

Responses to antismoking radio and television advertisements among adult smokers and non-smokers across Africa: message-testing results from Senegal, Nigeria and Kenya

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Received 18 March 2014

Accepted 5 August 2014

ABSTRACT

Background This study examined whether adaptation of existing antitobacco television and radio advertisements (ads) from high-income countries is a viable tobacco control strategy for Africa.

Methods 1078 male and female adult smokers and non-smokers, aged 18–40 years, from major and smaller urban locations in Kenya, Nigeria and Senegal, were recruited into groups using locally appropriate convenience sampling methods and stratified by smoking status, gender, age and socioeconomic status. Eligibility criteria included age, smoking status and literacy. Each participant rated five radio and five TV antismoking ads on five-point scales, which were later aggregated into measures of perceived effectiveness, potential behaviour change and antitobacco industry sentiment/support for government actions.

Results For radio ads across all three countries, two health harms-focused ads—*Coughing Child* followed by *Suffering*—had the highest odds of a positive rating on the Perceived Effectiveness measure among smokers and non-smokers. For television ads, the strong graphic ad *Baby Alive* tended to be rated most positively across the majority of measures by all subgroups.

Conclusions This first systematic study of tobacco control advertisements in Africa is consistent with findings from other countries, suggesting that graphic health-harms ads developed and used in other countries could also be effective in African countries. This implies that adaptation would be a successful approach in Africa, where scarce resources for tobacco control communications can be focused on advertising dissemination, saving programmes from the cost, time and technical expertise required for development of new materials.

INTRODUCTION

Mass media is a proven intervention against tobacco use: effective campaigns have been shown to prevent smoking uptake and promote cessation,^{1–3} protect children and adults from second-hand smoke (SHS),⁴ build public support for strong policies,^{5,6} and enhance implementation of policies, such as pictorial health warnings.⁷ However, not all mass media campaigns are equally effective. Research has found that across countries, advertisements (ads) that elicit negative emotions, such as fear, disgust and sadness, through graphic, health harms-focused imagery, are better understood, remembered and

discussed,¹ and more likely to create concern over tobacco use and motivate cessation.^{6,8}

Tobacco control mass media for Africa

By some estimates, the prevalence of tobacco use in sub-Saharan Africa is an average of 14% among adult men⁹ and nearly negligible among adult women.¹⁰ Without policy intervention, however, the number of adult smokers is projected to grow from 77 to 572 million by 2100, due to population growth, economic development and increasing industry presence.⁹ Tobacco control must therefore be a significant priority for Africa to escape the cycle of poverty created by tobacco consumption¹¹—which results from household incomes being spent on tobacco instead of on education and food—and to pre-empt a high burden of non-communicable disease. Currently, 42 of 47 African nations have recognised this priority by ratifying the WHO Framework Convention on Tobacco Control.

Appropriately implemented public education campaigns can prevent tobacco uptake in Africa by countering tobacco promotion and strengthening support for best-practice policies. The reach of traditional mass media, combined with the rapid growth of mobile communication technology,¹² could be leveraged to reach wide populations quickly and effectively. However, to date, only 9 of 47 WHO AFRO countries have engaged in mass media activity.¹³ Further, there has been no systematic study of the types of antitobacco messages that are likely to be effective in Africa.

This study was designed to identify potentially effective and adaptable advertisements that would resonate with African audiences. Radio and television ads, varying in content and emotional tone, were included. This study did not test the comparative effectiveness of TV and radio formats, since previous research has shown that, while TV ads are visual and therefore typically more effective, radio can also be effective in resource-limited settings.¹⁴

The study was conducted in Senegal, Kenya and Nigeria. Countries were selected for reasons including logistical feasibility, regional representation and sufficiently developed media markets to enable rigorous message-testing (eg, research agency presence, widespread consumption of mass media). The study used an established quantitative-qualitative methodology previously used in low-income and middle-income countries (LMICs).¹⁵

To cite: Perl R, Murukutla N, Occleston J, et al. *Tob Control* Published Online First: [please include Day Month Year] doi:10.1136/tobaccocontrol-2014-051682

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METHODS

Participants and sample structure

Male and female adult smokers (smoked daily in the past year) and non-smokers (<100 cigarettes in their lifetime and did not currently smoke) aged 18–40 years were recruited using locally appropriate convenience sampling methods. Those who worked in health promotion, market research or the tobacco industry were excluded. Basic literacy in at least one of two local languages was required.

