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- Stepanovic (URC) & Nguluwe (CRS). Zambia Mawa Project—March 2017

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Acknowledgements

Research for this barrier analysis study was conducted entirely by CRS and Caritas staff within the Mawa Feed the Future project’s agriculture team, led by James Ngulule (CRS, Agriculture Technical Quality Coordinator). We extend thanks to Fiona Pexton of Mawa’s MEAL team, who supported data entry for all 90 household surveys. Special thanks to URC head of graphics, Kurt Mulholland, who produced the job aide used during the study to describe the ideal vaccination practice to participating households, to Jillian Emerson (URC Nutrition Technical Advisor) who reviewed the report, and to Tom Davis, who provided comments on the customized BA implementation guide that was created for Mawa in support of this study.

The Barrier Analysis survey methodology was developed in 2004 by Tom Davis of Food for the Hungry. Subsequent and related work by the Core Group, in partnership with the USAID/Food for Peace-funded Technical and Operational Performance Support (TOPS) program (TOPS), resulted in the creation of the Designing for Behavior Change (DBC) framework, which has largely been used to address barriers to behavior change within food security program contexts. After a decade of field testing and feedback, the Core Group facilitated a revision to the BA training and survey implementation guide, written by Bonnie Kittle in 2013 with updates for gender and agricultural programming in July 2014¹. We are grateful to these thought leaders for their work in creating this important formative research tool.

Recommended Citation


Background

About the Feed the Future Zambia Mawa Project

The USAID-funded Feed the Future Zambia Mawa project is led by Catholic Relief Services in partnership with Caritas Chipata, Women for Change, Golden Valley Agricultural Research Trust, and University Research Co., LLC. Mawa aims to improve food and economic security for 21,500 households in Chipata and Lundazi districts in Zambia’s Eastern Province. Over five years (2012-2017), the Mawa project has worked toward this goal by providing a package of services for increasing and diversifying agricultural production for nutrition and markets, improving household health and nutritional status, and increasing incomes and productive assets. Mawa ensures gender-sensitive programming through its household approach, which is based on regular and inclusive dialogues to appreciate how gender norms, roles and beliefs influence household decisions and gains related to agriculture, nutrition and incomes. With expansion funding received in 2016, the Mawa project now implements activities in 22 agricultural camps in Chipata and Lundazi districts in the Eastern Province of Zambia. Under the project, URC is a technical assistance partner that leads innovation in linking agriculture and nutrition through dedicated short-term technical assistance.

Agricultural Extension under Mawa

Mawa uses the multi-disciplinary “five skills sets” approach, complemented with agricultural extension services, to reach targeted households in Eastern Province to increase and diversify agricultural production for nutrition and markets. The overall goal of the agricultural production component is to achieve the following among 20,000 farming households in targeted communities of Lundazi and Chipata districts:

- increased use of appropriate agricultural inputs
- increased use of appropriate agricultural production practices and technologies
- adoption of appropriate post-harvest handling and storage practices

Supported by Mawa, the Ministry of Agriculture and Livestock and Golden Valley Agricultural Research Trust, Mawa’s Agriculture Field Agents cascade agriculture production, post-harvest handling and innovation trainings to participating households as part of a broader Conservation Agriculture methodology.

Selecting the Study Scope

The Mawa Agricultural Extension team promotes nearly 20 different conservation agricultural practices among rural small holder farming households. In October 2014, the Mawa Agricultural Technical Quality Coordinator and Field Supervisors identified 12 practices among these, which participating households appeared to have difficulty adopting (see list below). Selection of practices was based in

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1 Estimate based the list of ideal behaviors defined within the Mawa Social and Behavior Change framework for Agriculture, June 2016 update (N=19). This estimate does not include all of the behaviors discussed within the Mawa Small Livestock Production Facilitation Guide for Field Supervisors and Field Agents.
part upon preliminary data from the 2014 Mawa Annual Survey and from informal field observations made by Agricultural Field Agents and Field Supervisors.

Data presented below reflects the 2014 Mawa Annual survey data from Module 2 (Agriculture), question 202B. The question asks whether the just-completed farming season is the first time that the respondent has practiced the technique. Percentages shown in the table reflect those respondents who answered ‘no’ to these questions, indicating that these respondents have more than one season of experience in practicing the farming technique.

<table>
<thead>
<tr>
<th>Agricultural Practice</th>
<th>% of Mawa Participants Regularly Practicing in 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Conservation Farming</td>
<td></td>
</tr>
<tr>
<td>Minimum tillage-basins/Ripping</td>
<td>21.8%</td>
</tr>
<tr>
<td>Crop rotation</td>
<td>n/a</td>
</tr>
<tr>
<td>Correct manuring and fertilizing amounts/timeliness</td>
<td>21.3%</td>
</tr>
<tr>
<td>Maintain soil cover after harvest</td>
<td>n/a</td>
</tr>
<tr>
<td>No burning of residues</td>
<td>13.6%</td>
</tr>
<tr>
<td>Continuous weeding-at least 3 times</td>
<td>17.6%</td>
</tr>
<tr>
<td>2 Crop genetics</td>
<td></td>
</tr>
<tr>
<td>Use of improved seed</td>
<td>54.5%</td>
</tr>
<tr>
<td>3 Diversification</td>
<td></td>
</tr>
<tr>
<td>Crop diversification: At least 3 crops from different food groups</td>
<td>n/a</td>
</tr>
<tr>
<td>Diversification of the farming system-irrigation/livestock/crop production</td>
<td>n/a</td>
</tr>
<tr>
<td>4 Improved livestock management</td>
<td></td>
</tr>
<tr>
<td>Good housing for livestock</td>
<td>n/a</td>
</tr>
<tr>
<td>Hygiene and sanitation in livestock housing</td>
<td>n/a</td>
</tr>
<tr>
<td>Vaccinations of small livestock</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Mawa’s Agriculture team’s leadership then prioritized two practices for further study: crop rotation (for which a Barrier Analysis study was conducted in November 2014) and vaccination of village chickens.

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3 From Q223h: Percentage of families that own an ox-harrow/ridger/weeder. This of course does not fully capture weeding practice but is the only survey data that specifically talks about weeding practices.
Poultry, Food Security and Nutrition

Animal sourced proteins have been well documented within the food security and nutrition literature as an important contributor to maternal and child health—particularly for reducing stunting during a child’s first 1,000 days of life. Key nutrients such as vitamin A, iron, zinc and choline have significantly higher absorption rates when packaged in animal sourced foods compared to their consumption through plant-based foods. This makes eating animal products such as milk and eggs more efficient ways to improve nutrition. In Zambia, recent literature notes the impact that decades of investment in grains and oil has had on food consumption patterns, urging policy and program planners to reinvest in making animal-source foods more available to address existing nutrition deficiencies. These patterns are noted despite the frequency with which potential animal-source foods are available within rural households that rear small ruminants, poultry and in some cases, cattle.

One of the most commonly available animal-source foods in rural Zambian homes is the village chicken. Women and children within rural Zambian households most often assume responsibility for rearing village chickens, although these chickens may be “owned” by either women or men within each family. Chickens that survive to adulthood will lay an average of 70 eggs per year; women within the home will most often make decisions about the proportion of these eggs to be eaten at home, sold at market to supplement farm income, or bartered in exchange for other households needs. The extent to which home-based egg and chicken consumption contributes to the animal-source protein intake and dietary diversity of each family member depends upon a complex set of variables including: sex-based differences in child feeding practices; the frequency with which eggs or adult chickens are used for social gathering hosted by the household or in religious rituals; and social norms around dietary practices during pregnancy, among others.

Newcastle’s Disease in Zambian Poultry

Newcastle’s disease is an aggressive, highly contagious virus that is found in avian populations across the globe. It is caused by one of the most virulent strains of avian paramyxovirus 1 (APVM-1); less virulent strains of APVM-1 can often remain asymptomatic and can be present among wild and domestic birds. While the strain of APVM-1 that leads to Newcastle affects many bird species, it presents the greatest

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burden of disease among poultry. Newcastle leads to death among poultry nearly 100% of the time and typically within a 2-6 day period from the point of infection.

Newcastle’s disease was first diagnosed in Zambia in 1952 during an outbreak among poultry in the Southern Province. By the early 1980s Newcastle was considered enzootic to rural (village) chickens throughout the country. Since this time, the government of Zambia has strictly enforced vaccination policy on commercial poultry farms. However, Newcastle continues to contribute to a high burden of morbidity and mortality among village chickens nationwide. Research published in 1994 estimated the seroprevalence of Newcastle’s disease among Zambia’s village chickens to be nearly 37%. The presence of Newcastle compounds the existing socio-cultural practices and environmental factors that undermine the health of village chickens in Zambia. Village chicks have a 55% mortality rate even in the absence of Newcastle, due to predator attacks, nutritional deficiencies and other diseases. Despite this, Newcastle’s disease is considered the leading killer of village chickens in Zambia, followed by worm infestation, mycoplasmosis, parasitic infections and coccidiosis.

