A community-based education programme to reduce insecticide exposure from indoor residual spraying in Limpopo, South Africa

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Abstract

Background: Indoor residual spraying (IRS), the coating of interior walls of houses with insecticides, is common in malaria-endemic areas. While important in malaria control, IRS potentially exposes residents to harmful insecticides. The World Health Organization recommends steps to minimize exposure; however, no programme has focused on educating populations.

Methods: A dramatic presentation and song were developed by study personnel and performed by lay performers in order to spread awareness of the importance of IRS and to minimize insecticide exposure. Performances were staged at 16 sprayed villages in the Vhembe District of Limpopo, South Africa, at which 592 attendees completed short questionnaires before and after the performance about behaviors that might limit insecticide exposure. Overall indices of the attendees' change in knowledge of precautions to take prior to and after spraying to prevent insecticide exposure were analyzed using hierarchical mixed models to assess the effect of the performance on change in participants' knowledge.

Results: Approximately half of attendees lived in homes that had been sprayed for malaria and 62% were female. Over 90% thought it better to allow IRS prior to the presentation, but knowledge of proper precautions to prevent exposure was low. The proportion answering correctly about proper distance from home during spraying increased from 49.4% pre-performance to 62.0% post-performance (RR = 1.26, 95% CI = 1.13, 1.41), and the proportion reporting correctly about home re-entry interval after spraying increased from 58.5 to 91.1% (RR = 1.54, 95% CI 1.35, 1.77). Attendees improved in their knowledge about precautions to take prior to and after spraying from mean of 57.9% correct to a mean of 69.7% (β = 12.1%, 95% CI 10.9, 13.4). Specifically, increased knowledge in closing cupboards, removing food and bedding from the home, covering immovable items with plastic, and leading animals away from the home prior to spraying were observed, as was increased knowledge in sweeping the floors, proper disposal of dead insects, and discarding dirty washrags after spraying.

Conclusions: A dramatic presentation and song were able to increase the attendees' knowledge of precautions to take prior to and after spraying in order to limit their insecticide exposure resulting from IRS. This approach to community education is promising and deserves additional study.

Keywords: Community education, Dramatic presentation, Indoor residual spraying, Insecticide exposure, Malaria prevention, Questionnaire, Vhembe, South Africa

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Background
In 2017, there were 219 million cases of malaria, resulting in about 435,000 deaths, with most deaths occurring to children under age 5 and living in sub-Saharan Africa [1]. Increased prevention and control measures have led to an overall reduction in global malaria mortality rate of about 60% since 2000 [1]. A total of 21 countries worldwide, including South Africa, were identified as likely to reach zero indigenous cases by 2020 [1]. However, South Africa is not on target to meet these World Health Organization (WHO) goals, having experienced a >20% increase in cases between 2016 and 2017 [1]. Inadequate mosquito vector control, improved reporting, and climatic changes likely play a role in this increase [1]. In South Africa, there are three malaria-endemic provinces: Mpumalanga, KwaZulu-Natal, and Limpopo [2]. Between 2000 and 2010, Limpopo had the lowest decrease in malaria cases in South Africa [2], and between 2013 and 2014 malaria cases nearly doubled [3].

South Africa is part of the Elimination 8 (E8) Regional Initiative to jointly plan and execute a regional malaria elimination strategy for eight Southern African countries by 2030 [4]. The major components of the South Africa national policy for malaria elimination includes malaria vector control by indoor residual spraying (IRS), early detection by rapid diagnostic test (RDT), and artemisinin-based combination therapy. IRS is the systematic insecticide application to the interior walls of homes to kill malaria-infected mosquitoes as they rest. IRS with the organochlorine insecticide dichlorodiphenyltrichloroethane (DDT) has been ongoing since 1946 in malaria-endemic regions of South Africa [5]. DDT and its main breakdown product, dichlorodiphenyldichloroethylene (DDE), have long half-lives in the human body (6 years and up to 10 years, respectively) and in the environment. Thus, the Stockholm Convention banned DDT for all uses except for public health purposes due to its toxicity [6–8]. In recent years, pyrethroid insecticides have been primarily used for IRS in South Africa [9]. In Vhembe, cypermethrin was used until 2015 and deltamethrin has been used since then. It is not South African policy to rotate pyrethroids or to distribute pesticide-impregnated bed nets.

Both DDT and pyrethroids are neurotoxic in developing animals through a number of mechanisms [9–11] and both DDT [12] and some pyrethroids [13] are endocrine disruptors. Thus, although effective prevention of malaria is of critical importance to human health, there is growing concern about the potential health effects of IRS insecticides [14, 15]. Previously, we have identified in a Vhembe birth cohort associations between DDT in maternal serum collected at delivery and increased maternal hypertension [16], childhood infections [17], and larger fetal and childhood growth in girls [18, 19]. Associations have also been found between pyrethroid metabolites in maternal urine and negative sequelae in their children, including impaired neurobehavioral development [20], and decreased childhood growth in boys [19].

A key goal of South Africa’s Malaria Elimination Strategy is to ensure that by 2018, 100% of the population has adequate malaria knowledge and practice [21]. To reach this goal, One Sun Health, a non-profit organization, developed a Malaria Awareness Programme (MAP) in the northern Vhembe region of Limpopo [22]. The curriculum for MAP included innovative methods to train home-based care, over multiple sessions, on malaria transmission. Teaching methods included visual diagrams, a song to teach symptoms, a drama to teach prevention, and a graphic to teach treatment. A number of other studies around the world have also investigated the effectiveness of education programmes in increasing knowledge of malaria symptomatology, prevention, and treatment [22–26] and several have used dramatic presentations or song to deliver the educational messages [27–29]. Although best practices to reduce exposure to insecticides were outlined by the WHO [30] and the President’s Malaria initiative [31], no prior study has included in their education programme the prevention of insecticide exposure to residents from IRS.

This study examines the effectiveness of a dramatic presentation and song to convey to residents living in the Vhembe district municipality of Limpopo South Africa the importance of IRS for malaria control and ways to prevent insecticide exposure. Herein, the effectiveness of a single dramatic educational presentation is assessed in increasing knowledge of prevention of undue insecticide exposure to residents.

Methods
Participants
Participants were adults residing in 16 villages in the Thulamela region of the Vhembe District Municipality of Limpopo Province in South Africa where IRS was conducted (Fig. 1). Participants were mainly VhaVenda and spoke TshiVenda. Research staff personally invited women (with phone calls and in person) who had participated in the Venda Health Examination of Mothers, Babies and their Environment (VHEMBE) birth cohort study [20]. In addition, they were encouraged to invite friends, family, and other residents of their villages. The meetings were also promoted with posters and word-of-mouth campaigns by VHEMBE staff and local chiefs. Attendees who were able to read and write and 18 years or older were asked to complete a questionnaire both before and immediately after the presentation. Of the
1068 adults who attended, 592 (55.4%) completed the questionnaire both pre- and post-presentation.

Educational programme
The educational programme was conceptualized within the framework of the Health Belief Model [32, 33], a widely used value expectancy theory that aims to both predict and explain behavior. This theory suggests that people’s propensity to individual health behaviour change depends on their perceptions of: (1) their susceptibility to a health risk or condition; (2) the severity of the risk or illness; (3) the benefits of taking action; and (4) the barriers or costs of acting [33]. Some theorists also emphasize the value of a “cue to action” which may motivate individuals to take a desired step. In this study, the educational intervention (performance and/or song) is both the means of providing knowledge and a “cue to action” encouraging or further reinforcing the desired health

Fig. 1 Location and names of the villages in Limpopo South Africa where skit and song were performed
behaviour changes, i.e., allowing indoor home spraying but practicing protective measures in advance.

The education programme consisted of a skit followed by a song in TshiVenda. The purpose of the skit and song was to educate the audience on the importance of IRS for malarial control and on the necessary precautions in preventing undue insecticide exposure. The skit was developed at University of California Berkeley (D.I.L.). Then, feedback was elicited from the field office staff of approximately 10 individuals. The revised skit was then presented to patients and staff at the local hospital, as well as to drama students at the University of Pretoria. The skit was then revised based on this feedback. The song was developed by the field office staff based on the information in the skit. The skit and song were performed by VHEMBE study staff in costume as mosquitoes (Fig. 2) and identified several precautions to be taken before and after spraying based on best practices outlined by the 2015 WHO Report [30].

The skit told a story about a mosquito army that sets out to spread malaria to the local village (see Appendix 1 for script in English and TshiVenda). The mosquitoes grow concerned when a loving mother tells her daughter how important it is to spray their home with insecticide. The daughter then provides several arguments against spraying: It will hurt her doll and her dog. The mosquito army cheers after each objection. Then the performers ask the audience for suggestions on how to keep toys safe from the spray. The mosquito army is sad when the mother points out—and acts out—that toys should be outside the home during the spraying. Performers identify and act out the WHO-recommended pre-spraying precautions and post-spraying behaviours that reduce exposure. At the end of the presentation, they sing a song reinforcing the overall message that IRS is beneficial and that everyone should minimize insecticide exposure to themselves and their families (see Appendix 2) (see videos of skit and song: https://www.youtube.com/watch?v=lvZ1W5ZJM8Y; https://www.youtube.com/watch?v=S_gbrBxDGys). The skit and song were performed in churches or community halls; however, the video clips above were taken from performances in local schools (at which questionnaires were not collected) due to better sound quality.

