In order to provide our readers with timely access to new content, papers accepted by the American Journal of Tropical Medicine and Hygiene are posted online ahead of print publication. Papers that have been accepted for publication are peer-reviewed and copy edited but do not incorporate all corrections or constitute the final versions that will appear in the Journal. Final, corrected papers will be published online concurrent with the release of the print issue.

This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Barriers and Opportunities to Advancing Women in Leadership Roles in Vector Control: Perspectives from a Stakeholder Survey

Mary H. Hayden,[1]* Erika Barrett,[2] Guyah Bernard,[3] Eunice N. Toko,[3] Maurice Agawo,[3] Amanda M. Okello,[2] Jayleen K. L. Gunn,[2] and Kacey C. Ernst[2]

[1]*Research Applications Laboratory, National Center for Atmospheric Research, Boulder, Colorado;* [2]*Mel and Enid Zuckerman College of Public Health, University of Arizona, Tucson, Arizona;* [3]*Department of Biomedical Sciences and Technology, School of Public Health and Community Development, Maseno University, Maseno, Nyanza, Kenya*

* Address correspondence to Mary H. Hayden, Research Applications Laboratory, National Center for Atmospheric Research, Boulder, CO 80305. E-mail: mhayden@ucar.edu

Abstract.

Increasing the active participation of professional women in vector control (VC) activities may help promote greater gender equity in the workplace and reduce the burden of vector-borne diseases. This stakeholder survey examined the current roles and perspective of professionals employed in the VC sector in Kenya, Indonesia, India, and other countries. The largest barriers that women face in pursuing leadership roles in the VC sector include lack of awareness of career opportunities, limitations based on cultural norms, and the belief that VC is men's work. These barriers could be addressed through improving education and recruitment campaigns, as well as supporting higher education and mentoring programs. Females were almost six times more likely to be encouraged to pursue leadership positions in their organization compared with male respondents (OR = 5.9, $P > 0.03$, 95% confidence interval: 1.19, 29.42). These findings suggest that once women are recruited into the VC workforce, they face minimal discrimination and have increased leadership opportunities.

Vector-borne diseases (VBDs) continue to increase in scale and intensity. Despite concerted efforts to reduce their burden, in 2016, VBDs account for more than 17% of all infectious diseases and more than 1 million deaths annually.[1] Achieving widespread, consistent adoption of interventions to reduce vector abundance continues to be an obstacle to decreasing the disease burden in many parts of the world; increasing participation of women and promoting them into leadership roles may enhance the uptake of interventions.[2–5] Examining VBD risk prevention and control strategies through a gender lens has been suggested by professionals as a means to increase the efficiency, effectiveness, and sustainability of vector control (VC).[5,6] Despite the global impact of VBDs on all population segments, historically, men have taken leadership roles in the uptake and execution of VC measures.[7] However, women are often key agents of change in programs to combat public health challenges, including VBDs.[8,9] Advancing women's involvement in VC and promoting gender equity in the workplace may result in better control of VBDs.[10] The purpose of this study was to examine the current roles and perspectives of

professionals employed in VC and identify potential strategies that will increase leadership roles for women.

As part of our larger study (CITE), we conducted focus group discussions (FGDs) and key informant interviews (KIIs) with stakeholders (e.g., decision-makers, those involved in VC activities or management, and health community leaders) in Indonesia and Kenya.[11] We compiled an expanded list of stakeholders and their contact information, from our FGDs and KIIs, through personal connections from other countries, and from a review of reports and literature. A cross-sectional stakeholder survey (SS) was then developed through the online survey software Qualtrics.[12] The SS included 30 questions (i.e., binary, multiple choice, multiple answer, free text, and Likert scale) derived from initial group discussions and interviews. The survey was active from August 18, 2016 to November 30, 2016, and distributed using the Dillman tailored design method[13] via e-mail through Qualtrics.[12] At the end of the SS, participants could identify other colleagues who should take the survey, also known as "snowball sampling." The SS was distributed to individuals identified through snowball sampling within 48 hours of their nomination following the same method. In addition, the survey was sent out to one listserv by a key stakeholder in Kenya and to two larger listservs provided later in the data collection process by stakeholders in Indonesia and India.

Respondents were excluded if they indicated their organization was not involved in VC or completed less than 10% of the SS. Descriptive analyses of respondent and organization demographics and reported barriers and opportunities for increasing women's participation in VC were completed using STATA (Stata Corp., College Station, TX).[14] Kruskal–Wallis H tests were used to determine differences between perceived gender associated with specific VC activities on a scale of Male, Somewhat Male, Neutral, Somewhat Female, and Female overall and stratified by region and gender. We interpreted the results in terms of means instead of medians because the groups for country and gender did not have similarly shaped distributions. Finally, we conducted logistic regression analyses stratified by the gender of respondents to assess differences in gender discrimination questions. The study protocol was reviewed and approved by the Human Subjects Committee at the National Center for Atmospheric Research.