Like other affected poultry, village chickens will usually become symptomatic within a week after being exposed to Newcastle. Signs of infection can include discharge of fluids from eyes and/or nose, bloody diarrhea, and body function changes that stem from damage to the central nervous system (e.g., depression, hyperexcitability, loss of balance, tremors, and paralysis).

Newcastle’s disease is spread through air, through contact with infected body fluids and feces/droppings, and through contact with contaminated items (e.g., cookware and chicken coops). Newcastle can also affect chickens before they are hatched when eggs come into contact with the contaminated flesh of infected chickens. Because of the ease of transmission and rapid incubation, Newcastle often quickly decimates entire village chicken populations. Effective containment of Newcastle among village chickens in eastern Zambia therefore requires community-level behavior change and must be based upon an understanding of existing norms related to chicken rearing.

Preventing Newcastle’s Disease in Zambian Poultry

Mawa promotes small livestock production in 19 agricultural camps across Chipata and Lundazi districts. Through this intervention, Field Agents help farming households to make practical and economical decision about which small livestock to rear; and then train households to properly reproduce, feed, house and care for the health of the animals that they have chosen. Because of the widespread preference for and availability of village chickens, Mawa has created two training modules

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14 Mawa’s agricultural sector does not extend into the 3 expansion zones where Mawa began working in 2016.
specifically focused on village chicken management (Lessons SLP 2a and SLP 2b). Through these group discussions and trainings, farming households work together to identify common challenges to rearing village chicken and then agree upon priority practices for improving how they manage their village chicken going forward.

In lessons on small livestock healthcare, Mawa identifies Newcastle as the leading killer of village chicks (Lesson SLP 2e) and describes the importance of vaccinating chicks against Newcastle (Lesson SLP 2f). This recommended practice, however, raises challenges for farming households due to a number of factors:

- **Predominance of traditional medicine for vaccinating village chickens:** Research has shown that in some rural Zambian communities, 39% of households used traditional methods to vaccinate their village chickens, adding leaves and stalks of plants such as agave, aloe and cassia to the chickens’ drinking water. According to this same research, only 14% of rural Zambian households used ‘conventional’ methods of vaccinating village chickens, which means that there remains a significant ‘unmet need’ for vaccination among village chickens in Zambia.

- **Challenges with using vaccines and medicines:** Mawa’s “Small Livestock Production” training Lesson 1b-4 highlights a number of reasons for vaccinations and medicines not being effective in protective small livestock and poultry from disease. These include using incorrect or damaged products; vaccinating or treating too late; using an incorrect dose of vaccine or medicine; and not following the recommended vaccination or treatment course (i.e., inconsistently applying the treatment).

Within this context, Mawa uses the following messages to promote the use of conventional village chicken vaccination among rural Zambian households:

- “Vaccination in combination with appropriate hygiene measures helps prevent outbreak.”
- “The live vaccination can be bought and given to birds. Contact your veterinary officer for more information.”

Mawa combined these messages with guidance on controlling the spread of Newcastle once an outbreak has occurred. However, the vaccination guidance provided in this lesson was deemed to be insufficiently explicit in promoting consistent adoption of the recommended practice. Mawa recognized that an effective vaccination guidance would need to spell out quantity, timing, use and other aspects of the behavior in order to be successful. The barrier analysis study (further described below) methodology was selected to provide more information on practical barriers and motivators for vaccinating village chickens according to a more detailed description of the recommended, conventional, community-based vaccination method.

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17 Mawa Small Livestock Production training manual, pg 17, Lesson SLP 2f: Chicken Disease Control.
Methodology

About the Barrier Analysis Methodology

The Barrier Analysis (BA) survey is a formative research methodology used for social and behavior change communication strategy design and for activity re-planning during implementation (as part of a continuous monitoring approach). BA builds upon a related formative research methodology called the Doer/Non-Doer study. The household survey-based Doer/Non-Doer study seeks to understand the relative importance of four determinants of behavior among members of a target group. Importance is compared between those who practice the behavior (Doers) and those who do not practice a behavior (‘Non-Doers’). As an expansion on this approach, the BA study looks at the four behavioral determinants included in the Doer/Non-Doer survey tool, plus eight additional behavioral determinants:

<table>
<thead>
<tr>
<th>Behavioral Determinant</th>
<th>Doer/Non-Doer Survey</th>
<th>Barrier Analysis Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived self-efficacy</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Perceived social norms</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Perceived positive consequences</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Perceived negative consequences</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Perceived access</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Cues for action/reminders</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Perceived susceptibility/risk</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Perceives severity</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Perceived action efficacy</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Perceived divine will</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Policy</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Culture</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

Analysis of data from the BA formative research tool allows projects to identify statistically significant differences between doers and non-doers of identified/priority behaviors and to use this knowledge for program design and improvement to address barriers to and leverage motivators for behavior change.
Mawa’s Barrier Analysis Process

The following overview, adapted from the *Practical Guide to Conducting a Barrier Analysis*[^18], highlights the seven implementation steps plus roles and responsibilities undertaken by Mawa staff when designing and implementing a BA study. The cumulative estimated time to complete within the Mawa context is 5-6 working days. The Mawa Agriculture team followed these steps over the course of a two-week period in February 2015.

**STEP #1: Define the Behavior & Priority Group**

*Who:* Team Leader (with support from team)

*What:* Create the ‘ideal’ and the ‘relaxed’ definitions of the priority behavior

*Suggested Process:* Team meeting, review of strategic priorities & implementation results + knowledge gaps to date

(≈2 – 3 hours)

**STEP #2: Develop the Behavior Screening Questions**

*Who:* Selected team members

*What:* Create a list of questions to categorize interview respondents as Doers or Non-Doers

*Suggested Process:* 1-2 team members to write questions, reviewed by Team Leader/designee

**STEP #3: Develop Research Questions & Pretest Questionnaire**

*Who:* Selected team members

*What:* Write 1-2 questions per determinant being studied (i.e., max of 24 questions)

*Suggested Process:* 2-3 team members to draft questions; reviewed by Team Leader/designee; translated, confirmed, pretested with program target audience, revised

(≈2 days)

**STEP #4: Organize the Field Work**

*Who:* Team Leader

*What:* Map out all logistics concerning BA study implementation—from drivers to locations to community introductions & research team field communication

*Suggested Process:* Team meeting, develop & distribute logistics chart to research team members

(≈4 hours)

**STEP #5: Collect Field Data**

*Who:* BA Research Team

*What:* Conduct BA study using quality control practices, small team supervision & logistics chart

*Suggested Process:* Conduct BA study

(≈1-2 days)

**STEP #6: Analyze BA Study Results**

*Who:* BA Research Team

*What:* Review & interpret questionnaire responses

*Suggested Process:* Team ‘workshop,’ code & tabulate responses, analyze & interpret data

(≈4 hours)

**STEP #7: Use BA Study Results as Data for Decision-Making**

*Who:* Team Leader (with support from team)

*What:* Develop Bridges to Activities

*Suggested Process:* Team ‘workshop,’ review current work plan & strategy, identify areas to modify implementation using new bridges to activities and SBCC activities

(≈4 hours)

Defining Mawa’s ideal behavior for vaccinating village chickens against Newcastle’s disease

The Mawa Agriculture team, with support from URC, began developing standardized definitions for each conservation agriculture practice between November 2014 and October 2015 to reinforce consistent messaging across all field agents. The team structured each behavior statement to include all key characteristics of the target group and of the behavior itself, per guidance provided within the Core Group’s Barrier Analysis implementation guide. Mawa defined the recommended (ideal) practice for vaccinating local chickens as follows:

<table>
<thead>
<tr>
<th>IDEAL BEHAVIOR STATEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male and female farmers, who are members of Mawa farmers’ groups, trained in small livestock/poultry production, and who raise village chickens, vaccinate their chickens against Newcastle’s Disease twice per year after the rainy season and just before the dry season.</td>
</tr>
</tbody>
</table>

As earlier noted, successful adoption of this practice must take place at the community level. Communities are specifically advised to purchase one portion of (name of vaccine) and to administer the vaccine to a maximum of 200 chickens within the village through a common poultry drinking water source.

Developing the survey tool

The Mawa Agriculture team selected and adapted the primary BA survey templates provided within the Core Group’s BA implementation guide. The team selected the template used for the November 2014 crop rotation survey due to team members’ familiarity with the tool’s structure (See Appendix B).

The first part of the survey included respondent demographic information, followed by six behavioral screening questions. These included questions on participation in specific Mawa groups (questions 1 and 2); questions on training in small livestock production (question 3); and questions on rearing of village chickens along with current vaccination practices (questions 4-6). The second part of the survey included 17 questions which covered the 12 behavioral determinant categories as shown below.