The study was conducted in one major urban and one smaller urban location within each country. Groups were stratified by smoking status, gender, socioeconomic status (SES) and age (see [table 1](#)). The group structure in all three countries was identical, except for two extragroups in Senegal among the 18–29-year-old women of lower SES (included to enhance the representativeness of the sample in that region, based on advice by the local research agency). Each group consisted of 9 or 10 participants, for a sample of approximately 360 within each country.

Advertisements

Five TV ads and five radio ads were chosen in close collaboration with government officials and partners in Africa (see [table 2](#)). Advisers selected ads nominated by partners in Africa and found in World Lung Foundation's Mass Media Resource (worldlungfoundation.org/mmr), a repository created by leading experts. Criteria included strong performance in ads' countries of origin, African stakeholders' assessment of their effectiveness and ease of adaptation.

To account for order effects, ads were presented in two orders, but radio ads always preceded television to prevent the latter from overpowering the former. Following strong negative reactions during pilot testing—where some participants believed the ad was unfairly targeting black people and negatively characterising them—the anti-industry television ad was always shown last to avoid potential 'contamination' of the others. All ads were translated and back-translated into locally appropriate languages (Kenya: Swahili and English; Nigeria: Pidgin English and Hausa; Senegal: Wolof and French), after consultation in-country.

Procedure and measures

Participants viewed and individually rated the 10 ads on a 14-item quantitative rating scale, then participated in structured group discussions led by a moderator. The rating scale and the qualitative discussion guide were adapted from previous message-testing studies.^{8 15} The qualitative findings were highly

congruous with the quantitative results and are not reported in detail here.

The rating scale included 14 items rated on five-point scales, ranging from strongly disagree to strongly agree. These 14 items were reduced to a parsimonious set of outcomes, as guided by data reduction findings from previous studies and confirmed by internal reliability tests of the subscales in this study (see [table 3](#)). The smoker and non-smoker versions of the scale were identical except for four items specific to smoking status (see [table 3](#)).

Data analysis

Data analysis was performed using Stata/SE V12.1. Frequency tables and χ^2 tests were used to examine differences in demographic characteristics within countries. As in previous studies, ad rating items were binary coded as positive or neutral/negative to allow for logistic regression analyses. Binary coding was preferred over averaging responses since it requires positive ratings for at least half of the subscale items in order to be coded as a positive response. Additionally, it accounted for the general positivity bias observed in the Senegal data: In Kenya and Nigeria, 'agree' and 'strongly agree' were coded as a positive response; owing to a high positivity bias in Senegal, only 'strongly agree' was coded as positive. Responses for the multi-item scales were then summed and recoded, where individuals who gave positive ratings on more than half of the items on each scale (eg, Quitting Preparedness; or Perceived Effectiveness, PE) were assigned a positive score.

Multivariate logistic regression analyses and Wald χ^2 tests were performed separately for radio and television ads. For all five outcomes, main effects of ad and country were assessed; for PE and Anti-Industry, main effects of smoking status and two-way interactions between ad and smoking status were also examined. Adjusted proportions of positive responses were then produced for these interaction and main effects models. All models used robust SEs to control for each participant having rated multiple ads. All models adjusted for age, education, parental status, smoking allowed in the home, living with a smoker, ad order, location of message-testing and SES.

RESULTS

Sample characteristics

A total of 1078 participants were recruited across the three countries. The final sample was comprised of 200 non-smokers and 160 smokers in Kenya, 200 non-smokers and 159 smokers in Nigeria, and 192 non-smokers and 167 smokers in Senegal.