Of the 252 total surveys that were distributed through e-mail (63 through snowball sampling), 93 were included in the final analysis for a response rate of 38%. Of the 93 respondents, 32% were from Indonesia, 26.7% from Kenya, 18.7% from India, and 22.6% from other regions. Demographic data were missing for 18 respondents. Respondents were gender-balanced, mainly older than 40 years of age, married, with postsecondary education, and had at least one child at home (Table 1). Respondents came from academia or research, state governments, and nonprofit organizations, and had been at their organization on an average of 12 years, typically supervising on average 10 males and eight females (Table 1).

Overall, the response rate for the SS was 38%; however, only 30 of the 252 (11.9%) surveys sent out from the initial stakeholder list were completed. This suggests the importance of snowball sampling and the benefits of providing respondents the option of sharing the survey with peers and colleagues. Face-to-face recruitment conducted in Kenya enhanced participation rates from this country, yielding an 84% response rate in Kenya compared with 20% response rate in Indonesia, excluding snowball sampling.

The perspectives of study participants indicated low levels of perceived gender discrimination in the workplace. Three-quarters (75%) felt respected in their workplace (no

differences by gender) and would recommend working at their workplace to a close female friend, colleague, or family member (80%). Most (70%) were aware of government programs to increase women's participation in VC, but only 43% felt the programs were effective or extremely effective.

A few respondents (five males and three females) noted instances of gender discrimination in the workplace, including gender bias during selection of jobs and less respect for female coworkers. Just under half (46%) were aware of policies/training in their workplace on gender discrimination; however, only 38% of those felt such training worked well or extremely well. There were no differences by country or gender. Female respondents were 5.9 times more likely to report being encouraged to pursue leadership positions in their organization than males (OR = 5.9, $P = 0.03$, 95% confidence interval: 1.19, 29.42).

In general, governmental organizations participated in all VC activities except the selling and marketing of personal protective equipment (PPE). Nonprofit organizations contributed the most to community engagement and education, and academic and research organizations were more involved in research, vector surveillance, and community engagement activities. Lack of awareness of career opportunities, cultural norms, the belief that VC is men's work, household obligations, and lack of job security during pregnancy were the most frequently reported barriers women face to entering the field of VC (Figure 1A). The strategies considered most effective to increasing women's participation were making structural changes to facilities, providing gender-specific protective equipment, ensuring job security during pregnancy, and providing micro-finance to start VC businesses. However, few of these strategies had been implemented previously by the organizations (Figure 1B).

The most frequently reported barrier to women engaging in VC was the lack of awareness of opportunities (Figure 1A). When examining the history of strategies used in respondent organizations to recruit women into VC positions, the most commonly reported strategy was mass media. More community-based efforts, such as working with women's groups, schools, and opinion leaders, were rarely used, despite a higher proportion of respondents indicating they would be effective (Figure 1B). Changing recruitment strategies may yield an effective increase in women's participation.

Most respondents indicated that applying pesticides, participating in vector collection, and traveling for work were mostly male VC activities whereas selling PPE, and education and collaboration were mostly female VC activities (Figure 2). A Kruskal–Wallis H test was conducted to determine if rating-scale questions were different for the three countries (Kenya, Indonesia, and India) and for differences in gender. Results showed that there was a statistically significant difference in the ranking of activities as mostly male to mostly female among countries for applying pesticides ($\chi^2[3] = 10.05$, $P = 0.02$) with India having a higher proportion ranking this as a male activity and no significant differences for gender.

Respondents also indicated that changes to the physical space and equipment used would be highly effective strategies to recruit women into VC positions. The African Indoor Residual Spray (AIRS) program has recognized the importance of having separate facilities and specific equipment for spray operators that are designed to fit women.[15] The multipronged focus on gender in specific countries by AIRS has resulted in increased participation by women. Not all VC will require physical space for women or tailored safety equipment; primarily this will be

important in programs that emphasize the use of pesticides. Programs that use pesticides also need to address alternative opportunities for women during pregnancy as the AIRS program has.

Pesticide application was primarily associated with the male gender; however, conducting vector collections for surveillance, traveling from home, and needing to be away from home overnight were also indicated as more "male." This may be associated with more traditional gender norms in which women are expected to be at home with children, preparing meals, and not associating with unknown persons. This is supported by the respondent perception that cultural norms are a leading barrier to women engaging in VC activities.

Although limited evidence suggests that women are not well incorporated into VC programs, this study suggests that when they are in leadership roles, they face minimal discrimination and are encouraged to take on leadership positions. Once women are employed in the VC field, they may be encouraged to pursue more leadership positions to equalize gender differences throughout all organizational levels. The individuals included in this work, however, are predominantly very well educated, with 85% having a master's degree or higher. A substantial proportion of the VC positions does not require higher education, and it has been demonstrated that higher education is associated with more equitable gender norms.[16,17] Furthermore, roles such as indoor residual spray operators, community organizers, vector habitat reduction teams, and education and outreach leaders require a greater interface with communities that may be more likely to hold to traditional gender norms. Follow-up studies on the influence of gender norms on engagement in VC programs at a community level are underway.