<table>
<thead>
<tr>
<th>Behavioral Determinant</th>
<th># of questions</th>
<th>Includes open-ended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived self-efficacy</td>
<td>3</td>
<td>✓</td>
</tr>
<tr>
<td>Perceived social norms</td>
<td>3</td>
<td>✓</td>
</tr>
<tr>
<td>Perceived positive consequences</td>
<td>1</td>
<td>✓</td>
</tr>
<tr>
<td>Perceived negative consequences</td>
<td>1</td>
<td>✓</td>
</tr>
<tr>
<td>Perceived access</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Cues for action/reminders</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Perceived susceptibility/risk</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

19 The alternative template can be found in Annex 3.
The survey was translated into Tumbuka for use within the Kapichila agricultural camp of Lundazi district.

Creating the village chicken vaccination job aide

Although the newly-created ideal behavior statement more clearly defined some of the requirements for successfully vaccinating village chickens against Newcastle, the Mawa team felt that the statement would not fully capture some of the other key features of this practice without support from a visual aid. The team worked with URC to create an illustration that depicts multiple village chicken coops and owners sharing one drinking water tray into which the vaccine is being poured. The Mawa team aimed to minimize misinterpretation of what was meant by ‘vaccinate your village chickens’ during the Barrier Analysis, in light of some local perceptions that providing herbs to village chickens also constituted vaccination. The illustration is intended to reference answer A (“I vaccinate my village chickens”) under BA screening question #5. The team also anticipated using the job aide as an action card to augment future delivery of related small livestock production training lessons.
Pre-testing the survey tool

Mawa’s agriculture team defines the ideal practice of village chicken vaccination as occurring twice per year—once after the rainy season (in or after April) and once just before the dry season (in or after August). However, based upon observed practice within the participating agricultural camps, the Mawa team felt it unlikely that many BA respondents would qualify as ‘Doers’ of this practice in its ideal state. The team therefore created and used the following ‘relaxed’ definition for village chicken vaccination during the BA study pretest and subsequent data collection.

**RELAXED BEHAVIOR STATEMENT**

Farmers, who are part of a Mawa Farmers’ group, who have been trained in small livestock/poultry production, and who raise village chickens, vaccinate their chickens against Newcastle’s Disease once per year after the rainy season.

The Mawa team pretested the village chicken BA survey tool in 1 day among a total of 16 households within Kanyama village in Kapichila camp in Lundazi district. The team used Quality Improvement Verification Checklist found in Lesson 10 of the training guide to evaluate and provide rapid feedback on interviewer performance during the pretest. The Mawa team conducted a pretest debrief20 focused on:

- Clarity of research questions and additional [Tumbuka] translation requirements
- Average time to complete each interview (to ensure efficient planning of field data collection)
- QIVC findings on interviewer performance

The Mawa team finalized the survey instrument based upon pretest feedback and incorporated additional interviewer guidance, which was communicated to the interviewer team at the start of the data collection period. Of note, the survey instrument did not include gender-related demographic information. As such the research team did not analyze any differences in perceived barriers or motivators related to gender.

Data Collection

Mawa obtained verbal consent from each BA survey respondent before administering screening or research questions. The team obtained the recommended total of 45 ‘Doers’ and 45 ‘Non-Doers’ for the village chicken BA study.

<table>
<thead>
<tr>
<th>Expected Doers</th>
<th>Actual Doers</th>
<th>Expected Non-Doers</th>
<th>Actual Non-Doers</th>
<th>Total Do Not Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>7</td>
</tr>
</tbody>
</table>

As shown in the table above, a total of x interview candidates were classified as ‘Do Not Interview’ based upon their responses to initial screening questions, using the classification table shown below:

**Doer/Non-Doer Classification Table**

Group: [ ] Doer [ ] Non-Doer

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20 See Step 3d (pg. 38) of the Mawa BA Implementation Guide.
The village chicken BA study was conducted exclusively in the Kapichila agricultural camp of Lundazi district by a team of 12 Mawa staff members organized into four data collection teams. Each data collection team was comprised of one team leader and 2 interviewers. Field work took place from February 18 to February 19, 2015. Each interviewer conducted an average of 12 household surveys.

**Survey Analysis**

Following the processes associated with Step #6 of the BA methodology, the Mawa BA training participants reviewed, coded (by hand) and compared survey responses on village chicken vaccination from both Doers and Non-Doers. The group identified 40 thematic response codes across the 7 open-ended questions.

The Mawa team used the BA tabulation workbook (a companion to the BA Guide) to identify statistically significant barriers and motivators for vaccinating village chickens at least once per year after the rainy season (as defined within the relaxed version of the behavior statement). The team used the recommended prevalence estimate of 10% due to the lack of project baseline data on village chicken vaccination in the project area. For open-ended questions, the team then entered the codes reflecting each type of open-ended response provided by Doers and/or Non-Doers. Lastly, the team included the total number of responses for each open or closed ended research question. Study results show that perceived self-efficacy, perceived social norms, perceived risk (of one’s village chickens contracting Newcastle’s disease), policy, culture, and two specific universal motivators are statistically significant for determinants of village chicken vaccination among Mawa-supported households in Lundazi province.
### Perceived Self-efficacy

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Self-Efficacy:</strong> With your present knowledge, resources, and skills do you think that you could vaccinate your chickens against Newcastle’s disease after the rains every year?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>43</td>
<td>35</td>
<td>96%</td>
<td>78%</td>
<td>18%</td>
<td>6.14</td>
<td>1.26</td>
<td>29.90</td>
<td>5.53</td>
</tr>
<tr>
<td>Possibly</td>
<td>2</td>
<td>9</td>
<td>4%</td>
<td>20%</td>
<td>-16%</td>
<td>0.19</td>
<td>0.04</td>
<td>0.92</td>
<td>0.21</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>2</td>
<td>0%</td>
<td>4%</td>
<td>-4%</td>
<td>0.00</td>
<td>1.00</td>
<td></td>
<td>0.00</td>
</tr>
<tr>
<td>Don’t know</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>1.00</td>
<td></td>
<td></td>
<td>1.000</td>
</tr>
</tbody>
</table>

Respondents who vaccinate their village chickens according to the relaxed definition (Doers) were 5.5 times more likely to say ‘yes’ to this question than were Non-Doers (p<0.05); where Non-Doers were 4.9 times more likely than Doers to reflect a degree of positively-leaning uncertainty (answering ‘possibly’) in response to this same question (p<0.05). One explanation for Non-Doers tentative response is the fact that they have yet to apply what they have learned about vaccinating village chickens.

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2. Self - Efficacy:</strong> What makes it easy for you to vaccinate your chickens against Newcastle’s disease after the rains every year?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having medicine available</td>
<td>14</td>
<td>20</td>
<td>31%</td>
<td>44%</td>
<td>-13%</td>
<td>0.56</td>
<td>0.24</td>
<td>1.34</td>
<td>0.596</td>
</tr>
<tr>
<td>Having money available</td>
<td>28</td>
<td>29</td>
<td>62%</td>
<td>64%</td>
<td>-2%</td>
<td>0.91</td>
<td>0.39</td>
<td>2.14</td>
<td>0.918</td>
</tr>
<tr>
<td>Having knowledge/training</td>
<td>14</td>
<td>21</td>
<td>31%</td>
<td>47%</td>
<td>-16%</td>
<td>0.52</td>
<td>0.22</td>
<td>1.22</td>
<td>0.549</td>
</tr>
</tbody>
</table>
Having easy access to vaccine | 6 | 7 | 13% | 16% | -2% | 0.84 | 0.26 | 2.71 | 0.849 | 0.500
---|---|---|---|---|---|---|---|---|---|---
Being committed | 0 | 1 | 0% | 2% | -2% | 0.00 | 0.00 | 0.00 | 0.000 | 0.500

Having medicine, available money for or access to the vaccine, having knowledge about how to administer the vaccine and being committed to using the vaccine were not statistically significant determinants within this study population. The average cost of village chicken vaccine is USD $2 per 1,000 chickens, compared with a GDP per capita, which stood at $4,300 in 2015, and a poverty headcount ratio of $3.10/day in 2011. All of these data suggest that even in rural subsistence farming contexts, the cost of vaccination should not present a financial obstacle, which the BA survey data confirms. That said, because ‘having money available’ for purchasing vaccine was the most commonly reported factor that made it easy for both Doers and Non-Doers to vaccinate their village chickens, further formative research may be useful for better understanding the context factors that help farmers to set aside funding for vaccine costs.

