Effects of a mass media intervention on HIV-related stigma: ‘Radio Diaries’ program in Malawi

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Abstract
HIV-related stigma has been recognized as a significant public health issue, yet gaps remain in development and evaluation of mass media interventions to reduce stigma. The Malawi ‘Radio Diaries’ (RD) program features people with HIV telling stories about their everyday lives. This study evaluates the program’s effects on stigma and the additional effects of group discussion. Thirty villages with 10 participants each were randomized to listen to RD only, to the program followed by group discussion or to a control program. Post-intervention surveys assessed four stigma outcomes: fear of casual contact, shame, blame and judgment and willingness to disclose HIV status. Regression analyses indicated that fear of casual contact was reduced by the intervention. Shame was reduced by the radio program, but only for those reporting prior exposure to the radio program and for those who did not have a close friend or relative with HIV. Shame was not reduced when the radio program was followed by discussion. The intervention reduced blame for men and not women and for younger participants but not older participants. Including people with HIV/AIDS in mass media interventions has potential to reduce stigma.

Introduction
HIV-related stigma is recognized as a significant public health issue, yet gaps remain in development and evaluation of large-scale interventions to reduce stigma. HIV-related stigma, defined by Herek et al. as ‘prejudice, discounting, discrediting and discrimination’ against people with HIV [1], has harmful effects on people living with HIV/AIDS (PLHA), such as rejection by family [2,3], including violence [4]; employment [5] and health care [6,7] discrimination and reduced medication adherence [8]. Stigma hinders prevention efforts by reducing HIV testing behavior [9–13] and suppressing discussions with health care personnel about HIV prevention [14], causing harm to the entire population.

Given these harms, there is a significant need for interventions to reduce stigma. Large-scale mass media campaigns have been used widely in HIV prevention [15] but have not generally focused on stigma reduction as a primary outcome [15,16]. A recent study in Nigeria found that exposure to HIV/AIDS communication programs was associated with more accepting attitudes toward PLHA [17]. Interventions to reduce HIV-related stigma have not generally included mass media and address small audiences, and few have been conducted outside the United States [18,19]. A recent evaluation in Nigeria of a fictional film about a young man
with HIV found reduced blame of PLHA among men who watched the film compared with men in the control group [20]. Women who watched the film, however, endorsed stigmatizing policies more than women in the control group, likely because they identified with the young man’s fiancé.

Several recent reviews have pointed to the need for more stigma-reduction interventions in developing countries and more involvement of PLHA in designing and implementing interventions [16, 19]. The current study examines the effects of a radio program featuring real men and women with HIV in Malawi.

**Malawi ‘Radio Diaries’**

An estimated 11% of the adult population in Malawi is infected with HIV [21]. Formative research [22] found that people in Malawi feared stigma-related consequences of a positive HIV test result, such as insults, teasing and social isolation. Twenty-nine percent of respondents felt people with HIV should be isolated from healthy people to avoid the spread of the disease. Half of the respondents believed that most families would reject a relative with AIDS, although 95.8% said they would be willing to take care of a family member with HIV.

To address HIV-related stigma in Malawi, the Malawi BRIDGE Project created the ‘Radio Diaries’ (RD) program as a component of a broader HIV prevention communication campaign; the campaign and its components are described elsewhere [23, 24]. Each of six radio stations, covering a variety of audiences, produced a weekly episode featuring two HIV-positive diarists, one male and one female. The diarists narrated 10-min segments in their own words (in their native language, Chichewa) about issues and key events in their lives, such as interpersonal relationships, experiences with health services and coming to terms with their condition. Each radio station tailored the program to its needs by supplementing the diary segments with call-in shows, expert panels or segments on nutrition and AIDS.

Preliminary survey data indicated that greater exposure to the program was associated with increased ability to talk openly about HIV and increased perception that PLHA were similar to oneself [22]. The cross-sectional nature of the data, however, made it difficult to determine whether exposure to the program reduced stigma or whether people with more positive attitudes toward PLHA were more likely to listen to the program. The current study uses improved stigma indicators [25] and aims to address causality by manipulating exposure to the program.

Our hypothesis is that compared with the control group, the intervention group will report reduced HIV-related stigma. The program may provide the audience with a form of ‘parasocial’ contact with PLHA that may challenge stereotypes about them [26, 27]. Contact is robustly associated with reductions in prejudice against minority groups [28]. Four of the more promising interventions reviewed by Brown et al. [18] included contact with PLHA as a main component [29–32], and contact has been identified as an effective strategy for reducing stigma related to mental illness [33].