Received September 1, 2017.

Accepted for publication January 19, 2018.

Note: Supplemental questionnaire appears at www.ajtmh.org.

Financial support: We would like to thank the Bill & Melinda Gates Foundation for providing the funding for this research and Emily Zielinski-Gutierrez for reviewing the manuscript.

Authors' addresses: Mary H. Hayden, Research Applications Laboratory, National Center for Atmospheric Research, Boulder, CO, E-mail: mhayden@ucar.edu. Erika Barrett, Amanda M. Okello, Jayleen K. L. Gunn, and Kacey C. Ernst, Department of Epidemiology and Biostatistics, Mel and Enid Zuckerman College of Public Health, University of Arizona, Tucson, AZ, E-mails: barrette@email.arizona.edu, kendall1@email.arizona.edu, jayleeng85@gmail.com, and kernst@email.arizona.edu. Guyah Bernard, Eunice N. Toko, and Maurice Agawo, Department of Biomedical Sciences and Technology, School of Public Health and Community Development, Maseno University, Maseno, Nyanza, Kenya, E-mails: guyah.bernard@yahoo.com, eunicetoko@gmail.com, and magawo@gmail.com.

This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

REFERENCES

<eref>1. WHO, 2016. *Vector-Borne Diseases*. Geneva, Switzerland: World Health Organization. Available at: http://www.who.int/mediacentre/factsheets/fs387/en/. Accessed July 25, 2017.</eref>

<jrn>2. Kateera F, Ingabire CM, Hakizimana E, Rulisa A, Karinda P, Grobusch MP, Mutesa L, van Vugt M, Mens PF, 2015. Long-lasting insecticidal net source, ownership and use in the context of universal coverage: a household survey in eastern Rwanda. *Malar J 14:* 390.</jrn>

<eref>3. Alonso P, Engles D, Reeder J, 2017. *Renewed Push to Strengthen Vector Control Globally*. Geneva, Switzerland: World Health Organization. Available at:

http://www.who.int/mediacentre/commentaries/strengthen-vector-control/en/. Accessed August 10, 2017.</eref>

<jrn>4. Horstick O, Runge-Ranzinger S, Nathan MB, Kroeger A, 2010. Dengue vector-control services: how do they work? A systematic literature review and country case studies. *Trans R Soc Trop Med Hyg 104:* 379–386.</jrn>

<jrn>5. A/Rahman SH, Mohamedani AA, Mirgani EM, Ibrahim AM, 1996. Gender aspects and women's participation in the control and management of malaria in central Sudan. *Soc Sci Med 42:* 1433–1446.</jrn>

<eref>6. Arenas-Monreal L, Piña-Pozas M, Gómez-Dantés H, 2015. Challenges and inputs of the gender perspective to the study of vector borne diseases. *Salud Publica Mex 57:* 66–75.</eref>

<jrn>7. Winch PJ, Lloyd LS, Hoemeke L, Leontsini E, 1994. Vector control at the household level: an analysis of its impact on women. *Acta Trop 56:* 327–339.</jrn>

<jrn>8. Hotez PJ, 2009. Empowering women and improving female reproductive health through control of neglected tropical diseases. *PLoS Negl Trop Dis 3:* e559.</jrn>

<jrn>9. Okwa OO, 2007. Tropical parasitic diseases and women. *Ann Afr Med 6:* 157–163.</jrn>

<jrn>10. Vlassoff C, Garcia Moreno C, 2002. Placing gender at the centre of health programming: challenges and limitations. *Soc Sci Med 54:* 1713–1723.</jrn>

<jrn>11. Gunn J, Ernst K, Center K, Bischoff K, Nuñez AV, Huynh M, Okello A, Hayden MH, 2018. Current strategies and successes in engaging women in vector control: a systematic review. *BMJ Glob Health 3:* e000366.</jrn>

<unknown>12. Qualtrics, 2014.</unknown>

<unknown>13. Dillman DA, Smyth JD, Christian LM. *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method*.</unknown>

<unknown>14. StataCorp, 2015. *Stata Statistical Software: Release 14*.</unknown>

<eref>15. Africa IRS, 2016. *Promoting Gender Equity in IRS*. Available at: http://www.africairs.net/2016/08/by-htm/. Accessed August 10, 2017.</eref>

<jrn>16. Scott J, Hacker M, Averbach S, Modest AM, Cornish S, Spencer D, Murphy M, Parmar P, 2014. Influences of sex, age and education on attitudes towards gender inequitable norms and practices in South Sudan. *Glob Public Health 9:* 773–786.</jrn>

<edb>17. Kågesten A, Gibbs S, Blum RW, Moreau C, Chandra-Mouli V, Herbert A, Amin A, 2016. Understanding factors that shape gender attitudes in early adolescence globally: a mixed-methods systematic review. *PLoS One 11:* e0157805.</edb>

FIGURE 1. (**A**) Proportion of stakeholders indicating a proposed barrier to women being employed in vector control (VC) is important and whether they can address it within their organization in the next year. (**B**) Proportion of stakeholders who perceive the proposed strategy to be effective in increasing the number of women in VC and the proportion whose organization has implemented the said strategy previously.