Table 1 Group structure within each country for Senegal, Kenya and Nigeria

	Major urban location		Smaller urban location	
	Non-smokers	Smokers	Non-smokers	Smokers
Males				
18–29 years	2 lower SES groups 2 higher SES groups	2 lower SES groups 2 higher SES groups	2 lower SES groups	2 lower SES groups
30–40 years	2 lower SES groups 2 higher SES groups	2 lower SES groups 2 higher SES groups	2 lower SES groups	2 lower SES groups
Females				
18–29 years	2 lower SES groups 2 higher SES groups	2 lower SES groups 2 higher SES groups	2 lower SES groups	*2 lower SES groups
30–40 years			2 lower SES groups	

*Senegal only.
SES, socioeconomic status.

Table 2 Description of radio and television ads tested

Advertisement	Description
Radio ads	
Emphysema Sufferer Keith	With laboured breathing, Keith describes how smoking from a young age has caused him to develop COPD, and how he will never recover
Industry Spokesman	At a tobacco industry meeting, executives discuss their need for more Africans to start smoking, because too many current smokers are dying every day. They say that they are not in this business for their health, and laugh evilly
Coughing Child	Listeners hear a baby coughing and gasping for breath. A voice-over describes the deadly poisons found in cigarette smoke and the harmful health effects the poisons can cause in children
Suffering	Listeners hear a smoker with emphysema, gasping for breath and coughing desperately. A voice-over states that dying from smoking involves suffering every minute, and that many Africans are suffering from emphysema caused by smoking
Bronchoscopy	Features a doctor talking about the late diagnosis of lung cancer in smokers. Listeners hear laboured breathing and a whistling noise, which is described as air racing around a lung cancer tumour as it blocks an airway
Television ads	
Cigarettes are Eating Your Baby Alive	The ad shows the effects of cigarette smoke on children's bodies. The voice-over talks about how the chemicals in cigarette smoke trigger severe health problems in children such as ear infections, asthma and pneumonia
Break the Chain	An Australian Aboriginal mother discusses her friends' and relatives' experiences with smoking disease. She mentions several people and their death or ill health caused by smoking. During this, the camera cuts away to show old photographs and images of her sick relatives. The woman discloses that she has now quit smoking for the sake of her children. The ad closes with her saying, "If I can do it, I reckon we all can"
Lung	A woman lights a cigarette in a public place. As she inhales, we follow the smoke down her trachea and into her lungs. A voice-over explains that lungs are like sponges with millions of tiny air sacs for transferring oxygen. Tobacco smoke attacks these air sacs, which explains why smokers feel short of breath—their lungs are rotting. We reverse back up the woman's trachea as she exhales the cigarette smoke. The end message is that every cigarette will increase the risk of lung cancer. <i>Note:</i> For better cultural congruity in Kenya, an Indian version of this ad featuring a man instead of a woman was used
Sponge	Opens on the silhouette of a man. An X-ray with two sponges is superimposed on the silhouette to clearly identify the sponges representing the lungs. The voice-over and visuals describe and demonstrate the damage that occurs to the lungs each time a smoker inhales cigarette smoke. The sponges transition from a yellow colour to a tar-blackened colour. A pair of hands is seen squeezing the tar from the sponge, revealing the amount of cancer-producing tar that goes into the lungs of a pack-a-day smoker every year
Industry Revealed	Describes the globalisation of the tobacco industry and points out that every cigarette purchase supports an industry without ethics. The visuals show very young people in countries with few marketing restrictions and no minimum age for purchasing cigarettes. It shows a tobacco industry person saying, "we reserve the right to smoke for the young the poor, the black, and the stupid." The ad challenges people to stop buying tobacco products

All ads can be viewed at <http://www.worldlungfoundation.org/mmr>
COPD, Chronic obstructive pulmonary disease.

Few demographic differences between smokers and non-smokers were observed within each country. Compared with non-smokers, a significantly higher proportion of smokers indicated that smoking was allowed inside their homes in Kenya (12.0% vs 36.9%, $\chi^2=31.00$, $p<0.001$) and Nigeria (11.0% vs 35.9%, $\chi^2=31.87$, $p<0.001$), and in all three countries, compared with non-smokers, a significantly higher proportion of smokers reported living with another smoker (Kenya: 23.0% vs 50.6%, $\chi^2=29.71$, $p<0.001$; Nigeria: 21.0% vs 65.4%,

$\chi^2=72.40$, $p<0.001$; Senegal: 57.8% vs 72.9%, $\chi^2=8.88$, $p<0.01$). Significantly more Senegalese non-smokers reported having a radio in their homes compared with Senegalese smokers (98.4% vs 94.0%, $\chi^2=5.01$, $p<0.05$); however, as with the entire sample, a high proportion of all participants (95.8%) reported having radios.