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expensive vaccine</td>
<td>35</td>
<td>35</td>
<td>78%</td>
<td>78%</td>
<td>0%</td>
<td>1.00</td>
<td>0.37</td>
<td>2.70</td>
<td>1.000</td>
</tr>
<tr>
<td>Lack of knowledge</td>
<td>16</td>
<td>22</td>
<td>36%</td>
<td>49%</td>
<td>-13%</td>
<td>0.58</td>
<td>0.25</td>
<td>1.34</td>
<td>0.608</td>
</tr>
<tr>
<td>Nothing makes it difficult</td>
<td>1</td>
<td>1</td>
<td>2%</td>
<td>2%</td>
<td>0%</td>
<td>1.00</td>
<td>0.06</td>
<td>16.50</td>
<td>1.000</td>
</tr>
<tr>
<td>Not committed</td>
<td>2</td>
<td>3</td>
<td>4%</td>
<td>7%</td>
<td>-2%</td>
<td>0.65</td>
<td>0.10</td>
<td>4.10</td>
<td>0.675</td>
</tr>
<tr>
<td>Limited access to vaccine</td>
<td>26</td>
<td>10</td>
<td>58%</td>
<td>22%</td>
<td>36%</td>
<td>4.79</td>
<td>1.91</td>
<td>12.00</td>
<td>3.940</td>
</tr>
<tr>
<td>Having sick family members</td>
<td>0</td>
<td>1</td>
<td>0%</td>
<td>2%</td>
<td>-2%</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>No household unity</td>
<td>0</td>
<td>1</td>
<td>0%</td>
<td>2%</td>
<td>-2%</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.000</td>
</tr>
</tbody>
</table>

3. Self - Efficacy: What makes it difficult for you to vaccinate your chickens against Newcastle’s disease after the rains every year?

---

24 Non-Doers were asked “What would make it difficult...”
Challenges with accessing the village chicken vaccine were a statistically significant barrier within the study population. Doers were 3.9 times more likely than non-Doers to feel that having limited access to vaccines makes it difficult to practice vaccination as recommended (p<0.001). Perceived access to vaccines is one of the most statistically significant behavioral determinants of vaccination practice within this study population. As shown in the table below, Zambian farmers primarily access vaccine for their chickens through agro-dealers and secondarily through their veterinary department\textsuperscript{25}. However, evidence also shows that the average distance from farm to agro-dealer or seller of veterinary medicines are 31.8 and 32.9 kilometers, respectively; this data supports the barrier analysis study findings on the challenges in accessing chicken vaccine.

![Graph showing vaccine access sources](image.png)

### Perceived Positive Consequences

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
</table>

[http://fsg.afre.msu.edu/zambia/3_livestock_status_in_Zambia_High_level_meeting.pdf](http://fsg.afre.msu.edu/zambia/3_livestock_status_in_Zambia_High_level_meeting.pdf)
4. Positive Consequences: What are the advantages of vaccinating your chickens against Newcastle’s disease after the rains every year?

<table>
<thead>
<tr>
<th></th>
<th>Doers</th>
<th>Non-Doers</th>
<th>Doers</th>
<th>Non-Doers</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaining income</td>
<td>32</td>
<td>31</td>
<td>71%</td>
<td>69%</td>
<td>2%</td>
<td>1.11</td>
<td>0.45</td>
<td>2.74</td>
<td>1.100</td>
</tr>
<tr>
<td>Higher production of chickens</td>
<td>45</td>
<td>43</td>
<td>100%</td>
<td>96%</td>
<td>4%</td>
<td>0.247</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Better household nutrition</td>
<td>17</td>
<td>15</td>
<td>38%</td>
<td>33%</td>
<td>4%</td>
<td>1.21</td>
<td>0.51</td>
<td>2.88</td>
<td>1.190</td>
</tr>
</tbody>
</table>

Doers and Non-Doers were equally likely to cite gaining income and having chickens that produce more as positive consequences associated with vaccinating their chickens. For example, one respondent who practices vaccination said, “Vaccination improves productivity. With high productivity one can have extra birds that can be sold and later using the proceeds for buying fertilizers, pay school fees, and other groceries. The income from chickens can also be applied on grinding maize into maize meal.” More than one Non-Doer respondent described the value of raising healthy chickens for sale. One said that selling the “excess chickens [helped to]… solve some problems.” Another non-doer said, “Since chickens can be easily sold, they can provide relief in terms of meeting sudden cash needs.” There were no statistically significant differences associated with positive consequences as a behavioral determinant.

Perceived Negative Consequences

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of knowledge</td>
<td>8</td>
<td>14</td>
<td>18%</td>
<td>31%</td>
<td>-13%</td>
<td>0.48</td>
<td>0.18</td>
<td>1.29</td>
<td>0.510</td>
</tr>
<tr>
<td>Cost of vaccine</td>
<td>3</td>
<td>3</td>
<td>7%</td>
<td>7%</td>
<td>0%</td>
<td>1.00</td>
<td>0.19</td>
<td>5.24</td>
<td>1.000</td>
</tr>
<tr>
<td>No disadvantage</td>
<td>35</td>
<td>31</td>
<td>78%</td>
<td>69%</td>
<td>9%</td>
<td>1.58</td>
<td>0.61</td>
<td>4.07</td>
<td>1.516</td>
</tr>
</tbody>
</table>

Most Doers or Non-Doers did not note any disadvantages in vaccinating their village chickens against Newcastle’s disease. However, a small number of Doers and Non-Doers mentioned the cost of the vaccine or a lack of knowledge as negative consequences of vaccinating against Newcastle’s. Describing this lack of knowledge, one non-doer said, “Vaccination requires special skills to be done successfully.” Another non-doer noted that vaccination does not guarantee the survival of village chickens. This potential disincentive was not adequately captured under a

---

26 Non-Doers were asked “What would be the advantages...”

27 Non-Doers were asked “What would be the disadvantages...”
survey response code but is worth highlighting as it was shared by non-doers in response to this question and to the question on perceived self-efficacy.

### Perceived Social Norms

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6. Social Norms:</strong> Do most of the people that you know support your decision to vaccinate your chickens against Newcastle’s disease?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>42</td>
<td>37</td>
<td>93%</td>
<td>82%</td>
<td>11%</td>
<td>3.03</td>
<td>0.75</td>
<td>12.26</td>
<td>2.800</td>
</tr>
<tr>
<td>Possibly</td>
<td>1</td>
<td>8</td>
<td>2%</td>
<td>18%</td>
<td>-16%</td>
<td>0.11</td>
<td>0.01</td>
<td>0.88</td>
<td>0.117</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>0</td>
<td>4%</td>
<td>0%</td>
<td>4%</td>
<td></td>
<td></td>
<td></td>
<td>10.419</td>
</tr>
<tr>
<td>Don't know</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td>1.000</td>
</tr>
</tbody>
</table>

The majority of Doers and Non-Doers were certain of the social support for this behavior. However, a small number of both groups gave more tenuous answers, which highlighted a statistically significant difference between the two groups. Non-Doers were 8.5 times more likely to have a positive-leaning uncertainty about vaccination social norms (p<0.05). They were statistically more likely to say it was possible that people they know would support their decision to vaccinate their village chickens against Newcastle’s disease. This may reflect limited conversation amongst non-Doers on this topic, which could in turn be related to other factors including the predominance of traditional vaccination methods amongst non-Doers in the response group.

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7. Social Norms:</strong> Who are all the people that support your decision to vaccinate your chickens against Newcastle’s disease?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

28 Non-Doers were asked “Would most of the people you know support...”
29 Non-Doers were asked “Who are all the people that would support your decision...”
<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Social Norms: Who are all the people that do not support your decision to vaccinate your chickens against Newcastle’s disease?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmers not in Mawa</td>
<td>6</td>
<td>6</td>
<td>13%</td>
<td>13%</td>
<td>0%</td>
<td>1.00</td>
<td>0.30</td>
<td>3.37</td>
<td>1.000</td>
</tr>
<tr>
<td>No one</td>
<td>28</td>
<td>27</td>
<td>62%</td>
<td>60%</td>
<td>2%</td>
<td>1.10</td>
<td>0.47</td>
<td>2.56</td>
<td>1.088</td>
</tr>
<tr>
<td>Lazy people</td>
<td>4</td>
<td>6</td>
<td>9%</td>
<td>13%</td>
<td>-4%</td>
<td>0.63</td>
<td>0.17</td>
<td>2.42</td>
<td>0.659</td>
</tr>
<tr>
<td>Neighbours who don’t appreciate</td>
<td>13</td>
<td>9</td>
<td>29%</td>
<td>20%</td>
<td>9%</td>
<td>1.63</td>
<td>0.61</td>
<td>4.30</td>
<td>1.539</td>
</tr>
<tr>
<td>Relatives who don't appreciate</td>
<td>3</td>
<td>6</td>
<td>7%</td>
<td>13%</td>
<td>-7%</td>
<td>0.46</td>
<td>0.11</td>
<td>1.98</td>
<td>0.492</td>
</tr>
</tbody>
</table>

Perceived lack of support is not a statistically significant determinant for village chicken vaccination in this study population; more than 60% of Doers and Non-Doers said they knew of no one who would be unsupportive of village chicken vaccination. Far fewer respondents in both

---

30 Non-Doers were asked “Who are all the people who would not support...”
categories cited neighbors and/or relatives who ‘don’t appreciate’ the benefits of vaccination as being among those who would not support this group-level practice. It is possible that respondents define those who do not appreciate vaccination as those who do not practice it. For example, one non-doer said, “Only people who do not keep chicken would not support me. Some of them would do so because of jealous.”