**Evaluation of knowledge of precautions**

Each eligible participant was asked to complete a pre- and a post-performance questionnaire. The two sets of questions were identical (see Appendix 3) except that demographic information, such as sex, age group, and whether an attendee’s home had been sprayed for malaria (regardless of whether they lived there at the time) were included in the pre-performance questionnaire. The pre- and post-performance questionnaires included questions about whether it was better to allow spraying for malaria control in their homes or not, the proper distance to stay from the home while spraying is occurring, and the length of time they should wait after spraying before reentering their homes. They were also given lists of behaviours (some helpful, some harmful, some neutral) for before and after spraying (12 each) and asked to indicate which they should do. All behaviours referred to in the questionnaire were touched upon in the skit and in the song.

Each participant was handed the pre-performance and post-performance questionnaires, with the latter folded and stapled closed so that the participant could not read it during the performance. Before the drama and song were begun the participants were asked to complete the pre-performance questionnaire. The staff then collected each of these pre-performance questionnaires. The drama and song were performed, and afterwards participants were asked to open the closed post-performance questionnaire and complete it; forms were again collected from each individual. During the completion of the questionnaires, study staff walked around to make sure that the participants would not instruct each other, copy from another, or complete the form for someone else. Instead, they were encouraged to ask staff if they needed clarification on how to complete the questionnaires; staff were not allowed to explain the meaning of the questions. Participants were asked to answer according to how they understood the questions.

No identifying information was collected. Verbal informed consent was obtained at the group level.
As part of the opening remarks, the event facilitator explained the purpose of the questionnaire and emphasized that participation was voluntary. Verbal consent was implied by completion of the questionnaire. The questionnaire and consent procedures were approved by the Institutional Review Boards at the University of California, Berkeley and the University of Pretoria in South Africa.

**Statistical analysis**

For questions regarding gender, age, and whether the participant’s home had been sprayed for malaria, invalid responses were set to missing. In all, there were 26 missing values for gender, 27 for age, and 38 for spray status.

Multiple-choice questions with a single correct answer were assessed using the proportion of correct responses before and after the presentation. As an overall measure, each attendee’s total percent correct was calculated for questions involving all individual pre-spraying behaviours (out of 9), all post-spraying behaviours (out of 12), and overall (out of 21). The neutral behaviours (3 pre-spraying behaviours having no effect on exposure, e.g., serving tea to the spray workers) were not included in the percent correct. Each specific behaviour was also assessed comparing the correctness of an attendee’s response pre- versus post-presentation.

The effect of the presentation was assessed by comparing responses before and after the presentation using hierarchical mixed models with random intercepts for the village and attendee, adjusted for age and gender. For multiple-choice questions with a single correct answer, relative risks (RR) of the probability of responding correctly were estimated, using binary models with a log link and Poisson distribution function, estimating standard errors using the Huber-White sandwich estimator [34, 35]. (Roughly, the RR represents the change in probability of a correct response, and an RR above 1 indicates an increased probability). For each attendee’s percentage of correct responses (for pre-spraying behaviours, post-spraying behaviours, and overall), mixed linear regressions were used to estimate the adjusted mean change (β) as a result of the presentation. Relative risks of the probability of responding correctly to individual questions were also assessed, using the same binary-outcome models as described above. The effects of the presentation were assessed for the entire study population, as well as for the subset of participants who reported that their homes had been sprayed for malaria control.

**Results**

The number of participants returning surveys from each of the 16 villages ranged from 8 to 97 people per village (median is 24) (see Fig. 1 for a map of the villages). Nearly two-thirds of participants (61.7%) were female. Participants were fairly evenly distributed among age categories, with the largest number over 40 years. Slightly more than half of participants (54.0%) reported currently living in homes that had ever been sprayed for malaria control (whether or not they lived there at the time) (Table 1).

| Table 1 Demographic characteristics of presentation attendees, Limpopo, South Africa, 2015–2016 |
|---------------------------------------------|----------|
| N (%)                                       |          |
| **Sex**                                    |          |
| Male                                        | 217 (38.3) |
| Female                                      | 349 (61.7) |
| **Age**                                    |          |
| 18–24                                       | 127 (22.5) |
| 25–30                                       | 128 (22.7) |
| 31–40                                       | 120 (21.2) |
| 41 and older                                | 190 (33.6) |
| **Home ever sprayed for malaria?**         |          |
| Yes                                         | 299 (54.0) |
| No                                          | 209 (37.7) |
| Don’t know                                  | 46 (8.3)  |

a Missing 26 values  
b Missing 27 values  
c Missing 38 values

Table 2 presents a comparison between the pre- and post-performance responses to questions about whether to allow IRS, their location during spraying, and the timing of re-entry into the home. Almost all thought it was better to have their home sprayed pre-performance, yet this percent increased slightly post-performance, from 95.1 to 98.1% (RR = 1.03, 95% CI 1.00, 1.06) for all and from 97.2 to 99.3% (RR = 1.02, 95% CI 0.99, 1.05) for those who had lived in a sprayed home. When asked about the distance they should stand from the home while spraying, the proportion answering correctly (a few metres away) went from 49.4% pre-performance to 62.0% post-performance (RR = 1.26, 95% CI 1.13, 1.41) for all and 48.9% to 59.1% (RR = 1.24, 95% CI 1.06, 1.44) for occupants of homes ever sprayed. When asked how soon they should wait to re-enter their homes after spraying, 58.5% gave the correct answer (at least an hour) before the presentation but 91.1% did so afterwards (RR = 1.54, 95% CI 1.35, 1.77) for the entire group and increased from 57.1 to 91.9% (RR = 1.61, 95% CI 1.42, 1.82) for occupants of homes that had ever been sprayed.

Table 3 presents overall summaries of knowledge before and after the presentation. The rate of correct answers for precautions to take before spraying improved from a mean of 59.9% before the presentation to 72.4% afterwards (β = 12.8%, 95% CI 11.0, 14.7) for all
participants and from a mean of 60.6 to 73.8% (β = 13.3%, 95% CI 10.5, 16.1) for those who lived in sprayed homes. Correct responses for post-spraying precautions increased significantly from 56.5% before the presentation to 67.7% afterwards (β = 11.6%, 95% CI 9.8, 13.3) for all participants and from 57.5 to 69.4% (β = 12.0%, 95% CI 8.7, 15.3) for those who lived in sprayed homes. Overall correct answers increased from 57.9 to 69.7% (β = 12.1%, 95% CI 10.9, 13.4) for all participants and from 58.8 to 71.3% (β = 12.5%, 95% CI 9.6, 15.4) for those who lived in sprayed homes.

The knowledge of attendees for individual pre-spraying precautions significantly improved post-presentation for many, but not for all, of the key items recommended by the WHO. In particular, significantly increased knowledge was observed for removing food from the home, closing cupboards, removing bedding, covering immovable items with plastic, and leading animals away. When considering only respondents living in homes that had previously been sprayed, the results were similar.

Of post-spraying behaviours, knowledge improved for sweeping the floors and proper disposal of dead insects (burning or discarding them in the latrine; not feeding them to animals or discarding them in the waste heap). They showed improvement in knowing to discard washrags after using them rather than rinsing them and using again, as well as not washing the walls with soap and water. However, no improvement was noted in the participants’ knowledge that they should clean children’s toys and wash inside furniture or floors with soap and water. Although there was significant improvement in knowledge about some precautions to take after spraying, less than 70% of the participants knew after the presentation to burn dead insects, sweep and wash their floors, wash indoor furniture, discard washing rags, and to wash children’s toys. When considering only respondents living in homes that they had reported as previously sprayed, the results were similar.

Table 2 Proportion of correct responses to questions about home spraying: pre- and post-performance, Limpopo South Africa, 2015–2016

| Question                                           | Correct response                  | All (% correct) | With sprayed homes (% correct) |
|----------------------------------------------------|-----------------------------------|-----------------|-------------------------------|
| Better to allow spraying for malaria control in home? | Yes                               | 95.1 98.1       | 1.03 (1.00, 1.06)* 97.2 99.3   |
| How close do you think you should be to your home while it is being sprayed? | A few meters away                  | 49.4 62.0       | 1.26 (1.13, 1.41)* 48.9 59.1   |
| How soon after a spraying do you think it is okay to enter your home? | After at least an hour             | 58.5 91.1       | 1.54 (1.35, 1.77)* 57.1 91.9   |

*p < 0.05
* Adjusted for sex and age, using mixed-effects models with a random intercept for village and attendee

Table 3 Comparison of percent correct to all pre- and post-performance spraying precaution questions and for all precautions

| Precaution     | Maximum | All (% correct) | With sprayed homes (% correct) |
|----------------|---------|-----------------|-------------------------------|
| Pre-spraying   | 9       | 59.9 72.4       | 12.8 (11.0, 14.7)* 60.6 73.8 |
| Post-spraying  | 12      | 56.5 67.7       | 11.6 (9.8,13.3)* 57.5 69.4   |
| All precautions| 21      | 57.9 69.7       | 12.1 (10.9,13.4)* 58.8 71.3   |