FIGURE 2. Vector control activities rating-scale questions.

TABLE 1

Basic demographics and organization characteristics of participating respondents

Basic demographics	Total *N* (%)	Male *N* (%)	Female *N* (%)
Age in years			
20–39	30 (40.0)	18 (47.4)	12 (32.4)
40–59	40 (53.3)	19 (50.0)	21 (56.8)
60+	5 (6.7)	1 (2.6)	4 (10.8)
Marital status			
Married or living with partner	61 (81.3)	26 (68.4)	35 (94.6)
Single	9 (12.0)	7 (18.4)	2 (5.4)
Divorced, separated, or widow	5 (6.7)	5 (13.2)	0 (0)
Children in the home	54 (58.1)	23 (42.6)	31 (57.4)
Education			
Less than high school	1 (1.3)	0 (0)	1 (2.7)
Diploma	1 (1.3)	1 (2.6)	0 (0)
Bachelor's degree	9 (12.0)	6 (15.8)	3 (8.1)
Master's degree	27 (36.0)	10 (26.3)	17 (46.0)
Doctorate	37 (49.4)	21 (55.3)	16 (43.2)
Country			
Kenya	21 (25.0)	12 (31.6)	8 (21.6)
Indonesia	28 (33.3)	10 (26.3)	14 (35.1)
India	21 (25.0)	2 (5.3)	12 (32.5)
Other	14 (16.7)	14 (36.8)	3 (10.8)
Organization			
Federal government	9 (9.8)	6 (15.8)	3 (8.1)
State government	18 (19.5)	5 (13.2)	9 (24.3)
Local government	11 (12.0)	1 (2.6)	5 (13.6)
Private/for-profit or environmental	11 (12.0)	8 (21.0)	2 (5.4)
Nonprofit	16 (17.4)	6 (15.8)	6 (16.2)
Academic/research	21 (22.8)	10 (26.3)	10 (27.0)
Other	6 (6.5)	2 (5.3)	2 (5.4)
Activities (multiple select)			
Community engagement and education	56	29 (51.8)	27 (48.2)
Research	55	33 (60.0)	22 (40.0)
Vector surveillance	49	25 (51.0)	24 (49.0)
Spraying and environmental management	37	15 (40.5)	22 (59.5)
Larviciding and distribution of *Gambusia*	30	13 (43.3)	17 (56.7)
Selling and marketing PPE and products	9	6 (66.66)	3 (33.33)

PPE = personal protective equipment.