Overall, smokers reported smoking 1–41 cigarettes per day, and the average daily consumption was 10 cigarettes. A one-way analysis of variance found a significant difference between

Table 3 Composition and internal reliability of the final ad rating outcomes

Scale	Internal reliability (α)	'This ad...'
Perceived Effectiveness (PE)	Total sample: 0.72 Non-smokers: 0.67 Smokers: 0.76	Made me stop and think Taught me something new Was relevant, believable and easy to understand Made me feel concerned about others smoking around me (non-smokers only) Made me feel concerned about my smoking (smokers only)
Anti-industry/government support	Total sample: 0.77 Non-smokers: 0.72 Smokers: 0.78	Made me feel angry at the tobacco industry Made me think that the tobacco industry is deceitful Increased my support of Government Actions to stop tobacco use I would discuss the message in this ad with someone else
Commitment to avoiding tobacco (non-smokers only)	Non-smokers: 0.61	Increased my commitment to not smoke Made me feel concerned about others smoking around children Made me think I should avoid places where people smoke
Quitting Preparedness (smokers only)	Smokers: 0.84	Made me feel motivated to quit Increased my confidence to quit
Single-item outcome	N/A	Made me think I should not smoke around others (smokers only)

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countries in terms of cigarette consumption ($F(2480)=3.33$, $p<0.05$). Bonferroni-adjusted pairwise comparisons indicated that smokers in Kenya ($m=10.16$, $SD=6.22$; $p<0.05$) and Senegal ($m=10.07$, $SD=6.02$; $p=0.058$) tended to smoke significantly more cigarettes per day than smokers in Nigeria ($m=8.48$, $SD=7.24$).

Ad ratings

Radio ads

Significant main effects of ads were found for all five outcome measures (all $p<0.001$), after controlling for country, ad presentation order, participant demographics and smoking status, where applicable (see [table 4](#)). Across all countries, *Coughing Child* had the highest proportion of positive ad ratings on PE by smokers and non-smokers. Among non-smokers, *Coughing Child* was rated higher than all other ads, except for *Bronchoscopy* among Nigerians. Kenyan and Nigerian smokers rated *Coughing Child* higher than *Emphysema Sufferer Keith*, *Industry Spokesman* and *Bronchoscopy*. Senegalese smokers rated *Coughing Child* significantly higher than *Industry Spokesman*.

Kenyan and Senegalese non-smokers rated *Industry Spokesman* highest on Anti-Industry, while Nigerian non-smokers rated *Coughing Child* highest. Smokers in Kenya and Senegal also rated *Industry Spokesman* at least marginally higher than all other ads. Nigerian smokers rated *Suffering* highest on Anti-Industry.

Non-smokers in all countries rated *Coughing Child* highest on Commitment to Avoiding Tobacco, significantly higher than *Industry Spokesman*. However, there was little differentiation between the remaining ads and *Coughing Child*. Similarly, Kenyan smokers rated *Suffering* highest on Quitting Preparedness. Nigerian smokers rated *Coughing Child* highest on this measure. Senegalese smokers also rated *Coughing Child* highest on this measure, but not significantly higher than the other ads. Smokers in every country rated *Coughing Child* significantly higher than every other radio ad on Should Not Smoke Around Others.