Perceived Access

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Access</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very difficult</td>
<td>15</td>
<td>16</td>
<td>33%</td>
<td>36%</td>
<td>-2%</td>
<td>0.91</td>
<td>0.38</td>
<td>2.16</td>
<td>0.915</td>
</tr>
<tr>
<td>Somewhat difficult</td>
<td>15</td>
<td>13</td>
<td>33%</td>
<td>29%</td>
<td>4%</td>
<td>1.23</td>
<td>0.50</td>
<td>3.01</td>
<td>1.205</td>
</tr>
<tr>
<td>Not difficult at all</td>
<td>11</td>
<td>7</td>
<td>24%</td>
<td>16%</td>
<td>9%</td>
<td>1.76</td>
<td>0.61</td>
<td>5.04</td>
<td>1.644</td>
</tr>
</tbody>
</table>

While two thirds of respondents among both Doer and Non-Doers said that it is either very or somewhat difficult to get the materials they need for vaccinating chickens, this was not a statistically significant determinant of whether or not a respondent would ultimately vaccinate his or her chickens.

Cues for Action/Reminders

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Reminders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very difficult</td>
<td>3</td>
<td>8</td>
<td>7%</td>
<td>18%</td>
<td>-11%</td>
<td>0.33</td>
<td>0.08</td>
<td>1.34</td>
<td>0.357</td>
</tr>
<tr>
<td>Somewhat difficult</td>
<td>15</td>
<td>13</td>
<td>33%</td>
<td>29%</td>
<td>4%</td>
<td>1.23</td>
<td>0.50</td>
<td>3.01</td>
<td>1.205</td>
</tr>
<tr>
<td>Not difficult at all</td>
<td>27</td>
<td>24</td>
<td>60%</td>
<td>53%</td>
<td>7%</td>
<td>1.31</td>
<td>0.57</td>
<td>3.03</td>
<td>1.278</td>
</tr>
</tbody>
</table>

Non-Doers were asked “How difficult would it be...”

Non-Doers were asked “How difficult do you think it would be...”
Although not statistically significant, more than half of Doers and Non-Doers said that it would not be difficult at all to remember when to vaccinate chickens against Newcastle’s disease. This may be due to prevailing traditional practices of vaccinating chickens which may occur in the same timeframe Mawa recommends for using conventional vaccine (after rainy season and before the hot dry season). However, remembering when to vaccinate village chickens is not a statistically significant behavioral determinant in this study population.

**Perceived Risk/Susceptibility**

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Risk - How likely is it that your chickens will become infected by Newcastle’s Disease in the next year?</td>
<td>Very likely</td>
<td>16</td>
<td>27</td>
<td>36%</td>
<td>60%</td>
<td>-24%</td>
<td>0.37</td>
<td>0.16</td>
<td>0.86</td>
</tr>
<tr>
<td></td>
<td>Somewhat likely</td>
<td>12</td>
<td>15</td>
<td>27%</td>
<td>33%</td>
<td>-7%</td>
<td>0.73</td>
<td>0.29</td>
<td>1.80</td>
</tr>
<tr>
<td></td>
<td>Not likely</td>
<td>17</td>
<td>3</td>
<td>38%</td>
<td>7%</td>
<td>31%</td>
<td>8.50</td>
<td>2.28</td>
<td>31.73</td>
</tr>
</tbody>
</table>

Non-Doers are 2.5 times more likely than Doers to believe in the high likelihood of their village chickens contracting Newcastle’s disease in the coming year (p<0.05). Conversely, Doers are 5.6 times more likely than Non-Doers to find it unlikely that their chickens will contract Newcastle’s in the coming year (p<0.001). These results suggest that Non-Doers recognize the efficacy of the recommended practice, even though they do not vaccinate their chickens.

**Perceived Severity**

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Severity - How serious would it be for your chickens to be infected by Newcastle’s Disease?</td>
<td>Very serious</td>
<td>40</td>
<td>36</td>
<td>89%</td>
<td>80%</td>
<td>9%</td>
<td>2.00</td>
<td>0.61</td>
<td>6.52</td>
</tr>
</tbody>
</table>
More than 80% of respondents in each category said that it would be very serious if their chickens were infected by Newcastle’s. Yet this recognition of mortality and loss of income and assets associated with Newcastle’s was not a statistically significant determinant of village chicken vaccination within this population.

**Perceived Action Efficacy**

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Action Efficacy - How likely is it that your chickens would get Newcastle’s Disease if you did not vaccinate them?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very likely</td>
<td>43</td>
<td>39</td>
<td>96%</td>
<td>87%</td>
<td>9%</td>
<td>3.31</td>
<td>0.63</td>
<td>17.36</td>
<td>3.056</td>
</tr>
<tr>
<td>Somewhat likely</td>
<td>1</td>
<td>5</td>
<td>2%</td>
<td>11%</td>
<td>-9%</td>
<td>0.18</td>
<td>0.02</td>
<td>1.62</td>
<td>0.200</td>
</tr>
<tr>
<td>Not likely at all</td>
<td>1</td>
<td>1</td>
<td>2%</td>
<td>2%</td>
<td>0%</td>
<td>1.00</td>
<td>0.06</td>
<td>16.50</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Both Doers and Non-Doers almost universally believed it to be very likely that their chickens would become infected with Newcastle’s if they are not vaccinated. This indicates that there is a strong local understanding of the efficacy of the recommended vaccination practice. Because of the strong similarity in believes across study groups, action efficacy is not a statistically significant behavioral determinant in this study population.

**Perceived Divine Will**

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. Divine Will - Do you think that it is God’s will for chickens to get sick and die from Newcastle’s Disease?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>6</td>
<td>4%</td>
<td>13%</td>
<td>-9%</td>
<td>0.30</td>
<td>0.06</td>
<td>1.59</td>
<td>0.327</td>
</tr>
<tr>
<td>Maybe</td>
<td>4</td>
<td>5</td>
<td>9%</td>
<td>11%</td>
<td>-2%</td>
<td>0.78</td>
<td>0.20</td>
<td>3.12</td>
<td>0.798</td>
</tr>
<tr>
<td>No</td>
<td>39</td>
<td>34</td>
<td>87%</td>
<td>76%</td>
<td>11%</td>
<td>2.10</td>
<td>0.70</td>
<td>6.29</td>
<td>1.978</td>
</tr>
</tbody>
</table>
The majority of Doers and Non-Doers did not believe it to be God’s will for their chickens to get sick and die from Newcastle’s disease. There were no statistically significant differences between these two groups. Perceived divine will, often associated with fatalism, is therefore not a behavioral determinant within this study population for vaccinating village chickens.

### Policy

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Policy - Are there any community laws or rules in place that you know of that encourage you to vaccinate your chickens against Newcastle’s disease? (If yes, what are they?)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21</td>
<td>9</td>
<td>47%</td>
<td>20%</td>
<td>27%</td>
<td>3.50</td>
<td>1.37</td>
<td>8.93</td>
<td>2.985</td>
</tr>
<tr>
<td>Maybe</td>
<td>1</td>
<td>2</td>
<td>2%</td>
<td>4%</td>
<td>-2%</td>
<td>0.49</td>
<td>0.04</td>
<td>5.59</td>
<td>0.516</td>
</tr>
<tr>
<td>No</td>
<td>23</td>
<td>34</td>
<td>51%</td>
<td>76%</td>
<td>-24%</td>
<td>0.34</td>
<td>0.14</td>
<td>0.83</td>
<td>0.384</td>
</tr>
</tbody>
</table>

Doers were 3 times more likely than Non-Doers to believe that there were community laws or rules that encourage village chicken vaccination (p<0.05). While all survey respondents were exposed to Mawa small livestock interventions, this statistically significant difference around vaccination policy may indicate that Doers are also socially connected in other ways that gives them greater access to or understanding of local government support for vaccinating chickens. Similarly, Non-Doers were 2.6 times more likely than Doers to feel that there were not community laws or rules encouraging chicken vaccination (p<0.05).

### Culture

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
</table>

23
16. Culture - Are there any cultural rules or taboos that you know of for or against vaccinating chickens against Newcastle’s disease? (If yes, what are they?)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>Maybe</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>43</td>
</tr>
<tr>
<td>%</td>
<td>2%</td>
<td>2%</td>
<td>96%</td>
</tr>
<tr>
<td>Odds Ratio</td>
<td>1.00</td>
<td>16.50</td>
<td>203.50</td>
</tr>
<tr>
<td>Confidence Interval</td>
<td>0.06</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>p-value</td>
<td>0.753</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Non-Doers were more than 320 times more likely than Doers to be uncertain about the existence of cultural rules or taboos against vaccinating chickens (p<0.001). Doers, on the other hand, were more than 200 times more likely than Non-Doers to be certain that such rules or taboos do not exist (p<0.001). Like the question on vaccination policy/laws, this statistically significant difference between Doers and Non-Doers may indicate that those vaccinating their chickens are generally more socially connected or mainstream than are those who do not vaccinate their chickens.