**The role of group discussion**

As part of the RD program, 18 Radio Listeners’ Groups met weekly to listen to the program and provide feedback to the diarists and producers on broadcast quality, comprehension and general interest in the content. While these groups served a specific purpose and included a very limited population, they raised the question as to whether discussion groups in the general population might enhance the effects of the program. Interpersonal communication can bolster the effects of a mass media intervention by enhancing cognitive elaboration of messages through the process of discussion [34]. Group discussion may also reduce or counter the effects of media programs, however, particularly if the topic is negative or divisive [35]. David, Cappella and Fishbein found that high-sensation seeking youth with pro-marijuana attitudes dominated a group discussion about anti-marijuana advertising, countering its overall effects on attitudes of other youth [36]. If higher status individuals hold stigmatizing attitudes and participate more in discussion of the RD program, group
discussion may have negative effects. Thus, we added an additional intervention arm that included group discussion. Our research question is: will an intervention group that includes discussion about the RD program reduce HIV-related stigma more than the intervention group with no discussion?

Types of stigma
Nyblade and MacQuarrie [25] developed HIV-related stigma measures based on qualitative research done in four countries [37], attempting to disentangle social exclusion and discrimination emerging from fear of transmission versus shame, blame and judgment. This study includes their measures of fear of transmission from casual contact with PLHA, shame, blame and willingness to disclose HIV status to others, with the goal of understanding whether the intervention has different effects on different aspects of stigma.

Methods

Study design
A three-group between-subjects post-test-only experimental design was used to assess the impact of the RD program on HIV-related stigma and to assess whether group discussion strengthened those effects. In the RD arm, participants listened to 20 min of diary segments from one diarist. In the RD-discussion (RD + D) arm, participants listened to the segments followed by 20–30 min of group discussion. In the control arm, participants listened to an unrelated radio program of equivalent length on child labor.

Sampling and participants
The study was conducted in 2007 in 30 villages near Lilongwe, the capital city. Because of the need for groups in the discussion arm, villages were used as the unit of randomization. Nine community-based organizations (CBOs) provided lists of their catchment areas, and three to four villages were randomly chosen from each list. Villages were randomized to one of the three experimental conditions, stratified by gender. We separated groups by gender to ensure open discussion in the RD + D condition. Of the 30 villages (10 participants per village), half yielded all male groups and the other half yielded all female groups, for a total study sample size of 300 participants. Power analysis indicated that this sample size would be sufficient to detect effects between groups and interactions by sex and other covariates.

CBO contacts secured approval from village heads to conduct the study and announced to villagers the day and time when the study would be looking for volunteers. Anyone age 16 or older was eligible to participate. If more than 10 volunteers were available upon arrival, we randomly selected 10 to participate in the study; otherwise we started when 10 volunteers had assembled. A local institutional review board and the Johns Hopkins School of Public Health Institutional Review Board provided ethical approval for the study.

Recordings
For the intervention conditions, 20 min of clips of the RD program were chosen from either a male diarist [from the show ‘Kalata Yanga’ (Breaking the Silence) on Capital FM] or a female diarist [from the show ‘Moyo Wanga’ (My Life) on Trans World Radio]. We chose separate recordings for women and men to increase the similarity participants might feel toward the diarists; because there were specific questions in the post-test interview referring to ‘the diarist’ (not included in this analysis), only one diarist could be included in each recording. These clips are typically broadcast weekly, accompanied by other material selected by the producer; as such, this study evaluates the efficacy in reducing stigma of a limited portion of the radio program at one time point. We obtained a program on child labor from the company that produced the RD programs of similar length and production value to serve as an attention control.

Procedure
The study was conducted in village outdoor meeting spaces or small buildings. The lead research assistant introduced the study and read the consent form. Participants then listened to the RD or the
control program. After listening to the radio program, the RD + D group discussed the program for 20–30 min. Discussion was started by one of the research assistants with an open question, such as, ‘What do you think about what you heard?’ with similar open probes to keep discussion moving in the opening minutes (after which the participants generally kept the discussion going on their own). Malawian research assistants (two women and one man) conducted post-test interviews with participants one-on-one and in private. Interviews were used due to the low literacy level of participants.

Measures

Measures were translated into Chichewa, back-translated and pre-tested prior to administration in the main study.

Stigma outcomes

Stigma was assessed using indicators developed by Nyblade and MacQuarrie [25]. Scales for fear of casual contact (Cronbach’s $\alpha = 0.89$), shame (Cronbach’s $\alpha = 0.86$) and willingness to disclose (Kuder–Richardson-20 = 0.80) all had non-normal distributions (due to a large percentage of respondents with the minimum or maximum scale value) that violated the assumptions of regression analysis and were thus dichotomized as described below.