Figure 1

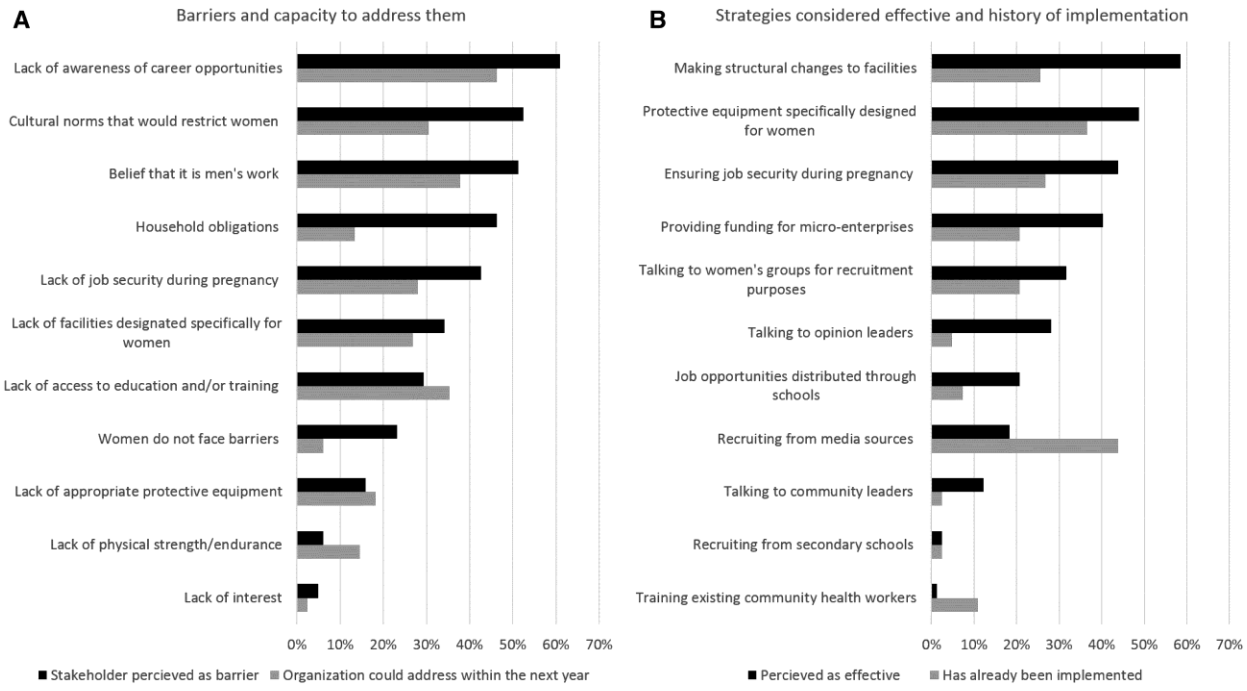
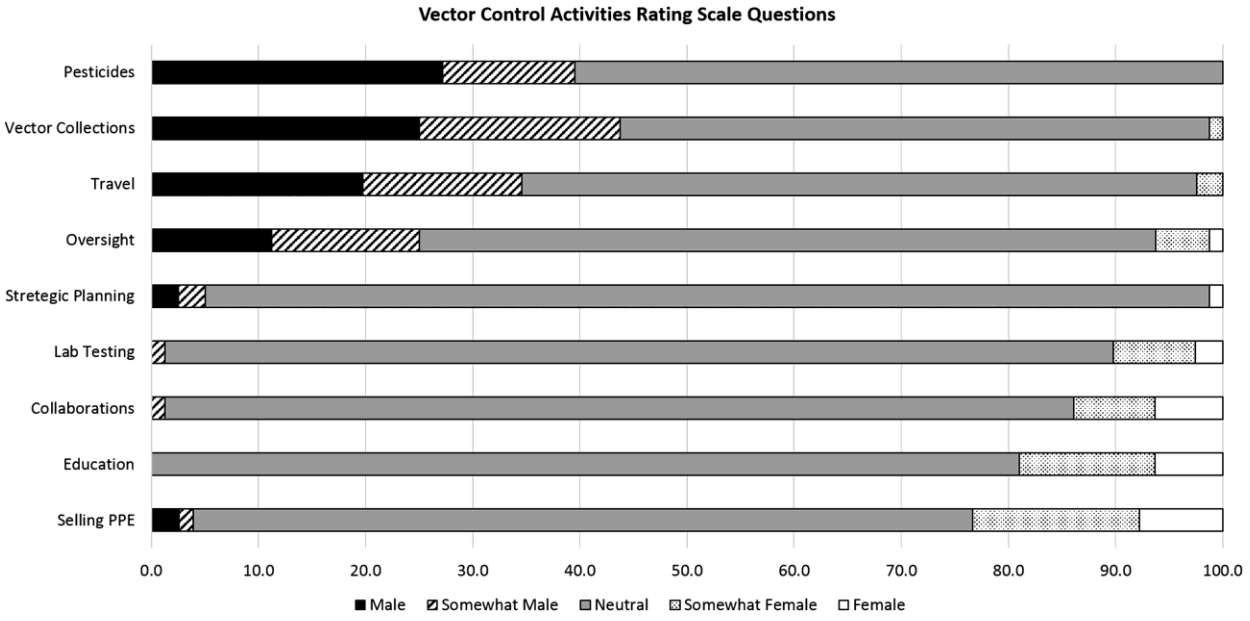

A
Barriers and capacity to address them
Lack of awareness of career opportunities
Cultural norms that would restrict women
Belief that it is men's work
Household obligations
Lack of job security during pregnancy
Lack of facilities designated specifically for women
Lack of access to education and/or training
Women do not face barriers
Lack of appropriate protective equipment
Lack of physical strength/endurance
Lack of interest
0% 10% 20% 30% 40% 50% 60% 70%
Stakeholder percieved as barrier
Organization could address within the next year
B
Strategies considered effective and history of implementation
Making structural changes to facilities
Protective equipment specifically designed for women
Ensuring job security during pregnancy
Providing funding for micro-enterprises
Talking to women's groups for recruitment purposes
Talking to opinion leaders
Job opportunities distributed through schools
Recruiting from media sources
Talking to community leaders
Recruiting from secondary schools
Training existing community health workers
0% 10% 20% 30% 40% 50% 60% 70%
Percieved as effective
Has already been implemented

Figure 2


Vector Control Activities Rating Scale Questions
Pesticides
Vector Collections
Travel
Oversight
Stretegic Planning
Lab Testing
Collaborations
Education
Selling PPE
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
Male
Somewhat Male
Neutral
Somewhat Female
Female

Women in Vector Control: Stakeholder Survey

Bahasa version of survey available upon request

Start of Block: Default Question Block

The National Center for Atmospheric Research and the University of Arizona are collaborating on a project funded by the Bill and Melinda Gates Foundation that examines the current roles and perceptions of women in vector control, and seeks to identify potential strategies that will accelerate women's involvement in vector control. You have been contacted to participate in this survey given your expertise in and knowledge of vector-borne diseases. Your participation is essential to determine next steps in involving more women in vector control to help reduce the burden of vector-borne diseases. The survey contains approximately 30 short questions and will take between 10-15 minutes to complete. Demographic information will be utilized for research purposes only. No individual information will be reported. The results will be disseminated through a publication and/or stakeholder meeting slated for late 2016/early 2017. CONFIDENTIALITY: Individual responses will not be reported. All responses that you provide will remain completely confidential. Quotations in the comment box may be used in their entirety if they do not compromise confidentiality. Do you want to proceed?

