Acceptability of Vaccination against HIV: A Mapping of Togolese People's Positions

To cite this article:

Kpanake, L., Gbandey, S., Sorum, P. C., & Mullet, E. (2016). Acceptability of vaccination against HIV: a mapping of Togolese people's positions. ***Journal of Health Psychology*****. doi: 10.1177/1359105316639440. Epub: 31 March 2016.**

Abstract

Progress is being made in the development of an effective HIV vaccine. Once the vaccine is available, an important public health goal will be its widespread uptake in sub-Saharan Africa, home to 70% of new HIV infections worldwide. It is important, therefore, to begin planning how to promote its widespread uptake there. The aim of this study was to map the different personal positions regarding HIV vaccination of people living in Togo, West Africa. From January to April 2014, we recruited 363 adult participants who were asked to indicate their level of willingness to receive a future HIV vaccine under different conditions varying as a function of five factors: perceived susceptibility to HIV infection; effectiveness of the vaccine; perceived severity of AIDS; cost of the vaccine; and influence of the family. Five qualitatively different positions were found, which were labelled Unconditional acceptance (49%), Depends on cost/effectiveness ratio (20%), Depends on cost (18%), Total indecision (10%) and Complete reluctance (3%). Members of the wealthier segment of society were less often members of the unconditional acceptance cluster and more often members of the cost/effectiveness cluster than others. The diversity of people's positions regarding a future HIV vaccine implies that HIV vaccination strategies in Togo and other African countries will need to be tailored in design and implementation rather than "one size fits all" interventions.

Keywords: HIV vaccine; acceptability; lay people; positions; Togo

Introduction

The development of a preventive HIV vaccine offers the best long-term hope of managing the impact of the AIDS pandemic that is ravaging sub-Saharan Africa (International AIDS Vaccine Initiative, 2009), where 70% of the 2.7 million new HIV infections worldwide in 2012, and 70% of all AIDS deaths occurred (UNAIDS, 2013). Progress is being made in the development of an effective HIV vaccine (Rappuoli and Aderem, 2011; Ross et al., 2010); however, findings from studies about the willingness of African people to participate in HIV vaccine trials (Jaspan et al. 2006; Smit et al. 2006) and about the acceptability of a potential HIV vaccine (Bishai, et al. 2004; Sayles, et al. 2010) strongly suggest that the advent of a HIV vaccine would not guarantee its uptake. It is important, therefore, to begin planning how to promote its widespread uptake.

A recent systematic review suggests that people vary considerably in their level of willingness to be vaccinated against HIV, ranging from 37.2 to 94 on a 100-point scale (Newman and Logie, 2010). In addition, the review has identified five broad factors impacting acceptability of the vaccine, as suggested by health-protective behavior theories (Weinstein, 1993): perceived susceptibility to HIV infection; effectiveness of the vaccine; perceived severity of AIDS; cost of the vaccine; and perceived social approval of vaccination. Nevertheless, very little is known about the relative contributions of these factors on African people's willingness to receive the vaccine and about the possibly diverse vaccination positions of these people. Addressing this gap in knowledge is important in order to be able to tailor promotion of HIV vaccination to different people's views and needs (Butler, 2015).

Methods

The study was conducted from January to April 2014. Ethics approval for the study was obtained from the Institutional Review Board of the University of Québec-Teluq.

Study setting

The study was conducted in Togo, a sub-Saharan African country with a population of 7 million (WHO, 2015) that faces a generalized HIV epidemic (CNLS-IST, 2015). In Togo, the HIV prevalence is 2.5%, with an estimated incidence of 6649 in 2011 ;AIDS remains the most common cause of death, accounting for 17% of all deaths (CNLS-IST, 2015). The study site was Lomé, the capital city, with a population of 1.5 million (United Nations, 2015), where the prevalence of HIV is the highest in the country (3.5%) (CNLS-IST, 2015). In Lomé, HIV is predominantly transmitted through heterosexual contacts; women are twice as likely to be infected as men, and sex workers are the most seriously affected (UNAIDS, 2009). People aged between 30-39 years face the most severe burden of HIV (CNLS-IST, 2015).

Study design

The study was designed in accordance with Anderson's Functional Theory of Cognition (Anderson, 2008). The procedure had two phases. In the familiarisation phase, the investigator explained to participants what was expected of them, i.e., that for each scenario they were to indicate their level of willingness to receive the vaccine. Next, each participant was presented with 18 of the 48 scenarios, in random order. The participant then provided ratings of willingness to receive the vaccine. After completing the 18 ratings, the participant was allowed to compare responses and make changes until

satisfied with the entire set of ratings. In the experimental phase, the whole set of 48 scenarios was presented. Each participant provided ratings at his or her own pace, but was neither allowed to compare responses nor allowed to go back and make changes. Each participant was tested individually.