*p < 0.05
* Models adjusted for sex and age, using mixed-effects models with a random intercept for village and attendee
### Table 4 Comparison of responses to pre- and post-spraying precautions: attendees’ likelihood of answering correctly before and after the performance

| Precaution                                                                 | All (% correct) | Sprayed (% correct) |
|---------------------------------------------------------------------------|-----------------|---------------------|
|                                                                            | Pre  | Post  | RR (95% CI)*       | Pre  | Post  | RR (95% CI)*       |
| **Before spraying**                                                       |      |       |                   |      |       |                   |
| Set out tea for the sprayers                                             | 7.1  | 5.6   | 0.69 (0.40, 1.18)  | 5.4  | 2.3   | 0.40 (0.19, 0.83)  |
| Remove all food from the home                                           | +    | 74.0  | 1.11 (1.05, 1.17)* | 76.6 | 84.9  | 1.11 (1.02, 1.20)* |
| Remove drinking water from home                                         | +    | 68.9  | 1.04 (0.96, 1.14)  | 70.9 | 74.6  | 1.05 (0.98, 1.14)  |
| Leave cupboards open                                                     | −    | 79.4  | 1.10 (1.05, 1.15)* | 82.6 | 89.0  | 1.08 (1.02, 1.14)* |
| Close all cupboards                                                      | +    | 33.1  | 1.28 (1.07, 1.52)* | 33.1 | 44.8  | 1.40 (1.19, 1.65)* |
| Remove bedding from the home                                            | +    | 21.5  | 3.07 (2.44, 3.86)* | 20.7 | 63.5  | 3.03 (2.30, 4.00)* |
| Clean and wax the floor                                                  | N/A  | 16.7  | 1.14 (0.89, 1.47)  | 17.4 | 15.4  | 0.90 (0.66, 1.22)  |
| Cover items that cannot be moved with fabric                            | N/A  | 52.5  | 0.97 (0.85, 1.10)  | 59.5 | 57.9  | 0.97 (0.84, 1.12)  |
| Cover items that cannot be moved with plastic sheet                      | +    | 45.4  | 1.47 (1.33, 1.62)* | 43.1 | 66.6  | 1.54 (1.36, 1.74)* |
| Lead animals away from the home                                         | +    | 31.3  | 1.77 (1.59, 1.96)* | 31.8 | 56.5  | 1.74 (1.49, 2.05)* |
| Close animals inside the home                                           | −    | 94.6  | 0.97 (0.93, 1.00)  | 95.7 | 91.3  | 0.95 (0.91, 1.00)  |
| Keep your children’s toys inside                                        | −    | 90.5  | 1.01 (0.98, 1.04)  | 91.3 | 92.6  | 1.02 (0.98, 1.05)  |
| **After spraying**                                                       |      |       |                   |      |       |                   |
| Sweep the floor                                                          | +    | 39.7  | 1.39 (1.20, 1.62)* | 39.1 | 55.5  | 1.44 (1.15, 1.79)* |
| Feed dead insects to animals                                            | −    | 93.6  | 1.02 (1.01, 1.04)* | 96.0 | 97.7  | 1.09 (0.99, 1.10)  |
| Discard dead insects in waste heap                                      | −    | 59.5  | 1.32 (1.25, 1.40)* | 60.9 | 79.6  | 1.34 (1.24, 1.45)* |
| Discard dead insects in latrine                                         | +    | 44.8  | 1.60 (1.47, 1.73)* | 45.8 | 73.2  | 1.59 (1.41, 1.80)* |
| Wash your children’s toys                                               | +    | 48.3  | 0.98 (0.85, 1.14)  | 54.5 | 46.8  | 0.87 (0.78, 0.97)* |
| Burn dead insects                                                       | +    | 29.6  | 1.57 (1.25, 1.96)* | 27.8 | 52.2  | 1.82 (1.39, 2.37)* |
| Wash furniture and seating left inside with soap and water              | +    | 50.2  | 1.10 (0.99, 1.22)  | 51.5 | 52.8  | 1.02 (0.90, 1.16)  |
| Wash the floor with soap and water                                      | +    | 52.7  | 0.99 (0.93, 1.06)  | 53.2 | 51.2  | 0.97 (0.87, 1.09)  |
| Wash walls with soap and water                                          | −    | 77.5  | 1.05 (1.01, 1.10)* | 78.6 | 84.3  | 1.07 (1.00, 1.13)  |
| Rinse wash rag well before using it again                                | −    | 61.1  | 1.26 (1.14, 1.38)* | 59.2 | 77.9  | 1.33 (1.14, 1.55)* |
| Discard wash rag after using it                                          | +    | 32.1  | 2.10 (1.75, 2.51)* | 30.4 | 69.2  | 2.23 (1.68, 2.97)* |
| Re-plaster or re-paint or wash walls as soon as possible                 | −    | 89.2  | 1.00 (0.97, 1.04)  | 93.0 | 92.3  | 0.99 (0.95, 1.04)  |

*P < 0.05

* Models adjusted for sex and age, using mixed-effects models with a random intercept for village and attendee

+ indicates that the behaviour should be performed, − indicates the behaviour should not be performed, and N/A indicates that it would not affect insecticide exposure.
Discussion

Acceptance of IRS was very high both before and after the skit. However, a brief dramatic presentation and song performed by research study staff, who were not formally trained in the performing arts and wearing simple costumes, was an inexpensive method to increase overall knowledge about ways to prevent undue insecticide exposure from IRS in communities such as those in Limpopo, South Africa. Specifically, knowledge increased after the skit and song about appropriate length of reentry interval and distance of residents from the spraying as well as for a number of precautions recommended by WHO: closing cupboards, removing bedding, covering moveable items with plastic tarps, and leading animals away from the home before spraying, and proper disposal of dead insects and insecticide-contaminated wash rags after spraying. However, there was no demonstrable increase in knowledge for other measures recommended by WHO, such as removing drinking water from the home before spraying or cleaning children’s toys, inside furniture, or floors after spraying. It is possible that there was no increase in knowledge about washing floors, or that participants may have known that floors should be washed but their homes’ mud or daub floors were not washable.

Use of entertaining skits, song, and other folk media [29] to convey public health messages has been employed as a community engagement method in promoting public health and in preventing disease such as of HIV/AIDS [36–39] or tuberculosis [40]. These methods are often used to reach young, low-literacy, or other traditionally hard-to-reach populations [39, 41]. The Program for Appropriate Technology in Health (PATH) developed an approach in Zambia, using drama for malaria education tailored to local language through skits, songs, and dance [42]. However, only a few previous investigations have evaluated the dramatic arts in malaria education. Specifically, a drama performed by professional actors was employed in 20 Cambodian villages to promote the use of insecticide-treated bed nets (ITN), repellents, and early diagnosis; the villagers reported that drama was their preferred choice of community engagement [29].

Using folk theater (Kalajatha) in rural India, 30 local performance artists performed songs, a drama, and a musical drama focused on the transmission, signs, treatment, and prevention of malaria. After 2 months of performances, households from 5 intervention and 5 control villages were interviewed [28]. Although the intervention respondents significantly gained knowledge compared to controls, they did not show immediate behavioral change. In a study from Ghana [27], teachers trained an intervention group of school-age children with picture charts, posters, dramatization, and song on malaria symptoms, treatment and prevention, who then educated adults in their villages with song, poetry recitals, and drama. Adults in the intervention communities significantly increased their knowledge as well as use of ITN, and children from these communities had lowered parasite prevalence compared to prior to the intervention and to control children. The WHO 2015 operational manual for IRS acknowledged the need for community participation and coordination for effective IRS education, and Atkinson et al. [43], in a review of the literature, concluded that community engagement and participation is an essential component of malaria education and ultimate elimination. Most malaria educational intervention studies have employed intensive and expensive means to inform populations, often with multiple in-person sessions using highly-trained personnel or using multiple media such as radio, posters, and booklets [44]. Overall, most educational interventions have resulted in modest, although in some cases statistically significant, increases in knowledge of malaria prevention, symptoms, or treatment [45]. No previous study has compared the efficacy of the various modalities in engaging communities and in malaria education.

The skit-based educational programme was limited. Although knowledge of participants was compared pre- and post-performance, we did not compare change in the intervention-sprayed communities with a change after a sham presentation in a control group from sprayed communities. Given that the presentation sought to encourage IRS while preventing undue insecticide exposure, not much information about malaria symptomatology, prevention, or treatment was provided. Future dramatic presentations could be supplemented to include more information. In addition, estimates of learning may be biased by non-random selection of who turned in the questionnaire. For example, it is plausible respondents low in literacy did not return the survey, although this group may have most benefited from this form of education. It is also plausible that those who learned the least or left early may not have turned in their questionnaire forms. The evaluation of the success of this programme was also limited in that the increase in knowledge was measured immediately after the presentation. Hence, it is not clear whether the attendees retained the new lessons and, most importantly, whether there was a behavioral change in precautionary practices. Time constraints did not allow for the collection of information on attendees’
confidence in their ability to perform safety measures, or any barriers that may exist to their implementation. Ideally, qualitative data collection should be considered to better understand barriers to implementation. The ultimate indicator of success of the programme would be to demonstrate a decrease in insecticide body burden [45–47].

However, there are a number of strengths of this study, including the large sample size and the low cost of a single brief training using lay presenters, rather than professional actors or singers. The presentations were brought to the communities, so large numbers of people could be educated at one time. Thus, this education programme can be readily reproduced even at a larger country-wide scale relatively cheaply using community members to perform the skit and teach the song. Other media or venues should also be explored such as on radio or in churches. Furthermore, although the entertainment value of the presentation was not formally assessed, anecdotal observation by staff and on recorded videotapes of the audience indicated that the attendees paid attention and many were laughing, clapping throughout, and joining in the song. In these low-income communities, where there is low employment and few entertainment options, the presentation provides an opportunity to provide entertaining health education tailored to the culture.

Conclusions

A single brief dramatic presentation and song was able to increase knowledge of precautions Limpopo villagers could take to reduce insecticide exposure from IRS and its potential adverse health outcomes. Future studies should evaluate whether this method of education results in sustained knowledge and in reduction in insecticide exposure. This approach to community education is promising and deserves additional study and potential expansion to include general information about malaria prevention, symptomatology, and treatment.