Fear of casual contact (five items, five-point scale ranging from 0 ‘not at all fearful’ to 4 ‘extremely fearful’) was measured by asking how fearful participants were of exposure to the saliva, sweat and excreta of PLHA, that their child could contract HIV by playing with a child with HIV/AIDS, and that they could become infected if they cared for someone with HIV. This variable was dichotomized by those reporting fear on at least one item (70%) versus those reporting no fear (30%).

Shame (three items, five-point scale from ‘strongly disagree’ to ‘strongly agree’) was measured with items stating that the participant would experience shame if he or she had HIV, would experience shame if a family member had HIV, and that PLHA should be ashamed of themselves. This variable was dichotomized by those who agreed with at least one item (36%) versus those who strongly or weakly disagreed with all three items (64%).

Blame/judgment (four items, five-point scale from strongly disagree to strongly agree) was measured as agreement with items stating that HIV is a punishment from God, HIV is a punishment for bad behavior, HIV is spread by women prostitutes and people with HIV are promiscuous. Factor analysis revealed that the first item did not load significantly onto the latent factor and was dropped. The remaining three items were averaged into a continuous scale ranging from 1 to 5 (Cronbach’s $\alpha = 0.55$).

Willingness to disclose was measured using four dichotomous (yes/no) items asking whether the participant would disclose a hypothetical positive HIV status to family, friends, a partner and neighbors in the village; the first item about family was dropped due to lack of variance—95.7% of participants responded yes. The variable was dichotomized by those reporting they would tell all groups (63%) versus those who said they would not tell one or more of those groups (37%).

Demographic and control variables

Demographic and control variables previously related to HIV-related stigma or to media exposure included age (dichotomized into 16–24 and 25 or older, groupings used by the Government of Malawi to designate youth and adults), marital status (ever married and never married), education (years completed) and religiosity [five-point scale (0–4) from ‘no strength of religious beliefs at all’ to ‘extremely strong religious beliefs’].

Knowledge about HIV was assessed using five items with the most variability in prior household surveys: (i) HIV and AIDS are the same thing, (ii) a person can get HIV from mosquito bites, (iii) people can protect themselves from the HIV virus even if they have multiple partners by using condoms every time they have sex, (iv) not having sex for a long period of time can be harmful to the body and (v) a pregnant woman can transmit the AIDS virus to her unborn child. Responses were true, false and don’t know, dichotomized into correct
versus incorrect and averaged into a normally distributed continuous scale ranging from 0 to 1.

Participants were asked yes or no questions about whether they were ever tested for HIV, whether they wanted to be tested, whether they knew someone with HIV and whether they owned a radio or had access to a radio. Given that the program had been airing on six radio stations since 2005, we assessed prior exposure to the RD program by asking whether the participant had heard any of the programs, using their titles. Those who had not were asked a second question about whether they had heard a program in which PLHA talked about their experiences. Participants who said yes to either question were considered exposed to the radio program.

Data analysis

The three study arms were compared on demographic and control variables using $\chi^2$ tests for categorical variables and one-way ANOVAs for continuous variables. Variables that differed by group were included as controls in regressions comparing the study conditions on stigma outcomes. Experimental group was entered as dummy variables (control group as reference) in regression; post-estimation Wald tests were used to compare the RD + D group with the RD group. Interactions with demographic and control variables (such as prior exposure to the RD program) were assessed for each outcome. Because villages were the unit of randomization, all regression analyses were conducted with adjustments for clustering within village and robust variance estimation.

Results

Table I describes the overall sample and the three study groups. Groups did not differ on any of the demographic or control variables, indicating that assignment to condition did not differ systematically on participant background characteristics; as such, these variables were not included in subsequent regression analyses. Analyses including the control variables were conducted and did not differ substantially from results without them. Table II shows mean blame scores and the percentage of respondents in each group who reported any fear of casual contact with PLHA, any shame related to HIV and willingness to disclose HIV status to friends, partners and neighbors.