Universal Motivators

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Doers: +Exp. (A)</th>
<th>Non-Doers: +Exp. (B)</th>
<th>Doers %</th>
<th>Non-Doers %</th>
<th>Diff.</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>Estim. Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>More food crops</td>
<td>19</td>
<td>28</td>
<td>42%</td>
<td>62%</td>
<td>-20%</td>
<td>0.44</td>
<td>0.19</td>
<td>1.03</td>
<td>0.483</td>
</tr>
<tr>
<td>Money</td>
<td>10</td>
<td>14</td>
<td>22%</td>
<td>31%</td>
<td>-9%</td>
<td>0.63</td>
<td>0.25</td>
<td>1.63</td>
<td>0.660</td>
</tr>
<tr>
<td>Livestock</td>
<td>36</td>
<td>32</td>
<td>80%</td>
<td>71%</td>
<td>9%</td>
<td>1.63</td>
<td>0.61</td>
<td>4.30</td>
<td>1.556</td>
</tr>
<tr>
<td>Nice house</td>
<td>18</td>
<td>17</td>
<td>40%</td>
<td>38%</td>
<td>2%</td>
<td>1.10</td>
<td>0.47</td>
<td>2.56</td>
<td>1.088</td>
</tr>
<tr>
<td>Household goods</td>
<td>11</td>
<td>14</td>
<td>24%</td>
<td>31%</td>
<td>-7%</td>
<td>0.72</td>
<td>0.28</td>
<td>1.81</td>
<td>0.739</td>
</tr>
<tr>
<td>Productive assets</td>
<td>9</td>
<td>19</td>
<td>20%</td>
<td>42%</td>
<td>-22%</td>
<td>0.34</td>
<td>0.13</td>
<td>0.88</td>
<td>0.375</td>
</tr>
<tr>
<td>Scaling up farming</td>
<td>5</td>
<td>2</td>
<td>11%</td>
<td>4%</td>
<td>7%</td>
<td>2.69</td>
<td>0.49</td>
<td>14.64</td>
<td>2.321</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Farm ADP mechanization</td>
<td>2</td>
<td>4</td>
<td>4%</td>
<td>9%</td>
<td>-4%</td>
<td>0.48</td>
<td>0.08</td>
<td>2.74</td>
<td>0.504</td>
</tr>
<tr>
<td>Educate children</td>
<td>10</td>
<td>9</td>
<td>22%</td>
<td>20%</td>
<td>2%</td>
<td>1.14</td>
<td>0.41</td>
<td>3.15</td>
<td>1.127</td>
</tr>
<tr>
<td>Improve living standards</td>
<td>7</td>
<td>2</td>
<td>16%</td>
<td>4%</td>
<td>11%</td>
<td>3.96</td>
<td>0.78</td>
<td>20.23</td>
<td>3.132</td>
</tr>
</tbody>
</table>

*Stepanovic (URC) & Nguluwe (CRS). Zambia Mawa Project—March 2017*
Borrowing from the private sector [consumer product marketing] tradition of tapping into the social aspirations that transcend place and time, the BA study often seeks to understand the overarching life goals of respondent groups. In cases where study results reveal some of these motivators to be statistically significant, development program designers are encouraged to use these ideas to motivate the priority audience to adopt a recommended practice. In the Lundazi village chicken vaccination study, Non-Doers were significantly more likely than Doers to desire more food crops (2.1 times more likely; \( p<0.05 \)) and productive assets (2.7 times more likely; \( p<0.05 \)).

Study Limitations

The Barrier Analysis survey can help program implementers to identify the most likely behavioral determinants for a recommended practice. However, BA does not always provide sufficient detail on the breadth or depth to which a likely behavioral determinant matters among members of a program’s priority group. In some cases, programs find it useful or necessary to further explore potential determinants using focus group discussions or in-depth interviews. In addition to these general limitations in the applicability or interpretation inherent in the BA tool, a number of challenges in the design and execution of the Lundazi Village Chicken BA survey tool should be noted.

- Question #16 (on the existence of cultural taboos regarding crop rotation) should have included a skip pattern, so that it was followed by Question #17 (‘Do you believe in those taboos?’) only in cases where the answer to question #16 was ‘yes.’

- For questions that required open-ended response (ex: on social norms), the Mawa research team did not always consistently or adequately probe for response clarity. For example, research question #8 asks respondents to describe all of the people who do not support crop rotation as a practice. Response Code #3 (relevant to a combined total of 10 Doers and Non-Doers) reflects an answer of ‘lazy people’ Further probing to clarify may have resulted in a richer response code, potentially shedding light on some personality or social traits within the Mawa communities that serve as barriers to priority group members being able to practice chicken vaccination.

Discussion & Conclusions

Study results indicate that perceived self-efficacy, perceived social norms, perceived risk, level of understanding of policy and cultural taboos, as well as specific universal motivators may be behavioral determinants for village chicken vaccination within the project area. As earlier stated, Non-Doers were 2.6 times more likely than Doers to feel that there were not community laws or rules encouraging chicken vaccination. Non-Doers were also 320 times more likely than Doers to be uncertain about the existence of cultural rules or taboos against vaccinating chickens. Lastly, Non-Doers were statistically more likely to say it was possible that people they know would support their decision to vaccinate their village chickens against Newcastle’s disease. By contrast, Doers were certain on this point. Taken together, these results suggest that Non-Doers may have other characteristics that make them less socially connected within their community than some of their Doer counterparts. Future interventions
may wish to build upon this finding by conducting additional qualitative research that sheds more light on this issue.

In addition, the BA study results show that Non-Doers were more likely than Doers to be motivated by a desire for productive assets and for increased food crop production. The importance of these universal motivators of Non-Doers—neither of which is necessarily linked to village chicken production or consumption—may indicate that some Non-Doer households place lower value on village chicken production than their Doer counterparts. However, further analysis is needed to confirm this potential correlation, particularly because it is unclear how either Doers or Non-Doers defined ‘productive assets.’

The Mawa Agricultural Production team used the results of this barrier analysis to strengthen the small livestock production training intervention. These training sessions represent the project’s primary channel for promoting village chicken vaccination among farming households. Borrowing from the Designing for Behavior Change framework, the team identified potential “bridges to activities” to address each of the behavioral determinants identified within this study (see table below). The Mawa team also identified specific steps for improving small livestock production training content, including developing SBC messaging content and integrating the village chicken job aide that was created for this study, into the training program. Because effective village chicken vaccination relies on whole communities agreeing to adopt the practice, Mawa seeks to further promote group dialogue within the training, focused on better understanding the social norms and perceived cultural taboos related to vaccination. For example, more clearly inviting small livestock training participants to discuss the idea of vaccinating village chickens within their community groups and within their households can foster a firmer perception among non-Doers that most people they know would support their adoption of this practice.

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Potential Bridges to Activities</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Self-efficacy</td>
<td>• Increase functional understanding about how to vaccinate village chickens</td>
<td>Modify the Mawa small livestock production lesson on vaccinating village chickens to include a) the ideal behavior statement and b) the village chicken vaccination job aide</td>
</tr>
<tr>
<td>Perceived social norms</td>
<td>• Increase support by relatives to vaccinate</td>
<td>Encourage small livestock training participants to discuss the idea of vaccinating village chickens within their community groups and within their households</td>
</tr>
<tr>
<td>Perceived risk</td>
<td>---------------------------------------------------------------</td>
<td>Encourage more discussion during small livestock production sessions to understand what hinders Non-Doers from vaccinating chickens, in light of their belief that Newcastle’s can be avoided through vaccination</td>
</tr>
<tr>
<td>Policy</td>
<td>• Increase local awareness of relevant policy/laws supporting for village chicken vaccination</td>
<td>• Provide a simple visual one-pager for lead farmers to share with farmer groups.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Produce &amp; air radio public service</td>
</tr>
</tbody>
</table>
announcement messages about policies supporting village chicken vaccination

<table>
<thead>
<tr>
<th>Culture</th>
<th>Universal Motivators</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Promote a clearer understanding of cultural values that may support practices like vaccinating chickens.</td>
<td>• Increase the perception that vaccination of chickens will lead to more food crop production</td>
</tr>
<tr>
<td></td>
<td>• Increase the perception that vaccination of chickens will lead to more productive assets</td>
</tr>
<tr>
<td></td>
<td>• Include new SBC message content to current messaging shared during livestock training. New content promoting village chicken vaccination should include key promise/s that build around universal motivators (see revised integrated lesson plan below).</td>
</tr>
<tr>
<td>Invite traditional leaders to talk to farmers (during small livestock trainings, etc.) about community values that support vaccination (e.g., values related to cooperation, keeping animals healthy, etc.)</td>
<td>Include new SBC message content to current messaging shared during livestock training. New content promoting village chicken vaccination should include key promise/s that build around universal motivators (see revised integrated lesson plan below).</td>
</tr>
</tbody>
</table>
Lesson SLP 2f: Chicken Disease Control

Objectives:
1) To understand the common chicken diseases found in the participants communities.
2) To encourage Male and female farmers, who are members of Mawa farmers’ groups, trained in small livestock/poultry production, and who raise village chickens, to vaccinate their chickens against Newcastle’s Disease twice per year after the rainy season and just before the dry season.