Participants

The participants were unpaid volunteers recruited and tested by five research assistants, well-trained in the research technique used. The assistants contacted a total of 500 people walking along the streets of Lomé. The diversity of the population of the capital enabled the recruitment of participants with various demographic characteristics. The assistants explained to them the purpose of the study, sought their participation, and obtained informed consent. This recruitment technique was an efficient and inexpensive means of revealing the basic trends needed for what was fundamentally an exploratory study.

Material

The material consisted of 48 vignettes composed of all combinations of the five main constructs of health-protective behavior theories (Weinstein, 1993): Perceived susceptibility to infection (1 chance in 10 or in 50); Effectiveness of the vaccine (70% or at least 90%); Perceived severity of AIDS (lethal or chronic owing to the availability of treatment); Cost of the vaccine (free, $100, or $200), and Influence of the family (encourages or does not encourage). The design was, consequently, a five within-subject factor design: Susceptibility × Effectiveness × Severity × Cost × Influence of the family, 2 × 2 × 2 × 3 × 2. Under each story, there was the question “to what extent would you take the vaccine in this case?” as well as an 11-point response scale with a left-hand

anchor of "certainly not" (0) and a right-hand anchor of "certainly yes" (10). The cards were arranged by chance and in a different order for each participant.

Statistical analysis

We detected strong individual differences during preliminary analysis. Accordingly, we performed cluster analysis (K-means) on the whole set of raw data as recommended by Hoffmans and Mullet (2013). We then conducted separate ANOVAs - full factorial with all the interactions- on the data of each cluster, using a Susceptibility x Severity x Effectiveness x Cost x Influence of the family, 2 x 2 x 2 x 3 x 2 design. Finally we performed Chi^2 test to test the effects of demographic characteristics. Data was analysed using STATISTICA 7.

Results

Participant profile

Of the 500 people contacted, 363 (205 men and 158 women) agreed to participate. The main reasons for refusal to participate were lack of available time and interest. Eighty-four per cent of participants chose to be tested at their private homes and the others chose a vacant classroom at the local university. The participants took 25 to 35 minutes to complete the questionnaires. Their ages ranged from 18 to 62 years (M=24.37, SD=4.63). More detailed demographic information is shown in Table 1.

Positions on vaccination

The cluster analysis gave a five-cluster solution. The main patterns of data that correspond to each cluster are shown in Figure 1. The detailed results of the corresponding ANOVAs are shown in Table 2.

For 178 participants (49%), the ratings were always high (M=9.01). This cluster was called *Unconditional acceptance.*

For 71 participants (20%), ratings strongly varied as a function of cost and effectiveness; this cluster was called *Depends on the cost/effectiveness ratio*. The Cost x Effectiveness interaction was significant. When the vaccine was fully effective, vaccination intention was always high (mean values ranging from 8.00 to 9.54). When it was not completely effective, intention depended strongly on cost (mean values ranging from 3.14 to 8.07). Also, when AIDS was perceived as not lethal (because of access to treatment), intention was lower (M=6.51) than when AIDS was perceived as lethal (M=7.53).

For 65 participants (18%), the ratings considerably varied as a function of the cost of the vaccine, and this cluster was called *Depends on cost*. When the vaccine was free, intention was higher (M=9.03) than when it was very costly (M=2.36) or moderately costly (M=4.24). Effectiveness had a weak effect.

For 39 participants (11%), the ratings were concentrated in the middle of the willingness scale (M=5.26). When family members encouraged vaccination, intention was slightly higher (M=6.37) than when they did not (M=4.16). This cluster was called *Total hesitation*.

Finally, for 10 participants (3%), the ratings were always low (M=2.88). None of the factors considered in this study had a significant effect. This cluster was called *Complete reluctance*.

The clusters differed significantly regarding educational level, $Chi^2(4) = 11.66$, $p < .05$, and income, $Chi^2(4) = 35.53$, $p < .001$. As shown in Table 1, all except one of the

members of the *Completely reluctant* cluster had not had access to post-secondary education. Also, wealthier participants (those earning more than $100 per month, the median income in Togo), were less often members of the *Unconditional acceptance* cluster and more often members of the *Depends on the cost/effectiveness ratio* cluster compared to poorer ones (those earning less than $100 per month) (World Bank, 2015).

Discussion

As expected, several qualitatively different positions were found. This finding is consistent with previous studies that show that people's views regarding vaccination can considerably differ and reflect clearly structured personal positions that are partly associated with sociodemographic characteristics (Bynum et al., 2012; Ziemer and Hoffman, 2013).