Fear of casual contact was significantly lower in the RD group than the control group (64% versus 80%, $\text{OR} = 0.44$, 95% CI = 0.22, 0.89). The RD + D group did not report significantly different fear than

| Table I. Characteristics of the study sample by study arm |
|-----------------|-----------------|-----------------|-----------------|-----------------|
|                 | Control $n = 100$ | RD only $n = 100$ | RD + D $n = 100$ | Total $n = 300$ |
| Age: $M$ (SD)  | 34.2 (12.8)      | 37.2 (13.7)      | 33.2 (12.8)      | 34.9 (13.2)      |
| Youth age 16–24 (%) | 30              | 25              | 28              | 28              |
| Married (%)     | 85              | 86              | 91              | 88              |
| Education in years: $M$ (SD) | 5.1 (3.8) | 4.6 (3.6) | 5.7 (3.8) | 5.2 (3.8) |
| Religiosity (0–4): $M$ (SD) | 2.4 (1.1) | 2.4 (1.1) | 2.6 (1.0) | 2.5 (1.0) |
| HIV knowledge: $M$ (SD) | 0.58 (0.25) | 0.62 (0.20) | 0.62 (0.20) | 0.61 (0.22) |
| Ever tested for HIV (%) | 32 | 24 | 34 | 30 |
| Want to be tested (%) | 90 | 86 | 91 | 89 |
| Know someone with HIV(%) | 30 | 36 | 35 | 34 |
| Own radio (%)    | 59              | 55              | 66              | 60              |
| Access to radio (%) | 93           | 94              | 96              | 94              |
| Prior RD exposure (%) | 69            | 80              | 73              | 74              |

No significant differences between groups on all above variables.
the control group (67% versus 80%, OR = 0.51, 95% CI = 0.23, 1.1), but there was a trend toward significance. There was no significant difference in fear between the RD and RD + D groups. There were no significant interactions.

Shame was significantly lower in the RD group than the control group (22% versus 45%, OR = 0.34, 95% CI = 0.17, 0.71). The RD + D group did not report significantly different levels of shame than the control group (41% versus 45%, OR = 0.85, 95% CI = 0.48, 1.5). The RD + D group, however, did report significantly higher levels of shame than the RD-only group (Wald $\chi^2 = 7.0, P = 0.008$). Two interactions emerged, shown in Fig. 1. There was a main effect of knowing someone with HIV on shame: participants who knew someone with HIV were overall less likely to report shame than those who did not (27% versus 41%, OR = 0.26, 95% CI = 0.11, 0.58). The reduction in shame for the RD group compared with the control group was greater for those who did not know someone with HIV than it was for those who did know someone; there was no effect of the intervention for the latter group. There was also an interaction between study group and prior exposure to the RD program. Only for those who reported prior exposure to the program was there a reduction in shame for the RD group compared with the control group.

Blame/judgment did not differ between the RD group and the control group (3.8 versus 4.1, Table II. Regression analyses of relationship between study condition and stigma outcomes

<table>
<thead>
<tr>
<th>Experimental condition</th>
<th>Control n = 100</th>
<th>RD n = 100</th>
<th>RD + D n = 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of casual contact (%)</td>
<td>80</td>
<td>64* **</td>
<td>67†</td>
</tr>
<tr>
<td>Shame (%)</td>
<td>45</td>
<td>22* **</td>
<td>41 b **</td>
</tr>
<tr>
<td>Blame/judgment: M (SD)</td>
<td>4.1 (1.0)</td>
<td>3.8 (1.3)</td>
<td>3.7 (1.2)*</td>
</tr>
<tr>
<td>Willingness to disclose (%)</td>
<td>58</td>
<td>66</td>
<td>66</td>
</tr>
</tbody>
</table>

aDifferent from control.
bDifferent from RD. *P < 0.10, **P < 0.05, ***P < 0.01.

Fig. 1. Interaction of intervention group with knowing someone with HIV and with prior RD exposure on shame-related stigma.
$\beta = -0.29$, 95% CI = $-0.72$, 0.14) but was significantly lower in the RD + D group than the control group (3.7 versus 4.1, $\beta = -0.32$, 95% CI = $-0.62$, −0.03). There was no significant difference between the RD and RD + D groups. There were significant interactions between study arm and sex and between study arm and age group, as shown in Fig. 2. The RD and RD + D groups reported lower levels of blame than the control group for men only; for women, the three study arms reported the same level of blame. For youth, but not for older people, the RD group reported lower blame than the control group. Looking at the effect of discussion, however, youth in the RD + D group reported higher blame than their counterparts in the RD group (bringing levels of blame back up to control levels). For older participants, the RD + D group did not report different levels of blame than the RD-only group but significantly lower blame than the control group.

Willingness to disclose potential HIV status did not differ between the three groups and there were no significant interactions found.

**Discussion**

This study indicates that radio programs featuring men and women with HIV show promise as a means of reducing some types of HIV-related stigma in the general population, such as fear of casual contact with PLHA and shame related to having HIV. Fear of casual contact and shame—arguably responses to the health and social threats represented by HIV—were more impacted by the radio program than blame/judgment and willingness to disclose HIV status. Effects on blame may not have been detectable due to the poor reliability of the measure. It is also possible, however, that blame reflects morals and values that should be countered through other means, such as direct promotion of competing values such as empathy, equality and fairness [38]. Willingness to disclose is likely impacted by perceived stigma from society [39], which may only change over a longer time. If people expect that the attitudes of others are changing in response to ongoing mass media programs—a phenomenon known as the influence of perceived influence [40]—then willingness to disclose may increase.