There were some systematic subgroup differences in the radio ad ratings. Non-smokers were significantly more likely to provide positive ratings on PE and Anti-Industry (both $p<0.001$). Males (all $p<0.001$) and younger participants (all at least $p<0.05$) were

Table 4 Adjusted percentages of positive radio ad ratings by country and comparisons between each ad and the highest-rated ad within each country and smoking status group

	Emphysema Sufferer Keith (%)	Industry Spokesman (%)	Coughing Child (%)	Suffering (%)	Bronchoscopy (%)
<i>Perceived Effectiveness</i>					
Non-smokers					
Kenya	83***	65***	97	94 ^t	89**
Nigeria	82*	70***	88	82*	84
Senegal	78**	58***	88	80*	81*
Smokers					
Kenya	79***	71***	92	88	83**
Nigeria	71***	64***	85	80	79 ^t
Senegal	63	57*	67	64	65
<i>Anti-industry/support for government actions</i>					
Non-smokers					
Kenya	63***	77	71 ^t	71 ^t	63***
Nigeria	66*	69*	74	69 ^t	65**
Senegal	72**	82	81	78	73**
Smokers					
Kenya	37**	51	43 ^t	41*	38**
Nigeria	46*	50	52	55	50 ^t
Senegal	49***	63	57 ^t	56*	51**
<i>Commitment to Avoiding Tobacco</i>					
Non-smokers					
Kenya	92	80***	96	92	94
Nigeria	86	76***	90	86	84*
Senegal	96 ^t	87***	99	97	98
<i>Quitting Preparedness</i>					
Smokers					
Kenya	65*	61**	69	74	62**
Nigeria	56*	54**	65	64	58 ^t
Senegal	66	65	69	63 ^t	65
<i>Should Not Smoke Around Others</i>					
Smokers					
Kenya	65***	57***	94	62***	61***
Nigeria	65***	58***	85	70***	68***
Senegal	68***	69***	93	73***	74***

Bold indicates the ad(s) that was rated the highest within each country (and smoking status, where applicable).

Ads rated significantly lower than the reference ad (**bold**) within each country (and smoking status, where applicable) at: * $p<0.05$; ** $p<0.01$; *** $p<0.001$; ^t $p>0.05$ but $p\leq 0.075$ (trend towards significance).

significantly less likely to provide positive ad ratings on PE, Anti-Industry and Commitment to Avoiding Tobacco. Parents were more likely to provide positive ad ratings on all measures except Commitment to Avoiding Tobacco (all $p < 0.01$, except Should Not Smoke around Others: $p = 0.051$). Those without a tertiary degree were more likely to give positive ratings than those without on all measures other than Commitment to Avoiding Tobacco and Quitting Preparedness (all $p < 0.05$).

Television ads

Significant main effects of television ads were found for all measures (all $p < 0.001$) other than Quitting Preparedness, where a trend towards an effect was found ($p = 0.060$), after controlling for country, ad presentation order, participant demographics and smoking status, where applicable (see table 5). *Baby Alive* was rated the highest on PE by non-smokers in Nigeria and Senegal, higher than *Break the Chain* in both countries and *Lung* in Senegal. There was essentially no difference in the ad ratings between *Baby Alive*, *Lung* and *Sponge* among Kenyan non-smokers, while *Break the Chain* and *Industry Revealed* were

significantly lower than the top-rated ad *Sponge*. A very similar pattern was seen among smokers on PE, although *Lung* was rated the highest in Kenya. Nigerian and Senegalese smokers rated *Baby Alive* significantly higher than *Break the Chain*, and Nigerian smokers also rated it higher than *Industry Revealed*.

Industry Revealed was the highest rated ad on the Anti-Industry measure across all countries and smoking statuses. However, while Kenyan and Senegalese non-smokers rated this ad at least marginally higher than all other ads, there was no difference among ratings for Nigerian non-smokers. Among smokers, *Industry Revealed* was rated higher than all other ads in all countries with the exception of *Lung* in Nigeria.

Baby Alive was rated the highest, or the same as the highest ad, by all non-smokers on Commitment to Avoiding Tobacco. The pattern of ad rating differences varied across countries, with Kenyan non-smokers rating *Lung* higher than *Break the Chain* and *Industry Revealed*, Nigerian non-smokers rating *Baby Alive* at least marginally higher than *Break the Chain* and *Sponge*, and Senegalese non-smokers rating *Baby Alive* higher than all ads other than *Break the Chain*.