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Authors’ contributions

BE served as the principal investigator of the VHEMBE study, from which the dramatic performance was produced. She is also the primary author of this manuscript. DL created the skit and provided important feedback of the manuscript, including the statistical analysis. SR served as the statistical analyst for the results presented here. MO and MC served as the field office coordinators for the VHEMBE study, and were instrumental in the creation of costumes and song, planning and performance of the dramatic presentation. MO provided translations for the script and song used in the performance. RB served as an advisor for the VHEMBE study in South Africa and in relations to community leaders. JC is an investigator on the VHEMBE study who provided key information on the intervention. All authors provided significant contributions and feedback on the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials

The datasets used for the analysis can be provided by the corresponding author on reasonable request. Data from individual questionnaires is not available due to privacy reasons.

Ethics approval and consent to participate

The study was approved by the Institutional Review Boards at the University of California, Berkeley and the University of Pretoria in South Africa. All participants provided verbal informed consent for participation.

Consent for publication

No identifiable data were collected and no individuals’ data is presented, so consent for publication was not needed.

Competing interests

The authors declare that they have no competing interests.

Abbreviations

CI: confidence interval; DDE: dichlorodiphenyldichloroethylene; DDT: dichlorodiphenyltrichloroethane; IRS: indoor residual spraying; ITN: insecticide-treated bed nets; MAP: Malaria Awareness Programme; PATH: Program for Appropriate Technology in Health; RR: relative risk; VHEMBE: Venda Health Examination of Mothers, Babies and their Environment; WHO: World Health Organization.

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Appendix 1a: Pre- and post-performance questionnaires in English

| WELCOME TO THE VHEMBE DRAMA. PLEASE TELL US A LITTLE ABOUT YOURSELF. |
|-----------------------------------------------------------------------|
| 1. What is your age group?                                            | 2. Are you...?                        |
| □ 18-24 years                                                        | □ Male                               |
| □ 25-30 years                                                        | □ Female                             |
| □ 31-40 years                                                        | □ No                                 |
| □ 41 years or older                                                  | □ Yes                                |
| □ I don’t know                                                       | □ I don’t know                        |

What do you think?

4. Is it better to ...
   □ Allow spraying for malaria control
   □ Refuse spraying

5. What are some good things to do BEFORE your home is sprayed? (YOU CAN CHECK MORE THAN ONE.)
   □ Set out tea for the sprayers
   □ Remove all food from the home
   □ Remove drinking water from home
   □ Leave cupboards open
   □ Close all cupboards
   □ Remove bedding from the home
   □ Clean and wax the floor
   □ Cover items that cannot be moved with fabric
   □ Cover items that cannot be moved with plastic sheet
   □ Lead animals away from the home
   □ Close animals inside the home
   □ Keep your children’s toys inside

6. How close do you think you should be to your home while it is being sprayed? (CHECK ONE)
   □ Okay to stay inside to assist sprayers
   □ Okay to stand at door to watch
   □ A meter away
   □ A few meters away

7. How soon after a spraying do you think it is okay to enter your home? (CHECK ONE)
   □ Right away
   □ After 10 minutes
   □ After 30 minutes
   □ After at least 1 hour

8. What are some good things to do AFTER your home is sprayed? (YOU CAN CHECK MORE THAN ONE)
   □ Sweep the floor
   □ Feed dead insects to animals
   □ Discard dead insects in waste heap
   □ Discard dead insects in latrine
   □ Wash your children’s toys
   □ Burn dead insects
   □ Wash furniture and seating left inside with soap and water
   □ Wash floor with soap and water
   □ Wash walls with soap and water
   □ Rinse wash rag well before using it again
   □ Discard wash rag after using it
   □ Re-plaster or re-paint or wash walls as soon as possible

THANK YOU!
WE HOPE YOU ENJOY THE DRAMA!
| 1. What do you think now? Is it better to ... |
|-----------------------------------------------|
| □ Allow spraying |
| □ Refuse spraying → WHY? |
| □ It’s too dangerous |
| □ It’s not convenient |
| □ The spray looks bad on my walls |
| □ Tell us any other reason?: |

| 2. What are some good things to do BEFORE your home is sprayed? (YOU CAN CHECK MORE THAN ONE.) |
|--------------------------------------------------------------------------------------------------|
| □ Set out tea for the sprayers |
| □ Remove all food from the home |
| □ Remove drinking water from home |
| □ Leave cupboards open |
| □ Close all cupboards |
| □ Remove bedding from the home |
| □ Clean and wax the floor |
| □ Cover items that cannot be moved with fabric |
| □ Cover items that cannot be moved with plastic sheet |
| □ Lead animals away from the home |
| □ Close animals inside the home |
| □ Keep your children’s toys inside |

| 3. How close do you think you should be to your home while it is being sprayed? (CHECK ONE) |
|-------------------------------------------------------------------------------------------|
| □ Okay to stay inside to assist sprayers |
| □ Okay to stand at door to watch |
| □ A meter away |
| □ A few meters away |

| 4. How soon after a spraying do you think it is okay to enter your home? (CHECK ONE) |
|-------------------------------------------------------------------------------------|
| □ Right away |
| □ After 10 minutes |
| □ After 30 minutes |
| □ After at least 1 hour |

| 5. What are some good things to do AFTER your home is sprayed? (YOU CAN CHECK MORE THAN ONE) |
|---------------------------------------------------------------------------------------------|
| □ Sweep the floor |
| □ Feed dead insects to animals |
| □ Discard dead insects in waste heap |
| □ Discard dead insects in latrine |
| □ Wash your children’s toys |
| □ Burn dead insects |
| □ Wash furniture and seating left inside with soap and water |
| □ Wash floor with soap and water |
| □ Wash walls with soap and water |
| □ Rinse wash rag well before using it again |
| □ Discard wash rag after using it |
| □ Re-plaster or re-paint or wash walls as soon as possible |

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Take home a brochure on spray safety and share it with your family.

**KEEP YOUR FAMILY SAFE FROM MALARIA!**
### Appendix 1b: Pre- and post-performance questionnaires in Tshivenda

Vho ŧanganedzwa jitambwani Ḡa VHEmbe
Ri humbela vha ri vhudze zwiţukutuku nga ha vhone vhaqe.

| 1. Thanga ya murole wavho ndi ifhio? | 2. Vha ...? |
|-------------------------------------|-----------------|
| □ Mińwaha ya 18-24                 | □ Munna         |
| □ Mińwaha ya 25-30                 | □ Mufumakadzi   |
| □ Mińwaha ya 31-40                 |                  |
| □ Mińwaha ya 41 years na u fhira  |                  |

| 3. Haya hune vha dzula khaho zwinho ho no vhuya ha fadadelela u langula dalai? |
|-----------------------------------------------|
| □ Hai                                         |
| □ Ee                                          |
| □ A thi ḏivhi                                 |

**Zwi tevhelaho vha zwi vhonisa hani?**

| 4. Ndi khwine u ... |
|---------------------|
| □ U tendela mufafadzelo wa vhulanguladali |
| □ U hana mufafadzelo wa vhulanguladali    |

| 5. Ndi zwišwe zwithu zwiwfiho zwavhuçi zwine zwa fanela u itiwa PHANĎA ha musi haya havhu ho tshi fadadelewa? (VHA NGA NANGA DZINO FHIRA NTHIHII) |
|---------------------------------------------------------------------------------------------------|
| □ U itela vhafafadzeli tie                                                                         |
| □ Bviselani zwiţiwa zwoţhe ndëha ndëgu                                                          |
| □ Bviselani mağë a u nwa ndëha ndëgu                                                            |
| □ Siani dziraga na w라도ro dzo vuła                                                                |
| □ Valani dziraga na w라도ro dzoţhe.                                                               |
| □ Bviselani dzinguvho na malagane ndëha ndëgu                                                    |
| □ Koropani ni ḏodze pholishi ḥhasi                                                                |
| □ Tibedzani zwithu zwoţhe zwi sa bvisori nga seila Ḡa puľasitiki                                  |
| □ Khadelani zwithu kuwo na ndëgu                                                                  |
| □ Valedani zwiwfuwo ngomu ndëni                                                                  |
| □ Vheyanĩ thoyi dza vhana ngomu ndëni.                                                           |

| 6. Vha humbula uri vha tea u vha vha tsini na ndëgu yavho nga mithara mingaffhani musi hu tshi khou fadadelewa? (NANGANITHIHII) |
|---------------------------------------------------------------------------------------------------------------|
| □ Zwo luga u dzula ngomu ndëni u thusa vhafafadzeli                                                        |
| □ Zwo luga u ima muşangoni vha ḏalela                                                                     |
| □ Kule nga mithara muthihi                                                                                  |
| □ Mimitthara yo vhafalo                                                                                     |

| 7. Vha humbula ndi lini hune zwo luga uri vha zhene ndëni yavho? (NANGANITHIHII) |
|----------------------------------------------------------------------------------|
| □ Zwezevo vha tshi tou fheda                                                    |
| □ Nga murahu ha miminete ya 10                                                  |
| □ Nga murahu ha miminete ya 30                                                  |
| □ Nga murahu ho no fhela zwaho awara 1                                          |

| 8. Ndi zwiwfiho zwavhuçi zwine vha tea u ita NGA MURAHU HA musi haya havhu vu tshi fadadelewa. (VHA NGA NANGA DZINO FHIRA NTHIHII) |
|---------------------------------------------------------------------------------------------------------------|
| □ U swiela fuńoro                                                                                           |
| □ U ńeza zwiwfuwo zwikhoakanono zwo faho                                                                      |
| □ Lańhani zwikhoakanono zwo faho ḏaleđaleni                                                                   |
| □ Posani zwikhoakanono zwo faho thoľethe ya dindi                                                            |
| □ Ḑanzwani thoyi dza vhana                                                                                   |
| □ U fhisa zwikhoakanono zwo faho                                                                               |
| □ Ḑanzwani fانtshara na zwiđulo zwo salaho ndëni mađini are na thbisibe                                      |
| □ Koropani dzifuńoro nga thbisibe na mađi                                                                       |
| □ Ḑanzwani mbondo nga thbisibe na mađi                                                                        |
| □ Ḑukisani labi nga maandđa ni saatthu u dovha na Ḡi shumisa hafhu                                                      |
| □ Lańhani labi Ḡa u koropa nga murahu ha u Ḡi shumisa                                                       |
| □ Puļasitelani kana ni penndulule kana u ŧazwama mbondo nga u Ḡavhany                                         |