O Yes (1)

O No (0)

Skip To: textno If = No (0)

text1 We'd like to start by asking you some questions about your organization and the programs in which you're involved.

org Is your organization involved in the prevention and control of pathogens transmitted by insects, ticks, or mites?

- O Yes (1)
- O No (0)
- O Don't know (3)

Skip To: textno If org = No (0)
Skip To: textno If org = Don't know (3)
Skip To: org If org = Yes (1)

textno Thank you for your time. We are targeting our survey specifically towards people involved in vector prevention and control.

To help us ensure this is distributed to the right individuals, please indicate the full name and e-mail of any colleagues who you think should participate or would be interested in participating in this survey.

_____

_____

_____

_____

_____

Skip To: End of Survey If

X→ X→

org What type of organization do you represent?

- O Federal government (1)
- O State government (2)
- O County government (3)
- O City government (4)
- O Private/For-profit organization (5)
- O Non-profit organization (6)
- O Environmental organization (7)
- O Academic/research institution (8)
- O Hospital/medical institution (9)
- O Other (Please specify) (10) _____

X→ X→

orgdis On what disease(s) does your organization focus? Please check all that apply:

- [ ] Malaria (1)
- [ ] Aedes transmitted viruses such as dengue, chikungunya, Zika and/or yellow fever (2)
- [ ] Filariasis (3)
- [ ] Rift Valley Fever (4)
- [ ] Encephalitis (5)
- [ ] Plague (6)
- [ ] Tick-borne diseases (Please specify) (7) _____
- [ ] Onchoceriasis (8)
- [ ] Trypanosomiasis (9)
- [ ] Leishmaniasis (11)
- [ ] Other (10) _____

orgactivity What types of activities best describe your organization's involvement with vector control and vector-borne diseases? Please check all that apply:

- [ ] Coordination of prevention and control activities among community organizations (1)
- [ ] Community engagement and organization (2)
- [ ] Community clean-up of trash/vector habitat (3)
- [ ] Education and outreach (4)
- [ ] Development of materials for education and outreach (5)
- [ ] Environmental management such as sanitation, drainage of ditches and swamps (6)
- [ ] Mass distribution of bed-nets (7)
- [ ] Indoor Residual Spray (IRS) (8)
- [ ] Space spraying indoors (9)
- [ ] Outdoor residual spraying (10)
- [ ] ULV spraying (fogging) (11)
- [ ] Aerial spraying (12)
- [ ] Larviciding (13)
- [ ] Distribution of Gambusia (14)
- [ ] Selling personal protective products such repellents (15)
- [ ] Selling commercial/industrial use insecticides (19)
- [ ] Marketing protective products such as mosquito coils, in-room spatial repellents/plug-ins (16)
- [ ] Vector surveillance and monitoring (17)

☐ Research (20)

☐ Other (Please specify) (18) _____

---

years How many years have you been with this organization?

▼ Under 1 year (0) ... 30 (30)

---

malesup How many male employees do you supervise (directly report to you)?

▼ 0 (0) ... 50+ (50)

---

femalesup How many female employees do you supervise (directly report to you)?

▼ 0 (0) ... 50+ (50)

---

supmf Is your direct supervisor male or female?

○ Male (1)

○ Female (0)

---

citycountry In what city/country do you work?

O City (1) _____

O Country (2) _____

---

text2 Next, we now want to ask you a few questions about your experiences in your workplace as a vector-bone disease professional. We are interested in learning more about the roles and equity in your workplace, so please refer to the definitions below when answering the following questions. The aim of **gender equity** is to achieve broadly equal outcomes for people in the workplace. Gender equity is achieved when people are able to access and enjoy the same rewards, resources, and opportunities regardless of gender. This can include equal pay, removal of barriers to full and equal participation in the workplace, access to all occupations, and elimination of discrimination. **Gender discrimination** in the workplace involves treating someone unfavorably because of the person's sex, whether he/she is applying for a job or is a current employee. This can include hiring, firing or promotions, pay discrepancies, job mis-classifications, and benefit discrepancies, all based on the acceptability of the person's gender.

X→ X→

govprog Are you aware of government programs in your country to achieve gender equity?

O Yes (1)

O No (0)

O Unsure (3)

Skip To: QID57 If govprog = No (0)
Skip To: QID57 If govprog = Unsure (3)

X→ X→

progeff
How effective are your country's programs to achieve gender equity?