Table 5 Adjusted percentages of positive television ad ratings by country, and comparisons between each ad and the highest-rated ad within each country and smoking status group

	Break the Chain (%)	Baby Alive (%)	Lung/Lung India (%)	Sponge (%)	Industry Revealed (%)
<i>Perceived Effectiveness</i>					
Non-smokers					
Kenya	86***	95	95	95	89*
Nigeria	86**	92	91	92	89
Senegal	76**	84	77*	84	80
Smokers					
Kenya	86**	92	94	92	88*
Nigeria	81*	89	87	87	78**
Senegal	65*	72	70	69	70
<i>Anti-industry/support for government actions</i>					
Non-smokers					
Kenya	68***	77***	77**	74***	89
Nigeria	78	80	77	77	80
Senegal	80**	85 [†]	80***	83*	89
Smokers					
Kenya	46***	53***	47***	48***	69
Nigeria	57***	62*	64	62*	70
Senegal	60***	65**	63***	59***	75
<i>Commitment to Avoiding Tobacco</i>					
Non-smokers					
Kenya	90**	97	97	94	84***
Nigeria	89*	94	94	90 [†]	92
Senegal	96	98	95*	92**	91**
<i>Quitting Preparedness</i>					
Smokers					
Kenya	76*	79	84	78*	76*
Nigeria	68*	73	75	73	71
Senegal	75	74	75	72	76
<i>Should Not Smoke Around Others</i>					
Smokers					
Kenya	74***	91	85*	72***	71***
Nigeria	82 [†]	88	85	80**	77**
Senegal	79**	88	75***	74***	77***

Bold indicates the ad(s) that was rated the highest within each country (and smoking status, where applicable). For some analyses, multiple ads appear to be the highest-rated due to rounding. The true highest is bolded.

Ads rated significantly lower than the reference ad (bold) within each country (and smoking status, where applicable) at: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; [†] $p > 0.05$ but $p \leq 0.075$ (trend towards significance).

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There was less differentiation between smokers' ratings on Quitting Preparedness. While Kenyan smokers rated *Lung* higher than *Break the Chain*, *Sponge* and *Industry Revealed*, Nigerian smokers rated this ad higher than only *Break the Chain*. *Industry Revealed* received the highest proportion of positive ad ratings among Senegalese smokers, but not significantly higher than any other ad. Smokers in all three countries rated *Baby Alive* the highest on Should Not Smoke Around Others. *Baby Alive* was rated at least marginally higher than all other ads except *Lung* in Nigeria on this measure.

The subgroup differences observed among television ad ratings were almost identical to those seen for radio ad ratings. Higher ratings on PE were given by non-smokers, older participants, women, those with children and those without tertiary degrees (all at least $p<0.05$). Higher Anti-Industry ratings were also given by those in smaller urban locations and in homes where smoking was permitted indoors (all at least $p<0.05$). Lower ratings on Commitment to Avoiding Tobacco were given by younger participants and males (all $p<0.05$). Finally, parents ($p<0.001$) and those in smaller urban locations gave higher ratings on Quitting Preparedness ($p<0.05$), while those with tertiary degrees ($p<0.05$) and parents ($p=0.051$) gave at least marginally higher ratings on Should Not Smoke Around Others.

Ads and smoking status interactions by country

Only one significant interaction between smoking status and ad type was found for either radio or TV ads. There was a significant interaction for ratings of PE on radio ads in Senegal (Wald $\chi^2=16.18$, $p=0.003$). Senegalese smokers rated all radio ads other than *Industry Spokesman* significantly lower on PE than non-smokers. A trend towards a similar effect was seen in Kenya on PE for radio ads (Wald $\chi^2=9.30$, $p=0.054$).

No significant interactions were found for Anti-Industry; for radio and TV ads, non-smokers rated all five ads significantly higher than smokers in all three countries (all at least $p<0.05$).

CONCLUSIONS

This study identified ads that had the greatest resonance and potential effectiveness among African audiences, and supported adaptation as a viable approach for tobacco control mass media communication in Africa. *Coughing Child* was the strongest-performing radio advertisement across the broad range of measures for smokers and non-smokers. *Suffering* showed a comparably strong performance, although it was rated lower than *Coughing Child* on PE by non-smokers and Should Not Smoke Around Others by smokers. *Baby Alive* and *Lung* consistently performed strongly among the TV ads, although these were not rated higher than *Industry Revealed* on the measure of anti-industry sentiment and support for government actions.