**RO LIVHUWA! RI A KHOLWA VHA DO ḏI PHINA NGA I, ITAMBWA!**
RO LVHUWA VHO RI THETSELESA.
RI A KHALWA VHO DJIPHINA NGA LITAMBWAI

### Vha humbula hani zwino? Zwi khwine u...

- Tenda u fadzelelwa
- Hana u fadzelelwa → NGANI?
- Zwi khombosa
- A zwi na mushumo
- Mufafadzelo wo vhifha kha mbondo dzanga
- Zwiwe zwitisisi-vho?:

### Ndi zwiwwe zwithu zwifhlo zwavhudl zwine zwa fanelo u itlw PHANDA ha musi haya havho htu tshi fadzelelwa? (VHA NGA NANGA DZINO FHIRA NTHIHI)

- U itela vhafafadzeli tie
- Vhiselelelli wo ndlela ngomu
- Bviselani zwilwa zwotie ndlela ha ndlela
- Bviselani maqhi u wina ndlela ha ndlela
- Siani dziprana na waqirobo dzo vulea

### 3. Vha humbula uri vha tea u vha tsini na ndlela yawho nga mitha mingafhansi musi hu tshi khou fadzelela? (NANGANI NTHIHI)

- Zwo luga u dzula ngomu ndlela u thusa vhafafadzeli
- Zwo luga u ima muqangoni vha tselela
- Kule nga mitha muthihi
- Mimitha yo vhalaho

### 4. Vha humbula ndi linen hune zwo luga uri vhavf ndlela yawho? (NANGANI NTHIHI)

- Zwezwo vha tshi tou fhedza
- Nga murahu ha miminete ya 10
- Nga murahu ha miminete ya 30
- Nga murahu ho no fhela zwaho awara 1

### 5. Ndi zwifhlo zwavhudi zwine vha tea u ita NGA MURAHU HA musi haya havho vhu tshi fadzelela. (VHA NGA NANGA DZINO FHIRA NTHIHI)

- U swiela fuloro
- U nea zwifuo zwikhokhonono zwo fako
- Latani zwikhokhonono zwo fako daledaleni
- Posani zwikhokhonono zwo fako thoilethe ya dindi
- Tanzwani thoyi dza vhana
- U fihla zwikhokhonono zwo fako
- Tanzwani fanitshara na zwidulo zwo salaho ndlela maqhi are na tshisibe
- Koropani dzifuJoro nga tshisibe na maqhi
- Tanzwani mbondo nga tshisibe na maqhi
- Tukisani labi nga maanja ni saathu u dovha na ji shumisa hafhu
- Latani labi ja u koropana nga murahu ha u ji shumisa
- Pujasileli kana ni penndulule kana u tanzwa mbondo nga u thvanya

Kha vha dzhile bammibiri nga ha tsireledzo kha mufafadzelo vha tewe nayo hayani vha i vhale na vha muta wavho.
KHA VHA TSIRELEDZE MUTA WAVHO KHA DALI
Appendix 2: Script of the skit performed by VHEMBE staff

A sample clip from the performance can be found at https://www.youtube.com/watch?v=lvZ1W5ZJMJ8Y

A script to teach about malaria and how to stay safe from pesticides

-ENGLISH-

General Trouble meets her Match:
David I. Levine

Announcer: As icebreaker- ask children a few questions to make sure they have an idea about malaria:

1. Who knows what malaria is?
2. How do we get malaria?

Announcer: We want to tell you a story about a mosquito army and things mummies can do to protect you against malaria and malaria spray.

Are you ready?

Mosquito army headquarters
[A general is addressing a line of new recruits.]

Mosquito General: Welcome new recruits. I am General Trouble. I command the most deadly army that has ever lived. My mosquito army has killed more people than all the wars of the world combined!

<<Mosquito soldiers cheer!>>

<<Images of aerial fleet of mosquitoes in military formation>>

Junior mosquito: How did we do that, General?

General: Let me tell you. Before I lay eggs, I need a great big meal. And my favorite big meal is human blood. I fly to a human- usually one that is sleeping.

-TSHIVENḒA-

Mulanammbi vho-Khakhathi vha wana mukhaedu wavho
David I. Levine

Muḓivhadzi: Sa mvulatswinga – vhudzisani vhana mbudziso dzi si gathi uri ni vhe na vhutanzi uri vha na helwa nga ha dali:

1. Ndi nnyi ane a divha uri dali ndi mini?
2. Ri wana dali?

Muḓivhadzi: Ri tama u ni vhudza nganea nga ha mmbi ya vhunyunyu na zwithu zwine vho-mme vha nga zwi ita u ni tsireledza kha dali na mufafadzelo wa vhunyunyu.

No luga?

Gammbani khulwane ya vhunyunyu
[Mulanagammbi u khou amba na maswole maswa mufoloni.]

Mulanga mmbi wa vhunyunyu: No ṱanganedzwa maswole maswa. Ndi npe Mulangammbi Khakhathi. Ndi ranga phanda mmbi ya khombosa kha mmbi dzोţhe dzô no vhuyaho dza vha hone. Mmbi yanga ya vhunyunyu yo no vhulaha vhathu vha no fhira vho vhulaiwaho kha ndnda dza [ifhasi dzọţhe dzô ťanganal

<<Maswole a vhunyunyu a ita khuwa!>>

<<Zwifanyiso zwa mutevhe wa vhunyunyu ho ita mufolo zwi khou leleţa muyani>>

Lunyunyu luṱuku: Mulangammbi, izwo ro tou zwi itisa hani?

Mulangammbi: I ra ndi u vhudze. Musi ndi saathu u kudzela makumba, ndi ťoţa u ja mahinyahinya nda fura. Mahinyahinya ane nda a funesa ndi malofha a muthu. Zwino ndi fhufha nda ya kha muthu – kanzhi o eגדלאה.
| Jr.: Then what do you do? | LL.: Nga murahu ha izwo vha ita mini? |
|--------------------------|-----------------------------------|
| G: I stick my pointy snout, and [SLURPP!!] suck up blood. | MM: Ndi toka ludomo lwanga holwu lwa lutoswi, nda [slllp!] tzonzwa, malofha. |
| Jr.: Oh, you suck their blood and they die? | LL.: Oh, vha tzonzwa malofha avho vha fa? ------ |
| G.: No! Taking a little blood doesn’t kill them. | MM: Na khathihi! U dzhiya zwidofha nyana khavho a zwi vha vhulahi. |
| Jr.: So what makes you deadly? | LL.: Zwino ndi zwifhio zwine zwa ita uri vha vhe khombo? |
| G.: When I bite them, I also leave a little “gift.” If last week I drank blood from someone with malaria, then this week I leave some malaria behind. Aren’t I nice!! | MM: Musi ndo luma, ndi vha siela kufhiwa kutfuko. Arali vhege yo fhiraho ndo nwa malofha kha muthu are na dali zwi amba uri ino vhege muthu ane nda mu luma ndi mu sia na dali. Ndi a vhavha thi?! |
| Jr.: I see. So our mosquito army spreads malaria. How fun! What happens next? | Jr: Ndi a vhona. Zwi amba uri mmbi yashu ya vhunyunyu i phadaladza dali. Ndi zwahudi hezwo! Zwino hu ite mini nga murahu ha izwo? |
| G.: When I am done feeding, I am so full that I turn red. Do you know why? | LL.: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| Jr.: You must be full of people blood! | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| G.: That is right. I am so full, I fly to the wall and rest. A few minutes later, I am on my way to spread even more malaria. | LL: Vha fanela u vha vho ḓala nga malofha a vhathu! |
| Jr.: And what happens to the person you bit? | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| G.: Well, the malaria bugs I left start to multiply. Soon, that poor human has billions of malaria bugs living inside. It is like having a whole city full of tenants, but they do not pay rent! They just give that poor human malaria! | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| Jr.: What is malaria? | LL: Vha fanela u vha vho ḓala nga malofha a vhathu! |
| G.: They get a high fever and usually a terrible headache. Best of all, sometimes they throw up! I love being a mosquito! | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| Jr.: Sounds great! Where do we start? | LL: Vha fanela u vha vho ḓala nga malofha a vhathu! |

| LL.: Nga murahu ha izwo vha ita mini? | MM: Ndi toka ludomo lwanga holwu lwa lutoswi, nda [slllp!] tzonzwa, malofha. |
|---------------------------------|-----------------------------------|
| MM: Ndi toka ludomo lwanga holwu lwa lutoswi, nda [slllp!] tzonzwa, malofha. | LL.: Oh, vha tzonzwa malofha avho vha fa? ------ |
| MM: Na khathihi! U dzhiya zwidofha nyana khavho a zwi vha vhulahi. | Jr: Ndi a vhona. Zwi amba uri mmbi yashu ya vhunyunyu i phadaladza dali. Ndi zwahudi hezwo! Zwino hu ite mini nga murahu ha izwo? |
| MM: Musi ndo luma, ndi vha siela kufhiwa kutfuko. Arali vhege yo fhiraho ndo nwa malofha kha muthu are na dali zwi amba uri ino vhege muthu ane nda mu luma ndi mu sia na dali. Ndi a vhavha thi?! | Jr: Ndi a vhona. Zwi amba uri mmbi yashu ya vhunyunyu i phadaladza dali. Ndi zwahudi hezwo! Zwino hu ite mini nga murahu ha izwo? |
| MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |

| LL: Vha fanela u vha vho ḓala nga malofha a vhathu! | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
|---------------------------------|-----------------------------------|
| MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
| MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? | MM: Musi ndo no fhedza u [a, ndi vha ndo fura nga maanđa lune ndi a tswukuluwa. U a ḓivha uri ndi nga mini? |
G.: We are going to attack << VILLAGE NAME>>.