Materials: Flip chart, markers, village chicken vaccination job aide, pen and pencils

ASK

What are the most common chicken diseases in your communities?

Let the participants discuss

SAY

The most common chicken diseases in Eastern Province include;
- Coccidiosis
- Newcastle disease
- Fowl cholera
- Fowl typhoid
- Fowl pox

Explain each disease in detail:

Coccidiosis:
This disease attacks the intestines of a bird; the young and old birds are particularly vulnerable.

Symptoms
- Birds have blood stained diarrhoea/feces
- Wings drop down, feathers are ruffled and eyes are closed
• Birds eat less food and grow thinner
• Most birds die after suffering for six to ten days

**Causes**
• Feeding and drinking water is contaminated with coccidiosis germs
• Litter/bedding contaminated with disease

**Prevention**
• Feed chicks with mash containing coccidiostat medicine
• House should be well ventilated, this helps in removing excess moisture which favors Coccidiosis germs and disease outbreak
• Place chicks in a house which has been thoroughly cleaned and disinfected
• Avoid mixing age groups in one house
• Remove dead birds from the house promptly
• Treat sick birds promptly

**Treatment**
• As well as using coccidiostat, Amprolium can also be used. Dilute in the chickens water. Use for 3 to 5 days at 0.012% and at 0.06% for one to two weeks after. Ask veterinary officer for assistance.

**Newcastle Disease**

**Symptoms**
• Twisting of the head and neck, circling, shivering and paralysis of legs and wings
• Birds may be drowsy and sleepy for most of the time with their heads turned backwards or drawn to the body
• Birds drink more water but eat less food
• Birds have yellow colored diarrhoea

**Prevention (See job aide below)**
• Vaccination in combination with appropriate hygiene measures helps prevent outbreak.
• The live vaccination can be bought and given to birds. Contact your veterinary officer for more information.
• **It is important that everyone in your community work together to vaccinate your chickens against Newcastle’s Disease twice per year after the rainy season and just before the dry season**
• Did you know that a dose of Newcastle’s vaccine only costs 10 kwacha and can treat up to 200 birds?
• By selling one chicken (and rotating this responsibility throughout the village each season) your village can purchase the 10 kwacha dose of vaccine each season.
• By pooling your money together as a community you can save the 10 kwacha to buy the vaccine
• It is best to purchase your vaccine the same day or the day before you plan to use it. This minimizes the need to refrigerate the vaccine.
• When you purchase the vaccine, ask your agrodealer for a free block of ice to store the vaccine overnight (if needed). Place the ice in a container and keep it out of the sun. This keeps the vaccine safe until you dilute and use it the next day.

• By vaccinating your chickens properly and regularly, you can be sure of earning the best price for the ones that you sell. Your chickens will also produce more babies. This way, you can use some of the money to purchase the things that your family needs and wants.

Control
If despite your efforts, Newcastle’s disease does affect your village’s chickens, please follow these steps to control the spread of the disease:

• Remove dead birds from the house promptly and dispose them by burning or deep burying.
• Control movements of birds between areas in the neighborhood when there is an outbreak.
• After an outbreak and before restocking clean and disinfect poultry house and all equipment.
• Keep the poultry house vacant for 3-4 weeks after an outbreak before introducing new stock.

Fowl Cholera
Symptoms
• Birds are drowsy and have ruffled feathers
• Watery stained diarrhoea
• Birds eat less food but drink more water
• Swelling of the combs and wattles
• Cheesy pus under the eyelids and in the mouth
• Swelling of joints and legs, resulting in lameness
• Difficulty in breathing

Control and Prevention
• Same as for Newcastle disease

Treatment
• This disease is difficult to control, but Sulphonamides, can help. Ask your veterinary officer for more information.

Fowl Typhoid
Symptoms
• Greenish coloured diarrhoea
• No appetite
• Ruffled feathers
• Birds are sleepy most of the time

Control and Prevention
• Keep poultry away from other fowl (turkeys, ducks, guinea fowl)
• Keep equipment and chicken house clean
**Fowl pox**

Fowl pox is caused by the viruses Poxviridae. There are two main forms of the disease. Biting insects, especially mosquitoes, spreads the first type. This forms lesions on the comb, wattles and beak and the bird usually recovers within a few weeks. The second is spread by inhalation of the virus. The birds rarely recover from this form.

**Symptoms**
- Lesions on comb, wattles, beak

**Treatment**
- Vaccines are available. Talk to your local veterinary officer for more information.

---

**PROBE and INFORM**

What do you think about adopting proper chicken disease prevention practices? If you don’t already vaccinate your chickens, what has prevented you from doing this? If you do vaccinate your chickens, how and when do you discuss this with your family and in your community? Is there anything that might prevent you from teaching others about the benefits of preventing /controlling chicken disease? What are these barriers and what might you do to overcome them? What support do you need to address these barriers?

*Try to find solutions to any of your concerns by discussing with Field Agents and Field Supervisors.*

**REQUEST**

Based on this information, what commitment will you make? Are you willing to commit to protecting your chickens from diseases? Are you willing to teach disease prevention and care to your communities?
Are you willing to talk about the importance of vaccinating chickens against Newcastle with your relatives and neighbors?
Barrier Analysis Questionnaire on
[Village Chicken Vaccination]
for use with [the USAID/Zambia ‘Mawa’ Project’s Farmers Group Members]

(Relaxed) Behavior Statement
Farmers, who are part of a Mawa Farmers’ group, who have been trained in small livestock/poultry production, and who raise village chickens, vaccinate their chickens against Newcastle’s Disease once per year.

Demographic Data
Interviewer’s Name: ____________________ Questionnaire No.: ______
Date: _____/____/____ Community: __________

Scripted Introduction
Hi, my name is ________ and I am part of a Mawa project study team looking into farmer practices for animal health. The study includes a discussion of this issue and will take about 15 minutes to complete. I would like to hear your views on this topic. You are not obligated to participate in the study and no services will be withheld if you decide not to. Likewise, if you decide to be interviewed, you will not be compensated in any way or receive any gifts or services. Everything we discuss will be held in strict confidence.
Would you like to talk with me? [If not, thank them for their time.]

Yewo, zina lane ndine ______ ndipo ndine yumoza wa ba Mawa Project ndipo tiku sambila na kulawiska pa ivyo balimi bakuchita pa umoyo uwemi wa viweto. Tilabiskenga na kudumbirana paza umoyo wa vibeto pa ma minisi 15 pera. Sono nipemphenge maghanoghano ghinu pa nkhani iyi. Ndipo ndimwe bakumasuka kuzomera panji kukana kuti tidumbirana namwe. Ufulu ngwinu ndipo muleke kuopa kuti pala mwakana kuchita chidumbirano ichi panji wa project wa lekenge kumuovwirani yayi. Ndipo chidumbirano chithu ncha muchisisi, vyose ivyo tidumbiranenge viwenge vya chisisi.
Section A: Doer/Non-Doer Screening Questions

1. Do you participate in any of the Mawa groups?

   a. Yes (Enya)
   b. No → End interview and look for another interviewee
   c. Don’t know / won’t say → End interview and look for another respondent.

2. In which Mawa group/s do you participate?

   a. Farmers group
   b. SILC group → If only B and no A, End interview and look for another respondent
   c. Mothers group → If only C and no A, End interview and look for another respondent
   d. Area association → If only D and no A, End interview and look for another respondent
   e. Don’t know / won’t say → End interview and look for another respondent

3. Have you been trained in small livestock or poultry production?

   a. Yes
   b. No → [End interview and look for another interviewee]
   c. Don’t know / no response → [End interview and look for another interviewee]

4. Do you rear village chickens?

   a. Yes
   b. No → [End interview and look for another interviewee]
   c. Don’t know / no response → [End interview and look for another interviewee]

5. What do you usually do to prevent Newcastle’s disease in your village chickens?

   a. I vaccinate my village chickens
   b. I feed my village chickens herbs → [Non-doer. Skip to Section B]
   c. Quarantine/penned up → [Non-doer. Skip to Section B]
   d. Nothing → [Non-doer. Skip to Section B]
   e. Don’t know / no response → [End interview and look for another interviewee]

6. How many times did you vaccinate your chickens against Newcastle’s disease in the last year?

   a. At least once
   b. Not at all → [Non-doer. Skip to Section B]
Doer/Non-Doer Classification Table

<table>
<thead>
<tr>
<th>Group:</th>
<th>Doer</th>
<th>Non-Doer</th>
<th>Do Not Interview</th>
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<tr>
<td>Question 1 = A</td>
<td>Question 1 = A</td>
<td>Question 1 = B, C</td>
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<tr>
<td>Question 2 = A + B, C, D</td>
<td>Question 2 = A + B, C, D</td>
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<tr>
<td>Question 3 = A</td>
<td>Question 3 = A</td>
<td>Question 3 = B or C</td>
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<td>Question 4 = A</td>
<td>Question 4 = A</td>
<td>Question 4 = B or C</td>
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<tr>
<td>Question 5 = A + B, C</td>
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<td>Question 6 = A</td>
<td>Question 6 = B</td>
<td>Question 6 = C</td>
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</tbody>
</table>

Section B: Research Questions

[Perceived Self-Efficacy/Skills]

1. **Doers and Non-Doers:** With your present knowledge, resources, and skills do you think that you could **vaccinate your chickens against Newcastle’s disease** every year?