The inclusion of PLHA as an integral intervention strategy for stigma reduction reflects the Greater Involvement of People Living with HIV and AIDS (GIPA) Principle promoted by UNAIDS and other programs [41]. The presentation of stories of people with HIV, told in their own words, may have an effect similar to that of real-life contact with
PLHA. Parasocial interaction through media produces similar cognitive processes as face-to-face social interactions [26], and parasocial contact serves a similar role as in-person contact in changing stereotypes and reducing prejudice [27]. Programs that create parasocial contact may challenge stereotypes by providing strong examples of people with HIV who are typical in ways familiar to the general audience. By showing the full lives of PLHA, the program may increase empathy toward PLHA [42] and make separation and dehumanization of PLHA more difficult. By appearing in a public forum and speaking powerfully about their lives, the diarists serve visible, useful and prominent social roles that counter expectations about the abilities and status of PLHA [43–46].

Role of group discussion

The findings indicate that informally moderated discussion groups may not enhance the effects on stigma of exposure to the program and, in the case of shame, may actually reverse the effects. While discussion has the potential to reinforce intervention messages, it also has the potential to stir group polarization on a potentially contentious issue [35]. We should be cautious, however, in concluding that radio listening groups may be an unhelpful part of a stigma-reduction interventions. Unlike the discussion groups in this study, the radio listening groups formally associated with the RD program were led by local PLHA groups. Additionally, HIV action committees have used the RD as a way to facilitate discussion about what HIV awareness and prevention activities the community should undertake. Discussions formally directed in positive ways toward the radio program may lead to reductions of HIV-related stigma over and above listening to the radio program.

Interaction effects

The reception of the radio program by different subgroups is worth further study. Participants in the RD group who did not know someone with HIV reported similar shame levels as those in the control group who knew someone with HIV, lending credence to the notion that listening to the program may provide a kind of parasocial contact similar to actual contact with PLHA.

The intervention had an effect on shame only for participants reporting prior exposure to the RD, indicating that, for this outcome, continued exposure may be more effective than one-time exposure. These results may also indicate, however, that the intervention is not effective in reducing shame in populations with lower levels of media exposure. While it would have been preferable to have an intervention-naive population, selecting only participants who had not heard the program would have limited the generalizability of the study, as these participants differ on many characteristics from the majority who had heard the program. Prior exposure would tend to attenuate effects of the program on stigma, making it more difficult to detect significant findings.

Women and older participants did not show as strong a relationship between exposure to the intervention and reduced blame/judgment as men and youth. One limitation of the study is that men and women listened to different RD clips. The clips may differ on characteristics such as how engaging the stories are or how likable or authoritative the speaker is. Our decision to vary the stimulus program by gender was driven by the desire to have gender congruency between the diarist and participant. Future studies should investigate whether gender congruency matters, by, for example, crossing gender of the diarist by gender of the respondent.

While the control groups did not report different levels of blame by age group, youth reported lower levels of blame in the RD group than in the control group; there was no effect for older participants. Younger people may be more receptive to changing their attitudes about PLHA. On the other hand, younger people in the RD + D group reported levels of blame comparable to control group levels and older people in the discussion group reported levels significantly lower than control group levels. Younger people may have had a positive influence on the opinions of older people but the views of older people may have countered the effect of the program on younger people. Future studies should
investigate why the program had positive effects on stigma for some audience segments and not others.

Limitations

A significant limitation is that the listening experience in the study is artificial and short-term. Participants heard several diary segments in a row at one time, without intervening weeks or the other program segments that would usually accompany the diary segments. Participants were volunteers, who may be more prosocial than the general population and may show a greater response to this kind of intervention. As such, this study assesses the efficacy of the intervention in a limited population but not necessarily its effectiveness in a real world setting.

Other limitations of design and measurement lower the power to detect associations as most of the stigma outcome measures had to be dichotomized. Because interviews were needed to collect data, a post-test only design was used instead of a pre-test, post-test design. Because randomization occurred at the village level, having baseline levels of stigma would have ameliorated concerns about pre-existing differences between villages on the outcome.

Future studies should evaluate this intervention in new populations, particularly assessing long-term effects and using group-randomized designs that increase generalizability. Investigating the mechanisms through which the program has effects and how the messages can be effectively tailored for different subgroups also warrants attention.

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Conflict of interest statement

None declared.

References

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