Announcer: In this village lives Tshinakaho and her child, Mulalo. Tshinakaho loves her child dearly, and she wants Mulalo to stay safe from malaria.

[Scout #1 flies in]

Scout #1: Bad news, General. Tshinakaho has agreed to spray the walls of her house with pesticides.

Junior: Why is that a problem?

General: I said how after we eat we have to fly to the wall and rest. When the walls have poison, we won’t ever take off! If this spraying becomes popular, <<VILLAGE NAME>> will be almost completely safe from me and my army.

[Scout #2 returns]

Scout #2: An update from Mulalo, General.

<<Shows image of Mulalo>> Mulalo said, “I am worried the spray will get on my doll and make her sick!”

General: That is great news! Keep it up, Mulalo! Without the spray, it is far easier for me to give malaria to lots of Tshinakaho’s family. A few weeks later, and my army can give malaria to even more of the village!

Junior: <Mosquitos Rule!> But how will we get the whole village sick? Won’t the neighbors have spray on their walls?

MM: Ri khou ya u ṱhasela <<DZINA ḼA MUVHUNDU>>.

Muṱivhadzi: Kha hoyu muvhundu, hu dzula vho-Tshinakaho na nwana wavho Mulalo. Vho-Tshinakaho vha fumesa nwana wavho nahone vha toda Mulalo a tshi dzula o tsireledzea kha dali.

[Matshingilane #1 tshi dzena tshi thufha]

Matshingilane #1: Mulangammbi, mafhungo mavhi khea. Tshinakaho o tenda uri hu fafadzelwe mbondo dza ndu yaye nga tshivhulayazwikohonono.

LL: Izwo zwi thaidzo nga mini?

MM: Ndo ṱalutschedza uri hani ro fhedza u ja ra fhufhela luvhondoni ra ya ra awela. Musi mbondo dzi na phoizeni (vhuṭulu/mushonga), a ri nga dovhi ra kona u takuwa. Arali hoyu mufafadzelo wa tou ḩivheya, muvhundu woṱhe <<DZINA ḼA MUVHUNDU>> u ḫo vha wo tsireledzea kha nṋe na mmbi yanga.

[Matshingilane #2 u a vhuya]

Matshingilane #2: Manwe maswa maswa khea a bvaho kha Mulalo, Mulangammbi.

<<Sumbedzani tshifanyiso tsha Mulalo>> Mulalo uri, “Ndi khou vhilaela uri mufafadzelo u ḩo dzhena kha mpopii wanga wa u lwadza.”

MM: Hee, hao ndi mafhungo a vhudiša! Isai phanda nga uralo Mulalo! Arali hu si na mufafadzelo, zwi a mndelutshela u phaḍaladza dali kha vhuṭho vha muṭa wa vho-Tshinakaho nga vhunzhi. Nga murahu ha vhege dzi si gathi, mmbi yanga I nga kona u phadaladza dali kha vhuṭho vhanzhi vha muvhundu hoyu.

LL: Ripe vhunyunyu ri dzingweya! Zwino ri ḩo tou zwi itisa hani uri ri lwadze muvhundu woṱhe? Naa vhadaɭatsini vhavho a vha na mushonga kha dzimbondo?
General: If we can attack even one family, the rest of the village is easier. We mosquitoes will stay filled up with fresh malaria bugs, and when the other villagers are away from home, the spray on their home’s walls cannot protect them.

Junior: I see. Then we can bite them!

General: That is right. It takes a village to fight us. Everyone needs to spray their houses. Otherwise, we will win!

The village
[Tshinakaho and Mulalo (child) sitting in front of their home. Mulalo is busy playing on the floor with her toys. This side contains some food, a water container, a table, a bowl with water and a cleaning cloth, toys and other props needed. There is a door or something representing a door to outside the home.]

Tshinakaho: The rains have come. Soon and army of mosquitoes will be here. I need to do something!

General, in a magnified corner of the room/other side of the stage: “I have to do something about Tshinakaho. Junior, carry this message to Mulalo.”

<<General sends Junior to whisper in M’s ear>>

M: Mummy, please don’t let them come to spray our house again. The spray will hurt my doll.

<<General is dancing with joy!>> “Mulalo is the best! Good work!”

Tshinakaho: If we do not spray, we are all at risk of getting sick. Good parents do not let mosquitoes into their homes.

<<General is sad.>>

M: I understand, mommy, but malaria control sprays all over our house and even my room. I worry that whatever kills mosquitoes is bad for my doll and MM: Arali ra nga kona u ṱhasela muvhundu woṱhe, na u ṱhasela muvhundu woṱhe zwo ri lelutshela. Rine vhunyunyu ri do dzula ro fura zwitzhilí, nahone vhanwe vhadzulapo vha vhuya vha tou bva nda ha mudi wavho, mushonga u re kha dzimbondo dza miṅini yavho a I nga koni u vha tsireledza.

LL: Ndi khou vha wana zwino. Zwi amba uri riṅe ri nga konaha u vha luma.

MM: Ndi zwone. U Iwa na riṅe, zwi ṱoṅda muvhundu woṱhe. Vhothe vha fanela u fafadzela ndu dzavho. Zwa sa ralo riṅe ri a vha phala.

Muvhunduni
[Vho-Tshinakaho na Mulalo (ṅwana) vha khou amba vho dzula phanda ha mudi wavho. Mulalo u kati u khou tambisa dzithoyi dzawe. Kha holwu lurumbu, huna zwiliwa, tshigubu tsha madi, tafula, ndishi ire na madi na labi la u koropa, thoyi na zwinwe zwishumiswa zwa litambwa. Huna vothi lo imelaho vothi la u bvela nda ha mudi.]

Vho-Tshinakaho: Dzimvula dzo no thoma khedzi. Hu si kale mmbi ya vhunyunyu I do vha yo shoma. Ndi tea u vhamba maano.

Mulangammbi vha kha inwe khona I vhonalaho ya lufhera/lunwe lurumbu Iwa vhugalatenga. Ndi tea u ita zwinwe zwithu.

<<Mulangammbi vha ruma Lunyunyunana u hevhedza ndevheni ya Mulalo>>

M: Mma, vha songo tenda vha tshi da u fafadzelwa ndu yashu hafhu. Mufafadzelo u do vhaisa mpopi wanga.

<<Mulangammbi vha khou tshina nga dakalo!>>

Mulalo, ndi wa nthesa. Wo shuma zwavhudi!

Tshinakaho: Arali ra sa fafadzelelwa, rothe ri khomboni ya u lwala. Vhabebi vhavhudi a vha tendeli vhunyunyu mahayani avho.

<<Mulangammbi vho tungufhala>>

Mulalo: ndi pfesesa mma, thedzi vha mufafadzelo vha fafadzelwa hothe hothe ndumi yashu na kamarani yanga. Ndi a vhilaela uri zwi no vhulahi vhunyunyu a
Bobby (the dog?)...and for me too!

T: But we can do things to keep us safe from the spray. We can keep the spray from getting into our food and water by covering the containers tightly and moving them several meters away from our house. We also need to move our dishes and pots.

M: But what about my toys and my bed? I don’t want spray on my toys!

<<The General dances with joy again!>>

Announcer: Now what do you think we should do? (ask school children)

M [thinking]: I can just move my bedding and toys out of the house near the food and water, a few meters outside the house. Then the bedding and toys won’t get spray on them.

<<T and Mashudu carry bedding and toys outside.>>

M: What about Bobby?

Announcer: Ask children-what do you think they should do with Bobby?

T: Yes, we should move him and all the other animals away from the spray and make sure they stay away.

<<General is sad again.>>

General: Junior, bring one more message for our friend M.

<<Junior flies to M’s ear.>>

M: But what about the things we can’t move?

T: You have a beautiful school bag. When it rains, do your books get soaking wet?

M: No, they don’t because I cover my school bag with my raincoat.

T: So, the same idea works... just like you use your raincoat to cover your school bag, we have to cover those things we can’t move. Now you can help me get ready!

M: A thi todi mufafadzelo kha dzithoyi dzanga!

<<Mulangammbi vha tshina vho takala hafhu!>>

Mudivhadzi: Zwino ni humbula uri ri tea u ita mini? (Vhudzisani vhana vha tshikolo)

M: [a tshi khou humbula]: Ndi nga kona u bvisa nguvho dzanga na thoyi dzanga nduni, nda dzi vhea tsini na zwiliwa na madi, kule ha ndu nga mimithara I si gathi. Nguvho na thoyi a zwi nga vhi na mufafadzelo khazwo.

<<Tshinakaho na Mulalo vha hwalela nguvho na thoyi vha isa ndu.>>

Mulalo: Bobby tshone?

Mudivhadzi: Vhudzisani vhana vha tshikolo - Zwino ni humbula uri ri tea u ita mini nga Bobby?

Tshinakaho: Ee, ri tea u tshi bvisa, na zwinwe zwifuwo zwothe ra zwi bvisela kule na mufafadzelo ra ita uri zwi bvele kule.