   1. Kulingana na ukaswiri ugho muli nagho pakusunga nkhuku kasi mukughanaghana kuti munga pereka katemera waku vikivira nkhuku zinu ku matenda gha chidelu chilimika chili chose?

   - A. Yes
   - B. Possibly
   - C. No
   - D. Don’t know

[Perceived Self-Efficacy]

2a. **Doers:** What makes it easy for you to **vaccinate your chickens against Newcastle’s disease** every year?

   2a. Kasi ni vinthu uli ivyo vikupangiska kuba chapafupi kupereka katemera wa kuvikilira chidelu ku nkhuku zinu chilimika chili chose?
2b. **Non-Doers:** What would make it easy for you to vaccinate your chickens against Newcastle’s disease every year? [Write all responses below. Probe with “What else?”]

2b. Kasi nivinthu uli ivyo mukugomezga vingapangiska kuba chapafupi kupereka katemera wa chidelu ku nkhuku zinu chimimika chili chose?

[Perceived Self-Efficacy]

3a. **Doers:** What makes it difficult for you to vaccinate your chickens against Newcastle’s disease every year?

3a. Kasi ni vinthu uli ivyo vikupagiska kuba chakusuzga kupereka katemera ku nkhuku zinu chimimika chili chose?

3b. **Non-Doers:** What would make it difficult for you to vaccinate your chickens against Newcastle’s disease every year? [Write all responses below. Probe with “What else?”]

3b. Kasi ni vinthu uli ivyo vingapangiska kuba chakusuzga kupereka katemera wa chidelu ku nkhuku zinu chimimika chili chose?

[Perceived Positive Consequences]

4a. **Doers:** What are the advantages of vaccinating your chickens against Newcastle’s disease every year?

4a. Kasi paliphindu uli kupereka katemera wa chidelu ku nkhuku zinu chimimika chili chose?
4b. **Non-Doers**: What would be the advantages of vaccinating your chickens against Newcastle’s disease every year? [Write all responses below. Probe with “What else?”]

4b. Kasi pangaba phindu uli pa kupereka katemera wa chidelu ku nkhuku zinu chilimika chili chose?

[Perceived Negative Consequences]

5a. **Doers**: What are the disadvantages of vaccinating your chickens against Newcastle’s disease every year?

5a. Kasi pali uheni uli kupereka katemera wa chidelu ku nkhuku zinu chilimika chili chose?

5b. **Non-Doers**: What would be the disadvantages of vaccinating your chickens against Newcastle’s disease every year? [Write all responses below. Probe with “What else?”]

5b. Kasi pangasangika uheni uli pala mwapeka katemera wachidula ku ckhuku zinu chilimika chili chose?

[Perceived Social Norms]

6a. **Doers**: Do most of the people that you know support your decision to vaccinate your chickens against Newcastle’s disease?

6a. Kasi wanthu banandi abo muku manya wakukoleranako namwe pa fundo ya kupereka katemera ku nkhuku zinu ku matenda gha chidelu chilimika chili chose?

- A. Yes
- B. Possibly
- C. No
- D. Don’t know / won’t say

6b. **Non-Doers**: Would most of the people that you know support your decision to vaccinate your chickens against Newcastle’s disease?
6b. Kasi wanthu banandi abo mukumanya bangiza kukoleranako nayo fundo yinu ya kupereka katemera nkhuku zinu?

☐ A. Yes
☐ B. Possibly
☐ C. No
☐ D. Don’t know / won’t say

[Perceived Social Norms]

7a. **Doers:** Who are all the people that support your decision to vaccinate your chickens against Newcastle’s disease?

7a. Mbanjani abo bakukoleranako nayo fundo yinu ya kupereka katemera wa chidelu ku nkhuku zinu?

7b. **Non-Doers:** Who are all the people that would support your decision to vaccinate your chickens against Newcastle’s disease? [Write all responses below. Probe with “Who else? “Anyone in particular?”]

7b. Kasi ni wanthu mbani abo ba ngakoleranako nayo fundo yinu ya kupereka katemera wamatenda gha chidelu ku nkhuku zinu?

[Perceived Social Norms]

8a. **Doers:** Who are all the people that do not support your decision to vaccinate your chickens against Newcastle’s disease?

8a. Kasi ni wanthu mbani awo wakukoleranako nayo yayi fundo yinu ya kupereka katemera wachidelu kunkhuku zinu?

8b. **Non-Doers:** Who are all the people that would not support your decision to vaccinate your chickens against Newcastle’s disease? Write all responses below. Probe with “Who else?” “Anyone in particular?”
8b. Kasi ni wantu mbani awo wakukana fundo yinu ya kupereka katemera wachidelu ku nkhuku zinu?

**[Perceived Access]**

9a. **Doers:** How difficult is it to get the materials that you need to **vaccinate your chickens against Newcastle’s disease**?

9a. Kasi ncha kusuzga uli kusanga vinthu vyakukhumbikira kupereka katemera wachidelu ku nkhuku zinu?

- A. Very difficult
- B. Somewhat difficult
- C. Not difficult at all

9b. **Non-Doers:** How difficult would it be to get the materials that you need to **vaccinate your chickens against Newcastle’s disease**?

9b. Kasi chingaba chakusuzga kaba kusanga vinthu vya kumovwirani kupereka katemera machidelu ku nkhuku zinu?

- A. Very difficult
- B. Somewhat difficult
- C. Not difficult at all

**[Perceived Cues for Action/Reminders]**

10a. **Doers:** How difficult is it to remember when to **vaccinate your chickens against Newcastle’s disease** every time you need to do it?

10a. Kasi nchakusuzga uli kukumbukira nyengo iyo mukwenera kupereka katemera machidelu ku nkhuku zinu?

- A. Very difficult
- B. Somewhat difficult
- C. Not difficult at all

10b. **Non-doers:** How difficult do you think it would be to remember when to **vaccinate your chickens against Newcastle’s disease** every time you need to do it?

10b. Kasi chingaba chakusuzga uli kukumbukira kupereka katemera machidelu ku nkhuku zinu nyengo yili yose iyo mukhumbenge?
[Perceived Susceptibility/Perceived Risk]

11. **Doers/Non-Doers**: How likely is it that your chickens will become infected by Newcastle’s Disease in the next year?

   11. Kasi na umo mukuolenala nkhuku zinu zingatolako chidetu chilimika chikwiza?

      - A. Very likely
      - B. Somewhat likely
      - C. Not likely at all

[Perceived Severity]

12. **Doers and Non-Doers**: How serious would it be for your chickens to be infected by Newcastle’s Disease?

   12. Kasi pangaba suzgo uli pala nkhuku zinu zakoleka na matenda gha chidelu?

      - A. Very serious
      - B. Somewhat serious
      - C. Not serious at all

[Perceived Action Efficacy]

13a. **Doers and Non-Doers**: How likely is it that your chickens would get Newcastle’s Disease if you did not vaccinate them?

   13a. Kasi pali mupata wa uli kuti nkhuku zinu zingakoleka na chidelu pala mulije kuzipa katemera?

      - A. Very likely
      - B. Somewhat likely
      - C. Not likely at all

[Perceived Divine Will]

14a. **Doers and Non-Doers**: Do you think that it is God’s will for chickens to get sick and die from Newcastle’s Disease?

   14a. Kasi mukughanaghana kuti nhumbiro la Chiuta kuti nkhuku zinu ziluwalenge matenda gha chidelu na kufwana?

      - A. Yes
[Policy]
15. **Doers/Non-Doers:** Are there any community laws or rules in place that you know of that encourage you to vaccinate your chickens against Newcastle’s disease? (If yes, what are they?)

15. Kasi ghaliko malango gha chikaya ghakouvwira kuchiska banthu kupereka katemera machidelu ku nkhuku zinu?

   - A. Yes
   - B. Maybe
   - C. No

   [If A., write all responses below.]

[Culture]
16. **Doers and Non-Doers:** Are there any cultural rules or taboos that you know of for or against vaccinating chickens against Newcastle’s disease? (If yes, what are they?)

16. Kasi ghilika mintondwe iyo ghikuzomerezga yayi kupereka katemera kunkhuku?

   - A. Yes
   - B. Maybe
   - C. No

   [If A., write all responses below.]

[Universal Motivators]
17. **Doers and Non-Doers:** What are the things that you want most in life? Write all responses below

17. Kasi ni vinthu uli ivyo mukukhumbisiska chomene pa umoyo winu?
Thank the respondent for his or her time!