First, vaccination acceptance is already achieved for half of the residents of Lomé. People in this group seem to be willing to get the vaccine, irrespective of its level of effectiveness, cost, or family attitudes. This result is consistent with the findings of Bishai et al. (2004) that a majority of adults in Uganda would be willing to be vaccinated against HIV even if the vaccine was not very effective. Second, for about one person in five, acceptability is determined by cost of the vaccine. This result is consistent with previous findings in South Africa (Sayles, et al. 2010) and Uganda (Bishai et al., 2004) showing that cost might be a barrier to uptake of the vaccine. This suggests that the main emphasis of vaccination promotion efforts among people in this group should be on the reduction of financial hurdles. Third, for one person in ten, acceptability is determined by influence of the family. This suggests that community-based interventions that are engaging and

persuasive to people would be necessary for people in this group. These interventions should involve community influential leaders (e.g. traditions and religious leaders) and local media. Finally, few people (3%) would be unwilling to take the vaccine, whatever its characteristics: strong resistance to its use is not expected.

Limitations of this study include the use of a convenience sample and its restriction to people living in one area. As a consequence, generalization of the results to people in Togo as a whole must be done with care. In addition, it is difficult to know how the views and demographic information of participants differed from those of the people who declined to participate. Future studies of the reproducibility of these findings in other African countries and among specific HIV-vulnerable populations are needed.

Despite its limitations, this study is the first to map the acceptability of HIV vaccine among people in Africa. It provides insights for the design and implementation of tailored HIV vaccination campaigns in Togo and probably in other sub-Saharan African countries.

References

Anderson NH (2008) *Unified social cognition*. New York: Psychology Press.

Bishai D, Pariyo G, Ainsworth M, et al. (2004) Determinants of personal demand for an AIDS vaccine in Uganda: contingent valuation survey. *Bulletin of the World Health Organization* 82(9): 652-660.

Butler R, MacDonald NE, the SAGE Working Group on Vaccine Hesitancy (2015) Diagnosing the determinants of vaccine hesitancy in specific subgroups: the guide to tailoring immunization programmes (TIP). *Vaccine* 33:4176-4179.

Bynum SA, Brandt HM, Annang L, et al. (2012) Do health beliefs, health care system distrust, and racial pride influence HPV vaccine acceptability among African American college females? *Journal of Health Psychology* 17(2):217-226.

CNLS-IST (Conseil national de lutte contre le SIDA et les infections sexuellement transmissibles - Togo) (2015) Rapport d'activité sur la risposte au VIH/SIDA au Togo. http://www.unaids.org/sites/default/files/country/documents/TGO_narrative_report_2015.pdf (accessed 12 September 2015)

Hofmans J and Mullet E (2013) Towards unveiling individual differences in different stages of information processing: A clustering-based approach. *Quality & Quantity*, 47(1): 455-464.

International AIDS Vaccine Initiative (2009) Estimating the global impact of an AIDS vaccine in developing countries. Policy brief # 20. New York: iAVi.

Jaspan HB, Berwick JR, Myer L et al. (2006) Adolescent HIV prevalence, sexual risk, and willingness to participate in HIV vaccine trials. *Journal of Adolescent Health*, 39(5): 642-648.

Newman PA, Logie C (2010) HIV vaccine acceptability : a systematic review and meta-analysis. AIDS, 24 :1749-1756.

Rappuoli R and Aderem A (2011) A 2020 vision for vaccines against HIV, tuberculosis, and malaria. *Nature* 473: 463-469.

Ross AL, Bråve A, Scarlatti G, et al. (2010) Progress towards development of an HIV vaccine: report of the AIDS Vaccine 2009 Conference. *Lancet Infectious Diseases* 10(5): 305-316.

Sayles JN, Macphail CL, Newman PA, et al. (2010) Future HIV vaccine acceptability among young adults in South Africa. *Health Education & Behavior* 37(2): 193-210.

Smit J, Middelkoop K, Myer L, et al. (2006) Willingness to participate in HIV vaccine research in a peri-urban South African community. *International Journal of STD & AIDS* 17(3): 176-179.

UNAIDS (2009) Epidemiological fact sheet: Togo. Geneva: UNAIDS. http://www.unaids.org/fr/regionscountries/countries/togo/ (accessed 12 September 2015)

UNAIDS (2013) Global report: UNAIDS report on the global AIDS epidemic 2013. Geneva: UNAIDS http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2013/gr2013/unaids_global_report_2013_en.pdf (accessed 10 March 2015)

United Nations - Statistics Division (2015) World statistics pocketbook : Togo. Available : http://data.un.org/CountryProfile.aspx?crName=TOGO. Accessed 10 October 2015.

Weinstein ND (1993) Testing four competing theories of health-protective behavior. *Health Psychology*, 12(4) :324-333.

World Bank (2015) World development indicators: Togo. Available: http://data.worldbank.org/country/togo ; accessed October 10, 2015.

World Health Organization (2015) Country statistics and global health estimates: Togo. Geneva: WHO.