<<MM vho dovha vha tungufhala.>>

MM: Lunyunyu Lutuku, isai munwe mulaedza kha khonani yashu Mulalo.

<<LL u fhufha a ya ndevheni ya Mulalo.>>

Mulalo: Zwino zwithu zwinw ra sa kone u zwi bvisa?

Tshinakaho: Ni na mukhwama wa u naka. Musi mvula I tshi na, bugu dzanu dzi a nukala?

M: Hai, a dzi nukali ngauri ndi fukedza mukhwama wanga nga renikhouthu.

T: Muhumbulo wonoyo muthihi u a shumavho haneifa... sa zwine na ita ni tshi tibedza mukhwama wanu nga renikhouthu, ri tea u tibedza hezwo zwithu zwine ra sa kone u zei bvisa. Zwino ni nga nthusa u
<<Here, and in all following cases of advice, Tshinakaho performs safe behaviors. >>

<< General is sad: “Oh no, Tshinakaho is giving good advice and doing the right thing.” >>

M: that makes sense to get ready for the sprayers. So mommy, when the sprayers arrive, can I stay in the house and watch TV?

T: No Mulalo, it is important to stay out of the house until all the spraying is done. The house will get all wet with that spray! We will have to wait outside of the house at least an hour before going back in after the spray team leaves. We need to give the spray a chance to dry.

<< General is sad, pacing: “I don’t like to hear this.” Send Junior over again. >>

M: But then when we go into the house mommy, won’t there still be spray everywhere we eat and play?

T: The spray team will give us a plastic sheet to cover our table before they spray. It will keep the spray off our table just like your raincoat keeps the rain off of you. When they are finished, they will remove the sheet. And after they leave, I will bathe our table- just like you bathe yourself. I will wipe our table with soapy damp cloth.

<<General perks up, calls to Junior: “Wash the walls! Tell them to wash the walls!” >>

M: Mommy, will you wash the walls too?

T: No, we must not wash the walls! We need the spray there to keep the mosquitoes away…

<<General appears crushed: “Nooooo!” >>

T: …but we will wash the tables and any other furniture left behind very well.

M: But Mommy, now the spray will be in the cleaning water and on the cleaning cloth!

T: Clever girl. That is why I should discard the water away from the home and throw away the cloth.
M: But what about spray on the floor where I play?

T: Mommy already knows how to clean the floor. I will sweep it. There will probably be many dead cockroaches, mosquitoes, and insects form all the spray.

<<General is sad. Holds his head and weeps loudly.>>

M: Oh goody! Our chickens will have a feast!

<< General is sad. Weeps even more loudly and dramatically.>>

T: No, not this time, Mulalo. Remember all dead cockroaches, mosquitoes and other insects will have spray on them. We don’t want the chickens to get that spray inside their bodies, because we don’t want to taste in in their eggs or meat.

<<MM vho tungufhala. Vha farelela thoho vha zhamba.>>

Mulalo: Oh, ndi zwavhudi. Khulu dzashu dzi do tou diphina!

<<MM vho tungufhala. Vha tou nana u zhamba.>>

T: Hai, I sini hezwino Mulalo. Ni humbule uri mabete othe o faho, vhunyunyu hothe na zwinwe zwikhokhono zwo faho zwi do vha zwi na mufafadzelo khazwo. A ri todi khulu dzi tshi vha na mufafadzelo mmivhilini yadzo ngaugi a ri todi u zwi la kha makumba adzo na nama yadzo.

Mulalo: Zwino vha do ita ngazwo Mma?

T: ndi do zwi gwela dindini, u zi fhisa kana nda zwi lata thoilethe.

<<MM: I si ni thoilethe!!!!>>

T: …Ndi do koropa fuloro dzine nda kona nga madi na tshitshie. Ni thogomele uri ni songo sendela tsini musi ndi tshi khou swiela kana u koropa. Ndi khwine ni tshi vha ni tshi khou tamba nda.

<<T vha swiela fuloro vha bvisela mathukhwi nnda ha vhugalatenga>>

Mulalo:zwino vha do ita ngazwo Mma?

M: So what will you do with them, Mommy?

T: I will bury them, burn them, or toss them into the latrine…

<<General: “Not the latrine!!!!”>>

T: …I will also wash the floors that I can with soap and water. Make sure you don’t come close to that while I sweep or wash. Better you should play outside.

<<T sweeps floor and carries what she has swept offstage>>

M: Mommy is so clever. I do not want our chickens and Bobby to eat bugs covered in the spray! And I don’t want to be near either!

T: Then, guess what is then left for mommy to do? [T holds up her hands]

M [pauses, thinking]: You have to wash your hands!

T: Yes! I will use soap and water to make sure no spray is on my hands.

<<T wash hands with soap and a basin (if feasible to wash on stage).>>

M: Now I understand, mosquitoes are too dangerous.

Mulalo: Fhedzi uyu mufafadzelo u re afha fhasi hune nda tamba hone?

T: Mma vha divha uri vha kulumagise hani fuloro. Ndi do u swiela. Hu nga vha hu na mabete manzhi, vhunyunyu na zwinwe zwikhonono zwo faho nga nthani ha mufafadzelo.

<<MM vho tungufhala. Vha farelela thoho vha zhamba.>>

Mulalo: Zwino vha do ita ngazwo Mma?

T: I sini hezwino Mulalo. Ni humbule uri mabete othe o faho, vhunyunyu hothe na zwinwe zwikhokhono zwo faho zwi do vha zwi na mufafadzelo khazwo. A ri todi khulu dzi tshi vha na mufafadzelo mmivhilini yadzo ngaugi a ri todi u zwi la kha makumba adzo na nama yadzo.

Mulalo: Zwino vha do ita ngazwo Mma?

T: ndi do zwi gwela dindini, u zi fhisa kana nda zwi lata thoilethe.

<<MM: I si ni thoilethe!!!!>>

T: …Ndi do koropa fuloro dzine nda kona nga madi na tshitshie. Ni thogomele uri ni songo sendela tsini musi ndi tshi khou swiela kana u koropa. Ndi khwine ni tshi vha ni tshi khou tamba nda.

<<T vha swiela fuloro vha bvisela mathukhwi nnda ha vhugalatenga>>

Mulalo:zwino vha do ita ngazwo Mma?

M [pauses, thinking]: You have to wash your hands!

T: Yes! I will use soap and water to make sure no spray is on my hands.

<<T wash hands with soap and a basin (if feasible to wash on stage).>>

M: Now I understand, mosquitoes are too dangerous.
You are the best mommy and I am not scared of the malaria spray workers anymore.

<<General is the saddest of all>> AARGh!!!

<<For the rest of this scene, the General is miming increasingly frantic frustration, pounding the walls, pulling his or her hair, throwing things, tipping over the headquarters table, ripping down the chart with village name, sobbing hysterically, falling face down and pounding the floor, etc. There is no limit to how melodramatic the General can act…>>

While general makes a scene move stuff back into the house.

T: Let’s see if you can remember what I have taught you. How can you help mommy to prepare for spraying?

<<M points to food, water and cooking utensils.>>

M: I can help you to cover food, water and cooking utensils tightly and move them outside the home.

T: And what about your toys and bedding?

M: I will help you to move my toys, Mupopi, Bedding and Bobby outside as well.

T: And what should we all do while they are busy spraying?

M: We should all stay far away from the house.

T: Ask the school children—How long before we can go back in again? [wait for the children to answer]

M: At least one hour before mommy can go back in to sweep and wash the floor and wipe the table with a damp cloth!

<<T holds up a broom and cloth>>

T: You are a clever girl!

M: I am going to teach Granny and Mpho’s mother as well. I do not want spray to get on their things either.

You are the best mommy and I am not scared of the malaria spray workers anymore.

<<MM vho tungufhalesa>> AARGh!!!

<<Hafha hothe, MM vha sumbedza tsumbo dza u dzikukana, vha rwa mbondo, vha di kokodzekanya mavhudzi, vha latekanya zwithu, vha thudzekanya tafula ya gammbani, vha kherukanya dzitshati dza madzina a muvhundu vha tshi khou tswimila, vha wa vha lala fhasi nga khotheni na u ginda fhasi nz. A huna u thivhelwa kha tshikalo tsha u dzikukana ha MM hune vha nga hu sumbedza…>>

Musi MM vha tshi khou ita misumbedzo, vhuyedzedzani thundu nduni

T: Zwino kha ri vhone arali ni tshi kha di humbula zwe nda ni funza. Ni nga thusa hani Mma u lugisela vha jufafadzelo?

<<Mulalo u sumba zwiliwa, madi na thundu ya u bika.>>

Mulalo: Ndi nga vha thusa nga u tiba zwiliwa, madi na pani dza u bika nda tou khwathisa nda bvisela na thundu nda ha haya.

T: Thoyi na dzinguvho dzone?

Mulalo: Ndi do vha thusa u bvisa dzithoyi, Mupopi, nguvhvo na Bobby na tshone nda tshi bvisela nda.

T: Rine ri fanela u ita mini musi vha kati na u fafadzela>

Mulalo: Ri tea u vha ri kuuule na ndu.

T: Vhuzisani vhana – Ri tea u lindela tshifhinga tshingafhani ri saathu u vhyelela nga ngomu nduni? [Lindelani vhana u fhindule]

Mulalo: Awara nthihi musi mma vha tshi nga vhuyelela nduni u swiela na u koropa fhasi na u phumula tafula nga labi lo nukalaho.

<<T vha takulelal nṱha luswielo na labi>>

T: Ni musidzana o thanyaho!

Mulalo: Ndi do funza-vho na gugu na mme a Mpho. A thi todi mufafadzelo u tshi dzhena kha thundu dzavho.
T: We can all work together to stay safe!