This study replicates findings from other countries on the effectiveness of negative health harms-focused messaging for tobacco control behaviour change communication.⁶ All of the highest-performing ads featured hard-hitting and emotionally evocative content. Both of the highest-performing ads—*Coughing Child* and *Baby Alive*—focused on the effects of tobacco on vulnerable and blameless victims—children, in this case. This messaging approach encourages smokers to modify their behaviour and raises concern among non-smokers about SHS exposure, and has been used successfully previously.^{16 17}

The high-performing ads were originally developed in high-income countries (HICs) yet performed strongly in Africa, particularly on the important measure of PE. Smokers' ratings of personalised PE of television ads has been shown to predict change in quitting-related intentions and behaviours.¹⁸ Their

high performance in this study—in three diverse African settings—suggests that such ads may be successfully adapted for use in Africa, thereby channelling resources from the development of advertisements to campaign implementation. The messages that performed most strongly in this study—and therefore lent themselves best to adaptation—relied on hard-hitting content that depicted bodily damage and evoked strong negative emotions. These findings underscore the universality of motivations for health across contexts: By graphically depicting the illness and burden caused by tobacco, these ads increase health concerns and the motivations to reduce risk by avoiding or quitting tobacco.

The findings highlight the importance of the clarity of messages and their ability to resonate with the target audience. The testimonial ads, *Emphysema* and *Break the Chain*, performed more modestly in this study. Previous message-testing research has also shown that while testimonials can be powerful in their countries of origin, they rely on cultural context and may not resonate with populations in other countries.¹⁵ *Sponge*, which has consistently been among the strongest-performing TV ads in message-testing in other LMICs,¹⁵ showed a positive performance overall, but the qualitative discussions in this study were found to be less easily understood. One possible explanation may have been its reliance on metaphorical imagery, albeit graphic in nature. Compared with the more literal and horrific sounds and imagery in *Coughing Child* and *Baby Alive*, the message in *Sponge* may not have been as accessible. This ad also relies heavily on an understanding of the concept of tar build-up in the lungs, but qualitative discussions revealed that many participants did not have prior knowledge of what tar was.

Though anti-industry messages tended to receive the lowest ratings in motivating behaviour change, they were the most likely of the ads to arouse anti-industry sentiment and support for government actions. This finding suggests that anti-industry messages are not optimal for communications that aim to directly prevent tobacco use or promote cessation. However, other studies have shown that anti-industry messages may be used successfully when the goal is to create anti-industry sentiment^{19 20} and advocacy around an issue, which may itself ultimately support longer term behaviour change at a population level.²¹

This study found that hard-hitting ads that portrayed the harms of SHS exposure were at least as highly rated as other visceral ads that focused on smoking cessation. As noted above, some features of the ads, including their graphic health messages and their focus on tobacco's impact on vulnerable children, may have been the main reasons for their higher performance. However, it is also conceivable that in a population where smoking rates are generally low, the health issues that affect vulnerable young non-smokers are more salient, urgent and universal.

There were minimal subgroup differences, with non-smokers tending to rate ads more positively than smokers; parents more than non-parents; older adults more than younger adults; and women more than men. These findings are consistent with others that have found these groups to be generally more sympathetic to tobacco control messages.¹⁵ However, the overall pattern of findings between groups remained consistent.

This study had several limitations. First, only participants with basic literacy could be included; the ads' effectiveness on non-literate populations was not studied. However, this protocol has been similarly implemented in other LMICs, where ads that rated highly in the message-testing were later found to be effective in campaign impact evaluations, including among lower-

literacy populations.¹⁶ Such findings increase the expectation of similar positive campaign outcomes in Africa. The sample was also limited to those in the age group 18–40 years, to ensure homogeneity within groups. Second, owing to cost considerations, only basic ad adaptations were tested, which could have interfered with their performance. However, the successful performance of the ads, despite minimal adaptation, suggests that they may perform more strongly with appropriate contextualisation. In addition, for efficiency and to optimise comparability, the same scales were used in all countries, ad types and smoking status groups. Third, the strong positive response bias across the Senegalese sample was mitigated by coding only ‘strongly agree’ ratings as positive responses, so response coding was not uniform across countries. Lastly, the study was conducted in African countries with developed media markets where rigorous message-testing was possible (ie, widespread consumption of mass media and presence of research agencies). This may limit the generalisability of the results to other African contexts, particularly lower-income settings and those with less pre-existing exposure to mass media. However, these same ads have evaluated well in urban and semirural settings of other low-income countries, such as China, India and Bangladesh.⁸