Ziemer KS and Hoffman MA (2013) Beliefs and attitudes regarding human papillomavirus vaccination among college-age women. *Journal of Health Psychology* 18(10):1360-1370.

Table 1. Demographic Characteristics of the Sample and Clusters.

Characteristic	Cluster					Total
	Complete Reluctance	Total Hesitat.	Depends on Cost	Cost/ Effectiveness	Uncondit. Acceptance	
Age	26.20	25.00	25.31	24.75	23.68	24.37
Gender						
Males	4 (3)	14 (9)	27 (17)	33 (21)	80 (50)	158 (100)
Females	6 (3)	25 (12)	38 (19)	38 (19)	98 (47)	205 (100)
Religion						
Christian	10 (4)	28 (10)	46 (16)	49 (17)	150 (53)	283 (100)
Muslim	0 (0)	6 (12)	8 (16)	16 (33)	19 (39)	49 (100)
Animist	0 (0)	1 (10)	4 (37)	3 (27)	3 (27)	11 (100)
Atheist	0 (0)	1 (17)	2 (33)	2 (33)	1 (17)	6 (100)
*Education**						
Primary or Secondary	9 (5)	22 (11)	31 (16)	45 (23)	87 (45)	194 (100)
Post-secondary or Tertiary	1 (1)	17 (10)	34 (20)	26 (15)	91 (54)	169 (100)
*Income**						
Less than $100	9 (3)	32 (10)	59 (19)	45 (15)	164 (53)	309 (100)
More than $100	1 (2)	7 (13)	6 (11)	26 (48)	14 (26)	54 (100)
Total	10 (3)	39 (11)	65 (18)	71 (20)	178 (49)	363 (100)

Note: * = $p<.05$

Table 2. Results of the ANOVAs for each cluster

Factor	Effect		Error				
	df	*MS*	*Df*	*MS*	*F*	*p*	Eta^2_p
Cluster : Complete reluctance							
Probability (P)	1	1.12	8	3.90	0.29	*.ns*	.00
Severity (S)	1	0.75	8	14.19	0.05	*.ns*	.00
Effectiveness (E)	1	21.33	8	4.69	4.55	*.ns*	.05
Cost (C)	2	116.97	16	35.77	3.27	*.ns*	.03
Influence of the Family (F)	1	19.59	8	1.18	16.59	*.ns*	.21
Cluster: Total hesitation							
Probability (P)	1	38.08	38	9.24	4.12	*.ns*	.10
Severity (S)	1	439.45	38	92.86	4.73	*.ns*	.11
Effectiveness (E)	1	7.06	38	12.99	0.54	*.ns*	.01
Cost (C)	2	20.32	76	20.94	0.97	*.ns*	.02
Influence of the Family (F)	1	2 273.49	38	91.45	24.86	.001	.40
Cluster: Depends on cost							
Probability (P)	1	58.99	64	9.97	5.91	*.ns*	.08
Severity (S)	1	10.50	64	16.84	0.62	*.ns*	.01
Effectiveness (E)	1	191.52	64	12.15	15.76	.001	.20
Cost (C)	2	12 283.99	128	52.55	233.74	.001	.79
Influence of the	1	0.00	64	10.77	0.00	*.ns*	

Family (F)							.00
Cluster : Depends on the cost/effectiveness ratio							
Probability (P)	1	329.69	70	12.68	26.00	.001	.27
Severity (S)	1	824.23	70	32.22	25.58	.001	.27
Effectiveness (E)	1	10 997.33	70	33.32	330.07	.001	.83
Cost (C)	2	3 059.89	140	20.69	147.88	.001	.68
Influence of the							
Family (F)	1	45.09	70	12.63	3.57	*.ns*	.05
S x E	1	133.30	70	14.97	8.91	.001	.11
S x C	2	47.66	140	7.32	6.51	.001	.09
E x C	2	972.07	140	12.94	75.10	.001	.52
Cluster : Unconditional acceptance							
Probability (P)	1	4.40	177	2.91	1.51	*.ns*	.01
Severity (S)	1	2.49	177	8.00	0.31	*.ns*	.00
Effectiveness (E)	1	180.54	177	5.72	31.57	.001	.14
Cost (C)	2	49.18	354	6.61	7.44	.001	.04
Influence of the							
Family (F)	1	80.63	177	6.36	12.69	.001	.06

Figure captions

Figure 1: Mean levels of willingness to receive the vaccine as a function of cost of the vaccine and effectiveness of the vaccine. In each panel, willingness to receive the vaccine is on the y-axis, the three levels of cost are on the x-axis, and each curve corresponds to one level of vaccine effectiveness. Each panel corresponds to one cluster: Complete reluctance (Reluctant), Total hesitation (Hesitant), Depends on cost (Cost), Depends on the cost/effectiveness ratio (Cost/Effectiveness), and Unconditional acceptance (Unconditional).