Mosquito attack in the village.
<<Flying mosquitoes in military formation approaching Tshinakaho’s village>>

Scout: the entire village has listened to Tshinakaho. They are all spraying.

<<Dozens of attacking and dying mosquitoes>>
Mosquito 1: What is this?
Mosquito 2: Oh no, it is poison!

Mosquito 1, 2, 3…: AAAargh!!

<<Mosquitoes are dying dramatic deaths. Make the deaths big, loud, exaggerated, and silly. Spin around, holding own neck. Fall on ground and kick feet. Pause, then kick one last time, etc.>>

Mosquito headquarters:
Junior, stumbling back: General, all the mosquito soldiers you sent to spread malaria are gone!

General: The battle is over. For the first time, we have lost! Who would have thought a mother and her daughter could defeat my beautiful army of death and disease!

<<Image of happy villagers>>

Junior, all battered up [wearing bandages or a sling, if feasible]: So have the mosquitoes lost our war against humans?

General, bandaged and limping into the sunset, with only Junior by his side: In six months, the spray will wear off. If the humans forget to spray again, mosquitoes and malaria will win next time! This war is not over yet...

The End

T: Ri nga shumisana rothe uri ri tsireledzee!

Vhungunyu vhu ṱhasela muvhundu.
<<Vhungunyu vhu no khou fhufha ho ita guma la mmbi ya maswole u swika muvhunduni wa vho Tshiakaho>>

Muvhundu woṱhe wo thetshelesa vho Tshinakaho. Vhothe vha khou fafadzelelwana.

<<Guma la vhunyunyu li ṱhaselaho line la khou ita na u fa>>

Lunyunyu 1: Ndi mini izwi?
Lunyunyu 2: Ehe Hai, ndi mushonga!

Lunyunyu 1, 2, 3…AAAargh!!

<<Vhungu vhu fa nga ndila I mangadzaho. Itani uri mpfu dza hone dzi vhonale dze khulwane, dzei phoso, zwo titilidzwa nahone zwi tshi seisa. Dzunguluwani, no farelela mukulo wanu. Niu we ni raherahe. Ni awele nyana ni kone u raha lwa u fhedzisa, nz>>

Gammbani ya vhunyunyu
LL a tshi khou pepeleka a tshi vhuya: Vho-Mulangammbi, maswole othe a vhunyunu e vha a rumela u phadaladza dali ha tsheeho!

MM: Heyi nndwa o fhela. Lwa u tou thoma, ro kundwa. Ndi nnyi we a vha a tshi nga humbula uri murathu na mukomana vha nga kunda mmbi yanga ya vhudivhudi ya bulayo na malwadze!

<<Hu vhonala vhathu vha muvhunduni vho takala. >>

LL, o huvhala, [o banditshiwa kana o vhohfiwa tshanda arali zwi tshi konadzea]: Zwi ambu uri vhathu vho ri kunda?

MM, vho banditshiwa nahone vha tshi khou tuzuza, vha tshi ya thango ya vhukvhela, vha tshi tou vha na LL nga thungo yavho. Nga murathu ha minwedzi ya rathi, mufafadzelu u do vha wo fhufha. Arali vhathu vha hangua u fafadzele la fhufha, vhunyunyu na dari zwi do wina roundu I daho. Heyi nndwa a yo ngo fhela....
Notes:

- The script can also be used as a play or puppet show.
- With illustrations, it can be made into a picture book.
- You can increase the number of lessons in discussion. For example, get people to talk about why they don’t want to spray. For example:
  - Believe spraying will bring cockroaches to their homes (remind them that there will likely be dead cockroaches as a result of spraying to address this concern).
  - Spray gives them headaches. That is why they need to stay far away and not go back for 1-2 hours.
  - Spraying might even increase the numbers of mosquitoes. Explain that mosquitoes do not thrive on spray.
  - Spray workers might see what is in their homes and spread stories in the village or even ‘steal’ their things.
- You can use the characters to reiterate the points in discussion. For example, one of the actors introduce one way to prevent malaria, e.g., bednets; you can have them teaching yet another character like a husband or child e.g., to make sure yard is clean from standing water, etc.
- You can have a role-play where the actors ask questions or play a scenario and participants must say if the actor did what was correct based on what they learned.
- We can give out a pre–post questionnaire to access learning
- At the end you can give them a check sheet or pamphlet.
- If you present to children, can we give the child a sticker if they help their parent on one of the things on the check sheet. Perhaps at church or school?

Melodramatic sadness video for inspiration for General’s tragic ending:

[https://www.youtube.com/watch?v=vYxPEOQcp](https://www.youtube.com/watch?v=vYxPEOQcp)
Appendix 3: The song sung by VHEMBE staff in TshiVenda after the presentation of the skit

A sample clip from the song performance can be found at https://www.youtube.com/watch?v=S_gbrBxDGys

| Tsini ha lunyunyu | Near the mosquito |
|-------------------|-------------------|
| Tsini ha lunyunyu; Tsini halwo | Near the mosquito |
| Nisongo sendela tsini halwo. | Near it |
| Arali no edela, di tsiireledzeni Lwa ni luma ni do lwala malaria. | Do not go near it. |
| Chorus: Ditselelezeni x3 Kha mufafadzelo. | If sleeping, protect yourself. |
|                          | If it bites you, you will have malaria. |
|                          | Chorus: Protect yourself x3 |
|                          | From malaria control indoor spraying |

**Rapping/ Talking:**

**Tsini ha lunyunyu**

Near the mosquito

Near it

Do not go near it.

If sleeping, protect yourself.

If it bites you, you will have malaria.

Chorus: Protect yourself x3

From malaria control indoor spraying

**Near the mosquito**

Signs and symptoms of malaria:

- High fever
- Headache
- Vomiting
- Shivering

Chorus: Protect yourself x3

From malaria control indoor spraying

**Rapping/ Talking:**

**Tsini halwo**

Near the mosquito

Near it

Do not go near it.

If sleeping, protect yourself.

If it bites you, you will have malaria.

Chorus: Protect yourself x3

From malaria control indoor spraying

**Rapping/ Talking:**

Tsumbo dza malaria:

Mufhiso ure nthya
U rema ha thoho
U tanza
Na u tetemela
Vha tshi pfa izwo, kha vha ye kiliniki.

Musi vha mufafadzelo vha tshi da;
Tendani vha tshi ni fáfadzelela.
Hone tevhedzani ndaela dzavho;
Uri na inwi-vho ni tsiireledze.
Chorus: Ditselelezeni x3 Kha mufafadzelo.

**Near the mosquito**

Signs and symptoms of malaria:

- High fever
- Headache
- Vomiting
- Shivering

Chorus: Protect yourself x3

From malaria control indoor spraying

**Rapping/ Talking:**

Tsumbo dza malaria:

Mufhiso ure nthya
U rema ha thoho
U tanza
Na u tetemela
Vha tshi pfa izwo, kha vha ye kiliniki.

Musi vha mufafadzelo vha tshi da;
Tendani vha tshi ni fáfadzelela.
Hone tevhedzani ndaela dzavho;
Uri na inwi-vho ni tsiireledze.
Chorus: Ditselelezeni x3 Kha mufafadzelo.

**Near the mosquito**

Signs and symptoms of malaria:

- High fever
- Headache
- Vomiting
- Shivering

Chorus: Protect yourself x3

From malaria control indoor spraying

**Rapping/ Talking:**

Musi vha mufafadzelo vha tshi da;
Tendani vha tshi ni fáfadzelela.
Hone tevhedzani ndaela dzavho;
Uri na inwi-vho ni tsiireledze.
Chorus: Ditselelezeni x3 Kha mufafadzelo.

**Near the mosquito**

Signs and symptoms of malaria:

- High fever
- Headache
- Vomiting
- Shivering

Chorus: Protect yourself x3

From malaria control indoor spraying

**Rapping/ Talking:**

Tsumbo dza malaria:

Mufhiso ure nthya
U rema ha thoho
U tanza
Na u tetemela
Vha tshi pfa izwo, kha vha ye kiliniki.

Musi vha mufafadzelo vha tshi da;
Tendani vha tshi ni fáfadzelela.
Hone tevhedzani ndaela dzavho;
Uri na inwi-vho ni tsiireledze.
Chorus: Ditselelezeni x3 Kha mufafadzelo.

**Near the mosquito**

Signs and symptoms of malaria:

- High fever
- Headache
- Vomiting
- Shivering

Chorus: Protect yourself x3

From malaria control indoor spraying

**Rapping/ Talking:**

Tsumbo dza malaria:

Mufhiso ure nthya
U rema ha thoho
U tanza
Na u tetemela
Vha tshi pfa izwo, kha vha ye kiliniki.

Musi vha mufafadzelo vha tshi da;
Tendani vha tshi ni fáfadzelela.
Hone tevhedzani ndaela dzavho;
Uri na inwi-vho ni tsiireledze.
Chorus: Ditselelezeni x3 Kha mufafadzelo.

**Near the mosquito**

Signs and symptoms of malaria:

- High fever
- Headache
- Vomiting
- Shivering

Chorus: Protect yourself x3

From malaria control indoor spraying

**Rapping/ Talking:**

Tsumbo dza malaria:

Mufhiso ure nthya
U rema ha thoho
U tanza
Na u tetemela
Vha tshi pfa izwo, kha vha ye kiliniki.

Musi vha mufafadzelo vha tshi da;
Tendani vha tshi ni fáfadzelela.
Hone tevhedzani ndaela dzavho;
Uri na inwi-vho ni tsiireledze.
Chorus: Ditselelezeni x3 Kha mufafadzelo.
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