- O Extremely effective (5)
- O Effective (4)
- O Neither effective nor ineffective (3)
- O Ineffective (2)
- O Extremely ineffective (1)

Next, we now want to ask you a few questions about your experiences in your workplace as a vector-bone disease professional.

---

leadposit Are you encouraged to pursue greater leadership positions within your workplace?

- O Yes (1)
- O No (0)
- O Unsure (3)

---

respect Do you feel respected in the workplace?

- O Yes (1)
- O No (0)
- O Unsure (3)

X→ X→

genderdis Have you experienced and/or witnessed any gender discrimination against females during the hiring process and/or within the workplace?

- O Yes (1)
- O No (0)
- O Unsure (3)

Skip To: training If genderdis = No (0)
Skip To: training If genderdis = Unsure (3)

genderdistext Please explain the discrimination against females in the workplace that you have witnessed.

_____

_____

_____

_____

_____

X→ X→

training Does your organization have special trainings and policies in place to protect women from discrimination?

- O Yes (1)
- O No (0)
- O Unsure (3)

Skip To: suggdes If training = No (0)

Skip To: suggdes If training = Unsure (3)

---

policy How well does your organization enforce these policies?

- O Extremely well (5)
- O Well (4)
- O Neither well nor poorly (3)
- O Poorly (2)
- O Not at all (1)

---

suggdes How well are your suggestions and decisions considered or implemented by your organization?

- O Extremely well (5)
- O Well (4)
- O Neither well nor poorly (3)
- O Poorly (2)
- O Not at all (1)

---

recpeer Would you recommend working for your organization to a close personal female contact (e.g. relative, friend, colleague)?

- O Yes (1)
- O No (0)
- O Unsure (3)

---

eqopp In which of the following do you believe males and females have equal opportunities to engage in vector control? Please check all that apply:

- [ ] In academia (1)
- [ ] In a professional capacity such as working for a mosquito abatement district (2)
- [ ] At the community level (3)
- [ ] In government positions (4)
- [ ] In industry (7)
- [ ] Non-Governmental Organizations (NGOs) (8)
- [ ] No where (0)
- [ ] Other (Please specify) (5) _____

mef Please indicate whether or not you feel a specific vector control activity is better for men (male or somewhat male) , better for women (female or somewhat female) or equally suitable for both genders (equal)?

	Male (0)	Somewhat Male (1)	Equal (2)	Somewhat Female (3)	Female (4)
Applying and handling pesticides (pesticides)	O	O	O	O	O
Driving motorbikes and vehicles within and between communities (travel)	O	O	O	O	O
Oversight of field teams conducting vector control activies that are predominantly or completely male (oversight)	O	O	O	O	O
Conducting entomological collections including overnight adult landing collection (collections)	O	O	O	O	O
Selling personal vector control products within a community (selling ppe)	O	O	O	O	O
Building collaborations with community partners	O	O	O	O	O

(collab)					
Educating the community about vector control strategies (education)	O	O	O	O	O
Developing strategic plans for vector control programs (mef_11)	O	O	O	O	O
Laboratory testing and maintaining colonies (mef_12)	O	O	O	O	O

barriers What barriers do women face while trying to pursue opportunities in vector control? Please check all that apply:

- [ ] Lack of awareness of career opportunities in vector control (2)
- [ ] Lack of access to education and/or training (3)
- [ ] Belief that it is men's work (4)
- [ ] Cultural norms that would restrict women (such as working on mixed gender teams, traveling outside the community, entering men's homes) (5)
- [ ] Household obligations (6)
- [ ] Lack of appropriate protective equipment (7)
- [ ] Lack of job security during pregnancy (8)
- [ ] Lack of facilities designated specifically for women, such as bathrooms, changing rooms, showers (9)
- [ ] Lack of physical strength/endurance (12)
- [ ] Lack of interest (13)
- [ ] Women do not face barriers (10)
- [ ] Other (Please specify) (11) _____

barriersinc Which of these barriers could your organization address within the next year to help increase the number of women in vector control? Please check all that apply:

- [ ] Lack of awareness of career opportunities in vector control (2)
- [ ] Lack of access to education and/or training (3)
- [ ] Belief that it is men's work (4)
- [ ] Cultural norms that would restrict women (such as working on mixed gender teams, traveling outside the community, entering men's homes) (5)
- [ ] Household obligations (6)
- [ ] Lack of appropriate protective equipment (7)
- [ ] Lack of job security during pregnancy (8)
- [ ] Lack of facilities designated specifically for women, such as bathrooms, changing rooms, showers (9)
- [ ] Lack of physical strength/endurance (12)
- [ ] Lack of interest (13)
- [ ] Women do not face barriers (10)
- [ ] Other (Please specify) (11) _____

extraeff Does your organization make extra efforts to recruit women and/or promote greater involvement of women in vector control, such as through gender quotas (quotas that are designed to create equal representation among genders) specialized recruitment, modification of facilities, provision of specific equipment, or training programs?

