya Demographic Health Survey DHS 2008–09 and Kenya Demographic Health Survey 2014.

Variable	AOR	95% CI LL	95% CI UL	p-value
Survey year				
2008–2009	Reference			
2014	1.590	1.282	1.972	<.0001
Religion				
Protestant/Other Christian	Reference			
Roman Catholic	0.809	0.610	1.073	.1415
Muslim	0.973	0.774	1.342	.8696
Other or No Religion	0.704	0.644	1.160	.1681
Education				
No education	Reference			
Incomplete primary	2.400	1.778	3.240	<.0001
Complete primary	4.618	3.226	6.610	<.0001
Incomplete secondary	2.476	1.572	3.902	<.0001
Complete secondary	4.929	2.731	8.897	<.0001
Post-secondary	3.680	2.105	6.435	<.0001
Residence				
Urban	Reference			
Rural	0.947	0.717	1.251	.7028
Media use	1.038	0.949	1.136	.4127

Note: AOR stands for “adjusted odds ratio,” CI stands for “confidence interval,” LL stands for “lower limit,” and UL stands for “upper limit.”

communication (more specifically prevention communication) in mass media via newspaper/magazine, radio, and television was not associated with having ever received a tetanus injection in our study. However, proliferation of a message does not necessarily occur only through direct transmission between sender and receiver, nor does a low frequency of intake necessarily imply that key preventive messages were not received at all. In addition, the link between tetanus vaccination and gender-related autonomy may be systematically different than for other health-related behaviors. Finally, our analyses of this factor were limited by the data collected as part of the KDHS, which is the only national-level survey of its kind in Kenya, and completely excluded the potential to receive information through other media venues, including social media.

This overall study was limited by a number of factors. First, data from the KDHS were cross-sectional, preventing the possibility of inferring causal attribution. Further, the analyses were required to use extant variables, which were collected for important purposes, but were not tailored for this study in particular. That stated, the KDHS administration timepoints did nicely surround the implementation of the Kenya Vaccination Policy Guidelines for which the language was analyzed in this study. The data clearly show that fewer women in the 2014 survey reported never having had at least one tetanus injection relative to the 2008–2009 survey, but there is a substantial amount of variability introduced by factors outside of the logistic regression model in this study (e.g., changes in vaccine resourcing which could have affected the dependent variable).

5. Conclusion

This study explored nuances and complexities ingrained in the gender-inclusive language from Kenya's vaccine policy and then

examined the association between having ever received at least one tetanus injection and year of data collection (several years prior to the policy, and then one year after policy implementation). Given Kenya's recent successes (World Health Organization, 2019), and the outcomes from this study, we suggest the potential importance of conducting elite interviews with vaccine decisionmakers in Kenya. This, on one hand will elucidate more about the success of the tetanus elimination in Kenya. It will also enable learning about community engagement mechanisms (Dutta et al., 2020) in order to critically understand the predominant gender-based disparities in Kenya (e.g. early marriage, female genital mutilation, legalized polygamy), to incorporate culture-specific gendered language in vaccination policies and gendered metrics in the KDHS.

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