This study provides important guidance for the development of tobacco control campaigns in Africa. It is the first systematic study of tobacco control mass media advertisements and included television and radio materials. Hard-hitting, health harms-focused advertisements were perceived to be most effective and most likely to motivate positive behaviour change. In this respect, the findings from Africa were consistent with findings from other countries, which have led to greater pressure on governments to run antitobacco campaigns using graphic and hard-hitting imagery.²²

This study also demonstrated the feasibility of adaptation as a successful approach in Africa. The upfront costs of developing and testing new campaign materials can be daunting and prohibitive. Ads from HICs that are found to be effective in LMICs through pretesting can be quickly and cost-efficiently adapted for local use as long as they are culturally appropriate. The identification of effective radio and television advertisements through this study provides programme managers with materials that can be expected to resonate with African audiences, create concern and motivate healthier tobacco-related attitudes and behaviours. Saving money through adaptation allows resources that would otherwise be expended on campaign development to be used to boost campaign reach, while taking the guesswork out of developing effective population-wide campaigns.²³

What this paper adds

- In a systematic quantitative study of 10 antitobacco advertisements in three diverse African countries, it was found that health-harm messages developed by and used in other countries would likely also be effective in African contexts.
- The message features of tobacco control television and radio advertisements with high potential for effectiveness were broadly similar.
- Being able to adapt existing effective tobacco control advertisements allows programme managers working in African settings to channel limited resources from advertising production into campaign implementation.

Programme managers should consider adaptation as one measure among various strategies to save costs on developing and sustaining campaigns. Additional strategies include buying radio airtime,¹⁴ extending campaign reach through the press or social media, and advocating governments to pass legislation that allocates free prime time to tobacco control advertising.

Acknowledgements The authors gratefully acknowledge the Ministries of Health of Senegal, Kenya and Nigeria, as well as the WHO and AFRO for their support and for granting access to conduct this study in their countries. We are also grateful for the support of the following NGOs: LISTAB in Senegal, Coalition Against Tobacco in Nigeria, the International Institute for Legislative Affairs in Kenya, and the Center for Tobacco Control in Africa. The authors thank the research agencies TNS Senegal, Millward Brown Nigeria, and Infotrak Kenya, who conducted the fieldwork; to Roshan Dauharry for his invaluable assistance with project management; and to Tahir Turk for his assistance in producing ads for testing.

Contributors RP was involved in the overall study management; study and questionnaire design; oversight of field activities; literature review; writing of this paper. NM was involved in the study and questionnaire design; participation in oversight of field activities and in data analysis; data interpretation; literature review and writing of this paper. JO and MB were involved in the study and questionnaire design; management of fieldwork; analysis and data interpretation; preparation of tables; review and editing of this paper. ML was involved in the management of fieldwork; literature review; review and editing of this paper. MW and SM were involved in the overall study design and guidance; guidance on management of fieldwork, data analysis and interpretation; review and contribution to the writing of this paper.

Funding The study was supported by grants from the Bloomberg Philanthropies and the Bill and Melinda Gates Foundation.

Competing interests None.

Ethics approval Prior to participation, the study was described to all participants and their formal consent to participate was sought. The questionnaire was administered only to respondents who agreed to participate in this research. As ESOMAR members, the participating agencies complied with the professional and ethical standards of ESOMAR International Code of Marketing and Social Research Practice.

Provenance and peer review Not commissioned; externally peer reviewed.

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Responses to antismoking radio and television advertisements among adult smokers and non-smokers across Africa: message-testing results from Senegal, Nigeria and Kenya

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Tob Control published online September 2, 2014

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