- O Yes (1)
- O No (0)
- O Unsure (3)

---

stratcb Which strategies would best increase women's participation in **community-based** vector control? By community-based we mean vector-control that is organized and takes place at the community level. Please check all that apply:

- [ ] Making structural changes to facilities such as adding showers, changing rooms and bathrooms to accommodate women (22)
- [ ] Ensuring job security during pregnancy (23)
- [ ] Ensuring availability of protective equipment specifically designed for women (24)
- [ ] Talking to women's groups for recruitment purposes (1)
- [ ] Talking to opinion leaders (such as politicians, business leaders, celebrities) for recruitment purposes (2)
- [ ] Talking to community leaders (including religious leaders, chiefs, elders) for recruitment purposes (3)
- [ ] Recruiting from media sources (such as radio, television, newspapers) (4)
- [ ] Sending fliers home with children from school for open positions in vector control (5)
- [ ] Recruiting from secondary schools (6)
- [ ] Training existing community health workers (7)
- [ ] Providing funding for micro-enterprises (8)
- [ ] Other (Please specify) (9) _____
- [ ] None (10)

---

stratorgcb Which strategies has your organization used to increase women's participation in community-based vector control programs? Please check all that apply:

- [ ] Making structural changes to facilities such as adding showers, changing rooms and bathrooms to accommodate women (22)
- [ ] Ensuring job security during pregnancy (23)
- [ ] Ensuring availability of protective equipment specifically designed for women (24)
- [ ] Talking to women's groups for recruitment purposes (1)
- [ ] Talking to opinion leaders (such as politicians, business leaders, celebrities) for recruitment purposes (2)
- [ ] Talking to community leaders (including religious leaders, chiefs, elders) for recruitment purposes (3)
- [ ] Recruiting from media sources (such as radio, television, newspapers) (4)
- [ ] Sending fliers home with children from school for open positions in vector control (5)
- [ ] Recruiting from secondary schools (6)
- [ ] Training existing community health workers (7)
- [ ] Providing funding for micro-enterprises (8)
- [ ] Other (Please specify) (9) _____
- [ ] None (10)

---

beststrat1 Which of these strategies do you think has worked best?

_____

_____

_____

_____

_____

stratreg Which strategies would best increase women's participation in regional or higher leadership level vector control programs? Please check all that apply:

- ☐ Higher education scholarships (1)
- ☐ Women's chapters in national and international organizations (2)
- ☐ Short courses and cross-disciplinary training such as double degree programs in entomology and public health/health education (3)
- ☐ Gender quotas (4)
- ☐ Mentorship programs (5)
- ☐ International associations/societies dedicated to engaging women in vector-control (6)
- ☐ Organizational sensitivity to gender based issues (7)
- ☐ Other (Please specify) (8) _____
- ☐ None (9)

tratorgreg Which strategies has your organization used to increase women's participation in regional or higher leadership level vector control programs? Please check all that apply:

- [ ] Higher education scholarships (1)
- [ ] Women's chapters in national and international organizations (2)
- [ ] Short courses and cross-disciplinary training such as double degree programs in entomology and public health/health education (3)
- [ ] Gender quotas (4)
- [ ] Mentorship programs (5)
- [ ] International associations/societies dedicated to engaging women in vector-control (6)
- [ ] Organizational sensitivity to gender based issues (7)
- [ ] Other (Please specify) (8) _____
- [ ] None (9)

---

beststrat2 Which of these strategies do you think has worked best?

_____

_____

_____

_____

_____

Finally, we would like to ask several demographic questions to contextualize our findings. This will also allow us to determine if opinions and experiences vary by age, gender, and family situation.

age What is your age?

- O 20-30 years old (1)
- O 31-40 years old (2)
- O 41-50 years old (3)
- O 51-60 years old (4)
- O 61-70 years old (5)
- O 71 + years (6)

gender What is your gender?

- O Male (1)
- O Female (0)

marital What is your marital status?

- O Never in union (1)
- O Married (2)
- O Single (3)
- O Living with partner (4)
- O Divorced (5)
- O Separated/no longer living together (6)
- O Widow/Widower (7)

X→ X→

children Do you have children living at home?

- O Yes (1)
- O No (0)

Skip To: education If children = No (0)
Skip To: fiveyoung If children = Yes (1)

X→ X→

fiveyoung How many children living in your home are five years of age and younger?

▼ 0 (0) ... 15+ (15)

X→ X→

fiveold How many children living in your home are older than five years of age?

▼ 0 (0) ... 15+ (15)

education What is the highest level of education that you have completed?

▼ Less than High School (1) ... Doctorate (7)

comments Please write any additional comments you may have:

_____

_____

_____

_____

_____

othrcoll Thank you for your time in completing this survey! To help us ensure this is distributed to the right individuals, please indicate the full name and e-mail of any colleagues who you think should participate or would be interested in participating in this survey.

_____

_____

_____

_____

_____

End of Block: Default Question Block